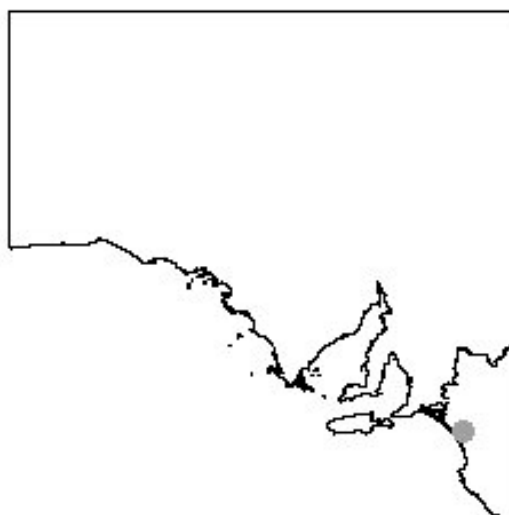


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A BIOLOGICAL SURVEY  
OF  
MESSENT CONSERVATION PARK  
SOUTH AUSTRALIA  
IN DECEMBER 1994

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by

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### **CARTOGRAPHY AND DESIGN**

**Biological Survey & Research Group, Resource Management Branch**

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**ISBN 0 7308 4690 3**

### **Cover Photograph**

**A sedgeland area bordered by stringybark woodland with a dense heath understorey, a combination of habitats typical of much of the south eastern part of Messent Conservation Park.**

**Photo: A.C. Robinson**

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# Abstract

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A one week survey of the vegetation and vertebrate fauna of Messent Conservation Park was undertaken in December 1994. This resulted in the recognition of

- Ten plant communities with 307 plant species (36 introduced)
- Sixteen mammal species (5 introduced)
- One hundred and thirty bird species (5 introduced)
- Eighteen reptile species.

The area of the south eastern part of the park which will be affected by a surface water drain proposed under the Upper South East Dryland Salinity and Flood Management Plan was studied intensively and a vegetation map was prepared covering this area.

This survey reinforces the conclusion that Messent Conservation Park is one of the largest and most significant areas of natural vegetation left in the Upper South East. With an area of 12 250 ha it is large enough to support populations of large animals such as Common Wombats and Emus as well as significant populations of rare plants and animals such as the large-fruit groundsel (*Senecio macrocarpus*) and the Southern Emu-wren (*Stipiturus malachurus*)

The proposed drain will result in the direct clearance of 43 ha of the parks' natural vegetation and will effectively isolate an area of 1 350 ha in the south east of the park. It is considered that five species of native mammals and nine species of birds could be affected through being isolated in this relatively small area of the park and at least some of these may be lost from this part of the park.

Clearly, on nature conservation grounds there can be no question of the adverse impact this proposed drain. If however a whole of Government decision is made to go ahead with construction through Messent Conservation Park a series of recommendations are made to reduce the biological impact of the drain. These include special requirements during construction and ongoing maintenance of the drain, provision of a series of revegetated access areas across the drain, revegetation to link the isolated area to other areas of natural vegetation to the south and monitoring of all these activities.



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## Messent Conservation Park Biological Survey

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# People Involved

Unlike previous biological surveys in this series the data contained in this report was collected over a one week period of field work in response to the need by DENR to acquire some biological information to enable the Department to better assess the potential conservation impact of a proposed surface water drain through the SE corner of Messent Conservation Park. To carry out this work a small team of people was developed under the supervision of the survey coordinator, Helen Owens. Each made a notable contribution in their field of expertise to the overall effectiveness of this short survey.

## 1. Fieldwork

### (a) Vegetation Survey

Personnel for this stage were; A. Dendy, P. Lang, A. Robinson and R. Taplin.

### (b) Vertebrate Survey

The groups contained a representative biologist in three taxonomic groups, birds (B), mammals (M), reptiles (R). They were; R. Foster (R), K. Martin (B) and H. Owens (M).

## 2. Specimen Identification

Plants: People nominated above, particularly P. Lang and R. Taplin with final determinations provided by the staff of the State Herbarium.

Mammals: H. Owens and C. Kemper and L. Queale at the S.A. Museum

Reptiles: R. Foster, H. Owens and M. Hutchinson at the S.A. Museum





# Introduction

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## 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. Previous surveys have been conducted or are currently in progress for 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), the Yellabinna area (1987), Kangaroo Island (1989 - 1990), Strezelecki Dunefields (1988 - 1992), Murray Mallee (1990 - 1991) Anangu Pitjantjatjara Lands (1991 -), the South Olary Plains (1991 - 1992) Diamantina River Area (1994) and the Stony Deserts (1994-). 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). In addition to these vegetation and vertebrate surveys, vegetation sampling analysis and mapping only has been completed or is in progress for the following areas:- South Mt Lofty Ranges (1986), Tallaringa Area (1988), Murray Mallee (1990), South-East (1991), Western Murray Flats (1991), Mid-North (1992), Burra Hills (1994) and Yorke Peninsula (1994).

The present survey differs somewhat from those listed above in that it was carried out in response to a need for biological information on Messent Conservation Park in order to adequately assess the possible impacts of a surface water drain proposed to be cut across the south east corner of the park as part of the Upper South East Dryland Salinity and Flood Management Plan (Upper South East Dryland Salinity and Flood Management Plan Steering Committee, 1993). Although it is a special purpose survey with more intensive sampling than the regional surveys conducted previously, the Messent Biological Survey utilised the standard sampling, analysis and presentation techniques developed as part of the Biological Survey of South Australia. It can therefore be considered as something of a model for the gathering in the future of more detailed biological information on relatively small and discrete areas such as conservation reserves in a systematic way which is completely compatible with existing biological survey information.

The location of Messent Conservation Park is shown in Fig. 1. The location of the park boundary, the present study area, and tracks within the conservation park in relation to the proposed route of the drain is shown in Fig. 2. The field work which covered 30 vegetation sample sites

twelve of which were also sampled for vertebrates was carried out from 12 to 17 December. The location of both the vegetation and the vegetation and vertebrate sample sites is shown in Fig. 2. A visual impression of the potential impact of the proposed drain is shown in Fig. 3.

Messent Conservation Park in the Northern Calcarene Ridges and Plains Environmental Region of Laut *et al.* (1977) falls almost entirely within the Messent Environmental Association (Fig. 1). It is described as 'an extensive calcarenite dune complex overlain with sand dunes. Many of the interdunal depressions are filled with water'. Examples of the range of environments in Messent Conservation Park are shown in Figs. 5-10 and in Appendix I

## PREVIOUS BIOLOGICAL STUDIES

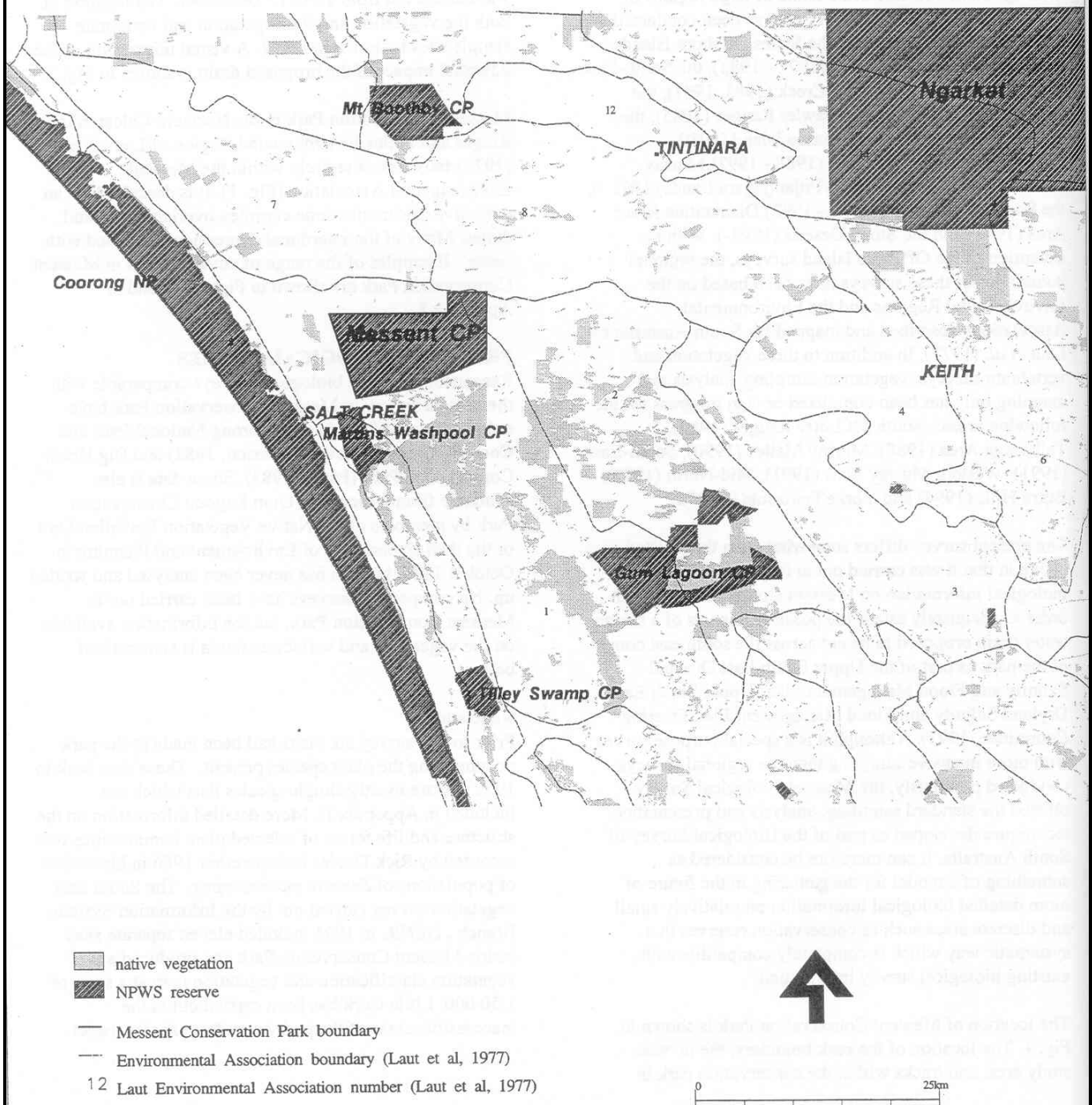
Reasonably detailed biological surveys comparable with the present survey in Messent Conservation Park have only been carried out in the Coorong National Park and Coorong Game Reserve (Robinson, 1982) and Big Heath Conservation Park (Paton, 1983). Some data is also available from a survey of Gum Lagoon Conservation Park by members of the Native Vegetation Retention Unit of the then Department of Environment and Planning in October 1984, but this has never been analysed and written up. No comparable surveys have been carried out in Messent Conservation Park, but the information available on the vegetation and vertebrate fauna is summarised below.

### Vegetation

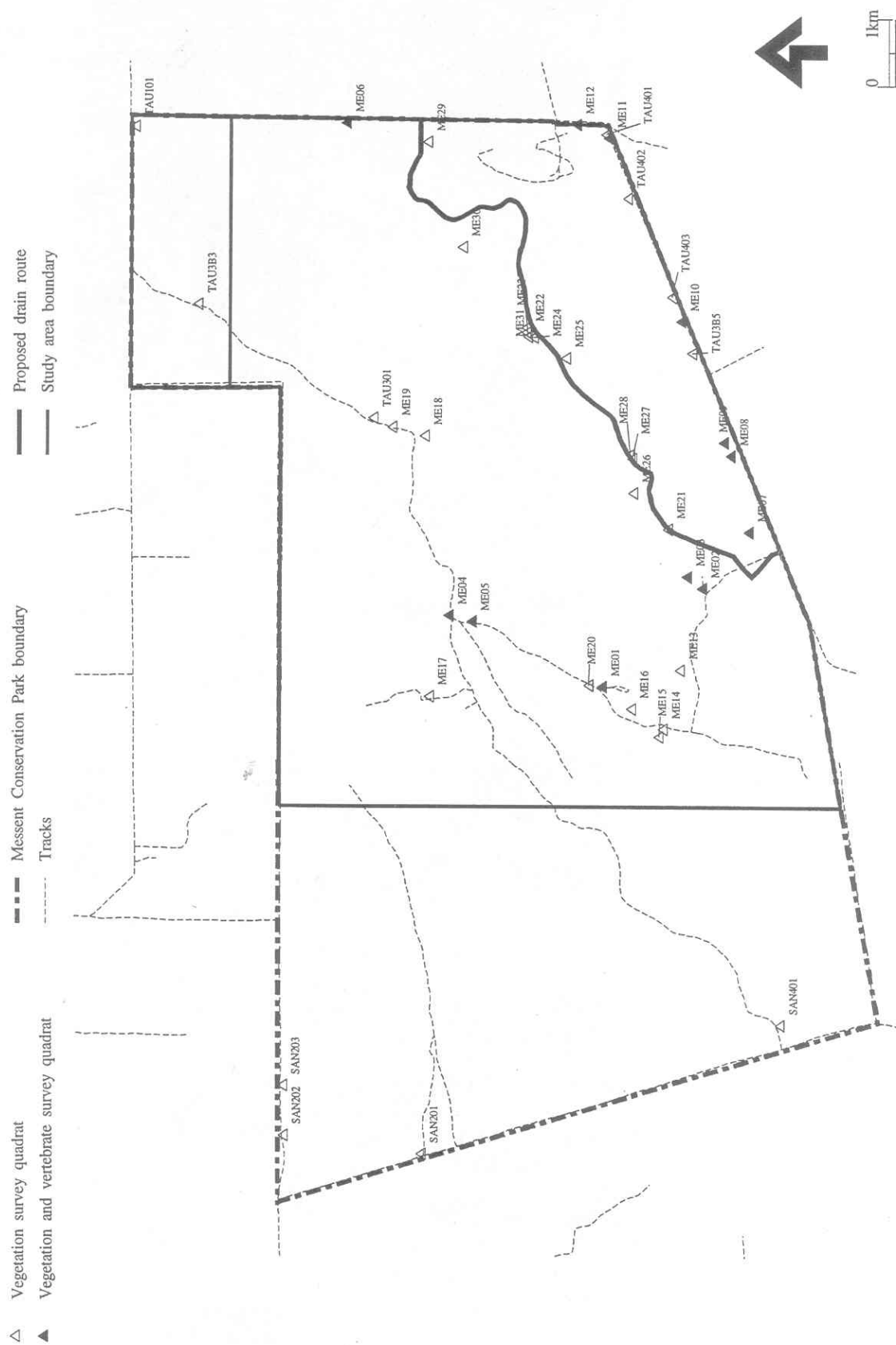
Prior to this survey six visits had been made to the park documenting the plant species present. These date back to 1979 and are mostly simple species lists which are included in Appendix II. More detailed information on the structure and life forms of selected plant communities was recorded by Rick Davies in September 1986 in his studies of populations of *Senecio macrocarpus*. The South East vegetation survey carried out by the Information Systems Branch, DENR, in 1991 included eleven separate sites inside Messent Conservation Park and produced a vegetation classification and vegetation map at a scale of 1:50 000. Little work has been carried out in the inaccessible areas of the park away from access tracks.

# Figure 1

The location of Messent Conservation Park and other areas of natural vegetation



**Figure 2**  
The location of survey sites, tracks and proposed drain within Messent CP







**Figure 3**  
**A view North across Messent Conservation Park from the Southern boundary showing the proposed drain route**

## Vertebrates

The vertebrate data available for the park prior to the current survey is very limited and far from comprehensive and are detailed in Appendices III, IV and V. Birds have been surveyed in the greatest depth with eleven separate visits since 1951. Some of these have only been short visits and most have been concentrated along the access tracks. Records for mammals, reptiles and amphibians are

restricted to a few observations with almost no trapping effort. The Common Wombat, *Vombatus ursinus*, is the only species occurring within the park that has been studied in any depth (Mallett and Cooke 1986).

This biological survey is the first time that a systematic overview of the vegetation and vertebrate communities of the park has been undertaken.



# Methods

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The rationale behind these regional biological surveys has been explained in detail by Copley and Kemper (1992) 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 Messent Conservation Park survey was the first to concentrate on a relatively small and isolated area 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 Messent Conservation Park was designed with the following aims;

- 1) To collate all previous information on the vegetation and vertebrate fauna of Messent C.P.
- 2) To plan and carry out a biological survey in December 1994, of an area of Messent C.P. around the proposed drain route using techniques and standards established for the Biological Survey of South Australia.
- 3) To include appropriately skilled volunteer biologists to assist with the field survey
- 4) To permanently mark all biological survey sites to enable them to be used to monitor changes should the proposed drain be built.
- 5) To provide the S.A.Museum with a set of properly documented voucher specimens of the reptiles and small mammals collected during the survey.

- 6) To provide the State Herbarium with properly documented voucher specimens of the vascular plants collected during the survey.
- 7) To prepare and digitise a 1:10 000 scale vegetation map of the study area using the best and most recent aerial photography available.
- 8) Enter all survey data into the South Australian Survey Database.
- 9) To carry out a pattern analysis of the vegetation data collected on the survey to define plant communities using techniques established by the Biological Survey of South Australia.
- 10) To prepare a consolidated report on the survey including the community analysis and vegetation map using standards already established for reporting on the Biological Survey of South Australia

a) **Site Selection and Nomenclature**

Park survey was designed to assess the potential impact of a proposed surface water drain through the park some changes were made to the site selection process. Here, the whole study area on the park was considered to be a single SITE designated with the code ME. Given the time available for the survey it was determined that a maximum of 12 vegetation and vertebrate sampling quadrats could be established. Six of these quadrats were to be to the north of the proposed drain route and six to the south within the area of the SE corener of the park that would be isolated by the drain. An attempt was made to pair sites to the N and S of the proposed drain route according to habitat and these paired quadrats and the habitat they were chosen to represent are shown in Table 1

**Table 1**

Paired vegetation and vertebrate sampling quadrats to the N and S of the proposed drain route. The names of vegetation types follow the South East Vegetation Survey in 1991 (L. Heard pers. comm).

VEGETATION ASSOCIATION	NORTH	SOUTH
<i>Baumea juncea</i> / <i>Leptocarpus brownii</i> Sedgeland	1	7
Sedgeland / Woodland ecotone	5	8
<i>Gahnia filum</i> / <i>Samolus repens</i> Tall Open Sedgeland	6	2
<i>Eucalyptus arenacea</i> / <i>E.fasciculosa</i> Low Woodland	3	9
<i>Banksia ornata</i> Heath	6	11
<i>Eucalyptus diversifolia</i> Mallee Woodland	4	10

An additional nineteen quadrats were sampled for vegetation only, to expand coverage of the range of habitats in the area potentially affected by the proposed drain. The vegetation survey of the South East in 1991 also sampled an additional 11 vegetation quadrats within Messent Conservation Park (prefixed with SA and TA on Fig. 2) and these, with appropriate adjustments to the species lists to

account for the different times of year of sampling were included in the overall vegetation analysis. The location of all this total of 42 quadrats is shown in Fig 2.

The maximum and minimum temperatures over the survey period are shown in Table 2.

**Table 2**

Temperature recorded during the biological survey of Messent Conservation Park

DATE	SHADE		COMMENTS
	MAX(oC)	MIN(oC)	
12/12/94			Hot day.
13/12/94	24		Drizzle in morning.
14/12/94	27	2	Cold night; fine, warm, day.
15/12/94	29	4	Fine, warm, day.
16/12/94	27	3.5	Fine, warm, day.
17/12/94		1	Fine, warm, day.

#### b) Data Collection

On the vegetation survey, standard data sheets were filled out which included a description of the location and physical environment and the vegetation within the 30 X 30m. area of each quadrat. All vascular plants present in the quadrat were recorded and a herbarium specimen of each species encountered was collected. 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. At each of the twelve quadrats sampled for vertebrates, a 50 m long line of six fenced pitfall traps was established. 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.

A separate line of 15 Elliott traps was run in association with each pitfall line sampling the same habitat within the quadrat, and two possum/cat size traps were placed at each end. A line of 6 micro-pitfalls consisting of plastic vials measuring 80 X 20mm and filled with 70% alcohol were set adjacent to the main pitfall line. All traplines were run for four nights. Reptiles and mammals were also sampled by searching each of the twelve quadrats at least once during the sampling period.

Birds were recorded for each quadrat. An observer spent from one to several hours during the best bird observation times of early morning and evening 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.

A permanent photographic monitoring point was established at each of the twelve vertebrate sampling



quadrats using two 1.4 m long steel posts set 10m apart. The standard photographs are in Appendix I.

Observations of some plants and vertebrates (especially birds and bats) encountered outside quadrats were recorded on special "opportunistic" data sheets. The limited time of sampling prevented any exhaustive inventories of bat communities; and although a harp trap was set up no bats were caught.

At least the first specimen of each small mammal and reptile species recorded for the survey area was preserved as a museum specimen. Larger species (ie. *Varanus rosenbergi*) which had been collected from the general region in the past and did not present any identification problems were not collected.

A small amount of vehicle and walking spotlight searching was carried out both on the quadrats and

opportunisticly 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. Tissue samples from all mammals and reptiles are permanently stored at the Museum.

Invertebrates were collected from the micro-pitfall and larger vertebrate pitfall traps or opportunisticly around each quadrat. These samples were lodged with the South Australian Museum.

A summary of the sampling effort over the whole survey is given in Table 3.

**Table 3**

Trapping and spotlighting effort during the Messent Conservation Park biological survey, December 1994

SITE	Pit Trap Nights	Elliott Trap Nights	Cage Trap Nights	Vehicle Spotlight Hours	Harp Trap Nights
ME0101	24	60	8		
ME0201	24	60	8		
ME0301	24	60	8		
ME0401	24	60	8		
ME0501	24	60	8		
ME0601	24	60	8		
ME0701	24	60	8		
ME0801	24	60	8		
ME0901	24	60	8		
ME1001	24	60	8		
ME1101	24	60	8		
ME1201	24	60	8		
OPPORTUNISTIC				3	3
TOTALS	288	720	96	3	3

The total number of observations of plants and vertebrates during the survey are shown in Table 4. It is

this data base for the plants which forms the basis for the vegetation community analysis presented in this report.

**Table 4**

Numbers of individual observations of plants and vertebrates during the Messent Conservation Park biological survey, December 1994.

	Quadrats		Opportunistic	Total
Plants	889	(31 sites)	9	898
Mammals	86	(12 sites)	13	99
Birds	201	(12 sites)	41	242
Reptiles	71	(12 sites)	8	79
Amphibians	0	(12 sites)	0	0

c) **Data Analysis**

Vegetation types and trends were determined using classification and ordination techniques described in Robinson et al (1988) , Copley and Kemper (1992).

The Messent Conservation Park vegetation data was analysed using the PATN software package to examine patterns and trends in the data (Belbin, 1987a, b, c) and ESRI's ARC/INFO Geographical Informations System software to display species and group distributions and analyse geographic trends in the data. The analysis pathway using PATN is detailed in Copley and Kemper (1992).

d) **Vegetation Mapping**

A special aerial photographic coverage of Messent C.P. was commissioned prior to this survey and was flown at 1:47 000 (Svy 4878). A colour enlargement of the study area at a scale of approximately 1:10 000 was then made. Preliminary vegetation mapping was carried out on this enlarged photo during the field survey and, following the floristic vegetation analysis, this was refined and completed. These vegetation boundaries were then transferred to a mylar film with an identically scaled plot of roads, tracks and the park boundary to allow the photographic distortion to be geographically corrected.. The vegetation map on this mylar base was then digitised using ARC-INFO software to produce the final vegetation map included in the pocket inside the back cover of this report.

# Results

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## VEGETATION

There are a number of sources of plant species lists for Messent Conservation Park and these are detailed in Appendix II. There has been an as yet unpublished vegetation floristic classification and 1:50 000 vegetation mapping programme completed for the South East Region (Heard pers comm) and these floristic group definitions and maps formed the basis for the present 1:10 000 mapping project. Where appropriate, vegetation types defined for the South East vegetation mapping survey were used but some of these types were further sub-divided for this more detailed mapping of a part of Messent Conservation Park. See Table 6 for the details of correspondence between the 1:50 000 and 1:10 000 vegetation mapping.

### Floristic Vegetation Analysis

Only those plants that would have been sampled consistently on both the winter/spring South East Survey and this survey in early summer were included in the floristic analysis. This reduced the number of species from 213 to 147 species. The final analysis was therefore conducted on 147 species occurring at 42 quadrats (11 from the South east vegetation survey and 31 from the present survey) and a total of 1158 plant records. The quadrats were grouped into 10 community types as shown on the dendrogram (Fig.4). The relationship between species and quadrats is shown in the two-way table (Table 5).

The ten floristic plant communities are discussed in detail below and information on each is presented in a standard format. The typical quadrats reference guides the reader to a photograph typical of the particular floristic community either in this chapter or in Appendix I.

The listing shows:

The floristic Group number.

A structural name following Specht et al (1974) corresponding to the categories shown on the vegetation map.

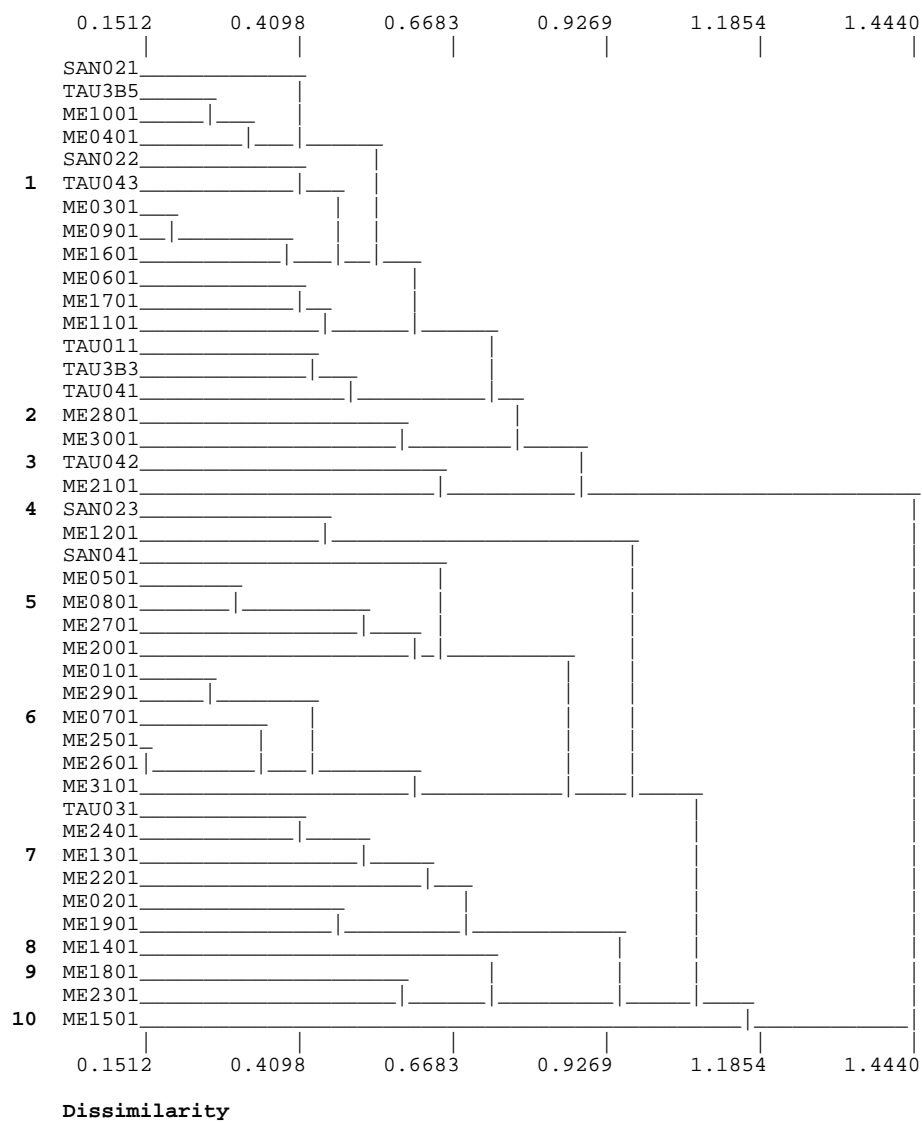
The dominant overstorey species defined as having a proportion of occurrence of greater than or equal to 0.50, a large lifeform size and a high value of chi square for average abundance. The chi square values indicate whether the species is likely to occur in the group by chance alone. The higher the value the more likely the species is representative of a group or a number of groups. A species

that occurs with the same frequency across all groups has a chi square value close to 0. A species that occurs more frequently in one or two groups and is absent in all others will have a large chi square value and hence is likely to be good indicator species for a particular floristic group.

The indicator species for each floristic group are defined as species having a proportion of occurrence greater than or equal to 0.40 and with a chi square of not less than 1.00 for average abundance

Structural data for the overall floristic group.

A floristic group species list with statistics on the average abundance and proportion of occurrence (including chi square values for both). Frequency data is also provided for the Braun-Blanquet cover/abundance scores. Only species that occurred at greater than or equal to 40% of the sites are listed.



**Figure 4**  
**Dendrogram of floristic groups from the**  
**vegetation analysis of Messent Conservation Park.**

**Table 5 A Two-way Table of the Floristic analysis of Messent Conservation Park**

	QUADRAT GROUP									
	1	2	3	4	5	6	7	8	9	10
STMMSTMMMMMTTMM.TM.SM.SMMMM.MMMMM.TMMMM.M.MM.M										
AAAAAEEEEEEAAA.EE.AE.AE.AEEEE.EEEEE.AEEEE.E.EE.E										
NU10NU001011UUU.23.U2.N1.N0022.020223.U21201.1.12.1										
030400396671030.80.01.02.05870.197561.043229.4.83.5										
2B00240000001B4.00.40.20.40000.000000.300000.0.00.0										
151123111111131.11.21.31.11111.111111.111111.1.11.1										
Acacia longifolia var. sophorae										*
Clematis microphylla										*
Isolepis nodosa										*
Myoporum insulare										*
Rhagodia candolleana ssp. candolleana										*
Kunzea pomifera	*		*	*	***	*	*	*	*	*
Acacia pycnantha					**		*			*
Eucalyptus fasciculosa	*	*		*			*			*
Myoporum parvifolium								*		*
Pteridium esculentum										*
Thomasia petalocalyx				*	**		*	*	*	*
Acaena novae-zelandiae									*	*
Marrubium vulgare								*		*
Solanum simile								*		*
Dianella revoluta var. brevicaulis										*
Muehlenbeckia gunnii										*
Verbascum virgatum										*
Olearia axillaris										*
Acacia myrtifolia var. myrtifolia	***		*	**						*
Isopogon ceratophyllus	*****	**	*	**	*		*			*
Calytrix alpestris	*****	***	*	*	*					*
Styphelia exarrhena	*****	**	**	*	*	*				*
Eucalyptus incrassata	*****	***	*	*	*	*				*
Allocasuarina muelleriana ssp. muelleriana	*****	*	*	*	*	*				*
Eucalyptus diversifolia	*****	*	*	*	*	*				*
Cassythia pubescens	*	***	***	*	*	*				*
Eucalyptus leptophylla	*	***	*	*	*	*				*
Hakea rostrata	***	*	***	*	*	*				*
Eucalyptus arenacea		****	*	*	*	*				*
Phyllota pleurandroides	***	*****	*	*	*	*				*
Phyllota remota		*****	*	*	*	*	*			*
Acacia spinescens	****	***	*	*	*	*	*	*		*
Banksia marginata	*	***	*	*****	*	*	*	*		*
Xanthosia dissecta var. floribunda	*****	*****	*	*	*	*	*	*		*
Hibbertia sericea var.	*****	*****	*	*	*	*	*	*		*
Lepidosperma carphoides	*****	*****	*	*	*	*	*	*		*
Pultenaea tenuifolia	*	*	*****	*	*	*	*	*	*	*
Adenanthos terminalis	*****	*****	*	*	*	*	*	*		*
Lepidobolus drapetocoleus	****	*****	*	*	*	*	*	*		*
Correa reflexa var. reflexa	*****	*****	*	*	*	*	*	*		*
Xanthorrhoea caespitosa	*****	*****	*	*	*	*	*	*		*
Leptospermum myrsinoides	*****	*****	*	*	*	*	*	*		*
Hibbertia riparia (glabriuscula)	*****	*****	*	*	*	*	*	*		*
Lepidosperma concavum	*	***	*****	*	*	*	*	*		*
Allocasuarina pusilla	*****	*****	*	*	*	*	*	*		*
Hypolaena fastigiata	***	*****	*****	*	*	*	*	*		*
Boronia coerulescens ssp. coerulescens	*****	*****	*	*	*	*	*	*		*
Daviesia brevifolia	*****	*****	*	*	*	*	*	*		*
Leucopogon costatus	*****	*****	*	*	*	*	*	*		*
Schoenus breviculmis	*****	*****	*	*	*	*	*	*		*
Banksia ornata	*****	*****	*	*	*	*	*	*		*
Acrotriche serrulata	*	*	*	*	*	*	*	*		*
Astroloma humifusum	***	*	*	*	*	*	*	*		*
Leucopogon clelandii	*	*	*	*	*	*	*	*		*
Stipa mollis group	*	*	*	*	*	*	*	*		*
Astroloma conostephioides	*****	*****	*	*	*	*	*	*		*
Baeckea ericaea	*	*	*	*	*	*	*	*		*
Cassythia glabella forma dispar	*****	*****	*	*	*	*	*	*		*
Gonocarpus tetragynus	*	*****	*	*	*	*	*	*		*
Hakea muelleriana	*	***	*****	*	*	*	*	*		*
Cryptandra tomentosa	***	*****	*	*	*	*	*	*		*
Dillwynia hispidula	*	*	*	*	*	*	*	*		*
Spyridium subochreatum var.	****	***	***	*	*	*	*	*		*
Acrotriche affinis	*	*	*	*	*	*	*	*		*
Goodenia geniculata		**	***	*	*	*	*	*		*
Hibbertia virgata	*	*	*	*	*	*	*	*		*
Olearia lanuginosa				*	*	*	*	*		*
Pultenaea vestita				*	*	*	*	*		*

	QUADRAT GROUP									
	1	2	3	4	5	6	7	8	9	10
STMMSTMMMMMTTMM.TM.SM.SMMMM.MMMMM.TMMMM.M.MM.M										
AAAAAEEEEEEAAA.EE.AE.AE.AEEEE.EEEEE.AEEEE.E.EE.E										
NU10NU001011UUU.23.U2.N1.N0022.020223.U21201.1.12.1										
030400396671030.80.01.02.05870.197561.043229.4.83.5										
2B00240000001B4.00.40.20.40000.000000.300000.0.00.0										
151123111111131.11.21.31.11111.111111.111111.1.11.1										



# WOODLAND AND HEATHLAND GROUPS

**Floristic Group:** 10 *Eucalyptus fasciculosa* Low Woodland

1 member

## Dominant Overstorey Species:

*Eucalyptus fasciculosa*, *Acacia longifolia* var *sophorae*, *Myoporum insulare*

## Indicator and Sub-dominant Species:

*Pteridium esculentum*, *Myoporum parvifolium*, *Acacia pycnantha*, *Thomasia petalocalyx*

**Typical Quadrat:** ME 15 Figure 5

Species Name	Cover/Abundance									
	R	T	1	2	3	4	5	Avg	Chi	Prop
								Ab.	Sq.	Occ.
										Sq.
<i>Acacia longifolia</i> var. <i>sophorae</i>	0	0	1	0	0	0	0	1.00	8.10	1.00
<i>Acacia pycnantha</i>	0	0	0	1	0	0	0	2.00	12.00	1.00
<i>Acaena novae-zelandiae</i>	0	1	0	0	0	0	0	0.10	0.32	1.00
<i>Billardiera cymosa</i>	0	1	0	0	0	0	0	0.10	0.25	1.00
<i>Clematis microphylla</i>	0	0	1	0	0	0	0	1.00	8.10	1.00
<i>Dianella revoluta</i> var. <i>brevicaulis</i>	0	1	0	0	0	0	0	0.10	0.81	1.00
<i>Eucalyptus fasciculosa</i>	0	0	0	0	1	0	0	3.00	20.38	1.00
<i>Isolepis nodosa</i>	0	0	1	0	0	0	0	1.00	8.10	1.00
<i>Kunzea pomifera</i>	0	0	1	0	0	0	0	1.00	6.00	1.00
<i>Melaleuca brevifolia</i>	0	1	0	0	0	0	0	0.10	0.39	1.00
<i>Muehlenbeckia gunnii</i>	0	1	0	0	0	0	0	0.10	0.81	1.00
<i>Myoporum insulare</i>	0	0	1	0	0	0	0	1.00	8.10	1.00
<i>Myoporum parvifolium</i>	0	0	0	1	0	0	0	2.00	15.26	1.00
<i>Olearia axillaris</i>	0	1	0	0	0	0	0	0.10	0.48	1.00
<i>Pteridium esculentum</i>	0	0	0	1	0	0	0	2.00	16.20	1.00
<i>Rhagodia candolleana</i> ssp. <i>candolleana</i>	0	0	1	0	0	0	0	1.00	8.10	1.00
<i>Thomasia petalocalyx</i>	0	0	0	1	0	0	0	2.00	10.55	1.00
<i>Verbascum virgatum</i>	0	1	0	0	0	0	0	0.10	0.81	1.00

**Floristic Group:** 2 *Eucalyptus incrassata*, *E. leptophylla*, *E. arenacea* Tall Open Shrubland

2 members

## Dominant Overstorey Species:

*Eucalyptus incrassata*, *E. leptophylla*

## Indicator and Sub-dominant Species:

*Hakea repullans*, *Acrotriche serrulata*, *Stylidium graminifolium*

**Typical Quadrat:** ME 28 Figure 6

Species Name	Cover/Abundance									
	R	T	1	2	3	4	5	Avg	Chi	Prop
								Ab.	Sq.	Occ.
										Sq.
<i>Acrotriche serrulata</i>	0	2	0	0	0	0	0	0.10	0.22	1.00
<i>Allocasuarina pusilla</i>	0	2	0	0	0	0	0	0.10	0.01	1.00
<i>Astroloma conostephioides</i>	0	2	0	0	0	0	0	0.10	0.13	1.00
<i>Banksia marginata</i>	0	2	0	0	0	0	0	0.10	0.01	1.00
<i>Banksia ornata</i>	0	0	0	1	0	1	0	3.00	7.26	1.00
<i>Boronia coerulescens</i> ssp. <i>coerulescens</i>	0	2	0	0	0	0	0	0.10	0.01	1.00
<i>Correa reflexa</i> var. <i>reflexa</i>	0	2	0	0	0	0	0	0.10	0.04	1.00
<i>Daviesia brevifolia</i>	0	2	0	0	0	0	0	0.10	0.01	1.00
<i>Eucalyptus arenacea</i>	0	1	0	1	0	0	0	1.05	5.29	1.00



**Figure 5. *Eucalyptus fasciculosa* Low Woodland at vegetation quadrat ME 15**  
**Photo A.Robinson**



**Figure 6. *Eucalyptus incrassata* / *E. leptophylla* / *E. arenacea* Tall Open Shrubland at vegetation quadrat ME 28. Photo A.Robinson**



Species Name	Cover/Abundance										
	R	T	1	2	3	4	5	Avg Ab.	Chi Sq.	Prop Occ.	Chi Sq.
<i>Eucalyptus incrassata</i>	0	1	0	1	0	0	0	1.05	2.41	1.00	2.97
<i>Eucalyptus leptophylla</i>	0	2	0	0	0	0	0	0.10	0.05	1.00	2.41
<i>Gonocarpus tetragynus</i>	0	2	0	0	0	0	0	0.10	0.00	1.00	1.39
<i>Hibbertia riparia</i> (glabriuscula)	0	2	0	0	0	0	0	0.10	0.03	1.00	1.16
<i>Hibbertia sericea</i> var.	0	1	1	0	0	0	0	0.55	0.23	1.00	0.88
<i>Hypolaena fastigiata</i>	0	0	2	0	0	0	0	1.00	2.40	1.00	1.60
<i>Isopogon ceratophyllus</i>	0	2	0	0	0	0	0	0.10	0.00	1.00	1.67
<i>Lepidosperma carphoides</i>	0	1	1	0	0	0	0	0.55	0.05	1.00	0.43
<i>Lepidosperma concavum</i>	0	2	0	0	0	0	0	0.10	0.00	1.00	1.89
<i>Leptospermum myrsinoides</i>	0	2	0	0	0	0	0	0.10	0.05	1.00	1.26
<i>Leucopogon costatus</i>	0	2	0	0	0	0	0	0.10	0.02	1.00	1.26
<i>Spyridium subochreatum</i> var.	0	2	0	0	0	0	0	0.10	0.00	1.00	1.39
<i>Xanthorrhoea caespitosa</i>	0	2	0	0	0	0	0	0.10	0.03	1.00	1.85
<i>Xanthosia dissecta</i> var. floribunda	0	2	0	0	0	0	0	0.10	0.02	1.00	0.90
<i>Acacia myrtifolia</i> var. myrtifolia	0	1	0	0	0	0	0	0.05	0.03	0.50	0.64
<i>Acacia spinescens</i>	0	1	0	0	0	0	0	0.05	0.03	0.50	0.20
<i>Adenanthos terminalis</i>	0	1	0	0	0	0	0	0.05	0.06	0.50	0.19
<i>Allocasuarina mackliniana</i> ssp. xerophila	0	1	0	0	0	0	0	0.05	0.01	0.50	0.67
<i>Allocasuarina muelleriana</i> ssp. muelleriana	0	1	0	0	0	0	0	0.05	0.11	0.50	0.29
<i>Argentipallium obtusifolium</i>	0	1	0	0	0	0	0	0.05	0.00	0.50	0.37
<i>Astroloma humifusum</i>	0	1	0	0	0	0	0	0.05	0.00	0.50	0.18
<i>Baeckea ericaea</i>	0	1	0	0	0	0	0	0.05	0.01	0.50	1.68
<i>Calytrix alpestris</i>	0	1	0	0	0	0	0	0.05	0.02	0.50	0.78
<i>Cassytha glabella</i> forma dispar	0	1	0	0	0	0	0	0.05	0.09	0.50	0.00
<i>Cassytha pubescens</i>	0	0	1	0	0	0	0	0.50	2.30	0.50	0.85
<i>Cryptandra tomentosa</i>	0	1	0	0	0	0	0	0.05	0.00	0.50	0.57
<i>Dillwynia hispida</i>	0	1	0	0	0	0	0	0.05	0.01	0.50	0.37
<i>Exocarpos sparteus</i>	0	1	0	0	0	0	0	0.05	0.00	0.50	1.10
<i>Hakea muelleriana</i>	0	1	0	0	0	0	0	0.05	0.01	0.50	0.18
<i>Hakea repullulans</i>	0	1	0	0	0	0	0	0.05	0.41	0.50	4.05
<i>Kunzea pomifera</i>	0	1	0	0	0	0	0	0.05	0.05	0.50	0.05
<i>Lepidobolus drapetocoleus</i>	0	1	0	0	0	0	0	0.05	0.01	0.50	1.05
<i>Leptocarpus brownii</i>	0	0	1	0	0	0	0	0.50	0.21	0.50	0.02
<i>Leucopogon clelandii</i>	0	1	0	0	0	0	0	0.05	0.00	0.50	0.78
<i>Persoonia juniperina</i>	0	1	0	0	0	0	0	0.05	0.09	0.50	0.93
<i>Phyllota pleurandroides</i>	0	0	1	0	0	0	0	0.50	0.96	0.50	0.57
<i>Phyllota remota</i>	0	1	0	0	0	0	0	0.05	0.01	0.50	0.47
<i>Pultenaea tenuifolia</i>	0	0	1	0	0	0	0	0.50	0.06	0.50	0.04
<i>Schoenus breviculmis</i>	0	1	0	0	0	0	0	0.05	0.13	0.50	0.08
<i>Stipa mollis</i> group	0	1	0	0	0	0	0	0.05	0.01	0.50	0.06
<i>Stylidium graminifolium</i>	0	1	0	0	0	0	0	0.05	0.30	0.50	3.01
<i>Styphelia exarrhena</i>	0	1	0	0	0	0	0	0.05	0.02	0.50	0.49

**Floristic Group:** 3 *Eucalyptus diversifolia* Tall Open Shrubland

2 members

**Dominant Overstorey Species:**

*Eucalyptus diversifolia*, *E. leptophylla*

**Indicator and Sub-dominant Species:**

*Hakea vittata*, *Dianella revoluta* var *revoluta*, *Logania linifolia*, *Lepidosperma viscidum*, *Lomandra collina*, *Lomandra effusa*, *Lomandra micrantha* ssp., *Acacia myrtifolia* var *myrtifolia*

**Typical Quadrat:** ME 21 Figure 7

Species Name	Cover/Abundance										
	R	T	1	2	3	4	5	Avg Ab.	Chi Sq.	Prop Occ.	Chi Sq.
<i>Acacia myrtifolia</i> var. <i>myrtifolia</i>	0	1	0	1	0	0	0	1.05	7.86	1.00	4.05
<i>Acacia spinescens</i>	0	1	1	0	0	0	0	0.55	1.97	1.00	1.97

<i>Acrotriche cordata</i>	0	0	1	1	0	0	0	1.50	11.64	1.00	4.68
<i>Allocastrum muelleriana</i> ssp. <i>muelleriana</i>	0	1	0	1	0	0	0	1.05	3.78	1.00	2.46
<i>Cassytha glabella</i> forma <i>dispar</i>	0	2	0	0	0	0	0	0.10	0.04	1.00	0.47
<i>Correa reflexa</i> var. <i>reflexa</i>	0	1	1	0	0	0	0	0.55	0.75	1.00	0.94
<i>Daviesia brevifolia</i>	0	2	0	0	0	0	0	0.10	0.01	1.00	1.03
<i>Eucalyptus diversifolia</i>	0	0	0	1	1	0	0	2.50	15.39	1.00	5.28
<i>Eucalyptus leptophylla</i>	0	2	0	0	0	0	0	0.10	0.05	1.00	2.41
<i>Hakea muelleriana</i>	0	2	0	0	0	0	0	0.10	0.01	1.00	1.89
<i>Hakea vittata</i>	0	0	2	0	0	0	0	1.00	7.37	1.00	6.45
<i>Hibbertia sericea</i> var.	0	0	2	0	0	0	0	1.00	1.75	1.00	0.88
<i>Isopogon ceratophyllus</i>	0	1	1	0	0	0	0	0.55	2.48	1.00	1.67
<i>Lepidosperma carphoides</i>	0	0	2	0	0	0	0	1.00	0.86	1.00	0.43
<i>Logania linifolia</i>	0	2	0	0	0	0	0	0.10	0.09	1.00	4.68
<i>Lomandra juncea</i>	0	2	0	0	0	0	0	0.10	0.39	1.00	3.94
<i>Spyridium subochreatum</i> var.	0	1	1	0	0	0	0	0.55	1.82	1.00	1.39
<i>Xanthosia dissecta</i> var. <i>floribunda</i>	0	1	1	0	0	0	0	0.55	0.92	1.00	0.90
<i>Acrotriche serrulata</i>	0	1	0	0	0	0	0	0.05	0.02	0.50	0.51
<i>Adenanthos terminalis</i>	0	1	0	0	0	0	0	0.05	0.06	0.50	0.19
<i>Argentipallium obtusifolium</i>	0	1	0	0	0	0	0	0.05	0.00	0.50	0.37
<i>Astroloma conostephioides</i>	0	1	0	0	0	0	0	0.05	0.01	0.50	0.18
<i>Astroloma humifusum</i>	0	1	0	0	0	0	0	0.05	0.00	0.50	0.18
<i>Banksia marginata</i>	0	0	1	0	0	0	0	0.50	1.09	0.50	0.16
<i>Billardiera cymosa</i>	0	1	0	0	0	0	0	0.05	0.03	0.50	0.30
<i>Boronia coerulescens</i> ssp. <i>coerulescens</i>	0	1	0	0	0	0	0	0.05	0.05	0.50	0.09
<i>Calytrix alpestris</i>	0	0	1	0	0	0	0	0.50	1.86	0.50	0.78
<i>Calytrix tetragona</i>	0	1	0	0	0	0	0	0.05	0.00	0.50	0.97
<i>Cassytha pubescens</i>	0	1	0	0	0	0	0	0.05	0.01	0.50	0.85
<i>Choretrum glomeratum</i> var. <i>glomeratum</i>	0	1	0	0	0	0	0	0.05	0.20	0.50	1.97
<i>Dianella revoluta</i> var. <i>revoluta</i>	0	1	0	0	0	0	0	0.05	0.41	0.50	4.05
<i>Dillwynia hispida</i>	0	0	1	0	0	0	0	0.50	2.04	0.50	0.37
<i>Eucalyptus fasciculosa</i>	0	1	0	0	0	0	0	0.05	0.25	0.50	0.57
<i>Eucalyptus incrassata</i>	0	0	0	1	0	0	0	1.00	2.11	0.50	0.40
<i>Exocarpos sparteus</i>	0	0	1	0	0	0	0	0.50	3.39	0.50	1.10
<i>Gonocarpus tetragynus</i>	0	1	0	0	0	0	0	0.05	0.02	0.50	0.09
<i>Goodenia geniculata</i>	0	1	0	0	0	0	0	0.05	0.00	0.50	1.52
<i>Grevillea ilicifolia</i> var. <i>ilicifolia</i>	0	1	0	0	0	0	0	0.05	0.30	0.50	3.01
<i>Hibbertia riparia</i> ( <i>glabriuscula</i> )	0	1	0	0	0	0	0	0.05	0.09	0.50	0.06
<i>Hypolaena fastigiata</i>	0	1	0	0	0	0	0	0.05	0.15	0.50	0.13
<i>Kunzea pomifera</i>	0	1	0	0	0	0	0	0.05	0.05	0.50	0.05
<i>Lepidosperma concavum</i>	0	1	0	0	0	0	0	0.05	0.03	0.50	0.18
<i>Lepidosperma viscidum</i>	0	1	0	0	0	0	0	0.05	0.41	0.50	4.05
<i>Leptospermum myrsinoides</i>	0	0	1	0	0	0	0	0.05	0.47	0.50	0.07
<i>Leucopogon costatus</i>	0	1	0	0	0	0	0	0.05	0.07	0.50	0.07
<i>Leucopogon woodsii</i>	0	1	0	0	0	0	0	0.05	0.06	0.50	1.05
<i>Lomandra collina</i>	0	1	0	0	0	0	0	0.05	0.41	0.50	4.05
<i>Lomandra effusa</i>	0	1	0	0	0	0	0	0.05	0.41	0.50	4.05
<i>Lomandra micrantha</i> ssp.	0	1	0	0	0	0	0	0.05	0.41	0.50	4.05
<i>Olearia ciliata</i> var. <i>ciliata</i>	0	1	0	0	0	0	0	0.05	0.02	0.50	1.68
<i>Persoonia juniperina</i>	0	1	0	0	0	0	0	0.05	0.09	0.50	0.93
<i>Phyllota pleurandroides</i>	0	1	0	0	0	0	0	0.05	0.06	0.50	0.57
<i>Pultenaea acerosa</i>	0	0	1	0	0	0	0	0.50	3.86	0.50	2.64
<i>Pultenaea tenuifolia</i>	0	0	1	0	0	0	0	0.50	0.06	0.50	0.04
<i>Schoenus breviculmis</i>	0	1	0	0	0	0	0	0.05	0.13	0.50	0.08
<i>Schoenus deformis</i>	0	0	1	0	0	0	0	0.50	3.37	0.50	2.64
<i>Styphelia exarrhena</i>	0	0	1	0	0	0	0	0.50	1.74	0.50	0.49
<i>Tetraria capillaris</i>	0	1	0	0	0	0	0	0.05	0.37	0.50	0.10
<i>Thomasia petalocalyx</i>	0	0	1	0	0	0	0	0.50	0.17	0.50	0.19
<i>Tricoryne tenella</i>	0	1	0	0	0	0	0	0.05	0.15	0.50	1.52
<i>Xanthorrhoea caespitosa</i>	0	0	1	0	0	0	0	0.50	0.58	0.50	0.17



**Figure 7. *Eucalyptus diversifolia* Tall Open Shrubland at vegetation quadrat ME 21**  
**Photo A. Robinson**



**Figure 8. *Tetraria capillaris* / *Baumea juncea* Closed Sedgeland at vegetation quadrat ME 13**  
**Photo A. Robinson**

**Floristic Group:** 1 *Banksia ornata* Shrubland

15 members

**Dominant Overstorey Species:**

*Banksia ornata*

**Indicator and Sub-dominant Species:**

*Lepidobolus drapeticoleus*, *Allocasuarina pusilla*, *Boronia coerulescens* ssp. *coerulescens*,  
*Leptospermum myrsinoides*

**Typical Quadrat:** ME 9 Appendix I

Species Name	Cover/Abundance										
	R	T	1	2	3	4	5	Avg Ab.	Chi Sq.	Prop Occ	Chi Sq.
<i>Banksia ornata</i>	0	3	2	6	4	0	0	1.75	1.50	1.00	0.90
<i>Boronia coerulescens</i> ssp. <i>coerulescens</i>	0	8	7	0	0	0	0	0.52	1.19	1.00	1.36
<i>Correa reflexa</i> var. <i>reflexa</i>	0	3	11	1	0	0	0	0.89	2.75	1.00	0.94
<i>Daviesia brevifolia</i>	0	9	6	0	0	0	0	0.46	0.87	1.00	1.03
<i>Leptospermum myrsinoides</i>	0	3	8	4	0	0	0	1.09	4.05	1.00	1.26
<i>Xanthosia dissecta</i> var. <i>floribunda</i>	0	8	7	0	0	0	0	0.52	0.78	1.00	0.90
<i>Adenanthos terminalis</i>	0	2	9	3	0	0	0	1.01	5.59	0.93	1.59
<i>Allocasuarina pusilla</i>	0	2	7	4	1	0	0	1.21	8.15	0.93	1.43
<i>Cassytha glabella</i> forma <i>dispar</i>	0	9	5	0	0	0	0	0.39	0.25	0.93	0.35
<i>Hibbertia riparia</i> ( <i>glabriuscula</i> )	0	2	10	2	0	0	0	0.95	3.40	0.93	0.93
<i>Lepidosperma carphoides</i>	0	1	12	1	0	0	0	0.94	0.69	0.93	0.31
<i>Leucopogon costatus</i>	0	4	10	0	0	0	0	0.69	1.96	0.93	1.01
<i>Xanthorrhoea caespitosa</i>	0	2	7	5	0	0	0	1.15	5.26	0.93	1.52
<i>Astroloma conostephioides</i>	0	12	1	0	0	0	0	0.15	0.38	0.87	1.26
<i>Hibbertia sericea</i> var.	0	6	7	0	0	0	0	0.51	0.16	0.87	0.53
<i>Schoenus breviculmis</i>	0	1	12	0	0	0	0	0.81	1.59	0.87	0.83
<i>Banksia marginata</i>	0	6	6	0	0	0	0	0.44	0.76	0.80	0.92
<i>Hypolaena fastigiata</i>	0	0	12	0	0	0	0	0.80	1.30	0.80	0.81
<i>Isopogon ceratophyllus</i>	0	10	2	0	0	0	0	0.20	0.15	0.80	0.85
<i>Lepidobolus drapetocoleus</i>	0	1	11	0	0	0	0	0.74	5.53	0.80	3.45
<i>Cryptandra tomentosa</i>	0	10	1	0	0	0	0	0.13	0.09	0.73	1.70
<i>Lepidosperma concavum</i>	0	1	9	1	0	0	0	0.74	3.51	0.73	0.75
<i>Spyridium subochreatum</i> var.	0	8	2	0	0	0	0	0.19	0.06	0.67	0.35
<i>Eucalyptus incrassata</i>	0	2	6	1	0	0	0	0.55	0.32	0.60	0.72
<i>Gonocarpus tetragynus</i>	0	7	2	0	0	0	0	0.18	0.07	0.60	0.23
<i>Leucopogon woodsii</i>	0	6	3	0	0	0	0	0.24	0.74	0.60	1.70
<i>Phyllota pleurandroides</i>	0	3	3	3	0	0	0	0.62	1.70	0.60	0.98
<i>Calytrix alpestris</i>	0	3	5	0	0	0	0	0.35	0.77	0.53	0.94
<i>Hakea muelleriana</i>	0	6	2	0	0	0	0	0.17	0.13	0.53	0.24
<i>Pultenaea tenuifolia</i>	0	3	4	1	0	0	0	0.42	0.01	0.53	0.06
<i>Stipa mollis</i> group	0	6	2	0	0	0	0	0.17	0.10	0.53	0.10
<i>Styphelia exarrhena</i>	0	3	5	0	0	0	0	0.35	0.71	0.53	0.60

**Floristic Group: 4** *Melaleuca brevifolia* Shrubland

2 members

**Dominant Overstorey Species:**

*Melaleuca brevifolia*

**Indicator and Sub-dominant Species:**

*Gahnia filum*, *Lawrenzia glomerata*, *Olearia lanuginosa*, *Schoenus nitens*

**Typical Quadrat:** ME 12 Appendix I

Species Name	Cover/Abundance									
	R	T	1	2	3	4	5	Avg Ab.	Chi Sq.	Prop Occ. Chi Sq.
<i>Gahnia filum</i>	0	0	0	1	1	0	0	2.50	19.58	1.00 4.05
<i>Melaleuca brevifolia</i>	0	0	0	1	0	1	0	3.00	10.38	1.00 0.71
<i>Baumea juncea</i>	0	1	0	0	0	0	0	0.05	0.19	0.50 0.06
<i>Cassytha glabella</i> forma <i>dispar</i>	0	1	0	0	0	0	0	0.05	0.09	0.50 0.00
<i>Danthonia</i> sp.	0	1	0	0	0	0	0	0.05	0.00	0.50 0.15
<i>Lawrenzia glomerata</i>	0	1	0	0	0	0	0	0.05	0.41	0.50 4.05
<i>Lepidosperma laterale</i>	0	0	1	0	0	0	0	0.50	0.00	0.50 0.11
<i>Leptocarpus brownii</i>	0	0	0	1	0	0	0	1.00	0.00	0.50 0.02
<i>Olearia lanuginosa</i>	0	1	0	0	0	0	0	0.05	0.03	0.50 2.64
<i>Schoenus nitens</i>	0	1	0	0	0	0	0	0.05	0.26	0.50 2.64
<i>Tetraria capillaris</i>	0	1	0	0	0	0	0	0.05	0.37	0.50 0.10

#### SEDGELANDS AND OTHER WETLAND AREAS

**Floristic Group: 5** *Lepidosperma carphoides*, *L. laterale*, *Leptocarpus brownii* Closed Sedgeland

5 members

**Dominant Overstorey Species:**

*Lepidosperma carphoides*, *Leptocarpus brownii*

**Indicator and Sub-dominant Species:**

*Phyllota remota*, *Gonocarpus tetragynus*, *Adenanthos terminalis*

**Typical Quadrat:** ME 8 Appendix I

Species Name	Cover/Abundance									
	R	T	1	2	3	4	5	Avg Ab.	Chi Sq.	Prop Occ. Chi Sq.
<i>Banksia ornata</i>	0	1	0	2	2	0	0	2.02	2.37	1.00 0.90
<i>Cassytha glabella</i> forma <i>dispar</i>	0	2	3	0	0	0	0	0.64	1.18	1.00 0.47
<i>Gonocarpus tetragynus</i>	0	2	3	0	0	0	0	0.64	2.97	1.00 1.39
<i>Hibbertia sericea</i> var.	0	1	4	0	0	0	0	0.82	0.97	1.00 0.88
<i>Lepidosperma carphoides</i>	0	3	1	1	0	0	0	0.66	0.16	1.00 0.43
<i>Lepidosperma laterale</i>	0	0	2	3	0	0	0	1.60	2.17	1.00 1.47
<i>Leptocarpus brownii</i>	0	0	1	2	1	1	0	2.40	2.27	1.00 0.83
<i>Leucopogon costatus</i>	0	3	1	1	0	0	0	0.66	1.73	1.00 1.26
<i>Melaleuca brevifolia</i>	0	1	0	3	1	0	0	1.82	2.75	1.00 0.71
<i>Schoenus breviculmis</i>	0	1	2	2	0	0	0	1.22	4.62	1.00 1.31
<i>Xanthosia dissecta</i> var. <i>floribunda</i>	0	3	2	0	0	0	0	0.46	0.54	1.00 0.90
<i>Adenanthos terminalis</i>	0	3	1	0	0	0	0	0.26	0.11	0.80 1.01
<i>Allocasuarina pusilla</i>	0	4	0	0	0	0	0	0.08	0.03	0.80 0.90
<i>Astroloma humifusum</i>	0	3	1	0	0	0	0	0.26	1.01	0.80 0.99
<i>Baumea juncea</i>	0	2	2	0	0	0	0	0.44	0.09	0.80 0.58
<i>Boronia coerulescens</i> ssp. <i>coerulescens</i>	0	1	3	0	0	0	0	0.62	1.87	0.80 0.67
<i>Hibbertia riparia</i> ( <i>glabriuscula</i> )	0	1	3	0	0	0	0	0.62	1.13	0.80 0.55
Species Name	Cover/Abundance									
	R	T	1	2	3	4	5	Avg Ab.	Chi Sq.	Prop Occ. Chi Sq.
<i>Kunzea pomifera</i>	0	4	0	0	0	0	0	0.08	0.02	0.80 0.50
<i>Leptospermum continentale</i>	0	4	0	0	0	0	0	0.08	0.51	0.80 5.12

<i>Phyllota remota</i>	0	3	1	0	0	0	0	0.26	0.53	0.80	1.85
<i>Stipa mollis</i> group	0	2	2	0	0	0	0	0.44	1.54	0.80	0.58
<i>Correa reflexa</i> var. <i>reflexa</i>	0	2	1	0	0	0	0	0.24	0.02	0.60	0.11
<i>Daviesia brevifolia</i>	0	0	3	0	0	0	0	0.60	1.75	0.60	0.13
<i>Dillwynia hispidula</i>	0	2	1	0	0	0	0	0.24	0.28	0.60	0.68
<i>Hibbertia virgata</i>	0	2	1	0	0	0	0	0.24	1.76	0.60	3.38
<i>Leptospermum myrsinoides</i>	0	2	1	0	0	0	0	0.24	0.01	0.60	0.19
<i>Pultenaea tenuifolia</i>	0	0	2	1	0	0	0	0.80	0.58	0.60	0.13
<i>Spyridium subochreatum</i> var.	0	2	1	0	0	0	0	0.24	0.16	0.60	0.23

**Floristic Group:** 6 *Lepidosperma laterale*, *Leptocarpus brownii* Closed Sedgeland

6 members

**Dominant Overstorey Species:**

*Lepidosperma laterale*, *Leptocarpus brownii*

**Indicator and Sub-dominant Species:**

**Typical Quadrat:** ME 7 Appendix I

*Senecio macrocarpus*

Species Name	Cover/Abundance										
	R	T	1	2	3	4	5	Avg Ab.	Chi Sq.	Prop Occ.	Chi Sq.
<i>Lepidosperma laterale</i>	0	0	0	4	0	2	0	2.67	8.66	1.00	1.47
<i>Leptocarpus brownii</i>	0	0	0	0	2	4	0	3.67	7.91	1.00	0.83
<i>Cassytha glabella</i> forma <i>dispar</i>	0	3	2	0	0	0	0	0.38	0.23	0.83	0.20
<i>Baumea juncea</i>	0	4	0	0	0	0	0	0.07	0.16	0.67	0.29
<i>Lepidosperma carphoides</i>	0	2	0	1	1	0	0	0.87	0.51	0.67	0.04
<i>Senecio macrocarpus</i>	0	3	1	0	0	0	0	0.22	0.92	0.67	1.02
<i>Stipa mollis</i> group	0	4	0	0	0	0	0	0.07	0.00	0.67	0.29
<i>Allocasuarina mackliniana</i> ssp. <i>xerophila</i>	0	3	0	0	0	0	0	0.05	0.01	0.50	0.67
<i>Banksia ornata</i>	0	2	1	0	0	0	0	0.20	0.37	0.50	0.02
<i>Danthonia</i> sp.	0	3	0	0	0	0	0	0.05	0.00	0.50	0.15
<i>Leucopogon clelandii</i>	0	3	0	0	0	0	0	0.05	0.00	0.50	0.78
<i>Pultenaea tenuifolia</i>	0	2	1	0	0	0	0	0.20	0.06	0.50	0.04
<i>Schoenus breviculmis</i>	0	3	0	0	0	0	0	0.05	0.13	0.50	0.08

**Floristic Group:** 7 *Tetraria capillaris*, *Baumea juncea* Closed Sedgeland

6 members

**Dominant Overstorey Species:**

*Tetraria capillaris*, *Baumea juncea*

**Indicator and Sub-dominant Species:**

**Typical Quadrat:** ME 13 Figure 8

*Danthonia* sp.

Species Name	Cover/Abundance										
	R	T	1	2	3	4	5	Avg Ab.	Chi Sq.	Prop Occ.	Chi Sq.
<i>Tetraria capillaris</i>	0	1	0	3	0	2	0	2.35	7.64	1.00	1.45
<i>Baumea juncea</i>	0	0	0	3	1	1	0	2.17	2.75	0.83	0.67
<i>Danthonia</i> sp.	0	3	2	0	0	0	0	0.38	1.77	0.83	0.99
<i>Lepidosperma carphoides</i>	0	4	0	0	0	0	0	0.07	0.29	0.67	0.04
<i>Lepidosperma laterale</i>	0	1	3	0	0	0	0	0.52	0.00	0.67	0.39
<i>Leptocarpus brownii</i>	0	0	0	2	2	0	0	1.67	0.56	0.67	0.16
<i>Melaleuca brevifolia</i>	0	2	0	2	0	0	0	0.70	0.03	0.67	0.12
<i>Pultenaea tenuifolia</i>	0	2	0	1	0	1	0	1.03	1.33	0.67	0.22

<i>Banksia ornata</i>	0	2	1	0	0	0	0	0.20	0.37	0.50	0.02
<i>Senecio macrocarpus</i>	0	3	0	0	0	0	0	0.05	0.01	0.50	0.42
<i>Stipa mollis</i> group	0	3	0	0	0	0	0	0.05	0.01	0.50	0.06
<i>Wilsonia backhousei</i>	0	1	1	1	0	0	0	0.52	0.00	0.50	0.25

**Floristic Group:** 8 *Wilsonia rotundifolia*, *Podolepis canescens* Herbland

1 member

**Dominant Overstorey Species:**

**Indicator and Sub-dominant Species:**

*Marrubium vulgare*, *Solanum simile*, *Wilsonia backhousei*

**Typical Quadrat:** ME 14 Figure 9

Species Name	Cover/Abundance					Avg Ab.	Chi Sq.	Prop Occ.	Chi Sq.
	R	T	1	2	3 4 5				
<i>Acaena novae-zelandiae</i>	0	1	0	0	0 0 0	0.10	0.32	1.00	3.20
* <i>Marrubium vulgare</i>	0	1	0	0	0 0 0	0.10	0.81	1.00	8.10
<i>Myoporum parvifolium</i>	0	1	0	0	0 0 0	0.10	0.06	1.00	3.20
<i>Podolepis canescens</i>	0	1	0	0	0 0 0	0.10	0.02	1.00	2.52
<i>Solanum simile</i>	0	1	0	0	0 0 0	0.10	0.81	1.00	8.10
<i>Vittadinia australasica</i> var. <i>australasica</i>	0	1	0	0	0 0 0	0.10	0.13	1.00	3.64
<i>Wilsonia backhousei</i>	0	0	0	0	1 0 0	3.00	12.44	1.00	2.25
<i>Wilsonia rotundifolia</i>	0	0	1	0	0 0 0	1.00	6.34	1.00	4.17

**Floristic Group:** 9 *Tetraria capillaris*, *Podolepis canescens* Open Sedgeland

2 members

**Dominant Overstorey Species:**

**Indicator and Sub-dominant Species:**

*Melaleuca halmaturorum*, *Wilsonia humilis* var. *humilis*, *Wilsonia backhousei*

**Typical Quadrat:** ME 18 Figure 10

Species Name	Cover/Abundance					Avg Ab.	Chi Sq.	Prop Occ.	Chi Sq.
	R	T	1	2	3 4 5				
<i>Podolepis canescens</i>	0	0	1	1	0 0 0	1.50	10.94	1.00	2.52
<i>Tetraria capillaris</i>	0	0	1	0	1 0 0	2.00	5.07	1.00	1.45
<i>Wilsonia backhousei</i>	0	0	1	1	0 0 0	1.50	1.99	1.00	2.25
<i>Wilsonia humilis</i> var. <i>humilis</i>	0	2	0	0	0 0 0	0.10	0.67	1.00	6.69
<i>Baumea juncea</i>	0	1	0	0	0 0 0	0.05	0.19	0.50	0.06
Species Name	Cover/Abundance					Avg Ab.	Chi Sq.	Prop Occ.	Chi Sq.
	R	T	1	2	3 4 5				
<i>Danthonia</i> sp.	0	1	0	0	0 0 0	0.05	0.00	0.50	0.15
<i>Gahnia filum</i>	0	1	0	0	0 0 0	0.05	0.17	0.50	0.64
<i>Kunzea pomifera</i>	0	1	0	0	0 0 0	0.05	0.05	0.50	0.05
<i>Lawrenzia spicata</i>	0	0	0	1	0 0 0	1.00	7.78	0.50	2.08
<i>Melaleuca brevifolia</i>	0	1	0	0	0 0 0	0.05	0.47	0.50	0.01
<i>Melaleuca halmaturorum</i>	0	0	1	0	0 0 0	0.50	4.05	0.50	4.05
<i>Olearia axillaris</i>	0	1	0	0	0 0 0	0.05	0.08	0.50	0.82
<i>Pultenaea tenuifolia</i>	0	1	0	0	0 0 0	0.05	0.26	0.50	0.04
<i>Pultenaea vestita</i>	0	1	0	0	0 0 0	0.05	0.02	0.50	1.97
<i>Senecio macrocarpus</i>	0	1	0	0	0 0 0	0.05	0.01	0.50	0.42
<i>Stipa mollis</i> group	0	1	0	0	0 0 0	0.05	0.01	0.50	0.06
<i>Thomasia petalocalyx</i>	0	1	0	0	0 0 0	0.05	0.19	0.50	0.19
<i>Vittadinia australasica</i> var. <i>australasica</i>	0	1	0	0	0 0 0	0.05	0.01	0.50	0.55
<i>Wilsonia rotundifolia</i>	0	1	0	0	0 0 0	0.05	0.04	0.50	0.67





**Figure 9. *Wilsonia rotundifolia* / *Podolepis canescens* Herbland at vegetation quadrat 14**  
**Photo A. Robinson**



**Figure 10. *Tetraria capillaris* / *Podolepis canescens* Open Sedgeland at vegetation quadrat ME 18**  
**Photo A. Robinson**



## Species of Particular Interest

Examples of plants found in Messent Conservation Park are shown in Figs 11-16

### (a) Species of national significance

Large-fruit groundsel *Senecio macrocarpus* (Fig. 13)

An erect narrow-leaved rayless daisy growing 20-40 cm high from a perennial rootstock. It is distinguished from its closest relatives, particularly *S. squarrosus*, by its larger flower heads and seeds. The species is found in South Australia and Victoria and previously occurred in Tasmania where it is now presumed to be extinct. There have been a number of recent investigations involving this species (Davies 1986, 1992 & 1995 in prep., and Green 1993) and details of the South Australian populations are held in the DENR Threatened Plant Population Database.

In terms of the conservation of threatened plant species, this is undoubtedly the most important vascular plant occurring in Messent Conservation Park. *Senecio macrocarpus* is rated as a vulnerable species (Briggs and Leigh, 1995 in prep.; ANZECC) and Messent Conservation Park has been regarded as its stronghold, having the largest and most secure populations. In fact according to Davies (1995, in prep.) the park contains “the only known large populations”. Consequently, if the populations in Messent are adversely affected by the proposed drainage scheme, this will have serious implications for the species survival.

*Senecio macrocarpus* has disappeared over much of its range in South Australia. Davies reports that there have only been two other confirmed populations and two probable populations located in the last 25 years. These all appear to represent small localised occurrences. In Victoria, where *S. macrocarpus* is listed as endangered, the species range has contracted to the region around Melbourne (Gullan, Cheal & Walsh, 1990). Here a total of 10 populations survive, eight in rail reserves and two on public lands, and most are under immediate threat of extinction due to habitat destruction and deleterious fire regimes (R.F. Parsons, pers. comm. 1991, cited by Davies (1995, in prep.).

Occurrences of *Senecio macrocarpus* in Messent Conservation Park are virtually confined to the broad, shallow intermittently inundated depressions or their margins, areas which are dominated by sedgeland or herbland communities (vegetation groups 5, 6, 7 and 9). This is a rather atypical habitat for the species as elsewhere in South Australia it occurs in grassy woodland areas on fertile soils or on calcareous soils with open vegetation and in Victoria it occurs on basalt plain grasslands. In the

Victorian situation, *S. macrocarpus* only occurs in grassland areas that have been burnt every three to four years and less frequent fires lead to dense swards of *Themeda triandra* (Kangaroo grass) which out-competes the *Senecio* (Scarlett, 1984, cited by Davies, 1995, in prep.). It would appear that the *S. macrocarpus* is able to survive in the sedgeland depressions because of the open spaces associated with the taller sedges (*Lepidosperma carphoides* tussocks and relatively sparse aerial parts of *L. laterale*) and the fact that it is able to overtop the shorter, finer sedges that grow in dense mats (*Leptocarpus brownii*, *Tetraria capillaris* and *Schoenus nitens*). Not surprisingly, no plants of *Senecio macrocarpus* were observed away from the depressions in the surrounding heathland (or vegetation with heathy understorey) where there would be extreme competition from the dense shrub layer. The predominant vegetation types in the park are unsuitable for *S. macrocarpus*, while the low-lying areas are critical for its survival.

Occurrences of *S. macrocarpus* are scattered throughout depressions in the central and southern parts of the park. Based on surveys in 1986 and 1992 Davies estimates a total number of 35,000 individuals distributed in 23 “populations”. The number of plants at some of the locations had increased substantially between 1986 and 1992 (DENR Threatened Plant Population Database). At the time of this survey in December 1994, however, much lower numbers were apparent. It is difficult to know whether this is a population trend or a seasonal effect, as most of the plants observed had died off above ground or had only a few leaves alive near their base. During the survey *S. macrocarpus* was recorded in plant communities 5, 6, 7 and 9. Davies also reports it for a herbland community dominated by *Wilsonia backhousei*, *W. rotundifolia* and *Podolepis canescens* which clearly corresponds with group 8.

Because of its specialised habitat in shallow low-lying areas of the park, the population of *S. macrocarpus* in Messent is likely to be sensitive to any changes in water regime that might result from implementation of the Upper South east Dryland Salinity and Flood Management Plan. *Senecio macrocarpus* is not a wetland species and would not survive prolonged inundation. Evidence in support of this provided by observations on the impact of deepening an old silted up channel. This channel was opened up several hundred metres into the park through the central southern boundary in 1992 and when observed in spring 1992 water was being carried from adjacent farmland to the south of the park into an area containing *S. macrocarpus*. The extent of previous inundation was obvious during this survey in December 1994 being marked by a zone where the scattered shrubs of *Banksia ornata* had recently died (Fig. 8). Although patches of *S. macrocarpus* were observed in the vicinity of this drain in 1992, there was no sign of the plants in 1994.



**Figure 11**  
The metallic sun-orchid *Thelymitra epipactoides*  
Photo D Kraehenbuehl



**Figure 12**  
Common Correa *Correa reflexa*  
Photo PJ Lang



**Figure 13. The large-fruited groundsel *Senecio macrocarpus***  
**Photo R. J-P. Davies**



**Figure 14. The rush fringe-lily *Thysanotus juncifolius***  
**Photo A. Robinson**





**Figure 15. Winged spyridium *Spyridium vexiliferum* var *latifolium***  
**Photo A. Robinson**



**Figure 16. Snow fringe-myrtle *Calytrix alpestris***  
**Photo A. Robinson**

*Senecio macrocarpus* is also likely to be adversely affected under the alternative scenario where the local water table is lowered and the depressions become drier. With increasing dryness heathland species are likely to increase, rendering the habitat unsuitable for the *Senecio*. In the extreme situation the depressions might be invaded completely by heathland. Davies (1995, in prep.) noted that *S. macrocarpus* occasionally extended upwards onto low broad ridges where shrubby species such as *Pultenaea tenuifolia* and *Thomasia petalocalyx* dominate a mid-dense to open shrub stratum over a ground stratum of *Lepidosperma*. Sites with such vegetation were sampled in this survey (corresponding to group 5) and they appear to represent a transition zone between the heathy communities on higher sands and the sedgeland communities of lower areas. Significantly, these zones have lower densities of *S. macrocarpus* whereas the greatest number of individuals occur towards the centre of the depressions.

The sedgelands in Messent which support *S. macrocarpus* represent a rather peculiar plant community that is probably unique to this district. Some areas of apparently similar vegetation are represented in Gum Lagoon Conservation Park to the south, where notably there is also an unconfirmed sighting of *S. macrocarpus*. One suggestion is that these communities have arisen as a result of the broad scale drain construction in the South East, perhaps replacing *Gahnia* tall sedgeland swamps as the original habitat dried out. The occurrence of *Banksia ornata* as a sparsely scattered emergent over sedges (without its usual associated heath plants) across the outer portions of the sedgeland depressions is a most unusual phenomenon. These large rounded shrubs give the appearance of being a relatively recent invasion into an area that was possibly previously too wet to support them. It is quite possible that the park has provided an effective refuge for *Senecio macrocarpus* as a result of these dried out wetlands and a return to a more historically natural regime would be at the expense of the species survival. Any attempt to re-instate the original flooding regime within the park must therefore be carefully considered.

(b) Metallic sun-orchid *Thelymitra epipactoides* (Fig. 11)

A geophyte producing a raceme of flowers in September-October. This large, fleshy sun-orchid occurs in a variety of colour forms characterised by a distinctive iridescent sheen. It is distributed from southern Eyre Peninsula to southeastern Victoria and is regarded as endangered throughout its range. Its biology and ecology have been well studied in Victoria and reviewed by Cropper (1993) specifically covers its management in Messent Conservation Park.

Davies (1995, in prep.) reports that about six plants were observed in Messent Conservation Park in 1977 by R. Bates. These plants occurred in sedgeland near the western boundary of the reserve, but were not relocated by searches in 1987 and 1992. The plant list attributed to K. Alcock

and based on a survey in 1979 (Appendix II, source 1) also includes *Thelymitra epipactoides* but there have been no subsequent records in the reserve. It is difficult to draw many conclusions about the current status of this species within the park other than saying that the sedgeland areas provide suitable habitat for the species. Data presented by Cropper suggests that the species may decline due to lack of disturbance, in particular by fire; or that it may persist undetected as the tuberoid is able to remain dormant for at least nine years. Davies suggests that the occurrence near the reserve boundary could have disappeared as a result of firebreak clearance or weed invasion. Given the absence of intensive surveys in spring, and the species tendency to occur as widely scattered plants or clumps of plants, it may well exist elsewhere within the reserve.

The proposed drain is unlikely to have a direct significant effect on *Thelymitra epipactoides*. However, as with *Senecio macrocarpus*, the impact could be serious if there was a significant change to the water regime of the sedgeland areas. Calder et al. (1989) advise that for the conservation of this species "it is essential to maintain the soil water regime involving winter waterlogging and summer dry. Alterations to the soil water regime could have adverse effects on survival."

While the species has a wide range and occurs in at least nine conservation reserves and Heritage Agreements in South Australia (Lang and Kraehenbuehl, 1994) the populations are small, isolated and their specific management needs are poorly understood. It is essential that incremental loss of habitat and/or populations of this endangered species be avoided.

(c) Spiral-leaf sun-orchid *Thelymitra matthewsii* (Fig. 12)

A geophyte with a small blue/purple flower which appears in September and an unusual spirally-coiled leaf. It is known from Western Australia, South Australia, Victoria and New Zealand (where it is now extinct). It is listed as nationally vulnerable (Briggs and Leigh, 1995, in prep.) and as endangered in South Australia where it has only been collected three times (Bates and Weber, 1990). Davies, 1995, in prep. provides information relevant to the management of this species in Messent Conservation Park.

A single plant of this species was observed in Messent by D. Murfet in October 1988 under *Eucalyptus diversifolia* on a limestone ridge which had been burnt the previous November. Details of this occurrence are held in the DENR Threatened Plant Population Database. Cropper (1993) describes the species as being a short-lived (5-10 years) post-disturbance coloniser, which is usually crowded out by other plants within about five years of the disturbance. Davies recommends that extensive searches be made over the two years following a future fire, and that trials be implemented once a number of populations are found, to investigate appropriate fire management strategies.

As the species habitat occurs on higher terrain, it is unlikely to be affected by the proposed drain.

(b) Species of State significance.

Scaly haeckeria *Haeckeria pholidota*

A bushy, erect shrub 1-2m tall, with scaly cypress like foliage and terminal flat-topped clusters of white-cream *Cassinia*-like flowers. *Haeckeria pholidota* is endemic to the mallee districts on either side of the Victoria-South Australia border. In South Australia its range extends from north of Kingston in the South-East to the Karoonda district south of the River Murray. Its distribution in South Australia corresponds to the areas that have been selectively and intensively cleared for agriculture due to their better soils and it is listed as vulnerable at State level (Lang and Kraehenbuehl, 1994). East of the border, large areas of vegetation in similar land systems remain uncleared (for example in the Big Desert area) and the species is not regarded as rare or threatened in Victoria.

*Haeckeria pholidota* was encountered and collected by T. Dendy in 1994 at two nearby locations just south of the proposed drain route in the south east section of the park. This represents the first definite record within a NPWS reserve; previously it was only known to be reserved in two Heritage Agreement areas. It seems likely that the species will also eventually be found in Billiatt Conservation Park and the northern part of Ngarkat Conservation Park as it has been recorded very close to these reserves.

Observations suggest that *Haeckeria pholidota* is a post-disturbance coloniser growing from seed following fire or clearance. Unlike many plants of this type which become very common over extensive areas following disturbance, *H. pholidota* generally occurs as isolated plants, clumps or a small localised patches. Its preferred habitats seem to be associated with a transition between mallee or woodland communities found on heavier soils and heathy vegetation communities typical of sandy soils.

Construction of the proposed drain is unlikely to have a significant impact on this species, although it is possible that some regeneration may occur as a result of soil disturbance.

### Flora records

There were 11 new vascular plant records for Messent C.P. made during this survey (source 9, Appendix I), and a further four new records made during the preliminary survey of the proposed drain route (source 8, Appendix II). This brings the total number of vascular plant taxa<sup>1</sup> to 307, comprising 271 indigenous taxa and 36 alien taxa. Undoubtedly more intense and regular surveying would reveal many more species, particularly annual forbs, geophytes and alien taxa.

It is interesting to consider the extent to which the known flora the park is sampled by the quadrat-based approach used for the Biological Survey System. At present, Messent C.P. is sampled by 42 quadrats, a greater number and density than for most other parks covered by so far by the Biological Survey program. The initial 11 quadrats were chosen during the South East Vegetation Survey to represent the major vegetation types spread throughout the park, although the 31 sites within the current survey contribute a much less representative sample being concentrated on vegetation types in the south-eastern portion of the park. Fortunately, the combined set of quadrats comprises samples from the key seasons of spring and summer.

With this overall relatively good sampling by quadrats, a total of 193 taxa were recorded, representing 63% of the total flora recorded to date. For indigenous taxa the figure is 180 taxa (66%) and for aliens 13 taxa (36%).

## MAMMALS

Mammals have been recorded from surveys in Messent Conservation Park since the 1960's. Even though there are not a large number of records the list in Appendix IV covers most of the expected species. *Felis cattus* has not been recorded but is likely to occur in the park. Of the 16 species recorded for the park 4 are considered of conservation significance.

Pictures of typical species from Messent Conservation Park are shown in Figs 17-20

Species of interest include:

### Little Pygmy-possum *Cercartetus lepidus*

This species has a restricted range within South Australia. The records from Messent Conservation Park in 1984, 1985 and 1994 represent the north-eastern limit of this species range on the Australian mainland. The species is listed as uncommon giving conservation significance to any suitable habitat remnants. Messent Conservation Park is obviously a suitable area and being on the edge of its range should be regarded as important for the species. It is also regarded as one of the species which may potentially disappear from the south-eastern section of the park isolated by the drain unless provision is made for movement too and from the rest of the park.

### Red-necked Wallaby *Macropus rufogriseus* (Fig. 18)

There are no records of Red-necked Wallabies occurring within Messent Conservation Park. During the survey in December 1994 the landowner at "Deepwater" reported a population in some remnant vegetation just south of the park. This along with a museum record from 1962 "near Currawong" suggest the species still occurs in the region in low numbers. Messent Conservation Park is on the northern boundary of this species distribution in South Australia. The species is considered rare and it is important to protect all remaining natural vegetation in this area to prevent further contraction of its range. It is also a species which will potentially be isolated by the drain as it does not move far from natural vegetation across cleared farmland.

### Silky Mouse *Pseudomys apodemoides* (Fig. 20)

The Silky Mouse has a conservation rating of uncommon although there are several areas where it has a stronghold in South Australia. Once again Messent Conservation Park is significant for this species as it falls on the northern limits of the species distribution. As with the Little Pygmy-possum, the drain will isolate a population in an area of the south-eastern corner of the park which may not be large enough to sustain it without the ability to move freely into and out of the rest of the park.

### Common Wombat *Vombatus ursinus* (Fig. 17)

Common Wombats have undergone a major decline in both distribution and numbers since European settlement of South Australia. Their original distribution covered much of the South East at least as far north as the Tatiara and Tailem Bend. They were common around Meningie at the time of settlement in 1866 but had disappeared by 1900. One isolated colony persisted near Wellington until 1920. Today the northern limit is the Coorong National Park and Game Reserve to about Salt Creek and Messent Conservation Park and the surrounding remnant natural vegetation. Through the rest of the South East they have a highly fragmented distribution shown in Fig. 21.

Ecological studies of wombats in both the Coorong and Messent C.P. (Mallett and Cooke 1986) showed that wombat burrows in this area are in slopes immediately above the water table where relief or vegetation provides cover. They also rely on perennial grasses. Mallett and Cooke (1986) proposed that these native perennial grasses are susceptible to grazing. From the late 1800's, in southern South Australia, grazing by rabbits and domestic stock had converted the majority of pastures to a mixture of native grasses and introduced annuals by 1891. Areas which were infested with rabbits earlier would have changed even earlier. This meant that in the winter rainfall areas of the distribution of the Common Wombat in South Australia the increasing dominance of pastures by introduced annuals meant that the quality of food available deteriorated by drying off at the time when young wombats were becoming self-reliant in early summer. Clearly the populations of Common Wombats that are surviving in the Coorong and Messent C. P. at present are still able to access suitable perennial native grasses late enough into the early summer to allow recruitment of young wombats into the population. In this respect, Messent C.P. with its relatively low rabbit population and the areas of sedgeland with their perennial grass component adjacent to mallee and heathlands with safe areas for burrow construction represent one of the most extensive areas of really top quality habitat remaining in the State. The construction of a drain which will probably act as a significant barrier to wombat movement has the potential to severely disrupt this critical wombat population unless appropriate wombat access across the drain is provided.





**Figure 17. The Common Wombat *Vombatus hirsutus***  
**Photo A. Robinson**



**Figure 18. The Red-necked Wallaby *Macropus rufogriseus***  
**Photo P. Canty**





**Figure 19.** The Western Pigmy-possum *Cercartetus concinnus*  
Photo A. Robinson



**Figure 20.** The Silky Mouse *Pseudomys apodemoides*  
Photo A. Robinson

## Figure 21

The distribution of the Common Wombat  
*Vombatus hirsutus* in the South East of South Australia



## BIRDS

A total of 114 species of bird have been recorded within Messent Conservation Park (Appendix IV). This list has been compiled from twelve separate sources dating back to 1951. The current survey recorded 66 species and included four new records for the park. The park has a high species richness reflecting the diversity of habitats in the park.

Five of the species listed are rare, vulnerable or endangered in South Australia (Parker and Horton, 1992). Carpenter and Reid (1988) also list the Elegant Parrot as indeterminate (either rare or vulnerable) in South Australia.

Typical species from Messent Conservation Park are shown in Figs 22-25

### Endangered Species:

#### Malleefowl *Leipoa ocellata*

The Malleefowl is a ground frequenting bird which has declined throughout its range through habitat clearance and introduced predators. There are no records for the park since the 1970's. An area of 10 300 ha., virtually the whole of Messent C.P. was burnt in a wildfire in December 1977 and it may be that there still has not been sufficient growth of mallee to again support of a nesting population of Malleefowl in the park. An area of 2 300 ha in the north east part of the park was burnt again in November 1988. Re-establishment of a breeding population in the park will depend on exclusion of fire and the continued development of suitable mallee and woodland habitats in the park together with re-colonisation from nearby populations in the Coorong Game Reserve and National Park, Gum Lagoon Conservation Park and some of the larger areas of privately owned native vegetation in the region.

### Vulnerable Species:

#### Fairy Tern *Sterna nereis*

A small tern associated with sheltered coastlines and subcoastal lagoons which has declined generally throughout south-eastern Australia, probably due to disturbance of nest sites. Records from the park coincide with extensive flooding.

#### Southern Emu-wren *Stipiturus malachurus*

Southern-Emu-wrens are very secretive birds which inhabit dense heathlands throughout south-eastern Australia. Populations have declined through clearance of habitat. The species is still found in Messent C.P. throughout the *Melaleuca brevifolia* and *Banksia ornata* Shrubland areas of the park. The Southern Emu-wren is considered to be one of the bird species with limited potential mobility which may be affected by the isolation of the south-eastern corner of the park by the proposed drain

#### Shy Heathwren *Hylacola cauta*

Heathwrens are small ground frequenting birds which inhabit the dense understorey of mallee and low woodlands. It is spread throughout the park in small numbers and is another species likely to be affected by the proposed drain.

#### Yellow-rumped Pardalote *Pardalotus xanthopygus*

Pardalotes are small birds which feed on leaf-eating insects. The Yellow-Rumped Pardalote has declined with the loss of its mallee habitat through clearance.

#### Elegant Parrot *Neophema elegans*

Although not listed by Parker and Horton (1992), Carpenter and Reid (1988) list the species as indeterminate (inadequately known but presumed rare or vulnerable) in South Australia. It is thought to be a non-breeding visitor in small numbers to the park, but its status is poorly known.

Another six species, the Southern Scrub Robin, Slender-billed Thornbill, Eastern Calamanthus, (and possibly the Western Calamanthus), Variegated Fairy Wren and Rufous Bristlebird are considered by their sedentary habits and/or specialised habitat needs to be potentially threatened in the part of the park which will be isolated by the proposed drain.

An additional 36 species were recorded by R. Hawkes in the Messent Region (list dated 30/6/1964) and include many waterbirds which would only frequent the park in wetter years. Eight of these species have been listed as vulnerable by Parker and Horton (1990) and should be considered as possibly occurring in the area.

### Vulnerable Species Possibly Occurring in Messent Conservation Park:

#### White-bellied Sea-Eagle *Haliaeetus leucogaster*

A bird of prey which feeds on aquatic vertebrates especially fish, which is under threat largely due to disturbance of nest sites. Occasional birds visit extensively flooded areas of the Upper South East but are not known to breed.

#### Musk Duck *Bizura lobata*

The Musk Duck occurs in the deeper non-permanent wetlands throughout south-eastern Australia. Its occurrence in the park would coincide with extensive flooding.





**Figure 22. The Red-rumped Parrot *Psephotus haematonotus***  
Photo S.A.O.A.



**Figure 23. The Common Bronzewing *Phaps chalcoptera***  
Photo S.A.O.A.



**Figure 24. The Laughing Kookaburra *Dacelo gigas***  
**Photo A. Robinson**



**Figure 25. A flock of Tree Martins *Hirundo nigricans* near quadrat ME 2**  
**Photo A. Robinson**

Peregrine Falcon *Falco peregrinus*

A bird of prey species which inhabits woodlands and areas where prey is abundant, especially ducks. It probably occurs irregularly in the park when waterbirds are abundant.

Beautiful Firetail *Emblema bellum*

The Beautiful Firetail is a finch which inhabits low woodlands and open scrubs, other adjacent swamps, or along the coast. In the park it would be found in low woodlands and *Melaleuca halmaturorum* open scrubs.

Swamp (Brown) Quail *Coturnix ypsilophora*

The Swamp Quail inhabits mostly dense sedge and grasslands, usually adjacent to swamps. There are few reports from South Australia in recent years. The record from the Messent area needs confirmation, but small numbers may occur in the park when low lying areas are flooded.

Yellow-tailed Black Cockatoo *Calyptrorhynchus funereus*

This species breeds in the wetter woodlands and forests and has declined through loss of nesting habitat. Large numbers visit the Upper South East over water to feed on the seeds of *Banksia ornata*.

Latham's Snipe *Gallinago hardwickii*

The Latham's Snipe is a migratory wader which breeds in Japan. It occurs in South Australia over the summer months where it inhabits grass and sedge cover at the margins of swamps. Small numbers probably visit the park when swamps contain water over the summer months.

Painted Button-Quail *Turnix varia*

The Painted Button-Quail inhabits woodlands and open scrub where the understorey leaf litter provides suitable habitat. It has declined throughout South-eastern Australia due to clearance of habitat and introduced predators. Although there are no recent reports from the area, and none from within the park, it is easily overlooked due to its secretive habits. This species may also be affected by the proposed drain.

## REPTILES AND AMPHIBIANS

The reptiles and amphibians within Messent Conservation Park have been poorly studied. Prior to this survey only one specimen had been lodged with the South Australian Museum from within the park. Currently there are 15 species of reptile known to occur in Messent Conservation Park with an additional 3 species that need confirmation (Appendix V). Further work should add to this list and confirm the presence of several amphibian species known to occur in the region. The amphibian species likely to occur within Messent Conservation Park include *Neobatrachus pictus*, , *Limnodynastes dumerili* and *L.tasmaniensis*, none of which are considered of high conservation significance.

No conservation ratings have as yet been assigned to South Australian Reptiles or Amphibians (Edwards and Tyler, 1990).

Typical species from Messent Conservation Park are shown in Figs 26-31

Species of particular interest include:

### Bearded Dragon *Pogona vitticeps*

Although this species is widespread and secure throughout its range the population in this region is significant as it represents a dwarf form of the species (Mark Hutchinson, pers.comm.).

### Bardick *Echiopsis curta*

The Bardick has not been officially recorded within Messent Conservation Park. There was, however, an unconfirmed sighting during the December 1994 survey. The only other record from the area is a museum specimen from Salt Creek which was registered between 1944-46. The museum record confirms the possibility of the species occurring in the area and the lack of more recent records could simply reflect the secretive nature of the species. Eastern populations of the Bardick are listed as Vulnerable in the ANCA Action Plan (Cogger, 1993) making all remaining habitat supporting this species throughout its range of conservation significance.

### Master's Snake *Drysdalia mastersi*

This species is considered secure throughout its range however, like the Bardick, it is rarely encountered. The record within Messent Conservation Park from this survey will assist with understanding its current status.

### Rosenberg's Goanna *Varanus rosenburgi*

This species is abundant on Kangaroo Island however the mainland population appears to be in decline (Mark Hutchinson, pers.comm.). Unlike *Varanus gouldii*, *V.rosenbergi* appears to rapidly disappear from cleared areas (Hutchinson, 1992). This combined with their use of a large home range makes the species dependant on large areas of remnant vegetation. A confirmed sighting within Messent Conservation Park provides a significant area of suitable habitat for their conservation.





**Figure 26. The Common Scaly-foot *Pygopus lepidopodus***  
**Photo A. Robinson**



**Figure 27. The Mallee Snake-eye *Morethia obscura***  
**Photo A. Robinson**





**Figure 28. The Heath Goanna *Varanus rosenbergi***  
**Photo A. Robinson**



**Figure 29. The Tiger Snake *Notechis scutatus***  
**Photo P. Canty**





**Figure 30. The Bull Frog *Limnodynastes dumerili***  
**Photo A. Robinson**



**Figure 31. A burrowing frog *Neobatrachus pictus***  
**Photo A. Robinson**



# Management of the Biological Impact of the Proposed Drain

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Prior to this survey and using biological data previously available from Messent Conservation Park and the surrounding district, Best and Croft (1994) discussed in some detail the potential impact of the proposed drain as it was then planned. They used the appropriate Australian scientific literature on the effects of barriers and isolation into relatively small areas of natural vegetation to develop the conclusions listed below:-

1. Based on current knowledge, the drain is unlikely to have an impact on groundwater levels in Messent Conservation Park. However, the possibility of altered ground water levels and hence indirect (possibly significant) impacts on vegetation cannot be ruled out.
2. The drain will clear approximately 36 ha, comprising six native vegetation associations, and including an estimated 10 ha of *Baumea juncea*/*Leptocarpus brownii* +/- *Melaleuca brevifolia* sedgeland considered to be of high regional and State significance. As the association appears to be conserved predominantly in Messent C.P., clearance of 10 ha would significantly reduce the total area conserved.
3. Of the three nationally rated plant species recorded in Messent C.P.. the drain clearance is highly likely to have an impact on *Senecio macrocarpus*, rated vulnerable. However, as this species appears to be a post-disturbance coloniser, the direction of impact (beneficial or detrimental) is uncertain.
4. Theoretically, in a worst case scenario, up to half the existing faunal species could be lost from the 980 ha area of the south eastern corner of the park, isolated by the drain. The species lost are likely to be those requiring specialised habitat and/or are existing rare species.
5. It is highly likely that the drain will be an effective barrier to all mammals (excluding bats) occurring in the park, and will isolate populations, or severely affect gene flow between populations. For the mammal species, therefore, the drain is likely to create two parks of approximately 980 ha and 11 266 ha. (see Table 6 for updated figures). The species most likely to be adversely affected are those which are rare, require specialised habitat, and/or large areas: namely the Red-necked Wallaby, Common Wombat, Western Pygmy Possum, Little Pygmy Possum and the Silky Mouse.

6. Nine bird species of conservation significance are considered at risk and could be lost from the 980 ha fragment created by the drain clearance.

7. Although the drain will isolate populations of reptiles and invertebrates, this habitat fragmentation is not expected to affect their population viability in the longer term.

8. The increased habitat 'edge area' created by the drain may cause vertebrate species loss (particularly small mammals) due to increased predation by pest species and will introduce additional habitat degradation into the park from increased weed invasion, altered microclimate and increased human access.

The present survey has resulted in a more detailed definition of the vegetation types that will be affected by the proposed drain and has provided data on the mammal, bird and reptile species actually present in this part of the park. In addition, the proposed route of the drain has been altered slightly from that considered by Best and Croft (1994) so that the area of park isolated by the proposed drain is larger and the length of drain and hence clearance of natural vegetation is larger. These changes are shown in Table 6. The fundamental conclusions summarised above however have not been significantly altered by this additional information.

**Table 6**

Acomparison of areas and vegetation types potentially affected by the proposed drain located in the position used in the study of Best and Croft (1994) and the position surveyed in during the present survey.

#### VEGETATION COMMUNITY AFFECTED

Best and Croft (1994)	This Study
Leptocarpus brownii / Baumea juncea	Lepidosperma carphoides / L.laterale / Closed Sedgeland Leptocarpus brownii Closed Sedgeland
	Lepidosperma carphoides / Leptocarpus brownii Closed Sedgeland
	Tetraria capillaris / Baumea juncea Closed Sedgeland
Banksia ornata Shrubland	Banksia ornata Shrubland
Melaleuca brevifolia Shrubland	Melaleuca brevifolia Shrubland
Gahnia filum Sedgeland	
Eucalyptus diversifolia Tall Open Shrubland	Eucalyptus diversifolia Tall Open Shrubland
	Eucalyptus incrassata / E. leptophylla Tall Open Shrubland
AREA OF VEGETATION CLEARED BY PROPOSED DRAIN	
36 ha	43 ha
AREA OF CONSERVATION PARK TO N.W. OF PROPOSED DRAIN	
11 226 ha	10 896 ha
AREA OF CONSERVATION PARK ISOLATED TO S.E. OF PROPOSED DRAIN	
980 ha	1 350 ha

Clearly, on conservation grounds, biologists of the Department of Environment and Natural Resources would prefer not to have a drain through the very significant area of Messent Conservation Park for the reasons outlined above.

If however a whole of Government decision is made to go ahead with such a drain then it's consequences need to be ameliorated as much as possible. These measures designed to reduce the biological impact of the drain need to be built into the detailed design phase of this drainage scheme and adequate funds must be allocated to ensure that they are properly carried out and that their long-term effectiveness is properly monitored. The five key areas that must be addressed are, the construction and ongoing maintainance of the drain, providing access across the drain, providing regulated flooding of the natural wetland of Messent C.P. as part of the proposed Wetlands Waterlink, provision of a revegetated corridor to link the isolated SE corner of Messent C.P. to other natural vegetation to the S and

monitoring the impact of both the drain crossings and subsequent waterlink flooding regimes on the vegetation and vertebrate fauna of Messent C.P.

#### Construction and maintainance of the drain

It is essential if the drain is to have minimum biological impact on the park that ALL soil excavated from the drain through the park is removed so that the drain banks are left as undisturbed as possible with the exception of the construction of the drain access track along one of them.

Another extremely important consideration, if the drain is to go through the park will be the ongoing maintainance requirements for the drain and its associated access track. At present this part of Messent Conservation Park is virtually untracked and hence is almost completely free of introduced weeds. Once the drain has been cut through there will be an ongoing requirement for weed control and slashing along the track. It should be carried out under

direct supervision of the National Parks and Wildlife Service but be funded as an integral part of the total drainage management budget. In addition, any future silt removal from the drain itself, will, for the conservation reasons outlined for the drain construction, be required to be removed from the park and dumped elsewhere in an environmentally acceptable place.

#### Access across the drain

The surveyed route of the proposed drain within Messent Conservation Park is shown on Fig 2. It will still be possible to make some modifications to this route in the design phase, but, if it goes through the park, the surveyed route shown on Fig. 2 is a compromise between engineering and conservation requirements. An attempt has been made, where possible, to run the drain along the edges of the sedgeland flats. There are two reasons for this. Although it largely destroys the ecotone between the mallee and heathland vegetation and the sedgeland of the flats, it keeps fragmentation of the important sedgeland areas to a minimum. Secondly, because the drain will be dug against rising ground it should be possible to develop a series of drain crossings with minimum amounts of earth moving. These should involve running sections of the drain through pipes and re-forming the natural contour over the area and re-vegetating with the original species from the site. The number and length of these piped sections of drain are open to negotiation, but a minimum starting point for them to have a chance to be biologically effective would be ten percent of the length of the drain through the park. This equates to ten sections of 100m length. Suggested positions for these ten crossings are shown on the contour plan in Fig. 32. When these sections of the drain are dug it is essential that the vegetation is removed mulched and stockpiled at a seed source and then the topsoil and subsoil is excavated separately. Once the pipes are in place, a proportion of the subsoil and all of the topsoil must be replaced as soon as possible and the mulched original vegetation spread over the disturbed area to allow revegetation from the seed store. The aim of this revegetation will be to replace the original vegetation as closely as possible, and not just a simple soil stabilisation approach to revegetation. There will almost certainly be important plant species which will not grow using this method and they may have to be grown as tubestock from locally collected seed and replanted to assist the revegetation. There will still need to be a drain access track along these crossing points but this should be kept as simple and narrow as practicable so that it does not constitute a significant barrier in itself.

#### Wetlands Waterlink flood regulation

Messent C.P. is at the end of the former flood regime in this part of the South East. The proposed drain will bring water into Messent C.P. against the natural slope of the land. It is essential that none of the very variable quality water from the proposed drain is allowed into the Messent Conservation Park wetlands. Any attempt to re-introduce surface floodwaters into Messent must therefore be part of

the proposed Wetlands Waterlink bringing water from the wetlands to the south as occurred in the past. It will be most practical to introduce them through the existing shallow drain already cut into the park. It is therefore necessary to plan for this wetland waterlink drain to cross over the top of the proposed new drain. The most practical place for this is where the proposed drain crosses the southern park boundary adjacent to the existing drain and any regulating gates could be constructed on the road reserve of in the adjoining cleared land on 'Currawong' rather than in the park. These regulating gates must allow water from the existing wetland waterlink drain to be discharged either into the proposed drain or into the continuation of the waterlink drain northwards into the park. This will allow low quality water from the waterlink swamps to the south to be discharged into the proposed drain and diluted by the water in that drain so that only good quality water from winter rainfall runoff is diverted into the wetlands in Messent C.P.

#### Revegetation and creation of corridors

Clearly another way of reducing the impact of the isolation of the SE corner of Messent C.P. by the proposed drain would be to try and increase the effective size of this isolate by linking it to other larger areas of natural vegetation to the south. The most practical option would involve revegetation of a fenced strip along either side of the existing wetland waterlink drain and then linking this through to the 6000 ha Heritage Agreement area to the SW. This will involve significant revegetation on currently cleared agricultural land on the private properties 'Deepwater' and 'Currawong' and would of course need to be a mutually agreed cooperative landcare programme and should therefore be negotiated further as part of the wetland waterlink planning. It should be noted that this will only provide a link between the extreme SE corner of the block of park which will be isolated by the proposed drain, but the extensive clearance of native vegetation on 'Deepwater' adjacent to the park makes development of a more biologically effective link unlikely.

#### Monitoring

The affect of the proposed new drain in isolating the south east corner of the park and the effectiveness of the crossings provided and, possibly, the proposed revegetation corridor, must be monitored. This will require a long-term ecological study which builds on the information gathered during the present survey, but which involves much more detailed, time consuming and expensive ecological studies. It will mean the establishment of a number of trapping grids on both to the north and south of the proposed drain together with some associated marked bird transects. These sample sites must be both near to the crossings and more remote to attempt to measure dispersal of birds and small mammals which



will hopefully utilise the crossings. Species to be monitored should include small mammals such as the Silky Mouse, Western and Little Pygmy Possums and some of the smaller and less mobile passerine birds such as the Southern Emu-wren, Shy Hylacola, Southern Scrub Robin, Slender-billed Thornbill, Painted Button Quail, Eastern Calamanthus, Variegated Fairy Wren and Rufous Bristlebird. As many of these species as possible should be individually marked and, in addition, the birds should be colour banded to enable individuals to be identified from sightings. There is a good model for this type of study in work in progress examining the affects of fire in Ngarkat Conservation Park and techniques and sampling frequencies could be transferred directly to the Messent C.P. drain monitoring study.

Use of the crossings by larger species such as Common Wombats, Western Grey Kangaroos, Red-necked Wallabies and Emus can possibly be monitored using remote camera systems.

Clearly monitoring such as this will involve a full time research scientist and technical assistant and to have any chance of providing scientifically acceptable data, monitoring should run annually for five years and then every two years for an additional ten years. It is clearly not possible for existing DENR Biologists to carry out such a study in addition to their current commitments so it will require budgetting additional funds for both staff and the logistics of this project as part of the more detailed planning of this drainage programme. This scientific input, when not monitoring at Messent C.P., can be involved in more necessary basic biological survey work and future monitoring in other areas of natural vegetation potentially affected by the overall drainage scheme and, additionally, could be involved in planning and implementation of the wetlands waterlink and any subsequent studies of potential affects of different flooding regimes on selected plants and animals.





# Resource Material and Bibliography

## MAPS

1:100 000 Topographic

Santo 6825

1:50 000 Topographic

Taunta 6825-I

Santo 6825-IV

## AERIAL PHOTOGRAPHS

Santo 1:40 000 Svy 4481 Photos 182, 184, 186 (9 February 1991)

Santo 1:40 000 Svy 4482 Photos 256, 258, 259 (9 February 1991)

Santo 1:47 000 Svy 4878 Photo 12 (1 December 1994)  
Enlargement to approx 1:10 000 for vegetation mapping of study area

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# Appendices

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## Appendix I

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### **QUADRAT AND TRAPSITE LOCATIONS AND PHOTOGRAPHIC MONITORING POINT PHOTOS: MESSENT CONSERVATION PARK SURVEY**

Site locations are shown on Fig. 2. The photographs are of the permanent photopoint at each quadrat. The latitude and longitude shown is the position of the sighting post for the photograph determined using a G.P.S. It has been converted from an A.M.G. reference obtained in the field to the nearest second of latitude and longitude. Data on the physical environment of each quadrat is from the survey database.

The scaling pole is 2m high with the top of the photopoint marker set at 1.5m.



Quadrat: ME 01 01    Date: 13 DEC 1994  
 Latitude: 36° 04' 24" S    Longitude: 139° 45' 46" E    Altitude: 10m  
 Location: 12km ENE SALT CREEK  
 Landform: Open depression    Soil: Loamy sand



Quadrat: ME 02 01    Date: 13 DEC 1994  
 Latitude: 36° 05' 12" S    Longitude: 139° 46' 44" E    Altitude: 10m  
 Location: 12km ENE SALT CREEK  
 Landform: Open depression    Soil: Loamy sand





Quadrat: ME 03 01                      Date: 13 DEC 1994  
 Latitude: 36° 05' 05" S    Longitude: 139° 46' 50" E    Altitude: 20m  
 Location: 12km ENE SALT CREEK  
 Landform: Dune crest                      Soil: Loamy sand



Quadrat: ME 04 01    Date: 13 DEC 1994  
 Latitude: 36° 03' 12" S    Longitude: 139° 46' 29" E    Altitude: 15m  
 Location: 14km ENE SALT CREEK  
 Landform: Dune crest                      Soil: Loamy sand





Quadrat: ME 05 01 Date: 13 DEC 1994  
 Latitude: 36° 03' 23" S Longitude: 139° 46' 25" E Altitude: 10m  
 Location: 14km NE SALT CREEK  
 Landform: Dune footslope Soil: Loamy sand



Quadrat: ME 06 01 Date: 12 DEC 1994  
 Latitude: 36° 02' 26" S Longitude: 139° 51' 21" E Altitude: 10m  
 Location: 21km ENE SALT CREEK  
 Landform: Interdune corridor Soil: Loamy sand



Quadrat: ME 07 01    Date: 12 DEC 1994  
 Latitude: 36° 05' 35" S    Longitude: 139° 47' 16" E    Altitude: 10m  
 Location: 13km ENE SALT CREEK  
 Landform: Open depression                      Soil: Loamy sand



Quadrat: ME 08 01    Date: 12 DEC 1994  
 Latitude: 36° 05' 27" S    Longitude: 139° 48' 01" E    Altitude: 15m  
 Location: 14km ENE SALT CREEK  
 Landform: Open depression                      Soil: Loamy sand





Quadrat: ME 09 01    Date: 12 DEC 1994  
 Latitude: 36° 05' 23" S    Longitude: 139° 48' 09" E    Altitude: 18m  
 Location: 14km ENE SALT CREEK  
 Landform: Interdune corridor                      Soil: Sand



Quadrat: ME 10 01    Date: 12 DEC 1994  
 Latitude: 36° 04' 30" S    Longitude: 139° 49' 22" E    Altitude: 20m  
 Location: 17km ENE SALT CREEK  
 Landform: Interdune corridor                      Soil: Sandy loam



Quadrat: ME 11 01    Date: 12 DEC 1994  
 Latitude: 36° 04' 30" S    Longitude: 139° 51' 10" E    Altitude: 20m  
 Location: 19km ENE SALT CREEK  
 Landform: Interdune corridor    Soil: Sandy loam



Quadrat: ME 12 01    Date: 12 DEC 1994  
 Latitude: 36° 04' 15" S    Longitude: 139° 51' 19" E    Altitude: 10m  
 Location: 19km ENE SALT CREEK  
 Landform: Closed depression    Soil: Loamy sand

# Appendices

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## Appendix II

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### PLANT SPECIES RECORDED FROM MESSENT CONSERVATION PARK

Plant Taxonomy follows Jessop (1989) but includes some more recent taxonomic changes which are in the SAFLORA Database. Common names are from Jessop and Toelken (1986) and are also from the SA FLORA Database.

Introduced species are indicated with an asterisk

Comments on particular species are indicated in the annotations at the end of the list

Records that are either not accepted or else represent redundant (incomplete) identifications are indicated by scientific names in normal rather than italic typeface.

Conservation status codes are in bold following the scientific name

Status codes listed in sequence: Australian (Species) / South Australian / South East Region.

The status categories are as follows:

- E Endangered:** rare and endanger of becoming extinct in the wild
- V Vulnerable:** rare and at risk from potential threats or long term threats which could cause the species to become endangered in the future.
- R Rare:** having a low overall frequency of occurrence: confined to a restricted range or scattered sparsely over a wider

area. Not currently exposed to significant threats, but warranting monitoring and protective measures to prevent reduction of population sizes.

- K Uncertain:** likely to be either Threatened or Rare but insufficient data for a more precise assessment.
- U Uncommon:** less common species of interest but not rare enough to warrant special protective measures.
- N** Not of particular significance / common.
- #** Not yet assessed but flagged as being of possible significance.

The final nine columns indicate the source of plant species records from Messent Conservation Park.

Records which are 'presumed' from a different identification are indicated by the letter 'p' under the source.

#### KEY: Source of Records

- 
- |   |  |
|---|--|
| 1 | K.Alcock (Naracoorte FNS) Sept 1979                                  |
| 2 | D.Murfet Oct 1985 & Oct 1988   |
| 3 | K.Mallet and B. Cooke 1985 (Common Wombat Survey)                    |
| 4 | R.J-P.Davies et al 25 Sept 1986 ( <i>Senecio macrocarpus</i> Survey) |
| 5 | L.M.Heard & P.J.Lang 16/17 Sept 1991 (South East Survey)             |
| 6 | C.R. & K.P.Nicolson 17 Sept 1991 (South East Survey)                 |
| 7 | D.Murfet & R.Taplin Feb 1993   |
| 8 | T.Dendy Nov 1994 (along proposed drain route)                        |
| 9 | P.J.Lang & R.Taplin Dec 1994 (This Survey)                           |
-

Scientific Name	Common Name	1	2	3	4	5	6	7	8	9
<b>AIZOACEAE</b>										
<i>Carpobrotus modestus</i>	inland pigface									+
<i>Carpobrotus rossii</i>	karkalla	+	+							+
<i>Carpobrotus</i> sp.				+						
<i>Tetragonia implexicoma</i>	bower spinach			+						
<b>BORAGINACEAE</b>										
<i>Cynoglossum australe</i>	Australian hounds tongue	+	+							+
<i>Cynoglossum</i> sp.			+							
* <i>Echium plantagineum</i>	Salvation Jane	+								+
<b>CAMPANULACEAE</b>										
<i>Lobelia gibbosa</i>	tall lobelia	+	+							
1 <i>Lobelia rhombifolia</i> N U K	tufted lobelia	+	+							
<i>Wahlenbergia gracilentia</i>	annual bluebell	+	+	+						+
<b>CARYOPHYLLACEAE</b>										
* <i>Cerastium glomeratum</i>	mouse-ear chickweed	+								
* <i>Moenchia erecta</i>	erect chickweed	+								
* <i>Spergularia media</i>	coast sand-spurrey								+	
<b>CASUARINACEAE</b>										
<i>Allocasuarina mackliniana</i> ssp. <i>xerophila</i>	Macklin's oak-bush			p				+	+	
<i>Allocasuarina muelleriana</i> ssp. <i>muelleriana</i>	common oakbush	+	+			+	+		+	+
<i>Allocasuarina pusilla</i>	dwarf oak-bush	+	+			+	+			+
2 <i>Allocasuarina striata</i>	tall oak-bush			+						
<b>CENTROLEPIDACEAE</b>										
<i>Centrolepis aristata</i>	pointed centrolepis					+				
<b>CHENOPODIACEAE</b>										
<i>Rhagodia candolleana</i> ssp. <i>candolleana</i>	seaberry saltbush									+
<i>Suaeda australis</i>	austral seablite	+	+							
<b>COMPOSITAE</b>										
<i>Actinobole uliginosum</i>	flannel cudweed	+	+							
<i>Angianthus preissianus</i>	salt cup-flower		+							+
3 <i>Apalochlamys spectabilis</i> N U U	showy firebush	+								+
* <i>Arctotheca calendula</i>	Capeweed	+								
<i>Argentipallium blandowskianum</i>	woolly everlasting	+	+				+		+	+
<i>Argentipallium obtusifolium</i>	blunt everlasting	+	+			+	+		+	+
<i>Brachycome ciliaris</i> var. <i>ciliaris</i>	variable daisy	+	+							
<i>Chrysocephalum apiculatum</i>	common everlasting	+	+							+
<i>Chrysocephalum baxteri</i>	fringed everlasting					+			+	
* <i>Cirsium vulgare</i>	spear thistle	+		+						+
<i>Cotula australis</i>	common cotula	+								
<i>Craspedia glauca</i>	batchelor buttons	+	+							
* <i>Dittrichia graveolens</i>	stinkwort	+		+						
<i>Euchiton sphaericus</i>	Japanese cudweed	+	+							
<i>Gnaphalium indutum</i>	tiny cudweed	+	+							
<i>Haeckeria pholidota</i> N V V	scaly haeckeria									+
<i>Helichrysum leucopsidium</i>	satin everlasting	+	+							
<i>Helichrysum scorpioides</i>	button everlasting	+	+							
<i>Hyalosperma demissum</i>	moss daisy		+							
Scientific Name	Common Name	1	2	3	4	5	6	7	8	9

* <i>Hypochaeris glabra</i>	smooth catsear	+			+		+
* <i>Hypochaeris radicata</i>	rough catsear					+	+
<i>Ixodia achillaeoides</i> ssp. <i>alata</i>	hills daisy			+		+	+
<i>Microseris lanceolata</i>	yam daisy	+	+				
<i>Millotia muelleri</i>	common bow-flower	+	+				
<i>Millotia tenuifolia</i> var. <i>tenuifolia</i>	soft millotia	+	+				
<i>Olearia axillaris</i>	coast daisy-bush	+	+			+	+
<i>Olearia ciliata</i> var. <i>ciliata</i>	fringed daisy-bush	+		+		+	+
<i>Olearia lanuginosa</i> <b>N U U</b>	woolly daisy-bush	+		+		+	+
<i>Olearia lepidophylla</i>	club-moss daisy-bush	+	+			+	
<i>Olearia ramulosa</i>	twiggy daisy-bush			+	+		
<i>Podolepis canescens</i> <b>N R R</b>	grey copper-wire						
	daisy	+	+	p		+	+
4 <i>Podolepis jaceoides</i>	showy copper-wire						
	daisy	+					
<i>Podotheca angustifolia</i>	sticky longheads	+	+			+	+
<i>Pogonolepis muelleriana</i>	stiff cup-flower						+
<i>Pseudognaphalium luteoalbum</i>	cudweed	+	+				
<i>Rutidosia multiflora</i>	small wrinklewort	+	+				
<i>Senecio glomeratus</i>	swamp groundsel					+	+
<i>Senecio glossanthus</i>	annual groundsel				+		
<i>Senecio lautus</i>	variable groundsel	+	+				
<i>Senecio macrocarpus</i> <b>V V V</b>	large-fruit groundsel			+	+	+	+
* <i>Senecio pterophorus</i> var. <i>pterophorus</i>	African daisy	+					
<i>Senecio quadridentatus</i>	cotton groundsel	+	+	+			+
<i>Senecio squarrosus</i> <b>N U U</b>	squarrose fireweed					+	
* <i>Sonchus oleraceus</i>	common sow-thistle			+			
<i>Vittadinia australasica</i>							
var. <i>australasica</i>	New Holland daisy	+				+	+
<i>Vittadinia dissecta</i> var. <i>hirta</i>	dissected New Holland						
	daisy	+	+				
<i>Vittadinia megacephala</i> <b>N N #</b>	giant New Holland						
	daisy	+					
<b>CONVOLVULACEAE</b>							
<i>Convolvulus erubescens</i>	Australian bindweed	+	+				
<i>Wilsonia backhousei</i>	narrow-leaved wilsonia	+	+	+	+	+	+
<i>Wilsonia humilis</i> var. <i>humilis</i> <b>N U U</b>	silky wilsonia						+
<i>Wilsonia rotundifolia</i>	round-leaved wilsonia			+	+		+
<b>CRASSULACEAE</b>							
<i>Crassula closiana</i>	stalked crassula				+		
<i>Crassula colorata</i> var. <i>acuminata</i>	dense stonecrop	+	+				
<i>Crassula decumbens</i> var. <i>decumbens</i>	spreading stonecrop	+	+				
<i>Crassula peduncularis</i> <b>N # #</b>	purple stonecrop	+					
<i>Crassula sieberiana</i> ssp. <i>tetramera</i>	Australian crassula	+	+				
<b>CYPERACEAE</b>							
<i>Baumea juncea</i>	bare twig-rush	+	+	+	+	+	+
<i>Caustis pentandra</i>	thick twist-rush	+			+		+
<i>Gahnia filum</i>	smooth cutting-grass	+			+		+
<i>Gahnia trifida</i>	cutting grass	+		+			+
5 <i>Isolepis hookeriana</i>					+		
<i>Isolepis marginata</i>	coarse club-rush	+					
<i>Isolepis nodosa</i>	knobby club-rush	+	+	+			+
<i>Lepidosperma carphoides</i>	black rapier-sedge	+	+	+	+	+	+
6 <i>Lepidosperma concavum</i>	spreading sword-sedge	+			+	+	+
7 <i>Lepidosperma congestum</i>	clustered sword-sedge				+		
<b>Scientific Name</b>	<b>Common Name</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6 7 8 9</b>

8	<i>Lepidosperma</i> cf. <i>laterale</i>	sharp sword-sedge				p	+	+	+	+				
	<i>Lepidosperma</i> <i>longitudinale</i>	pithy sword-sedge	+											
9	<i>Lepidosperma</i> <i>semiteres</i>	wire rapier-sedge		+										
	<i>Lepidosperma</i> sp.	sword-sedge		+			+							
10	<i>Lepidosperma</i> <i>viscidum</i>	sticky sword-sedge		+			+							
	<i>Schoenus</i> <i>breviculmis</i>	matted bog-rush					+	+	+	+				
	<i>Schoenus</i> <i>deformis</i>	tufted bog-rush	+	+			+			+				
	<i>Schoenus</i> <i>nitens</i>	shiny bog-rush	+	+		+	+			+				
	<i>Schoenus</i> sp.	bog-rush		+										
	<i>Tetraria</i> <i>capillaris</i>	hair sedge		+		+	+	+	+	+				
DENNSTAEDTIACEAE														
	<i>Pteridium</i> <i>esculentum</i>	bracken fern								+				
DILLENACEAE														
	<i>Hibbertia</i> <i>prostrata</i>	bundled guinea-flower	+											
	<i>Hibbertia</i> <i>riparia</i>	guinea-flower	+	+	+		+	+	+	+				
	<i>Hibbertia</i> <i>sericea</i> var.	silky guinea-flower			+		+							
	<i>Hibbertia</i> <i>sericea</i> var. <i>scabrifolia</i>	rough-leaf												
		guinea-flower	+	+			+		+	+				
	<i>Hibbertia</i> <i>sericea</i> var. <i>sericea</i>	silky guinea-flower					+							
	<i>Hibbertia</i> <i>virgata</i>	twiggy guinea-flower	+	+			+	+	+	+				
DROSERACEAE														
	<i>Drosera</i> <i>macrantha</i> ssp. <i>planchonii</i>	climbing sundew	+	+			+	+						
	<i>Drosera</i> <i>pygmaea</i>	tiny sundew	+	+										
	<i>Drosera</i> <i>whittakeri</i>	scented sundew	+	+			+	+						
EPACRIDACEAE														
	<i>Acrotriche</i> <i>affinis</i>	ridged ground-berry					+	+	+					
	<i>Acrotriche</i> <i>cordata</i>	blunt-leaf ground-berry	+	+			+	+		+				
	<i>Acrotriche</i> <i>serrulata</i>	honeypots	+	+			+		+	+				
	<i>Astroloma</i> <i>conostephioides</i>	flame heath	+	+	+		+	+		+				
	<i>Astroloma</i> <i>humifusum</i>	native cranberry	+	+	+		+	+	+	+				
	<i>Leucopogon</i> <i>clelandii</i>	Cleland's beard-heath			+				+	+				
	<i>Leucopogon</i> <i>costatus</i>	twiggy beard-heath	+	+	+		+	+	+	+				
	<i>Leucopogon</i> <i>woodsii</i>	nodding beard-heath		+	+		+		+	+				
	<i>Styphelia</i> <i>exarrhena</i>	desert styphelia	+	+	+		+	+	+	+				
GENTIANACEAE														
	* <i>Centaurium</i> <i>erythraea</i>	common centaury	+											
	* <i>Centaurium</i> sp.							+						
11	* <i>Centaurium</i> <i>spicatum</i>	spike centaury			+									
	* <i>Centaurium</i> <i>tenuiflorum</i>	branched centaury			p				+	+				
	<i>Sebaea</i> <i>ovata</i>	yellow sebaea	+	+										
GERANIACEAE														
	* <i>Erodium</i> <i>cicutarium</i>	common storks bill	+											
	<i>Geranium</i> <i>potentilloides</i>													
	var. <i>potentilloides</i>	native geranium			+									
	<i>Geranium</i> <i>solanderi</i> var. <i>solanderi</i>	native geranium	+	+										
	<i>Pelargonium</i> <i>littorale</i>	native pelargonium	+	+					+					
GOODENIACEAE														
12	<i>Dampiera</i> <i>lanceolata</i>				+									
	<i>Dampiera</i> <i>marifolia</i>	velvet dampiera	+	+	p				+	+				
	<i>Dampiera</i> <i>rosmarinifolia</i>	wild rosemary	+	+			+		+					
	<i>Goodenia</i> <i>blackiana</i>	native primrose							+	+				
Scientific Name			Common Name			1	2	3	4	5	6	7	8	9
	<i>Goodenia</i> <i>geniculata</i>	bent goodenia	+	+		+	+				+			



<i>Goodenia varia</i>	sticky goodenia				+				
<i>Selliera radicans</i>	shiny swamp-mat	+	+	+					+
GRAMINEAE									
<i>Agrostis avenacea</i> var. <i>avenacea</i>	blown grass	+							
<i>Agrostis billardieri</i>	blown grass				+				+
<i>Amphipogon strictus</i> var. <i>setifer</i>	spreading grey-beard grass	+	+			+			+
* <i>Avellinia michelii</i>	avellinia							+	
* <i>Briza minor</i>	lesser quaking-grass	+							
* <i>Bromus hordeaceus</i> ssp. <i>hordeaceus</i>	soft brome				+				
* <i>Bromus rigidus</i>	rigid brome	+							
<i>Danthonia caespitosa</i>	common wallaby-grass							+	
13 <i>Danthonia</i> cf. <i>racemosa</i>	slender wallaby-grass				+				+
<i>Danthonia geniculata</i>	kneed wallaby-grass	+	+			+			+
<i>Danthonia setacea</i> var. <i>setacea</i>	small-flower wallaby-grass								+
<i>Danthonia</i> sp.	wallaby grass				+				
<i>Danthonia tenuior</i> N # #	short-awn								
	wallaby-grass								+
<i>Dichelachne crinita</i> N N R	long-hair plume-grass	+							+
<i>Distichlis distichophylla</i>	emu-grass				+				
* <i>Ehrharta calycina</i>	perennial veldt grass				+				+
* <i>Lagurus ovatus</i>	hares tail grass	+		+					+
* <i>Lolium perenne</i>	perennial ryegrass				+				
<i>Neurachne alopecuroidea</i>	fox-tail mulga-grass	+	+						+
* <i>Poa annua</i>	annual meadow-grass					+			
* <i>Polypogon maritimus</i>	coast beard-grass				+				+
* <i>Rostraria cristata</i>	annual cats tail	+							
<i>Stipa acrociliata</i> N N R	graceful spear-grass				+				
<i>Stipa drummondii</i>	cottony spear-grass				+				+
14 <i>Stipa hemipogon</i>	half-beard spear-grass								+
<i>Stipa hemipogon</i> /mollis						+			+
15 <i>Stipa macalpinei</i>	annual spear-grass				+				+
16 <i>Stipa mollis</i>	soft spear-grass							+	
<i>Stipa nodosa</i>	smooth spear-grass					+			
<i>Stipa scabra</i> ssp. <i>falcata</i>	slender spear-grass	+							+
<i>Stipa</i> sp.	spear-grass				+				
* <i>Vulpia fasciculata</i>	sand fescue				+				
* <i>Vulpia myuros</i>					+				
* <i>Vulpia</i> sp.									+
GYROSTEMONACEAE									
<i>Gyrostemon australasicus</i>	buckbush wheel-fruit	+	+			+		+	+
HALORAGACEAE									
<i>Gonocarpus</i> sp.					+				
<i>Gonocarpus tetragynus</i>	small-leaf raspwort	+	+			+	+	+	+
<i>Haloragis acutangula</i>	smooth raspwort	+							
<i>Haloragis acutangula</i> forma <i>turbinata</i>	smooth raspwort				+				
<i>Haloragis</i> sp.	raspwort				+				
IRIDACEAE									
<i>Patersonia fragilis</i> N U U	short purple-flag	+	+					+	
JUNCACEAE									
<i>Juncus kraussii</i>	sea rush					+		+	
<b>Scientific Name</b>	<b>Common Name</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>
JUNCAGINACEAE									
<i>Triglochin centrocarpum</i>	dwarf arrowgrass	+							

LABIATAE										
*Marrubium vulgare	horehound	+								+
LAURACEAE										
Cassytha glabella forma dispar	slender dodder-laurel	+	+	+		+	+		+	+
Cassytha pubescens	downy dodder-laurel	+	+			+				+
LEGUMINOSAE										
Acacia cupularis	coast umbrella-bush	+	+	+						
Acacia leiophylla	coast golden wattle				+					
17 Acacia ligulata	umbrella bush	+	+	+						
Acacia longifolia var. sophorae	coastal wattle	+	+	+						+
Acacia myrtifolia var. myrtifolia	myrtle wattle	+	+	+		+	+		+	+
Acacia pycnantha	golden wattle	+	+						+	+
Acacia spinescens	spiny wattle	+	+	+		+			+	+
Daviesia brevifolia	leafless bitter-pea	+	+	+		+	+		+	+
Dillwynia hispida	red parrot-pea	+	+				+		+	+
Eutaxia microphylla var. microphylla	common eutaxia									+
Gompholobium ecostatum	dwarf wedge-pea	+	+				+		+	+
Hardenbergia violacea	native lilac				+					
Kennedia prostrata	scarlet runner	+	+	+			+		+	+
*Medicago sativa	lucerne				+					
Phyllota pleurandroides	heathy phyllota	+	+	+		+	+		+	+
Phyllota remota N U U	slender phyllota				+			+	+	+
Pultenaea acerosa N N U	bristly bush-pea	+	+	+		+	+			+
Pultenaea prostrata	silky bush-pea		+							
Pultenaea sp.	bush-pea						+			
Pultenaea tenuifolia	narrow-leaf bush-pea	+	+	+		+	+		+	+
18 Pultenaea teretifolia	terete-leaf bush-pea				+					
Pultenaea vestita N U R	feather bush-pea	+				+			+	+
Sphaerolobium minus N R R	leafless globe-pea		+						+	+
*Trifolium arvense var. arvense	hares foot clover				+					
*Trifolium fragiferum var. fragiferum	strawberry clover				+					
LILIACEAE										
Arthropodium strictum	common vanilla-lily			+						
Dianella revoluta	black-anther flax-lily	+			+					
Dianella revoluta var. brevicaulis	short-stem flax-lily			+						+
Dianella revoluta var. revoluta	black-anther flax-lily			+						+
Laxmannia orientalis	dwarf wire-lily	+	+				+			+
Lomandra collina	sandhill mat-rush	+	+				+			
Lomandra effusa	scented mat-rush	+	+				+			
Lomandra juncea	desert mat-rush	+	+				+		+	+
Lomandra micrantha	small-flower mat-rush	+	+				+			
Thysanotus juncifolius	rush fringe-lily				+				+	+
Thysanotus patersonii	twining fringe-lily	+	+				+		+	
Tricoryne tenella	tufted yellow rush-lily						+	+	+	+
Wurmbea dioica ssp. dioica	early star-lily	+								
19 Xanthorrhoea australis	austral grass-tree				+					
Xanthorrhoea caespitosa	sand-heath yacca	+	+	p		+	+		+	+
LINACEAE										
Linum marginale	native flax						+		+	
LOGANIACEAE										
Logania linifolia	flax-leaf logania	+	+			+	+		+	+
Scientific Name	Common Name	1	2	3	4	5	6	7	8	9
Mitrasacme paradoxa	wiry mitrewort		+							

<i>Lawrencia glomerata</i>	clustered lawrencia								+	+
<i>Lawrencia spicata</i> <b>N U U</b>	salt lawrencia						+	+		+
<b>MYOPORACEAE</b>										
<i>Myoporum insulare</i>	common boobialla	+								+
<i>Myoporum parvifolium</i> <b>N R R</b>	creeping boobialla	+		+						+
<b>MYRTACEAE</b>										
<i>Baeckea behrii</i>	silver broom									+
<i>Baeckea ericaea</i>	mat baeckea				+	+			+	
<i>Calytrix alpestris</i>	snow fringe-myrtle	+	+	+	+	+	+	+	+	+
<i>Calytrix tetragona</i>	common fringe-myrtle	+	+			+	+	+	+	+
<i>Eucalyptus arenacea</i>	sand stringybark	p		p			+	+	+	+
20 <i>Eucalyptus baxteri</i>	brown stringybark	+		+						
<i>Eucalyptus diversifolia</i>	coastal white mallee	+	+	+	+	+	+	+	+	+
<i>Eucalyptus fasciculosa</i>	pink gum	+	+	+	+				+	+
<i>Eucalyptus incrassata</i>	ridge-fruit mallee	+	+	+	+	+	+	+	+	+
<i>Eucalyptus leptophylla</i>	narrow-leaf red mallee	+	+	+	+	+	+	+	+	+
<i>Eucalyptus leucoxydon</i>	South Australian blue gum	+						+		
<i>Eucalyptus leucoxydon</i> ssp. <i>stephaniae</i>	scrubby blue gum									+
<i>Kunzea pomifera</i>	muntries	+	+	+	+			+	+	+
<i>Leptospermum continentale</i>	prickly tea-tree	+	+	+			+		+	+
<i>Leptospermum coriaceum</i>	sandhill tea-tree			+					+	
<i>Leptospermum myrsinoides</i>	heath tea-tree	+	+			+	+		+	+
<i>Leptospermum</i> sp.				+						
<i>Melaleuca acuminata</i>	mallee honey-myrtle		+							
<i>Melaleuca brevifolia</i>	short-leaf honey-myrtle	+	+	+	+	+	+	+	+	+
<i>Melaleuca halmaturorum</i>	swamp paper-bark	+	+						+	+
<i>Melaleuca lanceolata</i>	dryland tea-tree	+	+	+			+		+	+
<b>ORCHIDACEAE</b>										
<i>Acianthus pusillus</i>	mosquito orchid	+								
<i>Burnettia nigricans</i>	red-beak orchid	+	+			+	+			
<i>Caladenia cardiochila</i>	thick-lipped spider-orchid	+	+			+				
<i>Caladenia carnea</i> var. <i>carnea</i>	pink fingers	+								
21 <i>Caladenia dilatata</i> complex	green-comb spider-orchid	+	+							
<i>Caladenia latifolia</i>	pink caladenia	+	+							
<i>Caladenia patersonii</i> complex	white spider-orchid	+	+			+	+		+	
22 <i>Caladenia reticulata</i> <b>N U K</b>	veined spider-orchid					+				
<i>Corybas</i> sp.	helmet-orchid					+				
<i>Cyanicula deformis</i>	bluebeard orchid	+	+							
<i>Cyrtostylis reniformis</i>			+							
<i>Diuris</i> aff. <i>corymbosa</i>	wallflower									
<i>Diuris pardina</i>	donkey-orchid	+	+							
<i>Genoplesium nigricans</i>	spotted donkey-orchid	+	+			+				
<i>Genoplesium rufum</i>	black midge-orchid	+								
<i>Glossodia major</i>	red midge-orchid							+		
<i>Leporella fimbriata</i>	purple cockatoo	+	+							
<i>Microtis unifolia</i> complex	fringed hare-orchid	+	+							
23 <i>Prasophyllum elatum</i>	tall leek-orchid	+	+							+
<i>Prasophyllum odoratum</i>	scented leek-orchid	+								
<b>Scientific Name</b>	<b>Common Name</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>
<i>Prasophyllum</i> sp.	leek orchid					+				
<i>Pterostylis nana</i>	dwarf green-hood	+	+			+	+			
<i>Pterostylis plumosa</i>	bearded green-hood	+	+			+	+			

<i>Pterostylis sanguinea</i>	red banded green-hood	+	+			+			
<i>Pterostylis</i> sp.	green-hood					+			
<i>Thelymitra antennifera</i>	lemon sun-orchid	+	+			+	+		
<i>Thelymitra benthamiana</i> <b>N U R</b>	leopard sun-orchid	+	+			+	+	+	+
<i>Thelymitra canaliculata</i> <b>N U U</b>	azure sun-orchid		+						
<i>Thelymitra epipactoides</i> <b>E E E</b>	metallic sun-orchid	+							
<i>Thelymitra matthewsii</i> <b>V E E</b>	spiral-leaf sun-orchid		+						
<i>Thelymitra</i> sp.	sun-orchid								+
<b>OXALIDACEAE</b>									
<i>Oxalis perennans</i>	native sorrel	+							
<b>PITTOSPORACEAE</b>									
<i>Billardiera cymosa</i>	sweet apple-berry	+	+	p		+	+	+	+
24 <i>Billardiera scandens</i>	eastern apple-berry			+					
<i>Bursaria spinosa</i>	sweet bursaria	+	+	+				+	+
<b>POLYGALACEAE</b>									
<i>Comesperma calymega</i>	blue milkwort	+	+					+	+
<i>Comesperma polygaloides</i> <b>N R R</b>	mauve milkwort					+			
<i>Comesperma volubile</i>	love creeper								+
<b>POLYGONACEAE</b>									
<i>Muehlenbeckia adpressa</i>	climbing lignum			+					
<i>Muehlenbeckia gunnii</i>	coastal climbing lignum							+	
<b>PORTULACACEAE</b>									
<i>Calandrinia granulifera</i>	pigmy purslane		+						
<b>PRIMULACEAE</b>									
* <i>Anagallis arvensis</i>	pimpernel								+
<b>PROTEACEAE</b>									
<i>Adenanthos terminalis</i>	yellow gland-flower	+	+	+		+	+	+	+
<i>Banksia marginata</i>	silver banksia	+	+	+		+	+	+	+
<i>Banksia ornata</i>	desert banksia	+	+	+		+	+	+	+
<i>Conospermum patens</i>	slender smoke-bush	+	+						+
<i>Grevillea ilicifolia</i>	holly-leaf grevillea					+			
<i>Grevillea ilicifolia</i> var. <i>ilicifolia</i>	holly-leaf grevillea	+	+			+		+	+
<i>Hakea muelleriana</i>	heath needlebush	+	+			+	+	+	+
<i>Hakea repullulans</i> <b>N U U</b>	furze hakea	+	+					+	+
<i>Hakea rostrata</i>	beaked hakea	+	+	+		+	+	+	+
<i>Hakea vittata</i>	limestone needlebush	+	+			+		+	+
<i>Isopogon ceratophyllus</i>	cone-bush	+	+	+		+	+	+	+
<i>Persoonia juniperina</i>	prickly geebung	+	+			+	+	+	+
<b>RANUNCULACEAE</b>									
<i>Clematis microphylla</i>	small-leaved clematis	+	+	+					+
<b>RESTIONACEAE</b>									
<i>Hypolaena fastigiata</i>	tassel rope-rush	+	+	+		+	+	+	+
<i>Lepidobolus drapetocoleus</i>	scale shedder	+	+	+		+	+	+	+
<i>Leptocarpus brownii</i>	coarse twine-rush	+	+			+	+	+	+
<b>Scientific Name</b>	<b>Common Name</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8 9</b>
<b>RHAMNACEAE</b>									
<i>Cryptandra tomentosa</i>	velvet cryptandra	+	+	+		+	+	+	+
<i>Spyridium nitidum</i> <b>U U R</b>	shining spyridium		+						+
<i>Spyridium subochreatum</i>	velvet spyridium					+	+		
25 <i>Spyridium subochreatum</i>									

var. laxiusculum	velvet spyridium	+	+						
<i>Spyridium subochreatum</i>									
var. <i>subochreatum</i>	velvet spyridium	p	p				+	+	
26 <i>Spyridium thymifolium</i>	thyme-leaf spyridium			+					
<i>Spyridium vexilliferum</i> var. <i>latifolium</i>	winged spyridium	+	p				+	+	+
ROSACEAE									
<i>Acaena echinata</i>	sheep's burr			+					
<i>Acaena novae-zelandiae</i>	biddy-biddy	+		+					+
RUBIACEAE									
* <i>Galium murale</i>	small bedstraw	+							
<i>Opercularia scabrida</i>	stalked stinkweed						+		+
<i>Opercularia turpis</i>	twiggy stinkweed						+		
<i>Opercularia varia</i>	variable stinkweed	+	+						
RUTACEAE									
<i>Boronia coerulescens</i>									
ssp. <i>coerulescens</i>	blue boronia	+	+			+	+	+	+
<i>Correa reflexa</i> var. <i>reflexa</i>	common correa	+	+	+		+	+	+	+
SANTALACEAE									
<i>Choretrum glomeratum</i>									
var. <i>glomeratum</i>	white sour-bush	+	+	+			+		+
<i>Exocarpos cupressiformis</i> ?	native cherry			+					
<i>Exocarpos sparteus</i>	broom ballart	+	+	+			+	+	+
<i>Leptomeria aphylla</i> <b>N U U</b>	leafless currant-bush					+			
<i>Santalum acuminatum</i> <b>N N R</b>	quandong		+	+					
<i>Santalum murrayanum</i> <b>N U U</b>	bitter quandong		+						+
SCROPHULARIACEAE									
<i>Euphrasia collina</i> ssp. <i>tetragona</i>	coast eyebright	+	+				+		+
* <i>Parentucellia latifolia</i>	red bartsia	+			+				
* <i>Verbascum virgatum</i>	twiggy mullein								+
SOLANACEAE									
<i>Solanum simile</i>	Kangaroo apple	+	+	+					+
STACKHOUSIACEAE									
<i>Stackhousia aspericocca</i>	bush candles	+	+				+	+	+
STERCULIACEAE									
<i>Lasiopetalum baueri</i>	slender velvet-bush		+						
<i>Thomasia petalocalyx</i>	paper-flower	+	+					+	+
STYLIDIACEAE									
<i>Levenhookia dubia</i>	hairy stylewort	+	+						
<i>Levenhookia pusilla</i>	tiny stylewort		+		+				
<i>Stylidium graminifolium</i>	grass trigger-plant	+	+						+
THYMELAEACEAE									
<i>Pimelea glauca</i>	smooth riceflower	+	+			+			
<i>Pimelea octophylla</i>	woolly riceflower								
<b>Scientific Name</b>	<b>Common Name</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8 9</b>
<i>Pimelea phyllicoides</i>	heath riceflower	+	+				+	+	+
TREMANDRACEAE									
<i>Tetratheca pilosa</i> ssp. <i>pilosa</i>	hairy pink-bells	+	+			+			
UMBELLIFERAE									

<i>Daucus glochidiatus</i>	native carrot	+	+				+
<i>Hydrocotyle callicarpa</i>	tiny pennywort				+	+	
<i>Hydrocotyle capillaris</i>	thread pennywort	+					
<i>Hydrocotyle laxiflora</i>	stinking pennywort	+			+	+	
Hydrocotyle sp.				+			
<i>Xanthosia dissecta</i> var. <i>floribunda</i>	cut-leaf xanthosia	+	+		+	+	+
<i>Xanthosia pusilla</i>	hairy xanthosia				+	+	+

- 1 Fire-induced species. Likely to have declined since fire.
- 2 Incorrect identification, species does not occur in South East Region. Presumably *Allocasuarina mackliniana* ssp. *xerophila*.
- 3 Fire-induced species. Observed sporadically along firebreaks in 1994 (source 9).
- 4 Presumably in error for *Podolepis canescens* (based on habitat description & previous records).
- 5 Doubtful identification. Not recorded for South East Region
- 6 *Lepidosperma concavum* in the strict sense. A species typical of sand heath, but sometimes occurring on higher sandy patches near the margins of sedgeland depressions with *L. cf. laterale*.
- 7 Recorded in error. Davies (source 4) previously used this name to refer to *Lepidosperma cf. laterale* qv. However, *L. congestum* typically occurs on soils with limestone.
- 8 Not *Lepidosperma laterale* in the strict sense, nor *L. elatius* which has been referred to as *L. laterale* in South Australia. This taxon is a dominant species of seasonally inundated sedgeland depressions where it forms extensive colonies. It has a spreading rhizome and does not form dense tussocks. Plants are often sterile (as in *L. concavum*). The culms are generally rather tall with a long basal branch (as in *L. viscidum* and *L. elatior*) and the florets are packed densely (as in *L. congestum*). Davies (source 4) probably refers to this species as well as *L. concavum* s.str.
- 9 Presumably in error for *Lepidosperma carphoides* which was not listed.
- 10 The record by Mallett (source 3) most likely refers to another species. The record from source 6 warrants checking.
- 11 Probably in error for *Centaureum tenuiflorum* which was not listed.
- 12 This is probably in error for *Dampiera marifolia* given the absence of other *Dampiera* species in Mallett's survey.
- 13 Specimen from source 9 appeared intermediate between *Danthonia racemosa* and *D. setacea*.
- 14 This grass was common along slashed firebreaks but also occurred sparsely in sedgeland depressions. Two specimens vouchered from quadrats were identified as *Stipa hemipogon*, but some unvouchered records may be *S. mollis* or intermediates which were recorded in the same area (source 8)
- 15 Post-fire successional species. Confined to slashed firebreak at time of 1994 survey (source 9) where it was rare.
- 16 Shares some features of *Stipa hemipogon* and may represent an intergrade with that species
- 17 Records presumed to be *Acacia cupularis*, which was split from *A. ligulata* subsequent to surveys. Messent CP is beyond the southern limit of the distribution of *A. ligulata* s.str.
- 18 Incorrect identification. Species does not occur in South East Region.
- 19 Incorrect name. *Xanthorrhoea australis* was widely used at the time to refer to *X. caespitosa*.
- 20 Records presumed to be *Eucalyptus arenacea* which was split from *E. baxteri* subsequent to surveys.
- 21 Most likely to be *Caladenia tensa*.
- 22 Warrants checking as distribution in South East Region is uncertain
- 23 Fire-induced species. Likely to have declined since fire.
- 24 Incorrect identification. Well beyond north-western limit of species distribution. Presumed to refer to *Billardiera cymosa* which was not listed.
- 25 Identification to variety warrants checking. Presumed to be var. *subochreatum*.
- 26 Incorrect identification. Species does not occur in South East region. Presumed to refer to *Spyridium vexilliferum* var. *latifolium* which was not listed.

# Appendices

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## Appendix III

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### MAMMAL SPECIES RECORDED FROM MESSENT CONSERVATION PARK

Mammal taxonomy follows Kemper and Queale (1990). Species records from the collections of the South Australian Museum are up to 1993 and do not include specimens collected during the present survey.

Introduced species are indicated with an asterisk.

Comments on particular species are indicated in the annotations to the list.

The State conservation ratings are shown in bold following the scientific name. These have been taken from Kemper and Queale (1990).

The definition for the status codes are as follows:

**V** Vulnerable: taxa believed likely to move into endangered category in the near future if the causal factors continue operating.

**R** Rare: taxa with small populations in South Australia that are not at present endangered or vulnerable, but are at risk.

In addition two other categories have been used for species not considered at risk (Watts, 1990).

The definitions for these status codes are as follows:

**U** Uncommon: taxa occurring in relatively low numbers in South Australia, but not rare.

**C** Common: the category of greatest abundance; relatively numerous generally, locally and/or seasonally. (Local abundance applies to species with restricted distribution.)

The final seven columns indicate the source of mammal species records for Messent Conservation Park.

KEY: Source of Records

- 
- |   |  |
|---|--|
| 1 | South Australian Museum Records 1960-69                      |
| 2 | South Australian Museum Records 1980-89                      |
| 3 | South Australian Museum Records 1990-93                      |
| 4 | A Report on Messent Wildlife Reserve by C.T. & E.M. James, C |
| 5 | Survey by Field Naturalists Society Mammal Club<br>30/12/68  |
| 6 | The National Parks Commission Inspection Reports for Messent |
| 7 | This Survey Dec 1994   |
-

Scientific Name	Common Name	1	2	3	4	5	6	7
<b>BURRAMYIDAE</b>								
<i>Cercartetus concinnus</i> <b>C</b>	Western Pigmy-possum		+					+
<i>Cercartetus lepidus</i> <b>U</b>	Little Pigmy-possum		+					+
<b>CANIDAE</b>								
* <i>Vulpes vulpes</i>	Fox	+			+			+
<b>CERVIDAE</b>								
1 * <i>Cervus dama</i>	Fallow Deer						+	
<b>LEPORIDAE</b>								
* <i>Lepus capensis</i>	Brown Hare							+
* <i>Oryctolagus cuniculus</i>	Rabbit				+		+	+
<b>MACROPODIDAE</b>								
<i>Macropus fuliginosus</i> <b>C</b>	Western Grey Kangaroo				+	+	+	+
2 <i>Macropus rufogriseus</i> <b>R</b>	Red-necked Wallaby							?
<b>MURIDAE</b>								
* <i>Mus domesticus</i>	House Mouse					+		+
<i>Pseudomys apodemoides</i> <b>U</b>	Silky Mouse		+	+				+
<b>TACHYGLOSSIDAE</b>								
<i>Tachyglossus aculeatus</i> <b>C</b>	Short-beaked Echidna							+
<b>VESPERTILIONIDAE</b>								
<i>Chalinolobus gouldii</i> <b>C</b>	Gould's Wattled Bat					+		
3 <i>Eptesicus vulturnus</i> <b>C</b>	Little Forest Eptesicus		+			+		
<i>Mormopterus planiceps</i> <b>C</b>	Little Mastiff Bat					+		
<i>Nyctophilus geoffroyi</i> <b>C</b>	Lesser Long-eared Bat					+		
<b>VOMBATIDAE</b>								
<i>Vombatus ursinus</i> <b>V</b>	Common Wombat	+			+			+

1 A group of about seven seen in the SE part of the park by Tim Dendy, Nov 1994.

2 Not seen in the park during the survey but owner of 'Deepwater' reported a small population in remnant natural vegetation just S of park.

3 Museum record of *Eptesicus pumilis* during Mammal Club 1968 survey probably this species.



# Appendices

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## Appendix IV

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### BIRD SPECIES RECORDED FROM MESSENT CONSERVATION PARK

Species are arranged in alphabetical order of Family using the taxonomy and nomenclature of Parker and Horton (1990). Where common names differ from those recommended by the Royal Australian Ornithological Union the latter is given in parentheses.

Introduced species are preceded with an asterisk.

Comments on particular species are indicated in the annotations to the list.

The State conservation ratings are shown in bold following the scientific name. These have been taken from Parker and Horton (1990).

The definition for the status codes are as follows:

**E** Endangered: taxa in danger of extinction and whose survival is unlikely if the causal factors continue operating.  
**V** Vulnerable: taxa believed likely to move into endangered category in the near future if the causal factors continue operating.

The final twelve columns indicate the source of bird species records for Messent Conservation Park, arranged chronologically.

KEY: Source of Records

- 
- 1 List for Messent C.P. by Brian Glover 1951 to 1957
  - 2 Visit to Messent C.P. by J. Paton, July 1968
  - 3 Birds seen on the Ninth Spring School by B.W. Rundall, Messent C.P., September 1968
  - 4 National Parks Commission Inspection Reports for Messent C.P., 1968-71
  - 5 Visit to Messent C.P. by H. Possingham, 26/11/1982
  - 6 South Australian Bird Atlas Data Card for Messent C.P. by J. Paton, 10/9/1984
  - 7 South Australian Bird Atlas Checklist for Messent C.P. by J. Paton, et al., 20/10/1984
  - 8 South Australian Bird Atlas Data Card for Messent C.P. by J. Paton, et al., 10-20/1/1985
  - 9 South Australian Bird Atlas Data Card for Messent C.P. by J. Paton, April 1985
  - 10 Visit to Messent C.P. by Hugh and Max Possingham, 20 hours, 20-21/10/1989

11 Visit to Messent C.P. by Hugh and Max Possingham, 8 hours, 22-23/2/1992

12 This Survey December 1994

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Scientific Name	Common Name	1	2	3	4	5	6	7	8	9	10	11	12
<b>ACCIPITRIDAE</b>													
<i>Accipiter cirrhocephalus</i>	Collared Sparrowhawk											+	+
<i>Accipiter fasciatus</i>	Brown Goshawk										+		
<i>Aquila audax</i>	Wedge-tailed Eagle				+	+				+	+		+
<i>Circus assimilus</i>	Spotted Harrier												+
<i>Circus approximans</i>	Swamp (Marsh) Harrier	+			+								
<i>Elanus caeruleus</i>	Black-shouldered Kite				+						+		+
<i>Haliastur sphenurus</i>	Whistling Eagle (Whistling Kite)	+			+	+							
<b>ALAUDIDAE</b>													
* <i>Alauda arvensis</i>	Skylark		+	+		+		+		+	+		+
<b>ANATIDAE</b>													
<i>Anas castanea</i>	Chestnut Teal				+								
<i>Anas gracilis</i>	Australasian Grey Teal	+			+								
<i>Anas superciliosa</i>	Pacific Black Duck	+			+								
<i>Chenonetta jubata</i>	Wood Duck (Maned Goose)				+								
<i>Cygnus atratus</i>	Black Swan	+			+								
<b>ARDEIDAE</b>													
<i>Ardea alba</i>	Great (White) Egret	+											
<i>Ardea novaehollandiae</i>	White-faced Heron	+											
<b>CASUARIIDAE</b>													
<i>Dromaius novaehollandiae</i>	Emu	+	+	+	+								+
<b>CHARADRIIDAE</b>													
<i>Charadrius ruficapillus</i>	Red-capped Dotterel (Plover)				+								
<i>Elseyornis melanops</i>	Black-fronted Dotterel (Plover)	+											
<i>Holopterus miles</i>	Spurwing Plover (Masked Lapwing)	+		+	+								
<i>Recurvirostra novaehollandiae</i>	Red-necked Avocet				+								
<b>COLUMBIDAE</b>													
* <i>Columba livia</i>	Feral Pigeon									+			
<i>Geopelia placida</i>	Peaceful Dove									+			
<i>Ocyphaps lophotes</i>	Crested Pigeon					+		+	+				+
<i>Phaps chalcoptera</i>	Common Bronzewing					+			+	+	+	+	+
<i>Phaps elegans</i>	Brush Bronzewing	+	+	+				+			+	+	

Scientific Name	Common Name	1	2	3	4	5	6	7	8	9	10	11	12
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# CORVIDAE

<i>Artamus cyanopterus</i>	Dusky Woodswallow	+			+			+	+	+	+	+	+
<i>Artamus personatus</i>	Masked Woodswallow					+							+
<i>Artamus superciliosus</i>	White-browed Woodswallow					+					+		+
<i>Colluricincla harmonica</i>	Grey Shrike-thrush	+	+	+	+	+		+	+	+	+	+	+
<i>Coracina novaehollandiae</i>	Black-faced Cuckooshrike		+			+		+	+	+	+		+
<i>Corvus coronoides</i>	Australian Raven		+	+					+		+		
<i>Corvus mellori</i>	Little Raven					+	+	+		+		+	+
<i>Cracticus torquatus</i>	Grey Butcherbird	+	+	+	+			+	+	+	+	+	+
<i>Grallina cyanoleuca</i>	Australian Magpie-lark	+			+								+
<i>Gymnorhina tibicen</i>	Australian Magpie	+	+	+	+	+	+	+	+	+	+	+	+
<i>Lalage sueurii</i>	White-winged Triller										+		
<i>Myiagra inquieta</i>	Restless Flycatcher	+											
<i>Oreoica gutturalis</i>	Crested Bellbird		+	+	+	+					+		
<i>Pachycephala pectoralis</i>	Golden Whistler		+	+		+		+		+	+	+	+
<i>Pachycephala rufiventris</i>	Rufous Whistler					+							
<i>Rhipidura fuliginosa</i>	Grey Fantail	+	+	+			+	+	+	+	+	+	+
<i>Rhipidura leucophrys</i>	Willie Wagtail	+	+	+	+	+	+	+	+	+	+	+	+
<i>Strepera versicolor</i>	Grey Currawong	+			+			+	+	+	+	+	+

# CUCULIDAE

<i>Cacomantis flabelliformis</i>	Fan-tailed Cuckoo								+		+		
<i>Chrysococcyx basalis</i>	Horsfield's Bronze Cuckoo	+					+	+			+		

# DACELONIDAE

<i>Dacelo novaeguineae</i>	Laughing Kookaburra	+											
<i>Halcyon sancta</i>	Sacred Kingfisher	+											

# EOPSALTRIIDAE

<i>Daphoenositta chrysoptera</i>	(Varied) Sittella	+							+		+		+
<i>Drymodes brunneopygia</i>	Southern Scrub-robin	+				+						+	+
<i>Eopsaltria australis</i>	Eastern Yellow Robin							+	+	+	+	+	+
<i>Melanodryas cucullata</i>	Hooded Robin							+	+		+	+	+
<i>Microeca leucophaea</i>	Jacky Winter	+	+	+				+	+				+
<i>Petroica multicolor</i>	Scarlet Robin	+			+								

# FALCONIDAE

<i>Falco berigora</i>	Brown Hawk (Brown Falcon)	+	+	+		+		+	+	+	+		+
<i>Falco cenchroides</i>	Nankeen Kestrel		+	+	+	+		+	+	+	+	+	+
<i>Falco longipennis</i>	Little Falcon (Australian Hobby)												+

Scientific Name	Common Name	1	2	3	4	5	6	7	8	9	10	11	12
-----------------	-------------	---	---	---	---	---	---	---	---	---	----	----	----

FRINGILLIDAE														
*	<i>Carduelis carduelis</i>	Goldfinch								+			+	
HIRUNDINIDAE														
	<i>Cheramoeca leucusternum</i>	White-backed Swallow											+	
	<i>Hirundo neoxena</i>	Welcome Swallow	+			+			+		+	+	+	
	<i>Hirundo nigricans</i>	Tree Martin									+	+	+	
LARIDAE														
	<i>Chlidonias hybridus</i>	Whiskered (Marsh) Tern	+											
	<i>Larus novaehollandiae</i>	Silver Gull	+		+	+			+		+			
	<i>Sterna nereis</i> <b>V</b>	Fairy Tern	+		+									
*	<i>Turdus merula merula</i>	Blackbird	+									+		
MALURIDAE														
	<i>Malurus cyaneus</i>	Superb Blue Wren (Fairy-wren)	+	+	+	+	+		+	+	+	+	+	
	<i>Malurus lamberti</i>	Variegated Wren (Fairy-wren)					+			+	+	+	+	
	<i>Stipiturus malachurus</i> <b>V</b>	Southern Emu-wren					+				+	+	+	
MEGAPODIIDAE														
	<i>Leipoa ocellata</i> <b>E</b>	Malleefowl				+								
MELIPHAGIDAE														
	<i>Acanthagenys rufogularis</i>	Spiny-cheeked Honeyeater					+		+		+	+	+	
	<i>Anthochaera carunculata</i>	Red Wattlebird	+	+	+	+	+	+	+	+	+	+	+	
	<i>Anthochaera chrysoptera</i>	Little Wattlebird						+	+					
	<i>Ephthianura albifrons</i>	White-fronted Chat	+			+	+		+			+	+	
	<i>Gliciphila melanops</i>	Tawny-crowned Honeyeater	+	+	+		+	+	+	+	+	+	+	
	<i>Meliphaga cratitia</i>	Purple-gaped Honeyeater					+		+	+	+	+	+	
	<i>Meliphaga leucotis</i>	White-eared Honeyeater						+		+				
	<i>Meliphaga virescens</i>	Singing Honeyeater	+						+		+			
	<i>Melithreptus brevirostris</i>	Brown-headed Honeyeater	+					+	+		+	+	+	
	<i>Phylidonyris novaehollandiae</i>	New Holland Honeyeater	+	+	+	+	+	+	+	+	+	+	+	
PARDALOTIDAE														
	<i>Acanthiza chrysorrhoa</i>	Yellow-rumped Thornbill					+	+	+	+	+	+	+	
	<i>Acanthiza iredalei</i>	Slender-billed Thornbill									+			
	<i>Acanthiza lineata</i>	Striated Thornbill	+	+	+		+		+	+	+	+	+	
	<i>Acanthiza pusilla pusilla</i>	Brown Thornbill	+				+		+	+	+	+	+	
	<i>Acanthiza reguloides</i>	Buff-rumped Thornbill	+				+			+			+	
	<b>Scientific Name</b>	<b>Common Name</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>
1	<i>Calamanthus fuliginosus</i>	Eastern Fieldwren					+							

1	<i>Calamanthus sp.</i>									+	+	+	
	<i>Hylacola cauta</i> V	Shy Heathwren (Shy Hylacola)			+		+		+	+	+	+	+
	<i>Pardalotus striatus</i>	Striated Pardalote						+					
	<i>Pardalotus xanthopygus</i> V	Yellow-rumped Pardalote	+				+	+			+		+
	<i>Sericornis frontalis</i>	White-browed Scrubwren						+			+		+
	<i>Smicrornis brevirostris</i>	Weebill					+			+	+	+	+
PASSERIDAE													
	<i>Anthus novaeseelandiae</i>	Richard's Pipit	+	+	+	+	+		+	+	+	+	+
PELECANIDAE													
	<i>Pelecanus conspicillatus</i>	Australian Pelican											+
PHASIANIDAE													
	<i>Coturnix novaezelandiae</i>	Stubble Quail				+			+	+			+
PODICEPIDIDAE													
	<i>Poliiocephalus poliocephalus</i>	Hoary-headed Grebe	+										
	<i>Tachybaptus novaehollandiae</i>	Black-throated (Australasian) Grebe	+			+							
POMATOSTOMIDAE													
	<i>Pomatostomus superciliosus</i>	White-browed Babbler	+				+		+		+	+	+
PSITTACIDAE													
	<i>Barnardius zonarius barnardi</i>	Mallee Ringneck	+			+	+		+	+		+	+
	<i>Eolophus roseicapillus</i>	Galah	+	+	+	+	+		+	+		+	+
	<i>Glossopsitta concinna</i>	Musk Lorikeet	+								+		+
	<i>Glossopsitta porphyrocephala</i>	Purple-crowned Lorikeet	+					+			+	+	+
	<i>Neophema chrysostoma</i>	Blue-winged Parrot									+	+	
	<i>Neophema elegans</i>	Elegant Parrot									+		+
	<i>Nymphicus hollandicus</i>	Cockatiel						+					
	<i>Platycercus elegans</i>	Crimson Rosella				+							
	<i>Platycercus eximius</i>	Eastern Rosella				+			+		+	+	+
	<i>Psephotus haematonotus</i>	Red-rumped Parrot				+	+		+		+		+
RALLIDAE													
	<i>Fulica atra</i>	(Eurasian) Coot	+										
	<i>Gallinula ventralis</i>	Black-tailed Native-hen	+										
<b>Scientific Name</b>	<b>Common Name</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>
SCOLOPACIDAE													
	<i>Calidris acuminata</i>	Sharp-tailed Sandpiper				+							

STURNIDAE														
*	<i>Sturnus vulgaris</i>	Common Starling				+			+				+	+
SYLVIIDAE														
	<i>Cinclorhamphus cruralis</i>	Brown Songlark			+				+	+	+	+	+	+
	<i>Megalurus gramineus</i>	Little Grassbird	+											
TURNICIDAE														
	<i>Turnix velox</i>	Little Button-quail									+			
ZOSTEROPIDAE														
	<i>Zosterops lateralis</i>	Silvereye	+			+	+	+	+	+	+	+	+	+

- 1 Record of *Calamanthus sp.* requires confirmation. Both *C. fuliginosus* and the Western Fieldwren *C. campestris* could occur in the park.

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# Appendices

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## Appendix V

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### REPTILE AND AMPHIBIAN SPECIES RECORDED FROM MESSENT CONSERVATION PARK

Reptile taxonomy follows Edwards and Tyler (1990), but includes some recent taxonomic changes and additional common names from Hutchinson (1992). Species records from the collections of the South Australian Museum are up to 1993 and do not include specimens collected during the present survey.

No amphibian species have yet been recorded within Messent Conservation Park.

Comments on particular species are indicated in the annotations to the list.

The final four columns indicate the source of reptile species records for Messent Conservation Park.

KEY:      Source of Records

- 
- |   |   |
|---|---|
| 1 | A Report on Messent Wildlife Reserve by C.T. & E.M. James, October 1965                   |
| 2 | The National Parks Commission Inspection Reports for Messent C.P. by P.W. Tomlin, 1970-71 |
| 3 | South Australian Museum Records 1970-79   |
| 4 | This Survey Dec 1994  |
-



Scientific Name	Common Name	1	2	3	4
<b>AGAMIDAE</b>					
1 <i>Pogona viticeps</i>	Central Bearded Dragon		+		+
2 <i>Tympanocryptis lineata</i>	Five-lined Earless Dragon	+			+
<b>CHELIDAE</b>					
3 <i>Chelodina longicollis</i>	Long-necked Tortoise	+			
4 <i>Emydura macquari</i>	Murray Turtle	+			
<b>ELAPIDAE</b>					
<i>Drysdalia mastersi</i>	Masters' Snake				+
5 <i>Echiopsis curta</i>	Bardick				?
<i>Notechis scutatus</i>	Tiger Snake				+
<i>Pseudonaja textilis</i>	Eastern Brown Snake		+		
<b>PYGOPODIDAE</b>					
<i>Aprasia striolata</i>	Lined Worm-lizard				+
<i>Pygopus lepidopodus</i>	Common Scaly-foot				+
<b>SCINCIDAE</b>					
<i>Bassiana duperryi</i>	Eastern Three-lined Skink				+
<i>Ctenotus uber</i>	Spotted Ctenotus				+
<i>Hemiergis peronii</i>	Four-toed Earless Skink				+
<i>Lerista bougainvillii</i>	Bougainville's Skink			+	+
<i>Lampropholis delicata</i>	Garden Skink				+
<i>Morethia obscura</i>	Mallee Snake-eye				+
<i>Tiliqua rugosa</i>	Sleepy Lizard		+		+
<b>VARANIDAE</b>					
<i>Varanus rosenbergi</i>	Heath Goanna				+

- 1 "Bearded dragon" records for 1970-71 might include *Pogona barbata* which occurs in the region.
- 2 The record by James (1965) was from Messent Wildlife Reserve. The only confirmed record from within Messent Conservation Park is from the December 1994 survey.
- 3 James (1965) mentions a record listed by Cornwall 1965. Needs confirmation
- 4 The only record of this species are carapaces noted by James (1965) for 'Messent Wildlife Reserve'. The occurrence of this species within Messent Conservation Park needs confirmation.
- 5 Possible sighting during December 1994 survey.

