



# Silky Tea-tree and Cutting Grass Wetland Rehabilitation Project Summary 1999-2002



by Mark Bachmann

for



*The Nature Conservation Society of South Australia Inc*

and



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DEPARTMENT FOR  
**environment**  
and heritage

Conservation Strategies South East



NATURE FOUNDATION SA INC



Natural  
Heritage  
Trust



National  
Wetlands  
Program

A program of the Natural Heritage Trust

September 2002

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Conservation Strategies South East  
National Parks and Wildlife SA  
Department for Environment and Heritage

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**Cover Pictures:**

Andy Ellis proudly looks over his protected wetland near Canunda *Photograph: Mark Bachmann*

An illustration of the importance of fencing off Silky Tea-tree habitat from grazing *Photograph: Mark Bachmann*

## EXECUTIVE SUMMARY

The Silky Tea-tree and Cutting Grass Wetland Rehabilitation Project was initiated by the Nature Conservation Society of SA in June 1999, with funds provided by the Commonwealth Government Natural Heritage Trust. The project was intended to improve community understanding and protection of these wetland habitats in the South East of South Australia, given the severe extent of degradation of privately owned remnants. This report marks the completion of the project in September 2002.

Throughout the three year life of the project, contact was initiated and maintained with individual landholders, community groups, local and state government bodies, resulting in significant outcomes for wetland protection. Fifty-five remnant wetland sites were visited and assessed over this time, with direct contact made with 37 landholders. Ultimately the project was responsible for the construction of 22.8 km of fencing to protect 316 hectares of habitat across 15 sites, owned by 13 different landholders. The following table summarises protection works:

Site No.	Site Name	Ha Fenced	Km fencing	No. Aus Sp	No. SA Sp
5	West Dairy Range – Ogilvie	12	1.2	1	3
6	West Dairy Range – Ogilvie	20	1.4	0	0
18	Lake St Clair – McCourt	15	1.0	0	7
20	Lake George – McCourt	12	0.5	0	1
25	Woakwine Range Springs	10	1.3	0	0
28	Canunda Flat – Ellis	40	1.8	1	5
29	Canunda Flat – Watts	8	0.6	0	0
37	Blackfellows Cave – Unger	100	3.6	0	4
40	Nene Valley Wetland	7	1.5	0	0
41	Nene Valley Springs	5	0.9	1	2
43	Cape Douglas	25	3.3	1	2
45	Cress Creek – Jess	7	1.0	0	1
47	Jerusalem Creek Wetland	25	1.8	0	1
48	Jerusalem Creek Spring	25	2.1	1	5
51	Green Point - Feast	5	0.8	1	1
	<b>Total</b>	<b>316</b>	<b>22.8</b>		

In the process of protecting these remnants, the project also directly resulted in the protection of known populations of 16 threatened species, as summarised in the following table:

Common Name	Scientific Name	Aus Status	SA Status	No. Sites
<b>MAMMALS</b>				
Swamp Antechinus	<i>Antechinus minimus</i>		E	6
<b>BIRDS</b>				
Lewin's Rail	<i>Rallus pectoralis</i>		V	1
Olive Whistler	<i>Pachycephala olivacea</i>		V	2
Orange-bellied Parrot	<i>Neophema chrysogaster</i>	E	E	2
Rufous Bristlebird	<i>Dasyornis broadbenti</i>		V	3
Southern Emu Wren	<i>Stipiturus malachurus</i>		V	3
<b>REPTILES</b>				
Glossy Grass Skink	<i>Pseudomoia rawlinsoni</i>		E	2
Salamander Skink	<i>Nannoscincus maccoyi</i>		E	1
Swamp Skink	<i>Egernia coventryi</i>		E	3
<b>FISH</b>				
Dwarf Galaxias	<i>Galaxiella pusilla</i>	V	P	2
<b>INVERTEBRATES</b>				
White-banded Grass-dart	<i>Taractrocera papyria</i>		R	1
Sword-grass Brown	<i>Tisiphone abeona antoni</i>		V	1
Common Dusky Blue	<i>Erina hyacinthina</i>		R	1
<b>PLANTS</b>				
Small Sickie Greenhood	<i>Pterostylis</i> sp. aff. <i>falcata</i>		E	1
Swamp Greenhood	<i>Pterostylis tenuissima</i>	V	V	1
Sweet Onion-orchid	<i>Microtis rara</i>		R	1

A description, including status, of all Silky Tea-tree and Cutting Grass Wetland sites visited throughout the project was compiled, and those areas requiring most urgent protection have been highlighted. Private sites near Blackfellows Cave and Piccaninnie Ponds (Sites 36 and 52) are particularly worthy of mention given their high level of biodiversity and the serious threat of rapid degradation with which they are faced. An inventory of all sites visited or assessed throughout the project is provided in this report.

The project monitoring program has proven to be an excellent way of improving basic understanding of the biological resources of these wetlands habitats in South Australia, clearly vindicating the decision of landholders to protect their remnant areas. It is anticipated that as the annual monitoring program continues into future years that it will demonstrate clear, quantitative improvements in ecosystem health after the removal of grazing. Indeed even in the short time that the program has been operating, selected sites have already shown apparent improvements in vegetation, bird or small mammal communities in response to de-stocking.

The Silky Tea-tree and Cutting Grass Wetland Rehabilitation Project has successfully met its aims, among other outcomes having instigated on-ground conservation works and a monitoring program that will continue to reap rewards for regional biodiversity conservation well into the future.

## ABOUT THE NATURE CONSERVATION SOCIETY

The Nature Conservation Society of South Australia is a voluntary body with members drawn from all parts of the State and all walks of life. The Society's primary objective is to "foster the conservation of the State's wildlife and natural habitats". This has involved the Society in taking action on many varied environmental issues since its formation in 1963. Land use and resource use interact to such an extent that neither can be considered in isolation.

A major concern during the Society's early years was the need for South Australia to have an extensive Parks system to ensure that the State's many plants and animals can be conserved in their natural environment. The Society has sought the addition of new reserves and opposed the resumption of existing reserves when necessary. It has always been Society policy to put its case objectively, based on the facts available. In many cases it has been necessary to carry out field studies in the areas in question, and since 1966, in most years there has been a major biological survey carried out by members and other volunteers. The Society also seeks grant funding to contract research related to environmental management and education. Studies done by or on behalf of the Society are published and made available to the public through sales of reports and distribution to libraries and government institutions.

Over the last two decades the Society played a strong role in the formation and development of the Native Vegetation Management Act and more recently biodiversity planning and education. It is now obvious that conservation reserves alone will not ensure the survival of all of the State's plants and animals, and that as much native habitat as remains is needed to conserve the biological diversity of South Australia.

The Society is also active in public education through activities such as Sunday "Walks with Nature" which attract as many as 500 people on a day, general meetings and its journal *Xanthopus*.

An elected Committee handles the Society's affairs. However it is not necessary to be a Committee member to play an active role on behalf of the Society in pursuing particular issues or topics of research.

The Society has an office on the first floor of the Conservation Centre at 120 Wakefield Street, Adelaide, 5000. The Society is financed by subscriptions, sales of its publications, private donations and State and Federal Government grants. This enables it to employ an Office Manager and a Scientific Officer, though much of the work is voluntary. Donations are always welcome and fully tax deductible. For more information please contact the Society's Office by phone (08) 8223 6301, fax (08) 8232 4290, or email [nccsa@nccsa.asn.au](mailto:nccsa@nccsa.asn.au) and attend our informative general meetings in the Royal Society of South Australia's rooms (off Kintore Ave, behind the State Library) at 8pm on the first Thursday of every month except January.

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## **Acknowledgements**

The Nature Conservation Society of SA Steering Committee overseeing this project have provided tremendous support throughout and are thanked for their level of commitment. Members on this committee have been Robert Brandle, Tim Croft and Jason van Weenen.

Robert Brandle in particular requires a special mention for his foresight in putting together an NHT application to commence the project in 1999, and for his dedication over many years to the activities of the Nature Conservation Society of SA.

The South East community, including landowners, community groups, government agencies and regional media, embraced the project and its activities. The level of success of this project is as a direct result of their involvement, enthusiasm and growing interest in wetland conservation.

## **Monitoring Program Ethics Approvals**

2000 Survey:                      Department for Environment and Heritage  
Wildlife Ethics Committee Approval  
Application number - 10/2000

2001& 2002 Surveys:         Department for Environment and Heritage  
Wildlife Ethics Committee Approval  
Application number - 3/2001

***“...half the area south of Salt Creek is  
under water every wet season”***

**G. H. Goyder (1866)**

(as Surveyer General presenting evidence  
to a Parliamentary Standing Committee)

## INTRODUCTION

The South East was originally home to the majority of South Australia's permanent and seasonal wetlands, but since European settlement, drainage schemes and clearance for agriculture have had a massive impact on the landscape. Today, less than 6% of the original wetlands of the region remain and many of those are degraded and not formally protected.

A couple of examples of threatened regional wetland habitats, particularly associated with freshwater ecosystems, include Silky Tea-tree (*Leptospermum lanigerum*) wet shrublands and Cutting Grass (*Gahnia trifida*) sedgeland. In the South East, these mostly occur within the near-coastal districts from Kingston to the Victorian border. They are usually found on self-forming, saturated black peat soils and are associated with freshwater springs, soaks, creeks or wetlands on broad flats. Importantly, these habitats also support a diverse, and in many cases highly specialised, array of flora and fauna.

In 1998 Robert Brandle, on behalf of the Nature Conservation Society of SA (NCSSA), successfully applied for NHT funds to commence this habitat protection, restoration and monitoring project. His concern for the preservation of these wetland habitats and the species they contain stemmed from an involvement in another NCSSA steering committee (with Tim Croft from the SA Department for Environment and Heritage), overseeing a project investigating the distribution and status of the Swamp Antechinus in SA. Jason van Weenen, who was contracted to undertake this study and write a report, made it clear in his draft report that habitat loss and degradation were ongoing threats to the Swamp Antechinus and other, similarly dependent, swamp inhabiting species.

The Silky Tea-tree and Cutting Grass Wetland Rehabilitation Project officially began in June 1999 and this report marks its completion in September 2002.

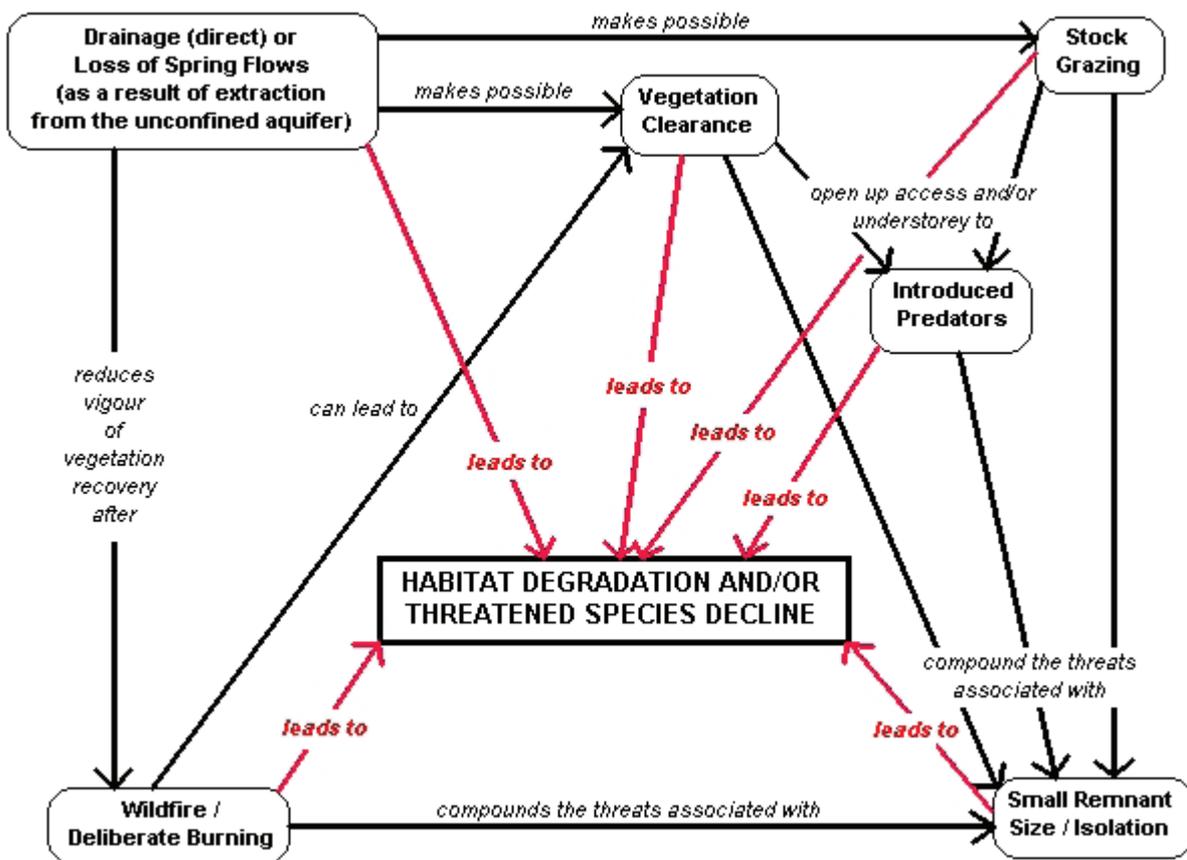
The purpose of this document is to provide feedback to all that have been instrumental in making the project a success, including landholders, community groups and government agencies, and includes the following sections:

- Section 1- Background as to why the project was needed
- Section 2- A project overview
- Section 3- A brief inventory of the biological resources of the habitats
- Section 4- An inventory of all sites visited and/or protected throughout the course of the project
- Section 5- A summary of survey results of protected sites being annually monitored

## SECTION 1: BACKGROUND

Silky Tea-tree and Cutting Grass wetlands have suffered significantly from land clearance, drainage and overgrazing. In fact, around 95% of the original area of Silky Tea-tree and Cutting Grass habitats have been lost from the South East. Important areas are still protected in Piccaninnie Ponds, Lake Frome and Lake St Clair Conservation Parks, with smaller areas conserved in Bucks Lake Game Reserve and Canunda National Park. However, the majority of habitat remnants are found on private property where considerable threats (especially grazing pressure) still exist. Additionally, all remaining areas are highly fragmented and isolated from each other; one of the main concerns for the future of the species that rely on these habitats for their survival.

A summary of the matrix of threats posed to remnant Silky Tea-tree and Cutting Grass wetlands is represented in the following flow chart:



Given the complex nature and high level of interaction between these numerous threats, the project was targeted to act in way that would allow the greatest impact to be made in the short-term (3 years) with limited resources, and to provide long-term positive consequences.

## SECTION 2: PROJECT OVERVIEW

### Project Aims

1. improve community awareness of the importance of Silky Tea-tree and Cutting Grass wetland remnants in preserving regional biodiversity
2. improve management and encourage protection and re-establishment of Silky Tea-tree and Cutting Grass wetlands
3. increase knowledge of the habitats and their associated threatened flora and fauna
4. establish a community based *Silky Tea-tree and Cutting Grass Wetland Rehabilitation Team*

### Project Officer Actions

- 1.1 meet with all relevant local groups and bodies
- 1.2 engage with the local print, radio, television and field days to publicise the issue
- 1.3 progressively meet with landholders that manage wetland remnants
- 1.4 organise field days that enable interested people to visit remnant wetland habitats and see the results of on-ground works
  
- 2.1 offer fencing materials and volunteer labour to private landholders to facilitate wetland protection from stock grazing
- 2.2 discuss the management of wetland hydrology (drainage) with landholders when appropriate
- 2.3 work to enhance other projects that have a role in private wetland habitat protection
  
- 3.1 facilitate research work upon the habitats and their dependent threatened species
- 3.2 commence a monitoring program of protected sites to measure the success of wetland protection and to improve baseline knowledge of the habitats
- 3.3 provide support to / liaise with related conservation and research projects in the region
  
- 4.1 draw interested people from the region together to form a group to continue 'ownership' of the project, especially its monitoring component, after NHT funding ceases

## Reporting Against Project Actions

### 1.1 *meet with all relevant local groups and bodies*

Meetings with, and/or presentations to, all relevant groups and bodies in the region occurred over the past three years, some on multiple occasions to enable members to be kept up to date with the progress of the project and to re-enforce the message about the importance of habitat protection.

Many people from local community groups have become actively involved themselves in promoting the project, assisting with the annual monitoring, visiting sites and sharing information about the location of habitat remnants. Without this valuable knowledge and resource base to draw on, it is certain that the project would not have been as successful as it has been.

The following is a list of those groups and bodies:

- Mount Gambier Field Naturalists' Society
- Millicent Field Naturalists' Society
- Association of South East Field Naturalists
- Friends of Mt Gambier Area Parks
- Friends of Butcher Gap Conservation Park
- Friends of Little Dip Conservation Park
- Friends of Canunda/Beachport
- Port MacDonnell Landcare Group
- Wattle Range Council Environmental Manager
- District Council of Grant Environment Committee
- Wetlands and Wildlife Inc
- Department for Water, Land and Biodiversity Conservation
- Department for Environment and Heritage (National Parks and Wildlife SA)

### 1.2 *engage with print, radio, television and field days to publicise the issue*

The following is a summary of activities undertaken to improve community awareness of the project:

- Colour pamphlet produced to distribute throughout the region (Appendix A)
- Spoke and presented a display at a Bushcare workshop in October 1999
- Several interviews have been conducted with South East ABC Radio over the past 3 years
- Attended the launch of the South East Biodiversity Plan, on behalf of the Nature Conservation Society of SA, in November 1999
- Annual project summaries and articles have been written and printed in the Nature Conservation Society Newsletter, *Xanthopus*
- Local newspapers have printed articles publicising the project, including: The Border Watch, The South Eastern Times, The Border Chronicle and The Kingston Leader
- Presented the project, and its role in making habitat protection relevant to landholders, as a case study at a dairy interest group seminar, *Cows Create Careers*, in Mount Gambier in November 2000

- A brief summary of the project was included in the 2000 SA NHT report as a case study, demonstrating successful wetland protection
- Appeared on WIN TV News in February 2001, speaking about the project, its progress and why it is important for regional biodiversity
- Spoke at the Nature Conservation Society of SA General Meeting in Adelaide in June 2001 about the project and its progress
- Article in Winter 2002 edition of 'From the Ground Up' summarising achievements of the project in their section celebrating NHT
- This report is the final activity of the project and will inform all those who have been involved or are interested about what has been achieved over the past 3 years

### *1.3 progressively meet with landholders that manage wetland remnants*

Fifty-five sites have been visited and assessed throughout the duration of the project, with landholders of 37 of these sites directly contacted.

This ultimately resulted in the protection of 316 hectares of habitat across 15 sites, owned by 13 different landholders.

### *1.4 organise field days that enable interested people to visit remnant wetland habitats and see the results of on-ground works*

Several field days/weekends were organised over the life of the project to enable interested members of the general public to experience Silky Tea-tree and Cutting Grass wetland habitats and some of the species these habitats support. The site usually used was Lake St Clair Conservation Park, where an established small mammal monitoring program allows people a rare opportunity to see the endangered Swamp Antechinus. The people (over 100) who were involved were drawn from all walks of life and included:

- individual landholders;
- members of regional environmental groups;
- members of the Nature Conservation Society of SA;
- university and TAFE students and staff;
- National Parks and Wildlife SA staff and,
- other members of the general public.

### *2.1 offer fencing materials and volunteer labour to private landholders to facilitate wetland protection from stock grazing*

Fencing materials were actually supplied to 12 landholders of 13 remnant areas of habitat. One of the two remaining areas was protected voluntarily and *Sustaining the South*, the regional devolved grant scheme for funding private conservation works, funded the other.

Ultimately the project supplied materials to enable 21.4 km of fencing to be erected around 299 hectares of habitat.

## 2.2 *discuss the management of wetland hydrology (drainage) with landholders when appropriate*

There are very few locations where it is possible to reverse the effects of artificial drainage without inundating developed agricultural land. The only place where this has not been an issue is at Jerusalem Creek Spring (Site 48) where a regulating weir has been installed to raise the level of spring and therefore lift the water table in associated wetlands on the property. The ongoing management of the level of the weir, for the benefit of the wetlands on the property, has and will be discussed with the owners and the SEWCDB.

## 2.3 *work to enhance other projects that have a role in private wetland habitat protection*

In early 2001, preliminary discussions were held with DNRE staff from the Victorian State Government, to provide them with logistical information about the project, so that they could apply for NHT funding to get a parallel project running in SW Victoria.

This project received funding and has been working as a dual focus project to protect both Swamp Scrub (Silky Tea-tree habitat) and woodland habitats for Red-Tailed Black Cockatoos.

One area (East of Nelson – Site 55) was directly referred to this project for assistance.

## 3.1 *facilitate research work upon the habitats and their dependent threatened species*

A report detailing the distribution and status of the Swamp Antechinus in SA (Bachmann & van Weenen 2001) involved extensive survey work in Silky Tea-tree habitat remnants. This work was published jointly by the Nature Conservation Society of SA and the Department for Environment and Heritage.

An honours thesis entitled *Distribution, Habitat Use and Status of the Swamp Antechinus in SA* (Bachmann 2001) also resulted from this survey work.

Being able to show people the endangered Swamp Antechinus first-hand, in some cases on their own property, also proved to be a useful tool in highlighting the value of Silky Tea-tree habitat remnants.

Support was provided to a project investigating the Swamp Greenhood, see Action 3.3.

As a result of the significant findings of the project monitoring program, Wildlife Conservation Funds have been sought to investigate the distribution and status of the Salamander Skink and Swamp Skink in SA.

### *3.2 commence a monitoring program of protected sites to measure the success of wetland protection and to improve baseline knowledge of the habitats*

The project monitoring program commenced in April 2000 and consists of an annual field survey of the vegetation, vertebrate and invertebrate fauna of four sites fenced with the assistance of the project, and a control site that has never been grazed. This program has completed three years of annual monitoring and the results are summarised in Section 5 of this document. The results provide a clear justification for both habitat protection works and the need for ongoing monitoring and research in these wetland habitats.

The monitoring project is seen as the most practical way of measuring the long-term success of the project by quantifying the benefits of wetland habitat protection. The ongoing responsibility for managing this program will be taken on by regional staff from the Department for Environment and Heritage.

### *3.3 provide support to / liaise with related conservation projects in the region*

In 2000, the SE SA/SW Victoria Threatened Orchid project commenced with Anne Craig of Naracoorte and Andrew Pritchard of Warrnambool as Project Officers. One of the target species of this project is the Swamp Greenhood, which occurs exclusively in Silky Tea-tree wet shrubland habitat. Anne was responsible for writing recovery plans for the three species considered and habitat management plans, a role that has now ceased, while Andrew continues to have responsibility for co-ordinating and undertaking the project population monitoring program.

This project has therefore worked closely with Andrew Pritchard, providing information about relevant sites in SA and assisting with field work. Throughout the duration of the project 4 new populations of the Swamp Greenhood have been discovered, as well as a host of other threatened plant species at various sites. At this stage the threatened orchid project is ongoing, subject to continuation of NHT funding.

### *4.1 draw interested people from the region together to form a group to continue 'ownership' of the project, especially its monitoring component, after NHT funding ceases*

This action has proven to be the only one that has not been able to be fulfilled. Early in the life of the project it became apparent that there are a limited number of people in the region with an active interest in conservation and that these people's time and resources are already greatly stretched between a number of different groups and activities.

There was also the added complication that the project area spans a vast strip of near-coastal land between Kingston and the Victorian border. Because of these factors it was not considered feasible or practical to set up another specific group, but instead each of the respective environment groups operating in the region have been kept informed and involved in the project. This has proven to be a successful method of maintaining community involvement.

Regional staff from the Department for Environment and Heritage have adopted management of the monitoring program, to ensure this vital aspect of the project continues.

## SECTION 3: A BRIEF BIOLOGICAL INVENTORY OF THE HABITATS

### HABITAT DESCRIPTIONS

#### Cutting Grass Sedgelands

##### *Status*

SE: Vulnerable (Croft *et al* 1999)

##### *Description*

Cutting Grass (*Gahnia trifida*) sedgeland habitats were once widespread across the broad, wet interdunal flats of the lower South East and have suffered markedly as a result of drainage and clearance. As the water quality on these flats generally changes from fresh to brackish in a northward direction in the region, Thatching Grass (*Gahnia filum*) sedgelands, more tolerant of saline conditions, become more prominent.

As a generally fresher habitat, Gutting Grass sedgeland also contains a wide variety of small herbaceous species including rushes and sedges, but have little taller vegetation than the occasional shrub. Reflecting their more saline nature, Thatching Grass sedgelands are typically more open between tussocks but may contain small, salt tolerant herbs.



**Cutting Grass sedgeland habitat**

*Photograph: Jason van Weenen*

## Silky Tea-tree Wet Shrublands

### Status

SE: Vulnerable (Croft *et al* 1999)

### Description

The highest quality remnant areas of Silky Tea-tree habitat in the South East are generally found to support a tall shrub layer with a closed canopy and an intact, dense understorey, dominated by cutting grass (*Gahnia*) species, wetland herbs and fallen / decomposing vegetation (Bachmann & van Weenan 2001).

In the southern portion of the range of Silky Tea-tree wet heath habitat, between Canunda and the Victorian border, the wettest areas possess a Silky Tea-tree (*Leptospermum lanigerum*) overstorey equally dominated by Scented Paper-bark (*Melaleuca squarrosa*) with stands of Tall Saw-sedge (*Gahnia clarkei*) and Leafy Twig-rush (*Cladium procerum*) in the understorey. In this part of the range the, mostly permanent, wetlands are usually fed by rising groundwater springs, are very fresh and have deep peat soils. Towards the slightly drier edges of these wetlands, the habitat resembles the dominant structure of most of the remnant Silky Tea-tree habitats that occur in areas north of Canunda. Cutting Grass (*Gahnia trifida*) becomes dominant in the understorey and the Tree Everlasting (*Ozothamnus ferrugineus*) can be equally dominant in the overstorey with Silky Tea-tree. Near the north-western limits of the habitat's regional distribution, some of the wetlands are more seasonal and brackish, and are characterised by lower, mixed vegetation over shallower peat soils.



**Silky Tea-tree wet shrubland habitats:** Tall Saw-sedge undertorey (left) and Cutting Grass undertorey (right)

Photographs: Mark Bachmann

## ASSOCIATED THREATENED SPECIES DESCRIPTIONS

### Introduction

Fresh wetland habitats provide conditions favourable to a high level of biological diversity, with copious moisture that in turn supports rich soils, vegetation and faunal life. Being situated at the fringes of the large temperate zone of eastern Australia (the Great Dividing Range) and adjacent to the arid interior of central Australia, such wetlands of the South East are literal 'hot-spots' for biodiversity. Given this and the extent of loss and degradation of these habitats in the region, it is not surprising that a wealth of temperate Australian species are found at the extreme western limit of their range and that many of these are highly threatened.

### *Mammals*

#### **Swamp Antechinus (*Antechinus minimus maritimus*)**

##### *Status*

Aus: Lower Risk (near threatened) (Maxwell *et al* 1996)

SA: Endangered (*National Parks and Wildlife Act 1972*)

##### *Description*

The Swamp Antechinus (*Antechinus minimus*) is a small carnivorous marsupial that occurs in dense heath and sedgeland habitats of south-eastern Australia (*A.m.maritimus*) and Tasmania (*A.m.minimus*). In South Australia the species appears to be almost entirely restricted to Silky Tea-tree vegetated wetland habitats, in near-coastal districts between Robe and the Victorian border (Bachmann & van Weenen 2001). The species is highly vulnerable to local extinction at sites where remnants are small and isolated or where habitat disturbance, particularly loss of understorey density and structure, is occurring as a result of stock grazing.



**Swamp Antechinus**

Photograph: Jason van Weenen

## **Birds**

### **Ground Parrot (*Pezoporus wallicus wallicus*)**

#### *Status*

Aus: Vulnerable (Garnett & Crowley 2000)

SA: Endangered (*National Parks and Wildlife Act 1972*)

#### *Description*

This species of ground-frequenting parrot is now considered extinct in South Australia (Croft & Carpenter 2001), with the last reports being from the Piccaninnie Ponds area in the 1950's (Meredith 1983). This species is known to favour heathland and sedgeland habitats (Garnett & Crowley 2000) and in the South East was only ever recorded from within or near Silky Tea-tree wet heath habitats between Nene Valley and the Victorian border (Condon 1942; Meredith 1983). The drainage and clearance of the large-scale wetlands of this type, such as Nene Valley/Cape Douglas wetlands, Eight Mile Creek swamp and drainage of wetlands in the Piccaninnie Ponds area, can be considered the most significant factor in this species decline in the region.

The most feasible option for the species return to SA would include recovery works in the Piccaninnie Ponds Conservation Park area, including adjacent private lands. A population is still reported to exist nearby to the east in Long Swamp, adjacent to the mouth of the Glenelg River, in far south-western Victoria.



**Ground Parrot**

*Photograph: Joseph M. Forshaw / Graeme Chapman (Readers Digest 1988)*

## **Lewin's Rail (*Rallus pectoralis pectoralis*)**

### *Status*

Aus: Near-threatened (risk of further decline) (Garnett & Crowley 2000)

SA: Vulnerable (*National Parks and Wildlife Act 1972*)

### *Description*

Lewin's Rails inhabit permanent to ephemeral, fresh to saline wetlands that have dense emergent or fringing vegetation. The bird usually remains well concealed and is exceedingly difficult to detect, most records resulting from birds being flushed from the undergrowth by chance. They mostly feed upon invertebrates and occasionally birds eggs and frogs. Their nests are usually well concealed within dense, low vegetation on the ground or above water, with 3-5 eggs laid in spring or summer.

The species occurs in mostly coastal areas of eastern and south-eastern Australia from SA to Queensland but is thought to have suffered a marked decline as a result of wetland habitat destruction and introduced predators.

## **Olive Whistler (*Pachycephala olivacea hesperus*)**

### *Status*

Aus: Near-threatened (risk of further decline) (Garnett & Crowley 2000)

SA: Vulnerable (*National Parks and Wildlife Act 1972*)

### *Description*

The Olive Whistler is a species more typically associated with the moist, temperate, forested environments of the Great Dividing Range in south-eastern Australia. However, similar in distribution to a number of other species that favour such temperate conditions, the lower South East of SA is at the western fringe of Olive Whistler's range. As such, wetland habitats and particularly the resource rich, fresh Silky Tea-tree wetland remnants are favoured by this species in the region. Like many other similarly distributed species, the past destruction and ongoing degradation of these habitats near the edge of its range severely threatens the future of the Olive Whistler in the South East. The Glenelg sub-species of Olive Whistler (Garnett & Crowley 2000) is presently only known from a handful of localities between Beachport and the Victorian border in SA, and extends to Port Fairy in south-west Victoria (Emison *et al* 1987).



**Lewin's Rail**

*Photograph: Mark Bachmann*



**Olive Whistler**

*Photograph: Arnold McGill / Tom and Pat Gardner (Readers Digest 1988)*



**Orange-bellied Parrots**

Photograph: Joseph M. Forshaw / Len Robinson (Readers Digest 1988)



**Rufous Bristlebird**

Photograph: G. T. Smith / J. Purnell (Readers Digest 1988)

## **Orange-bellied Parrot (*Neophema chrysogaster*)**

### *Status*

Aus: Endangered (*Environment Protection and Biodiversity Conservation Act 1999*)

SA: Endangered (*National Parks and Wildlife Act 1972*)

### *Description*

The Orange-bellied Parrot is an endangered species (< 200 remain) that breeds in tree hollows on the forested edges of the sedge plains of south-western Tasmania (Croft et al 1999). It over-winters in the near-coastal environments of south-eastern Australia from Lake Alexandrina to South Gippsland in Victoria. Although the species' feeding in SA is now usually associated with degraded pastures, samphire salt-marshes or low coastal dune vegetation, Orange-bellied Parrots favour dense coastal scrub or wet heath vegetation for roosting. The Silky Tea-tree wetland remnants, particularly along the lower SE coast between Carpenter Rocks and the Victorian border, are known roosting sites for this species, however many remain under significant threat from agricultural practices.

## **Rufous Bristlebird (*Dasyornis broadbenti whitii*)**

### *Status*

Aus: -

SA: Vulnerable (*National Parks and Wildlife Act 1972*)

### *Description*

The Rufous Bristlebird is a territorial, predominantly ground-dwelling species that was distributed in south-west WA (may now be extinct) and south-eastern Australia. The south-eastern subspecies (*Dasyornis broadbenti whitii*) is found in scattered near-coastal localities from the Murray Mouth to around Angelsea in Victoria (Readers Digest 1979). Within this range the species is now fragmented, mostly restricted to dense coastal succession vegetation and densely vegetated (particularly Silky Tea-tree) wetlands. These habitats provide an abundance of food resources, namely invertebrates, berries and seeds, and a dense understorey that provides suitable protection for this ground nesting species.

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

### *Status*

Aus: -

SA: Vulnerable (*National Parks and Wildlife Act 1972*)

### *Description*

The Southern Emu-wren is a species distinctive by its emu-like, elongate tail feathers. Populations of this species in the South East are considered continuous with those in eastern Australia (Victoria) and although still widespread in the region are now highly fragmented in distribution. The favoured habitats of this species, Cutting/Thatching Grass (*Gahnia* spp.) sedgelands and adjacent wooded areas have suffered markedly from broadscale drainage and clearance for agriculture and ongoing degradation through burning and grazing. An ongoing conservation concern for this sedentary species will be addressing the condition and isolation of habitat remnants (Croft et al 1999).

## **Reptiles**

### **Glossy Grass Skink (*Pseudomoia rawlinsoni*)**

### *Status*

Aus: -

SA: Endangered (*National Parks and Wildlife Act 1972*)

### *Description*

The Glossy Grass Skink is restricted to the damp, humid microclimates and is only found in in south-eastern Australia. This species is also found at the western margin of its range in the South East of SA. The Glossy Grass Skink is known from a variety of wetland habitats in SA, but particularly those sedgelands dominated by *Gahnia* (Cutting/Thatching Grass) tussocks. The species is also one of a number of reptile species that are livebearing, producing 4-8 young (Cogger 1996).



**Southern Emu-wren**

Photograph: Shane Parker / F. Park (Readers Digest 1988)



**Glossy Grass Skink**

Photograph: Jason van Weenen



**Salamander Skink** (underside shown below)

Photographs: Mark Hutchinson (South Australian Museum)



**Swamp Skink**

Photograph: Jason van Weenen

## **Salamander Skink (*Nannoscincus maccoyi*)**

### *Status*

Aus: -

SA: Endangered (*National Parks and Wildlife Act 1972*)

### *Description*

The Salamander Skink is the only species in the *Nannoscincus* genus to occur in Australia. Although more typically associated with cool, moist forested areas in the uplands of southern Victoria and south-east NSW, the western limit for the species range is now a Silky Tea-tree wetland near Canunda in the South East of SA . This outlying population of the species was discovered during the monitoring component of this project (2 records). To date these are the only known records for the Salamander Skink in SA. A major factor that limits the species' distribution is its remarkable sensitivity to temperature and desiccation (drying out), having the lowest preferred body temperature (21°C) and the highest rate of desiccation of any Australian skink (Greer 1989).

## **Swamp Skink (*Egernia coventryi*)**

### *Status*

Aus: -

SA: Endangered (*National Parks and Wildlife Act 1972*)

### *Description*

The Swamp Skink is a medium-sized reptile, found throughout Southern Victoria, extending just into south-eastern NSW and the lower South East of SA. This species is restricted to swamp and wetland habitats throughout its range, but in SA has only ever been located in Silky Tea-tree swamps between Southend and the Victorian border. The species is readily identified by its highly distinctive black and gold scaling pattern.

## **Amphibians**

### **Southern Bell Frog (*Litoria raniformis*)**

#### *Status*

Aus: Vulnerable (*Environment Protection and Biodiversity Conservation Act 1999*)

SA: Vulnerable (*National Parks and Wildlife Act 1972*)

#### *Description*

This large species (up to 85mm) is usually found where permanent water and emergent vegetation is a feature, such as many Silky Tea-tree wetlands, particularly those between Carpenter Rocks and the Victorian border. Over the past 15 years populations are reported to have declined dramatically in the South East (Tyler 1997), a trend that is being repeated as a result of habitat degradation across many parts of this species distribution in south-eastern Australia.

When present at a site, males can be heard calling during the breeding season, from August to April, making a growling sound superficially similar to a motor-boat or bike.

## **Fish**



**Southern Bell Frog**

Photograph: Michael Hammer

## Introduction

The broadscale loss and/or ongoing degradation of aquatic habitats that has resulted from agricultural development in the South East has been and continues as a major threat to native fish populations in the region. Four species in particular that are restricted in distribution to south-eastern Australia and have specific habitat requirements are mentioned here, and three of these are listed as vulnerable species under the federal *Environment Protection and Biodiversity Conservation Act 1999*.

Being associated with fresh wetland systems, Silky Tea-tree tall wet shrublands often provide important riparian habitat in creek systems and are a dominant vegetation type in more expansive wetland areas. Due to the landforms of the South East, there are many more of the latter category and these are mostly fed by rising groundwater springs - some of these also provide a source of permanent fresh water. At such sites, many known to have threatened fish populations, the conservation of aquatic habitats and associated terrestrial wetland habitats (especially Silky Tea-tree shrublands) cannot be considered in isolation.

## Dwarf Galaxias (*Galaxiella pusilla*)

### Status

Aus: Vulnerable (*Environment Protection and Biodiversity Conservation Act 1999*)

SA: Protected species (*Fisheries Act 1982*)

### Description

This very small (3-5cm) fish is patchily distributed in near-coastal zone of southern Victoria and the adjacent portion of the South East. The species occupies both seasonal and permanent habitats with either still or gently flowing water and will even occur in thickly vegetated, wetlands with a shallow inundation. Although a short-lived fish, the Dwarf Galaxias is thought to cope with summer drying of ephemeral wetlands by sheltering (aestivating) in yabby burrows over the dry period.



**Dwarf Galaxias:** male (above) and female (below)

Photograph: Michael Hammer



**Ewen Pygmy-perch**

Photograph: Michael Hammer



**River Blackfish**

Photograph: Rudie Kuitert (Allen et al 2000)

## **Ewen Pygmy-perch (*Nannoperca variegata*)**

### *Status*

Aus: Vulnerable (*Environment Protection and Biodiversity Conservation Act 1999*)

SA: Protected species (*Fisheries Act 1982*)

### *Description*

The Ewen Pygmy-perch is a highly restricted species, being confined to the rising groundwater spring-fed Ewen Ponds system and tributaries of the Glenelg River system in south-eastern Australia. The species prefers small, swiftly flowing creeks in clear, cool water and feeds primarily on aquatic insects and benthic microcrustaceans (Allen *et al* 2002). The Ewen Pygmy-perch was first discovered in the early 1980's at Ewen Ponds in the lower South East.

## **River Blackfish (*Galopsis marmoratus*)**

### *Status*

Aus: -

SA: Protected species (*Fisheries Act 1982*);

### *Description*

The River Blackfish grows up to 35cm and is a nocturnal species that requires good cover in clear, gently flowing streams. This freshwater species naturally has a restricted distribution in the South East but must also have declined severely as a result of habitat loss. While clearly restricted in SA, the species is more common and widespread in Victoria and New South Wales. Remarkably the established home range of a River Blackfish may mean an individual remains in the same 20 to 30 metre stretch of a watercourse throughout its lifespan (Allen *et al* 2002). Spawning occurs each year from November to January.

This species is proposed for listing as an endangered species under Schedule 7 of the *National Parks and Wildlife Act 1972*.

## **Yarra Pygmy-perch (*Nannoperca obscura*)**

### *Status*

Aus: Vulnerable (*Environment Protection and Biodiversity Conservation Act 1999*)

SA: Protected species (*Fisheries Act 1982*)

### *Description*

The Yarra Pygmy-perch is a small native fish that feeds primarily on insect larvae and microcrustaceans (Allen et al 2002). Swimming in small shoals, sometimes with the more common Southern Pygmy-perch (*N.australis*), the species occurs in streams, ponds and small lakes, preferring flowing water with an abundant cover of aquatic vegetation. The distribution of this species is highly fragmented in the South East, with a handful of isolated populations located between Henry Creek in the north, southwards to the Piccaninnie Ponds area near the Victorian border. In Victoria the distribution of the species extends eastwards as far as Frankston, an outer suburb of Melbourne.

## ***Invertebrates (Butterflies)***

(descriptions reproduced from: Grund 2000)

### **Skippers (Family: Hesperinae)**

## **Chrysotricha Sedge-skipper (*Hesperilla chrysotricha cyclospila*)**

### *Status*

Aus: -

SA: Vulnerable (Grund 2000)

### *Description*

A large colourful skipper, which forms part of Australia's ancient endemic butterfly fauna, being confined to the cool temperate areas of Tasmania and southern mainland Australia. The female can be moth-like in appearance, especially when heavy with eggs. The skipper is very intolerant of wetland degradation, and is therefore a good indicator species for the environmental condition of saw-sedge wetlands. Its presence is a good sign that the wetland is environmentally healthy, and its absence means that the wetland has suffered previous severe degradation processes.

The larvae eat the leaves of Cutting Grass (*Gahnia trifida*), the preferred species for this skipper in South Australia. The skipper requires its habitat and foodplant to be in full sun. Flight period is from October to January.



**Yarra Pygmy-perch**

Photograph: Michael Hammer



**Chrystotricha Sedge-skipper**

Female (left) Photograph: Roger Grund and Male (right) Photograph: Lindsay Hunt



**Flame Sedge-skipper**

*Female on side (left) Photograph: Roger Grund and Female above (right) Photograph: Lindsay Hunt*



**White-banded Grass-dart**

*Male above (left) Photograph: Roger Grund and Male on side (right) Photograph: Roger Grund*

## **Flame Sedge-skipper (*Hesperilla idothea idothea*)**

### *Status*

Aus: -

SA: Locally Uncommon (Grund 2000)

### *Description*

This is a large skipper, capable of very fast flight. Its underside is rather dull, but the uppersides of the wings have more markings, and in the female there is a large orange 'flame' marking on the hindwing from where the common name derives. The skipper forms part of Australia's ancient endemic butterfly fauna, being confined to the cool temperate areas of southeast mainland Australia and Tasmania. It occurs as two subspecies in South Australia. The nominotypical race that occurs in the cool temperate areas of the Lower South East Region of South Australia, and a relict race to be found along the South Mt Lofty Ranges and on Kangaroo Island.

This skipper utilises the Tall Saw-Sedge (*Gahnia clarkei*) and Cutting Grass. The larvae eat the leaves of the foodplant. The skipper normally requires its foodplant to be in the shade. Flight time is from November to March.

## **White-banded Grass-dart (*Taractrocera papyria papyria*)**

### *Status*

Aus: -

SA: Rare (Grund 2000)

### *Description*

This skipper belongs to a group of skippers (Hesperiinae) that are more at home in the hot tropics and subtropics but have adapted to cold temperate areas of Australia and Tasmania. This species is the most cold tolerant member of the group in the Australian Region. The skipper, along with most others in the group, has a characteristic wing pose when settled in full sun, with the forewings being held vertical (or nearly so) while the hindwings are held horizontal.

Several native and introduced grasses, particularly where found in moist habitats, are suitable for this species. The larvae eat the leaves of the foodplant. It flies mainly during the warmer months, from late September to early May.

## Brush-foot Butterflies (Family: Nymphalidae)

### Bright-eyed Brown (*Heteronympha cordace wilsoni*)

#### Status

Aus: -

SA: Endangered (Grund 2000)

#### Description

This butterfly belongs to a generic group of very interesting endemic satyrs having their origin from the ancient period when Australia was still attached to Africa, Antarctica and South America. Like most satyrs, the wing undersides are cryptically camouflaged, and it is sometimes difficult to detect these butterflies when they are settled with wings closed and erect, owing to their close resemblance to dead leaf and plant debris.

Carex species are required by this butterfly, including the Tall Sedge (*C. appressa*), this species' preferred foodplant. Larvae eat the leaves of the foodplant. The flight period is from mid-November to late January, with the bulk of the butterflies flying during early January.

### Striped Xenica (*Oriexenica kershawi kanunda*)

#### Status

Aus: -

SA: Vulnerable (Grund 2000)

#### Description

A small satyr that is now very rarely seen in South Australia, where it occurs only in Silky Tea-tree / Tall Saw-sedge wetlands in the extreme southern parts of the Lower South East. Males are usually seen sunning themselves with wings spread open on the tea-tree, while the females tend to occur near ground level as they flit over the *Poa* grasses beneath the tea-trees looking for places to lay eggs.

Native grasses with small, soft leaves are required by the Striped Xenica, including Rice-grasses (*Tetrarrhena* species) and *Poa* species including *P. tenera* (Poaceae). The larvae feed on the foodplant leaves. The bulk of butterflies emerge from mid-January to mid-February, with odd butterflies continuing to fly until the end of March.



**Bright-eyed Brown**

Male above (left) and Male below (right) Photograph: South Australian Museum



**Striped Xenica**

Female on side (left) Photograph: Roger Grund and Male above (right) Photograph: Roger Grund



**Silver Xenica**

*Male on side (left) Photograph: Roger Grund and Male above (right) Photograph: Roger Grund*



**Sword-grass Brown**

*Female on side (left) Photograph: Roger Grund and Female above (right) Photograph: Roger Grund*

## **Silver Xenica (*Ori xenica lathoniella herceus*)**

### *Status*

Aus: -

SA: Endangered (Grund 2000)

### *Description*

Another small satyr that belongs to the *Oreixenica* generic group of highly picturesque Xenica butterflies. In South Australia, it is presently only known to occur in the Piccaninnie Ponds Conservation Park in the extreme southern part of the Lower Southeast Region. Both sexes tend to fly together over their *Poa* foodplant grass, with females often accompanied by a large entourage of males.

Native grasses with small, soft leaves are required by the silver xenica, including *Microlaena stipoides* (weeping rice-grass), *Poa* species including *P. labillardieri* (tussock grass) and *P. meionectes*, and probably *Tetrarrhena* species (rice-grasses) (Poaceae). The larvae feed on the foodplant leaves. In South Australia the butterfly has only been seen to fly in March and April. In the adjacent areas of western Victoria and the Grampians, the butterfly has an extended flight period from late January to late April with the bulk of the butterflies flying during February to mid-April.

## **Sword-grass Brown (*Tisiphone abeona albifascia*)**

### *Status*

Aus: -

SA: Vulnerable (Grund 2000)

### *Description*

A large, attractive butterfly that only occurs in the southern part of the Lower South East Region. It is now very rarely seen due to the drainage, fragmentation and degradation of its required habitat, Tall Saw-sedge (*Gahnia clarkei*) wetland habitats. Both sexes are usually seen in flight near its foodplant, where it will suddenly appear above the tops of the Tall Saw-sedge foodplant, fly a few metres, then suddenly dip and disappear back in amongst the saw-sedge, and quite often it may not reappear again.

Larvae have only been found on the Tall Saw-sedge in South Australia and they feed on the young leaves of this foodplant. This species has an extended flight period from mid-October to early March, with the bulk of the butterflies flying during late November to early February.

## **Coppers and Blues (Family: Lycaenidae)**

### **Common Dusky Blue (*Erina hyncinthina* form *josephina*)**

#### *Status*

Aus: -

SA: Rare (Grund 2000)

#### *Description*

This is a very interesting butterfly, in which the adults occur in several very distinct colour forms. The nominotypical form occurs in the high rainfall coastal and Great Dividing Range areas of south-east Qld, NSW and Victoria. In this form, both males and females have dull purple coloured areas on the wing uppersides. The form *simplexa* (Tepper) occurs in dry temperate areas of southern Australia, and is present in all the southern mainland states. In this form, both males and females have bright metallic blue coloured areas on the wing uppersides. Where these two forms meet geographically, there is another adult colour form, which can have a mix of purple (violet) and blue on the wing uppersides. This form is called *josephina* (Harris).

Larvae of the Common Dusky-blue feed on Downy Dodder-laurel (*Cassytha pubescens*). The larvae will eat the buds, flowers and soft stems of the foodplant. The purple ('hybrid') form *josephina* flies from late September to early March, but is most common in mid to late summer.

## **Plants**

### **Maroon Leek-orchid (*Prasophyllum frenchii*)**

#### *Status*

Aus: Endangered (*Environment Protection and Biodiversity Conservation Act 1999*)

SA: Endangered (*National Parks and Wildlife Act 1972*)

#### *Description*

This endangered species is only known from permanent swamps and marshy meadows in South Australia and Victoria. In South Australia it is presently only known from the wetland habitat at Piccaninnie Ponds Conservation Park.

Like all leek-orchids this species develops a spike covered with numerous individual flowers. It flowers between late spring and early summer and requires permanent moisture over this period – hence its requirement for swampy habitats.



**Common Dusky Blue**

Male on side (left) Photograph: Roger Grund and Male above (right) Photograph: Roger Grund



**Maroon Leek-orchid**

Flowering spike (left) and Flower (right) Photographs: Mark Bachmann



**Small Sickie Greenhood**  
*Photographs: Mark Bachmann*



**Swamp Greenhood**  
*Flower (left) Photograph: Mark Bachmann and Basal leaves (right) Photograph: Mark Bachmann*

## **Small Sickle Greenhood (*Pterostylis* sp. aff. *falcata* [*furcata*])**

### *Status*

Aus: no official status yet

SA: Endangered (*National Parks and Wildlife Act 1972*)

### *Description*

This species was presumed extinct in the South East until re-discovered at two sites in the course of this project, in conjunction with the SE SA/ SW Vic Threatened Orchid Project, in early 2001. It is restricted to high rainfall areas where it only grows in fertile soils situated under a dense, shaded canopy – conditions provided by some Silky Tea-tree habitats in the South East. At the sites where it occurs, the Small Sickle Greenhood has been found along with the Swamp Greenhood, another species with similar habitat requirements. The orchid mostly flowers during late spring to early summer.

## **Swamp Greenhood (*Pterostylis tenuissima*)**

### *Status*

Aus: Vulnerable (*Environment Protection and Biodiversity Conservation Act 1999*)

SA: Vulnerable (*National Parks and Wildlife Act 1972*)

### *Description*

This extremely delicate orchid grows exclusively under the dense canopy of Silky Tea-tree in alkaline peat swamps. It is highly sensitive to disturbance, particularly moisture loss caused by drainage, and as a result has an extremely fragmented distribution in the South East. The species' distribution extends into western Victoria.

The Swamp Greenhood appears to be reproductively opportunistic, having been observed flowering during all months of the year.

## **Swamp Helmet Orchid (*Corysanthes* sp. aff. *diemenica* Portland)**

### *Status*

Aus: no official status yet

SA: no official status yet

### *Description*

This orchid is known only to occur at sites where a saturated alkaline peat soil is fully shaded by a canopy of Silky Tea-tree and Scented Paper-bark, and is so far only known from south-western Victoria and the Piccaninnie Ponds area of the lower South East. It has been located at two sites in SA, where it has been found in habitat that also supports the Swamp Greenhood.

This orchid has been observed to flower between late winter and early spring.

## **Sweet Onion-orchid (*Microtis rara*)**

### *Status*

Aus: -

SA: Rare (*National Parks and Wildlife Act 1972*)

### *Description*

Like all *Microtis* this orchid is characterised by a flowering spike, but unlike other onion-orchids the flowers are more sparsely spaced (*rara*). This species is confined to high rainfall areas where it inhabits swamps or deeply shaded creek-lines and forms colonies by vegetative increase. Its flowers are sweetly scented and are usually observed in late spring to early summer.



**Swamp Helmet Orchid**

*Flower (left) Photograph: Mark Bachmann and Basal leaves with buds (right) Photograph: Mark Bachmann*



**Sweet Onion-orchid**

*Photograph: R. Bates (Bates & Weber 1990)*

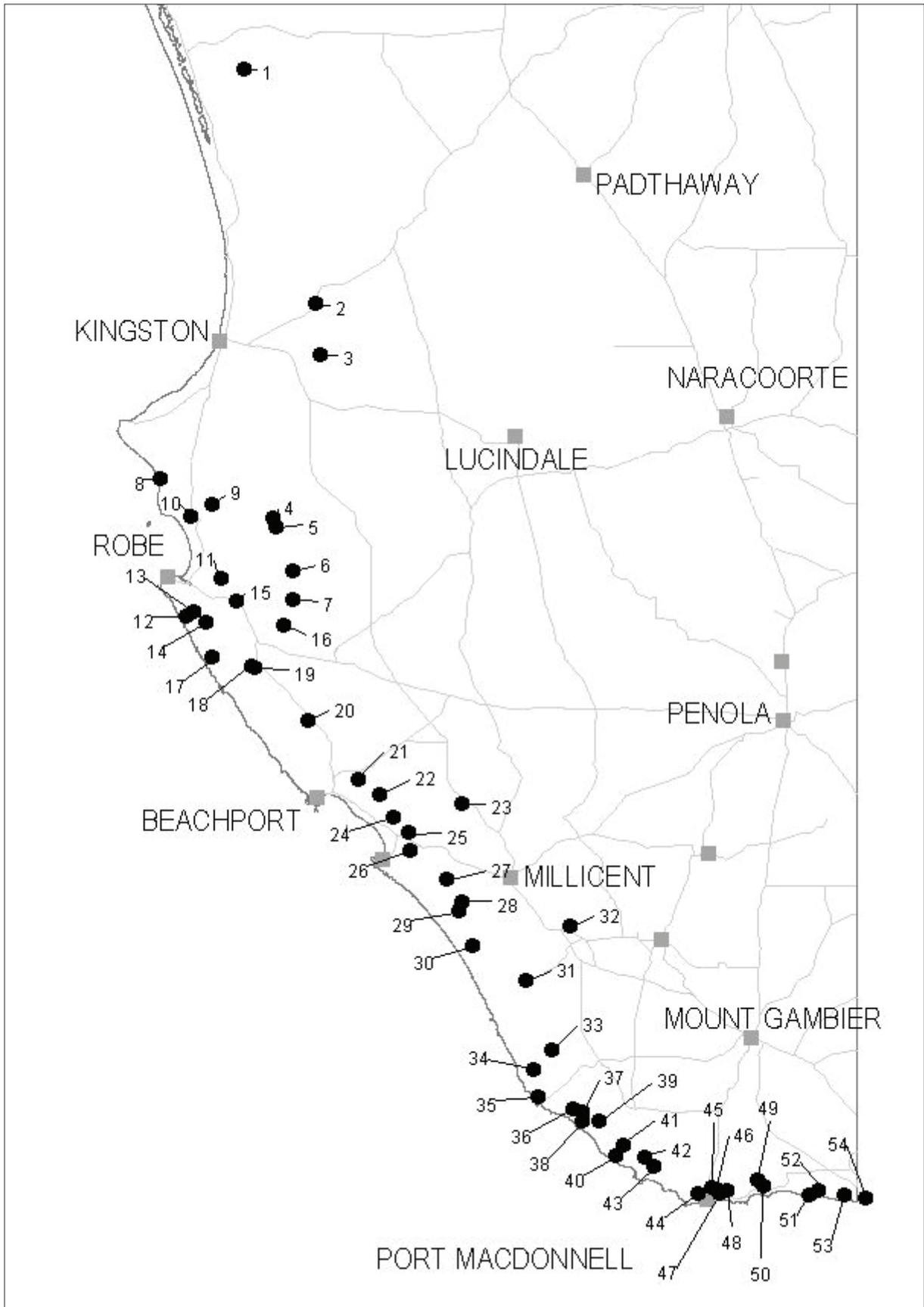
## SECTION 4: REVIEW OF SIGNIFICANT REMNANTS AND HABITAT PROTECTION WORKS

*Note: aerial photography in this section is infra-red and therefore areas with high soil or vegetative moisture are highlighted by being coloured red, particularly useful in representing cleared wetland areas.*

*Infra-red Aerial Photography courtesy of Department for Land, Water and Biodiversity Conservation, Mt. Gambier.*

### Sites Considered in this Section

1. Henry Creek
2. Blackford
3. Blackford Road Springs
4. West Dairy Range - Pomanda
5. West Dairy Range - Ogilvie
6. West Dairy Range - Ogilvie
7. West Dairy Range - Hurst
8. Cadara Swamp
9. Bagdad Road – Woakwine Range
10. Guichen Bay Wetland
11. Dawson Swamp
12. Ghost Lake
13. Lake Robe (Game Reserve)
14. Lake Eliza West
15. The Springs - Lake Eliza East
16. Lake Hawdon South
17. Coastal Soaks (between Robe and Nora Creina)
18. Lake St Clair - McCourt
19. Lake St. Clair (Conservation Park)
20. Lake George - McCourt
21. Woakwine Range - 'Burks Island'
22. Woakwine Range - 'Iluka'
23. Belt Range Springs - Hatherleigh Parklands
24. Mullins Swamp
25. Woakwine Range Springs
26. Lake Frome Basin / Canunda (Conservation Park)
27. Canunda Flat North
28. Canunda Flat – 'Spring Hill'
29. Canunda Flat – 'Canunda Heights'
30. Begg's Swamp - Canunda National Park
31. Woakwine Range Springs / Lake Bonney
32. Mount Burr Range Springs - Snuggery
33. Benara/German Creek
34. Green Swamp
35. Bucks Lake (Game Reserve)
36. Blackfellows Cave Wetland – Old Rocks Road
37. Blackfellows Cave Wetland – Houstons Road
38. Blackfellows Cave Wetland – Blackfellows Cave Road
39. North of Nene Valley – Meyers Road
40. Nene Valley Wetland
41. Nene Valley Springs
42. Winterfield Creek - Cape Douglas
43. Cape Douglas
44. Germein Reserve
45. Cress Creek - Jess
46. Cress Creek Spring
47. Jerusalem Creek Wetland
48. Jerusalem Creek Spring
49. Eight Mile Creek / Ewens Ponds (Conservation Park)
50. Eight Mile Creek Swamp (Sinkholes and Drainage Reserves)
51. Green Point – Stoney Creek
52. Pick's Swamp
53. Freshwater Creek / Piccaninnie Ponds (Conservation Park)
54. Freshwater Creek / Holloways Swamp



**Regional Location of Sites Considered in Section 4**

Map produced by Robert Brandle, Department for Environment and Heritage, Keswick.

## 1. Henry Creek

<b>Hundred:</b>	Wells
<b>Section:</b>	Deposited Plan 43752 / Allotment 3 (Formerly part of Section 24)
<b>Tenure:</b>	Crown Leasehold
<b>Lessee:</b>	Keith and Victoria McBride
<b>Area total:</b>	1717 hectares
<b>Area habitat:</b>	74 hectares
<b>Habitat type:</b>	Mixed woodland (with Silky Tea-tree habitat only along creekline)
<b>Landform:</b>	Spring-fed creekline / Dry mixed woodland
<b>Status:</b>	Fenced

The northern portion of Allotment 3, that the creek is situated in, is a (61 ha) block of remnant vegetation that has been fenced off from stock grazing since 1989, while the riparian zone around the down stream section of creek (southern portion of Allotment 3 – 13 ha) was fenced in April 2002 through the Wetlands Waterlink project.

### **Description:**

Henry Creek is a natural watercourse north east of Kingston in the upper South East region of South Australia. It forms a connecting point where northerly flows spill from the West Avenue watercourse into the Tilley Swamp flat. In an otherwise mostly brackish to saline environment, the spring fed ‘fresh’ creek flows of Henry Creek offer a refuge to aquatic fauna and flora as rare source of permanent water and distinctive outlier stream habitat. In this regard it is significant being the northern-most location for the occurrence of Silky Tea-tree habitat in the South East region. The habitat formation at the site is an interesting mix between this fresh ecosystem type and more salt tolerant species such as Swamp Paperbark (*Melaleuca halmaturorum*). This mixture is a direct reflection of the partially spring fed (fresh), partially groundwater fed (saline) hydrological regime in place at the site.

A comprehensive examination of the distribution of freshwater fishes in the South East by Michael Hammer (2002) has identified Henry Creek as highly significant in terms of habitat and species composition for its location.

### **Threatened species known to occur at the site:**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Australian Status</b>	<b>SA Status</b>
River Blackfish	<i>Gadopsis marmoratus</i>	-	P
Yarra Pygmy-perch	<i>Nannoperca obscura</i>	V	P

### **Project involvement at site:**

Site visit and habitat assessment in 2002.

### **Direct contact with owner made:**

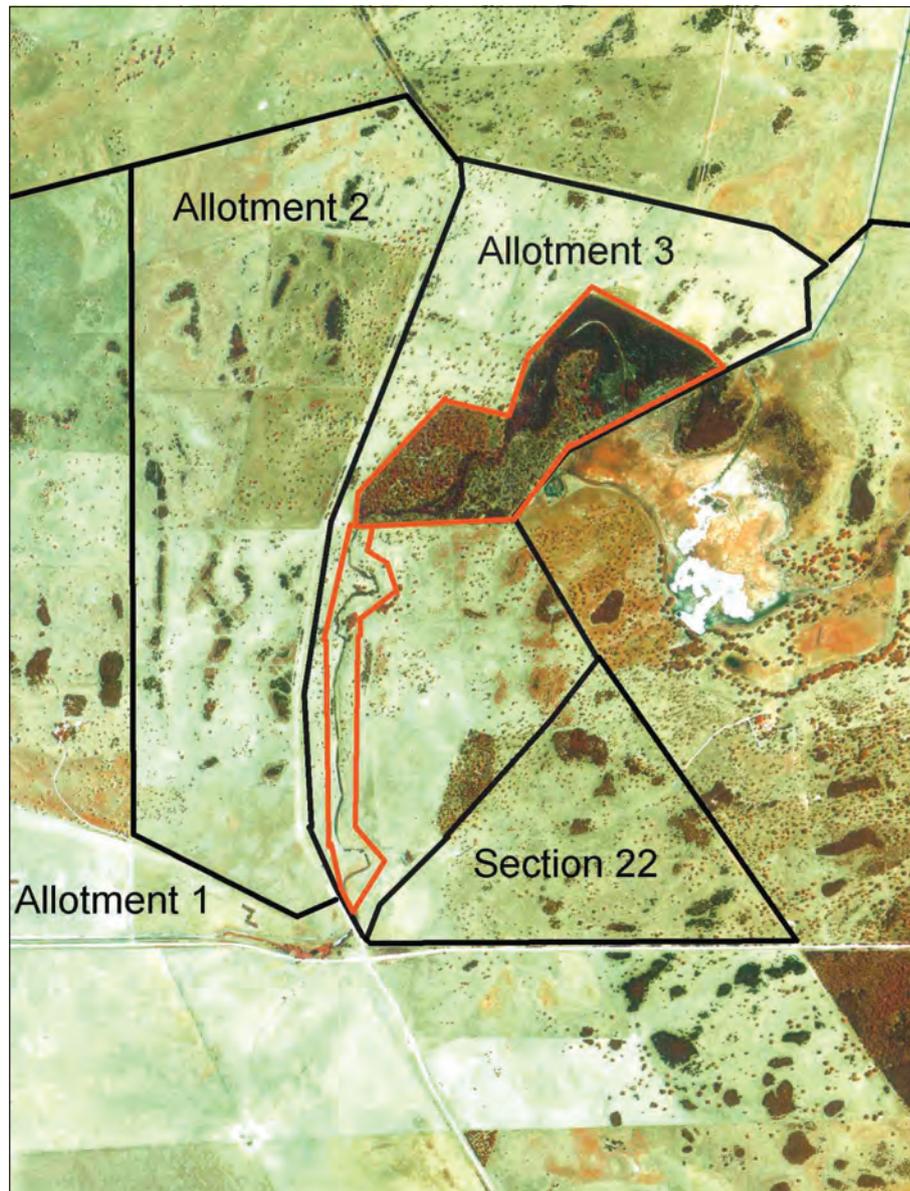
No

***Priority for further action:***

Low

***Recommendations:***

Nil. Site is being actively managed for conservation.



**Site 1: Henry Creek - Red line indicates approximate areas fenced**  
Approximate Scale: 1cm = 100m *Infra-red Aerial Photography: Provided by Department for Land, Water and Biodiversity Conservation, Mt. Gambier.*

## 2. Blackford

**Hundred:** Murrabinna  
**Section:** 32 & 33  
**Tenure:** Freehold  
**Owner:** Aboriginal Lands Trust  
**Area total:** 128 hectares  
**Area habitat:** 20 hectares  
**Habitat type:** Silky Tea-tree tall shrubland  
**Landform:** Spring/seepage fed (from the base of the Reedy Creek Range)

**Status:** Under threat

In early 2002 a swathe of Silky Tea-tree habitat along the eastern boundary of this land (up to 15 metres wide) was cleared to establish a stock-proof boundary fence. When last inspected cattle were grazing this site.

### **Description:**

This site is highly significant as it forms the edge of the range for Silky Tea-tree habitat growing in a tall (up to 8 metres), dense thicket formation, with an almost impenetrable Cutting Grass understorey. In comparison Henry Creek to the north supports a more mixed vegetation community along the riparian zone.

While the habitat is clearly degraded through reduction in spring flows, caused by drainage of the Reedy Creek Flats and drawdown from Blackford drain nearby to the north, and weed invasion (blackberries, bridal creeper), it still provides habitat likely to be vital for the retention local biodiversity. The site is likely to support important bird and butterfly species and is worthy of targeted conservation works.

### **Threatened species known to occur at the site:**

Nil. No surveys yet undertaken.

### **Project involvement at site:**

Site inspection and habitat assessment in mid 2002.

### **Direct contact with owner made:**

No

### **Recommendations:**

That the eastern portion of Section 32 with significant remnant habitat is fenced off and stock grazing excluded.

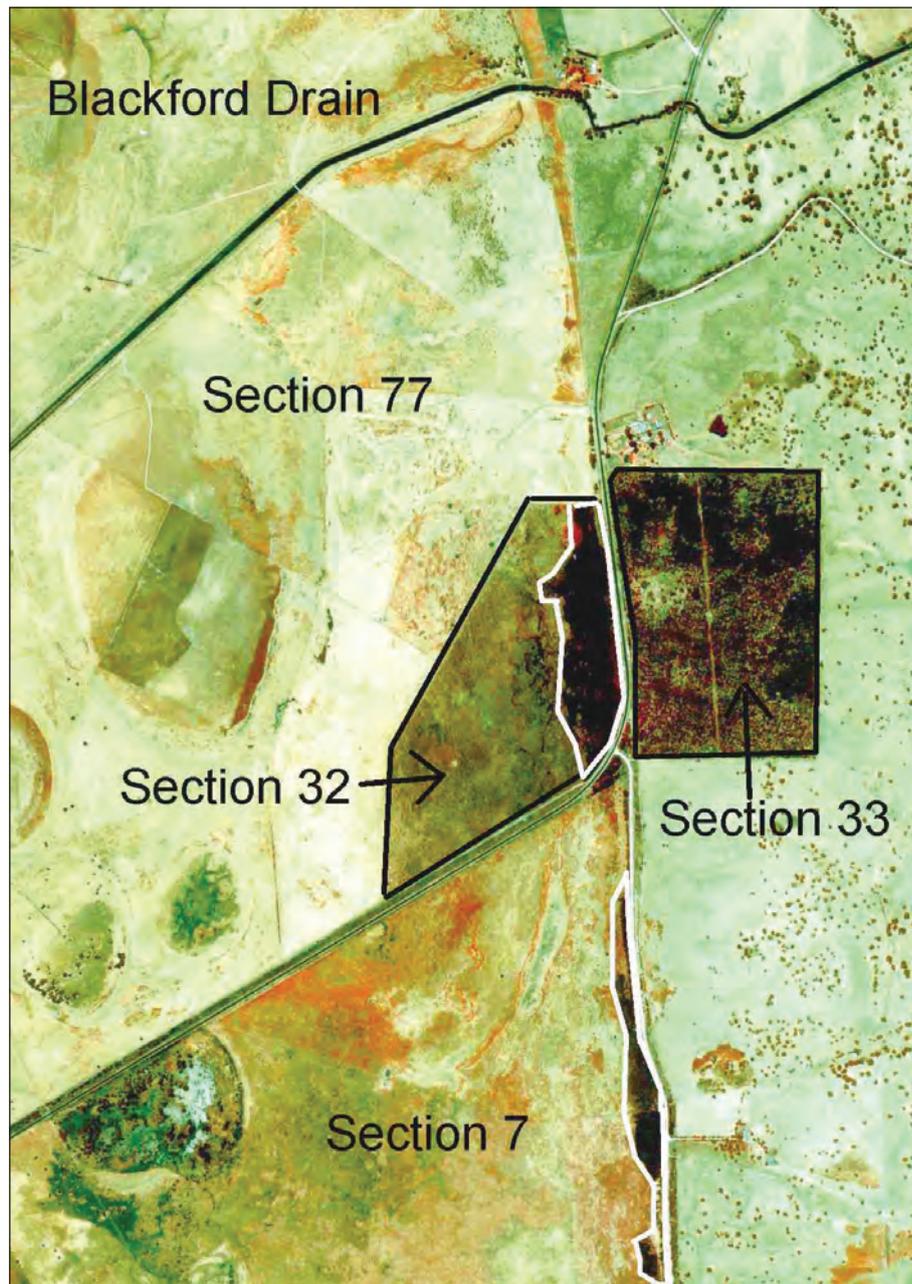


**Site 2: Blackford** - Clearance of a 1km strip of remnant Silky Tea-tree tall shrubland along the eastern boundary of Section 32

Photograph: Mark Bachmann

*Priority for further action:*

High



**Site 2 & 3: Blackford** - White line indicates approximate area of remnant Silky Tea-tree habitat  
Approximate Scale: 1cm = 250m *Infra-red Aerial Photography: Provided by Department for Land, Water and Biodiversity Conservation, Mt. Gambier.*

### 3. Blackford Road Springs

**Hundreds/Sections:**

Murrabinna, 7, 19 & 73  
Bowaka, 68, 123 & 132

**Tenure:** Crown Leasehold

**Lesee:** Sct 7, Wilgena Pastoral Co  
Sct 19, Robert and Linda McBride  
Sct 73, Robert Willis  
Sct 68, AJ & PA McBride Pty. Ltd.  
Sct 123 & 132, Tandez Pty. Ltd. & Bluelens Pty. Ltd.

**Area habitat:** A mostly narrow, dis-continuous strip along the road reserve and properties adjacent to Blackford Road

**Habitat type:** Silky Tea-tree shrubland

**Landform:** Spring/seepage fed (from the base of the Reedy Creek Range)

**Status:** Part under threat / Part fenced

Small sections of this strip of habitat have been fenced off but it was not clear at the time of inspection whether they were being periodically grazed. Larger areas are clearly not fenced and are either partly or highly degraded by stock grazing pressure.

**Description:**

This significant strip of habitat is continuous with the previous site (2. *Blackford*) and consists of Silky Tea-tree habitat growing in a variety of size forms and mixed with other vegetation types, particularly where the habitat meets the limestone at the base of the Reedy Creek Range, which is where the road is situated. Cutting Grass is the dominant understorey plant where pure Silky Tea-tree habitat is formed over deeper peat soils.

While the habitat is partly degraded through reduction in spring flows, caused by drainage of the Reedy Creek Flats inland of the range, a reduction in direct drawdown from the Blackford drain (further away to the north) seems to allow these wetlands to remain moist for a more prolonged period. In some sections weed invasion (blackberries, bridal creeper) is an issue but this semi-continuous strip must play an important function as both habitat and a resource rich corridor for local species. Species particularly likely to benefit in this case include birds and butterflies.

**Threatened species known to occur at the site:**

Nil. No surveys yet undertaken.

**Project involvement at site:**

Site inspection and habitat assessment in mid 2002.

**Direct contact with owners made:**

No

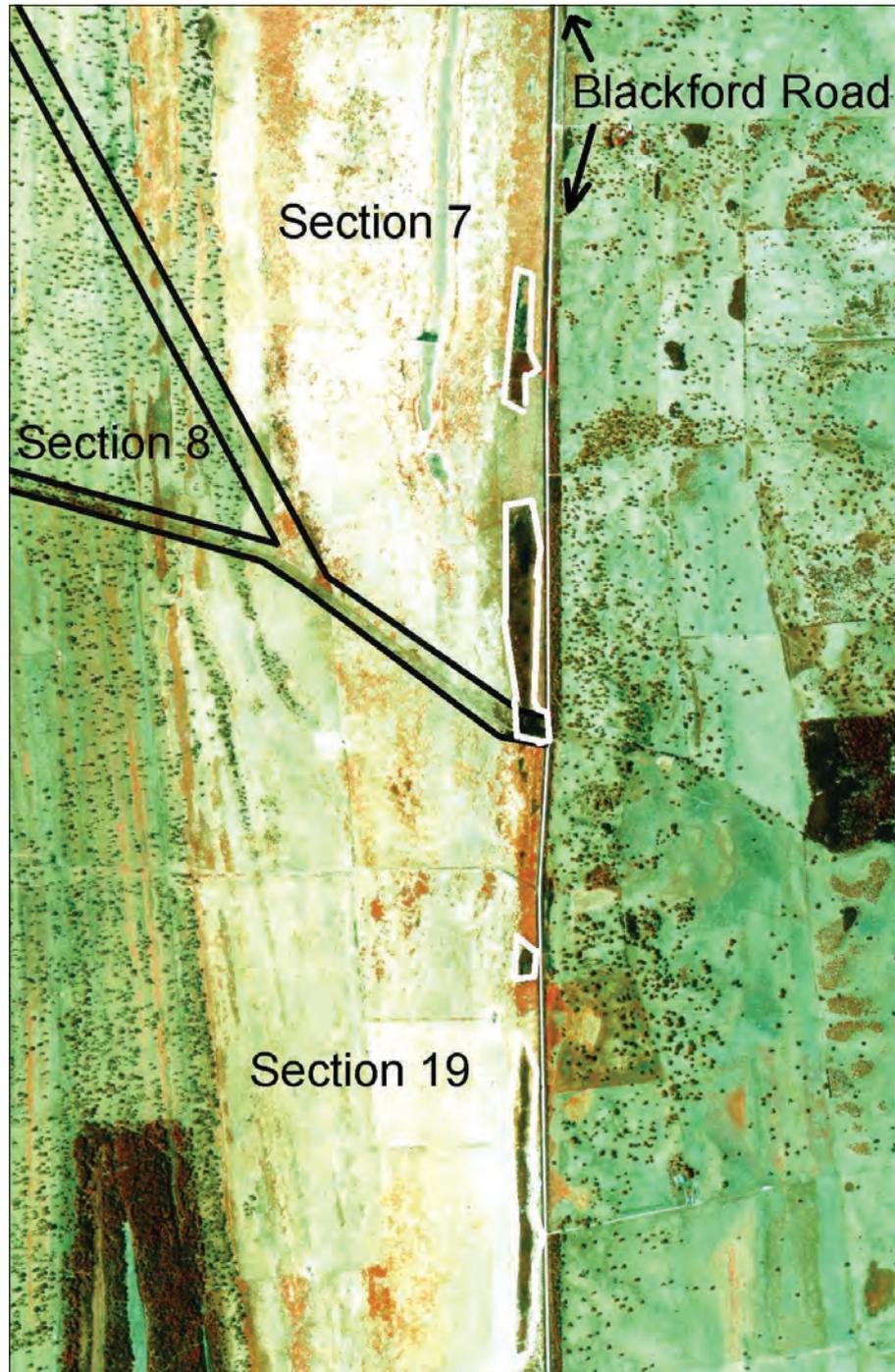
**Recommendations:**

That unprotected portions of the narrow strip of Silky Tea-tree habitat along the Blackford Road are fenced off and stock grazing excluded from all remnants.

That the relevant landowners be encouraged to link areas of existing habitat and create a more extensive habitat corridor.

**Priority for further action:**

Medium



**Site 3: Blackford Road Springs** - White line indicates approximate area of remnant Silky Tea-tree habitat  
Approximate Scale: 1cm = 266m Infra-red Aerial Photography: Provided by Department for Land, Water and Biodiversity Conservation, Mt. Gambier.

#### 4. West Dairy Range - Pomanda

**Hundred:** Ross  
**Section:** 83, 154, 111  
**Tenure:** Crown Leasehold  
**Lesee:** Tom and Pat Brinkworth  
**Area total:** 770 hectares  
**Area habitat:** 35 hectares  
**Habitat type:** Silky Tea-tree tall shrubland  
**Landform:** Spring/seepage fed (from the base of the West Dairy Range)

**Status:** Currently under threat (but a large portion of remnant habitat to be fenced soon)

There are small segments of habitat on Section 83, adjacent to the Dairy Range Road, that are highly degraded by stock grazing that will continue to degrade without fencing.

The owner has agreed to fence the highly significant remnant habitat on Section 154, and Section 111 (a corridor of degraded habitat) to link the area with another remnant on the property to the south. An application for assistance to complete this fencing work has been lodged with Sustaining the South, the devolved grant scheme for the lower South East. This area was initially submitted by the owner for a voluntary Heritage Agreement in 1992, but was later withdrawn.

**Description:**

Section 83 contains small areas (approx. 5 hectares) of severely degraded Silky Tea-tree habitat. This site is reported to have contained the nationally vulnerable Swamp Greenhood as little as 15 years ago (E. Lawson pers. comm.). The former *Gahnia* dominated understorey of this patch has been all but destroyed and the peat soil is exposed, boggy and trampled.

The 15 hectare remnant area on Section 154 is one of the most significant Silky Tea-tree remnants near the north-west limit of the habitat's range in the region, containing threatened orchids and supporting an extremely tall (up to 10 metres) habitat formation scarcely seen elsewhere in South Australia. The understorey in the heart of the area is dominated by thickets of 2 metre high Tall Saw-sedges and a ground layer of rapidly breaking down fallen debris. Importantly, the hydrology of the wetland does not appear to have been significantly altered through drainage or reduced spring flows, with the peat soil remaining moist throughout the summer months. There are no serious weed issues at present however penetration by stock further into the heart of this area has the ability to seriously undermine its integrity. On the range side of the habitat a rare, intact ecotone between the wetland habitat and Pink Gum (*Eucalyptus fasciculosa*) woodland exists.

Section 111 presently only retains remnant Cutting Grass (*Gahnia trifida*) tussocks but would formerly have been covered with an overstorey of Silky Tea-tree. This approximate area of 10 hectares could serve a valuable role as a linkage between higher quality remnant areas to the north and south.

**Threatened species known to occur at the site:**

Common Name	Scientific Name	Australian Status	SA Status
Small Sickle Greenhood	<i>Pterostylis</i> sp. aff. <i>falcata</i>	-	E
Swamp Greenhood	<i>Pterostylis tenuissima</i>	V	V

***Project involvement at site:***

Several site visits and a habitat assessment.

***Direct contact with owner made:***

Yes. Including discussions about management of the area that has led to the current application for its protection.

***Recommendations:***

That fencing works are undertaken as soon as possible to halt the degradation of this high quality remnant through grazing.

That should the proposed fencing of Section 111 take place, it be actively rehabilitated to form an effected habitat corridor.

That discussion about protection/recovery of habitat on Section 85 with the owner is required.

***Priority for further action:***

If fenced – Low

If not fenced – Very High

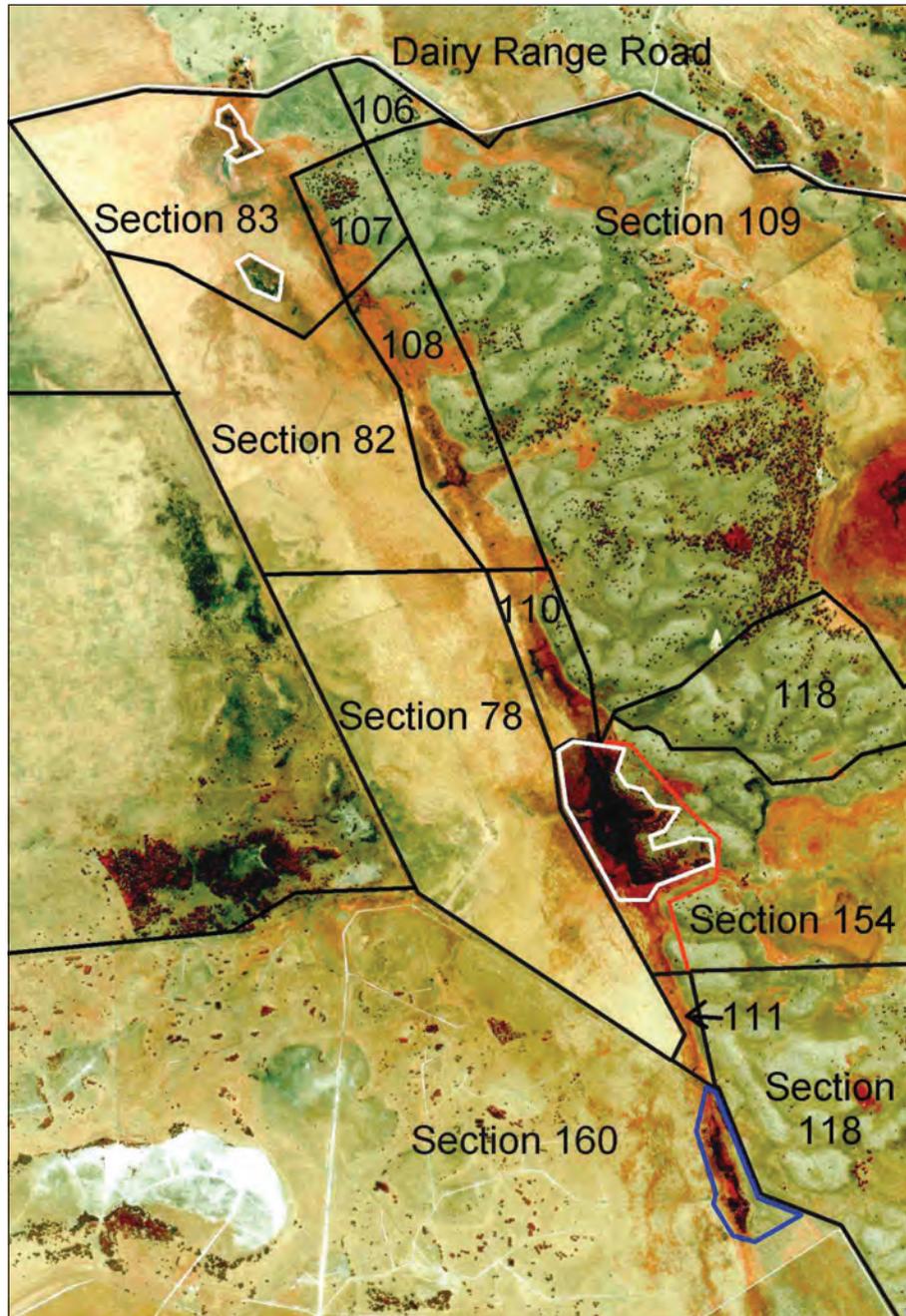


**Site 4: West Dairy Range - Very tall (up to 10m) Silky Tea-tree habitat formation with a Tall Saw-sedge understorey**  
*Photograph: Mark Bachmann*

## **5. West Dairy Range - Ogilvie**

<b><i>Hundred:</i></b>	Ross
<b><i>Section:</i></b>	160
<b><i>Tenure:</i></b>	Crown Leasehold
<b><i>Lesee:</i></b>	Wally Ogilvie
<b><i>Area total:</i></b>	1060 hectares
<b><i>Area habitat:</i></b>	12 hectares
<b><i>Habitat type:</i></b>	Silky Tea-tree tall shrubland
<b><i>Landform:</i></b>	Spring/seepage fed (from the base of the West Dairy Range)
<b><i>Status:</i></b>	Fenced

The owner fenced off this significant area of habitat with the assistance of this project before winter 2001, and in the short period since it has shown remarkable signs of recovery.



**Site 4 & 5: West Dairy Range Springs** - White line indicates approximate area of remnant Silky Tea-tree habitat currently not fenced. Red line indicates proposed fencing. Blue line indicates fencing completed with the assistance of the project.  
Approximate Scale: 1cm = 300m Infra-red Aerial Photography: Provided by Department for Land, Water and Biodiversity Conservation, Mt. Gambier.

**Description:**

Perhaps a reflection of shallower soils, the Silky Tea-tree at this site (of around 12 hectares) is more stunted than the remnant area on the property to the north (Site 4), but otherwise consists of habitat providing very similar conditions. This is evidenced by the fact that similar threatened orchid species are recorded from the site, even though the degree of degradation in this area much more severe prior to fencing. The one saviour for these threatened species of flora it seems has been the reliability of annual spring-flows that, over winter in particular, make area of the habitat inaccessible to stock and provide a form of natural relief from grazing and trampling. However the consistent intrusion and grazing pressure from stock over the drier months had clearly taken its toll on the quality of the understorey at this site.

Grazing stock have introduced some pasture weed species to the understorey of the habitat and, now that it is fenced, regeneration at the fringes of the area may be hampered by vigorous growth of Tall Wheat-grass.

**Threatened species known to occur at the site:**

Common Name	Scientific Name	Australian Status	SA Status
Small Sickle Greenhood	<i>Pterostylis</i> sp. aff. <i>falcata</i>	-	E
Swamp Greenhood	<i>Pterostylis tenuissima</i>	V	V
Sweet Onion-orchid	<i>Microtis rara</i>	-	R

**Project involvement at site:**

Several site visits and a habitat assessment.

**Direct contact with owner made:**

Yes. Proven to be fruitful with the owner extremely interested in the orchids and actively managing the habitat for conservation (fencing, weed control).

**Recommendations:**

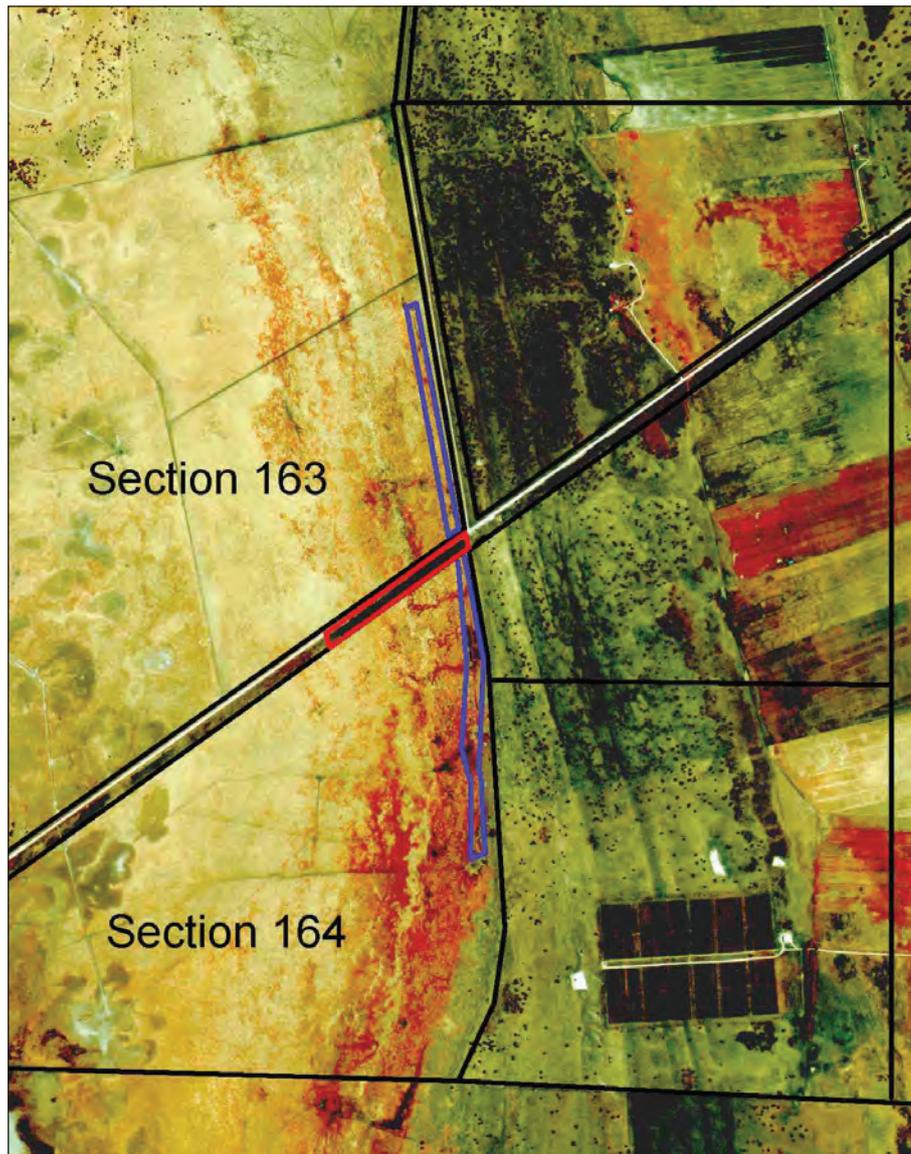
Continue to provide support to the owner with future management.  
Control weeds in protected area.

**Priority for further action:**

Low.



**Site 5: West Dairy Range - Wally and Mark Ogilvie standing in front of the recently fenced Silky Tea-tree habitat on the family property**  
 Photograph: Mark Bachmann



**Site 6: West Dairy Range** - Blue line indicates area to be fenced with the project's assistance and re-vegetated with Silky Tea-tree habitat. Red line indicates remnant habitat on the adjacent Road Reserve.  
Approximate Scale: 1cm = 100m Infra-red Aerial Photography: Provided by Department for Land, Water and Biodiversity Conservation, Mt. Gambier.

## 6. West Dairy Range - Ogilvie

<b>Hundred:</b>	Ross
<b>Section:</b>	163 & 164
<b>Tenure:</b>	Crown Leasehold
<b>Lessee:</b>	Wally Ogilvie
<b>Area total:</b>	850 hectares
<b>Area habitat:</b>	nil – will re-establish 15-20 hectares of former habitat adjacent to a roadside remnant
<b>Habitat type:</b>	Former Silky Tea-tree tall shrubland
<b>Landform:</b>	Spring/seepage fed (from the base of the West Dairy Range)
<b>Status:</b>	Currently cleared and grazed – to be fenced and revegetated

The owner is preparing to fence and revegetate a 15-20 hectare strip of Silky tea-tree along the base of the range, to the north and south of a roadside remnant on the Old Naracoorte Road.

### **Description:**

The revegetation site, being at the very junction between the West Dairy Range and the Lake Hawdon Flat, is at the surface a mixture of pasture, boggy peat, potholes and outcropping limestone. This junction is to be rehabilitated with dry and wetland species to recreate a corridor of this valuable habitat and to expand the small, isolated remnant that exists on the adjacent road reserve.

### **Threatened species known to occur at the site:**

Nil.

### **Project involvement at site:**

Site visit and assessment.

### **Direct contact with owner made:**

Yes. With resolution made that the area will be fenced, rehabilitated and managed for conservation.

### **Recommendations:**

Establish fencing at the site  
Assist the owner in accessing funds that will assist with revegetation costs  
Provide ongoing support with management

### **Priority for further action:**

Low.

## 7. West Dairy Range - Hurst

**Hundred:** Bray  
**Section:** 79, 133, 149 & 229  
**Tenure:** Freehold  
**Owner:** Brian & Christine Hurst  
**Area total:** not available  
**Area habitat:** Approx. 15 hectares  
**Habitat type:** Silky Tea-tree shrubland  
**Landform:** Spring/seepage fed (from the base of the West Dairy Range)

**Status:** Not confirmed but likely to be under threat

Aerial photography indicates that the area is not likely to be fenced and is therefore probably subjected to grazing.

### **Description:**

The area would be expected to support similar habitat to remnants further north along the West Dairy Range, with the aerial photography indicating that an overstorey of Silky Tea-tree is still present in two-three semi-continuous patches. The condition of the understorey is impossible to gauge from the aerial photography. This assessment requires on-ground verification.

### **Threatened species known to occur at the site:**

Nil. No surveys have been conducted at the site.

### **Project involvement at site:**

Nil.

### **Direct contact with owner made:**

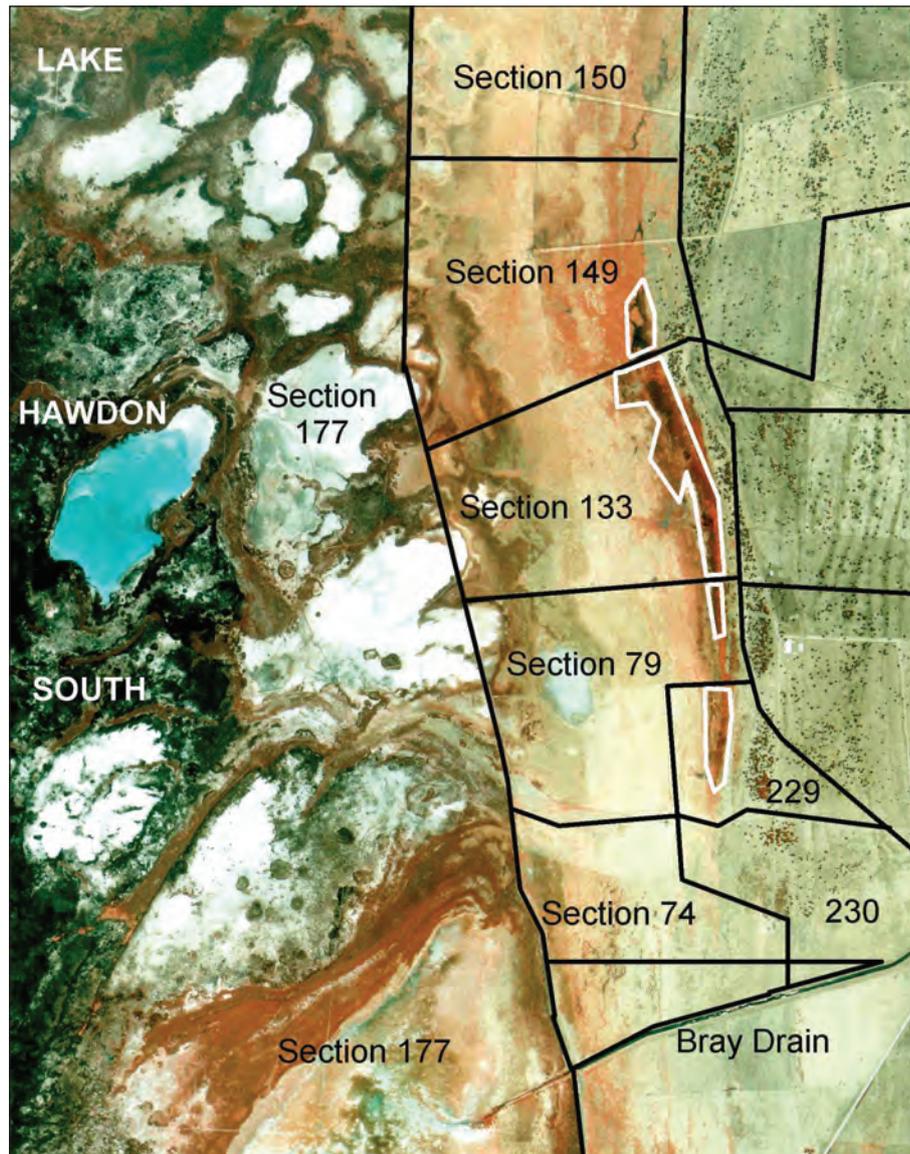
No.

### **Recommendations:**

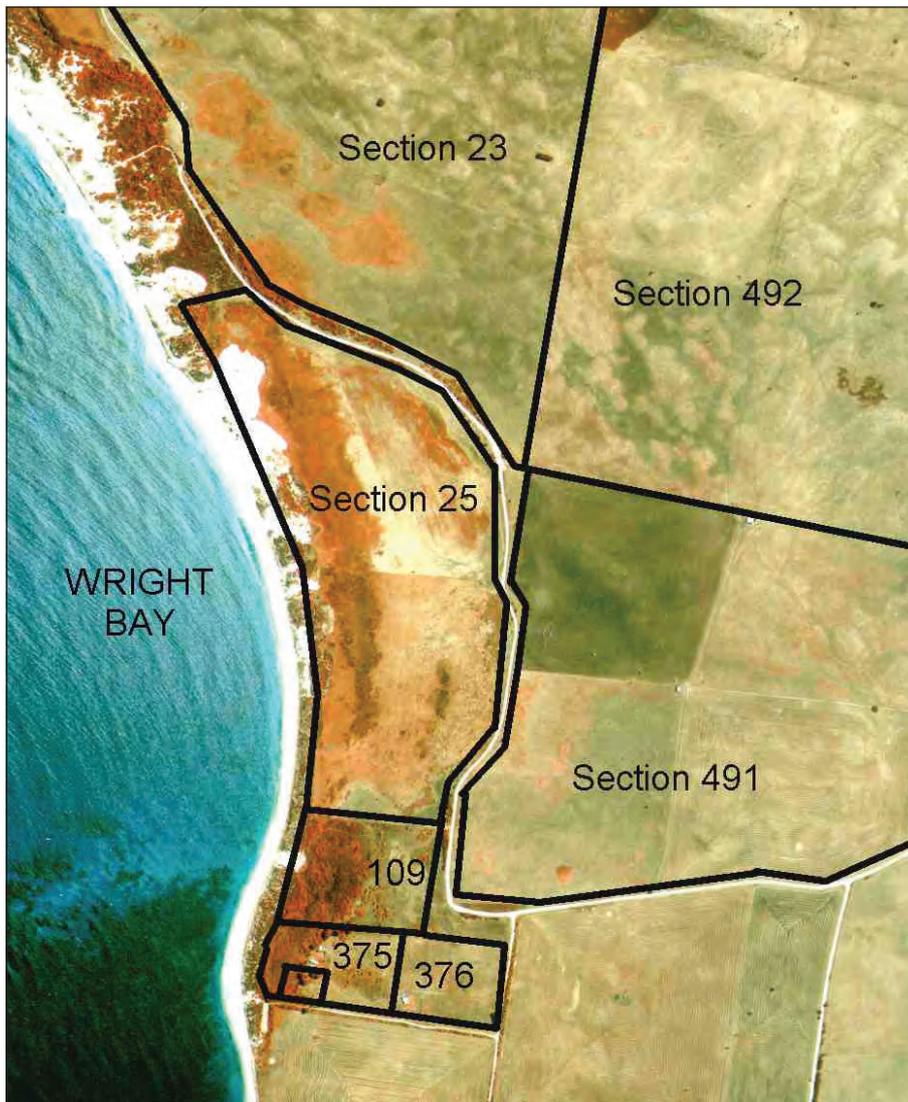
Owner be contacted and approached about meeting on site  
Site visit and habitat assessment be undertaken  
Discuss future management options with owner based upon outcomes of above recommendations

### **Priority for further action:**

Unknown (thus contact is a high priority)



**Site 7: West Dairy Range Springs** - White line indicates approximate area of remnant Silky Tea-tree habitat  
Approximate Scale: 1cm = 350m Infra-red Aerial Photography: Provided by Department for Land, Water and Biodiversity Conservation, Mt. Gambier.



**Site 8: Cadara Swamp**

Approximate Scale: 1cm = 200m *Infra-red Aerial Photography: Provided by Department for Land, Water and Biodiversity Conservation, Mt. Gambier.*

## 8. Cadara Swamp

<b>Hundred:</b>	Mount Benson
<b>Section:</b>	25
<b>Tenure:</b>	Crown Leasehold
<b>Owner:</b>	Robin Ling
<b>Section:</b>	109
<b>Tenure:</b>	Freehold
<b>Owner:</b>	Thomas & Barbara Webb
<b>Area total:</b>	80 hectares
<b>Area habitat:</b>	virtually nil
<b>Habitat type:</b>	former Silky Tea-tree shrubland
<b>Landform:</b>	Rising spring/seepage fed coastal wetland
<b>Status:</b>	Grazed and highly degraded

### **Description:**

There is little evidence (aside from a smattering of representative species) left of the former Silky Tea-tree and Cutting Grass wetland that would have been present at this site.

### **Threatened species known to occur at the site:**

Nil.

### **Project involvement at site:**

Site visit and assessment

### **Direct contact with owner made:**

No

### **Recommendations:**

If the current owners are interested in rehabilitating their wetland habitat that they be fully supported logistically and financially in undertaking this activity

### **Priority for further action:**

Low

## 9. Bagdad Road – Woakwine Range

<b>Hundred:</b>	Waterhouse
<b>Section:</b>	559
<b>Tenure:</b>	Unallotted Crown Land
<b>Owner:</b>	Minister for Environment and Conservation
<b>Area total:</b>	0.9 hectares
<b>Area habitat:</b>	0.5 hectares
<b>Habitat type:</b>	Silky Tea-tree shrubland
<b>Landform:</b>	Spring-fed (from the base of the Woakwine Range)
<b>Status:</b>	Fenced

This parcel of land was subjected to grazing pressure after the deterioration of fencing allowed cattle access to the site. The fence was repaired and made stock-proof by National Parks and Wildlife staff from the Robe office during the mid-1990's. Regeneration is occurring and the site is now considered secure.

### **Description:**

A very small and isolated remnant patch of Silky Tea-tree habitat that provides a less common example of spring flow from the inland side of the Woakwine Range. This site was on the northern outskirts of a larger area of Silky Tea-tree swamp that is now all but cleared. While due to its size the habitat is likely to have limited biodiversity value as permanent habitat for many species, it could provide a valuable function as a stepping stone for wildlife moving through the landscape. Due to its size the effect of weeds is likely to be an ongoing concern. The southern portion of Section 559 is an old quarry site.

### **Threatened species known to occur at the site:**

Nil

### **Project involvement at site:**

Site visit and assessment

### **Direct contact with owner made:**

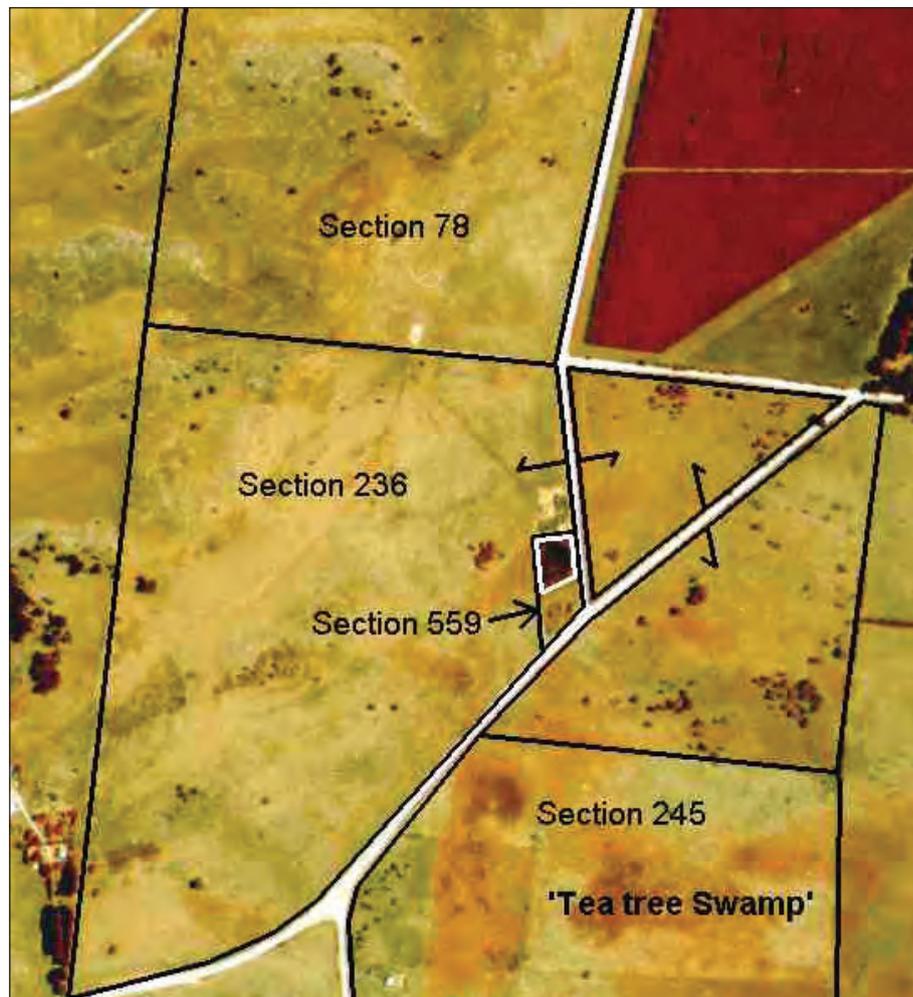
Yes. Management has been discussed with local NPWSA staff.

### **Recommendations:**

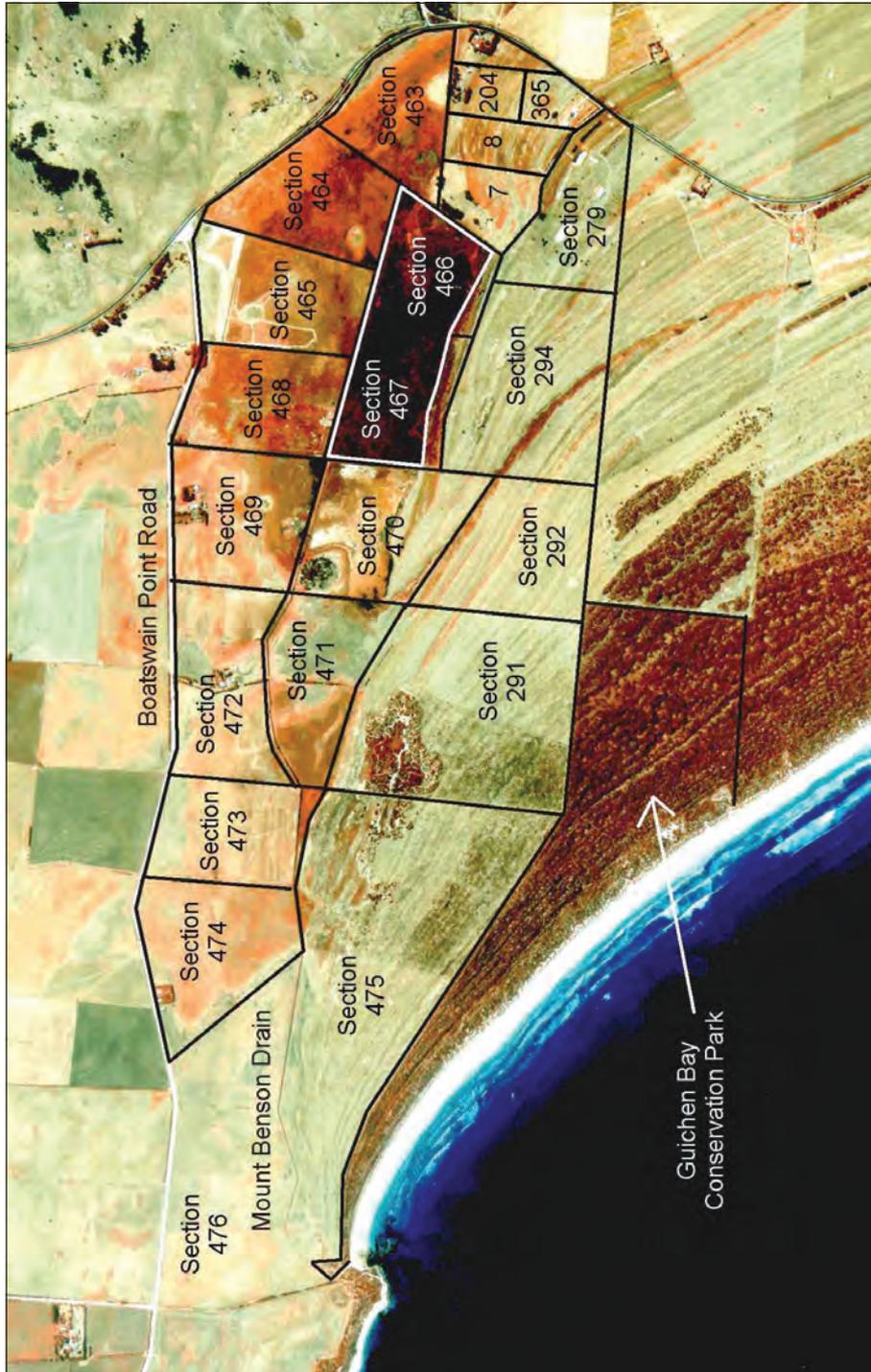
Monitor and manage weed invasion of the site  
Manage to encourage habitat regeneration

### **Priority for further action:**

Low



**Site 9: Tea-tree Swamp** - White line indicates approximate area of protected remnant Silky Tea-tree habitat  
Approximate Scale: 1cm = 110m *Infra-red Aerial Photography: Provided by Department for Land, Water and Biodiversity Conservation, Mt. Gambier.*



**Site 10: Guichen Bay Wetland** - White line indicates approximate area of protected remnant Silky Tea-tree habitat  
Approximate Scale: 1cm = 270m Infra-red Aerial Photography. Provided by Department for Land, Water and Biodiversity Conservation, Mt. Gambier.

## 10. Guichen Bay Wetland

<b>Hundred:</b>	Waterhouse
<b>Section:</b>	466 & 467
<b>Tenure:</b>	Crown Leasehold
<b>Lesee:</b>	Ian & Fran McInnes
<b>Area total:</b>	37 hectares
<b>Area habitat:</b>	35 hectares
<b>Habitat type:</b>	Silky Tea-tree shrubland / Cutting Grass Sedgeland
<b>Landform:</b>	Spring-fed (from the base of the Woakwine Range)

**Status:** Fenced. Not grazed.

### **Description:**

The Mount Benson Drain, which enters the sea at Boatswains Point, drains this swamp and has made development of neighbouring sections of land for grazing possible. The drain runs along the northern boundary of this remnant habitat, which consists mostly of low Silky Tea-tree shrubland with a dense Cutting Grass understorey, grading into pure Cutting Grass sedgeland in places. With the drier conditions provided by drainage, dry coastal primary succession species such as Coastal Wattle (*Acacia sophorae*) and Coastal Bearded-heath (*Leucopogon parviflorus*) have infiltrated the wetland habitat. An introduced eastern Australian sheoak *Allocasuarina cunninghamii* species is visibly spreading and also requires management. Along the drain, taller Silky Tea-tree habitat has developed in the riparian zone and good aquatic habitat is preserved.

### **Threatened species known to occur at the site:**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Australian Status</b>	<b>SA Status</b>
Southern Emu-wren	<i>Stipiturus malachurus</i>	-	V

### **Project involvement at site:**

Site visit and assessment

### **Direct contact with owner made:**

Yes. Owners are happy to see the area preserved in its current state.

### **Recommendations:**

That remnant habitat on the road reserve between the highway and Section 466 be rehabilitated.  
 That the owners be actively encouraged to manage invasive plants at the site.  
 That , as this strip contains important species such as Leafy Twig-rush and Tall Saw-sedge, further survey of the property is undertaken to establish if threatened species are present.  
 That adjacent property owners be encouraged to re-establish habitat along the boggy margins of drains.

### **Priority for further action:**

Low-medium

## 11. Dawson Swamp

<b>Hundred:</b>	Waterhouse
<b>Section:</b>	Deposited Plan 29451 / Allotments 1, 2 & 4 (Formerly Part of Section 116, 117, 118 & 388)
<b>Tenure:</b>	Freehold
<b>Owner:</b>	William Chapman
<b>Area total:</b>	345 hectares
<b>Area habitat:</b>	250 hectares including open, degraded seasonally inundated wetland
<b>Habitat type:</b>	Silky Tea-tree shrubland and Cutting Grass sedgeland
<b>Landform:</b>	Spring-fed (from the base of the Woakwine Range)
<b>Status:</b>	Under threat of ongoing degradation from grazing

The owner of this site has been prepared to negotiate a sale to National Parks and Wildlife SA, but this has not yet progressed. For a short period the government actually owned the northern portion of Dawson Swamp and the adjacent portion of the Woakwine Range after the government paid out the Lang family for their perpetual lease rights to the property in 1988. This took place under a provision of the then *Native Vegetation Management Act 1985* that allowed for the government buy-out of properties that were deemed to be non-viable for farming as a result of refusal to clear native vegetation. Instead of retaining and rehabilitating the wetland and the adjacent heavily wooded range, government officials at the time negotiated to exchange the cleared and partly cleared swamp portions of the Lang property with the heavily wooded section of the Woakwine Range owned by the southern neighbour, Mr Chapman. As a result of the sub-division that followed in 1990, the government retained as Crown Land and dedicated the Allotments (3 & 5) situated on the range as a Conservation Reserve under the *Crown Lands Act 1929*, with the low-lying and/or cleared Allotments (1,2,4 & 6) transferred under freehold title to Mr. Chapman.

### **Description:**

This mixed wetland and woodland area of habitat that consists of Silky tea-tree and Short-leaf Honey-myrtle (*Melaleuca brevifolia*) shrubland, Cutting Grass Sedgeland, with adjacent Dryland Tea-tree (*Melaleuca lanceolata*) and Coastal Mallee (*Eucalyptus diversifolia*) woodland, flanks the western side of Woakwine Conservation Reserve. Like this reserve to its east, the wetland is bisected by Drain L, and culverts into this drain, located under the drain spoil banks, probably speed up the annual drying out of Dawson Swamp. It is anticipated that if the site were protected for its wetland values that this could be regulated and that a more natural hydrological regime could be achieved. The significant wetland values of Dawson Swamp for a wide range of waterfowl have been observed but no other detailed biological information has ever been collected from the site.

### **Threatened species known to occur at the site:**

Nil. However the site does provide potential habitat for several threatened species.

### **Project involvement at site:**

Site visit and habitat assessment

### **Direct contact with owner made:**

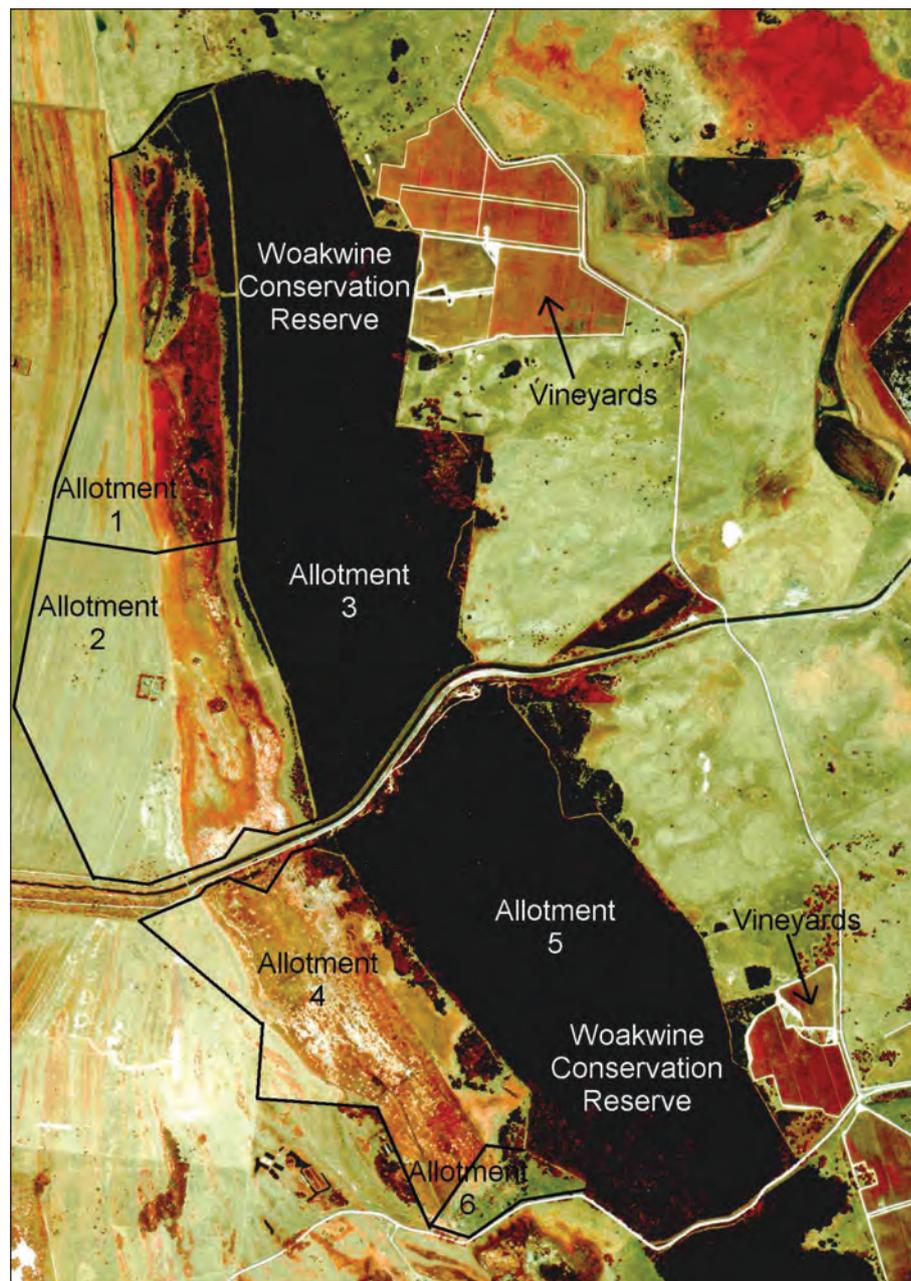
No

**Recommendations:**

That the government negotiate the purchase of the property from Mr. Chapman for addition to the Woakwine Conservation Reserve. This unique opportunity to conserve a cross-section of wet and dry habitats on the Woakwine Range may never present itself again. Woakwine Conservation Reserve is also currently being encroached on its eastern side by land-use intensification with the broad scale planting of vineyards. In addition to enhancing the viability of the existing reserve through land addition, there is also an opportunity to allow for the natural rehabilitation of a significant corridor of wet habitat along the base of the range.

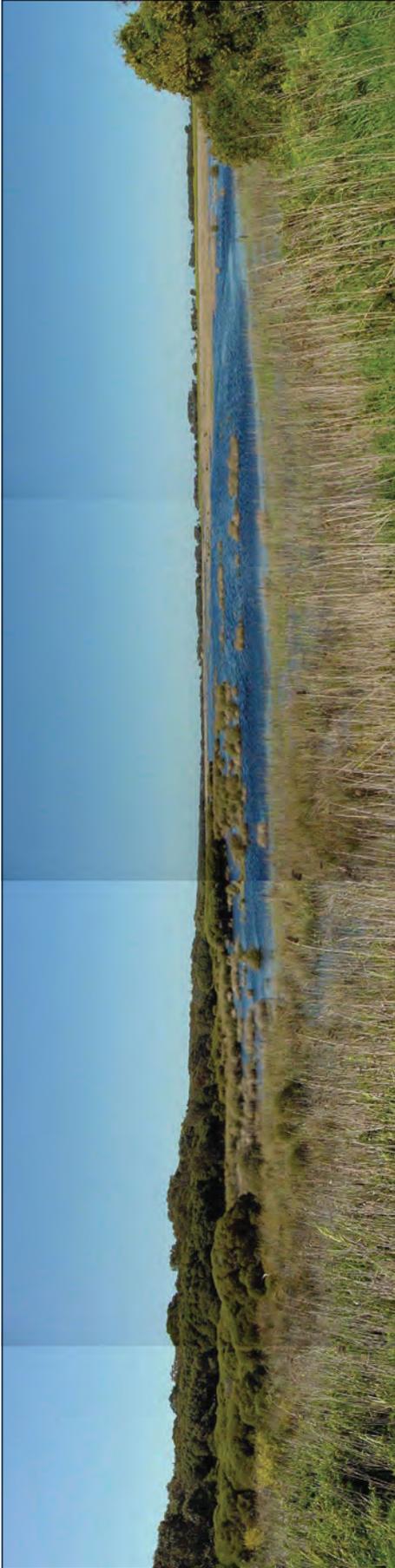
**Priority for further action:**

High

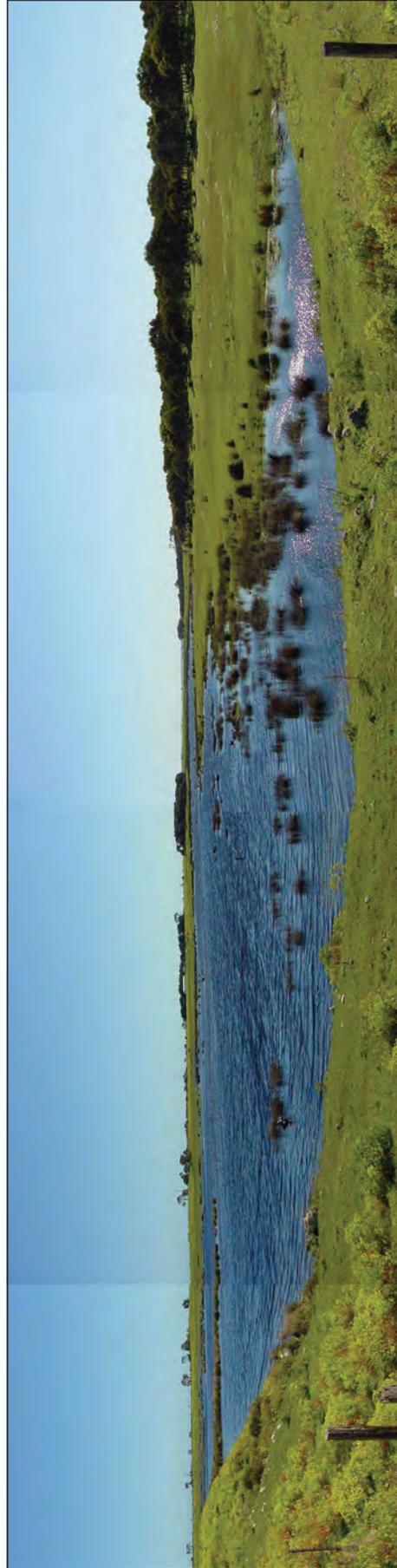


**Site 11: Dawson Swamp**

Approximate Scale: 1cm = 300m Infra-red Aerial Photography: Provided by Department for Land, Water and Biodiversity Conservation, Mt. Gambier.



**Site 11: Dawson Swamp - Looking south from the bank of Drain L (late winter 2000)**  
Photograph: Mark Bachmann



**Site 11: Dawson Swamp - Looking north from the bank of Drain L (late winter 2000)**  
Photograph: Mark Bachmann

## 12. Ghost Lake

<b>Hundred:</b>	Waterhouse
<b>Section:</b>	412
<b>Tenure:</b>	Freehold
<b>Owner:</b>	Joyce and John Enright
<b>Area total:</b>	60 hectares
<b>Area habitat:</b>	5 hectares
<b>Habitat type:</b>	Silky Tea-tree shrubland
<b>Landform:</b>	Seepage-fed (from the Robe Range – dune system)
<b>Status:</b>	Unknown – likely to be under threat

While it is unlikely that the owner has specifically protected this area, there were no signs of physical disturbance (such as grazing) around the portion of Ghost Lake visible from the Little Dip Conservation Park boundary track.

### **Description:**

Ghost Lake is a small semi-permanent soak situated on private property between Little Dip Conservation Park and Lake Robe Game Reserve. Freshwater seepage into the lake from the Robe Range (sand dunes) has allowed the formation of an area of seasonally inundated Silky Tea-tree habitat that fringes the edges of Ghost Lake.

### **Threatened species known to occur at the site:**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Australian Status</b>	<b>SA Status</b>
Rufous Bristlebird	<i>Dasyornis broadbenti</i>	-	V

### **Project involvement at site:**

Site inspection and assessment

### **Direct contact with owner made:**

No

### **Recommendations:**

That, if necessary, the owners be encouraged to protect Ghost Lake and its fringing habitats from stock grazing via fencing.

### **Priority for further action:**

Medium

### 13. Lake Robe (Game Reserve)

<b>Hundred:</b>	Waterhouse
<b>Section:</b>	522 & 584
<b>Tenure:</b>	Reserve
<b>Owner:</b>	Minister for Environment and Heritage
<b>Area total:</b>	340 hectares
<b>Area habitat:</b>	20 hectares
<b>Habitat type:</b>	Silky Tea-tree shrubland
<b>Landform:</b>	Seepage-fed
<b>Status:</b>	Protected Area

Dedicated as a Game Reserve under the *National Parks and Wildlife Act 1972*.

#### **Description:**

The northern tips of this reserve preserve areas of seepage-fed Silky Tea-tree habitat with a dense Cutting Grass understorey. Nearer to the edges of Lake Robe the habitat reflects the saltier nature of the area, grading into a more open Swamp Paperbark woodland.

#### **Threatened species known to occur at the site:**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Australian Status</b>	<b>SA Status</b>
Rufous Bristlebird	<i>Dasyornis broadbenti</i>	-	V

#### **Project involvement at site:**

Site visit

#### **Direct contact with owner made:**

Yes. Local National Parks and Wildlife staff are aware of the importance of this remnant Silky Tea-tree habitat.

#### **Recommendations:**

Encourage neighbouring landholders to protect adjacent degraded habitats through removal of stock.

#### **Priority for further action:**

Low.



Site 12, 13 & 14: White line indicates approximate area of remnant Silky Tea-tree habitat.  
Yellow line indicates former Silky Tea-tree swamp.

Approximate Scale: 1cm = 400m Infra-red Aerial Photography: Provided by Department for Land, Water and Biodiversity Conservation, Mt. Gambier.

## 14. Lake Eliza West

<b>Hundred:</b>	Waterhouse
<b>Section:</b>	Deposited Plan 47616 / Allotment 1 (formerly part section 404 & 518)
<b>Tenure:</b>	Unallotted Crown Land
<b>Owner:</b>	Minister for Environment and Heritage
<b>Section:</b>	Deposited Plan 47616 / Allotment 5 (formerly section 343)
<b>Tenure:</b>	Freehold
<b>Owner:</b>	Malcolm McCourt
<b>Section:</b>	423, 424 & 426
<b>Tenure:</b>	Crown Leasehold
<b>Lessee:</b>	William & Michael Quinlan-Watson
<b>Area total:</b>	not available
<b>Area habitat:</b>	not available
<b>Habitat type:</b>	Silky Tea-tree shrubland
<b>Landform:</b>	Seepage-fed

### **Status:**

Allotment 1:	fenced, secure.
Allotment 5:	habitat drained and cleared.
Sections 423, 424 & 426:	subjected to grazing.

### **Description:**

These wetland habitats essentially fringe Lake Eliza and are associated with the lateral seepage of fresh ground and surface water from the Robe Range to this large coastal salt lake. Allotment 1 retains important areas of Silky Tea-tree habitat that are partially degraded by past grazing but are quickly rehabilitating now that this area is fenced and stock excluded.

Allotment 5 is privately owned and in 1983 was the site of discovery for a new population of the State endangered Swamp Antechinus. Over subsequent years this Silky Tea-tree swamp was drained, burned and cleared by the owner, contributing to the local extinction of that population of Swamp Antechinus. The area is now heavily grazed and supports only tussocks of Cutting Grass, but is still seasonally inundated. This area would slowly rehabilitate if protected.

Sections 423, 424 & 426 are privately owned and contain significant areas of remnant Cutting Grass sedgeland with occasional Silky Tea-tree. This area would have supported an intact overstorey of Silky Tea-tree that is likely to have been lost as a result of past clearance, burning and grazing. Cutting Grass, being more resilient in coping with these pressures, has retained good cover in the area and the habitat would rehabilitate rapidly if fenced.

### **Threatened species known to occur at the site:**

Although the Swamp Antechinus is now considered extinct from Allotment 5, survey work of Allotment 1 should be undertaken to establish whether the species still occurs in the local area.

### **Project involvement at site:**

Site visit and assessment

**Direct contact with owner made:**

Yes. Local National Parks and Wildlife staff are appropriately managing Allotment 1, while the owner of Allotment 5 will not manage his wetland for conservation. The owner of Sections 423, 424 & 426 has not been specifically approached about this area of habitat (see Site 15).

**Recommendations:**

That the owner of Allotment 5 continue to be encouraged to manage this wetland area for conservation.

That the owner of Sections 423, 424 & 426 be approached about protection of this area of habitat.

**Priority for further action:**

Medium



1978



1982



1987



1992

**Site 14: Allotment 5** - Habitat clearance adjacent to Little Dip Conservation Park. Habitat is outlined in red.  
Approximate Scale: 1cm = 200m Aerial Photography: Provided by Mapland, SA Department for Environment and Heritage



**Site 14: Allotment 5** - The Silky Tea-tree swamp as it appeared in 1983 (left) Photograph: Peter Bird  
and the same, now denuded swamp in 2001(right) Photograph: Mark Bachmann

## 15. The Springs - Lake Eliza East

**Hundred:** Waterhouse  
**Section:** 104  
**Tenure:** Freehold  
**Owner:** William & Michael Quinlan-Watson  
**Area total:** 98 hectares  
**Area habitat:** 25 hectares  
**Habitat type:** Silky Tea-tree shrubland and Cutting Grass sedgeland  
**Landform:** Spring-fed (from the base of the Woakwine Range)

**Status:** Under threat - particularly grazing

Habitat condition at the site is quite good considering the history of grazing. There also is evidence of some habitat clearance by slashing and in the past by burning.

### **Description:**

This site is highly significant as it currently forms the north-westerly extent in distribution for the endangered Swamp Antechinus and is therefore very important for this species' conservation. Silky Tea-tree habitat at this site is mostly restricted to growing along a network of drains that take water from the springs to Lake Eliza. Intervening areas are more dominated by Cutting Grass sedgeland habitat.

Native species that are suited to drier ground such as Coastal Wattle, Coastal Daisy (*Olearia axillaris*) and Boobialla (*Myoporum insulare*) have infiltrated this fragmented wetland, along with introduced weeds like Bridal Creeper (*Myrsiphyllum asparagoides*).

### **Threatened species known to occur at the site:**

Common Name	Scientific Name	Australian Status	SA Status
Swamp Antechinus	<i>Antechinus minimus</i>	-	E
Rufous Bristlebird	<i>Dasyornis broadbenti</i>	-	V

### **Project involvement at site:**

Site visit and habitat assessment

### **Direct contact with owner made:**

Yes. Interested in the Swamp Antechinus but does not perceive grazing as a threat and therefore not interested in fencing.

### **Recommendations:**

To continue contact with the owner in an attempt to see this highly important site managed more appropriately for conservation.

***Priority for further action:***

High



**Site 15: The Springs** - White line indicates approximate area of remnant Silky Tea-tree habitat.  
Approximate Scale: 1cm = 266m Infra-red Aerial Photography: Provided by Department for Land, Water and Biodiversity Conservation, Mt. Gambier.



**Site 16: Lake Hawdon South**

Approximate Scale: 1cm = 500m *Infra-red Aerial Photography: Provided by Department for Land, Water and Biodiversity Conservation, Mt. Gambier.*

## 16. Lake Hawdon South

<b>Hundred:</b>	Bray
<b>Section:</b>	177
<b>Tenure:</b>	Unallotted Crown Land (subject to annual grazing licences)
<b>Owner:</b>	Minister for Environment and Heritage
<b>Area total:</b>	3190 hectares
<b>Area habitat:</b>	3190 hectares
<b>Habitat type:</b>	Cutting Grass sedgeland in a mosaic of wet sedge/rush habitats
<b>Landform:</b>	Wetland basin
<b>Status:</b>	Not resolved

Lake Hawdon is currently the subject of an investigation by the Lake Hawdon Management Committee, established by the Minister for Environment and Heritage in 1999. This committee is in the process of producing a plan for the future management of both Lake Hawdon North and South.

### **Description:**

Lake Hawdon South is a large, brackish seasonal wetland that supports broad flats dominated by a variety of sedgeland and aquatic habitats. Cutting Grass and Thatching Grass, along with a variety of rushes and sedges are broadly present in this vast wetland basin.

### **Threatened species known to occur at the site:**

Common Name	Scientific Name	Australian Status	SA Status
Southern Emu Wren	<i>Stipiturus malachurus</i>	-	V
Glossy Grass Skink	<i>Pseudomoia rawlinsoni</i>	-	E

Other threatened species, birds in particular, have been recorded from Lake Hawdon but are outside the scope of species summarised and considered in this document. Lake Hawdon is also likely to support threatened butterfly species.

### **Project involvement at site:**

Site visit and assessment

### **Direct contact with owner made:**

Yes. National Parks and Wildlife SA and Crown Lands SA regional staff have current responsibility for the management of this land.

### **Recommendations:**

That this important wetland habitat is government land and retains features worthy of immediate protection and thus the land should be given high consideration for inclusion in the Reserve System.

### **Priority for further action:**

High

## 17. Coastal Soaks (between Robe and Nora Creina)

<b>Hundred:</b>	Waterhouse
<b>Section:</b>	94, 121, 333 & Filed Plan 214633, Allotments 113 & 114
<b>Tenure:</b>	Freehold
<b>Owner:</b>	Malcolm McDonald
<b>Section:</b>	138
<b>Tenure:</b>	Crown Leasehold
<b>Lessee:</b>	Malcolm McDonald
<b>Section:</b>	Deposited Plan 24258, Allotment 5
<b>Tenure:</b>	Freehold
<b>Owner:</b>	Allan & Helen Mercer
<b>Section:</b>	98, 317, 318 & 328
<b>Tenure:</b>	Freehold
<b>Owner:</b>	Malcolm, Raymond, David & Kevin Domaschenz & Dorothy Gibbs
<b>Section:</b>	Deposited Plan 31594, Allotment 1
<b>Tenure:</b>	Reserve
<b>Owner:</b>	Minister for Environment & Heritage

**Habitat type:** Fringing Silky Tea-tree shrubland  
**Landform:** Coastal Soaks (fed by seepage from the coastal dune range)

### Status:

The soaks in Little Dip Conservation Park (D31594, Allotment 1) and the Mercer property (D24258, Allotment 5) are protected, the latter being situated within a Heritage Agreement, administered under the *Native Vegetation Act 1991*. The other privately owned properties contain soaks that are either known to be grazed or their status is not clear.

The South Eastern Wetlands Committee (SEWC) Report of 1984 (pages 124, 125) indicates that protection of the swamp that is partly located on Section 138 has been the subject of negotiation before with the owner and it was recommended that this wetland remain in public ownership.

### Description:

The series of fresh-brackish soaks between Robe and Nora Creina support fringing Silky Tea-tree habitat and/or sedgeland and aquatic habitats. Some of the lakes included in this zone are: Freshwater Lake, Old Man Lake and Perch Hole in Little Dip Conservation Park, with Errington Hole, Dolly, German, Pud and several other lakes on private properties to the south.

### Threatened species known to occur at the site:

Common Name	Scientific Name	Australian Status	SA Status
Rufous Bristlebird	<i>Dasyornis broadbenti</i>	-	V
Southern Emu-wren	<i>Stipiturus malachurus</i>	-	V

The Ornithological Association of SA submission to the SEWC Report (1984 – pages 122, 123) stated that Lewin's Rails were found to be present and breeding in the fringing wetland vegetation around German Lake (Section 328). This swamp has continued to degrade without protection from grazing and, given its current condition, it is unlikely that species would still be present at the site.

***Project involvement at site:***

Some sites were visited and assessed.

***Direct contact with owner made:***

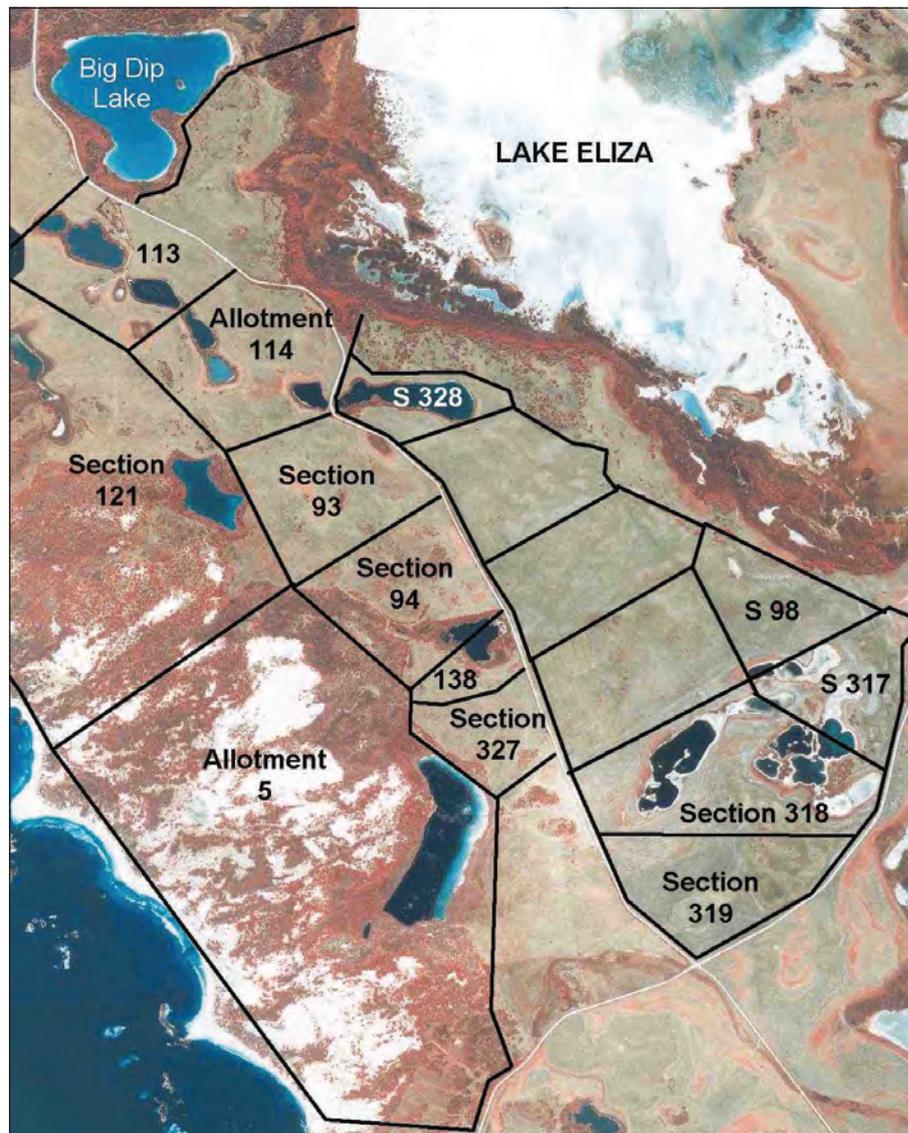
Some owners have been contacted.

***Recommendations:***

It should be considered a priority to assess the coastal soaks where status is unclear and discuss their protection and options for management with the respective property owners.

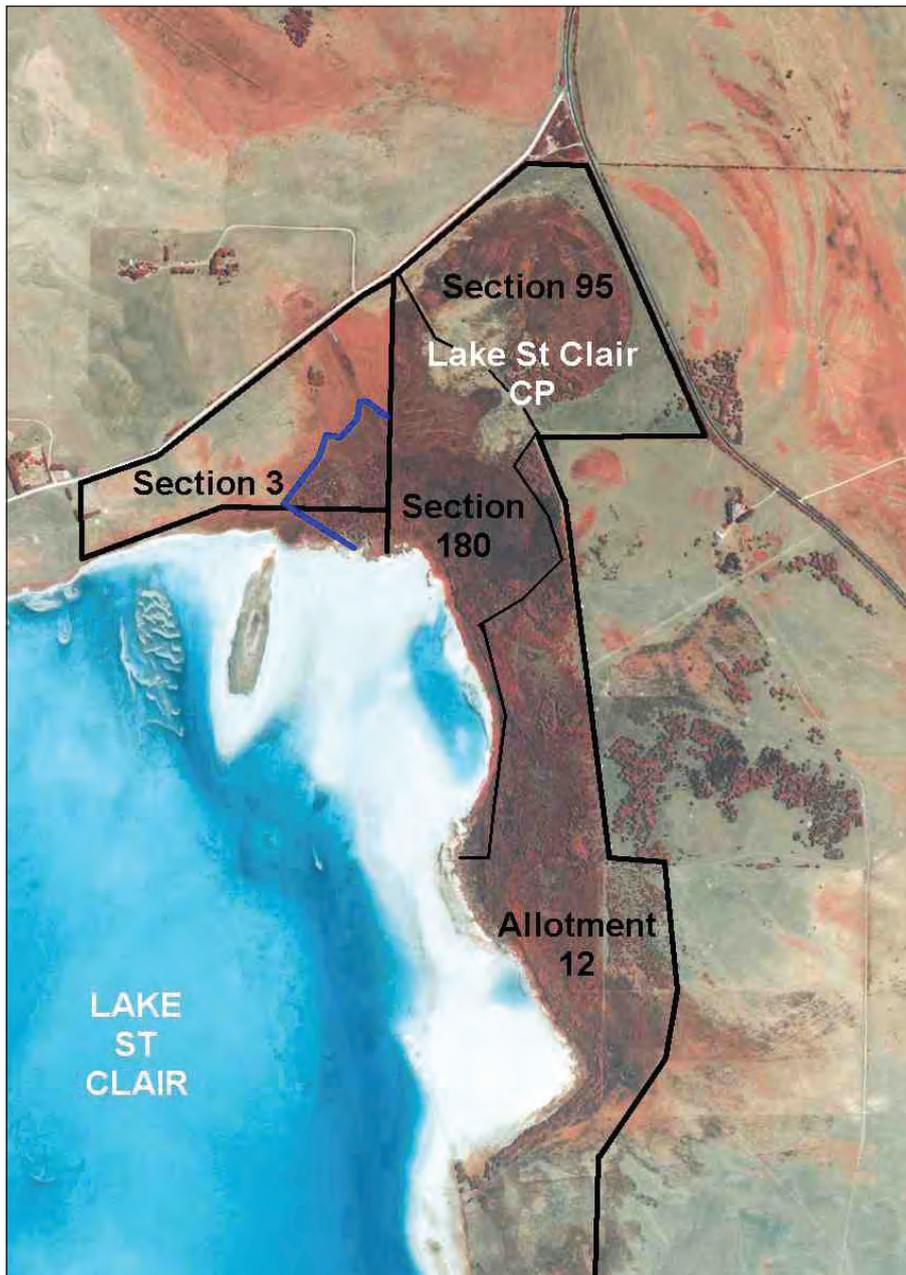
***Priority for further action:***

Medium



**Site 17: Coastal Soaks**

Approximate Scale: 1cm = 285m Infra-red Aerial Photography: Provided by Department for Land, Water and Biodiversity Conservation, Mt. Gambier.



**Site 18 & 19: Lake St Clair** - Blue line indicates area fenced with the assistance of the project.  
Approximate Scale: 1cm = 230m *Infra-red Aerial Photography: Provided by Department for Land, Water and Biodiversity Conservation, Mt. Gambier.*

## 18. Lake St Clair - McCourt

<b>Hundred:</b>	Waterhouse
<b>Section:</b>	3
<b>Tenure:</b>	Crown Leasehold
<b>Lessee:</b>	Fresall Pty. Ltd.
<b>Area total:</b>	113 hectares
<b>Area habitat:</b>	15 hectares
<b>Habitat type:</b>	Silky Tea-tree shrubland
<b>Landform:</b>	Fresh groundwater seepage into Lake St. Clair

**Status:** Fenced

This site was fenced in April 2000 after discussions with the owner Michael McCourt about the importance of the site. His company Woakwine donated the posts, while the Silky Tea-tree and Cutting Grass Wetland Rehabilitation Project supplied the fencing wire. Local National Parks and Wildlife SA staff (Don Mount and Roger Davidson) provided vital support in constructing the fence.

**Description:**

The area fenced consists of Silky Tea-tree shrubland and Cutting Grass sedgeland habitats where fresh seepage is dominant and in the salt impacted ground nearer the lake edge Swamp Paperbark (*Melaleuca halmaturorum*) woodland over a Thatching Grass understorey is present. An ecotone, a narrow zone where these habitats intermix, is also present.

**Threatened species known to occur at the site:**

Common Name	Scientific Name	Australian Status	SA Status
Swamp Antechinus	<i>Antechinus minimus</i>	-	E
Lewin's Rail	<i>Rallus pectoralis</i>	-	V
Rufous Bristlebird	<i>Dasyornis broadbenti</i>	-	V
Southern Emu-wren	<i>Stipiturus malachurus</i>	-	V
Glossy Grass Skink	<i>Pseudomoia rawlinsoni</i>	-	E
White-banded Grass-dart	<i>Taractrocera papyria</i>	-	R
Common Dusky Blue	<i>Erina hyacinthina</i>	-	R

**Project involvement at site:**

Site visit and assessment. Contributed materials to the fence that now protects the area from grazing. This site is surveyed annually as part of the project monitoring program.

**Direct contact with owner made:**

Yes. The owner will continue to manage the area for conservation

**Recommendations:**

That future consideration be given to extending the fenced area to protect the lake fringe from grazing and to allow the regeneration of habitat along this strip.

**Priority for further action:**

Low-medium

## 19. Lake St. Clair (Conservation Park)

<b>Hundred:</b>	Bray
<b>Section:</b>	95, 180, Deposited Plan 58109, Allotment 12
<b>Tenure:</b>	Reserve
<b>Owner:</b>	Minister for Environment and Heritage
<b>Area total:</b>	130 hectares
<b>Area habitat:</b>	50 hectares (previously ungrazed)
<b>Habitat type:</b>	Silky Tea-tree shrubland
<b>Landform:</b>	Fresh groundwater seepage into Lake St. Clair
<b>Status:</b>	Protected Area

Awaiting dedication as a Conservation Park under the *National Parks and Wildlife Act 1972*.

### **Description:**

After a protracted period of investigation by National Parks and Wildlife SA, Sections 95 & 180 were finally purchased by the government for inclusion in the Reserve System in mid 2000. The previous owner Peter Falkner had managed part of the land for conservation, restricting stock access to the remnant vegetation on the property that was adjacent to Lake St Clair. Allotment 12 was added to the area for conservation in late 2001.

This land contains a significant area and mixture of wetland vegetation types, grading between Short-leaf Honey-myrtle, Silky Tea-tree and Swamp Paperbark wet heath habitats. The property includes a high quality area that has never been grazed adjacent to Lake St Clair (Section 180), and another degraded, but rapidly regenerating swamp (Section 95).

The never grazed area of Silky Tea-tree habitat is home to a population of Swamp Antechinus that is being monitored on an ongoing basis.

### **Threatened species known to occur at the site:**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Australian Status</b>	<b>SA Status</b>
Swamp Antechinus	<i>Antechinus minimus</i>	-	E
Lewin's Rail	<i>Rallus pectoralis</i>	-	V
Rufous Bristlebird	<i>Dasyornis broadbenti</i>	-	V
Southern Emu Wren	<i>Stipiturus malachurus</i>	-	V
Glossy Grass Skink	<i>Pseudomoia rawlinsoni</i>	-	E
White-banded Grass-dart	<i>Taractrocera papyria</i>	-	R
Common Dusky Blue	<i>Erina hyacinthina</i>	-	R

### **Project involvement at site:**

Site visit and assessments. Provided information to NPWSA to assist with the case for the purchase of this land for addition to the State Reserve System. This site is surveyed annually as a control site in the project monitoring program.

***Direct contact with owner made:***

Yes. Both the previous owners and local National Parks and Wildlife SA staff. The entire property is now being managed to protect remnant habitat and encourage natural regeneration.

***Recommendations:***

That blocks be placed in a shallow drain that takes surface water away from part of Section 180 into Lake St Clair to restore the natural hydrology of the area. The longer the ground in this formerly grazed area remains wet, the faster the wetland habitat will naturally regenerate.

***Priority for further action:***

Low

## **20. Lake George - McCourt**

<b><i>Hundred:</i></b>	Lake George
<b><i>Section:</i></b>	Deposited Plan 42965, Allotment 2
<b><i>Tenure:</i></b>	Crown Leasehold
<b><i>Owner:</i></b>	Michael McCourt
<b><i>Area total:</i></b>	not available
<b><i>Area habitat:</i></b>	10 hectares
<b><i>Habitat type:</i></b>	Silky Tea-tree shrubland
<b><i>Landform:</i></b>	Spring-fed (from the base of the Woakwine Range)
<b><i>Status:</i></b>	Fenced

While this area has been fenced by the owner since mid 2001, stock are occasionally driven through for access reasons.

***Description:***

This small area of Silky Tea-tree habitat, with an overstorey equally dominated by Tree Everlasting (*Ozothamnus ferrugineus*), is highly isolated but retains important biodiversity values. The Southern Emu-wren has been consistently observed at the site and it is also likely to provide an important stepping stone in the local environment.

***Threatened species known to occur at the site:***

<b>Common Name</b>	<b>Scientific Name</b>	<b>Australian Status</b>	<b>SA Status</b>
Southern Emu-wren	<i>Stipiturus malachurus</i>	-	V

***Project involvement at site:***

This site is surveyed annually as part of the project monitoring program.

***Direct contact with owner made:***

Yes. Discussions with the owner Michael McCourt led to his company voluntarily fencing this area off from continuous grazing pressure.

***Recommendations:***

That stock access to the site be minimised to allow natural regeneration and prevent disturbance of the boggy peat soil.

***Priority for further action:***

Low



**Site 20: Lake George** - White line indicates approximate area of remnant Silky Tea-tree habitat.  
Blue line indicates fencing completed by owner to protect the area.  
Approximate Scale: 1cm = 133m *Infra-red Aerial Photography: Provided by Department for Land, Water and Biodiversity Conservation, Mt. Gambier.*

## 21. Woakwine Range - 'Burks Island'

<b>Hundred:</b>	Symon
<b>Section:</b>	180
<b>Hundred:</b>	Rivoli Bay
<b>Section:</b>	352, 353, 354 & 355
<b>Tenure:</b>	Freehold
<b>Owner:</b>	Kevin & Toni McGrath
<b>Area total:</b>	1609 hectares
<b>Area habitat:</b>	30-40 hectares
<b>Habitat type:</b>	Silky Tea-tree
<b>Landform:</b>	Spring-fed (from the base of the Woakwine Range) and wet interdunal flat
<b>Status:</b>	Under threat

There are several areas of habitat across this property, in various states of degradation as a result of past clearance, drainage and ongoing grazing.

### **Description:**

Only the spring-fed remnants at the base of the Woakwine Range have been inspected on this property. These retain very good species diversity and do not appear to have suffered severely from reduced spring flow. This extra moisture (which is lacking from many other sites) has afforded the area increased protection from grazing stock, which are unable to penetrate far into the habitat when the peat soil is wet.

The spring-fed habitat at the site has a tall Silky Tea-tree overstorey and an understorey dominated by Cutting Grass and Tall Saw-sedge. The site has been inspected twice as the habitat provides conditions that superficially appear suitable for the Swamp Greenhood, but so far this species has not been detected.

On the wet flats (nearer the coast) where habitat remnants also occur, the vegetation appears from a distance to be more stunted and mixed in composition. It is likely that these areas are more brackish, dry for longer periods and as a result are probably more severely degraded by grazing, but they need to be inspected and surveyed to establish their potential value and priority for protection.

### **Threatened species known to occur at the site:**

Nil. However the habitat present at the site is likely to support threatened bird and butterfly populations.

### **Project involvement at site:**

Site visit and assessment.

### **Direct contact with owner made:**

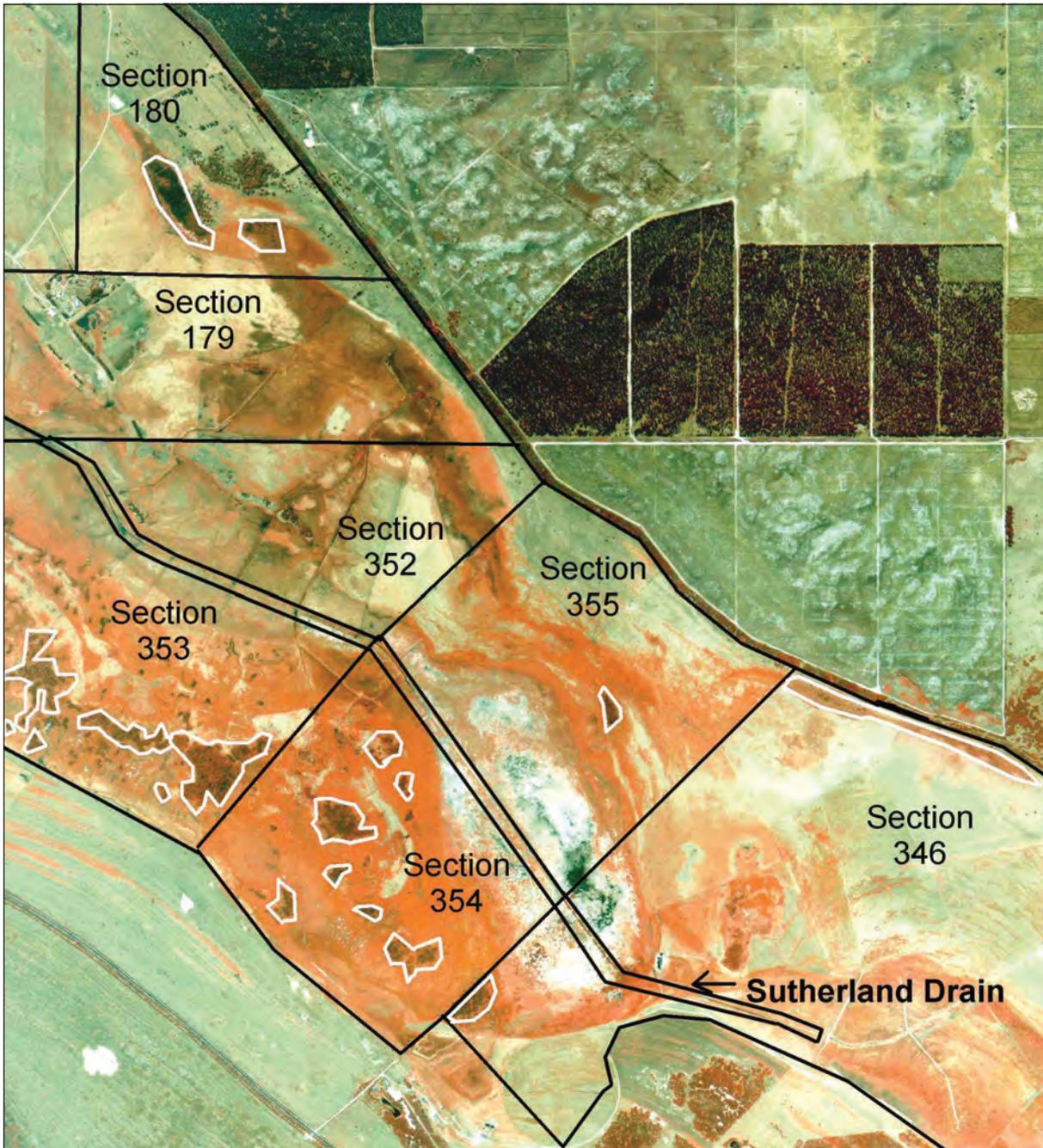
Yes. The owner indicated that they would consider wetland habitat protection in the future but were currently not ready to commit to this.

**Recommendations:**

Contact is maintained with the owner and they be actively encouraged to protect the most significant areas of remnant Silky Tea-tree habitat on the property.

**Priority for further action:**

High



**Site 21 & 22: Woakwine Range Springs** - White line indicates approximate area of remnant Silky Tea-tree habitat.  
Approximate Scale: 1cm = 333m Infra-red Aerial Photography: Provided by Department for Land, Water and Biodiversity Conservation, Mt. Gambier.

## 22. Woakwine Range - 'Iluka'

<b>Hundred:</b>	Rivoli Bay
<b>Section:</b>	346
<b>Tenure:</b>	Freehold
<b>Owner:</b>	Ian Spehr
<b>Area total:</b>	712 hectares
<b>Area habitat:</b>	5-10 hectares
<b>Habitat type:</b>	Silky Tea-tree shrubland
<b>Landform:</b>	Spring-fed (from the base of the Woakwine Range)
<b>Status:</b>	Under threat

Highly degraded as a result of drainage, clearance and grazing, the narrow strip spring-fed remnant habitat on this property is in need of urgent protection or it will be lost. There also appears to be a small remnant area of habitat on the flats that is also likely to be highly degraded.

### **Description:**

This area of remnant Silky Tea-tree shrubland is suffering badly from the effects of grazing and its small size. However, the degraded vegetation that remains would still have the capacity to recover quite quickly if it were protected and there is still a good variety of wetland species present at the site.

### **Threatened species known to occur at the site:**

Nil.

### **Project involvement at site:**

Site visit and assessment

### **Direct contact with owner made:**

No

### **Recommendations:**

That the owner be approached about protecting this remnant area before it is lost entirely

### **Priority for further action:**

Medium-High

## 23. Belt Range Springs - Hatherleigh Parklands

<b>Hundred:</b>	Mount Muirhead
<b>Section:</b>	997, 998 & 999
<b>Tenure:</b>	Reserve
<b>Owner:</b>	Wattle Range Council
<b>Area total:</b>	40 hectares
<b>Area habitat:</b>	not available
<b>Habitat type:</b>	Silky Tea-tree shrubland
<b>Landform:</b>	Spring-fed (from the base of the Belt Range)
<b>Status:</b>	Party under threat / Section 999 now fenced

The land is dedicated as Parkland Reserve but is and/or has been subjected to farming by neighbouring landholders, apparently without formal lease arrangements being in place.

Section 999 was recently fenced on the correct boundary and the South East regional Bush Management Adviser, Bryan Haywood, is assisting Wattle Range Council with its future management conservation.

### **Description:**

These very small and degraded remnant areas of Silky Tea-tree and Cutting Grass habitat are situated on either side of the Belt Range. They are degraded by drainage and grazing but as public land should be managed in the public interest for conservation.

### **Threatened species known to occur at the site:**

Nil.

### **Project involvement at site:**

Site visit and assessment.

### **Direct contact with owner made:**

Yes. Negotiations with Wattle Range Council staff, over the protection of these lands from grazing by neighbouring landholders, have been positive with an initial result of protection/rehabilitation of Section 999..

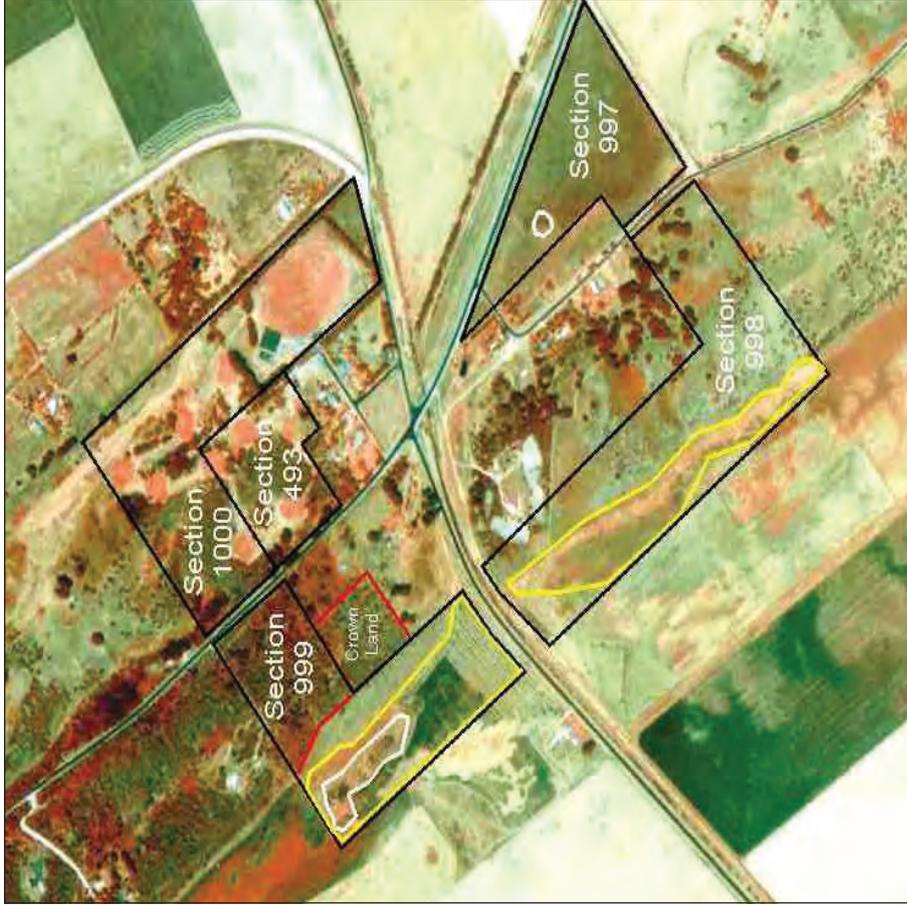
### **Recommendations:**

That support be provided to Wattle Range Council until the remnant areas indicated area adequately protected.

That, in the longer term, Wattle Range Council is encouraged to undertake broader restoration of the wetland habitat across the Parklands.

### **Priority for further action:**

Medium-High



**Site 23: Belt Range Springs** - White line indicates approximate area of remnant Silky Tea-tree habitat. Yellow line indicates former Silky Tea-tree swamp worthy of rehabilitation. Red line indicates Crown Land already fenced off from grazing.

Approximate Scale: 1cm = 133m Intra-red Aerial Photography: Provided by Department for Land, Water and Biodiversity Conservation, Mt. Gambier.

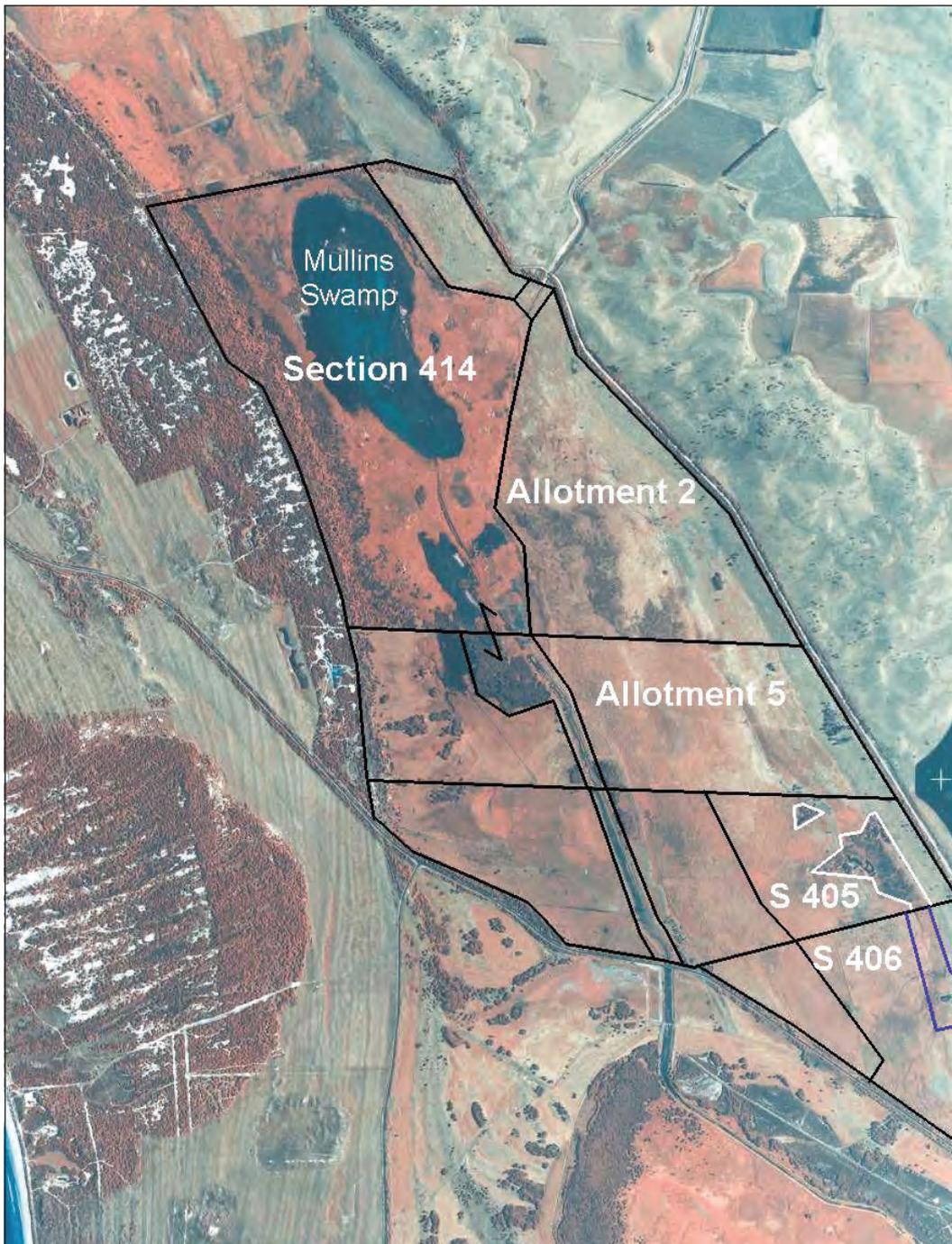


**Site 23: Section 999** - Looking north over Section 999 from the Hatherleigh-Rendelsham Road, winter 2000 (above).

**Site 23 Section 999** - Looking south over the wetland portion of Section 999, including remnant Silky Tea-tree habitat, from the northern boundary, winter 2000 (below).

Photographs: Mark Bachmann





Site 24 & 25: White line indicates approximate area of private remnant Silky Tea-tree habitat.  
 Blue line indicates are being fenced to allow Silky Tea-tree habitat rehabilitation.  
 Approximate Scale: 1cm = 300m Infra-red Aerial Photography: Provided by Department for Land, Water and Biodiversity Conservation, Mt. Gambier.

## 24. Mullins Swamp

<b>Hundred:</b>	Rivoli Bay
<b>Section:</b>	414
<b>Tenure:</b>	Reserve
<b>Owner:</b>	South Eastern Water Conservation and Drainage Board
<b>Area total:</b>	260 hectares
<b>Area habitat:</b>	Estimated 130 hectares of Silky Tea-tree shrubland, 150 hectares of Cutting Grass sedgeland in both Lake Frome and Mullins Swamp (SEWC 1983)
<b>Habitat type:</b>	Fringing Silky Tea-tree shrubland
<b>Landform:</b>	wetland basin

**Status:**

The land is a drainage reserve that is leased by John Mullins for grazing. The majority of the area is not currently grazed, with stock only having access to the eastern margin of Section 414, from Allotment 2. The impact of this ongoing grazing has not been assessed, but it is likely to be detrimental to the health and structure of the wetland vegetation within this portion of the site.

**Description:**

Important historic and descriptive information about Mullins Swamp is available in the SEWC Report (1984 – pages 132-137). In summary, the hydrology of the area that includes Mullins Swamp has been dramatically altered through drainage works. For example Mullins Swamp was created when a stop bank was constructed along the northern end of Section 414, interrupting the northerly flow of water towards Lake George. Water from Mullins Swamp now drains to the south after the construction of the Lake Frome drains, which terminate at an artificial outlet into Rivoli Bay at Southend. As a result of these changes Mullins Swamp itself is now a permanent body of water, fed primarily by continual flow down the Mt Hope Drain, which brings water from the flats behind the Woakwine Range. Important emergent wetland habitat, including fringing Cutting Grass Sedgeland and Silky Tea-tree shrubland are present at the site.

**Threatened species known to occur at the site:**

Common Name	Scientific Name	Australian Status	SA Status
Lewin's Rail	<i>Rallus pectoralis</i>	-	V

Although it has never been confirmed from the site, potential habitat for the Swamp Antechinus exists and this species is present in the nearby Lake Frome Basin.

**Project involvement at site:**

Nil.

**Direct contact with owner made:**

No.

**Recommendations:**

That although the present lessee appears to be managing the area sympathetically, it is clearly in the public interest for the current leasing arrangements of the land to be reviewed and the wetland area considered for more formal protection.

**Priority for further action:**

Medium

## 25. Woakwine Range Springs

<b>Hundred:</b>	Rivoli Bay
<b>Section:</b>	405
<b>Tenure:</b>	Freehold
<b>Owner:</b>	Vaughan Chambers
<b>Section:</b>	406
<b>Tenure:</b>	Freehold
<b>Owner:</b>	Robert & Mary Huppatz
<b>Area total:</b>	177 hectares
<b>Area habitat:</b>	20 hectares
<b>Habitat type:</b>	Silky Tea-tree shrubland
<b>Landform:</b>	Spring-fed (from the base of the Woakwine Range)
<b>Status:</b>	Fenced

The small area (10 hectares) of habitat on Section 406 is soon to be fenced by the owner an area of equivalent habitat on Section 405 appears to already be fenced but it is unclear whether it is occasionally grazed.

### **Description:**

These narrow strips of spring-fed habitat are similar in composition to those found along the Woakwine Range to the north. The structure and condition of the vegetation is less degraded on Section 405 than 406, probably as a result of a different grazing regime and history of management. Together these small areas provide a valuable representation of this vegetation type that would formerly have occurred in a virtually continuous strip along the base of the Woakwine Range.

### **Threatened species known to occur at the site:**

Nil. However the site has habitat suitable for threatened bird and butterfly species.

### **Project involvement at site:**

Site visit and assessment.

### **Direct contact with owner made:**

Yes. Mr Huppatz is fencing off his area of spring fed habitat and an area for re-habilitation with materials supplied by the project. Mr Chambers has not been contacted.

### **Recommendations:**

That the management of Section 405 be discussed with the owner to determine the level of its management for conservation.

### **Priority for further action:**

Low

## 26. Lake Frome Basin / Canunda (Conservation Park)

**Hundred:** Rivoli Bay  
**Section:** 410, 427 & Deposited Plan 34788 / Allotment 78  
**Tenure:** Reserve  
**Owner:** Minister for Environment and Heritage  
**Section:** 383  
**Tenure:** Crown Leasehold  
**Lessee:** Wattle Range Council  
**Area total:** 1400 hectares approx.  
**Area habitat:** Estimated 130 hectares of Silky Tea-tree shrubland, 150 hectares of Cutting Grass sedgeland in both Lake Frome and Mullins Swamp (SEWC 1983)  
**Habitat type:** Silky Tea-tree shrubland  
**Landform:** Seepage-fed (from the back of the coastal dune range)

**Status:** Protected

Sections 410 & 427 are part of Canunda National Park, dedicated under the *National Parks and Wildlife Act 1972*. Allotment 78 was recently declared Canunda Conservation Park under the *National Parks and Wildlife Act 1972*.

Section 383 is the present location for an effluent treatment plant for the township of Southend and is leased by Wattle Range Council. Given the conservation significance of the rest of this land it is unlikely that Crown Lands SA would allow further development on Section 383.

### **Description:**

This wetland basin contains a variety of habitats, but contains a significant expanse of Cutting Grass sedgeland and an extensive strip of Silky Tea-tree shrubland, which follows the base of the dune range to the south of Lake Frome. Lake Frome is one of the most significant wetland habitats remaining in the South East and is described in greater detail in SEWC (1983) and SEWC (1985 – pages 132-137).

### **Threatened species known to occur at the site:**

Common Name	Scientific Name	Australian Status	SA Status
Swamp Antechinus	<i>Antechinus minimus</i>	-	E
Rufous Bristlebird	<i>Dasyornis broadbenti</i>	-	V
Southern Emu-wren	<i>Stipiturus malachurus</i>	-	V
Lewin's Rail	<i>Rallus pectoralis</i>	-	V
Swordgrass Brown	<i>Tisiphone abeona</i>	-	V

Given the size and condition of this wetland basin is likely that further threatened species occur at the site.

### **Project involvement at site:**

Site visit and assessment

**Direct contact with owner made:**

Yes. Local National Parks and Wildlife SA staff manage the areas under the Ministers control. Wattle Range Council staff are responsible for Section 383 and have shown interest in improving awareness of this site's conservation value.

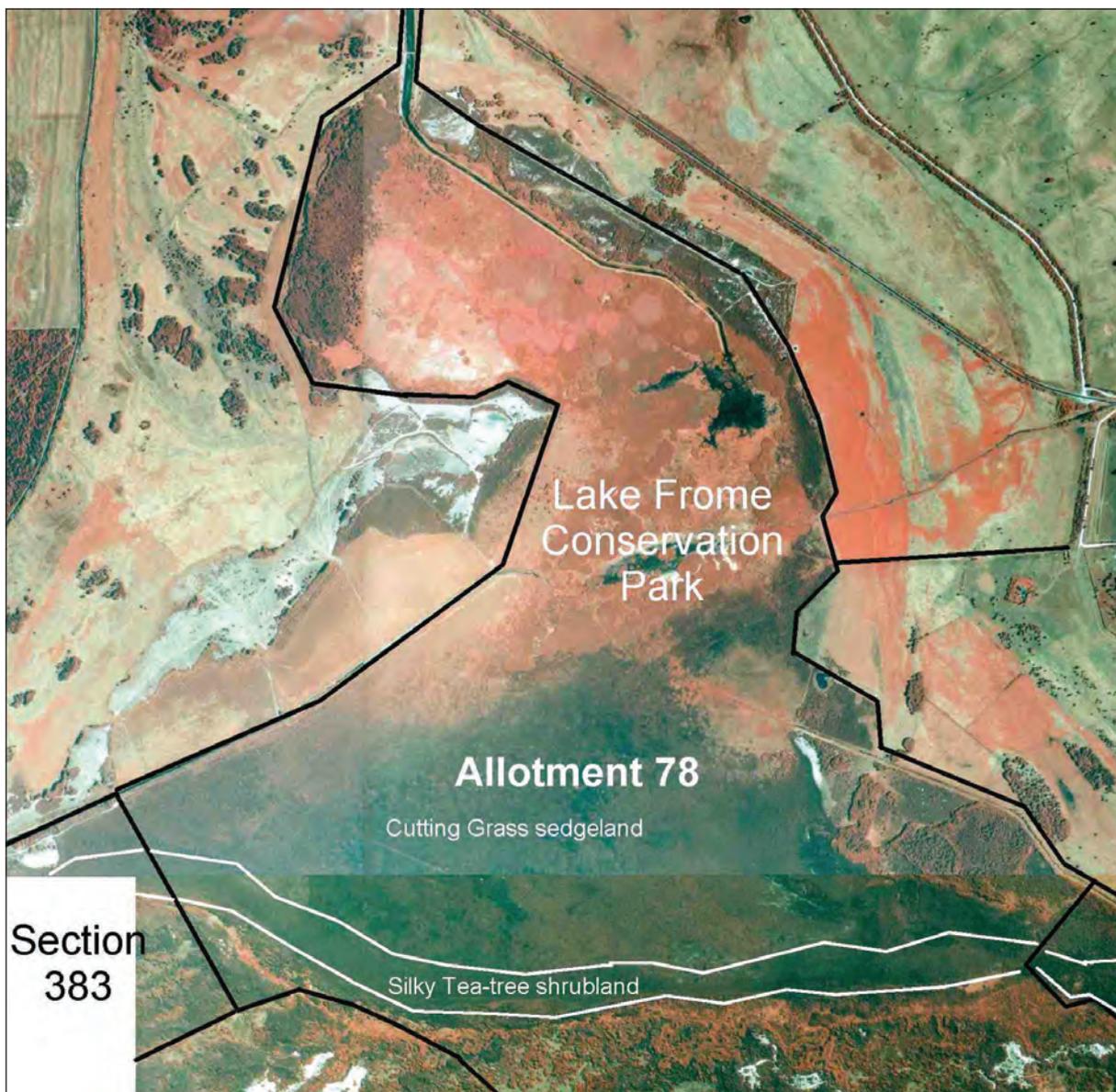
**Recommendations:**

That contact continue with Wattle Range Council staff to ensure the proactive management of Section 383 for conservation.

That Crown Lands SA staff are kept aware of the importance of Section 383 renewing / assessing future leasing arrangements for the area with Wattle Range Council.

**Priority for further action:**

Medium



**Site 26: Lake Frome** - White line indicates approximate area of remnant Silky Tea-tree habitat.  
Approximate Scale: 1cm = 266m Infra-red Aerial Photography: Provided by Department for Land, Water and Biodiversity Conservation, Mt. Gambier.

## 27. Canunda Flat North

<b>Hundred:</b>	Rivoli Bay
<b>Section:</b>	384
<b>Tenure:</b>	Crown Leasehold
<b>Lesee:</b>	Anthony & Cheryl Brennan
<b>Section:</b>	387
<b>Tenure:</b>	Crown Leasehold
<b>Lesee:</b>	Fred & Yvonne Ellis
<b>Area total:</b>	not available
<b>Area habitat:</b>	50 hectares (approx.)
<b>Habitat type:</b>	Silky Tea-tree shrubland grading into mixed woodland habitat
<b>Landform:</b>	Seepage-fed (from the coastal dune range) and on the Canunda Flats
<b>Status:</b>	Under threat

These areas are not fenced and appear to be grazed regularly.

### **Description:**

Section 384 is an undulating area that supports wet (Silky Tea-tree) and dry (woodland) habitats, and borders the eastern flank of Canunda National Park. There are also intervening areas of Cutting grass sedgeland.

While obviously impacted by grazing the area retains good structural and species diversity and would readily recover if protected. This mixture of habitats is rarely now seen in South Australia as a result of broadscale drainage and clearance, and the conservation of this area which lies immediately adjacent to the National Park should be considered a high priority.

Smaller portions of habitat in Section 387 also appear to be degraded but would greatly benefit from the exclusion of stock.

### **Threatened species known to occur at the site:**

Nil. However, it is highly probable that the Swamp Antechinus, Rufous Bristlebird, Southern Emu-wren and other threatened species are present at the site. A survey should be undertaken to establish its exact conservation value.

### **Project involvement at site:**

Site visit and assessment

### **Direct contact with owner made:**

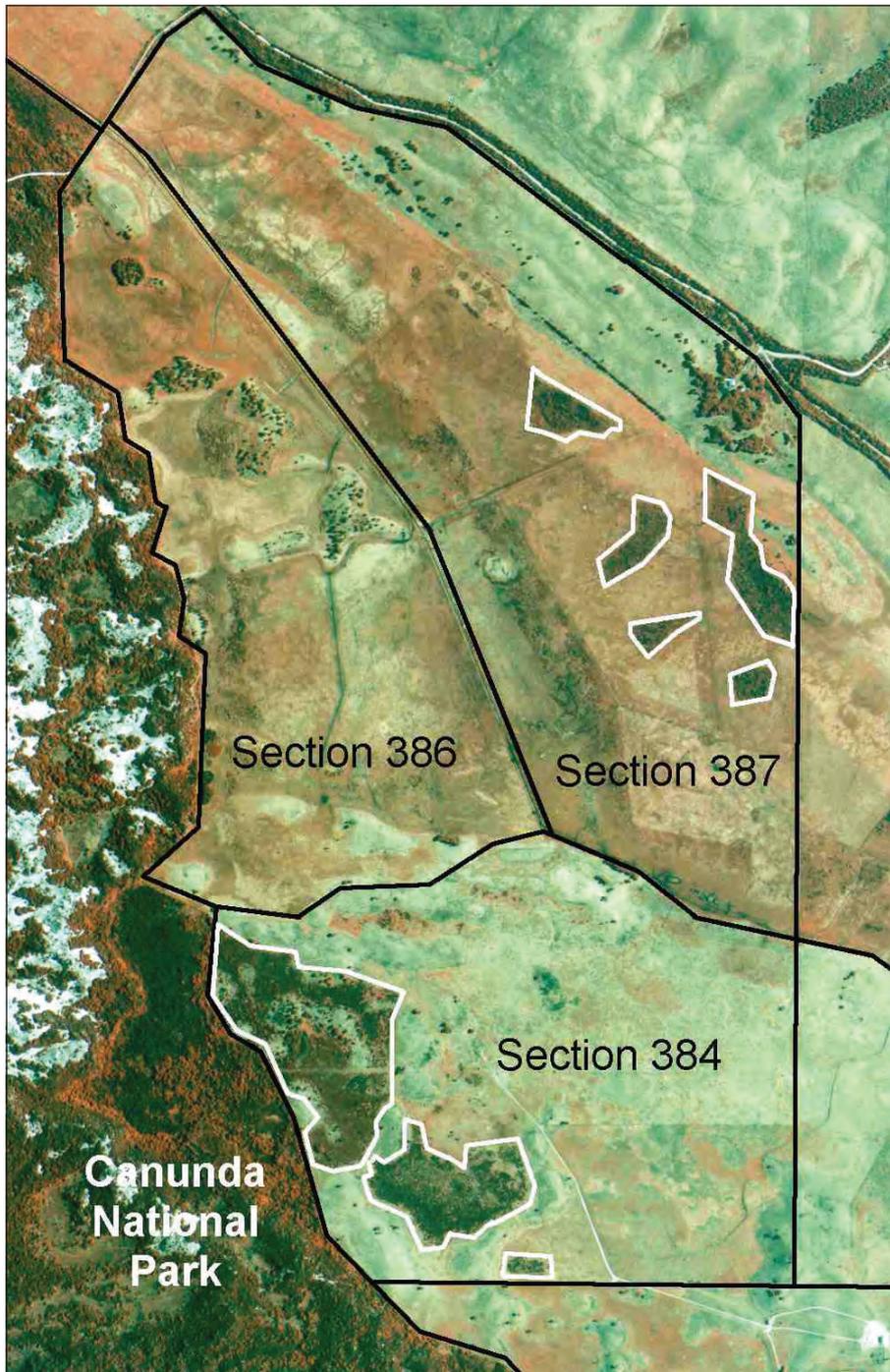
No

**Recommendations:**

That the owners be contacted and on-site meetings arranged to discuss management of the remnants. It would also be beneficial to conduct a survey at the sites to establish the presence of threatened species.

**Priority for further action:**

High



**Site 27: Canunda Flat North** - White line indicates approximate area of remnant Silky Tea-tree habitat.  
Approximate Scale: 1cm = 200m Infra-red Aerial Photography: Provided by Department for Land, Water and Biodiversity Conservation, Mt. Gambier.

## 28. Canunda Flat – ‘Spring Hill’

<b>Hundred:</b>	Mayurra
<b>Section:</b>	Deposited Plan 46299, Allotment 1
<b>Tenure:</b>	Crown Leasehold
<b>Lesee:</b>	Andrew and Karen Ellis
<b>Section:</b>	Deposited Plan 46299, Allotment 2
<b>Tenure:</b>	Freehold
<b>Owner:</b>	Fred Ellis
<b>Area total:</b>	588 hectares
<b>Area habitat:</b>	50 hectares (approx.)
<b>Habitat type:</b>	Silky Tea-tree
<b>Landform:</b>	Spring-fed / Wet inter-dunal flat
<b>Status:</b>	Fenced

The largest (around 35 hectares) and most important area of remnant wetland on these properties was fenced in 2000. Several smaller pockets of Silky Tea-tree shrubland remain open to summer grazing.

### **Description:**

The open wetland on this property was formerly bounded to the north-east by a Silky Tea-tree thicket hundreds of acres in size, before the area was made available for soldier re-settlement then drained and cleared. Pockets of habitat were initially left behind in the thicket to provide stock shelter and some of these (although small) remain reasonably intact. The larger wetland area is still inundated each winter but probably dries up more quickly than it would have prior to drainage. This large wetland area also retains a diverse mixture of significant wetland habitats that are rapidly regenerating as a result of the area having been protected from stock grazing.

### **Threatened species known to occur at the site:**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Australian Status</b>	<b>SA Status</b>
Southern Emu-wren	<i>Stipiturus malachurus</i>	-	V
Glossy Grass Skink	<i>Pseudomoia rawlinsoni</i>	-	E
Salamander Skink	<i>Nannoscincus maccoyi</i>	-	E
Swamp Skink	<i>Egernia coventryi</i>	-	E
Dwarf Galaxias	<i>Galaxiella pusilla</i>	V	P

The Swamp Antechinus has not been recorded from the property since the late 1970's when a dead male was found near a pocket of remnant Silky Tea-tree. Degradation of the remaining habitat since that time has probably led to the local disappearance of this species.

### **Project involvement at site:**

The fencing of the swamp areas so far protected, were completed by the owner with materials provided by the project. The large swamp is a site annually surveyed as part of the project monitoring program.

***Direct contact with owner made:***

Yes. The owner is conservation minded and has indicated a future interest in protecting some of the smaller pockets of Silky Tea-tree habitat scattered across the property.

***Recommendations:***

To continue to provide support to the owner when required to see the ongoing management of this area for conservation.

***Priority for further action:***

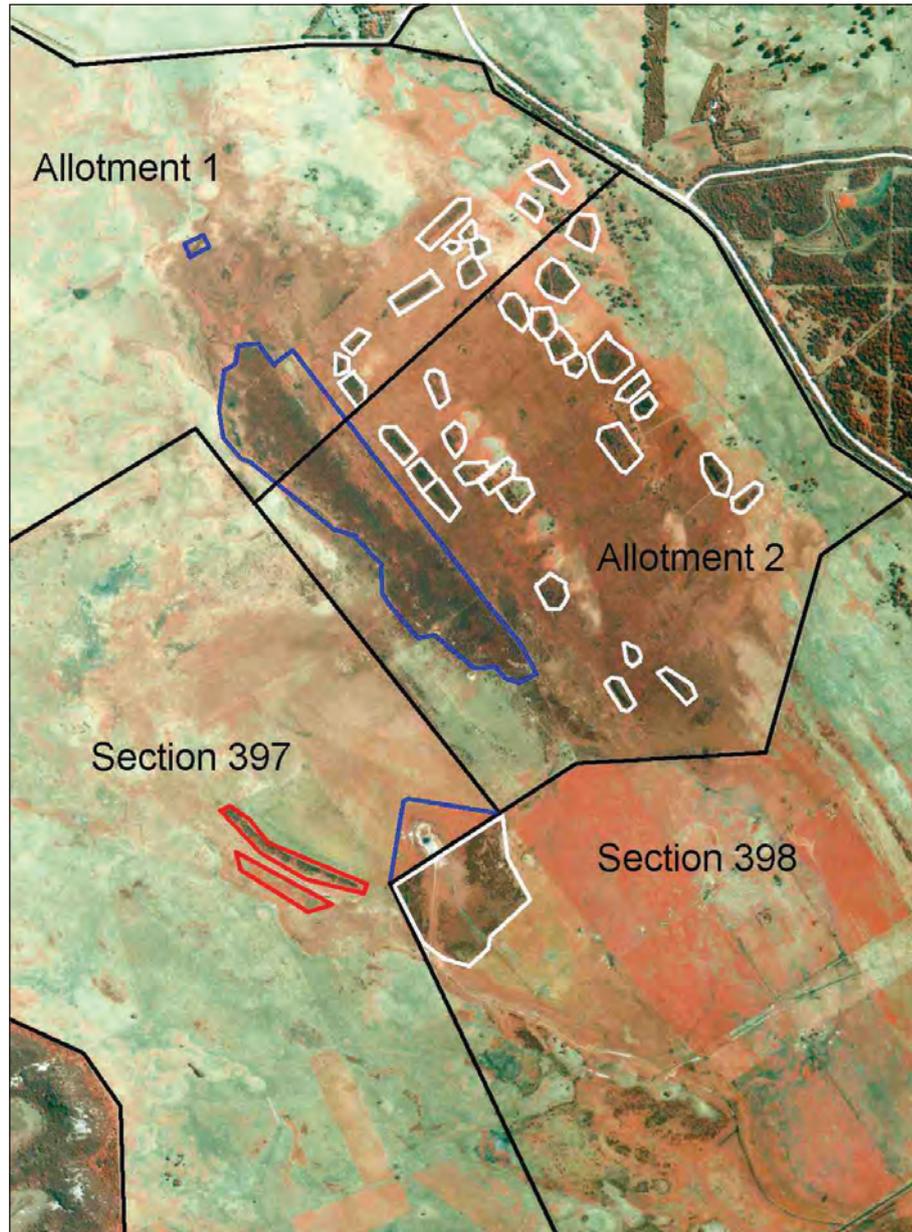
Low



**Site 28:** Andy Ellis standing in front of his protected wetland, fenced with materials provided by the project.  
*Photograph: Mark Bachmann*



**Site 28:** The protected wetland on the Ellis family properties.  
*Photograph: Mark Bachmann*



**Site 28 & 29: Canunda Flat** - White line indicates approximate area of grazed remnant Silky Tea-tree habitat.  
Blue line indicates area protected with assistance from the project.  
Red line indicates other habitat fenced previously by the owner.

Approximate Scale: 1cm = 220m *Infra-red Aerial Photography: Provided by Department for Land, Water and Biodiversity Conservation, Mt. Gambier.*

## 29. Canunda Flat – ‘Canunda Heights’

<b>Hundred:</b>	Mayurra
<b>Section:</b>	397
<b>Tenure:</b>	Crown Leasehold
<b>Lesse:</b>	Robin and Judith Watts
<b>Area total:</b>	500 hectares
<b>Area habitat:</b>	8 hectares
<b>Habitat type:</b>	Re-establishment of former mixed wetland habitat.
<b>Landform:</b>	Wet inter-dunal flat
<b>Status:</b>	Fenced

This site was recently fenced to allow natural regeneration of the wetland habitat. The neighbouring portion of the same swamp (Section 398) retains remnant vegetation that is expected to seed this area, but the owner of this site continues to graze this significant vegetation and is presently unwilling to see it fenced.

### *Description:*

This entirely denuded swamp is rapidly regenerating with small herbaceous wetland species and has resulted in a sharp increase in overall vegetative cover. No Silky Tea-tree or Cutting Grass habitat regeneration has yet been observed but the area is proving a valuable reference site for learning what may be expected to occur when a totally cleared swamp is de-stocked.



**Site 29:** Tim Watts and family stand before their regenerating wetland  
*Photograph: Mark Bachmann*

***Threatened species known to occur at the site:***

Nil. As the area regenerates with wetland habitat it is hoped/expected that threatened species will re-colonise from habitat on the neighbouring properties.

***Project involvement at site:***

The owner completed the fencing of the denuded swamp with materials provided by the project. This site is annually surveyed as part of the project monitoring program.

***Direct contact with owner made:***

Yes. They are committed to ongoing management of the swamp for conservation.

***Recommendations:***

That the site continue to be monitored for habitat and species recovery.  
That the owner continue to be supported with management of the area.

***Priority for further action:***

Low.

### **30. Begg's Swamp - Canunda National Park**

<b><i>Hundred:</i></b>	Mayurra
<b><i>Section:</i></b>	157
<b><i>Tenure:</i></b>	Reserve
<b><i>Owner:</i></b>	Minister for Environment and Heritage
<b><i>Area total:</i></b>	5160 hectares
<b><i>Area habitat:</i></b>	50 hectares
<b><i>Habitat type:</i></b>	Silky Tea-tree shrubland / Cutting Grass sedgeland
<b><i>Landform:</i></b>	Seepage-fed (from the dune range)

***Status:*** Protected Area

Canunda National Park is dedicated under the *National Parks and Wildlife Act 1972*.

***Description:***

Begg's Swamp is a depression fed by seepage from the adjacent dune range and supports areas of Silky Tea-tree and Cutting Grass habitat. The swamp is likely to be much drier now than before Lake Bonney was drained in 1958.

There are opportunistic records of both the Swamp Antechinus and Rufous Bristlebird from this swamp in the mid-late 1990's.

**Threatened species known to occur at the site:**

Common Name	Scientific Name	Australian Status	SA Status
Swamp Antechinus	<i>Antechinus minimus</i>	-	E
Swamp Skink	<i>Egernia coventryi</i>	-	E
Rufous Bristlebird	<i>Dasyornis broadbenti</i>	-	V

**Project involvement at site:**

Site visit and assessment

**Direct contact with owner made:**

Yes. Local National Parks and Wildlife SA staff manage the National Park.

**Recommendations:**

None.

**Priority for further action:**

Low.



**Site 30: Begg's Swamp** - White line indicates approximate area of remnant Silky Tea-tree habitat.  
Approximate Scale: 1cm = 266m Infra-red Aerial Photography: Provided by Department for Land, Water and Biodiversity Conservation, Mt. Gambier.

### 31. Woakwine Range Springs / Lake Bonney

<b>Hundred:</b>	Mayurra
<b>Section:</b>	Sections along the western flank of Lake Bonney
<b>Owner:</b>	Various owners
<b>Area total:</b>	not available
<b>Area habitat:</b>	not available
<b>Habitat type:</b>	Silky Tea-tree shrubland / Cutting Grass sedgeland
<b>Landform:</b>	Spring-fed (from the base of the Woakwine Range)
<b>Status:</b>	Under threat

There are several remnant areas of wetland habitat along the western flank of Lake Bonney worthy of protection. Currently only some sections of lake frontage where Silky Tea-tree and Cutting Grass are regenerating have been fenced and de-stocked.

The Department for Environment and Heritage is currently negotiating with landowners along this strip to allow the lake frontage to be fenced from grazing, however the spring-fed sites nearer the range lie entirely within private property and remain under threat. Lake Bonney and its shoreline is Unallotted Crown Land, and managed by the Department for Environment and Heritage.

**Description:**

For a detailed description of the biodiversity values of Lake Bonney see Bachmann (2002).

There is habitat regenerating within the former lake bed, which is quite mixed in composition as a result of the brackish conditions but includes Silky Tea-tree and Cutting Grass and is providing important habitat for species such as the Southern Emu Wren.

The remnant spring-fed habitat along the Woakwine Range consists of a more typical fresh Silky Tea-tree shrubland formation, but in most cases is highly degraded by grazing.

**Threatened species known to occur at the site:**

Common Name	Scientific Name	Australian Status	SA Status
Southern Emu-wren	<i>Stipiturus malachurus</i>	-	V

**Project involvement at site:**

Site visit and assessment

**Direct contact with owner made:**

No.

**Recommendations:**

That the current program undertaken by DEH be continued to prevent stock grazing of the lake frontage.

That private landholders be encouraged to consider protection of remnant spring-fed habitats along the eastern flank of Lake Bonney.

***Priority for further action:***

Medium

## **32. Mount Burr Range Springs - Snuggery**

<b><i>Hundred:</i></b>	Hindmarsh
<b><i>Section:</i></b>	345W & Filed Plan 215382, Allotment 101
<b><i>Tenure:</i></b>	Freehold
<b><i>Owner:</i></b>	John Facey
<b><i>Area total:</i></b>	105 hectares
<b><i>Area habitat:</i></b>	35 hectares
<b><i>Habitat type:</i></b>	Mixed woodland/wetland communities including Silky Tea-tree shrubland
<b><i>Landform:</i></b>	Spring-fed (from the base of the Mt Burr Range)

***Status:*** Under threat

A swathe of vegetation was cleared around the boundary of this property after its ownership changed in mid 2000, including a stand of Silky Tea-tree shrubland, for the construction of a boundary fence. This fence has enabled new areas of remnant vegetation on the property to be degraded by grazing stock. The owner is apparently unwilling to manage the remnant vegetation on the property for conservation.

Past drainage of the adjacent Millicent flats and the present significant level of extraction of groundwater nearby at Snuggery by Kimberly Clarke appear to have reduced the discharge of spring flow, with dry peat soil observed at the site in winter 2000. The rate of habitat degradation is likely to be swift with stock grazing and wetland habitat's reduced ability to persist in drier conditions.

***Description:***

Habitats at the site range from Messmate (*Eucalyptus obliqua*), Rough-barked Manna-gum (*E. viminalis*) and Swamp Gum (*E. ovata*) woodlands to Scented Paperbark (*Melaleuca squarrosa*), Silky Tea-tree and Cutting Grass wetland habitats. The Scented Paperbark habitat formation in particular is poorly conserved in South Australia and very rarely seen on private property.

The wetland habitats on the site were notably dry and it is unlikely that they will be able to tolerate an ongoing grazing regime without sever degradation.

***Threatened species known to occur at the site:***

Nil. The site provides potential habitat for threatened bird and butterfly species.

***Project involvement at site:***

Site visit and assessment

***Direct contact with owner made:***

No

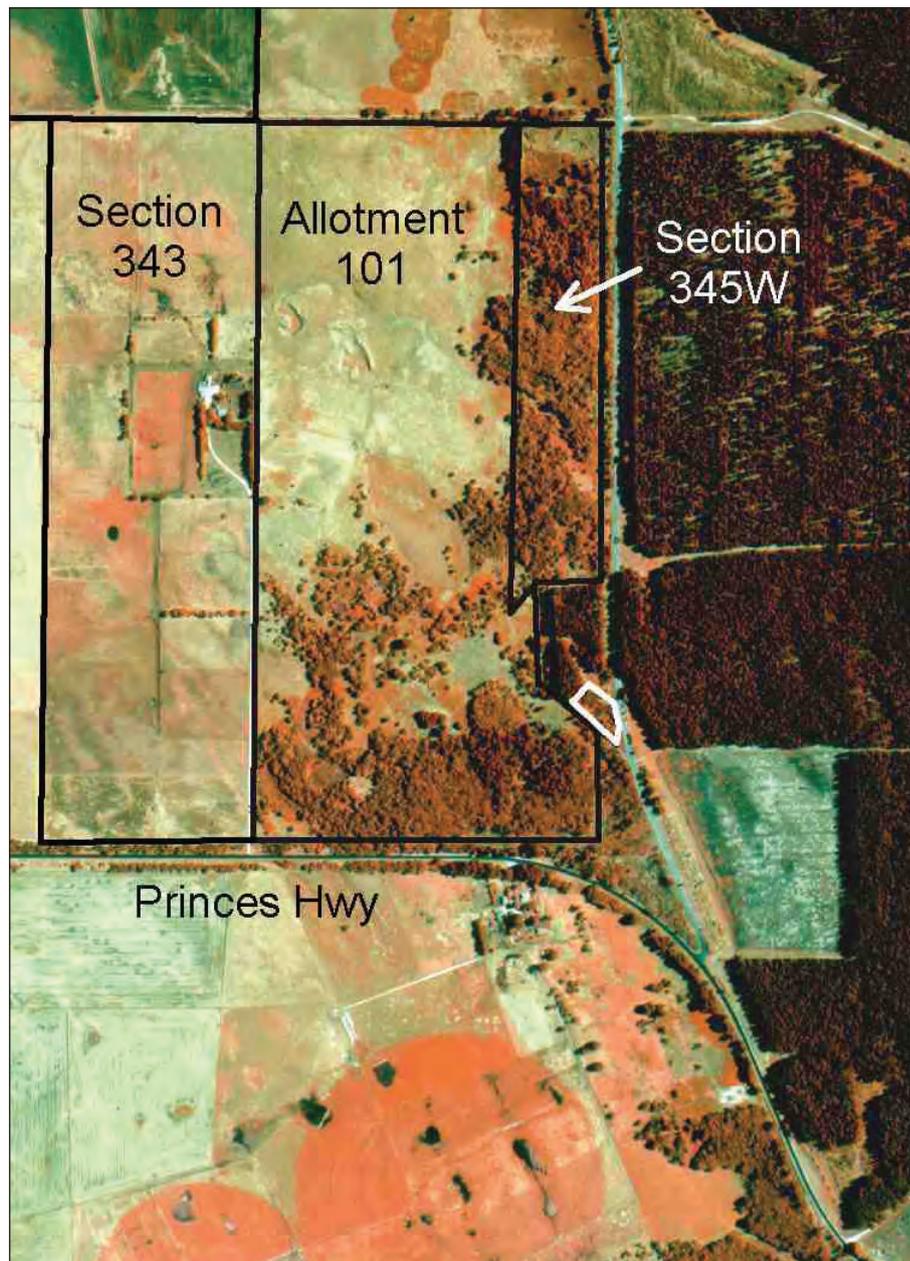
***Recommendations:***

That the owner be encouraged to more appropriately manage the remnant vegetation on the property.

That alleged recent breaches of the *Native Vegetation Act 1991* be investigated.

***Priority for further action:***

Medium-high



**Site 32: Mount Burr Bange Springs** - White line indicates remnant Silky Tea-tree habitat on the road reserve.  
Approximate Scale: 1cm = 230m Infra-red Aerial Photography: Provided by Department for Land, Water and Biodiversity Conservation, Mt. Gambier.

### 33. Benara/German Creek

<b>Hundred:</b>	Benara
<b>Section:</b>	378
<b>Tenure:</b>	Crown Leasehold
<b>Owner:</b>	Green Triangle Forest Products Ltd.
<b>Section:</b>	379, 380, 382
<b>Tenure:</b>	Freehold
<b>Owner:</b>	Kevin Bowering
<b>Section:</b>	441
<b>Tenure:</b>	Crown Leasehold
<b>Lessee:</b>	Michael & Julie Ridge
<b>Section:</b>	82
<b>Tenure:</b>	Freehold
<b>Owner:</b>	Justin & Quentin Ridge
<b>Area total:</b>	not available
<b>Area habitat:</b>	not available
<b>Habitat type:</b>	Silky Tea-tree shrubland
<b>Landform:</b>	Creepline

#### ***Status and Description:***

The creepline in Section 378 is not currently under threat, being surrounded by mature pine plantation that is not grazed. The quality of the remnant vegetation varies along this section of creepline but essentially retains a semi-continuous canopy of Silky Tea-tree.

Sections 379, 380 and 382 contain the most degraded section of creepline, where a section of drain appears to have been excavated through a swampy depression on Tommy Dodd Flat. This section of the creek would require de-stocking and rehabilitation works.

Section 441 contains the most intact section of Benara Creek but is heavily impacted by stock grazing, which has all but removed most of the understorey vegetation. A very tall formation of Silky Tea-tree is conserved along this section of creepline and the habitat in general would rapidly recover if it were fenced off from grazing.

Section 82 also contains some Silky Tea-tree and Cutting Grass habitat associated with fresh water seepage into Lake Bonney. Although degraded by grazing this area would rapidly regenerate if protected.

Creepline Silky Tea-tree habitat is naturally rare in the South East as a result of the region's geomorphology and as such the preservation of all creepline habitats, even those in a semi-natural or degraded state, should be considered a high priority.

#### ***Threatened species known to occur at the site:***

Nil. However the area provides habitat suitable for a variety of threatened species

***Project involvement at site:***

Site visit and assessment

***Direct contact with owner made:***

No.

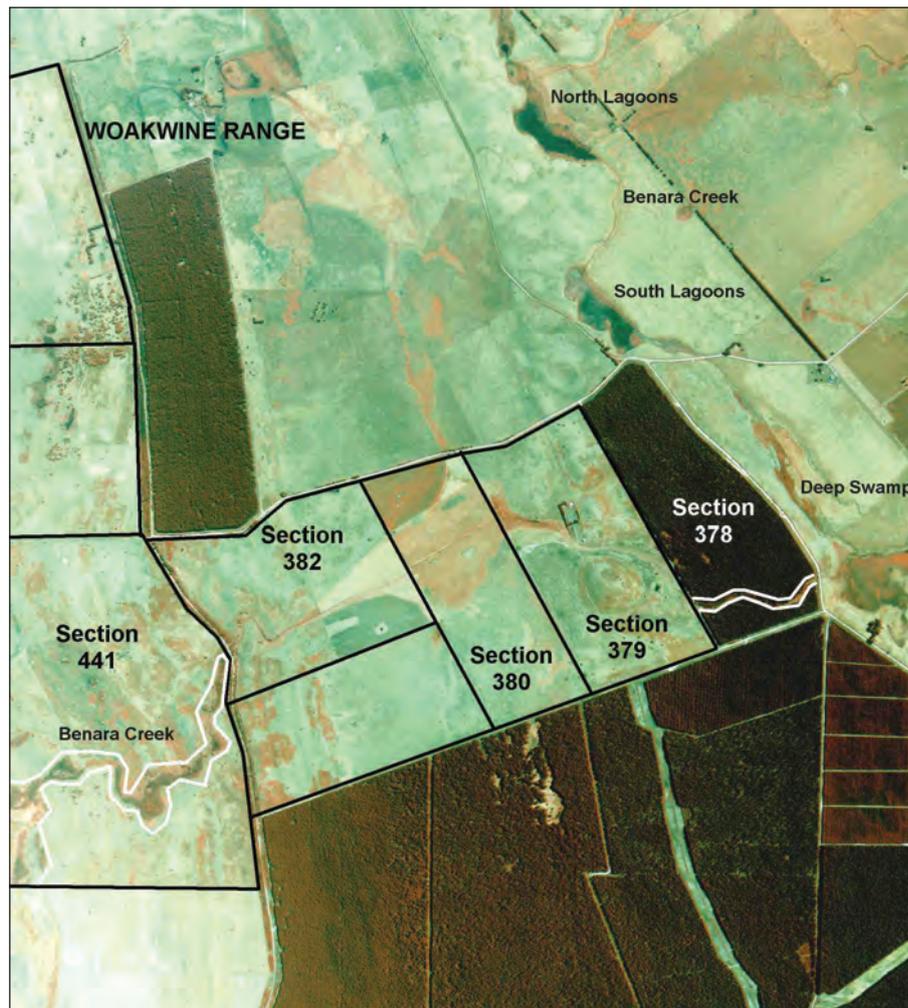
***Recommendations:***

That each of the respective owners be contacted and approached about co-operatively managing Benara Creek for conservation.

That the owner of Section 441 be advised in particular the importance of the section of creek on that property.

***Priority for further action:***

High



**Site 33: Benara Creek** - White line indicates areas of remnant Silky Tea-tree habitat.  
Approximate Scale: 1cm = 400m Infra-red Aerial Photography: Provided by Department for Land, Water and Biodiversity Conservation, Mt. Gambier.

## 34. Green Swamp

<b>Hundred:</b>	Kongorong
<b>Section:</b>	634
<b>Tenure:</b>	Unallotted Crown Land
<b>Owner:</b>	Minister for Environment and Heritage
<b>Section:</b>	750
<b>Tenure:</b>	Crown Leasehold
<b>Owner:</b>	David McEachern
<b>Area total:</b>	682 hectares
<b>Area habitat:</b>	15 hectares (approx.)
<b>Habitat type:</b>	Silky Tea-tree shrubland / Cutting Grass sedgeland
<b>Landform:</b>	Seepage-fed swamp

**Status:** Degraded and under ongoing threat

A portion of Lake Bonney foreshore land (owned by the Crown) that forms part of the former Green Swamp still retains wetland habitat but is being degraded by neighbouring land use for grazing.

### **Description:**

The drainage of Lake Bonney in 1958 subsequently sped up annual drying of many of the fresh seasonal wetlands that lay adjacent to this body of water. One of those areas affected was Green Swamp, a fresh wetland near the southern end of Lake Bonney, that was almost entirely subsequently cleared. A small area of the remnant Silky Tea-tree and Cutting Grass vegetation of this swamp remains in Section 634, but has been fenced into the neighbouring property and has allowed for its gradual degradation.

### **Threatened species known to occur at the site:**

Nil. Habitat at this site is likely to support the Southern Emu Wren.

### **Project involvement at site:**

Site visit and assessment.

### **Direct contact with owner made:**

Yes. Crown Lands SA and National Parks and Wildlife SA regional staff are investigating options to allow for the fencing of Section 634 along a surveyed boundary to enable the recovery of degraded wetland habitat.

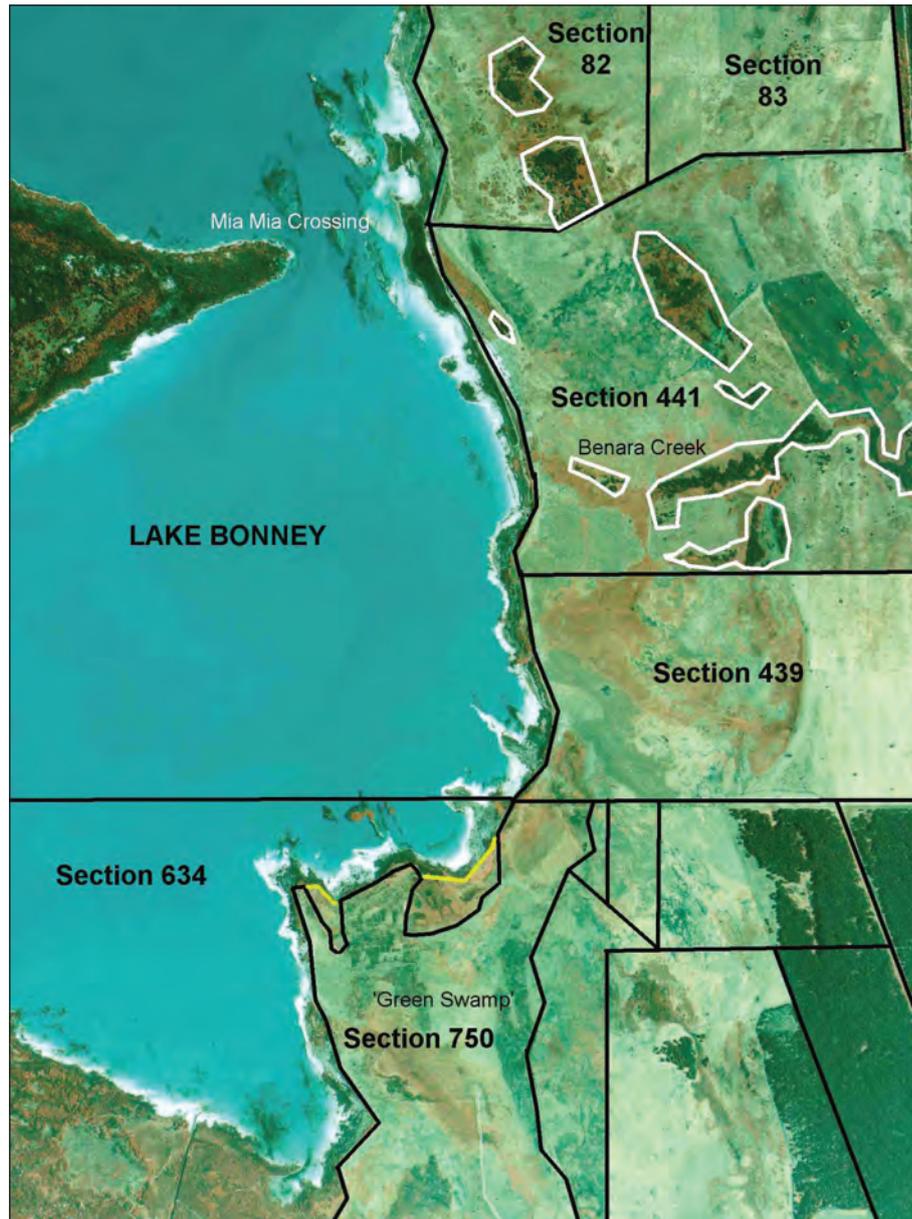
### **Recommendations:**

That the area concerned be fenced as soon as possible.

That, at the same time, the neighbouring landholder be encouraged to also protect some of the degraded habitat on that property to increase the effective size of regenerating habitat.

***Priority for further action:***

High



**Site 33 & 34:** White line indicates areas of remnant Silky Tea-tree habitat.  
Yellow line indicates location of existing fencing that has led to degradation of Silky Tea-tree habitat on Crown Land.  
Approximate Scale: 1cm = 333m *Infra-red Aerial Photography: Provided by Department for Land, Water and Biodiversity Conservation, Mt. Gambier.*

### 35. Bucks Lake (Game Reserve)

<b>Hundred:</b>	Kongorong
<b>Section:</b>	Deposited Plan 34791, Allotments 1,2,3 & 4
<b>Tenure:</b>	Reserve
<b>Owner:</b>	Minister for Environment and Heritage
<b>Area total:</b>	140 hectares
<b>Area habitat:</b>	140 hectares
<b>Habitat type:</b>	Mixed wetland habitats including Silky Tea-tree and Cutting grass habitat
<b>Landform:</b>	Wetland basin & Spring/Seepage-fed
<b>Status:</b>	Protected Area

Dedicated as a Game Reserve under the *National Parks and Wildlife Act 1972*.

#### **Description:**

This reserve contains a variety of wetland habitats that include more open sedgelands in the basin area and occasional Silky Tea-tree shrublands at the fringes where springs seep into the basin. On slightly higher ground there are areas of Dryland Tea-tree (*Melaleuca lanceolata*) woodland, dry coastal heath and *Eucalyptus* woodland.

Bucks Lake used to form part of the southerly flow path for water overflowing from Lake Bonney to the ocean outlet at Carpenter Rocks. As a result of the drainage of Lake Bonney in 1958, and again in 1972, Bucks Lake now rarely holds water for any length of time, except when there are heavy localised rains. This is affecting the composition and health of the wetland vegetation in the area, with species tolerant of drier conditions invading the basin. The loss of spring flow to Silky Tea-tree habitats is also causing degradation and even death of this habitat type in places.

#### **Threatened species known to occur at the site:**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Australian Status</b>	<b>SA Status</b>
Swamp Antechinus	<i>Antechinus minimus</i>	-	E
Rufous Bristlebird	<i>Dasyornis broadbenti</i>	-	V

It is also highly likely that the Southern Emu Wren, Swamp Skink and other threatened species are present at this site.

#### **Project involvement at site:**

Site visit and assessment

#### **Direct contact with owner made:**

Yes. Local National Parks and Wildlife staff manage this reserve.

**Recommendations:**

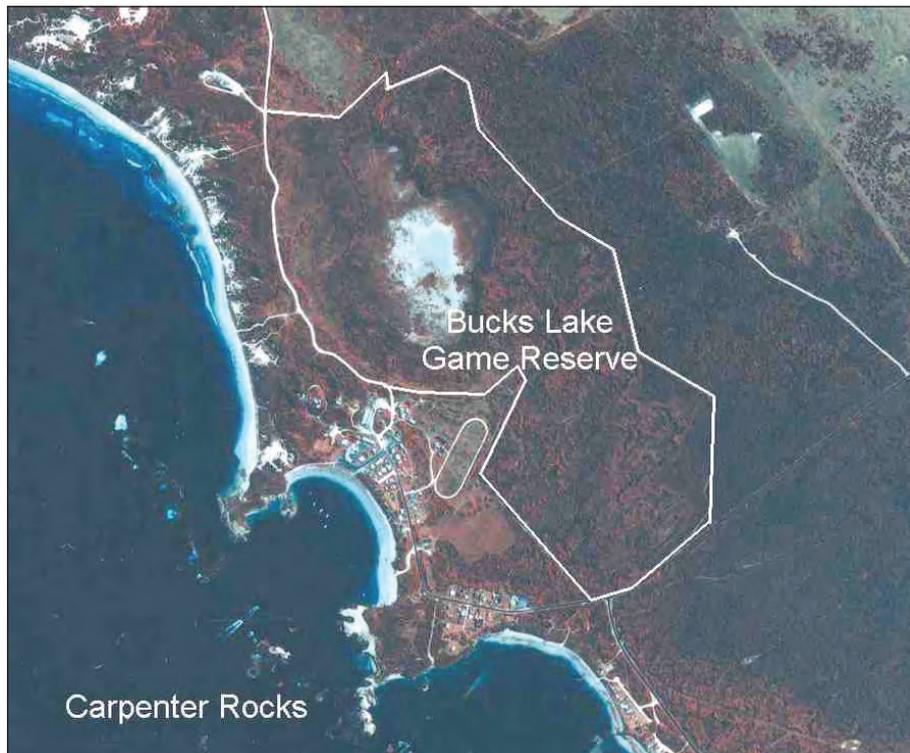
That methods of re-invigorating this wetland be explored, including management options for Lake Bonney to the north and an investigation into the local causes of reduced spring flow.

**Priority for further action:**

Medium.



**Site 35: Death of Silky Tea-tree habitat in Bucks Lake Game Reserve.**  
Photograph: Mark Bachmann



**Site 35: Bucks Lake Game Reserve**

Approximate Scale: 1cm = 240m Infra-red Aerial Photography: Provided by Department for Land, Water and Biodiversity Conservation, Mt. Gambier.

### 36. Blackfellows Cave Wetland – Old Rocks Road

**Hundred:** Kongorong  
**Section:** 497, Filed Plan 195260 / Allotment 648  
**Tenure:** Freehold  
**Owner:** South Range Pty Ltd  
**Area total:** 686 hectares  
**Area habitat:** 80 hectares  
**Habitat type:** Silky Tea-tree tall shrubland and mixed woodland habitats  
**Landform:** Spring-fed

**Status:** Highly threatened

Since the present owner purchased the property in the late 1980's extensive areas have been cleared along fencelines and as internal tracks, and a very high stocking rate of sheep has been introduced. Private drainage works have also been undertaken in an attempt to drain and open up the thick vegetated wetland habitat on the site to more intensive grazing. This drainage appears to be having the desired effect with the owner reporting to have dropped the water table in the spring by up to 1 metre. This is causing the wetland understorey to undergo obvious changes, including the loss of water-plants and herbs, the burning-off of delicate fern foliage, and the virtual loss of the local Swamp Greenhood population. This nationally vulnerable species of orchid is currently restricted to a small area approximately 2 x 2 metres that is only being kept moist by seepage from the neighbouring property.



**Site 36:** Outlet from the shallow network of recently constructed drains causing habitat degradation  
*Photograph: Mark Bachmann*



**Site 36:** Rare Silky Tea-tree formation with a fern dominated understorey (below)  
*Photograph: Mark Bachmann*

**Site 36:** Clearance of a 'track' through pristine Silky Tea-tree habitat, opening up the heart of the wetland habitat to grazing (below left)  
*Photograph: Mark Bachmann*



**Description:**

This area of mixed habitat is home to a vast array of threatened species. It provides one of the rare examples in SA where woodland, wetland habitats and the ecotones between, remain intact. In addition to Silky Tea-tree tall shrubland there are areas of Drooping Sheoak (*Allocasuarina verticillata*) woodland, Swamp Gum (*Eucalyptus ovata*) woodland and Messmate Stringybark (*E. obliqua*) woodland.

In part of the wetland, the tall Silky Tea-tree habitat occurs in an extremely rare formation with fern species dominating the understorey. This unique habitat will rapidly be lost if present management of the area is not altered.

**Threatened species known to occur at the site:**

Common Name	Scientific Name	Australian Status	SA Status
Swamp Antechinus	<i>Antechinus minimus</i>	-	E
Olive Whistler	<i>Pachycephala olivacea</i>	-	V
Orange-bellied Parrot	<i>Neophema chrysogaster</i>	E	E
Rufous Bristlebird	<i>Dasyornis broadbenti</i>	-	V
Swamp Skink	<i>Egernia coventryi</i>	-	E
Dwarf Galaxias	<i>Galaxiella pusilla</i>	V	P
Common Dusky Blue	<i>Erina hyacinthina</i>	-	R
Swamp Greenhood	<i>Pterostylis tenuissima</i>	V	V

Other SA vulnerable species recorded from this site include: Crested Shrike-tit (*Falcunculus frontatus*) and Latham's Snipe (*Gallinago hardwickii*).

SA rare species recorded from this site include: Beautiful Firetail (*Stagonopleura bella*), Hard Water-fern (*Blechnum watsii*), Creeping Cotula (*Cotula repens*), Pale Twig-rush (*Baumea acuta*), Leafy Twig-rush (*Cladium procerum*), Tender Bracken (*Pteris tremula*) and the Common Wombat (*Vombatus ursinus*).

**Project involvement at site:**

Site visit and assessment

**Direct contact with owner made:**

Yes. The owner has proven extremely difficult to negotiate habitat protection with.

**Recommendations:**

That the government exhaust all possible options to see this land conserved and/or present management altered.

That the effects of drainage works be reversed (blocks installed in drains) immediately.

That vegetation clearance and heavy stocking of the remnant habitat should end.

**Priority for further action:**

Very High

### 37. Blackfellows Cave Wetland – Houstons Road

<b>Hundred:</b>	Kongorong
<b>Section:</b>	Filed Plan 195267 / Allotment 655, Deposited Plan 4717 / Allotment 100
<b>Tenure:</b>	Freehold
<b>Owner:</b>	Karl Unger
<b>Area total:</b>	297 hectares
<b>Area habitat:</b>	100 hectares
<b>Habitat type:</b>	Silky Tea-tree tall shrubland and mixed woodland habitats
<b>Landform:</b>	Spring-fed
<b>Status:</b>	(being) Fenced

This highly significant area of habitat is in the process of being fenced with the assistance of the project. Given the scale of the job, it is taking some time for the owner to complete.

The springs that supply the wetland habitat adjacent to the road no longer flow, presumably as a result of the development of vast pine plantations on the ranges inland from the site preventing recharge, as well as drainage works on the neighbouring property. This has and is having a noticeable impact on the wetland habitat, which requires annual saturation to maintain its health.

**Description:**

The area being fenced contains a significant strip of wetland and woodland habitat that lies adjacent to Houstons Road and an area adjacent to the remnant habitat on the neighbouring property (Site 36). The wetland habitat has a longer history of grazing and is therefore slightly more degraded than Site 36, but is otherwise quite similar in the vegetation communities that are present.

**Threatened species known to occur at the site:**

Common Name	Scientific Name	Australian Status	SA Status
Swamp Antechinus	<i>Antechinus minimus</i>	-	E
Olive Whistler	<i>Pachycephala olivacea</i>	-	V
Rufous Bristlebird	<i>Dasyornis broadbenti</i>	-	V
Swamp Skink	<i>Egernia coventryi</i>	-	E

**Project involvement at site:**

Site visit and assessment. The project has provided all fencing materials required to protect the remnant habitat on the property from stock grazing.

**Direct contact with owner made:**

Yes. Owner is committed to protecting and managing the habitat on the property for conservation.

**Recommendations:**

That the owner be supported with the ongoing management of this area.



1956



1965



1978



1982



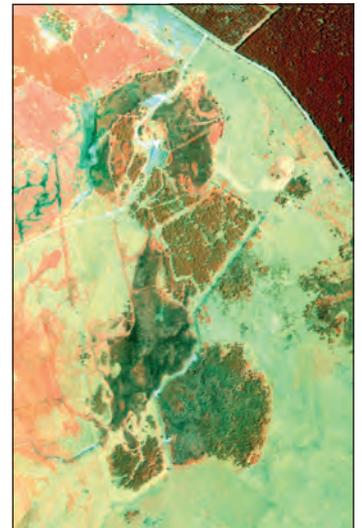
1987



1992



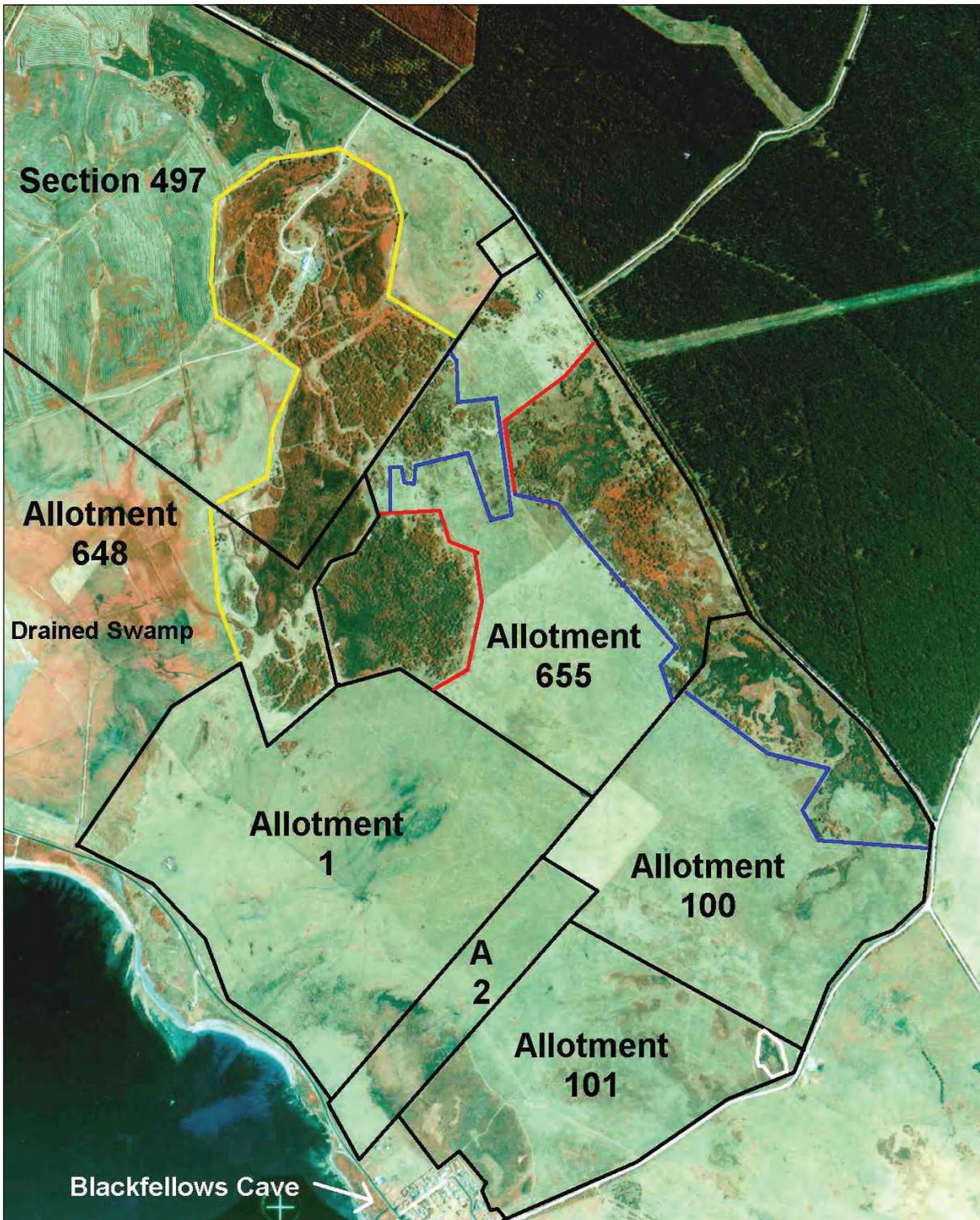
1997



2000

**Site 36:** Vegetation clearance near Blackfellows Cave

Approximate Scale: 1cm = 400m Aerial Photography: Provided by Mapland, SA Department for Environment and Heritage



**Site 36, 37 & 38: Blackfellows Cave Wetland** - Yellow line indicates fenceline that protected this portion of remnant habitat until clearance, drainage and grazing were introduced in the late 1980's.  
Blue line indicates fences being constructed from materials provided by the project.  
Red line indicates previously fenced habitat.  
White line indicates area proposed for Heritage Agreement.

Approximate Scale: 1cm = 200m Infra-red Aerial Photography: Provided by Department for Land, Water and Biodiversity Conservation, Mt. Gambier.

***Priority for further action:***

Low

**38. Blackfellows Cave Wetland – Blackfellows Cave Road**

***Hundred:*** Kongorong  
***Section:*** Deposited Plan 4717 / Allotment 101  
***Tenure:*** Freehold  
***Owner:*** Malcolm Unger  
***Area total:*** 85 hectares  
***Area habitat:*** 5 hectares  
***Habitat type:*** Silky Tea-tree tall shrubland and mixed woodland habitats  
***Landform:*** Spring-fed

***Status:*** (to be a) Protected Area

This small but valuable area of Silky Tea-tree habitat is in the process of being placed under a Heritage Agreement, under the *Native Vegetation Act 1991*.

***Description:***

This is a small remnant area of Silky Tea-tree and Cutting Grass habitat that has been degraded by grazing pressure. The habitat is expected to recover quickly after it has been fenced.

***Threatened species known to occur at the site:***

Nil. However the site is in close proximity to Sites 36 and 37 where several threatened species are known to occur.

***Project involvement at site:***

Site visit and assessment.

***Direct contact with owner made:***

No. But owner is clearly interested in conserving the area, having been in contact with the South East Bush Management Adviser and instigating the Heritage Agreement process.

***Recommendations:***

That the owner be supported with the ongoing management of this area.

***Priority for further action:***

Low.

### 39. North of Nene Valley – Meyers Road

<b>Hundred:</b>	Kongorong
<b>Section:</b>	Section 485
<b>Tenure:</b>	Freehold
<b>Owner:</b>	Donald and Isabel Peglar
<b>Area total:</b>	294 hectares
<b>Area habitat:</b>	10 hectares (approx.)
<b>Habitat type:</b>	Silky Tea-tree tall shrubland and mixed woodland habitats
<b>Landform:</b>	Spring-fed
<b>Status:</b>	Under threat

This small, degraded remnant spring-fed wetland area is currently grazed. The area is also likely to be impacted by reduced spring flow.

**Description:**

This small area of habitat includes Silky Tea-tree and Cutting Grass habitat, with a number of Blackwood (*Acacia melanoxylon*) trees throughout.

**Threatened species known to occur at the site:**

Nil

**Project involvement at site:**

Site visit and assessment.

**Direct contact with owner made:**

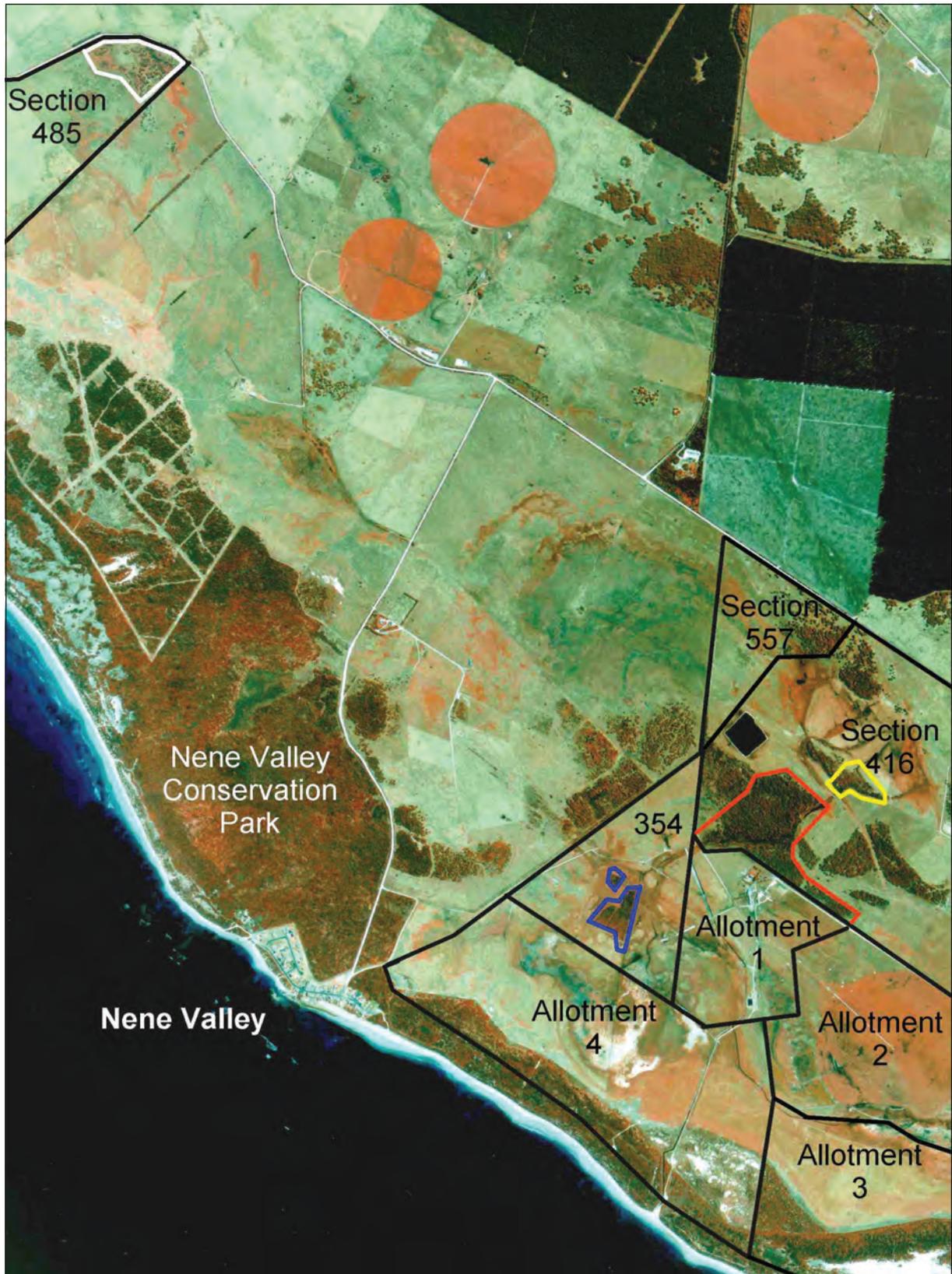
No

**Recommendations:**

That the owner be encouraged to manage his area for conservation through fencing out grazing stock.

**Priority for further action:**

Low.



**Site 39, 40 & 41: Nene Valley** - White line indicates grazed remnant Silky Tea-tree habitat.

Blue line indicates fence constructed from materials provided by the project.

Red line indicates habitat previously fenced by owner.

Yellow line indicates area fenced through Sustaining the South.

Approximate Scale: 1cm = 333m Infra-red Aerial Photography: Provided by Department for Land, Water and Biodiversity Conservation, Mt. Gambier.



1978



1982



1987



1992



1997

**Site 40: Nene Valley Wetland - Drainage and clearance of Nene Valley wetland**  
Approximate Scale: 1cm = 500m Aerial Photography: Provided by Mapland, SA Department for Environment and Heritage

## 40. Nene Valley Wetland

<b>Hundred:</b>	Kongorong
<b>Section:</b>	354, 367, Deposited Plan 16230 / Allotments 1,2,3 & 4
<b>Tenure:</b>	Freehold
<b>Owner:</b>	Nukara Pty Ltd
<b>Area total:</b>	562 hectares
<b>Area habitat:</b>	7 hectares
<b>Habitat type:</b>	Silky Tea-tree shrubland
<b>Landform:</b>	Wetland basin (fed by spring-fed creek)
<b>Status:</b>	Fenced

This fragment of the former Nene Valley wetland was fenced with the assistance of the project.

### **Description:**

In 1978, aside from being grazed, the dominant wetland vegetation communities of Nene Valley wetland were essentially intact. It was around this time that a previous owner indicated he was interested in selling the property and offered it to the SA Government for addition to the Nene Valley Conservation Park (SEWC 1985). The offer was declined and in the years that followed the wetland was rapidly degraded after a subsequent owner drained and cleared the area. The small remnant of Silky Tea-tree habitat that was not cleared initially has continued to be whittled away and degraded over time.

A highly degraded fragment of this former wetland that remains on Section 354, consists of Silky Tea-tree and Cutting Grass habitat.

### **Threatened species known to occur at the site:**

Nil. However it can be assumed that prior to the degradation and clearance, that has led to the current state of the habitat, this site would have supported a range of threatened species. One of these, the Swamp Antechinus, still occurs on the neighbouring property to the north (Site 41).

### **Project involvement at site:**

Site visit and assessment. Materials were provided to the owner to enable the remnant to be fenced.

### **Direct contact with owner made:**

Yes. The small fenced remnant area will be managed to enable habitat recovery.

### **Recommendations:**

That the owner be encouraged the link the remnant habitat with that on the property to the north.

### **Priority for further action:**

Low-medium.

## 41. Nene Valley Springs

<b>Hundred:</b>	Kongorong
<b>Section:</b>	416 & 557
<b>Tenure:</b>	Freehold
<b>Owner:</b>	Cooee Nominees Pty Ltd
<b>Area total:</b>	344 hectares
<b>Area habitat:</b>	25 hectares (not including other woodland areas on the property)
<b>Habitat type:</b>	Silky Tea-tree shrubland and adjacent woodland habitat
<b>Landform:</b>	Spring-fed creekline
<b>Status:</b>	Fenced

The most significant portion of Silky Tea-tree habitat on this property is fenced off with adjacent buffering woodland habitat. This fenced area has been enlarged after the owners applied for funding through the lower South East devolved grant scheme, *Sustaining the South*. Small degraded sections of creek near the springs in the northern part of the property are not fenced.

### **Description:**

The creekline is dominated by a band of Silky Tea-tree habitat and is buffered by Messmate Stringybark woodland. This main conservation area has been fenced for a few years and is showing good signs of recovery after a long history of stock grazing.

The small area that was more recently protected to the north includes Swamp Gum woodland and another section of creekline Silky Tea-tree that has been heavily disturbed by stock.

The creekline flow from rising groundwater springs on this property used to terminate in Nene Valley wetland to the south, but this is now diverted, via a series of drains, to the ocean.

### **Threatened species known to occur at the site:**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Australian Status</b>	<b>SA Status</b>
Swamp Antechinus	<i>Antechinus minimus</i>	-	E
Swamp Greenhood	<i>Pterostylis tenuissima</i>	V	V

### **Project involvement at site:**

Site visit and assessment. The second area of Silky Tea-tree habitat fenced was as a result of discussions held with the owner. Due to a lack of remaining funds, they were advised to apply for financial assistance from *Sustaining the South*.

### **Direct contact with owner made:**

Yes. The owner is interested in continuing to manage the area of conservation.

### **Recommendations:**

That the owner is offered ongoing support in the management of the areas so far protected.

***Priority for further action:***

Low

**42. Winterfield Creek - Cape Douglas**

<b><i>Hundred:</i></b>	Kongorong
<b><i>Section:</i></b>	345
<b><i>Tenure:</i></b>	Crown Leasehold
<b><i>Lesee:</i></b>	Peter Caskey
<b><i>Section:</i></b>	Deposited Plan 30074 / Allotment 1 & 2
<b><i>Tenure:</i></b>	Freehold
<b><i>Owner:</i></b>	Ronald Lewis
<b><i>Section:</i></b>	652
<b><i>Tenure:</i></b>	Crown Leasehold
<b><i>Lesee:</i></b>	Thomas Megaw
<b><i>Area total:</i></b>	not available
<b><i>Area habitat:</i></b>	not available
<b><i>Habitat type:</i></b>	Silky Tea-tree shrubland
<b><i>Landform:</i></b>	Spring-fed creekline
<b><i>Status:</i></b>	Under threat

Some very narrow sections of the upper reaches of Winterfield creek (on Lot 1) appear to be fenced but the broader, more valuable areas of habitat that occur on Section 652 and 345 are highly degraded by grazing and in need of urgent protection. In recent years Winterfield Creek has also suffered a reduction in rising spring flow, no longer flowing 12 months of the year.

***Description:***

There is a fringe of Silky Tea-tree habitat, of varying widths and quality, along the length of Winterfield Creek and its associated drainage lines. Towards the end of the creek on Sections 652 and 345, where a former large terminal wetland used to occur (Big Swamp), the habitat remnants are larger and in better condition. There are very good stands of Tall Saw-sedge easily visible in this area, with more palatable species, including the Silky Tea-tree overstorey, being lost to constant grazing pressure.

***Threatened species known to occur at the site:***

Nil. Section 652 is known to have supported a population of Swamp Antechinus until the 1980's. The last and only records from the habitat at this site are from the South East Coast Survey of 1983. Big Swamp, which was the terminal wetland at the end of Winterfield Creek prior to being drained, was one of the last sites where the Ground Parrot was known to occur in South Australia (Condon 1942).

***Project involvement at site:***

Site visit and assessment

***Direct contact with owner made:***

No.

***Recommendations:***

That the owners of land along Winterfield Creek are approached about fencing off this waterway and allow for the restoration / regeneration of Silky Tea-tree habitat along its length.

***Priority for further action:***

Medium.

### **43. Cape Douglas**

<b><i>Hundred:</i></b>	Kongorong
<b><i>Section:</i></b>	342
<b><i>Tenure:</i></b>	Crown Leasehold
<b><i>Lessee:</i></b>	Bray Milstead
<b><i>Hundred:</i></b>	MacDonnell
<b><i>Section:</i></b>	662 & 667
<b><i>Tenure:</i></b>	Freehold
<b><i>Owner:</i></b>	John Jenkin
<b><i>Area total:</i></b>	229
<b><i>Area habitat:</i></b>	25 hectares
<b><i>Habitat type:</i></b>	Silky Tea-tree shrubland and mixed woodland
<b><i>Landform:</i></b>	Spring-fed / Limestone range

***Status:***

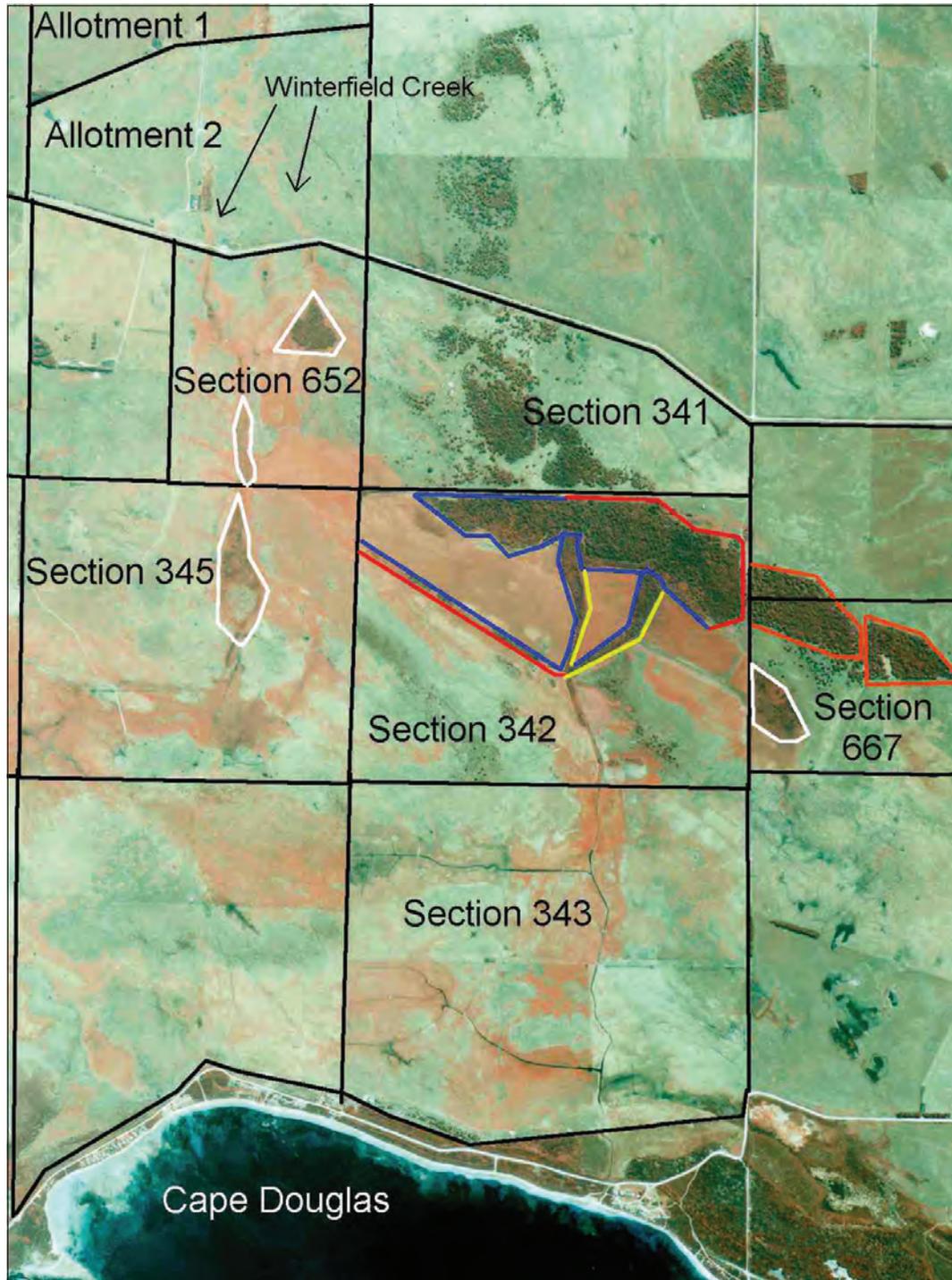
Section 342: Fenced  
Section 667: Under threat

Much of the wetland habitat in this area was drained and cleared in the 1980's but valuable remnants remain along the base of the limestone range and the network of drains. The remaining habitat on Section 342 is being fenced with the assistance of the project, while a small, formerly contiguous area on Section 667 appears to be grazed at present.

The owner of Section 342 has observed that the spring on the property that formerly flowed year round now goes dry through the summer months. This is consistent with reported reduction in spring flow of nearby Winterfield Creek.

***Description:***

Section 342 retains a good example of an ecotone between woodland and wetland habitat, with a Messmate Stringybark/Rough-barked Manna-gum mixed woodland on the range, grading into Swamp Gum woodland and Silky Tea-tree wetland on the peat flats.



**Site 42 & 43: Winterfield Creek and Wetlands** - Yellow line indicates drains that prevent stock access to habitat.

Blue line indicates fences being constructed from materials provided by the project.

Red line indicates previously constructed fences.

White line indicates habitat being severely degraded by grazing and reduced spring flow.

Approximate Scale: 1cm = 230m Infra-red Aerial Photography: Provided by Department for Land, Water and Biodiversity Conservation, Mt. Gambier.

***Threatened species known to occur at the site:***

<b>Common Name</b>	<b>Scientific Name</b>	<b>Australian Status</b>	<b>SA Status</b>
Swamp Antechinus	<i>Antechinus minimus</i>	-	E
Dwarf Galaxias	<i>Galaxiella pusilla</i>	V	P

***Project involvement at site:***

Site visit and assessment. Remnant habitat on Section 342 has been fenced with materials provided by the Silky Tea-tree project.

***Direct contact with owner made:***

Section 342: Yes. Interested in managing remaining areas of habitat for conservation.  
Section 667: No.

***Recommendations:***

That the owner of Section 667 be contacted to discuss protection/future management of the small area of Silky Tea-tree habitat adjacent to Section 342.

***Priority for further action:***

Medium.



**Site 43:** This spring, photographed in summer, used to flow 12 months of the year.  
*Photograph: Mark Bachmann*



1978



1982



1986



1992



1997

**Site 42 & 43:** Wetland drainage and vegetation clearance inland from Cape Douglas  
Approximate Scale: 1cm = 266m Aerial Photography: Provided by Mapland, SA Department for Environment and Heritage

## 44. Germein Reserve

<b>Hundred:</b>	MacDonnell
<b>Section:</b>	817
<b>Tenure:</b>	Reserve
<b>Owner:</b>	District Council of Grant
<b>Area total:</b>	100 hectares
<b>Area habitat:</b>	30 hectares
<b>Habitat type:</b>	Silky Tea-tree shrubland and Large-fruited Blue Gum ( <i>Eucalyptus leucoxylon</i> spp. <i>megalocarpa</i> ) woodland
<b>Landform:</b>	Spring-fed wetland
<b>Status:</b>	Protected

This area is managed by the local Landcare group for conservation.

### **Description:**

This site provides another interesting example where the ecotone between woodland and wetland habitats has been preserved. The site has a history of disturbance through grazing and drainage, and there are some weeds infiltrating the area. This area is considered a stronghold for the restricted Large-fruited Blue Gum. The mixed habitat with good species diversity has also made the site an important location for threatened butterfly species.

### **Threatened species known to occur at the site:**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Australian Status</b>	<b>SA Status</b>
Chrysotricha Sedge-skipper	<i>Hesperilla chrysotricha</i>	-	V
Flame Sedge-skipper	<i>Hesperilla idothea</i>	-	U
White-banded Grass-dart	<i>Taractrocera papyria</i>	-	R
Striped Xenica	<i>Ori xenica kershawi</i>	-	V
Sword-grass Brown	<i>Tisiphone abeona antoni</i>	-	V
Common Dusky Blue	<i>Erina hyacinthina</i>	-	R

### **Project involvement at site:**

Site visit and assessment

### **Direct contact with owner made:**

Yes. The local Landcare group actively manage the area for conservation.

### **Recommendations:**

Support be provided to the Landcare group for voluntarily managing Germein Reserve

### **Priority for further action:**

Low

## 45. Cress Creek - Jess

<b>Hundred:</b>	MacDonnell
<b>Section:</b>	543, 544 & 545
<b>Tenure:</b>	Freehold
<b>Owner:</b>	Rhonda Jess
<b>Area total:</b>	13 hectares
<b>Area habitat:</b>	7 hectares
<b>Habitat type:</b>	Silky Tea-tree shrubland / Cutting Grass sedgeland and mixed woodland.
<b>Landform:</b>	Spring-fed (from Cress Creek spring)
<b>Status:</b>	Fenced

The areas of significant remnant habitat were fenced on this property with the support of the project.

### *Description:*

The main area of habitat (adjacent to Section 707) contains a mixture of creekline and seepage fed Silky Tea-tree and Cutting Grass habitats, as well as an area of woodland dominated by Swamp Gum. The woodland in particular was showing signs of degradation, with gradual die-back of the overstorey occurring and infiltration by weeds an issue throughout the area. Garden escapees such as Polygala (*Polygala myrtifolia*), Blackberries (*Rubus* spp.), Coprosma (*Coprosma repens*), Briar Rose (*Rosa rubiginosa*) and Gorse (*Ulex europaeus*) are present at this site and are a serious threat in the district.

### *Threatened species known to occur at the site:*

Common Name	Scientific Name	Australian Status	SA Status
Swamp Antechinus	<i>Antechinus minimus</i>	-	E

### *Project involvement at site:*

Site visit and assessment. Materials were provided for the construction of fences around two areas of habitat.

### *Direct contact with owner made:*

Yes. The owner is highly interested in managing the areas protected for conservation.

### *Recommendations:*

That the owner be provided with ongoing support in the management of this area.

### *Priority for further action:*

Low



**Site 45:** Rhonda Jess proudly displays her new fence  
 Photograph: Mark Bachmann

## 46. Cress Creek Spring

<b>Hundred:</b>	MacDonnell
<b>Section:</b>	707
<b>Tenure:</b>	Freehold
<b>Owner:</b>	Grant Beltchev & Gina Ploenges
<b>Section:</b>	Deposited Plan 54611, Allotment 1
<b>Tenure:</b>	Freehold
<b>Owner:</b>	E. Frank Millard
<b>Area total:</b>	10 hectares
<b>Area habitat:</b>	8 hectares
<b>Habitat type:</b>	Mixed woodland/wetland habitat including Silky Tea-tree shrubland
<b>Landform:</b>	Spring-fed creekline
<b>Status:</b>	Fenced

The habitat on these properties was intentionally set-aside by the owners and retains extremely valuable remnant habitat.

### *Description:*

The site contains wetland habitats along the creekline and a mixture of woodland habitats on adjacent drier ground. Cress Creek, like many along the coast was not historically a true creek along its current length, but a spring that formerly flowed 'blind' into a vast terminal wetland area that then subsequently discharged to the sea. An excavated drain that takes water directly from the spring to the coast, to lower the local water table and make the surrounding peat ground suitable for agriculture, is what is now referred to as Cress Creek.



**Site 46:** The Long-nosed Potoroo may have survived near Port MacDonnell until as recently as the early 1970's.  
*Photograph: Mark Bachmann*

Several weed species are a cause for concern in the future management of this site. They include Blackberries (*Rubus* spp.), Coprosma (*Coprosma repens*), Briar Rose (*Rosa rubiginosa*) and Gorse (*Ulex europaeus*).

***Threatened species known to occur at the site:***

<b>Common Name</b>	<b>Scientific Name</b>	<b>Australian Status</b>	<b>SA Status</b>
Swamp Antechinus	<i>Antechinus minimus</i>	-	E
River Blackfish	<i>Gadopsis marmoratus</i>	-	P

Mr Millard also reported having seen small animals that he referred to as a 'rat-kangaroos' on the property up until around thirty years ago. Subsequent investigation has led to the conclusion that it is highly probable that the Long-nosed Potoroo (*Potorous tridactylus*) occurred in the area until the early 1970's. It has long been assumed that the species would have been historically present in the thick, damp habitats of the near-coastal districts of the lower South East and this strong anecdotal report confirms that suspicion. Mr Millard stated that around the time when he last saw the animals that vegetation clearance in the area was continuing at an accelerated rate.

***Project involvement at site:***

Site visit and assessment.

***Direct contact with owner made:***

Yes. The owners are interested in managing the area for conservation.

***Recommendations:***

To continue to provide support to the owners in managing the area.

***Priority for further action:***

Low

## 47. Jerusalem Creek Wetland

<b>Hundred:</b>	MacDonnell
<b>Section:</b>	477, 582, 583, 584, 585, 588, 589, 591, 592, 593, 594, 595, 596, 599, 600, 601, 602, 603, 626, 790
<b>Tenure:</b>	Freehold/Crown Leasehold
<b>Owner:</b>	Ben Tilley
<b>Area total:</b>	80 hectares (approx.)
<b>Area habitat:</b>	25 hectares
<b>Habitat type:</b>	Silky Tea-tree shrubland
<b>Landform:</b>	Spring-fed wetland
<b>Status:</b>	Fenced

The fence around the southern portion of this wetland has been completed and the northern side will be done as soon as the wetland is dry enough (next Autumn). This wetland is also influenced by Jerusalem Creek (drain), which runs along its eastern side, causing it to dry out more quickly than it would have originally.

### **Description:**

The wetland at this site retains a highly diverse habitat structure and composition. The slightly degraded fringes, where stock had penetrated, will/are rehabilitating rapidly with their exclusion.

Floristically the overstorey of this wetland is dominated by Silky Tea-tree, Scented Paper-bark and Tree Everlasting, with occasional Swamp Gum. The understorey maintains good indigenous species diversity but has been seriously invaded by Blackberries.

Jerusalem Creek, like Cress Creek and many others along the coast, historically was not a true creek but a spring that flowed 'blind' into a surrounding wetland area. The remnant wetland habitat on this property forms part of the terminal wetland fed by Jerusalem Creek Spring. The Creek, as it is called today, is an excavated drain that takes water directly from the spring to the coast, to lower the local water table and make the surrounding peat ground suitable for agriculture.

### **Threatened species known to occur at the site:**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Australian Status</b>	<b>SA Status</b>
Swamp Antechinus	<i>Antechinus minimus</i>	-	E

### **Project involvement at site:**

Site visit and assessment. Materials were provided to enable the construction of fencing to exclude stock from the remnant wetland.

### **Direct contact with owner made:**

Yes. The owner is continuing to manage the wetland area for conservation.

**Recommendations:**

That the owner continue to be supported with the management of the remnant wetland area

**Priority for further action:**

Low



**Site 44, 45, 46, 47 & 48: Port MacDonnell District wetlands - Blue line indicates fences constructed from materials provided by the project. Red line indicates fences previously constructed by the owners to protect habitat.**  
Approximate Scale: 1cm = 260m Intra-red Aerial Photography: Provided by Department for Land, Water and Biodiversity Conservation, Mt. Gambier.

## 48. Jerusalem Creek Spring

<b>Hundred:</b>	MacDonnell
<b>Section:</b>	464
<b>Tenure:</b>	Freehold
<b>Owner:</b>	Ken & Lyn Jones
<b>Area total:</b>	43 hectares
<b>Area habitat:</b>	25 hectares
<b>Habitat type:</b>	Silky Tea-tree shrubland / Mixed woodland habitat
<b>Landform:</b>	Spring-fed creek and seepage-fed wetland
<b>Status:</b>	Fenced

This site has been protected from grazing with the assistance of the project. A weir has been installed by the South Eastern Water Conservation and Drainage Board at this site to enable management (raising) of the water level of the spring.

### **Description:**

This remnant vegetation at this site is a complex mixture of open and vegetated wetland habitats, both surrounding a permanent spring and in wetland areas fed by groundwater seepage. There are Silky Tea-tree shrublands, Swamp Gum and Messmate Stringybark woodlands and aquatic habitats all represented. Again, like most wetland remnants in the areas to the near-east of Pt MacDonnell, Blackberry invasion is also serious problem at this site.

The wetland areas and spring have clearly suffered from a lowering of the local water table that has occurred as a result of the excavation of Jerusalem Creek (drain). In a trend common to most wetland remnants influenced by drainage (and therefore most sites summarised in this document), there is often little evidence of recruitment of species that require constant soil moisture for seedling recruitment, such as Cutting Grass and Tall Saw-sedge. As these species are long-lived once established, such effects of drainage are not always immediately apparent. However, now that the water level in this area can potentially be managed for these requirements, it will be interesting to see if there is an improvement in recruitment levels of the most sensitive wetland species over coming seasons.

### **Threatened species known to occur at the site:**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Australian Status</b>	<b>SA Status</b>
Olive Whistler	<i>Pachycephala olivacea</i>	-	V
Orange-bellied Parrot	<i>Neophema chrysogaster</i>	E	E
Rufous Bristlebird	<i>Dasyornis broadbenti</i>	-	V
Swamp Skink	<i>Egernia coventryi</i>	-	E
Sword-grass Brown	<i>Tisiphone abeona antoni</i>	-	V

### **Project involvement at site:**

Site visit and assessment. All materials required to complete fencing of this site were supplied by the project.

***Direct contact with owner made:***

Yes. Area is being actively managed for conservation.

***Recommendations:***

Provide support to the owners with management of the area.

***Priority for further action:***

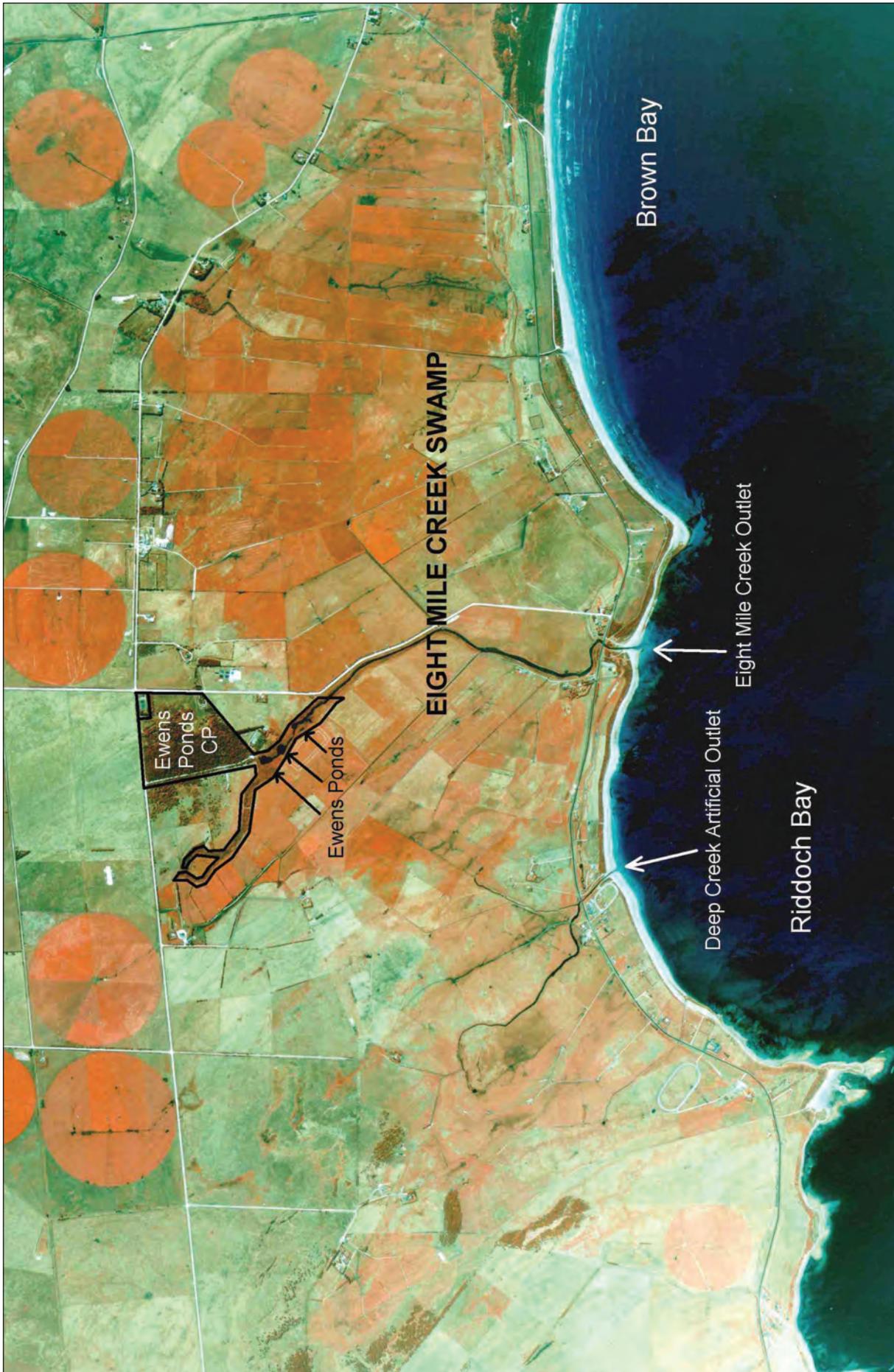
Low



**Site 48:** *Habitat now protected on Ken and Lyn Jones' property 'Ningana Springs'.*  
*Photograph: Mark Bachmann*



**Site 48:** *Ken and Lyn Jones proudly display their new fence, with Mount Schank in the distance.*  
*Photograph: Mark Bachmann*



**Site 49 & 50: Eight Mile Creek Swamp**  
Approximate Scale: 1cm = 300m Infrared Aerial Photography: Provided by Department for Land, Water and Biodiversity Conservation, Mt. Gambier.

## 49. Eight Mile Creek / Ewens Ponds (Conservation Park)

<b>Hundred:</b>	MacDonnell
<b>Section:</b>	815, 888, 904 & 915
<b>Tenure:</b>	Reserve
<b>Owner:</b>	Minister for Environment and Heritage
<b>Area total:</b>	34 hectares (approx.)
<b>Area habitat:</b>	not available
<b>Habitat type:</b>	Silky Tea-tree
<b>Landform:</b>	Spring-fed (dredged) creekline habitat
<b>Status:</b>	Protected Area

Ewens Ponds are dedicated as a Conservation Park under the *National Parks and Wildlife Act 1972*.

### **Description:**

A very narrow band of Silky Tea-tree habitat and emergent aquatic vegetation forms riparian habitat along the fringes of Ewens Ponds and channels of Eight Mile Creek. Given the lack of vegetated swamp habitat left, the aquatic properties (particularly for fish) of the Eight Mile Creek system are now the focus of current conservation interest and efforts.

### **Threatened species known to occur at the site:**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Australian Status</b>	<b>SA Status</b>
Ewen Pygmy-perch	<i>Nannoperca variegata</i>	V	P
River Blackfish	<i>Gadopsis marmoratus</i>	-	P
Sword-grass Brown	<i>Tisiphona abeona antoni</i>	-	V

### **Project involvement at site:**

Site visit and assessment

### **Direct contact with owner made:**

Yes. National Parks and Wildlife SA staff manage the area.

### **Recommendations:**

Where possible negotiate with and encourage neighbouring landholders to re-establish buffering habitat around Eight Mile Creek.

### **Priority for further action:**

Low

## 50. Eight Mile Creek Swamp (Sinkholes and Drainage Reserves)

<b>Hundred:</b>	MacDonnell / Caroline
<b>Location:</b>	Area bounded by Nelson Road and Creek Road, East of Port MacDonnell
<b>Ownership:</b>	Sections (Private) and Drains (South Eastern Water Conservation and Drainage Board- SEWCDB)
<b>Area total:</b>	2000 hectares (approx.)
<b>Area habitat:</b>	virtually nil
<b>Habitat type:</b>	Fringing Silky Tea-tree shrubland
<b>Landform:</b>	Spring-fed ponds / drains

### **Status:**

Several sinkholes/ponds and drains fed by rising springs are located on SEWCDB Drainage Reserves. Some of these are fenced, while the status of others is unclear.

### **Description:**

The vast wetland area encompassed by Eight Mile Creek Swamp includes numerous spring-fed sinkholes such as; Stratman's Pond, Dead Pond, Bone's Pond, Pretty Pond, 54 Foot Pond and Spencer's Pond. These aquatic systems, often fringed by remnant Silky Tea-tree habitat, are highly important for threatened species of fish.

Historically, the Eight Mile Creek Swamp was probably the largest continuous area of Silky Tea-tree wet shrubland habitat in South Australia, being estimated to cover at least 1,500 hectares. It was drained and cleared systematically in the latter years of the Second World War and the years that followed. Unfortunately the type of fringing habitat preserved at Ewens Ponds Conservation Park, is also typical of that found more broadly along drainage reserves across this formerly extensive wetland, with no large blocks of habitat preserved.

### **Threatened species known to occur at the site:**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Australian Status</b>	<b>SA Status</b>
Ewen Pygmy-perch	<i>Nannoperca variegata</i>	V	P
River Blackfish	<i>Gadopsis marmoratus</i>	-	P

The Ground Parrot was recorded by Condon (1942) in the Eight Mile Creek Swamp, at a time when the clearance and drainage of this area had begun. He stated that representations to the state government of the time failed to result in the protection or preservation of even a small portion of the area, and that he feared the Ground Parrot 'would be deprived of many square miles of its natural habitat'.

### **Project involvement at site:**

Site visit

### **Direct contact with owner made:**

No

**Recommendations:**

Opportunities for revegetation of Silky Tea-tree habitat should be investigated.

**Priority for further action:**

Low

**51. Green Point – Stoney Drain**

**Hundred:** Caroline  
**Section:** 594  
**Tenure:** Freehold  
**Owner:** Stuart Feast  
**Area total:** 182 hectares  
**Area habitat:** 5 hectare remnant (and more along drains)  
**Habitat type:** Silky Tea-tree shrubland  
**Landform:** Rising spring-fed

**Status:** (to be) fenced

The owner will fence a small remnant of Silky Tea-tree habitat that remained too wet to be cleared after the swamp was initially drained.

**Description:**

The rising spring discharge waters that supplied vast wetlands behind the sand dunes in the Piccaninnie Ponds area, between the Glenelg Mouth and Green Point, originally terminated at a single natural outlet near the mouth of the Glenelg River. Stoney Drain was the first artificial drainage outlet constructed in the system, and this outlet was used as the terminal point for a series of drains on Section 594 that made the peat soil of this wetland area available for agriculture.

A small, isolated area of Silky Tea-tree habitat with a reasonably diverse and intact understorey is all that remains of this formerly large segment of wetland. Narrow strips of habitat still occur along the network of drains in the area.

**Threatened species known to occur at the site:**

Common Name	Scientific Name	Australian Status	SA Status
Orange-bellied Parrot	<i>Neophema chrysogaster</i>	E	E

**Project involvement at site:**

Site visit and assessment. The project has provided the owner with materials to complete fencing of the small area of remnant habitat.

***Direct contact with owner made:***

Yes. Is interested in managing the small remnant area for conservation.

***Recommendations:***

To support the owner with the management of this area.

To encourage the owner to allow for the regeneration of more Silky Tea-tree habitat on the property, including a corridor that links the isolated remnant to the habitat that occurs along the drainage network.

***Priority for further action:***

Low

## **52. Pick's Swamp**

<b><i>Hundred:</i></b>	Caroline
<b><i>Section:</i></b>	690, Deposited Plan 18136 / Allotment 100 & 101
<b><i>Tenure:</i></b>	Freehold
<b><i>Owner:</i></b>	Robert & Janet Donovan
<b><i>Area total:</i></b>	220 hectares
<b><i>Area habitat:</i></b>	30 hectares
<b><i>Habitat type:</i></b>	Silky Tea-tree tall shrubland and sinkhole
<b><i>Landform:</i></b>	Rising spring-fed

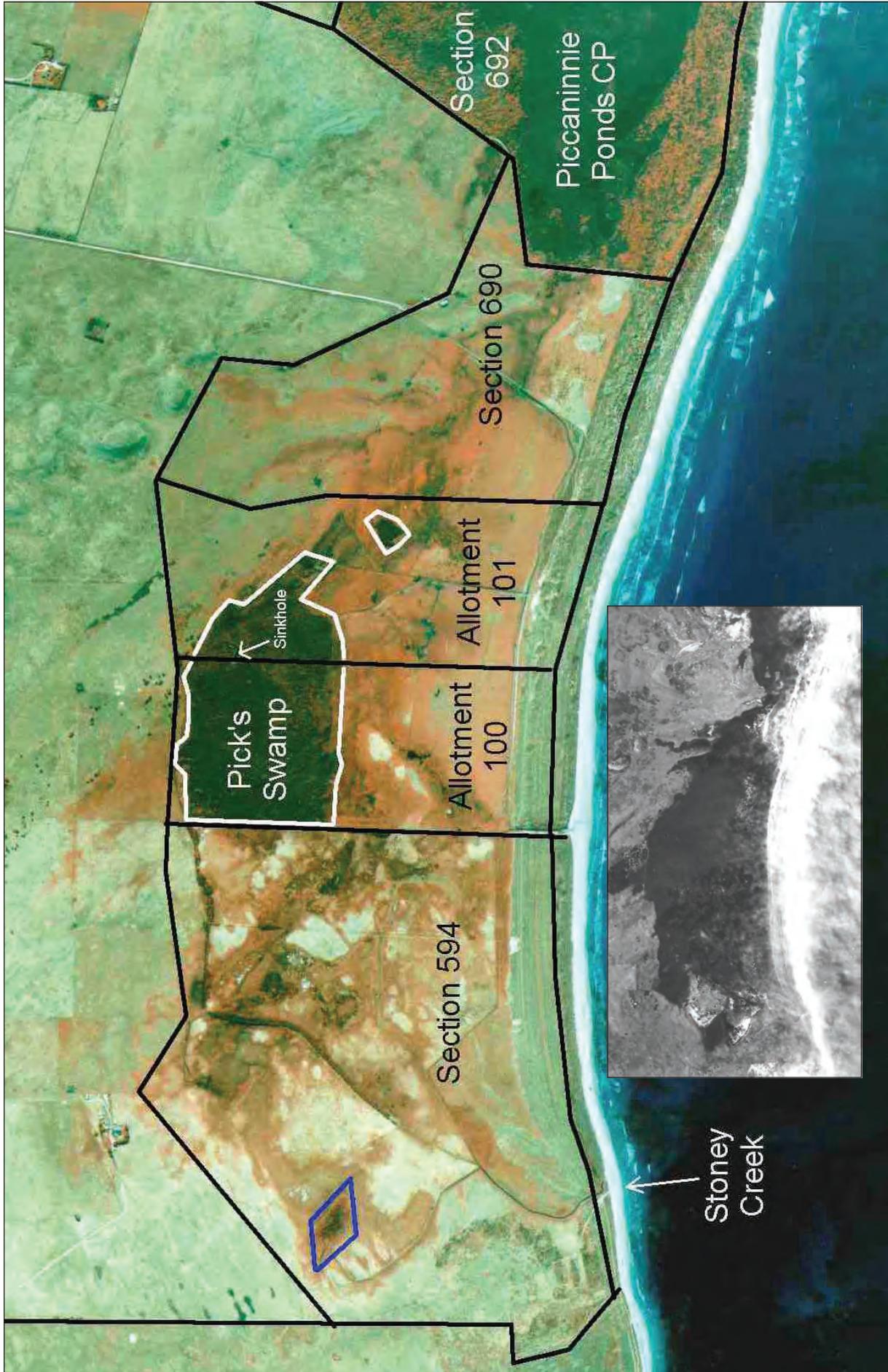
***Status:*** Highly threatened

The remnant habitat that remains on this property has gradually been whittled away to its present size and is under serious ongoing threat of degradation through drainage and grazing. The property was highlighted by the South Eastern Wetland Committee in 1985 as an area worthy of inclusion in Piccaninnie Ponds Conservation Park, but their recommendation was never followed through. The protection, and if possible re-instatement, of the wetlands on this property should be considered one of the highest priorities in Silky Tea-tree habitat management in this State.

***Description:***

Although previous clearance has obviously taken place on the property, by the late 1970's the habitat of Pick's Swamp was still virtually contiguous with that of Piccaninnie Ponds Conservation Park to the east. Over the subsequent 25 years, clearance and improved drainage have left the remaining habitat highly isolated and of a size that makes it vulnerable to edge effects and the direct degradation caused by cattle grazing.

Given its decline, it is remarkable that this remaining area still retains a suite of threatened species virtually unrivalled in this habitat type elsewhere in South Australia. The clear reason for this is the moisture level of the wetland, where, in the areas least affected by drainage, the peat remains saturated throughout the summer. Historically this would have been a feature of most spring-fed Silky Tea-tree wet shrublands, but as a result of the extensive drainage programs undertaken across the region very few retain this natural state of hydrology. As a result species that are highly



**Site 51 & 52: Stoney Drain/Creek and Pick's Swamp** - Inset shows original vegetated swamp in 1956 - after the construction of Stoney Drain, but prior to comprehensive drainage and clearance. Blue line shows fences being constructed from materials provided by the project. White line indicates grazed remnant Silky Tea-tree habitat, under serious threat of degradation. Approximate Scale: 1cm = 160m Infra-red Aerial Photography: Provided by Department for Land, Water and Biodiversity Conservation, Mt. Gambier.

sensitive to desiccation, such as the Swamp Greenhood, or have a reproductive requirement for saturated soil, such as Cutting Grass, Tall Saw-sedge and most wetland plants, are thriving and successfully recruiting to their populations in Pick's Swamp. It is a concern that this trend is not repeated around most remnant Silky Tea-tree wetlands in SA.

There are very few established weeds in the remnant vegetation on the site, however some Coprosma was noted infiltrating the habitat.

**Threatened species known to occur at the site:**

Common Name	Scientific Name	Aus Status	SA Status
Swamp Antechinus	<i>Antechinus minimus</i>	-	E
Orange-bellied Parrot	<i>Neophema chrysogaster</i>	E	E
Rufous Bristlebird	<i>Dasyornis broadbenti</i>	-	V
Swamp Skink	<i>Egernia coventryi</i>	-	E
Dwarf Galaxias	<i>Galaxiella pusilla</i>	V	P
Yarra Pygmy-perch	<i>Nannoperca obscura</i>	V	P
Swamp Greenhood	<i>Pterostylis tenuissima</i>	V	V
Swamp Helmet Orchid	<i>Corysanthes</i> sp. aff. <i>diemenica</i>	No status yet	No status yet

It is also highly likely that this area supports many of the threatened butterfly species known to occur at nearby Piccaninnie Ponds Conservation Park.

**Project involvement at site:**

Site visits and assessment

**Direct contact with owner made:**

Yes. Interested in biodiversity of the site but not willing to protect the area.

**Recommendations:**

All available options should be exhausted to see this highly significant area of habitat protected.

Continue to negotiate habitat protection with the current owner.

**Priority for further action:**

Very high



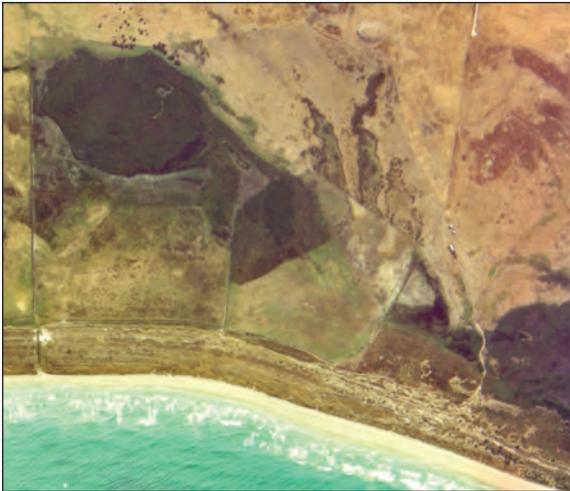
**Site 52: Crescent Sinkhole** - home to a population of the nationally vulnerable Yarra Pygmy Perch  
 Photograph: Mark Bachmann



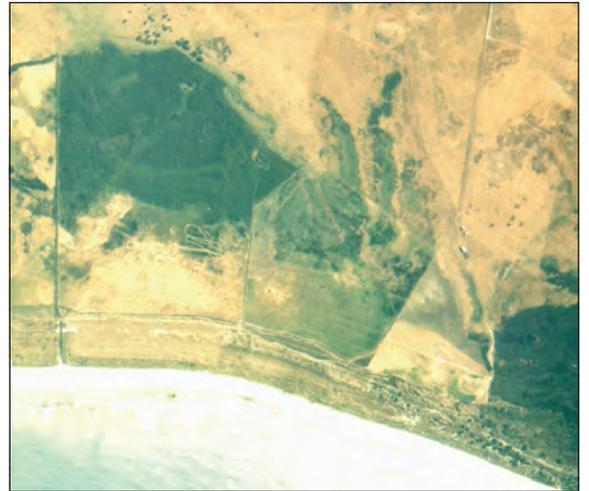
1965



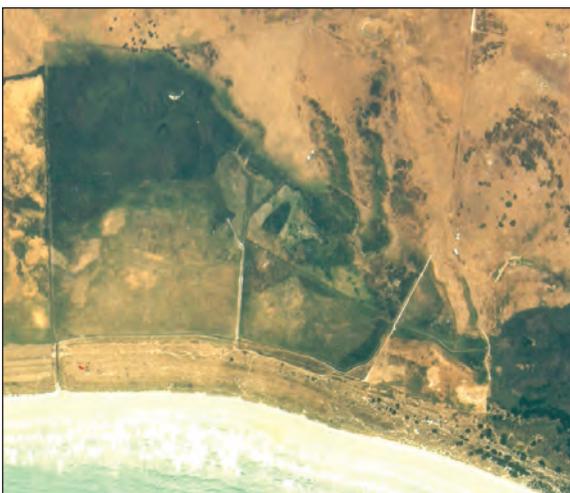
1978



1982



1986

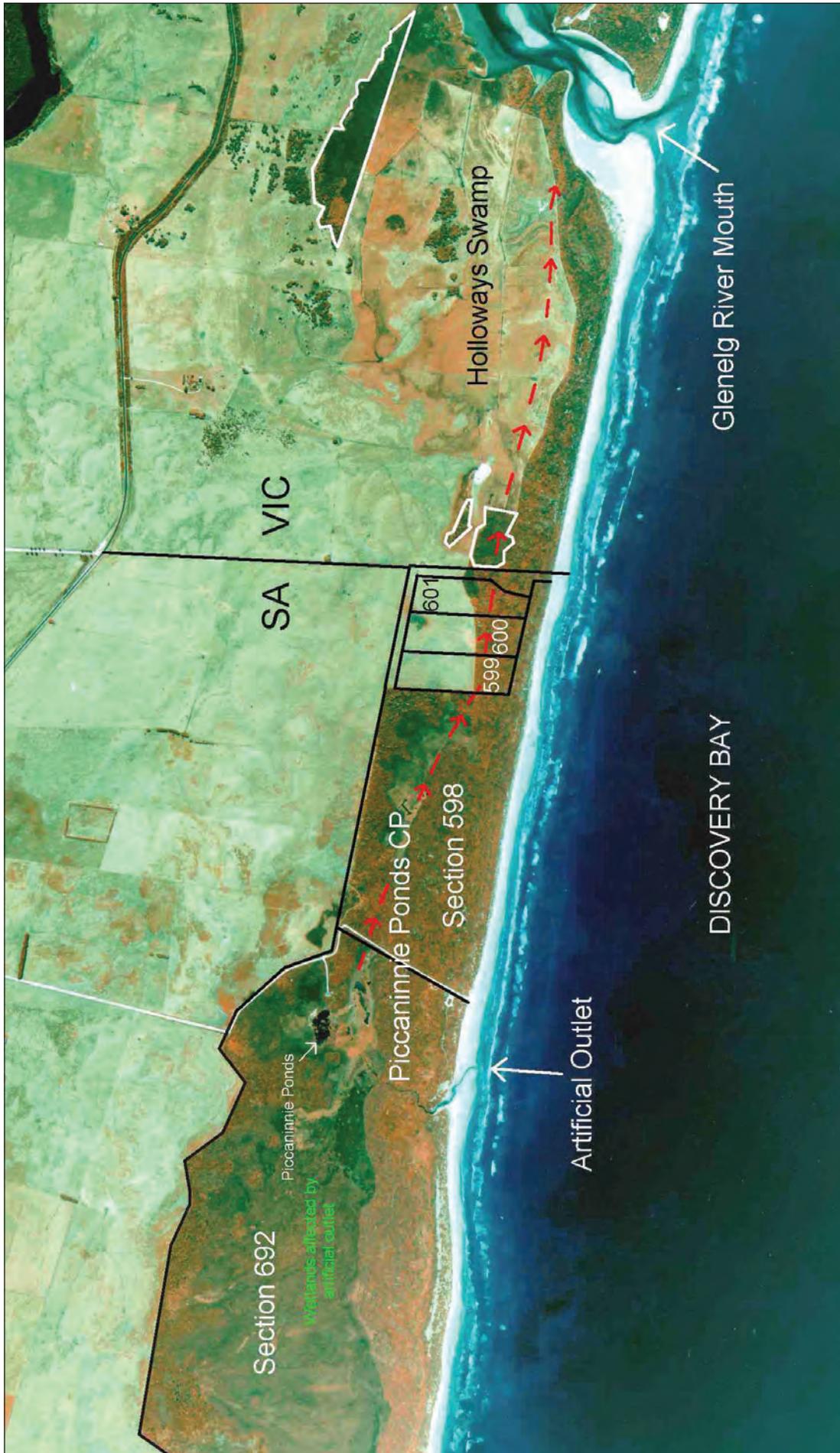


1992



1997

**Site 52:** Silky Tea-tree habitat clearance at Pick's Swamp: adjacent to the western end of Piccaninnie Ponds CP  
Approximate Scale: 1cm = 266m Aerial Photography: Provided by Mapland, SA Department for Environment and Heritage



**Site 53 & 54: Piccaninnie Ponds CP and Holloways Swamp - Red line indicates the approximate original flowpath of Freshwater Creek. White line indicates remnant Silky Tea-tree habitat on private properties in Victoria.**

Approximate Scale: 1cm = 230m Intra-red Aerial Photography: Provided by Department for Land, Water and Biodiversity Conservation, Mt. Gambier.

### 53. Freshwater Creek / Piccaninnie Ponds (Conservation Park)

<b>Hundred:</b>	Caroline
<b>Section:</b>	598 & 692
<b>Tenure:</b>	Reserve
<b>Owner:</b>	Minister for Environment and Heritage
<b>Section:</b>	599, 600 & 601
<b>Tenure:</b>	Freehold
<b>Owner:</b>	Rosemarie & Joseph Lapatha
<b>Area total:</b>	575 hectares (including a near-coastal marine strip)
<b>Area habitat:</b>	350 hectares (approx.)
<b>Habitat type:</b>	Silky Tea-tree shrubland and sinkholes
<b>Landform:</b>	Rising spring-fed
<b>Status:</b>	Protected Area / Fenced

Piccaninnie Ponds is dedicated as a Conservation Park under the *National Parks and Wildlife Act 1972*. A small section of the former Freshwater Creek, that still retains remnant wetland habitat, is situated on Section 599, 600 & 601 and is fenced off from grazing.

The wetland habitat in Piccaninnie Ponds is showing slow but gradual signs of degradation from drying as a result of the artificial outlet drain lowering the water table in the wetland. Dry coastal species, intolerant of prolonged wet conditions such as Coastal Wattle, are visibly encroaching in former wetland habitats.

#### **Description:**

Like all other wetlands and springs along the lower South East coastal districts, Piccaninnie Ponds did not manage to avoid dramatic changes to its hydrology. The existing artificial outlet from Piccaninnie Ponds through the sand dunes to the sea was cut between 1917 and 1945, probably prior to 1927 (NPWS 1984), to reduce flooding of land adjacent to the wetland area. This considerably reduced the level of the Ponds, and hence the flow of water along Freshwater Creek, which formerly created a channel of open water behind the sand dunes and flowed out to the ocean at the mouth of the Glenelg River (Coombe & Hinsliff 1982).

There are pockets of remnant Silky Tea-tree habitat that are fed by springs in places along the former flowpath of Freshwater Creek (to the east of the Ponds), but much of the intervening channel area has been lost under sand or encroached by dry coastal succession vegetation. There are also significant areas of Silky Tea-tree habitat associated with the wetland around Piccaninnie Ponds, with these areas showing signs of degradation as a result of a prolonged period of reduced inundation since the excavation of the artificial outlet.

**Threatened species known to occur at the site:**

Common Name	Scientific Name	Aus Status	SA Status
Swamp Antechinus	<i>Antechinus minimus</i>	-	E
Orange-bellied Parrot	<i>Neophema chrysogaster</i>	E	E
Rufous Bristlebird	<i>Dasyornis broadbenti</i>	-	V
Southern Emu Wren	<i>Stipiturus malachurus</i>	-	V
Swamp Skink	<i>Egernia coventryi</i>	-	E
Dwarf Galaxias	<i>Galaxiella pusilla</i>	V	P
Chrysotricha Sedge-skipper	<i>Hesperilla chrysotricha</i>	-	V
Flame Sedge-skipper	<i>Hesperilla idothea</i>	-	U
White-banded Grass-dart	<i>Taractrocera papyria</i>	-	R
Striped Xenica	<i>Oriexenica kershawi</i>	-	V
Silver Xenica	<i>Oriexenica lathoniella</i>	-	E
Common Dusky Blue	<i>Erina hyacinthina</i>	-	R
Swamp Greenhood	<i>Pterostylis tenuissima</i>	V	V
Swamp Helmet Orchid	<i>Corysanthes</i> sp. aff. <i>diemenica</i>	No status yet	No status yet
Maroon Leek-orchid	<i>Prasophyllum frenchii</i>	E	E

The remnants of the original Freshwater Creek watercourse in Piccaninnie Ponds Conservation Park was the last site in South Australia where the Ground Parrot was recorded, last being seen in the 1950's (Meredith 1983). After the construction of the outlet drain, a heavily reduced flow continued to discharge from the eastern wetland at Piccaninnie Ponds along the original creek channel, until this was choked off by drifting sand in 1958 (Coombe and Hinsliff 1982). The re-creation and rehabilitation of the wetland habitat in this area, through controlling the level of the wetland (via the installation of a weir structure at the artificial drain outlet), would enhance potential habitat for the Ground Parrot, which is now considered extinct in South Australia. This site is the most likely to be feasible for a reintroduction of this species because of its size and the fact that the species is still reported to exist nearby, on the opposite side of the Glenelg River Mouth, in Discovery Bay Coastal Park in Victoria.

**Project involvement at site:**

Site visit and assessment.

**Direct contact with owner made:**

Sections 598 & 692: Yes. Local National Parks and Wildlife staff manage this area.  
Sections 599, 600 & 601: No.

**Recommendations:**

That an investigation into the feasibility of raising the level of the main Piccaninnie Ponds wetland, potentially allowing for the diversion of spring flow back down Freshwater Creek to the Glenelg Mouth, be undertaken. This would clearly allow for the rehabilitation and recreation of wetland habitat in the area, through restoration of a more natural hydrological regime.

**Priority for further action:**

High

## 54. Freshwater Creek / Holloways Swamp

**Location:** SW Victoria, between the SA/Vic border and the Glenelg River mouth  
**Habitat type:** Silky Tea-tree shrubland  
**Landform:** Rising spring-fed wetland

### ***Status and description:***

Although previously drained and cleared, pockets of remnant Silky Tea-tree habitat still occur in Holloways swamp and are either associated with rising springs or drains.

There is also an area of high quality Silky Tea-tree wetland associated with the former flowpath of Freshwater creek, adjacent to the border. At present it is not clear whether this particular land is in public or private ownership, but it is fenced and extremely valuable being home to two highly vulnerable orchid species.

### ***Threatened species known to occur at the site:***

<b>Common Name</b>	<b>Scientific Name</b>	<b>Aus Status</b>	<b>SA Status</b>
Swamp Greenhood	<i>Pterostylis tenuissima</i>	V	V
Swamp Helmet Orchid	<i>Corysanthes</i> sp. aff. <i>diemenica</i>	No status yet	No status yet

### ***Project involvement at site:***

Site visit and assessment

### ***Direct contact with owner made:***

No

### ***Recommendations:***

That liaison with Parks Vic and the owner of Holloways Swamp and is conducted as part of the process of assessing the feasibility of recreating the flow of Freshwater Creek into the Glenelg River.

That the owner of Holloways Swamp be encouraged to re-instate part of this large former wetland.

### ***Priority for further action:***

High

## 55. East of Nelson – Sun Valley Eco Farm

**Owner:** Stan Berrymann  
**Habitat type:** Silky Tea-tree and Cutting Grass swamp  
**Landform:** Seepage-fed swamp (associated with the dune range)

**Status:** Fenced

The owner of this land, who is based in Mount Gambier, was seeking funding assistance to fence off the wetland areas on the property from grazing. It was outside the scope of the project to fund activities in Victoria, but when a similar project was initiated for SW Victoria the owner was referred to the relevant Project Officer.

### ***Description:***

This almost entirely denuded swamp was fenced a couple of years ago, but with natural regeneration from stumps and roots still in the ground it is now barely recognisable. There is a large stand of Silky Tea-tree up to 3 metres tall around the fringes of the wetland and Cutting Grass and other sedges have regrown at a phenomenal rate.

This area is an example of the extreme difference removing grazing pressure can make, especially when the former native vegetation has been heavily grazed down but not physically cleared or the soil turned over. It also clearly demonstrates the distinct advantage that wetland areas have when it comes to speedy natural recovery in comparison to rehabilitation of dry-land sites.

### ***Threatened species known to occur at the site:***

Nil. However at the current rate of rehabilitation this site may soon provide suitable habitat for several threatened species.

### ***Project involvement at site:***

Site visit and assessment. Put the owner in touch with a parallel project in Victoria.

### ***Direct contact with owner made:***

Yes. The owner is enthusiastically managing the area for conservation.

### ***Recommendations:***

Continue to provide the owner with support and advice.

### ***Priority for further action:***

Low

## SECTION 5: MONITORING PROGRAM SUMMARY 2000-2002

### 5.0 Introduction

In April 2000 a monitoring program of four grazed Silky Tea-tree and Cutting Grass wetland sites, that were soon to be protected, was commenced. These sites were compared to a 'control' site that had not been previously grazed or degraded, wetland habitat situated in what is now Lake St Clair Conservation Park.

#### *Control:*

**Site 1** – (STO1) Lake St Clair (Conservation Park) (for site summary see Site 19, page 76)

#### *Previously grazed sites:*

**Site 2** – (STO2) Lake St Clair – McCourt (for site summary see Site 18, page 74)

**Site 3** – (STO3) Lake George – McCourt (for site summary see Site 20, page 77)

**Site 4** – (STO4) Canunda Flat – 'Spring Hill' (for site summary see Site 28, page 91)

**Site 5** – (STO5) Canunda Flat – 'Canunda Heights' (for site summary see Site 29, page 94)

Subsequent to this collection of initial biodiversity baseline data, the sites have been annually monitored to determine their biota response to destocking. As such, the sites were monitored and resurveyed in March 2001, and again in March 2002. All sites are now fenced and destocked.

This monitoring program summary contains the following sections:

**5.1** *Photopoint Monitoring*

**5.2** *Vegetation Monitoring*

**5.3** *Invertebrate Monitoring*

**5.4** *Vertebrate Monitoring*

## 5.1 Photopoint Monitoring 2000-2002

### *Methodology*

Photopoints provide an inexpensive and easily repeated method of visually monitoring the changes that an area undergoes over time. A photopoint is set up by establishing two points, 10 metres apart, that are each permanently marked with a star dropper. The photographer simply needs to stand at one of these points and photograph the other to establish a photopoint. Photopoints were monitored each year during the survey period.

### *Results*

Control Area

Site 1 (STO1)



STO 1 - March 2001

Site 2 (STO2) - Photopoint 1



**STO 2 Photopoint 1 - April 2000**



**STO 2 Photopoint 1 - March 2001**



**STO 2 Photopoint 1 - March 2002**

Site 2 (STO2) - Photopoint 2



**STO 2 Photopoint 2 - April 2000**



**STO 2 Photopoint 2 - March 2001**



**STO 2 Photopoint 2 - March 2002**

Site 3 (STO3)



**STO 3** *April 2000*



**STO 3** *March 2001*



**STO 3** *March 2002*

Site 4 (STO4) - Photopoint 1



**STO 4 Photopoint 1 - April 2000**



**STO 4 Photopoint 1 - March 2001**



**STO 4 Photopoint 1 - March 2002**

Site 4 (STO4) - Photopoint 2



**STO 4** *Photopoint 2 - April 2000*



**STO 4** *Photopoint 2 - March 2001*



**STO 4** *Photopoint 2 - March 2002 (taken from a closer point)*

Site 4 (STO4) - Photopoint 3



**STO 4 Photopoint 3 - April 2000**



**STO 4 Photopoint 3 - March 2001**



**STO 4 Photopoint 3 - March 2002**

Site 5 (STO5) - Photopoint 1 looking east



**STO 5** *Photopoint 1 - April 2000*



**STO 5** *Photopoint 1 - March 2001*



**STO 5** *Photopoint 1 - March 2002 (taken from a point slightly further away)*

Site 5 (STO5) - Photopoint 2 looking west



**STO 5 Photopoint 2 - April 2000**



**STO 5 Photopoint 2 - March 2001**



**STO 5 Photopoint 2 - March 2002 (taken from a point slightly further away)**

## 5.2 Vegetation Monitoring 2000-2002

by Tim Croft

### *Methodology*

Monitoring of nine (9) vegetation quadrats over four sites commenced in April 2000, as part of the Silky Tea-tree and Cutting Grass Habitat Rehabilitation Project in the Lower South East of South Australia, when baseline biodiversity information was recorded prior to their fencing and destocking. A further site (Site 1), already fenced and destocked and under ownership of the Minister for Environment and Heritage, was also monitored as a reference site.

As in previous years, the vegetation monitoring component has been undertaken in conjunction with related fauna monitoring. Timing of the monitoring is undertaken to coincide with warmer weather, more conducive to recording of reptile species.

Monitoring methods were chosen for their repeatability, low level of skill and cost effectiveness in effort required. It is aimed that the vegetation be sampled regularly and initially annually at approximately the same time of year, on a strictly limited budget. The methods chosen were not done so for scientific rigor, but to simply determine basic trends within the vegetation present over an extended time period. These changes may be in the form of species composition and structure, species density and the level of canopy gap or litter build-up. These changes will critically affect the quality and suitability of fauna habitat available for different species. Choice of methods also reflected the envisaged thickening of the vegetation over time.

As such, two primary methods have been undertaken to determine baseline information at each site, each aimed to sample different facets of the vegetation present. Accurate location details were determined at each site to enable sampling of the vegetation in subsequent years and allow a direct comparison.

At each site, it was determined to sample each main vegetation type present, resulting in up to three quadrats sampled per site. A site here is defined as a separate property, with a total of 10 quadrats sampled.

### *Method 1*

Species diversity and structure was assessed using standardised Vegetation Survey techniques over 30m x 30m quadrats, as per Guide to a Native Vegetation Survey (Heard & Channon 1997).

Herbarium specimens for each plant species per quadrat were taken. Plant specimens were taken for verification of identification and for depositing in the State Herbarium, Plant Biodiversity Research at a later date, and were pressed and dried in an appropriate way.

Data collected was entered on standard Biological Survey data sheets. These data sheets record species present, prominent overstorey and understorey species, and for each species, life form and height class, estimate of cover and abundance, and their life stage.

## Method 2

Percent cover for prominent species present was determined by line transects, sampling every 0.5m from 0m to 10m along a tape measure. Ten such lines, five metres apart, were sampled within the vegetation per quadrat. Where a quadrat was on the edge with cleared land or property boundary, the line transects were taken 5 metres in from that boundary, to avoid edge effects.

At every 0.5m, species present, gap in canopy or litter was recorded. Where the vegetation structure was a more complex shrubland, canopy structure was measured, with taller species divided into 0-1m, 1-2m, 2-3m and 3-4m strata. Where a plant fell at the 1m, 2m or 3m height category, it was taken as the next highest strata.

Where the structure of the vegetation was less complex sedgeland or herblands (eg. *Gahnia trifida* or *Baumea arthrophylla* sedgelands), species, bare ground or litter was recorded for each 0.5m point on the tape measure.

Percent cover for each quadrat was then simply calculated and tabulated for future reference.

Monitoring methodology for subsequent years followed that devised for collecting the baseline information with only minor modification. Additional and more detailed information was recorded March 2001 for groundcover at quadrats where overstorey structure is more complex. It was considered this additional information would be more important as fauna habitat development, and considering the current considerable variation in groundcover.

At each quadrat, species presence and cover abundance was checked with Method 1 of the previous years, and recorded separately. Additional species were noted at some sites, while some species were also no longer observed.

Line transects were undertaken as the previous year, and percent cover again calculated and compared in table form with the previous years results.

## Discussion

In 2002, the vegetation generally appeared in better condition and thicker compared to the previous years. Although there is still some seasonal fluctuation of annual species, including weeds, there are now visual signs of a trend in thickening of *Leptospermum lanigerum*, *Gahnia trifida* and *Typha domingensis* plant communities following destocking.

The *Leptospermum lanigerum* plant community of the baseline Site 1 and adjacent Site 2 have not shown much change over the three years. Both were initially thickly vegetated habitats, however the Site 2 results are indicating some alteration in groundcover.

For Site 2, within the *Gahnia trifida* plant community, there has been a decline in the *Baumea juncea* cover for some reason, but a marked increase in *Juncus kraussii* and *Leptocarpus brownii* cover.

Site 3 *Leptospermum lanigerum* plant community results again indicate little change in basic structure, but some changes in groundcover, particularly of soft herbaceous perennial native species, such as *Lobelia alata* and *Selliera radicans*. Cover within the *Gahnia trifida* plant community is

also largely unchanged, although there is a steady slight increase in the amount of *Leptospermum lanigerum* cover.

Within the three quadrats of Site 4, results for the structural overstorey cover of the *Leptospermum lanigerum* plant community indicate a slight increase in its major components of *L. lanigerum* and *Melaleuca squarrosa*, but a decline in the more minor component of *Ozothamnus ferrugineus*. The *L. lanigerum* areas of this site were characteristically very small, and more susceptible to stock grazing, compared with the similar plant communities within Site 1, 2 and 3. Within Site 4, there has also been generally a marked increase in the native perennial herbaceous species cover.

Within the *Baumea* sedgeland plant community, there has been little change in its structure, except for an increase in *Gahnia trifida* cover. While the *Typha domingensis* plant community is characteristically becoming structurally thicker with *T. domingensis* and *Cladium procerum*, with a marked decline in groundcover species.

Site 5 is the most interesting site, as it was essentially a bare grazed paddock at the time of fencing. The number and density of native wetland species is increasing at this site within all three quadrats. These species were previously not recorded from the quadrats, despite extensive search of the quadrats 1 and 2 initially, but are now found to be quite prominent. A number of these species are rated quite highly for the State, such as the State rare *Brachycome gracilis*. This site may have been expected to at least initially have a serious weed problem, which may have needed active management, but this has not proved to be the case at least in the first year.

As the wetland vegetation types surveyed are considered poorly represented in the region's Government Reserves, a number of plant species of high conservation significance at the regional and state level were recorded for almost all quadrats.

## **5.3 Invertebrates**

### **5.3.1 Micro-pitfall captures 2000-2001**

by R. G. Simms

#### ***Methodology***

Each year when the field survey was undertaken, micro-pitfalls filled with a saline alcohol solution were placed in close proximity to each large vertebrate pitfall installed. These were left in situ for the duration of the monitoring period (4 nights), being topped up with saline alcohol solution if evaporation was a problem during that time.

The captures for 2002 have not yet been analysed.

## Results

### Survey - April 2000 (see Appendix B)

The year 2000 survey revealed a capture of 16 different Orders of invertebrates with a great variation in the numbers sorted from each Order. There is a high dominance of the Collembola species (Springtails) 93.4% over all other Orders captured include Formicidae species (Ants) 1.5%, Coleoptera species (Beetles) 1.35%, Acarina species (Mites) 1.3% and Diptera species (Flies) 1.2% being the most common.

The other 11 Orders amounted to 1.25% of the total capture.

A total of 9680 individual specimens were sorted

The control sample adjacent to Lake St. Clair recorded the lowest capture rate (1.41%), while the sample adjacent to Lake George recorded the highest capture (52.39%).

The two pit fall samples set in grazed land recorded higher capture rate than those in the adjacent natural environment.

### Survey - March 2001 (see Appendix C)

The 2001 survey gave a substantial lower capture of specimens than the previous collection in April 2000. The Orders recovered showed a greater even spread which could be accounted the survey being conducted one month earlier.

The highest dominance was the Acarina species 32.78% taking precedence over the Collembola species 26.66%, with Formicidae species 13.98%, Diptera species 8.89% and the Coleoptera species 5.94%. The remaining Families accounted for the remaining 11.75% with one Order Diplopoda not recorded.

A total of 2611 individual specimens were sorted, representing 26.97% of the previous 2000 survey.

The control sample at Lake St. Clair rated third in specimen capture (19.9%) with the grazing site at Canunda recorded the highest capture (30.9%), while the Lake George sample fell to 16.7%.

## Discussion

One explanation for the great difference in specimens captured could be that the rainfall during February and March in the year 2000 was higher than in same period in 2001.

Both surveys showed that the specimens captured would support only a small native marsupial population as a food source, not withstanding competition from the water birds.

Pitfall Site Summary (as a percentage of total captures each year):

	<i>STO 01</i>	<i>STO 02</i>	<i>STO 03</i>	<i>STO 04</i>	<i>STO 05</i>
<b>2000</b>	1.42 %	6.32 %	52.39 %	16.18 %	23.39 %
<b>2001</b>	18.94 %	19.48 %	16.72 %	14.07 %	30.90 %

### **5.3.2 Butterflies 2002**

by Bryan Haywood

#### **Methodology**

Butterfly surveys were undertaken on February 12<sup>th</sup>, March 10<sup>th</sup> & 13<sup>th</sup>, 2002 at five Silky Tea Tree (*Leptospermum lanigerum*) and Cutting Grass (*Gahnia sp.*) sites in the Lower South East of SA. A total of 9 butterfly species were observed including three of conservation significance. Each of the five sites were surveyed twice whereby species and abundance was recorded. No strict methodology was used for these surveys however Haywood and Wilson (2001) was used as a guide. Weather conditions can have considerable effect on the numbers of butterflies seen (Pollard, 1977). Therefore before each survey the temperature, time, cloud cover, wind direction and speed (Beaufort Scale) were recorded. All butterflies were identified using Braby (2000). Two uncommon species were taken as specimens, mounted, labelled and stored at the Mount Gambier DEH office invertebrate collection for future reference.

Grund (2000) recorded butterflies (both flying adults and larvae) for all areas (including adjacent lands) and provided a good list of larval food plants present. This 2002 survey recorded species specific to a fenced site (property) and included an estimate of abundance. No direct searches were made towards finding larvae of any species.

#### **Results**

The coastal lake fringe sites (Lake George and Lake St Clair) were the most diverse sites surveyed with the Canunda Flats sites (Watts and Ellis) being relatively Lepidoptera poor during this period, although several diurnal moths were observed. Grund and Hunt (2000) have previously recorded the butterfly fauna for these districts indicating that all wetland remnants offer suitable habitat for a wide range of threatened species including sedge skippers, namely *Hesperilla chrysotricha* and *Hesperilla ideothea*. These skippers are dependant on *Gahnia* sedgeland as food plants for their larvae. Unfortunately these two skippers and other rare *Gahnia* spp. feeding butterflies were not encountered during this survey period. Further survey work may report them in years to come as was encouraged by Grund and Hunt (2000) for these areas.

The results for each site and survey period can be found in Appendix D.

#### **Recommendations**

Butterflies in these habitats generally emerge as adults during the Summer (Dec-Feb) period and into Autumn (March). If these surveys were undertaken over the entire Summer/Autumn period the full suite of butterflies known to exist in these habitats could be encountered. For future monitoring of adult butterflies each site should be surveyed four times a year, from December through to March, allowing a snapshot of all the months of known flight periods for common and rare species. It would be possible to walk a similar route throughout each site making the methodology more consistent with Haywood and Wilson (2001). This provides a good basis to compare variations from year to year and ultimately changes in habitat recovery or degradation.

### 5.3.3 Butterfly Site Summaries 2000-2001

by Roger Grund

#### Site 1 and 2

**LOCATION:** Northeast Lake St Clair.

**DATE OF SURVEY:** 8 March 2000, 15 January 2001.

**WEATHER CONDITION:** Hot and fine.

**HABITAT:** Wetland.

**VEGETATION TYPE:** Wetland herbs, grasses and sedges at the lake edge, followed by a 50 m perimeter of *Melaleuca halmaturorum* which further grades landward into *Leptospermum lanigerum/Ozothamnus ferrugineus* wetland with *Gahnia filum* and *G. trifida*.

**CONDITION OF SITE:** The fenced southern area of the site is in excellent condition, with dense pristine wetland vegetation. The northern area is degraded due to heavy cattle grazing, but most of the understorey vegetation is still present, and there are large open habitat areas of regenerated *Gahnia trifida*.

**OBSERVED BUTTERFLY FOODPLANT:** *Acacia cupularis*, *A. leiophylla*, *A. longifolia* var. *sophorae*, *Amyema melaleucae*, \**Arctotheca calendula*, *Atriplex prostrata*, \**Carduus tenuiflorus*, *Cassytha pubescens*, *Chenopodium* sp, *Danthonia* spp, *Dianella revoluta*, *Distichlis distichophylla*, *Exocarpos cupressiformis*, *Gahnia deusta*, *G. filum*, *G. trifida*, *Goodenia* sp, *Hakea vittata*, *Hemarthria uncinata*, \**Holcus lanatus*, *Kennedia prostrata*, \**Lagurus ovatus*, *Lepidosperma congestum*, *L. laterale*, *Parietaria debilis*, *Pimelea serpyllifolia*, *Plantago* spp, \**P. lanceolata*, *Plantago coronopus*, *Poa labillardieri*, \**Polypogon monspeliensis*, *Rhagodia candolleana*, *Schoenus nitens*, \**Sisymbrium erysimoides*, \**S. orientale*, *Swainsona lessertiifolia*, \**Trifolium* spp, *Urtica incisa*.

#### BUTTERFLY POPULATION:

**Seen on site:** *Erina hyacinthina hyacinthina* (R), *Hesperilla donnysa delos*, *Heteronympha merope merope*, *Junonia villida calybe*, \**Pieris rapae*, *Taractrocera papyria papyria* (R), *Vanessa itea*, *Zizina labradus labradus*.

**Seen in adjacent area:** *Danaus chrysippus petilia*, *D. plexippus*, *Delias aganippe* (R), *Theclinesthes albocincta*.

**Probably present at site:** *Erina acasta*, *Geitoneura klugii*, *Lampides boeticus*, *Nacaduba biocellata biocellata*, *Ocybadistes walkeri hypochlora*, *Theclinesthes serpentata serpentata*, *Vanessa kershawi*.

**Possibly present at site:** *Anisynta cynone cynone* (V), *Candalides heathi heathi* (R), *Lucia limbaria* (R), *Ogyris amaryllis meridionalis*, *Oreixenica kershawi kanunda* (V).

Non-resident migrant and vagrant butterfly species will also likely be periodically observed at the site. These have only been listed if seen.

**SUMMARY:** The wetland butterfly indicator species *Hesperilla donnysa* was present at the site in low numbers, showing the site is not suffering from ongoing degrading processes. Another wetland butterfly indicator species *Hesperilla chrysotricha*, which indicates how pristine the site is, or if it has suffered previous severe degradation processes, was not observed. It was surprising however, that this butterfly was not present, as the present open *Gahnia* habitat is ideal for its existence. It would suggest the previous degradation processes were too severe for its survival. The nearest known location for this butterfly is presently Bucks Lake Game Reserve.

The site, if it can be preserved and revegetated, has considerable potential for the conservation of a number of threatened and rare butterflies, but particularly *Anisynta cynone* and *Hesperilla chrysotricha*, both of which may have to be reintroduced.

During the January visit, a good population of the rare Southeast form of *Erina hyacinthina* was seen. The mistletoe *Amyema melaleucae* seems to be very rare. It is a principle foodplant of *Ogyris meridionalis* and *Delias aganippe*, and the low density of the mistletoe may preclude viable breeding populations of these two butterflies in the area. January is the main flight time for the vulnerable small satyr *Oreixenica kershawi kanunda*. It was not seen and it is likely that the butterfly is not present.

### Site 3

**LOCATION:** Northeast Lake George.

**DATE OF SURVEY:** 8 March 2000, 15 January 2001.

**WEATHER CONDITION:** Hot and fine.

**HABITAT:** Wetland.

**VEGETATION TYPE:** Wetland remnant of mainly *Leptospermum lanigerum*/*Ozothamnus ferrugineus* with *Gahnia filum* and *Gahnia trifida*. A few scattered *Melaleuca halmaturorum*.

**CONDITION OF SITE:** A small wetland remnant, in reasonable condition, degraded by cattle and clearing. There are some peripheral areas of regenerated *Gahnia trifida*.

**OBSERVED BUTTERFLY FOODPLANT:** \**Carduus tenuiflorus*, *Cassytha pubescens*, *Distichlis distichophylla*, *Gahnia filum*, *Gahnia trifida*, Gramineae, \**Sisymbrium erysimoides*, \**Sisymbrium orientale*, \**Trifolium* spp.

#### **BUTTERFLY POPULATION:**

**Seen on site:** *Hesperilla donnyisa delos*, \**Pieris rapae*, *Vanessa itea*, *Zizina labradus labradus*.

**Seen in adjacent area:** *Danaus chrysippus petilia*, *Danaus plexippus*, *Delias aganippe* (R), *Junonia villida calybe*, *Theclinesthes albocincta*.

**Probably present at site:** *Geitoneura klugii*, *Heteronympha merope merope*, *Ocybadistes walkeri hypochlora*, *Taractrocera papyria papyria* (R), *Vanessa kershawi*.

**Possibly present at site:** *Anisynta cynone cynone* (V).

Non-resident migrant and vagrant butterfly species will also likely be periodically observed at the site. These have not been listed.

**SUMMARY:** The wetland butterfly indicator specie *Hesperilla donnyisa* was present at the site in low numbers, showing the site is not suffering unduly from ongoing degrading processes. Another wetland butterfly indicator specie *Hesperilla chrysotricha*, which indicates how pristine the site is, or if it has suffered previous severe degradation processes, was not observed. The nearest known location for this butterfly is presently Bucks Lake Game Reserve.

This site is too small and too degraded for most of the rarer butterflies, and even the common species would likely only be encountered in low numbers, if at all.

The site if it can be preserved, and adjacent areas revegetated, has potential for the conservation of threatened and rare wetland butterflies, particularly *Anisynta cynone* and *Hesperilla chrysotricha*, both of which may have to be reintroduced.

## **Site 4 and 5**

**LOCATION:** Northwest of Canunda Causeway, Sections 396, 397, 398.

**DATE OF SURVEY:** 8, 9 March 2000, 15 January 2001.

**WEATHER CONDITION:** Hot and fine.

**HABITAT:** Wetland and woodland.

**VEGETATION TYPE:** Stringybark woodland in the higher areas (S 396), *Gahnia clarkei* and *Leptospermum lanigerum/Melaleuca squarrosa/Ozothamnus ferrugineus* wetland with *Gahnia filum* and *Gahnia trifida* in the lower areas, and *Cladium/Typha* wetland in the wettest parts. There are occasional remnant stands of *Melaleuca halmaturorum* on the seaward side of the wetlands (S 397, 398).

**CONDITION OF SITE:** A large, badly fragmented wetland system. Some of the remnants have been fenced off. Most are grazed, either by cattle or sheep. Surprisingly, many of the wetland remnants are in reasonable condition, probably due to the fact that not all of them are grazed year round. There are large isolated areas of regenerated *Gahnia trifida*.

**OBSERVED BUTTERFLY FOODPLANT:** *Acacia melanoxylon*, *Acacia* spp, *Amyema preissii*, \**Carduus tenuiflorus*, *Cassutha pubescens*, *Distichlis distichophylla*, *Gahnia clarkei*, *Gahnia filum*, *Gahnia trifida*, Gramineae, *Muellerina eucalyptoides*, \**Sisymbrium erysimoides*, \**Sisymbrium orientale*, \**Trifolium* spp, *Urtica incisa*.

### **BUTTERFLY POPULATION:**

**Seen on site:** *Hesperilla donnyssa delos*, *Heteronympha merope merope*, *Heteronympha penelope penelope*, *Junonia villida calybe*, \**Pieris rapae*, *Vanessa itea*, *Zizina labradus labradus*.

**Seen in adjacent area:** *Danaus chrysippus petilia*, *Danaus plexippus*, *Delias aganippe* (R), *Erina hyacinthina hyacinthina*, *Geitoneura klugii*, *Lampides boeticus*, *Ogyris amaryllis meridionalis* (coastal form), *Taractrocera papyria papyria* (R), *Theclinesstes albocincta*, *Theclinesstes serpentata serpentata*, *Tisiphone abeona albifascia* (V), *Vanessa kershawi*.

**Probably present at site:** *Ocybadistes walkeri hypochlora*, *Taractrocera papyria papyria* (R).

**Possibly present at site:** *Anisynta cynone cynone* (V), *Candalides heathi heathi* (R), *Erina acasta*, *Erina hyacinthina hyacinthina*, *Geitoneura klugii*, *Hesperilla idothea idothea*, *Lucia limbaria* (R), *Nacaduba biocellata biocellata*, *Neolucia agricola agricola*, *Oreixenica kershawi kanunda* (V), *Tisiphone abeona albifascia* (V).

**Possibly present in adjacent areas:** *Dispar compacta*, *Ogyris abrota* (R), *Ogyris olane*, *Trapezites eliena*.

Non-resident migrant and vagrant butterfly species will also likely be periodically observed at the site. These have not been listed.

**SUMMARY:** The wetland butterfly indicator specie *Hesperilla donnysa* was locally present at the site in low numbers. Its distribution was very irregular, indicating that the remnants are under severe degradation pressure. Another wetland butterfly indicator specie *Hesperilla chrysotricha*, which indicates how pristine the site is, or if it has suffered previous severe degradation processes, was not observed. The nearest known location for this butterfly is presently Bucks Lake Game Reserve. Wetland butterfly indicators specifically for *Gahnia clarkei* wetland are *Hesperilla idothea* and *Tisiphone abeona*. There was no firm evidence for these butterflies at the site, and it is believed there are no resident breeding populations present, although *Tisiphone abeona* has been reported from the adjacent Canunda National Park. The survey site is also where the original population of the vulnerable small satyr *Oreixenica kershawi kanunda* was first found and described back in 1948, when there were still vast areas of pristine habitat. The survey area was severely fragmented in the 1950's and this butterfly has not been seen in the area since that time.

Some of the small *Gahnia clarkei* remnants occurring on the south side of the site are still in their original pristine condition, and have not suffered overly from grazing. They would seem to be adequate enough to support those butterflies that specialise in that habitat, such as *Hesperilla idothea idothea*, *Oreixenica kershawi kanunda* (V) and *Tisiphone abeona* (V). It was therefore a surprise that there was no firm evidence for these butterflies. The lack of the above rarer butterflies would suggest the remnants have suffered severe degradation in the past, and have still not fully recovered.

The understorey of the woodland remnants is near totally degraded. However, there are still excellent roadside remnants of this habitat adjacent to the Woakwine Range, with diverse understorey containing *Lomandra longifolia*, the foodplant for the endemic vulnerable skippers *Trapezites eliena* and *Trapezites symmumus*.

The site remnants, if they can be preserved and adjacent areas revegetated, have considerable potential for the conservation of a large number of threatened and rare butterflies, particularly

*Anisynta cynone cynone* (V), *Candalides heathi heathi* (R), *Hesperilla chrysotricha cyclospila* (V), *H. idothea idothea*, *Lucia limbaria* (R), *Ogyris abrota* (R), *Oreixenica kershawi kanunda* (V), *Taractrocera papyria papyria* (R), *Tisiphone abeona albifascia* (V), *Trapezites eliena* (V), *Trapezites symmumus soma* (V). Unfortunately, many of the species may have trouble returning naturally, and may have to be reintroduced.

## 5.4 Vertebrates

### 5.4.1 Birds 2000-2002

*by Graham Carpenter*

#### *Methods*

Birds were recorded using the standard Biological Survey technique because it was considered important to maximise coverage at each site. About one hour in both the morning and afternoon were spent at each of the five sites during the survey period each year, 2000-2002. A similar sized area of about 5 ha was searched on foot at each site and all bird species seen or heard were recorded. Species flying over only were also noted, although these were not included in the analysis. Morning and afternoon counts are combined in the analysis.

#### *Results*

A total of 64 bird species have been recorded at the 5 sites over the survey period. In 2002 sites were found to share a similar number of species (20-24) except ST05 (Canunda paddock) where only 11 species were recorded. A total of 238 observations (Table 1) of 610 individuals were made at the five sites in 2002. Similar numbers of observations were made at Sites 1, 2 and 4 and the fewest at Site 5 (Canunda paddock). The most individuals were also recorded from Site 4 but the fewest from Site 5.

Significant species included Southern Emu-wren (all sites except 5), Rufous Bristlebird (both Lake St Clair sites), Beautiful Firetail (all sites except Canunda paddock and Lake George) and Golden-headed Cisticola (Sites 4 and 5).

#### *Discussion*

The species recorded for each site were similar between surveys. New species in 2002 were Emu (tracks at Sites 1 and 2), Yellow-tailed Black Cockatoo (small flock overhead at Site 2), Whistling Kite (1 at Site 3) and Stubble Quail (1 at Site 4). In addition, brief sightings were made of a single rail as it flushed from both Sites 1 and 2, probably a Lewin's Rail. The Lewin's Rail is a State listed vulnerable species that has been recorded from few sites in the South-east. Jaensch (1987) reported a pair with young at a small saltlake south-east of Robe in 1981.

The 2002 survey recorded less individuals for most sites than the 2000 and 2001 surveys (Appendix E), probably because of the windy conditions experienced in 2002.

A comparison of the Lake St Clair sites suggests a further increase in the numbers of Superb Fairy-wrens and Southern Emu-wrens at Site 2 after it was fenced to exclude stock. This might be due to an increase of low (0-1m) cover evident at this site (see Vegetation section 5.2).

The largest differences in birdlife are evident at Site 5, which now has a cover of sedges and clover up to 30 cm high since being fenced from stock. Golden-headed Cisticolas were widespread in this area, while Australian Magpie, Richard's Pipit, Little Raven and Skylark have declined.

## 5.4.2 Terrestrial vertebrates (pitfalls and observation) 2000-2002

by Stephen Milne and Gavin Kluske

### Methods

Monitoring was carried out using a modified Biological Survey technique. Twenty standard pitfall traps, measuring 40cm deep by 15cm diameter, were installed at each site for four trap-nights during April 2000, March 2001 and March 2002. Active searching for animals, scats and tracks was carried out at each site for at least one hour.

**Table 1. Trapping effort**

Site	Location	Nights open	No. of pits
ST01	Lake St Clair ungrazed	4	20
ST02	Lake St Clair grazed (Woakwine property)	4	20
ST03	Lake George	4	20
ST04	Canunda Causeway grazed swamp (Ellis)	4	20
ST05	Canunda Causeway paddock (Watts)	4	20

Note: Vertebrate taxonomy and common names used in this report follow Robinson et al. (2000).

### Results

A total of 25 vertebrate species have been recorded over the monitoring period, consisting of 9 reptile, 6 frog and 10 mammal species. Table 2 shows the number of animals recorded in pitfalls.

Three species of conservation significance were recorded: *Egernia coventryi* (swamp skink), *Pseudemoia rawlinsoni* (glossy grass skink) and *Antechinus minimus* (swamp antechinus). In addition, the skink *Nannoscincus maccoyi* was captured at the Canunda Crossing swamp (site 4). This species has never previously been recorded in South Australia, and consequently has no formal conservation status. However, it is probably more rare and less secure in South Australia than the state-endangered *E. coventryi* or *P. rawlinsoni*.

All species recorded in the first year of monitoring were also recorded in this second year, except *Pogona barbata* (bearded dragon) and *Limnodynastes dumerilii* (eastern banjo frog). Four additional native species were recorded in this second year of monitoring: *Austrelaps superbus*, *Neobatrachus pictus*, *Nannoscincus maccoyi* and *Tachyglossus aculeatus*. Perhaps as a result of cooler weather in the third year, reptile diversity was slightly lower than in the first two years.

The endangered skink *Egernia coventryi* was captured in a pitfall for the first and only time in 2001 at the Canunda Crossing swamp (site 4); it was first captured there in 2000 in an Elliott trap. The diurnal, surface-active skink *Pseudemoia entrecasteauxii* was recorded for the first time in 2001 at Lake St Clair (site 2) and *Pseudemoia rawlinsoni* (Glossy Grass Skink) was also recorded this site in 2002. However, activity of these small skinks at the Lake St Clair sites was still not noticeable; they are obviously present, but not in large numbers.

*P. entrecasteauxii* was also captured for the first time at the Canunda Crossing grazed paddock (site 5) in 2001 and again in 2002, while *Notechis scutatus* was first detected at this site in 2002. Vegetation cover at this site has increased progressively each year and may explain the

improvement in survey results from the site.

Snakes were heard in or observed fleeing into *Gahnia* tussocks at most sites; tiger snakes (*Notechis scutatus*) and/or copperheads (*Austrelaps superbus*) are likely to be present at all vegetated sites.

**Table 2. Terrestrial Vertebrates Recorded in Pitfalls/Observed 2000 - 2002**

SPECIES	COMMON NAMES	Lake St Clair			Lake St Clair			Lake George			Canunda Flat			Canunda Flat			
		ST01			ST02			ST03			ST04			ST05			
		'00	'01	'02	'00	'01	'02	'00	'01	'02	'00	'01	'02	'00	'01	'02	
<b>FROGS</b>																	
<i>Crinia signifera</i>	Common Froglet	1	1			2		11	6	23		3	13	7	12	64	11
<i>Limnodynastes dumerilii</i>	Eastern Banjo Frog				1			2									1
<i>L. peronii</i>	Striped Marsh Frog			1				1	1	2		19	13	82	5	3	33
<i>L. tasmaniensis</i>	Spotted Grass Frog											2			5	4	3
<i>Litoria ewingii</i>	Brown Tree Frog								1	2		1	1	7	4	20	2
<i>Neobatrachus pictus</i>	Meeowing Frog					1											1
<b>REPTILES</b>																	
<i>Austrelaps superbus</i>	Lowland Copperhead													1	1		
<i>Egernia coventryi</i>	Swamp Skink													1			
<i>Hemiergis peronii</i>	Four-toed Earless Skink		1			1			1								
<i>Pseudemoia entrecasteauxii</i>	Southern Grass Skink					2	1	10	17	11		3	4	2		2	1
<i>Pseudemoia rawlinsoni</i>	Glossy Grass Skink						1					1	1				
<i>Nannoscincus maccoyi</i>	Salamander Skink												1	1	1		
<i>Notechis scutatus</i>	Tiger Snake	1										1	1	6			1
<i>Pogona barbata</i>	Bearded Dragon	1															
<i>Tiliqua sp.</i>	Blue-tongue lizard		1														
<b>MAMMALS</b>																	
<i>Antechinus minimus</i>	Swamp Antechinus	1		1		2	1										
<i>Mus musculus*</i>	House Mouse	1	1	5	1	6	3	1				4	5	1	3		6
<i>Rattus fuscipes</i>	Bush Rat	1	2														
<i>Rattus lutreolus</i>	Swamp Rat							1				1	1	2			
<i>Dama dama*</i>	Fallow Deer	1	1			1											
<i>Lepus capensis*</i>	Hare												1				
<i>Macropus fuliginosus</i>	Western Grey Kangaroo	1	1	5		1	1	1				1	1	1			
<i>Tachyglossus aculeatus</i>	Echidna								1								
<i>Vombatus ursinus</i>	Common Wombat	1	1		1	1	1										
<i>Vulpes vulpes*</i>	Fox												1				

## Discussion

The single *Nannoscincus maccoyi* records from 2001 and 2002 are extremely significant. This genus (which contains only the one species in Australia) had never been recorded in South Australia. *N. maccoyi* is an inhabitant of the cooler and wetter areas in south-eastern New South Wales and southern and eastern Victoria. It is extremely sensitive to temperature and desiccation, having the lowest preferred body temperature (21°C) and the highest rate of desiccation known from any Australian skink (Greer 1989). The Canunda Crossing swamp is subject to a much warmer and drier climate than any other known habitats, so this may represent an important outlier population. The digital formula of the two individuals captured (four fingers and three toes) also differs from all other populations of *Nannoscincus maccoyi*; most have five fingers and toes, while some eastern Victorian animals have four fingers and five toes.

The capture of *N. maccoyi* at the Canunda Crossing swamp further highlights the importance of these lower South East swamp remnants in maintaining the biological diversity of the region, and serves as further emphasis of the need to protect and rehabilitate the few remnants we have left. It is also a reminder that we still know very little about the biodiversity or ecology of these ecosystems.

### 5.4.3 Terrestrial vertebrates (Elliott trapping) 2000-2002

by Mark Bachmann

#### Methods

Monitoring was carried out by setting up transects through the habitats to be sampled. Elliott traps were placed out in pairs, spaced apart in approximately 10 metre intervals. When practical, traps were placed out on site shut 2-3 days prior to survey to enable to reduce the chances of a disturbance response from local small faunal populations. The traps were baited with a mixture of peanut butter, rolled oats and honey and set for between 2 and 4 nights. Seventy-five traps were set at Site 1, as this is an established survey transect of an ongoing monitoring program for the Swamp Antechinus. All other sites were set with 60 traps for the survey period.

**Table 1. Trapping effort**

Site	Location	Nights open			No. of traps
		'00	'01	'02	
ST01	Lake St Clair ungrazed	3	*2	4	75
ST02	Lake St Clair grazed (Woakwine property)	3	*2	4	60
ST03	Lake George	3	4	4	60
ST04	Canunda Causeway grazed swamp (Ellis)	3	4	4	60
ST05	Canunda Causeway paddock (Watts)	3	4	4	60

\*These sites were surveyed in December 2000

#### Results

A total of 10 species have been recorded over the survey period in Elliott Traps, including 1 amphibian, 3 reptiles, 5 mammals and 1 bird species. Table 2 shows the number of animals captured in Elliott Traps.

**Table 2. Terrestrial Vertebrates Recorded in Elliotts 2000 - 2002**

SPECIES	COMMON NAMES	Lake St Clair			Lake St Clair			Lake George			Canunda Flat			Canunda Flat		
		ST01			ST02			ST03			ST04			ST05		
		'00	'01	'02	'00	'01	'02	'00	'01	'00	'00	'01	'02	'00	'01	'02
FROGS																
<i>Litoria ewingii</i>	Brown tree frog														28	
REPTILES																
<i>Egernia coventryi</i>	Swamp skink										1	3				
<i>Notechis scutatus</i>	Tiger snake											1	1			
<i>Tiliqua</i> sp.	Blotched Blue-tongue		2			3										
MAMMALS																
<i>Antechinus minimus</i>	Swamp Antechinus	41	52	54		6	13									
<i>Mus musculus</i> *	House Mouse	3	5	67	53	11	79	116	36	125	39	28	25	8	2	4
<i>Rattus fuscipes</i>	Bush Rat	63	25	66	17	5	56									
<i>Rattus lutreolus</i>	Swamp Rat	28	14	48	2	13	55	16	3	4	11	12	12			
<i>Rattus rattus</i> *	Black Rat							2		1						
BIRDS																
<i>Rallus pectoralis</i>	Lewin's Rail			2												

Three significant species have been captured during the monitoring program; the Swamp Skink and Swamp Antechinus, which are endangered in SA, and Lewin’s Rail, which is listed as vulnerable in this state.

A single Swamp Skink was initially detected at Site 4 in 2000 and there were three subsequent captures there in 2001. This species was not detected in 2002 and has not been located at any other site.

The Swamp Antechinus is present at the control site, Site 1, where it forms a significant component of the local small mammal community and has been detected in strong numbers each year. The species also appears to be re-establishing in the formerly grazed neighbouring habitat at Site 2, where captures have increased from nil in 2000 to 13 in 2002. Similarly, increased captures of Swamp and Bush Rats appear to indicate a marked improvement in habitat health for native small mammals at Site 2.

The capture of a Lewin’s Rail (an individual caught twice) at the control site is an unusual but important record in confirming this species presence at the site. Graham Carpenter reported in the birds section of this report that rails, which he assumed were Lewin’s Rails, were flushed from both sites 1 and 2.

Figures 1 to 5 display the trends for each species/site over time, with the number of captures made comparable based on the number of traps actually checked. Of these, only site 2 appears to display what could be interpreted at a trend of improved health in the small mammal community. At this site the average number of captures for native species has increased with time. House mouse numbers are erratic which is normal for this species depending on the availability of their preferred resources at any given time.

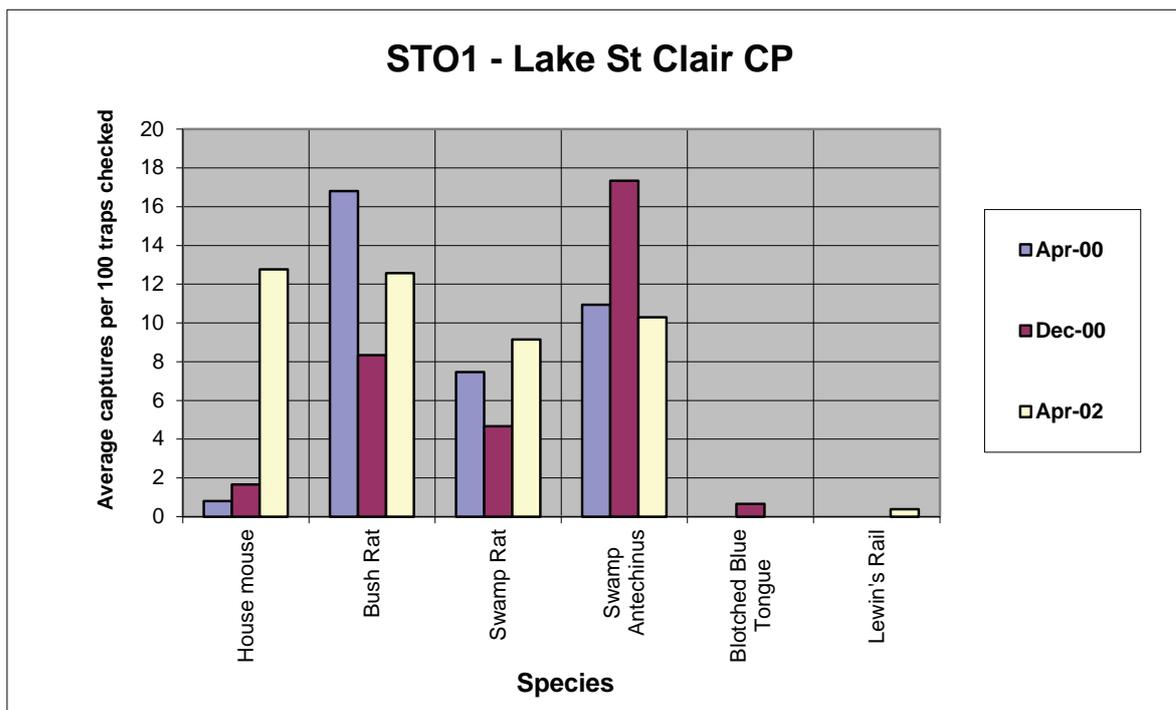


Figure 1 Comparative summary of results for Site 1

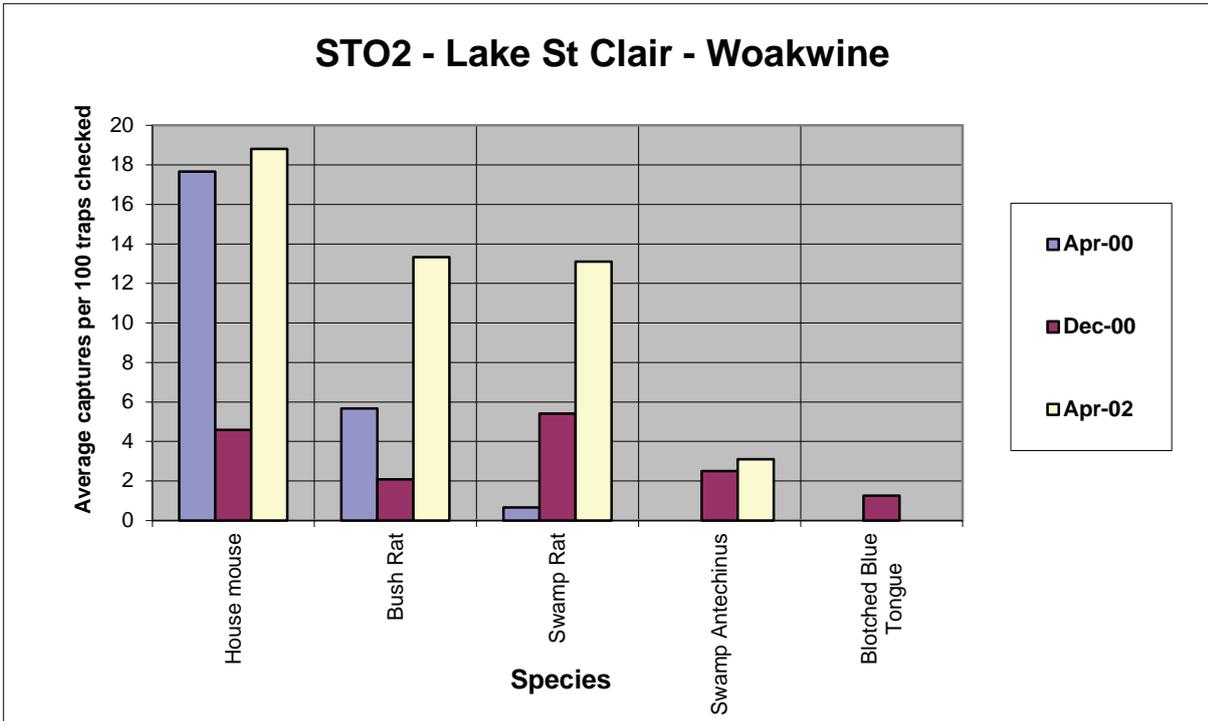


Figure 2 Comparative summary of results for Site 2

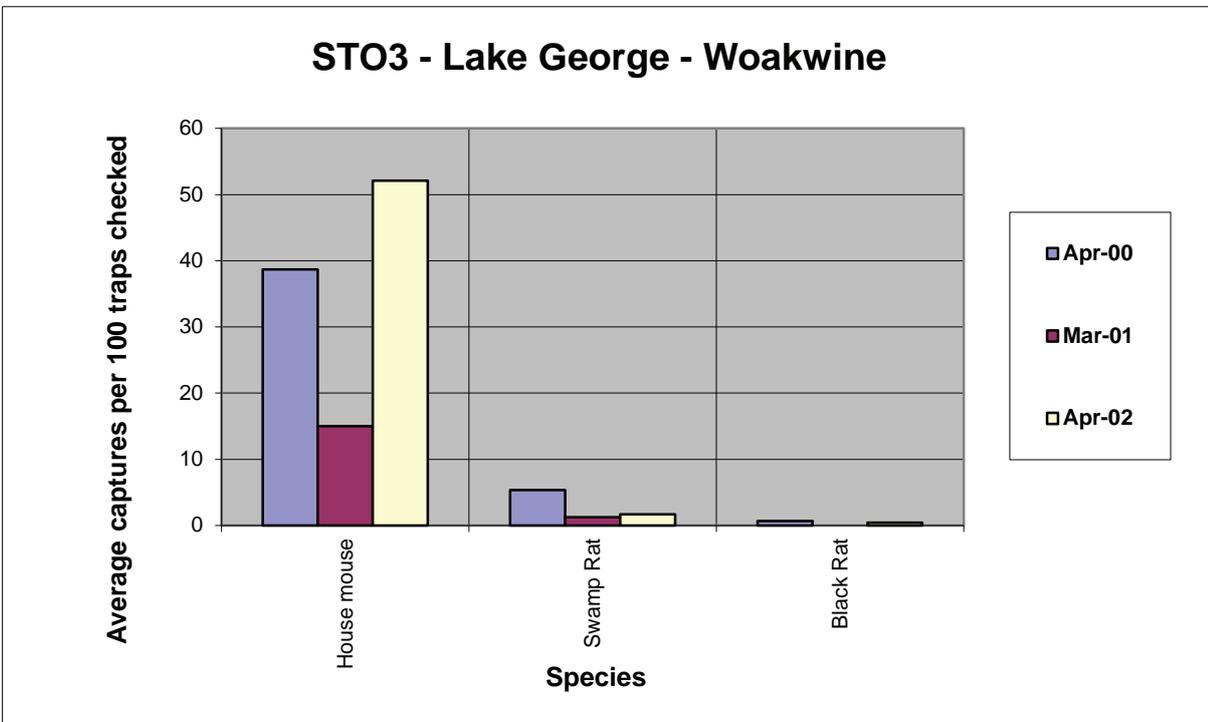


Figure 3 Comparative summary of results for Site 3

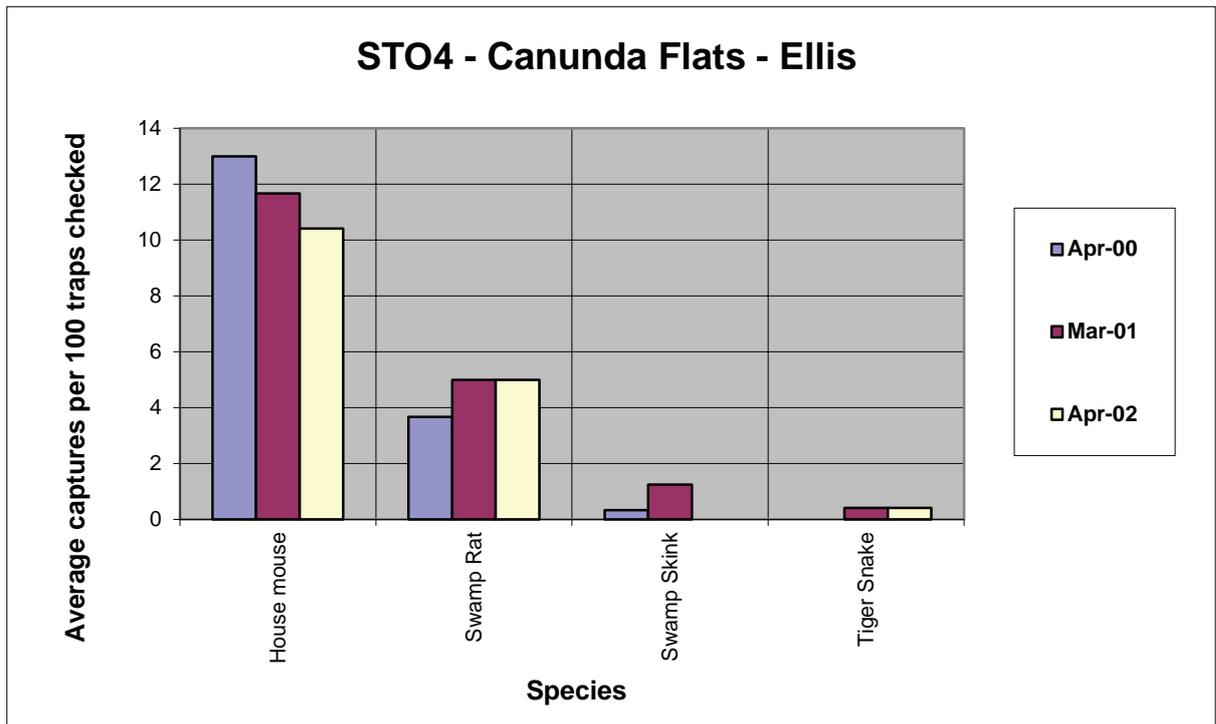


Figure 4 Comparative summary of results for Site 4

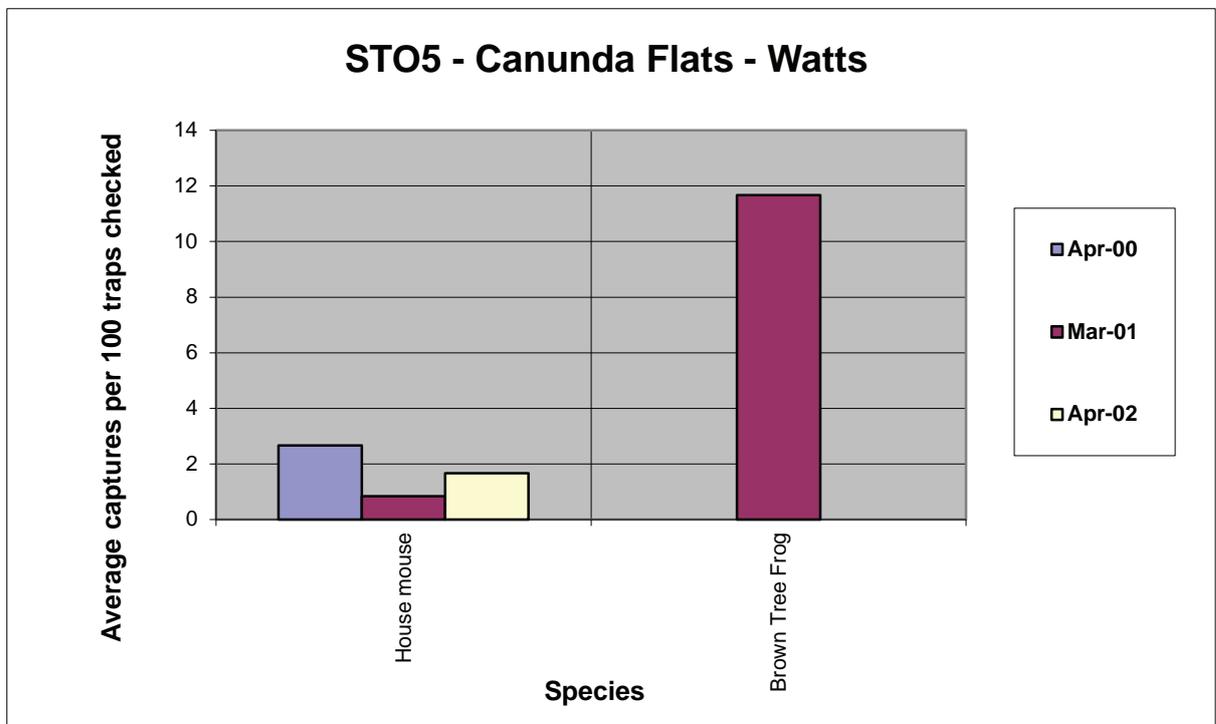


Figure 5 Comparative summary of results for Site 5

## Discussion

The confirmation of Lake St Clair as a site for Lewin's Rail was significant, as indeed was capturing the same individual twice in an Elliott Trap. This species is rarely seen by ornithologists as a result of its secretive behaviour, moving through, feeding and nesting in thick wetland undergrowth.

The apparent re-establishment of a Swamp Antechinus population at Lake St Clair site 2, highlights the significance of protecting grazed remnants. Not only is removing stock grazing important in allowing understorey density and diversity to recover, but this also indicates the value of being in close proximity to pristine habitat. This recovering area now serves the dual role of acting both as a buffer zone to the pristine habitat, but also as potential habitat for species within that area to recolonise.

The capture of the Swamp Skink in Elliott traps has reaffirmed the usefulness of this method in detecting this particular threatened species of reptile. Four of the five captures over the monitoring program have been made in Elliott traps.

Overall the Elliott trapping component of the monitoring program has proven to be a valuable way of measuring changes in the small mammal communities of each site, as well as being a vital tool in providing opportunistic captures of other vertebrates such as reptiles and birds.

## SECTION 6: REFERENCES AND APPENDICES

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## The Silky Tea-tree & Cutting Grass Wetland Rehabilitation Team

- The team is open to any interested people, particularly community groups and locals of the lower South East.
- We will attempt to reverse the current trend of degradation in remnant silky tea-tree and cutting grass wetlands by working in cooperation with landholders to fence habitat remnants on private property.
- The rehabilitation of fenced sites will be monitored by the team and searches conducted for threatened plants and animals.
- The team is being funded by the Natural Heritage Trust



Photo: J. van Weenan

Trapping exercise for the Swamp Antechinus



Photo: J. van Weenan

The Swamp Antechinus

To become involved or for further information contact:

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 Address: 120 Wakefield St.  
 ADELAIDE-5000

## Silky Tea-tree & Cutting Grass Wetland Rehabilitation Project

## Silky Tea-tree and Cutting Grass Wetland Rehabilitation Brochure



*Protecting habitat for threatened animals and plants in the lower South East*

## Silky Tea-tree and Cutting Grass Habitats

Silky Tea-tree (also known as Woolly or Blue Tea-tree) and Cutting Grass Habitats are highly threatened in the lower South East of SA. These habitats tend to occur in low-lying areas that are prone to having waterlogged soil.



Photo: J. van Weenan

1. Silky Tea-tree (*Leptospermum lanigerum*)
2. Cutting Grass (*Gahnia* sp.)

Land clearance for agriculture and land drainage schemes have threatened these habitats in the lower South East. The remnants that remain today are typically small and isolated. In addition, the degradation of these habitats by sheep or cattle grazing continues at many sites.

We need to protect these habitats as they support a variety of threatened plants and animals, some of which only occur in these specific habitat types, including the following examples:

## Swamp Greenhood (*Pterostylis tenuissima*)



Photo: Courtesy of G. Bachhouse

- The Swamp Greenhood is a slender orchid that grows to a height of 20cm. It is listed as vulnerable nationally, being highly restricted in SA and Vic.
- This orchid only survives in dense, shaded habitats that are a characteristic of Silky Tea-tree swamps and mainly flower between October and March.

## Rufous Bristlebird (*Dasyornis broadbenti whitei*)



Photo: L. Pedler

- The Rufous Bristlebird is restricted to coastal heath habitats (including Silky Tea-tree heath) from the Coorong through into Victoria.

## Swamp Antechinus (*Antechinus minimus maritimus*)



Photo: J. van Weenan

- The Swamp Antechinus is a small insectivorous marsupial that is listed as endangered in South Australia and rare in Victoria.
- Unfortunately, the Swamp Antechinus has a high risk of becoming locally extinct in isolated habitat remnants due to continuing habitat degradation.

## Swamp Skink (*Egernia coventryi*)



Photo: J. van Weenan

- The Swamp Skink is an endangered, medium sized reptile that has distinctive black and gold scales.
- In SA it has only been found in a few thickly vegetated swamps in the lower South East.

## Appendix B: Invertebrate Results 2000

### April 2000 Survey

ORDER	STO 01	STO 02	STO 03	STO 04	STO 05	Total	%
Blattodia	0	1	1	0	0	2	0.02
Coleoptera	1	1	13	10	106	131	1.35
Collembola	42	500	5000	1500	2000	9042	93.41
Dermaptera	1	0	0	0	0	1	0.01
Diptera	15	11	9	17	65	117	1.21
Formicidae	57	80	8	0	2	147	1.52
Hemiptera	0	0	0	8	2	10	0.10
Hymenoptera	0	1	1	0	3	5	0.05
Isopoda	6	0	1	0	0	7	0.07
Orthoptera	6	7	3	1	4	21	0.22
Siphonaptera	0	0	3	0	0	3	0.03
Thysanoptera	1	0	0	0	0	1	0.01
Diplopoda	0	0	4	0	0	4	0.04
Acarina	2	35	8	18	63	126	1.30
Araneida	2	3	13	5	8	31	0.32
Amphipoda	4	4	8	7	11	34	0.35
<b>Total</b>	<b>137</b>	<b>642</b>	<b>5071</b>	<b>1566</b>	<b>2264</b>	<b>9680</b>	
Site Percentage	1.415	6.632	52.386	16.178	23.388		

## Appendix C: Invertebrate Results 2001

### March 2001 Survey

ORDER	STO 01	STO 02	STO 03	STO 04	STO 05	Total	%
Blattodia	0	0	0	0	0	0	0.00
Coleoptera	30	90	13	11	11	155	5.94
Collembola	154	57	195	230	60	696	26.66
Dermaptera	7	13	0	0	1	21	0.80
Diptera	29	39	46	18	100	232	8.89
Formicidae	92	95	35	2	141	365	13.98
Hemiptera	6	12	13	10	40	81	3.10
Hymenoptera	3	7	5	6	13	34	1.30
Isopoda	6	26	0	0	0	32	1.23
Orthoptera	13	10	9	1	2	35	1.34
Phasmatodea	0	1	0	0	0	1	0.04
Protura	0	0	1	0	0	1	0.04
Siphonaptera	0	1	0	0	0	1	0.04
Thysanoptera	2	0	0	1	1	4	0.15
Diplopoda	0	0	0	0	0	0	0.00
Acarina	141	125	100	70	420	856	32.78
Araneida	6	23	13	10	12	64	2.45
Amphipoda	5	9	6	8	5	33	1.26
<b>Total</b>	<b>494</b>	<b>508</b>	<b>436</b>	<b>367</b>	<b>806</b>	<b>2611</b>	
Site Percentage	18.92	19.46	16.70	14.06	30.87		

## Appendix D: Butterfly Results 2002

Common name	Scientific name	Date	Lake St Clair - grazed		Lake St Clair CP		Lake George		Watts new wetland		Ellis wetland	
			12-Feb-02	10-Mar-02	12-Feb-02	10-Mar-02	12-Feb-02	10-Mar-02	12-Feb-02	13-Mar-02	12-Feb-02	13-Mar-02
Common brown	<i>Heteronympha merope</i>		3	3	1	2	2	1				
Grass blue	<i>Zizina labradus</i>		3	10	2		C	A	B	D	A	C
Dusky blue	<i>Erina hyacinthina</i>	R	A				A					
Cabbage white	<i>Pieris rapae</i>		B		1		C		B	8	C	C
White-banded grass-dart	<i>Taractroceera papyria</i>	R	1	1	3							
Meadow argus	<i>Junonia villida</i>		1				A					
Donnysa skipper	<i>Hesperilla donnysa</i>	U	3	2			B		2			
Australian admiral	<i>Vanessa itea</i>						1					
Wanderer	<i>Danaus plexippus</i>											1

Abundance code:  
A = 1-3, B = 4-10, C = 11-30, D = 31-100, E = 101+

Conservation Status code for SA as per South Australian Butterflies website (1998). [www.chariot.net.au/~rgrund](http://www.chariot.net.au/~rgrund)

E = Endangered, V = Vulnerable, R = Rare, U = Uncommon

**Appendix E: Bird monitoring results 2000-2002**

COMMON NAME	SCIENTIFIC NAME	Site 1			Site 2			Site 3			Site 4			Site 5		
		00	01	02	00	01	02	00	01	02	00	01	02	00	01	02
Emu	<i>Dromaius novaehollandiae</i>				Tracks	4		Tracks								
Black Swan	<i>Cygnus atratus</i>											Old nests each year				
White-faced Heron	<i>Ardea novaehollandiae</i>											1	47	13		
Australian White Ibis	<i>Threskiornis aethiopicus</i>											2				
Wedge-tailed Eagle	<i>Aquila audax</i>															1
Whistling Kite	<i>Haliastur sphenurus</i>								1							
Swamp Harrier	<i>Circus approximans</i>											1				
Peregrine Falcon	<i>Falco peregrinus</i>											1				
Brown Falcon	<i>Falco berigora</i>	1			2	1	1					2	1		1	3
Australian Hobby	<i>Falco longipennis</i>								1							
Nankeen Kestrel	<i>Falco cenchroides</i>								1						1	1
Black-shouldered Kite	<i>Elanus notatus</i>			1		1	1	2	1			3	1			
Purple Swamphen	<i>Porphyrio porphyrio</i>											Skeleton				
Buff-banded Rail	<i>Gallirallus philippensis</i>								1							
Lewin's Rail	<i>Rallus pectoralis</i>			1			1									
Stubble Quail	<i>Coturnix pectoralis</i>											1				
Banded Lapwing	<i>Vanellus tricolor</i>														2	2
Masked Lapwing	<i>Vanellus miles</i>											42	24	45	2	
Brush Bronzewing	<i>Phaps elegans</i>	2	1	1	1	2										
Crested Pigeon	<i>Ocyphaps lophotes</i>														2	
Yellow-tailed Black																
Cockatoo	<i>Calyptorhynchus funereus</i>						4									
Galah	<i>Eolophus roseicapillus</i>															6
Eastern Rosella	<i>Platycercus eximus</i>							2	7	2						
Blue-winged Parrot	<i>Neophema chrysostoma</i>											2	5	36		11
Superb Fairy-wren	<i>Malurus cyaneus</i>	3	16	25	11	23	33	18	13	12		36	22	28	6	2
Southern Emu-wren	<i>Stipiturus malachurus</i>	4	9	7	3	11	13	8	12	9		10	11	9		
Rufous Bristlebird	<i>Dasyornis broadbenti</i>	3	5	4	1	4	5									
White-browed Scrub-wren	<i>Sericornis frontalis</i>	6	11	18	7	2	5	9	13	5		8	9	8		edge
Striated Fieldwren	<i>Calamanthus fuliginosus</i>	3	1	3	9	12	11	2	8	3		11	8	9	1	1
Brown Thornbill	<i>Acanthiza pusilla</i>	4	16	7	4	5	4	4	9	2		4	4	4		
Yellow-rumped Thornbill	<i>Acanthiza chrysorrhoa</i>		4	3	4	3	4									
Spiny-cheeked Honeyeater	<i>Acanthogenys rufogularis</i>		4			3	2		1							
Red Wattlebird	<i>Anthochaera carunculata</i>		1				2		1							
Little Wattlebird	<i>Anthochaera chrysoptera</i>		1	1					2							
Yellow-faced Honeyeater	<i>Lichenostomus chrysops</i>		1	1						1		1				
Singing Honeyeater	<i>Lichenostomus virescens</i>											2				edge
New Holland Honeyeater	<i>Phylidonyris novaehollandiae</i>	4	4	11	3	2		9	7	10		1				
White-fronted Chat	<i>Ephthianura albifrons</i>				2	4		2	32	15		10	12	2		12
Eastern Yellow Robin	<i>Eopsaltria australis</i>	2	3	2	1		1	1	1							7
Restless Flycatcher	<i>Myiagra inquieta</i>		1													3
Golden Whistler	<i>Pachycephala pectoralis</i>	3		3				1		1						
Grey Shrike-thrush	<i>Colluricincla harmonica</i>	2	3	3		3	6	1	1	2		1	1			
Magpie-lark	<i>Grallina cyanoleuca</i>								4			2	2		2	2
Grey Fantail	<i>Rhipidura fuliginosa</i>	1	11	9	1	3	5	2		1		1				
Willie Wagtail	<i>Rhipidura leucophrys</i>							1	2			2		1	2	2
Dusky Woodswallow	<i>Artamus cyanopterus</i>							3				5	4			
Australian Magpie	<i>Gymnorhina tibicen</i>				6	4	6	4		3		18	2	4	18	36
Grey Butcherbird	<i>Cracticus torquatus</i>						2									4
Grey Currawong	<i>Strepera versicolor</i>	2	1	1												
Forest Raven	<i>Corvus tasmanicus</i>	1		4	2	2	2		1	2				2		2
Little Raven	<i>Corvus mellori</i>			1		1	2	2				4	1	7	13	52
Skylark	<i>Alauda arvensis</i>											2			7	1
Richard's Pipit	<i>Anthus novaeseelandiae</i>					1						1			3	2
Red-browed Finch	<i>Neochmia temporalis</i>	2	7			4			4							
Beautiful Firetail	<i>Stagonopleura bella</i>	3		7	3	3	2	2	1			3	1	1		edge
European Goldfinch	<i>Carduelis carduelis</i>	1		8	2	2		2	15			6	3	24	33	
European Greenfinch	<i>Carduelis chloris</i>								1							
Welcome Swallow	<i>Hirundo neoxena</i>	1	11		6	2	4	9	4	1		2	3		2	3
Tree Martin	<i>Hirundo nigricans</i>			15												
Golden-headed Cisticola	<i>Cisticola exilis</i>					5		3				6	5	16		14
Brown Songlark	<i>Cinclorhamphus cruralis</i>															1
Little Grassbird	<i>Megalurus graminea</i>			3					1					2		
Silvereye	<i>Zosterops lateralis</i>	3	36	11	2	23	4	8	63	8		43	6	17		
Common Blackbird	<i>Turdus merula</i>	1		1	2		1	1	2							
<b>TOTAL INDIVIDUALS</b>	<b>1959</b>	<b>52</b>	<b>165</b>	<b>133</b>	<b>73</b>	<b>126</b>	<b>120</b>	<b>97</b>	<b>206</b>	<b>83</b>	<b>221</b>	<b>175</b>	<b>238</b>	<b>107</b>	<b>127</b>	<b>36</b>