

Volume 28 Part 1

2010

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better parks....or
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**Conservation Biology
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Interactions between
global & local stressors:
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**Murray Darling Basin
Refugia Survey**

**NCSSA Conservation
Biology Grant 2010**

Around NCSSA

NCSSA major concerns include

- **Native vegetation, threatened species and habitats**
- **Protecting all forms of life (biodiversity) on land and in the oceans**
- **Park dedication, management and legislation**
- **Education about biodiversity to all sections of the community**
- **Cooperation with other conservation groups**

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Biodiversity indicators for schools

The NCSSA, in conjunction with the Department for Education and Children's Services, will be developing a series of biodiversity indicators for schools. These indicators will enable students and teachers to evaluate current biodiversity attributes of their school and grounds, and will provide the basis for re-evaluation in the future to see if changes have occurred.

At this stage, we are working on a birds indicator, which will centre on students observing a bird's behaviour and appearance and scoring the type of foraging "guild" that bird belongs in.

This is an exciting project, and will hopefully lead to NCSSA being involved in the development of a variety of different indicators. Tina Gillespie (nee Bentz) will be leading this project.

NCSSA to accurately map all 160 of our woodland bird sites onto GIS.

These sites have been monitored 3 times per year across spring and summer for the last ten years by our surveyors (for a summary of this project, see *Xanthopus* Autumn 2008).

The funding support will allow us to create an overall map of sites that the Board can use to demonstrate the monitoring that is occurring in the region, and will also help us to create individual site maps for assessors to use - including such details as nearest safe place to park! This will supplant the photocopies of 1:50,000 maps we currently use.



Extra Support for Woodland Birds Monitoring Project

The Adelaide and Mount Lofty Ranges Natural Resources Management Board have provided funding for

NCSSA people

Management Committee

President Helen Vonow
Vice-President Katie Fels
Secretary Susan Graham
Assistant Secretary Caroline Taylor
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General committee

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Ben Taylor
Hugh Kneebone
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Conservation Ecologists Anthelia Bond and Georgina Mollison
Administrative Manager Elizabeth Lonie
Project Manager Tim Milne
Temperate Woodland Campaigner Penny Paton
Threatened Plant Action Group Coordinator Tim Jury
MLR Woodland Bird Survey Coordinator Tina Bentz
Database & Website Project Officer Lesley Parton
Other ongoing project staff: Bill New, Kerry Gilkes

Regular volunteers

Sara Boulton - *Activities sub-committee*
Max Possingham - *Membership database*
Keith Lloyd - *General office support and library*
Christina Robertson - *General support*

Conservation Ecologist's Report:

Arkaroola – Conservation and Resource Use in the Northern Flinders Ranges

The Society recently provided comments on the document *Seeking A Balance: Conservation and Resource Use in the Northern Flinders Ranges*. This is an extremely disappointing and scientifically flawed document developed by DEH and PIRSA to redefine the mineral exploration access zones for the Northern Flinders Ranges.

We have recently received notification that the Departments received 485 submissions regarding this document and that all of these submissions will soon be available on the PIRSA website (www.pir.sa.gov.au). A copy of the NCSSA submission can be found on our website.

Black Hill - Morialta Conservation Parks Trail Plan - Community Reference Group

The Society's involvement in the development of trails Master Plans for Parks in South Australia has continued. We recently sent a letter to DEH regarding their consultation process for these plans. This letter requested an improved commitment to a fair and genuine consultation process in order to ensure the effectiveness and value of the time and expertise we have been investing in reference group participation. We are currently awaiting a response to this communication.

Cleland Conservation Park - Trails Master Plan

Over the last two years the Society has invested a great deal of time in the development of the Cleland Conservation Park Trails Master Plan, including providing detailed written comments on the draft plan and attending numerous meetings.

The Society believes that the Trails Master Plan provides inadequate consideration for conservation objectives, and fails to adequately assess the impacts of trails development on biodiversity. We are also gravely concerned about the recommendation to review cycling access to the park, as this recommendation has been made on the basis of subjectively interpreted, unverified evidence.

We are disappointed to report that after much work on our part, none of our comments or recommendations have been included in the plan.



Duck Hunting

The Society has continued to be an active member in the Duck and Quail Hunting Reference Group.

We can report that DEH have announced a restricted duck and quail hunting season for 2010.

The Development of Torrens Island

The Society has recently been made aware of a State Government plan lodged with the Development Assessment Commission (DAC), to develop the last of the Port's remnant sand dune system on Torrens Island. This plan proposes to carve up 48 hectares of "unused" Crown land on Torrens Island to create seven new industrial allotments.

The proposal will put at risk the remnant vegetation of the northern tip of the Island and would have dire implications for the EPBC listed mangrove communities of the region. The Society also questions the secretive nature of the proposal and we are calling for an open and transparent public consultation process.

More information about this development can be found in an article featuring in the current issue of the Portside Messenger, which can be viewed at www.portside-messenger.whereilive.com.au

If are interested in becoming involved in our advocacy work we encourage you to contact us on the email below or by telephoning the office.

Anthelia Bond and Georgina Mollison
NCSSA Conservation Ecologists
Email: scientific@ncssa.asn.au

HANDS ON ACTIVITIES FOR MEMBERS

get a grip

Activities of the Threatened Plant Action Group (TPAG)

Come and be involved in some **hands~on** action to help threatened plants and vegetation communities recover with the Threatened Plant Action Group. Everyone welcome.

Most working bees are in the morning, generally from 9.30am onwards, with training and some tools provided on the day. Please dress sun-smart, wear a hat & sturdy footwear.

Working bees over the next few months on the following dates:

Millbrook Reservoir Every Tuesday

Come help with the management and restoration of grassy Red gum - Blue gum woodlands that are habitat for threatened plant species, including: White spider orchid *Caladenia rigida*; Clover glycine *Glycine latrobeana*; Behr's cowslip orchid *Diuris behrii* and Pale flax-lily *Dianella longifolia* var. *grandis*.

Belair Saturday April 11, Saturday May 9 and Saturday June 13

Pitch in by joining efforts to protect and restore habitat for the Leafy greenhood orchid *Pterostylis cucullata* at Belair National Park. Share in the action by doing a morning's work amongst beautiful Manna Gum woodland in the southern Mount Lofty Ranges.

Tarlee Friday May 22

Help recover threatened threatened Temperate grasslands and the nationally endangered Spalding blown-grass *Lachnagrostis limitanea* at sites north of Adelaide. Activities include, weeding, slashing, planting and site management.

Pine Point, YP Weekends of April 25 and 26 & June 27 and 28

Join in the planting and weeding on these weekend trips to reinstate and restore habitat for Neat wattle *Acacia rheticarpha*.

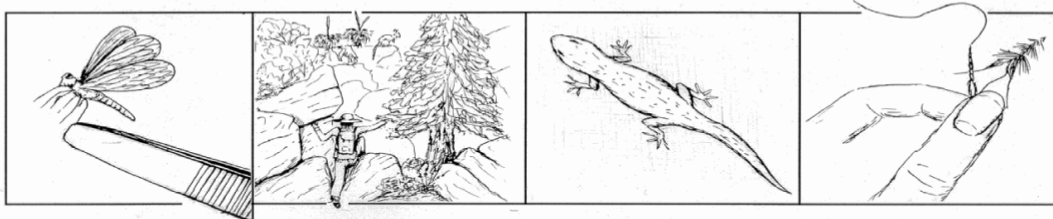
Mount Lofty /Cleland Friday June 5

Come work in perched swamps to help manage weed threats and monitor endangered plant species and communities.

Finniss Saturday July 18

In order to help restore the habitat of Fat-leaved wattle *Acacia pinguifolia* and Neat wattle *A. rheticarpha*, revegetation and threat abatement of *Asparagus* weeds will be continued.

**Dates are subject to change due to weather and seasonal factors
so to volunteer or for further information
please contact Tim Jury on 08 7127 4166 or tpag@ncssa.asn.au**



High Noon for Minda Dunes

Minda Incorporated possess the last remaining remnant sand dune system along the Adelaide coastline under private ownership (Daniels and Tait 2006). The Minda dunes make up 3.5 hectares of the 27 hectares of dunes remaining in the Adelaide region (Cordingley and Petherick 2006).

The NCSSA support Minda Incorporated's previously expressed stance on the dune system, namely that 'the dunes need careful management, protection, conservation and restoration' and 'Minda is committed to the preservation of the dune system and to direct community involvement in the management of the dunes.' (Thompson 2006).

Astonishingly, these dunes are now threatened by planned developments on the Minda site. In the recently released Master Plan, it is proposed that significant remnant secondary dunes be destroyed to make way for retirement apartments. Even more surprising is the fact that the Draft Master Plan fails to acknowledge that construction of the retirement apartments in the proposed location would result in clearance of remnant native vegetation on the secondary dunes. In fact, the Plan erroneously states that "the sand dunes are a protected site and will not be affected".

The scientific and educational importance of this remnant dune system should not be underestimated and this area should be protected and utilised as a rare example of Adelaide's coastal dune system. The secondary dunes are of tremendous biological and social importance for the following reasons:

- the plants in the secondary dunes have a unique diversity not found in other locations along the Adelaide Coastline (Thompson 2006).
- A report produced by the SA Urban Forest Biodiversity Program (2006) lists twelve plants of conservation significance that occur in the Minda dune system. Seven of these species of conservation significance were found within the proposed development site.
- A bird survey of the dune area by Tina Bentz (2007) found 31 native bird species, including two species that have not been recently

recorded for the City of Holdfast Bay. These were the Golden Whistler (*Pachycephala pectoralis*) and the Grey Fantail (*Rhipidura fuliginosa*).

- A significant investment of funding and community volunteer hours has been made in the restoration and protection of the Minda dune system by organisations and Government departments including ; The City of Holdfast Bay, The Department for Environment and Heritage, The Adelaide and Mount Lofty Ranges Natural Resource Management Board, Coast Protection Board. Funds have also been received through the Wildlife Conservation Fund Grant Program and the Federal Governments Caring for Our Country Program. If the secondary dune system is developed much of the time, energy and funds invested in the dunes will be lost.

The Society urges Minda to consider other options and possible sites for the development of their retirement apartments, to retain this vision of conservation, restoration and community involvement.

For further information please contact the Society's Conservation Ecologists, Georgina Mollison and Annie Bond on (08) 7127 4630 or via email at georgina.mollison@ncssa.asn.au or anthelia.bond@ncssa.asn.au

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More visitors means better parks... or does it?

Visitor and recreation planning documents recently prepared by the SA Department for Environment and Heritage share a common premise that increasing the number of visitors to parks and reserves will lead to an increase in public support for conservation. This premise is used to justify the development of new trails and other facilities in parks, as well as introducing recreation uses such as cycling and horse riding to areas that were previously only accessible by foot.

Before we allow our park managers to blindly accept that the ends (more public support for conservation) justify the means (legal mountain bike access to parks in the Mt Lofty Ranges for example) let's take a closer look at the assumptions that link the two. It would be possible to accept the proposed recreation developments if it was reasonable to believe that:

- participation in outdoor recreation engenders conservation attitudes
- all types of outdoor recreation are effective for creating conservation attitudes
- the proposed recreation developments won't have a negative impact on biodiversity

To date we have focussed much of our attention on illuminating evidence that challenges the third assumption. This time I'd like to take the opportunity to share some information that will test the first two.

Does outdoor recreation engender conservation attitudes?

In their study of factors influencing environmental attitudes Ewert *et al* (2005) did find that a proportion of variation in environmental attitudes was explained by participation in some outdoor recreation experiences. Similarly Hartig *et al* (2007) found that the use of natural environments for psychological restoration was a predictor of environmental behaviour. However these studies do not attribute the experiences in natural environments as the cause of pro-environmental attitudes or behaviour, they simply report a correlation between the two.

While Ewert *et al* (2005) claim that direct outdoor experiences are the most important variables related to conservation attitudes, they also examined the influence of other factors including formal education, the media, witnessing negative environmental events and involvement with organisations. Their results showed that appreciative outdoor activities, consumptive outdoor activities, media exposure and witnessing negative environmental events explained 14% of the variance in environmental attitudes, while the other factors were not shown to be significant predictors of environmental attitudes.

Does the type of outdoor recreation make a difference?

Peterson *et al* (2008) report that in their study, environmental attitudes were positively related to appreciative outdoor recreation (eg camping and hiking) and were negatively related to non-appreciative activities (eg fishing, hunting and riding all terrain vehicles). This pattern is supported by Zaradic *et al* (2009) who found that time spent hiking was correlated with increased financial contributions to conservation organisations while contributions to conservation organisations were negatively correlated with time spent fishing or visiting public lands.

Summary

From the information outlined above it seems clear that the assumptions above are tenuous at best. While it is reasonable to accept that there is a relationship between participation in outdoor recreation and conservation attitudes, this relationship may not be causal, and other factors may be more or equally important for explaining conservation attitudes. It is also clear from the research cited that the relationship between recreation participation and conservation attitudes is dependent on the type of recreation, with 'appreciative' recreation linked to positive environmental attitudes.

Rather than opening our parks to new and increased recreation pressures on such a shaky premise, we should be searching for a smarter and more sustainable way to re-engage with the public and build support for conservation.

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What do you think?

I'm really keen to hear your views on this subject, especially your views on the value of different types of recreation for developing pro-conservation attitudes, and what kinds of factors have influenced your attitudes towards the natural environment.

Please write to me at scientific@ncssa.asn.au or give me a call at the office 08 7127 4633.

Anthelia Bond
Conservation Ecologist
Nature Conservation Society of South Australia

Examples of damaging impacts in Canberra's Nature Parks caused by off-track cycling and other recreation uses

To view the complete set of these photographs, got to www.flickr.com then search for Anthelia Bond under people



NCSSA CONSERVATION BIOLOGY GRANT 2009 REPORT :

Interactions between global and local stressors:

Introduction

Traditionally, predictions about the effects of climate change on ecosystems have been made based on understanding developed by studying climate change in isolation. However, the response of ecosystems will not be determined solely by global conditions, but also the local environment in which they manifest (e.g. Przeslawski et al. 2005).

Currently, local-scale effects of human activities are resulting in highly productive kelp forests and their coralline crust understorey being replaced by areas of morphologically-simple turf-forming algae (Gorgula and Connell 2004; Russell et al. 2005). It is possible that marine systems already affected by local stressors, such as elevated nutrients resulting from sewage outfall, may be more susceptible to climate change than those which are not influenced by local stressors (Russell et al. 2009).

The aim of this study was, therefore, to examine the responses of coralline crusts and turf-forming algae to a global climate stressor (i.e. future carbon dioxide) and the local stressors of pollution (i.e. elevated nutrients) and removal of biota (i.e. kelp loss).

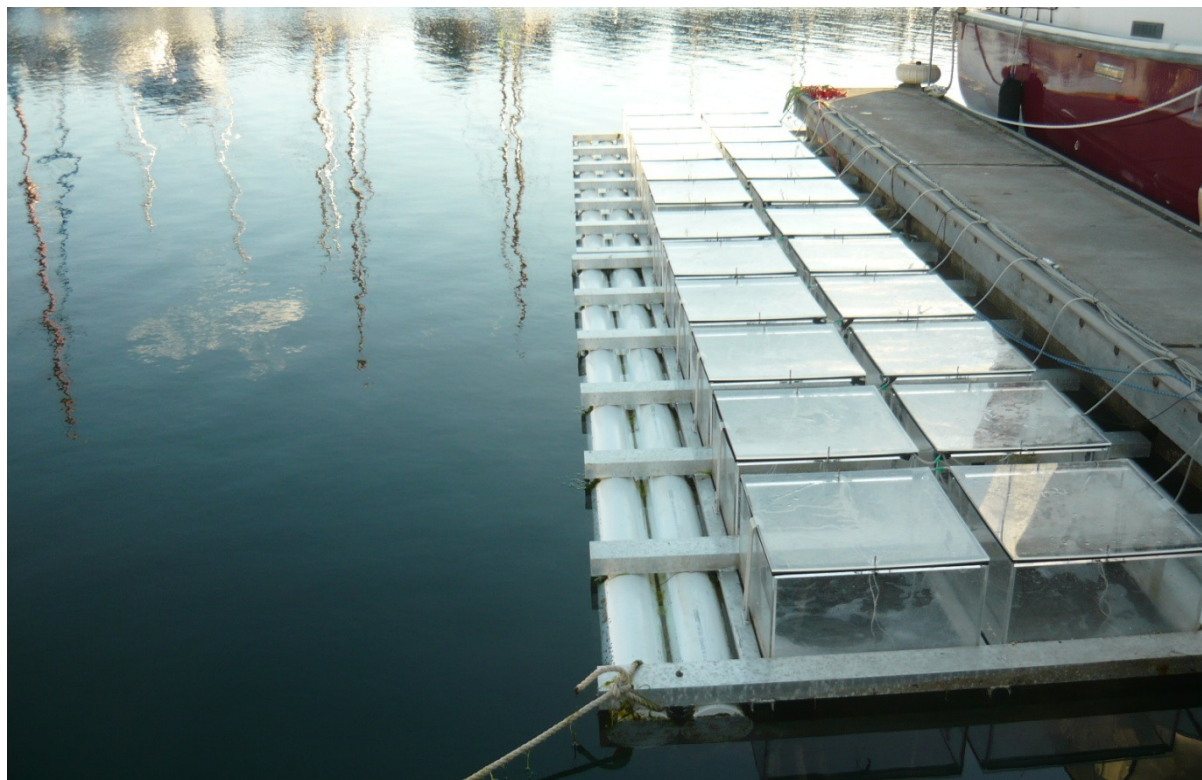
Methods

To examine the responses of algae to these stressors, carbon dioxide levels, nutrient concentrations and kelp presence or absence were manipulated in field-based mesocosms (tanks) to moderate future levels in isolation and combination. Levels for carbon dioxide were based on the current ambient (current; 380 ppm) and IS92a model predictions for the year 2050 (future; 550 ppm) (Meehl et al. 2007). The elevated nutrient concentration was chosen to be similar to concentrations in waters off the coast of metropolitan Adelaide (Gorman et al. 2009).

The influence of future carbon dioxide, elevated nutrients and kelp loss on coralline crusts and turf-forming algae was identified in terms of biomass, percentage cover and photosynthetic yield.

Preliminary results

Together, experimental implementation of these stressors (i.e. future carbon dioxide, elevated nutrients and removal of kelp) caused an increase in turf-forming algae but not coralline crusts. Future carbon dioxide levels negatively affected coralline crusts, particularly in terms of



Experimental mesocosms (tanks) utilised in this study. Photo: Laura Falkenberg.

consequences for marine assemblages of rocky temperate coasts

recruitment to initially available space on the substrate, while positively affecting turf-forming algae.

When this global-scale stressor was combined with local-scale stressors (i.e. elevated nutrients and removal of kelp) turf-forming algae was the most strongly positively affected, covering space that was initially occupied by coralline crusts in addition to that which was initially unoccupied.

These results indicate that future climate conditions (i.e. elevated carbon dioxide) will reduce the occupation of space by coralline crusts while increasing the area occupied by turf-forming algae, particularly when combined with local-scale stressors. Therefore, if these global- and local-scale stressors occur concurrently, it is possible that a shift will occur from areas dominated by coralline crusts and their associated kelp canopies to areas of turf-forming algae.

Discussion and Conclusions

Interactions between global and local stressors, including those which were considered here, have important implications for understanding the effects of global-scale change on communities which exist at local-scales (Paine et al. 1998; Harley et al. 2006; Russell et al. 2009). If, for example, these stressors had been considered in isolation, the magnitude of benthic responses, particularly of turf-forming algae, would have been underestimated due to the existence of compounded effects. Furthermore, the identification of interactions has an important implication for the conservation of biodiversity in South Australia as this indicates the effect of policies that reduce local stressors (e.g. loss of kelp canopies, nutrient pollution) on the effects of global stressors (e.g. ocean acidification). Specifically, the findings of this study indicate that appropriate management of local stressors, such as nutrient discharge or removal of kelp, may influence the resilience of kelp forests to climate change, enabling the conservation of these important ecosystems.

Acknowledgements

Laura Falkenberg would like to acknowledge the Nature Conservation Society of South Australia and SARDI for funding support.

This project is co-funded by the Australian Research Council and Department for Environment and Heritage.

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Laura Falkenberg
The University of Adelaide

Murray Darling Basin Refugia Survey

There is only patchy information regarding the state and function of the waterways located on the eastern flanks of the northern Mount Lofty Ranges. These areas lie within the South Australian Murray Darling Basin area, and fall within that region's Natural Resource Management (NRM) Board area. This lack of information greatly increases the risk of poor decision making and limits understanding of management strategies and their impacts. For this reason the NRM Board contracted NCSSA to collect baseline biological data during the winter of 2009. This covered aquatic and terrestrial flora and fauna at eight sites with permanent water within this region, on Burra, Baldina, Brady and Newikie Creeks. Permanent water sites were chosen as they may be particularly significant as **refuges** – that is, they maintain habitats where adequate conditions for organism survival are maintained during circumstances that threaten survival, such as drought.

NCSSA teamed up with representatives from a number of field naturalist groups to complete this task. Sarah Telfer conducted the standard biological survey for flora; Tim Jury and Bob Bates (Threatened Plant Action Group) carried out opportune searches for flora, particularly threatened species; Gavin Kluske (South Australian Herpetology Group) surveyed reptiles, amphibians and mammals; Scotte Wedderburn (Native Fish Australia South Australia Inc) fish and macroinvertebrates; and Dragos Moise and Tom Hands observed birds.



A total of 58 native plant species and 38 introduced species were found within the standard biological survey sites. Whilst no species were of state or national conservation significance, eight species of regional significance were noted. Two of these, Creeping Brookweed *Samolus repens* and Streaked Arrowgrass *Triglochin striata*, are water dependent species, and thus it is likely that they are refugia species within the survey area. Evidence of grazing pressure on plants was noted in all but two of the sites, indicating that the permanent/semi-permanent water present at all sites acts as a foci for grazing animals.

Opportune survey for plants in areas adjacent to biological survey sites revealed a combined total of 374 indigenous plant species and 158 introduced plant species. Overall 106 species, or 28% of total observed flora, were of some conservation significance. Three plant species found were listed as threatened species at a national level, fifteen rated at the state level and a further 91 plant species found were of regional conservation significance. For most sites we found that steep rocky terrain such as cliffs, gorges and rock outcrops were equally or more significant as refugia for rare or restricted plant species than water bodies, probably owing to the lower accessibility for herbivores.

Twelve species of mammals, composed of 5 native and 7 introduced species were recorded during the surveys at and around the eight permanent water sites. One species, the Brushtail Possum *Trichosurus vulpecula* is listed as *Rare* under the revised (2008) Schedule 9 of the National Parks and Wildlife (NPW) Act 1972.

The weather conditions during the trapping period were not conducive to trapping reptiles. Nine reptile species were recorded by active searching. Only two species of frogs, the Common Froglet *Crinia signifera* and the Spotted Marsh Frog *Limnodynastes tasmaniensis*, were trapped.

Ninety-two bird species, 85 native and 6 introduced, were recorded during the surveys. Three species, the Peregrine Falcon *Falco peregrinus*, the Chestnut Quail-thrush *Cinclosoma castanotum* (ssp. *castanotus*), the White-winged Chough *Corcorax melanorhamphos* are listed as *Rare* under the revised (2008) Schedule 9 of the National Parks and Wildlife (NPW) Act 1972. Eleven bird species were observed breeding in or around the sites. Twelve bird species were identified as possible refugia species, of those, six are waterbirds or are associated with wetland habitats.

During the surveys, only one species of fish, the introduced *Gambusia holbrooki*, was captured, along Burra Creek. Forty species of macroinvertebrates from 12 main taxonomic groups were identified. Notably, higher diversities were recorded from the smaller catchments, namely Brady Creek and Newikie Creek. Samples from Baldina Creek had the lowest diversity.

It is possible that during the hotter summer months, when this temporary water is unavailable, the permanent water sources of the survey sites support a greater number of animals than was recorded during the surveys. Despite this, the data indicated that these permanent waterholes do provide significant refuge value for water dependent species.

This survey has been written up as a formal survey report, and is available from the NCSSA offices. Its reference is "Moise, D. and Milne, T. (eds) (2010). *A Biological Survey of Permanent Water Sites within the South Australian Murray Darling Basin Rangelands*. Nature Conservation Society of South Australia, Adelaide."

Tim Milne



NCSSA Conservation Biology Grant 2010

The NCSSA 2010 Conservation Biology Grant was announced at the 6th May meeting of the Society (held in conjunction with the Biology Society of SA meeting).

This grant aims to assist honours and post-graduate level student research into aspects of conservation biology. Funds are available for research aimed at: improving understanding of the conservation status of species or ecological communities; providing recommendations for improvement of some aspect of biodiversity conservation; understanding the ecology of species or communities; and understanding threats to biodiversity and management of those threats.

2010 Conservation Biology Grant recipients are:

Scott Groom — Flinders University of South Australia (\$1000)

"South Australian native bee conservation in the face of combined habitat fragmentation and climate change"

Victoria Marshall—University of Adelaide (\$1000)

"Mapping/ modelling the distribution of invasive weed, Buffel grass (*Cenchrus ciliaris*)"

The Conservation Biology Grants aim to extend the excellent work undertaken by research students on aspects of the biodiversity of South Australia. Previous grants have contributed to research into diverse topics including studies of the locally extinct Ghost Bat (*Macroderma gigas*) of southern Australia, Pollination biology and ecology of saltmarsh communities in S.A., Effect of the removal of exotic willows on the invertebrate communities in the River Murray, SA, and Video monitoring of nest predation events in the Superb Fairy-wrens.

**This Grant is supported by donations to your Society —
please consider contributing to this worthwhile**

XANTHOPUS

The views presented in this newsletter are not necessarily those of the NCSSA

Copy deadline for the WINTER edition is **18th May 2010**.

Contributions in a variety of formats will be considered, but electronic submissions are preferred.

Editorial Team for this issue: Helen Vonow and Elizabeth Lonie.

GENERAL MEETINGS

will generally be held on the first Thursday
of every second month at the University of Adelaide

Upcoming meetings:

Thursday August 6th, 6.00 for 6.30pm

Joint meeting with the Biology Society of South Australia

"Rabbits on the rebound; dire consequences for biodiversity"

by

*Ron Sinclair, Senior Research Officer, NRM Biosecurity Unit,
Department of Water, Land & Biodiversity Conservation*

Venue: Benham Lecture Theatre, Benham Building,