

yaakka



A publication of the Northern and Yorke
Natural Resources Management Board
Number 2 > April 09



It takes two to tango

Humans must help if our
estuaries are to remain
perfect stages for our wildlife
superstars. Page 14.

3RD SUNDAY OF EACH MONTH

Wirrabara Producers Market

The Wirrabara Producers Market showcases the produce of the Flinders Ranges. It is a genuine producers only market and items range from fresh and dried fruit and meats to superb olive oils and baked goods.

When 3rd Sunday of each month

Where High Street, Wirrabara

Time 8:30am – 12pm

MARCH - APRIL

2009 ANZANG Nature and Landscape Photographer Of The Year Competition

Photographers are encouraged to enter this competition. Entries close 17 April 2009

When Entries Open Now

Who SA Museum

Contact www.anzangnature.com

MAY & JUNE

Revive Our Wetlands Activity Days

Are you interested in participating in the revival of our wetlands? Activities include seed collection, bird surveys, barrier fencing, plant propagation and revegetation.

When and Where

18-22 May, Telowie Beach

06-08 June, Telowie Beach

22-26 June, Telowie Beach

Who Conservation Volunteers Australia, BHP Billiton, Northern & Yorke NRM Board, District Council of Mt Remarkable and DEH

Contact Tricia Curtis, Project Officer on 8212 0777, mobile 0428 533 031 or email tcurtis@cva.org.au

23 MAY

Native Plant Sale And Display-Kadina

Come along and purchase drought and limestone tolerant, coastal and windbreak plants to suit local conditions. Visit other stalls including native food, and landscaping supplies. Food and drinks available. Stall bookings available.

When 23 May

Where Farm Shed, Moonta Road, Kadina

Time 10:00am – 3:00pm

Who Northern Yorke Peninsula Group of the Australian Plants Society

Contact Coral Johnston on 0438 247 890

05 –09 JULY

Marine Connectivity AMSA 2009 International Conference

This conference will address the “what”, “Where & How” and “Why” of marine connectivity.

When 05 –09 July

Where Adelaide Convention Centre

Who AMSA-SA Committee

Contact www.amsaconference.com.au or phone (08) 207 5305

17 –19 AUGUST

Tourism Futures Conference

This conference will present forums designed to provide cutting edge best practice updates, with a strong focus on the future. Topics will feature innovation, trends and directions.

When 17 –19 August

Where Surfers Paradise Marriott Resort & Spa, Gold Coast

Who Tourism Australia, Tourism Queensland and Gold Coast Tourism

Contact Tony Charters on (07) 3012 9575, email info@tonycharters.com or go to www.tourismfutures.com.au

18 –19 AUGUST

Local Government Sustainable Development Conference

This conference will feature award-winning and leading-edge best practice case studies in sustainable development within local government.

When 18 –19 August

Where Sebel Albert Park, Melbourne

Who Hallmark Conferences and Events

Contact Emma Stirling, Conference Director on (03) 8534 5017 or email emma.stirling@halledit.com.au

EDUCATION

Graduate Certificate and Graduate Diploma in NRM Policy and Planning

(Fully online study)

The University of Western Australia offers full online courses in NRM policy and planning.

When Contact University for intake details

Who University of Western Australia, Faculty of Natural and Agricultural Sciences

Contact <http://www.fnas.uwa.edu.au/postgraduates/coursework> or phone (08) 9842 0808

Making a Difference to our World by Tackling Today's Big Issues in Environmental Management

Graduates of this course will tackle today's big issues including monitoring and responding to environmental change, promoting sustainable development, adapting to climate change, and shaping where and how we will live in the future.

When Various intakes

Who University of Queensland

Contact Email gpm@uq.edu.au or phone (07) 3365 3752

Master of Integrated Water Management

This a problem based degree designed to prepare future water leaders in integrated solutions for real-world problems.

When Contact the International Water Centre

Who International Water Centre

Contact <http://www.watercentre.org/education>

Master of Environmental Management

(Fully online course)

This course is designed to build the skills and knowledge necessary to integrate environmental planning, conservation and monitoring into the broader decision-making of organizations.

When Semester two commences 27 July

Who Edith Cowan University

Contact <http://www.sons.ecu.edu.au> or call Associate Professor Mark Lund on (08) 6304 5644

Revive Our Wetlands 'Wetland Education Space' program

This program is a partnership between Conservation Volunteers Australia and BHP Billiton and it aims to help make wetland related projects on or near schools a reality.

When Expressions of interest close 10th April

Who Conservation Volunteers and BHP Billiton, Northern & Yorke NRM Board, District Council of Mt Remarkable and DEH

Contact www.reviveourwetlands.net/schools or phone 1800 032 501



GRANTS

Coles Junior Landcare School Garden Grant

Any school or youth group seeking to educate young Australians about the environment can apply for this grant. Activities can include bush tucker gardens, vegetable gardens, composting and green waste recycling activities, awareness raising of food miles through growing your own produce, waterwise and carbon gardening activities and purchase of kids gardening equipment.

When Applications open throughout the year Round 2 closes on Friday 15th May

Who Landcare

Contact <http://www.lanconline.com/funding>

Community Infrastructure Grant

Rural communities can apply for funds for community building, infrastructure and maintenance projects.

When Grant closes on 30 April

Who Woolworths

Contact www.woolworths.com.au

FarmReady Reimbursement Grants

FarmReady wants to hear from training providers across Australia wanting to register with the program.

When Registration now open

Who Australian Government

Contact www.daff.gov.au/farmingfuture or phone 1800 638 746

Macquarie Bank Foundation

This Foundation welcomes applications for funding relating to education, health care and research, welfare, the environment and arts. The application should aim to provide long term benefits to the community.

When Accepted throughout the year

Who Macquarie Bank

Contact http://www.macquarie.com/foundation/aboutus/application_process.htm

Recognising Women Farmers

This grant offers support to stage events that will build the leadership and representative capacity of women in primary industries.

When Closing date: 5pm, 9th April

Who Department of Agriculture, Fisheries and Forestry

Contact http://www.daff.gov.au/climatechange/australias-farming-future/community_networks_and_capacity_building/recognising_women_farmers



PUBLICATIONS

2008 Farm Gross Margin Guide

This book provides a format and general estimates for calculating crop & livestock gross margin profit for broadacre enterprises across South Australia.

Contact Rural Solutions at www.ruralsolutions.sa.gov.au/bookshop or Freecall 1800 356 446

Making a Difference - A Celebration of Landcare

This publication celebrates the achievements and evolution of landcare over the last 20 years.

Who Australian Landcare Council and Department of Agriculture, Fisheries and Forestry

Contact landcare@daff.gov.au

Pasture Cropping & No Kill Cropping A pre and post harvest investigation

This educational cd covers interviews with leading farmers. Topics relate to pre cropping, post cropping and combines used for pasture & no kill cropping.

Who The Advanced Pasture Cropping Company 2008 and Lake Cowal Foundation 2008

Contact peter.hill@lakecowalfoundation.org.au or angus@pasturecropping.com

Samphire Coast Shorebird Trails, Thompson Beach, Northern Gulf St Vincent

This brochure provides information about the habitat and birds that you may encounter when walking the north and south trails at Thompson Beach.

Author Anne Jensen, Wetland Care Australia

Who Thompson Beach Ratepayers Assoc Inc

Contact Mallala Council, 2a Wasleys Road, Mallala. Phone (08) 8527 2006

WEBSITES

Department of Environment and Heritage "Nature Maps"

This website allows you to view aerial photography and overlay information such as roads, watercourses, contours and cadastral information.

➔ www.naturemaps.sa.gov.au

Drought Information Websites

Australian Government Drought Assistance

➔ <http://www.daff.gov.au/agriculture-food/drought>

Beyondblue

➔ <http://www.beyondblue.org.au/>

Centrelink Drought Assistance

➔ http://www.internet.nsf/payments/drought_assist.htm

PIRSA Website Drought Page

➔ www.pir.sa.gov.au/drought

Rural Financial Counselling Service SA

➔ <http://www.rfcssa.org.au/>

SA Government Drought Response

➔ <http://www.sa.gov.au/drought>

GRANTS & FUNDING WEBSITES

Caring For Our Country

➔ www.nrm.gov.au/funding/index.html

DAFF Grants & Assistance

➔ www.daffa.gov.au/about/grants_and_assistance

DEWHA Grants & Funding

➔ www.environment.gov.au/programs/index.html

FRRR Grants

➔ www.frrr.org.au/currentprojects.asp

Grantslink

➔ www.grantslink.gov.au

Landcare

This website provides the community with news, campaigns, funding opportunities and more.

➔ www.landcareonline.com

New Online Concessions Application Form

An online form that makes applying for a range of State Government concessions faster and more accessible for South Australian residents is now available.

➔ www.sa.gov.au/concessions

Permaculture Southern Flinders

Are you interested in learning more about permaculture? This website is full of news and information and you can become a member of the group.

➔ www.permaculturesf.org

Pirsa Crop and Pasture Report - February 2009

This report provides the latest crop and pasture information for districts in South Australia

➔ www.pir.sa.gov.au/cropreport

Saltland Genie

This website provides landholders with customized on-farm recommendations about how productivity on their saline land can be boosted while reducing the impacts of salinity.

➔ www.satlandgenie.org.au

Youth Environment Council of South Australia

Newsletters for the Youth Environment Council of South Australia can be found at the Sustainability Learning Centre website. These newsletters and articles aim to inspire young people and adults interested in the environment and youth participation.

➔ www.environment.sa.gov.au/education/pages/about/news.html

features



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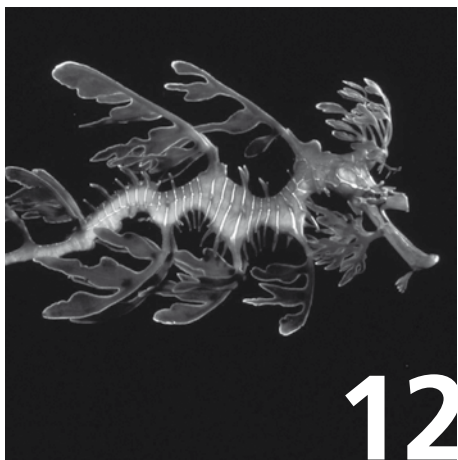
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From the Presiding Member's Desk

This is an exciting time for the NRM Board as we have completed the development of a NRM Plan for the Region. I have been privileged to be involved in this process and was also involved in the development of the Integrated NRM plan for the region which was developed in 2003.

There is a huge amount of work behind the documents and that work itself is a valuable exercise. The review of existing documented information on the natural resources of the region identifies new knowledge and insights, discussion and debate over the issues. Many people were engaged in this process - both those that work in the field and the community at large. I thank them all for their contribution.

The consultation on the plan raised approximately six hundred comments for consideration. The comments ranged from identification of spelling mistakes to information inaccuracies and strategic suggestions. The Board has considered all comments and has where appropriate made the necessary edits. The large amount of information gathered will, if not included in the plan be used to inform the Board and may be relevant to the next iteration of the plan.

Having an NRM Plan for the region will assist us to work with the community, Government agencies and individual natural resource managers to nurture our natural resources. It is a tool which articulates the situation, the threats and the activities we believe are required to ensure sustainability.

Never before have we been more acutely aware of the importance of our natural resources than now, in these times of drought. Water is a key natural resource and its scarcity has heightened our reliance on secure supply. We have been pondering for years how we can engage with the less aware community on NRM but now I would be surprised if there is anyone in South Australia who is not aware of the current crisis.

The NRM Board has a legislative role to play in endeavouring to ensure sustainability of the water resources in this region and we invest considerable time and effort in this area. We have recently employed a dedicated NRM Officer Water to concentrate on this issue.

Climate change is an issue that is also a phenomenon that has captured our attention and will have considerable impact on our Region. The conservative predictions are even indicating major change including different rainfall patterns, increase in temperature and sea level rise. We cannot ignore these predictions and this Board is committed to working with the community to mitigate the impacts and to adapt over the long term.

While at my age I will not notice many of the changes, children born today will inherit a different place when they get to my age. That is scary, as never before in recorded history has humanity seen this pace of change.

We have a tendency to take our natural resources for granted. We need to understand that natural resources are the infrastructure of our existence.

Merv Lewis





Frill neck lizard. Photo: Tim Milne

Tothill Ranges survey

Understanding and managing the wide bio-diversity of the Tothill Ranges has been the focus of a recent assessment by the Native Conservation Council of SA with funding from the Northern and Yorke NRM Board.

Thirty volunteers spent 10 days in the ranges and recorded 150 plants species, 46 birds, 13 lizards, two snakes (brown and whip snake), four frogs, seven bats and seven other mammals.

The Tothill Ranges is a low range of up to 650m above sea level, running 15km south north and north east of Marrabel.

Containing the largest area of remnant vegetation in the Northern and Yorke region outside the DEH system, Tothill Ranges is a

literal biodiversity oasis in a sea of cleared land. Much of the remnant vegetation is managed for biodiversity by the privately owned Bushland Conservation Company.

Conservation of the Tothill is paramount in the biodiversity protection of the region.

Project manager Dr Tim Milne was delighted with the enthusiasm and work carried out by the volunteers, which included landholders, members of conservation groups and university students.

"About half of the volunteer group were highly experienced field naturalists, and so it was a valuable learning experience for the other volunteer participants," said Dr Milne.

The data gathered will form a useful benchmark for future surveys to be able to detect changes in regional biodiversity.

Bird's eye view of Northern and Yorke

Technology has taken to the air to provide us with a unique bird's eye view of the landscape.

Aerial photographs and satellite imagery of vast tracts of land across South Australia have been produced and delivered to NRM Boards and other parties.

The Imagery Baseline Data Program, an initiative of the Department of Water, Land and Biodiversity Conservation, will help streamline the planning, monitoring and evaluation of the landscape by Natural Resources Management Boards.

There are four components to the program.

- An up to date State-wide imagery/ aerial photographic database has been established.
- Digital elevation models (3D digital terrain models) for high-priority areas have been developed.
- Building on the existing coverage, a land use survey for SA has been established and telemetry has been used to manage high priority assets in time of drought.
- A record and measurement of the landscape during the extended drought period has been undertaken.

Imagery reveals a panorama of what the drought looks like from above, what is happening at this time and the response of regional water supplies.

Imagery Baseline Data Program manager Susan Stovell said the information can be used in a variety of ways, depending upon what projects individuals and departments wish to prioritize.

"For example, in the Northern and Yorke region, data will be used to look at River Red Gum health, vegetation assessment, property planning and water catchment management.

"In addition imagery will be used for the second edition of the Yorke Peninsula - Mid North Emergency Services Map Book," she said.

Ms Stovell said it was the first time a coordinated whole-of-the-State approach had been used to acquire baseline data on a major scale.

"In the past, activities of this sort have been undertaken on a small-scale, isolated basis.

"This initiative resulted in a range of stakeholders, including State and Australian Governments, contributing funds to maximize outcomes for SA," she said.

Aerial highlights

- About 80 percent of South Australia (791,000km) photographed from the sky or by satellite, including the entire Northern and Yorke region.
- Land use maps prepared for all of South Australia, with nearly every road in the Northern and Yorke region driven by the 'Ground Truthing' Team to ensure data accuracy.
- Telemetry demonstration sites established in the Northern and Yorke region. (Telemetry is a

technology which measures and reports data from remote locations, and will help monitor changes in the condition of natural resources such as bushland, soils and water.)

- Three priority areas along the River Murray system photographed and 'stitched' together with existing images to create Digital Elevation Models for the entire 600km of the River Murray in SA.



A ground cover search and identification procedure. Photo: Dragi Markovic

Focus on bushland condition

A native bushland condition 'monitoring' program is underway in the southern Flinders Ranges and beyond.

The Northern and Yorke NRM Board is monitoring 69 sites on the coast and inland, noting the difference between untouched native bushland and land which has been affected by farming, and clearing of vegetation.

"The benchmark for healthy bushland is a system where bushland is virtually untouched and where undergrowth such as fallen logs and a variety of plant and native animal species thrive," said Ms Zita Stokes, a senior environment consultant with Rural Solutions SA.

"Our visits have proved a terrific engagement tool in that we liaise with landholders and can help them by advising and suggesting ways to better protect the environment.

"Data is provided to monitor changes in the condition of the bushland and to carry out appropriate management actions," she said.

"We look at the state of the bush now and compare it to how we understand the condition of the land was in pre-European times," said the Board's Program Manager Dene Cuthbertson.

"We've produced a bushland condition monitoring manual, and staff are being trained in its use by Nature Conservation Society of SA," he added.

Council Snapshots



Clare and Gilbert Valleys Council

The NRM Board has provided funding for environmental weed control in Winkler Park, south of Saddleworth.

Winkler Park originally was farmland bequeathed by a local landholder, and it was later established as parklands featuring local native trees and shrubs.

Winkler Park Development Committee Secretary, Peter van Beusichem, said Board funding had allowed weed control and removal of elm trees at the northern end of the park.

"The elm trees were threatening to clog the Gilbert River," Peter said. "With the support of a contractor, they have been removed and we are currently revegetating the area with native vegetation."

The Winkler Park Development Committee is seeking new volunteer members to help in the maintain this community asset.



District Council of the Copper Coast

Two projects in the Kadina and Wallaroo areas have been funded to encourage greater understanding of the beauty and resilience of local native indigenous plants that may be grown in home gardens, and to address local salinity issues.

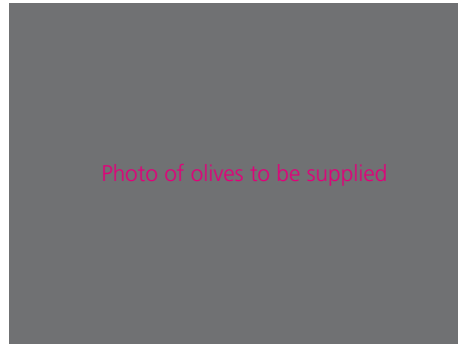
A demonstration garden has been established at the Wallaroo north beach area featuring local plants selected by the Board's Yorke Peninsula NRM Officer David Sloper.

The species include shrubs, grasses, ground cover and tussock plants.

"There have been some problems with exotic or non-indigenous plants being grown in home gardens with the threat of them spreading into local sand dune areas where they may compete with native indigenous plants for space and moisture," David explained.

"The purpose of the garden is to demonstrate that local native plants can grow well and be of amenity value in home gardens.

"The next step is to ensure that nurseries have a supply of these plants for local homeowners."



Light Regional Council

The Light Regional Council's Roadside Vegetation Plan has identified areas of significance, including sites of high conservation value.

With funding from the NRM Board, the Council is implementing measures to control feral olive infestations in these high conservation areas, particularly west and north of Kapunda.

Board funding has also allowed fencing of land along St Kitts Creek to protect silver leaved daisy plants, which are a conservation rated plant.

Andrew Philpott, the Council's Environmental Projects Officer, said the focus was on conserving the silver leaved daisies and caring for the overall biodiversity of the area along St Kitts Creek.



Flinders Ranges Council

Funding has been provided to the Flinders Ranges Council to support community action in pest weed control, revegetation work, and efforts to establish a native plant seed bank in Quorn.

A local community group has been active in removing a boxthorn infestation in the Capowie Creek south of Quorn.

Separately, there have been revegetation efforts along the banks of the Pinkerton Creek that runs through the town.

Local resident and native plant expert, Brian Powell, said a major objective was to collect seeds from trees and shrubs found within a 20km radius of Quorn and establish a native plant showcase in the town.

Are you Bushfire Ready? Manage native vegetation on your property.

Bushfire is a real risk for all South Australians and you can't predict when a bushfire will strike. But your chances of survival are increased if you are prepared.

The Native Vegetation Council (NVC), SA Country Fire Service (CFS) and local councils work together to protect life and property, while still recognising the value of and need to conserve native vegetation.

Native vegetation refers to naturally occurring communities of local, native plants such as native grasses and ground covers, shrubs and trees.

Native vegetation contributes to our State's basic life support systems and valuable biodiversity.

However, where native vegetation threatens people or property it needs to be managed or even removed. Though it is protected under the *Native Vegetation Act 1991*, exemptions do exist to ensure some clearance of native vegetation can occur without approvals to protect your property from bushfire.

To find out how you can manage native vegetation on your property and help your family and home be Bushfire Ready please visit www.cfs.sa.gov.au

Waterproofing Port Augusta

Port Augusta City Council is working on a range of strategies aimed at waterproofing the city to reduce its reliance on mains water sourced from the River Murray.

It is analyzing the city's potential water sources and will develop an integrated water resource management system.

Rieck Shine, the Council's Parks and Gardens Strategic Coordinator and the Northern and Yorke NRM Board's Upper North Group member, said a computerised model was being developed to identify alternative water sources and systems.

"We are looking at a range of potential resources, including stormwater runoff, the creation of wetlands to naturally purify stormwater, re-use of reclaimed water reuse and underground aquifer storage," Rieck explained.

"Testing of the aquifers is being carried out to determine their suitability for storage and recovery. This is a process where treated stormwater is pumped into the aquifer for storage and then accessed for irrigation in drier months."

In addition, a wastewater treatment plant has been in operation for more than two years.

It takes untreated wastewater from the SA Water sewage pump station and treats it at a plant in the Central Oval precinct. Each day, the plant produces up to 500 kilolitres fit-for-purpose water for irrigation of open space and gardens.

The aim of the Council is to use additional reclaimed or treated storm water to supplement the resource created by the wastewater treatment plant.

Located in an arid area, Port Augusta would be a very dry and dusty city without the many parks, public gardens and sporting grounds the Council provides for its residents.

The council's water initiatives will help ensure they are retained for future community use.

Port Augusta City Council is already a leader in its innovative approach to a sustainable water supply. It recently won a National Award for Innovative Water Management.

Collaboration strengthens NRM

The Northern and Yorke NRM Board and 15 regional councils are reviewing a joint engagement strategy.

The strategy, developed by the Central Region of Local Government (CRLG) and supported by the Board, reinforces NRM outcomes for the region through an alignment of approaches and resources.

The strategy covers areas such as communications, vegetation and coastal management, water, pest plant and animal control, dry land salinity, tourism and recreation, climate change, planning and legislative review.

"The Board recognises Local Government as a key stakeholder in natural resource management, as a landowner, and as the authority to prepare Council development plans," said Board General Manager Lynne Walden.

"In addition, Local Government has a role in collecting the NRM levy, so it is a major partner in natural resource management in our region.

"The Board wants to work much closer with the councils in supporting initiatives that will contribute to the long-term sustainability of our natural assets, such as stormwater re-use and protection of our coastal areas," she said.

"It is about building on our strong relationship with Local Government and extending the engagement process to communities and organisations to help meet our natural resource management priorities.

"The Board is also keen to collaborate on joint community projects that encourage volunteering and skill development," she said.

Councils and the Board will continue to meet periodically to ensure a clear and collaborative approach to regional natural resources management.

yorke peninsula



Alan Wilson (right) and son Peter fencing at Daly heads, Yorke peninsula. Photo: Debbie Gray

Balancing grazing and biodiversity

The Daly Head property on Yorke Peninsula operated by Alan Wilson and his son, Peter, is an excellent example of a successful balance between productive farming and native vegetation protection.

The property between Marion Bay and Corny Point stretches over 5,000 acres.

About 600 acres is arable and has traditionally been sown with barley every second year.



Who Allan and Peter Wilson, NYNRM Board

What Fencing for Biodiversity

Where Daly Heads, Yorke Peninsula

The remainder comprises coastal dunes primarily vegetated with mallee, Tea Tree and sheoaks, providing an ideal habitat for a wide variety of fauna, including an abundance of native birds.

For the past 20 years, the Wilson family has used the arable land at Daly Head for cropping, and as a hay resource when required.

However, Alan and Peter, along with their wives Marilyn and Kristen, decided in 2006 to run some sheep on the land to extend their overall grazing strategy from another family property at Brentwood.

The inhibiting factor was the lack of fencing to prevent stock from roaming into the native vegetation that formed an important natural corridor between land used for primary production and the pristine stretch of coastline.

The family successfully applied to the Northern and Yorke NRM Board for funding to assist in the construction of 7km of fencing to control stock movement.

"The Board supported the application with funding of about \$20,000 on the basis that we would also make an investment in terms of dollars or labour to the project," Alan explained.

"A contractor was engaged to put in the fence posts and we did the wiring, completing the job in Spring 2008.

"It has been an excellent outcome in terms of being able to extend our grazing operations while ensuring the remnant native vegetation and the coastal ecosystem it supports is protected."

David Sloper, Board NRM Officer for Yorke Peninsula, said that fencing was crucial for keeping stock out of high value native vegetation.

"The Wilson property at Daly Head is a shining example of protecting native vegetation while not restricting farming enterprise," he said.

lower north

Farmers team up for NRM

The Bismark Valley provides a cradle of cropping and grazing land stretching from north west of Balaklava almost to Lochiel.

In the past, sections of the valley have been subjected to erosion and soil loss resulting from heavy rain.

About three years ago, the former Lower North Soil Conservation Board sought the interest of local farmers in developing strategies to reduce the threat of erosion.

Whitwarta farmer, Richard Wilson, said a foundation group of farmers identified a range of measures that could be implemented on their properties, including renewing contour banks, revegetating and fencing off remnant native vegetation, clearing out drains and redirecting stormwater.

With support from the Northern and Yorke NRM Board, Rural Solutions SA and the Wakefield Regional Council, the farmers recognised a broader opportunity to develop an integrated landscape approach to addressing erosion in the Bismark Valley.

Initially, this involved landholders participating in an assessment of natural resources on their own properties, and then identifying issues they could address with assistance from the Board.

This approach was highly successful in terms of landholder involvement and interest in the application and integration of land protection and revegetation measures.

Later the group participated in a risk management course partly funded by the Australian Government, and worked together to identify further options to increase productivity of farming land.

The group was also involved in the Management of Sandy Soils Project, an Advisory Board of Agriculture initiative.

The group was encouraged to examine the strategy of clay spreading on sandy soil to help absorb moisture, increase nutrient holding capacity, reduce water repellence, prevent wind damage and resulting erosion.

"We organised field days where we visited various locations to work out where we could access good clay for carting and spreading, or delving to bring clay to the surface," Richard explained.

"The objective is to mix the clay with the sandy soil to hold moisture and take it to the root zone.

"With funding support from the NRM Board, we spread our wings to encourage more landholders to consider clay spreading and delving using a contractor."

Whitwarta farmer Richard Wilson. Photo: Vanessa Size



upper north

Old saltwork's environmental masterplan

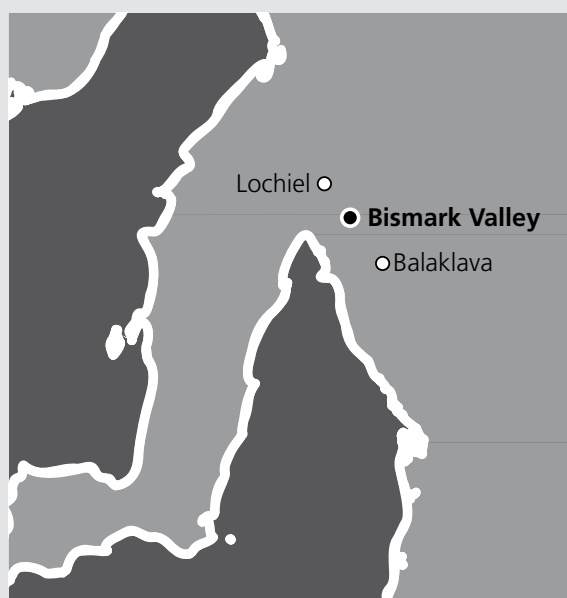
Another field day was held in March 2009 to consider outcomes of spreading and delving on various properties, and to look at improvements in soil texture and quality.

"The outcomes to date have been very positive, particularly in areas on non-wetting sandy soil," Richard said.

"However, it is important to remember that we have been through an extended dry period and it will be interesting to look at the overall results over a five to ten year period."

David Woodard, Soil and Land Management Consultant for Rural Solutions SA, said landholders had to manage natural resources issues on their properties and the Bismark Valley project embraced their skills and knowledge.

"The intention has been to get landholders together to tackle the issues in an integrated and strategic manner," he said.



Who Bismark Valley Farmers, NYNRM Board
What Integrated landscape scale natural resources management
Where Bismark Valley



TAFE SA Conservation and Land Management students helping Port Augusta Council staff clean up the Old Salt Works conservation zone. Photo: Doug Reilly

Resilience is a good word to describe the area known as the Old Salt Works situated between the narrow upper reaches of Spencer Gulf and the Stuart Highway immediately north of Port Augusta.

In pre-European times, Upper Spencer Gulf was a significant meeting and trading area for Aboriginal people from across Australia. The evidence of their long journeys and interaction at the head of the gulf can be found in the shifting sands that reveal hand tools made from rocks originating many hundreds of kilometres away.

Then early last century, a prosperous salt factory operated at the site with workers scraping and refining the natural residue of seawater that flowed and evaporated into low lying areas. It later became a camping ground, rifle range and popular location for four-wheel drive and motor bike enthusiasts.

But to understand the true significance of this area, we have to go back through countless generations of original inhabitants and visitors.

While developments and recreation have impacted on the natural and cultural heritage of the Old Salt Works site, it is now undergoing a remarkable recovery with the ultimate objective of turning it into a showpiece of coastal land management and protection.

The 7,500-hectare area is Crown land licensed to the Corporation of the City of Port Augusta as a conservation zone adjoining the National Arid Lands Botanic Gardens.

Many people are passionate about its recovery, but none more than Doug Reilly, Program Manager of the TAFE SA Port Augusta Campus.

Armed with an extensive management and action plan developed by the South Australian Department for Environment and Heritage and TAFE SA Port Augusta Campus, Doug is being supported by a partnership of organisations including the Northern and Yorke NRM Board, Port Augusta Council, GreenCorp, Envirofund and community volunteers through the Spencer Gulf Environmental Alliance.

The NRM Board's involvement has primarily been through funding for fencing work to shield the area from damaging four wheel drive vehicles and motorbikes, and by assisting in the identification and management of plant species.

Slowly, the battle is being won to return the Old Saltworks site to a pristine area for passive recreation including walking, fishing, picnicking and bird watching, and for educational purposes, particularly for TAFE students pursuing careers in land management.

It features a fascinating intertidal area with seagrass meadows, shingle and sandy beaches, mangrove stands, samphire, saltmarsh, native shrubs and grassland providing habitat for a range of fish, crustaceans, insects, birds and mammals.

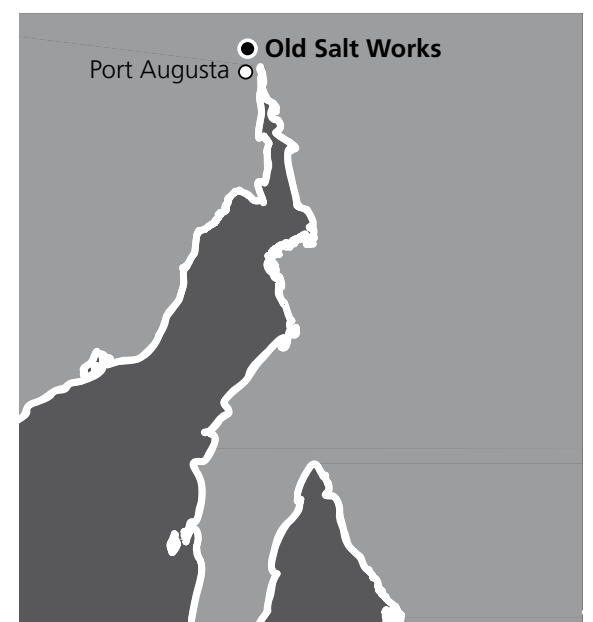
More than 120 species of birds have been recorded in the area, and it beckons a range of native animals including the western grey kangaroo, stripe faced and fat-tailed dunnart, Mitchell's hopping mice and reptiles.

Doug says a pest plant eradication and revegetation program is succeeding with a horticultural centre at the Port Augusta TAFE serving as a propagation area for plantings by students and community volunteers.

Earthworks have been initiated to help prevent erosion traditionally caused by heavy summer rains, and a major effort is underway through fencing and natural barriers to arrest sand drift.

Rieck Shine, the Northern and Yorke NRM Board's Upper North Group member, and the Parks and Gardens Strategic Coordinator for the Port Augusta Council, said the Old Saltworks site was a vital part of an integrated environmental master plan being developed for the region.

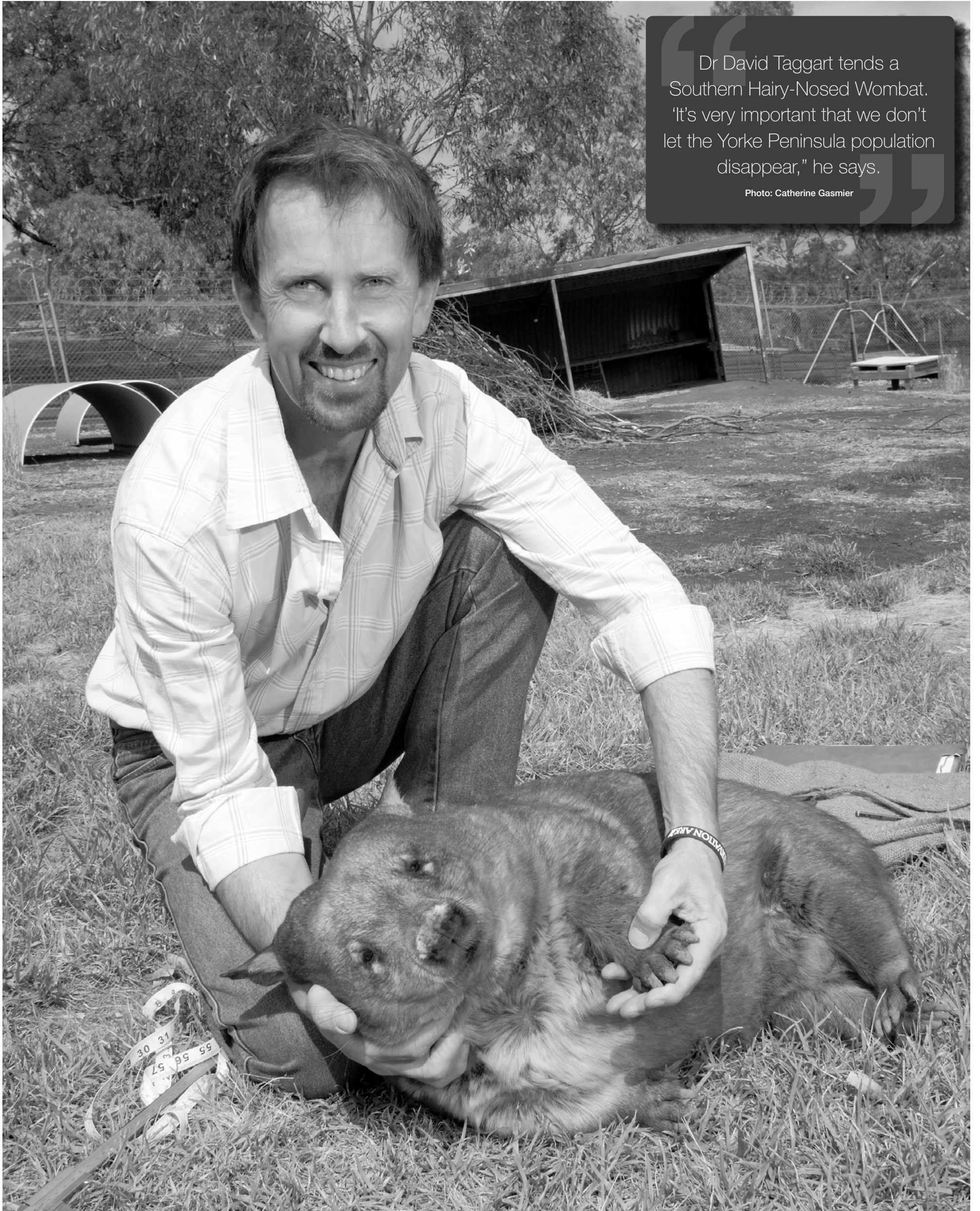
Despite decades of abuse and abandon, change for the better is occurring at this unique site where the most northern waters of Spencer Gulf ebb and flow.



Who Pt Augusta TAFE, NYNRM Board, Pt Augusta Council, GreenCorp, Envirofund, Spencer Gulf Environmental Alliance

What Landscape Scale integrated, natural resource management

Where Old saltworks conservation zone, Pt Augusta



Dr David Taggart tends a Southern Hairy-Nosed Wombat. "It's very important that we don't let the Yorke Peninsula population disappear," he says.

Photo: Catherine Gasmier

Cute but condemned?

Look out for these endangered creatures, maybe in a paddock near you. Story by Lance Campbell.

The southern hairy-nosed wombat, with its honest furry features and relatively gregarious nature, is a likeable creature. It is also SA's fauna emblem. That's a fact that is often overlooked.

Another often overlooked fact is that from Kulpara in the north to a small colony near Edithburgh and Yorketown in the south, Yorke Peninsula has between 500 and 1000 southern hairy-nosed wombats.

Every one of them is in danger from mange, brought into their warrens and burrows by the feral fox.

The mange, caused by a mite that eats away at the base of the wombat's skin, can lead to a slow and painful death. Already the Peninsula's three known largest southern hairy-nosed wombat colonies at Kulpara, Point Pearce and Urania, are believed to have mange.

The Northern and Yorke Natural Resources Management Board has started a study aimed at saving the southern hairy-nosed wombats of Yorke Peninsula. Wombat expert Dr David Taggart, principal scientist with Conservation Ark, is working with PhD student Elisa Sparrow and bushie Ron Dibben, mapping and counting every colony, every warren, every burrow and every wombat that they can.

The team began last October and by around August intends to produce a detailed report that will lead to a strategy to save the wombats in general, and from the mange in particular.

It is a matter of urgency, according to David Taggart. Southern hairy-nosed wombats once roamed and burrowed the semi-arid scrub and mallee country

in continuous numbers from across the Nullarbor in WA east to NSW. Not so now. The populations are fragmented, and the main cause of their retreat is known to us all – human intervention.

But on Yorke Peninsula, with its rich farming land, the wombats' circumstances have been more acute for much longer.

"The species as a whole is not threatened," David says, "but the Yorke Peninsula part of the population is, quite severely. While these wombats don't look any different from southern hairy-nosed wombats elsewhere, their genetic information is different from the populations of the Murraylands, the Gawler Ranges and the Far West Coast.

"It's very important that we don't let the Yorke Peninsula population disappear. If we do, it will be to the detriment of the fitness of the species as a whole. We have to get a handle on where the animals are and how to manage them, or we will lose them."

Wombats and cereal growing don't normally get on. When a header falls into a wombat warren and breaks a blade in the middle of harvest, farmers are understandably frustrated. David has spoken to some old timers who recall larger numbers of wombats 50 years ago. Most of them probably were shot out.

Put simply, because much of the Peninsula is so good for growing grain, the land has been widely cleared. The wombats lost the competition, pushing them further into the non-arable areas or remnant scrub. This forced migration also deprived the wombats of their main usefulness.

"In any landscape there are key species," David says. "In semi-arid environments, the wombats' job was to turn over the soil to allow moisture penetration. They provided nutrient rich areas for native grasses. They were the biological equivalent of aerators on golf courses."

Wombats remain powerful burrowers, and fortunately humans no longer object to their activity by eradicating them. Now the wombats' undermining efforts attract foxes and the dreaded mange. The scientist paints an ugly picture: the infection spreads all over the wombat. The skin becomes scabby and crusty, eyes and ears weep with pus, the fur falls away.

The wombat's body tries to mount an immune response. "It becomes incredibly itchy," David says. "The wombats have to spend more time above ground, looking for feed for the energy to fight the infection".

In heatwaves and droughts, the wombats' chances of survival are greatly reduced, the chances of reproduction even worse.

David says the female hairy-nosed wombat can produce one young every two or three years, or one a year in "really good" years. As these aren't really good years, the odds against the wombats are not difficult to work out. These odds can be improved, though, by tackling the mange. At the moment, David adds, the treatment is a wildlife version of a drug for treating parasites in cattle and sheep.

First, however, all Yorke Peninsula's surviving southern hairy-nosed wombats have to be tracked down, this time for their own good. Some colonies may remain undetected.

Local people have the best local knowledge of where the wombats are, and David Taggart and his team want to hear about it at david.taggart@adelaide.edu.au

"The southern hairy nosed wombat is an animal that is very dear to a lot of people," David says.

So the rest is up to the people.

Facts about Southern Hairy-Nosed Wombats

There are only six pockets of the endangered Southern Hairy-Nosed Wombat, and one of those is Yorke Peninsula. The wombat is sedentary and copes with extreme local conditions, rarely has access to water and green shoots in summer.

It optimises water and protein intake with its rodent-like incisor teeth and split lip which enables it to pick emerging shoots from around the base of perennial grasses.

During the day, the wombat rests in its burrow, allowing its body temperature to fall to conserve both water and energy. It emerges late in the evening when temperatures are lower. Burrows are extensive and connected by a network of trails which are scent marked with faeces and urine. Wombats tend to share burrows.

During breeding season, males become aggressive and bite each other's ears and rump. Most births occur from late September to December, and a single young wombat remains in the pouch for up to nine months.

The joey is weaned at one year, and mature at three years. Population increases depend on a minimum of three years of effective rainfall, a critical factor determining the female's ability to produce milk, and the growth of grass to meet the energy requirements of juveniles.

www.australiazoo.com.au



Surface cover saving soils

Many erosion lessons have been learnt, but the job is not yet finished.

Mary-Anne Young

Once regarded as ‘trash’, the plant remains of crops and pastures now play a vital part in protecting soils from the ravaging effects of wind and water.

Stories of erosion from the first half of the 20th century evoke images of thick, choking dust storms, creeks gouged in the landscape and abandoned properties as farmers battled with drought and the Depression. The imperative was to pay off debt and State and Federal Governments urged farmers to grow more wheat to raise valuable export income for the country. Farming practices of the day lay land bare to the elements.

Much of the region’s land has potential to erode due to natural characteristics such as soil erodibility and topography. Over 630,000 ha or 29 percent of the region is prone to water erosion. This land is generally found on the hilly country of the Southern Flinders, Northern Mount Lofty, Barunga and Hummock Ranges.

Approximately 225,000 ha or 10 percent of the region is at moderate or higher risk of wind erosion. Most of this land is on the Yorke Peninsula, the coastal plains west of the Barunga and Southern Flinders Ranges, and the dune-swale land around Balaklava, Avon and Port Wakefield.

In the days of the ‘wheat – fallow’ rotation, paddocks were worked up in winter, then cultivated again several times before they were sown to wheat the following autumn. Given that wheat yields were usually less than one tonne per ha or five bags / acre, there was little stubble left after harvest. What was left, was usually burned before being fallowed the following winter.

Today, farmers have learned from the sobering experiences of the past and have adopted a range of practices that protect the soil from erosion and improve its ability to take rain in.

The introduction of fertilizers, inclusion of pasture phases into crop rotations, reduction in the number of tillage operations and retention of stubbles, have all served to improve soil condition, grow more plant matter (and thereby provide more surface cover) and reduce erosion. While surface cover can be anything from bitumen, stones, plastic sheeting to mulch, most farmers rely on plants to protect the soil. It’s a ‘win:win’ situation – the more crops and pastures grow, the more cover is provided for the soil (as long as it is not eaten out, burned, blown or washed away, or buried by cultivation).

Farmers also notice that keeping surface cover improves soil structure – the soil doesn’t set like concrete after a rain because the rain isn’t pounding the soil surface into a hard layer. Plant residues also break down to form organic matter in the soil which helps store nutrients and water, and bind soil particles together, making them more resistant to erosion.

Burning stubbles after harvest was once the norm however the majority of farmers now keep stubbles. Harvesters are fitted with spreaders which spread chaff and straw behind them. Seeding machinery now has the ability to work through large quantities of straw without blocking up. ‘Precision agriculture’ technology enables steering of machines with great accuracy so that they can be driven to sow new crops between rows of standing stubble.

Grazing management practices are changing, in that more and more producers are taking stock out of paddocks before protective surface cover is eaten off. Many properties now have dedicated small paddocks or yards in which stock can be held and fed grain or hay. Some farmers are using rotational

grazing systems where large numbers of stock graze a paddock for a few days before they are moved onto another paddock. The grazed paddocks are given a recovery period before they are grazed again. This results in more even grazing and less barring off of paddocks.

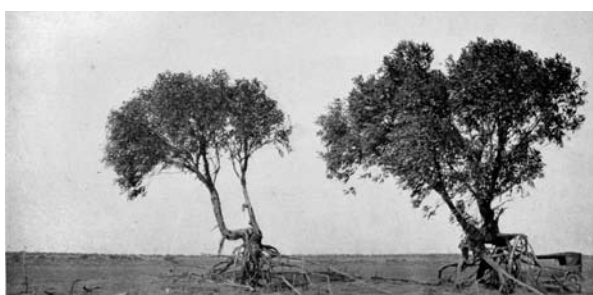
The Upper North Farming Systems Group is being highly innovative, investigating the use of perennial native grasses as their pasture base. For many years, farmers in lower rainfall areas have battled to find pasture species that persist over a number of seasons, are good grazing for stock and provide soil surface cover particularly over summer and into autumn. Introduced pasture species have tended to be annual species that struggle in the area’s more clayey soils, cold climate and poor rainfall years, and rely on rain between April to October. Perennial species that respond to any rainfall event and live over a number of years will provide more year-round grazing and cover. Plants that naturally occur in the area are already adapted to the local climate and soil types. The challenge is to find ways of establishing, growing and managing these plants under grazing and the occasional cropping, on a broadacre basis.

Data from surveys of land managers conducted by the Department of Water, Land and Biodiversity Conservation show that farmers in the region are reporting an increased use of a range of practices that improve soil erosion protection. Around 80 percent of producers surveyed from the region reported using no-till or direct drill sowing methods to sow at least some of their crop. This was an increase from 62 percent in 2000. The proportion of Northern and Yorke farmers usually or occasionally use long cultivated fallows has dropped from 19 percent in 2002 to 12 percent in 2008. The usual or occasional use of burning when preparing for cropping has reportedly dropped from a high in 2002 of 60 percent to 30 percent in 2008. Despite this use of burning, over 90 percent of the

What does erosion cost?

Soils act as a storehouse for plant nutrients and water. Losing soil means losing this storehouse. The loss of 1 mm of soil through erosion represents a loss to farmers in the order of \$75 / ha. These are the costs associated with replacing lost nutrients (such as phosphorus, nitrogen, potassium and sulphur) and lost production from loss of water holding capacity.

Then there are the off-site effects. Soil is dumped on other land, roads, fences, culverts, railway lines and other property. After an erosion event, Councils often spend tens, if not hundreds of thousands of dollars clearing silt or drift off of roads.



How does surface cover protect the soil?

A raindrop hits bare soil with considerable velocity – around 30 km/hr – smashing soil aggregates apart. These particles are knocked into other soil particles, damaging them. A barrier between the raindrop and the soil absorbs the impact of raindrops. On agricultural land, the barrier is usually plant matter, dead or alive. The greater the area of soil surface covered by this layer, the better the protection.

If runoff starts to occur, plant material can slow the water movement, provided the flow is not great enough to sweep the material itself away.

On wind erosion prone soils, wind sweeping over the soil surface can dislodge and pick up soil particles. Barriers which kick the wind up away from the soil surface prevent the wind reaching these particles. They also reduce wind speed, lessening its energy and ability to pick up soil particles. The higher the barrier, the greater the distance behind the barrier is protected so knee-high stubbles will offer more protection than ankle-high ones.

How much surface cover is needed to protect soils from erosion?

The amount of cover required depends to some extent on the soil’s soil type and topography.

On loamy soils, at least 15% surface cover or 0.5 t / ha of stubble is required to provide adequate protection against wind erosion. Sandy soils need at least 50% surface cover or 1.5 t / ha. The best protection is given by stubble anchored in the soil and standing upright that deflects wind up and away from the soil surface.

The amounts of surface cover required to protect against water erosion is even higher – at least 75% surface cover or 3.0 t / ha on sloping land. This cover is best if it is flattened and covering as much of the soil surface as possible.

There are various ways of assessing how much cover is in a paddock and these are described in the Department of Water, Land and Biodiversity Conservation’s Fact Sheet No. 89 “Surface cover for protection against wind and water erosion”. This is available from the website http://www.dwlbc.sa.gov.au/publications/fs_brochures.html#FactSheets



region's farmers surveyed considered stubble retention to be important over the four surveys conducted since 2000. About 40 percent of Northern and Yorke respondents surveyed in 2008 said they put stock into confined feeding areas to manage erosion risk in paddocks.

There are still a number of challenges for the region's farmers in maintaining soil surface cover.

One of the most obvious challenges in recent years, has been the lack of rainfall to grow enough plant matter in the first place to provide protection against erosion. For many farmers, surface cover in October, when plant growth usually reaches its maximum, has not been enough to provide protection at that time, let alone after grazing and natural breakdown of residues has occurred.

Grain legumes are valuable as a source of income and as break crops in crop rotations. Stock thrive when grazing on grain legume stubbles. There is little crop residue left after harvest of grain legume crops however, and what is left, can be quickly grazed off. Some of the region's barest paddocks in autumn were grain legume crops in the previous year. Farmers have to weigh up the benefits of growing and grazing grain legumes against the erosion risk they pose in late summer and early autumn.

A very thick residue sitting on the soil surface, particularly when it is wet, can be difficult to work through with seeding machinery. Some crop herbicides are most effective when they are applied to bare soils.

One of the management options for pests and problems such as snails, crop diseases and herbicide-resistant weeds, is burning. It is used where there are no practical or effective alternatives available to control pests, however fire completely removes or significantly reduces surface cover.

Surface cover is fuel for fires particularly when it is standing tall. Summer storms often bring downpours of rain which could lead to erosion. On the other hand, lightning strikes can ignite fires that feed on the vegetation providing soil cover. The risk of erosion has to be weighed against the risk of fire.

Water and wind erosion are not as bad as they were two to three generations ago. However losses over time have diminished the soil resource. Soil formation is at an extremely slow rate and far less than the rate of soil loss so, there is a pressing need to protect what remains.

Kulpara farmer Nick Correll has noticed a significant improvement in soil structure on his property since adopting practices to maintain surface cover.

Sandy soil areas of his 700-hectare farm have in the past been subject to wind erosion. However, Nick is successfully addressing this threat through a range of strategies.

"For example, we do not till the land, we practice direct drilling to retain as much crop residue as possible," he explained.

"Maintaining crop residue requires careful monitoring and management because we also graze sheep during the summer months, but we have picked up extra adjustments to spread the stock as much as possible.

"We have also gone away from grazing grain legumes because it reduces ground cover very quickly."

At their 3,600-hectare property at Peterborough, Neil and Antoinette Sleep have in the past experienced wind-driven soil loss on some of their paddocks.

They have now adopted cell grazing techniques by

moving their sheep progressively through a series of fenced paddocks.

"We shift the stock every four or five days to allow the natural grass, mainly spear grass, to recover," Neil explained. "Since we started cell grazing, we've also noticed regrowth of windmill grass, wallaby grass and kangaroo grass.

"The system allows a rest period of up to 120 days for each paddock. Apart from the good environmental outcome in terms of regrowth, we are now able to stock about 10 per cent more sheep and don't have to rely on baled hay for feed."

In 2006, Neil Klingner decided to spray to eradicate pasture grass out of clover at the property he runs with his wife Catherine at Narridy near Crystal Brook.

The "zealous" spray application was effective, but so was the lack of Spring rain that resulted in no clover growth on the grazing property.

As a result, Neil and Catherine decided to establish a network of containment paddocks in which stock had access to feed cages primarily containing hay, oats, barley and lupins.

This left other paddocks free of grazing allowing barley grass, ryegrass and wild oats to flourish.

"The move to containment paddocks has allowed us to keep our sheep numbers with a focus on the broader acre areas growing with natural grasses for the lambing season.

"The strategy is good for the soil, good for the stock and good for us because we've maintained stock numbers and increased lambing percentages."

Mary-Anne Young is a Soils and Land Management Consultant with Rural Solutions SA.

Marine scientist Dimitri Colella mapping the sea floor using video and sonar off the bottom of Yorke Peninsula near Pandalowie Bay.



Mapping the sea's moods

We're recording our seafloor's present to protect its future.

Lance Campbell

Imagine your average sonar fish finder and multiply its range many times, so you can detect anything in the sea for 100 metres around your boat in any direction. Get in a plane for overhead photographs of the shallows, and drop video cameras over the side for the deepwater shots. Use a diver for the tricky bits.

That's how you map the seabed in the 21st century, and that's exactly what has been happening for the past three years around the coast of Yorke Peninsula. There you will find internationally significant marine habitats and some of the largest seagrass meadows in the world.

Whenever the weather window has opened, Department of Environment and Heritage marine scientists in local fishing charter boats have mapped about 50 square kilometres of the ocean floor a day. In the past eight months research scientists David Miller, Dimitri Colella and Henry Rutherford have concentrated on Yorke Peninsula's west coast, about 270 kilometres from Port Victoria down to the Bottom End.

Before the program wraps in June, they aim to survey another 125 kilometres from near Port Broughton south to Cape Elizabeth, and 40 kilometres up the Peninsula's east coast from Troubridge Point to Oyster Point.

When they do that, and combine it with earlier work north of Port Broughton and north of Stansbury, the DEH will have mapped the floor of the entire near coastline in the Northern and Yorke Natural Resources Management Board's region – all 1380 kilometres of it.

Why?

Board Presiding Member Merv Lewis points out that the Board's responsibility extends to the middle of both gulfs, Spencer and St Vincent. "It's very important that we get an understanding of what's going on in the sea, so we can measure the potential impacts and threats," Mr Lewis says.

"The mapping will allow us to determine whether the biodiversity changes over time, whether it gets better or worse. It's well known that increased nutrients such as human waste from sewerage outlets, fertiliser run off from farmlands and animal manure can lead to algae forming and seagrass dying.

"Our marine environment, our fish and other organisms, are extremely important to us. We have some pristine areas of mangroves. With the DEH, we have previously developed a plan for Spencer Gulf, and we are looking at doing one for Gulf St Vincent.

"These maps are one of the first steps towards understanding and protecting our marine environment."



The Northern and Yorke region accounts for a significant total of SA's gulf environments.

Spencer and St Vincent are recognised as distinct bioregions with the largest seagrass areas in the State, as well as in the world. Significant habitats include rocky reefs, salt marshes, mangroves and intertidal flats.

Marine benthic habitats, which refer to anything associated with or occurring on the sea floor, support a diversity of life by providing spawning, nursery, refuge and foraging grounds for coastal and marine species. These habitats also provide the basis for valuable commercial and recreational industries and opportunities.

The crunch, as Merv Lewis says, is that these precious marine habitats are prey to land based impacts. Population centres, intensive land use areas and major drainage catchments are their constant dangers.

Dr Bryan McDonald, DEH principal marine conservation scientist in charge of the project, says developments in marine mapping technology in the past five years had greatly assisted the survey. Going right back, knots on a line dropped over the side of the vessel was the method of measuring the sea.

Today's sophisticated sonar acoustic sounding and underwater video could not be more different. "It allows us to take very detailed sound images and cover a lot of territory in a relatively short space of time," Dr McDonald says. "We can detect things one metre in size on the seabed in the middle of nowhere.

"We have computer software to trace habitats from the pictures. We can drop video cameras down to 100 metres to record footage of the seabed. We record GPS positions. Our research profiles the landscape of the sea floor as well as the sea life in the habitats, and the Northern and Yorke district has pioneered a lot of this work to a very fine scale.

"If the old maps were 1:100,000 scale, what we're doing now is 1:10,000. That's a lot closer and more accurate. The old maps had 600 habitat blocks. The new ones show 4000 habitat blocks.

"Our goal is to provide natural resources managers in the region with detailed information on their coastal waters. They will have the ability to monitor for seagrass loss and changes in any habitats. They will be able to make the comparisons for many years to come."

As the survey comes to its close, Dimitri Colella and Henry Rutherford continue to work in and on the waters, with David Miller coordinating and analysing data. Over more than three years it has been a steady commitment, surveying the seabed of Yorke Peninsula, every 750 metres along the coastline out to deep water.

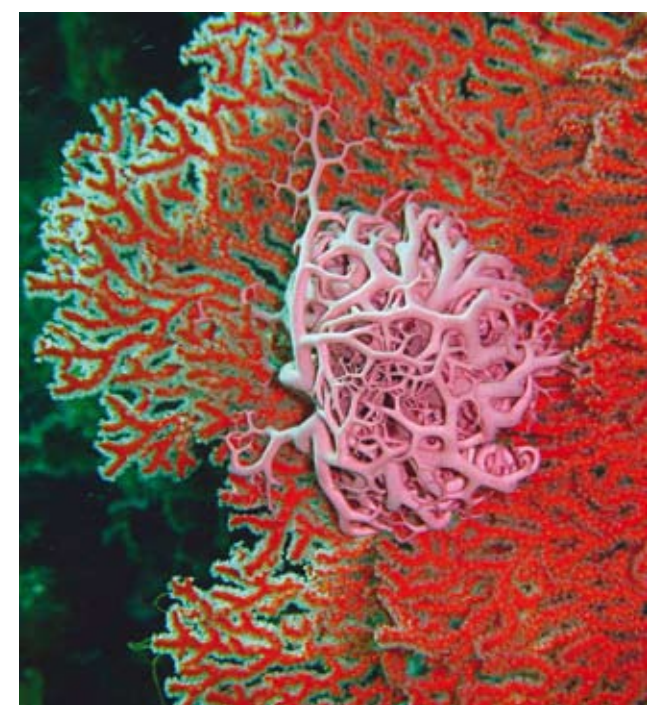
Like Dr McDonald, David Miller sees the survey as taking the lead in its field. "There has been other mapping on a national scale," he says, "but setting a regional baseline is pioneering in its own little way. This set of maps will form an integral part of the local marine environment management from now on."

Although mainly land based, David has spent his share of time mapping the blue waters of Spencer Gulf. "We've had some really spectacular days around Corny Point," he says, "and absolutely brilliant ones near Cape Spencer, down off Innes National Park. I really like that exposed coastline.

"There was one crystal clear day, not a breath of wind, no swell. We were near the cliffs, somewhere we couldn't normally be. It made me appreciate the sea and the place so much."

Preserving those places is what surveying Yorke Peninsula's sea floor is all about.

Dr McDonald says the maps will be available to the public in about July.



Photos this page: Thierry Laperousaz, SA Museum

Fresh 'n' salty



Where sea and land get together we can find some of the best fish and most valued birds in the world. Yet most of us don't know much about estuaries.

Estuaries are those special places where fresh water meets salt water, where the sea mingles with the land.

Unlike sandy beaches, estuaries are not everywhere around our coast. But estuaries are distinctive.

The plants and animals that live there have adapted to their unusual conditions. Humans are drawn to these unique environments by natural curiosity. Sea water, fresh air, sea air and fresh water in the one natural mix. How does it all work?

Northern and Yorke has 16 estuaries on the edges of its three million hectares, from the Light River delta just north of Adelaide to Blanche Harbor southwest of Port Augusta.

Most are tidal channels or the mouths of rivers that don't always flow. So they don't have the visual impact of raging surf beaches or towering sea cliffs. Yet without exception, their importance to us, and to the natural resources we want to protect and manage, cannot be underestimated.

Fourteen of Northern and Yorke's 16 estuaries are listed as wetlands of national significance. All of them support a wide diversity of bird and fish life, some contain Aboriginal heritage sites, and many contribute to local economies through tourism, agriculture and exports.



More than 120 species of waterbird make up the 60,000 individuals who live in or visit N & Y's estuaries and their surroundings. On the Samphire Coast from Port Gawler to Ardrossan alone, the red-capped plover, sharp-tailed sandpiper, red-necked stint and banded stilt are internationally significant.

The estuaries of Port Augusta, Port Davis/Broughton River, Salt Creek at Coobowie and Wills Creek at Price saltfields are wader bird sites, while Port Pirie River and First, Fisherman, Salt and Wills Creeks are part-time or permanent home to sea birds.

The intermediate egret, which ranges from east Africa to eastern Australia, is spotted in the shallows of the Port Pirie River estuary (see separate story).

In and under the water it's a similar tale. King George whiting, southern sea garfish and yellow-eyed mullet are economically important fish in the region. Congolii and other natives such as the small-mouthed hardyhead and the blue spot goby have been recorded.

Internationally protected seahorses and pipefish have been found in seagrasses around the Port Pirie estuaries. Blue swimmer crabs, western king prawns, razorfish and mud cockles like to inhabit our estuaries.

Nearly half of SA's mangroves are in Northern and Yorke, many in extensive networks surrounding the estuaries. The Light River delta has one of the largest pristine mangrove areas in the State. Both the Fisheries Management and Native Vegetation Acts protect all mangroves.

Saltmarshes and seagrass communities also are major contributors to estuarine life. Saltmarsh, or samphire, is prevalent from Port Pirie south to the Port Davis/Broughton River estuary on Spencer Gulf and in the arc around Gulf St Vincent from Wills Creek to the Light River delta.

In both gulfs, seagrass is the most abundant in the State, and habitat for many commercial and recreational fish species, not least the famous KGW. Floodplains that provide habitat for migratory birds and other animals in dry seasons, and intertidal mudflats that provide feed for the birds complete the picture of Northern and Yorke's estuaries in an ideal world.

Needless, perhaps, to say, the pressures on our estuaries make this a less than ideal world. Activities that have led to changes to their natural state include cropping and grazing, salt production and electricity supply, wastewater disposal, fishing, boating and camping, tourism and transport and even petroleum, mining and geothermal exploration.

Add to those illegal rubbish dumping, off-road vehicles, regional developments, urban and agricultural runoff, alterations to river flows, mosquito controls and weed infestation, and Northern and Yorke's estuaries are prey to influences that cause similar concern in other sectors of our environment.

Our mangroves are in danger from increased nutrients, industrial heavy metals and sewage, oil spills, dredging, anchoring and human trampling. Our saltmarshes suffer from inappropriate access tracks, off-road vehicles and rubbish dumping.

Sea level rise from climate change also will affect fish and other species dependent on their saltmarsh habitat. Seagrass is under pressure from agricultural and urban runoff, wastewater and industrial effluents.

The Port Davis/Broughton River estuary is a case study. Along with its wader and shore birds, it is an important nursery area for KGW, snapper and gar. The region's popularity for catching these prized table fish is well known throughout SA.

So it's no surprise that launching and fishing there does the estuary no favours. Land clearance for agriculture from long ago, as well as more recent unsustainable practices, doesn't help. People make tracks through the saltmarshes, and dump rubbish.

Increased sedimentation in the channel has reduced environmental flow. Mining companies are interested in the region, and there is always the potential for sea level rise and coastal erosion.

Add up all these, and an estuary that has served its wider environment for thousands of years might not be able to do so in the future.

What can be done to conserve these precious resources? Northern and Yorke believes greater understanding of estuarine environments is a key to the way ahead. There are "information gaps" that, once filled, will lead to better management of our estuaries.

The list is 10 points long, and includes a monitoring program for priority estuaries and targeted education programs and activities for landholders, tourists, industry and other estuary users, along with the wider community.

It also looks at environmental flow, groundwater, stormwater, artificial openings, urban encroachment, other potential pollution sources and climate change.

Importantly, community groups have joined government and council groups and other agencies to focus on our estuaries. Primary Industries and Resources, Planning SA, the University of Adelaide, the Department of Environment and Heritage, Yorke Regional Development Board and Barunga West Council have estuary projects in Northern and Yorke.

These range from marina strategy to mosquito control and marine pest incursion.

But the Coobowie Estuary Steering Committee has a monitoring program for Salt Creek at the Bottom End of Yorke Peninsula, and further west the Friends of Point Davenport Conservation Park, between Edithburgh and Marion Bay, are active in their estuary.

Those special places where fresh water and salt water gather together to create life of their own are worth keeping at any cost.



The intermediate egret is only one of a host of significant waterbirds found in the estuaries of Spencer Gulf, where 10 internationally important and 12 nationally important species are listed.

A medium sized-heron also known as the median or yellow-billed egret, about 90 cm tall with white plumage, the intermediate egret ranges from east Africa across tropical southern Asia to Australia.

In Northern and Yorke it settles in the Port Pirie River region, along with the likes of the great and little egret, the Australian white ibis, the nankeen night heron and the straw-necked ibis.

There the intermediate egret is at home in shallow sea or fresh water, foraging for fish, crustaceans and insects. Most birds are excellent environmental monitors, giving early warnings when something is wrong.

Aquatic ecologists acknowledge that the top predators in wetlands and estuarine systems are the best indicators. Bird enthusiast Wally Klau, of Wilmington, who monitors populations for DEH, says species such as the intermediate egret are in that category.

So should the water bird and its kin fly the Northern and Yorke coop, we would know that work had to be done to preserve its habitat.

But better now than when it's too late.

Cover or be dammed



Greg Pearce, Foster's Group
Clare Valley Vineyard Manager
beside the dam recently
topped with a floating cover.
Photo: Vanessa Size

Preventing evaporation from farm dams is emerging as an important way to save water, protect environments and boost economies in rural Australia. Trevor Gill reports.

More water is lost to evaporation than is received from rainfall across at least 70 per cent of the Australia continent,

More water evaporates from surface water storages such as dams, than is used, and this amount will rise with climate change and continue to deplete our precious water resources.

Evaporation impacts on agriculture and natural resources. It reduces the amount of water available for farming, impacts on natural flows along rivers and creeks and may ultimately reduce recharge to aquifers, particularly in semi-arid zones.

In the Northern and Yorke region, a major study has been undertaken of the region's farm dams to assess the level of risk presented by evaporation using latest aerial imagery.

Conducted by the Northern and Yorke Natural Resources Management (NRM) Board, the assessment identified more than 8,800 dams with a potential storage of around 22,000 megalitres.

Board Member Kerry Ward said more than 90 per cent of the dams had an estimated full supply volume of less than five megalitres, meaning less than 10 per cent of dams held almost 50 per cent of the total storage volume.

The study showed that in the Clare Prescribed Area, about 1,400 megalitres of water was taken annually from dams between 2000 and 2004 (1). The annual evaporation loss was estimated at 2,100 megalitres.

Meanwhile, surface water flows diminished from 20,700 megalitres per annum (1969 to 1984) to 9,000 megalitres (2000 to 2004).

In the Broughton River catchment, which covers an area of about 5,600 square kilometres, including the Hill River and Hutt River tributaries, there has also been a significant reduction of surface water flow.

Similarly, there has been a major drop in water flow in the Wakefield River catchment across an area of 690 square kilometres including the Skillagolee, Eyre, Pine and Rices Creeks.

Kerry Ward said options for improving surface water flows include reducing water allocations or dam capacity, both of which would have a major impact of irrigators and farmers holding water for stock.

“Reducing evaporation from dams offers a more attractive option,” he said.

“It is our best opportunity for reducing the impact of farm dams on the environment because substantially more water is lost to evaporation than is ultimately accessed for stock, irrigation or domestic use.

He said considerable research has been undertaken on methods of reducing evaporation, including dam storage design, covers, windbreaks and monolayers.

“Dam storage design can include reducing the exposed surface area by improving the overall depth,” said Kerry.

“Pumping from dam to dam to store captured water in the best possible storage is another option.”

On larger storages, dividing the dam into cells enables the transfer of water from one cell into another as the water level drops. This also introduces the potential to cover a smaller area.

Covers are expensive options, but “the economics are improving,” says Kerry.

The most expensive of all water storage systems is a complete bladder. SA Water already has two mains water storages utilising bladders at Paskerville and Auburn.

Floating tyres have also been used successfully, and they represent a good recycling option. Various other floating devices and covers are already available.

“One of the more viable options for our region is the use of shade cloth on a cable structure, such as that used for cherry growing,” said Kerry.

“This has been shown to achieve 70 per cent reduction in evaporation and is supported by the National Program for Sustainable Irrigation.

“Vegetation windbreaks around a dam can save up to 20 per cent of losses from evaporation,” he said.

“Monolayers, or ultra thin films, also have potential, but they work best where the wind effect can be kept to a minimum.”

The National Water Commission recently announced a \$750,000 research project to develop a unique set of chemicals and polymers acting as monolayers to control evaporation in water storages and irrigation channels.

In a warming and drying environment with escalating issues of water security and rising prices, I am certain evaporation protection measures will become standard rather than exceptional within a decade.

The new monolayers will be evaluated in laboratory trials and performance tested in small scale field trials. This will be followed by larger scale field trials in a number of commercial scale water storages.

The objective is to reduce evaporation and improve the ability of farmers and other water users to achieve greater water use efficiency and sustainability.

At the Foster’s Group Clare Estate, a floating cover has been installed to provide 100 per cent evaporation protection of captured and stored water run-off.

Greg Pearce, the Group’s Clare Valley Vineyard Manager, said a key feature of the project results from the covered dam being central and connected to the other dams on site.

“This allows consolidation of all our water to the protected site,” he explained.

“While evaporation losses for the district amount to about 1300 to 1400mm (13 to 14 megalitres per ha of dam surface area) per year, the evaporation savings are doubled from storage consolidation.

Greg said the savings in the first year of operation totalled 40 megalitres. Excluding the value added to the grape crop by applying the water for irrigation, the project offered a return on investment of 25 per cent (valuing water at current SA Water prices).

“With the value of water increasing, the project has a forecast payback period of three years,” said Greg.

“This has exceeded even our best expectations.

“In a warming and drying environment with escalating issues of water security and rising prices, I am certain evaporation protection measures will become standard rather than exceptional within a decade.”

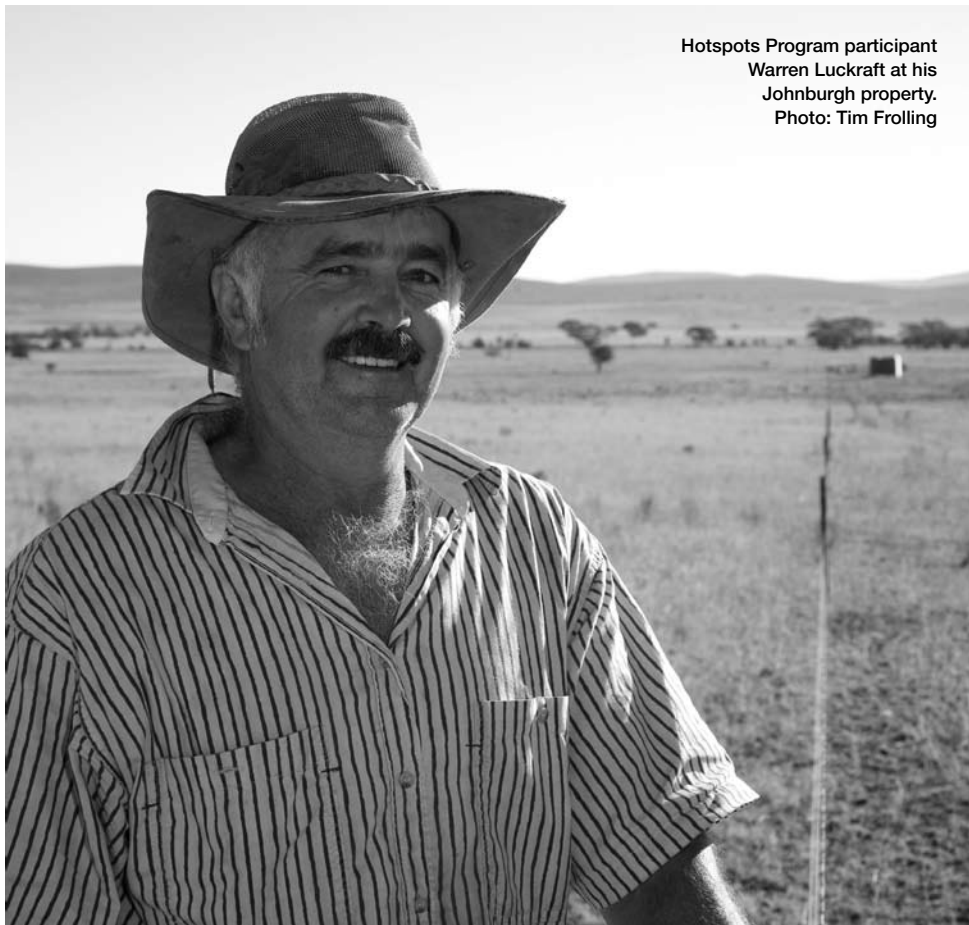
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Photo: Kerry Ward





Hotspots Program participant Warren Luckraft at his Johnburgh property. Photo: Tim Froling

Hotspots program

High conservation value habitat in the South Flinders region will be protected under a total of \$600,000 awarded last year to 27 local landholders.

The Southern Flinders Ranges Hotspots Program is helping to protect 12,000ha of native vegetation between Beetaloo Valley and Johnburgh.

Warren and Jane Luckraft run a 5588ha property (Bendleby) near Orroro, of which about one third of the total land will come under the Hotspots program.

They intend limiting the grazing of stock in some areas, fencing in the hills and helping clean out feral goats, foxes and rabbits.

"We'll be shifting stock to avoid over-grazing and fencing some of the high country to restrict access to stock," said Jane.

"We are also co-operating with the SA Lands Board to help prevent the spread of feral goats. That means trapping and, at times, shooting the goats," Jane said.

The Greening Australia program operates under a 'stewardship tender process' in which landholders 'bid' for funding to manage valuable ecosystems on their land.

"Interested bidders arranged for a free, on-site ecological assessment of their land with a qualified conservation advisor who helped them develop a biodiversity management plan," said Greening Australia's Northern and Yorke senior vegetation consultant Anne Brown.

"They then set their own price for the actions they were prepared to take. The price was compared with other bids from within the region and the successful bidders were those who offered best value for money," she said.

"Those landholders who are good land managers and willing to contribute to the costs of conservation action on their land were the most competitive bidders," she said.

Other successful Hotspots bids included programs targetting feral goats, foxes and rabbits, weeds in remnant vegetation and wetlands protection.

Mount Remarkable Orchids under threat

Up to nine native orchids are under threat in the Mount Remarkable National Park.

A habitat for more than 30 species of native orchids, the region also harbors five nationally threatened species, including three orchids which only occur in the Southern Flinders Ranges.

They are the Bayonet Spider, Woolcock's Spider, Flinders Ranges White, Pale Leek and Robust Leek orchids. Their threats include weed invasion, grazing kangaroos and rabbits and drought.

The Northern Lofty Block Threatened Orchid Recovery Project (NLBTORP) aims to aid the recovery of nationally threatened orchid species in the region.

NLBTORP is a cooperative with a host of organisations under its umbrella.

They include the Native Orchid Society of SA (NOSSA); Department of Environment and Heritage (DEH); Threatened Plant Action Group (TPAG); Trees For Life (TFL); Friends of Halbury Parklands; Friends of Brentwood Cemetery; Local Councils and Friends of Spring Gully CP.

The project is supported by the Northern and Yorke NRM Board.

DEH Clare's Biodiversity Support Officer Mick Higgins, said there were a number of different orchid species in the area under threat.

"Among the threatened orchids specific to Mount Remarkable are Caladenia, gladiolata, woolcockiorum, saxatilis, ensigera, xantholeuca, flindersica and Prasophyllum Validum," he said.

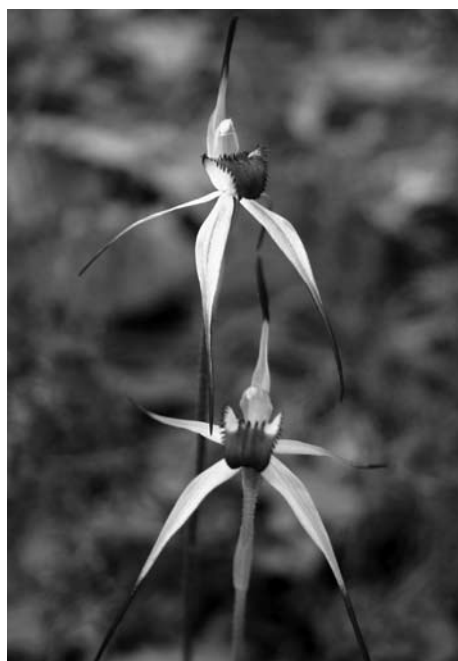


Photo: Mick Higgins

"Results from the 2008 season reveal a drop in Caladenia gladiolata numbers at Alligator Gorge, yet germination of the plant along the Ring Route is reasonably high," he said.

"There were lower numbers of Caladenia woolcockiorum compared with previous years along Sugar Gum Camp Track and Woods Hut Track," he added.

"Caladenia xantholeuca hasn't been seen in the wild since 1982 despite targeted searches," he said.

"This plant requires high autumn and winter rainfall and possibly fire to flower, so prevailing conditions have not been conducive and it is unknown whether the plant is extinct or not."

Bird team to the rescue

A study to determine whether woodland bird populations are affected by seasonal changes and different vegetation is being conducted in the Mid North.

Members of the Declining Woodland Birds Recovery Team are monitoring bird numbers and habitats throughout the Clare Valley with a focus on the area's Eucalyptus leucoxylon woodland.

"Because of the distances between patches of fragmented vegetation, and reduced understorey, woodland birds have limited sources of food and nesting sites," said Mick Higgins, DEH Clare's Biodiversity Support Officer.

"Coupled with seasonal and climatic changes, bird species diversity could be affected," he said.

"Monitoring of woodland birds is an ongoing process because long term monitoring provides a better picture of changes in bird species diversity, over the medium to longer term.

"This allows for more effective management strategies to be developed which benefit the long-term survival of woodland birds. Short term monitoring may give a misleading picture of what really is occurring," he said.

The Declining Woodland Birds Recovery Team is managed by the Department for Environment and Heritage (Clare office) with funding from the Northern and Yorke Natural Resources Management Board.

The Recovery Team also provides community education about Woodland birds, and plans

to oversee on-ground works programs to help manage the habitat of woodland birds.

Bird enthusiasts from the Clare-based Biodiversity and Endangered Species Team (BEST), in conjunction with Birds Australia Routine Monitoring Program, monitor birds and habitat over a huge area of the Northern and Yorke region covering Halbury Parklands, Tothill Ranges, Wilmington and Maitland, plus many other sites.

Data collected from the BEST bird monitoring sites provides updated information about the status of woodland birds for the Declining Woodland Birds Recovery Team.

The monitoring project is funded under Envirofund.



Red capped robin. Photo: Annika Everaadt



Photo: Catherine Gasmier

Rabbit costs in perspective

A strategic, \$900,000 program to help eradicate rabbits and restore pastoral grazing land and remnant vegetation is underway across the Northern and Yorke region.

Program funding was recently sourced by the Northern and Yorke NRM Board from the State Complementary Funding Scheme, and will provide a substantial boost to its 2008/09 animal and plant control program.

Under the program, Board staff in the Upper North, Lower North and Yorke Peninsula regions are working alongside individuals and community groups to identify and destroy rabbit warrens on private and public properties.

"In recent years, the impact of rabbit infestation has seriously compounded the effects of drought conditions that have diminished grazing resources," said the Board's General Manager Lynne Walden.

"In many cases, there is evidence of degeneration of native plant species, often exposing properties to potential soil erosion," she said.

"Many farmers affected by rabbit populations have been forced to reduce stock numbers, and this has contributed to economic hardship.

"Destroying warrens is the most effective way of control as rabbits have a very low survival rate without the natural protection of their burrows," she said.

In the Board's Upper North region, the program is targeting bulldozer operations to rip rabbit warrens for landholders who had identified problem areas of their properties.

"It is succeeding on the basis of collaboration with landowners to locate and record warrens, often using GPS technology, and directing contracted machinery operators onto target sites," said the Board's Upper North Operations Officer, Kevin Teague.

"In some cases follow-up baiting and fumigation strategies may be required," he said.

"The Board's funding is a major step towards achieving rabbit free properties in the region.

"It demonstrates that the Board is serious about reducing the devastating impact of feral rabbits, and we encourage landholders to take the opportunity to rid this pest from their land."

In the Lower North region, the eradication program is concentrating on sandy soil areas, particularly along roadsides and in remnant vegetation.

"We are advising landholders that the Board can assist with best practice baiting programs and the provision of contractors with small implements to rip warrens in areas of remnant vegetation," said Lower North Team Leader Grant Roberts.

"There are clear benefits in terms of reducing the impact of rabbits on agricultural land, along with control of soil erosion and biodiversity outcomes.

"Once the rabbits are removed, we hand control back to the landholder with a voluntary management agreement to keep the property in a rabbit-free condition."

The Board's Yorke Peninsula Team Leader Rob Lincoln said the State Complementary Funding Scheme had contributed to control measures in rural, urban and semi-urban areas from broadacre to domestic situations.

"The Board is supplying materials and equipment free of charge to address the problem of rabbit infestation," he said.

For more information about the rabbit control measures, telephone Kevin Teague on 8658 1086, Grant Roberts on 8847 2544 or Rob Lincoln on 8853 2795.

Community tackles olive and ash

The dense and spreading threat of feral olive and ash trees in the Willochra Creek near Melrose has been a growing concern to local landholders and town residents.

Northern and Yorke NRM Board Upper North Operations Officer, Kevin Teague, said the feral plants had infested the creek bed over a distance of more than three kilometres.

"Quite apart from competing with river red gums along the creek and the impact on the biodiversity value of the area, there were concerns about a fire risk for local property owners because of the density of the infestation," Kevin explained.

"If a fire occurred, the feral olives and ash could carry flames right into Melrose.

"Flooding emerged as a risk factor because of potential obstruction to the flow of the Willochra Creek and the possibility of water spreading onto low lying areas in Melrose, including homes, sporting facilities and the local caravan park," he said.

The area is adjacent to the Mount Remarkable National Park, and wind and birds could spread seeds from the offending olive and ash trees.

Kevin said local landowners were consulted about an NRM Board-funded proposal to eradicate the feral trees, and they were unanimously supportive.

"The eight affected landowners were very willing to provide access for machinery and workers to carry out the work," he said.

Heavy machinery included a 28-tonne excavator to cut down the olive and ash trees, and an implement called the 'Bandit Beast' that converted wood into five tonnes of mulch

per hour.

Once the trees were felled, chain saws were used to reduce them to stumps that were treated with an environmentally friendly herbicide.

A wood chipper followed up the heavy machinery to deal with smaller trees.

The work was completed in late February, restoring the Willochra Creek to a healthy state prior to Autumn rains.

"There has been a total transformation in the creek bed, and the local landowners and towns people are pleased with the natural resource management outcome," Kevin said.

Greening Australia's NY Senior Vegetation Consultant, Anne Brown, said the project built on another success story upstream in the Willochra Creek.

"With support from the Board, the Melrose Community Development Committee last year removed a smaller section of feral olive plants from the creek," Anne said.

"Overall, there has been a major community effort to control feral plant growth in the creek. The effort has removed a weed source that had potential to invade large areas of high quality habitat, including the nearby national park.

"We appeal to landholders to monitor the area to identify and remove seedlings of pest trees to alleviate the threat in the longer term," Anne said.

"It is also important for any person growing olives for human consumption on their property to ensure harvesting occurs before birds and foxes can carry the olives into surrounding countryside."

Trials of a creeping pest

A Creeping Knapweed trial project along a roadside stretch at Cocky's Crossing beside the Lower Broughton River is being carried out by the Northern and Yorke NRM Board.

A range of herbicides, including Lontrel, Tordon, Amicide 625 and Glyphosate, are being tested to assess the cost and effectiveness of treatment.

Creeping Knapweed can dominate an area to the exclusion of all other plants, and has established in significant pockets around Georgetown and Port Pirie.

The Board's Authorised Officer Stewart McIntosh said there is potential to cost-effectively remove the threat of Creeping Knapweed in areas of the Board's Lower North region

He said the removal of patents from some herbicides had opened the way for generic brands. This had significantly reduced the cost of some herbicides making treatment options more affordable.

Creeping Knapweed, also known as Russian Knapweed, is a competitive perennial pest plant that can reduce cereal crop yields by up to 75 per cent.

Originating from eastern Europe, the introduced species is a persistent plant that is commonly found on cereal cropping and horticultural land, on roadsides and wasteland.

It is an erect thistle-like herb with an extensive root system that removes vital moisture and nutrients from the soil.

Root fragments broken off during cultivation are the most common cause of spread.

Findings of the Board's Creeping Knapweed trials were presented at a workshop forum for farmers at a Butlers Bridge Hall in late March 2009.

The trial site may also be expanded this year.



Photo: Steve Dewey



Local salinity management show cased at international forum

Land salinity is a major problem across broad landscapes of agricultural land in Australia, with the Northern and Yorke region declared a priority area for action.

Where groundwater driven salinity is a natural feature of the landscape, it is referred to as primary salinity. Where it is caused by human-induced changes, it is known as secondary salinity of soil.

Secondary salinity, or salinisation, results from water table rises that are often caused by changing land use actions such as land clearing or irrigation. The term water table refers to underground water that may be very deep, or quite close to, or even at the surface.

Since European settlement, considerable areas of deep-rooted native vegetation have been cleared for agriculture and crop growing.

Perennial native vegetation uses much more water than shallow-rooted annual crops and pastures, so on cleared land significantly more rainfall soaks into the soil and to the water table. This causes the water table to rise, bringing dissolved salts with it and picking up salt stored in the deep sub-soil. If it rises to within a metre or two of the surface, the saline groundwater can stunt growth, or even kill plants.

Perennial native vegetation helps to keep the ground water further from the surface. Replanting cleared areas with trees and deep rooted grasses can prevent the problem of rising water tables, but revegetation needs to occur over large areas to provide any significant lowering of ground waters.

Flooding or irrigation can also increase soil salinity either through the direct addition of salt in the water, or by causing the underlying water table to rise closer to the surface, bringing dissolved salt with it.

Damage to agricultural land and loss of productivity can be significant.

It is estimated that 10,000 hectares of land in the Northern and Yorke Region is affected by primary salinity in the form of salt marshes and salt lakes, while there are 30,000 hectares of secondary salinity brought about by human-induced changes

The Northern and Yorke NRM Board is taking comprehensive steps to manage the problem through extensive monitoring and evaluation studies, community awareness programs and funding for projects such as stormwater and flood control to reduce the threat.

A paper on catchment planning for salinity management in the Northern and Yorke region was presented at the 2008 International Salinity Forum in Adelaide.

Prepared by Andrew Harding and Trevor Dooley of Rural Solutions SA, and NRM Board Presiding Member, Mervyn Lewis, the report reflected on the origins and development of the salinity management planning process, along with landholder engagement and on-ground works to address the problem.

It highlighted a case study of the Minlaton-Ramsay catchment on southern Yorke Peninsula where there has been an integrated effort to manage the impact of salinity.

Landholders, community groups, the District Council of Yorke Peninsula and clay spreading contractors were engaged through educational workshops and field days.

The objective was to raise awareness of the problem and to help generate greater involvement in management activities, including cleaning out culverts, regrading surface drains, clay spreading, revegetation programs and fencing.

The focus was on removing excess surface water to reduce waterlogging and flooding that recharged groundwater causing saline water tables to rise.

Andrew Harding, Senior Soil and Land Management Consultant, Rural Solutions SA, said the effectiveness of some of the works was being monitored through a series of observation wells.

The strategic approach to salinity management has allowed the Northern and Yorke NRM Board to focus on high priority catchments.

Andrew said this had enabled the Board and the community to gain a better understanding of the process of salinity, to assess management options and identify target areas.

"More investment has been directed at the cause of the problem aimed at reducing recharge rather than trying to fix the effects.

"Monitoring and evaluation have been important components, but it will take some time to detect changes."

Ecology of ephemeral streams in the Clare Valley

The extended drought that has beset southern Australia in recent years has had a significant impact on permanent pools scattered along the Wakefield, Hutt and Hill rivers, downstream of the Clare Valley.

These rivers are classified as ephemeral, which means they carry water immediately after rainfall, but are dry for much of the year.

Even when water does not flow, ephemeral streams often feature permanent waterholes that may be recharged by groundwater discharged from surrounding aquifers.

These pools are ecologically vital as they can sustain various aquatic organisms and wildlife through long periods without rainfall.

A group of researchers from Flinders University School of Biological Sciences and Flinders Research Centre for Coastal and Catchment Environments have undertaken a study of the ecology of these ephemeral rivers.

The NRM Board is represented on the steering committee for this project and has provided field assistance for sampling and liaising with landowners.

The Broughton and Wakefield River catchments have a substantial part of their total flows originating in the Clare Valley.

The headwaters of the catchments are divided by an east to west topographic elevation that causes the Broughton River to flow northward to Spencer Gulf while the Wakefield River system goes south west to the Gulf of St Vincent.

Flinders University researcher, Dr Amy George, said the study specifically aimed to:

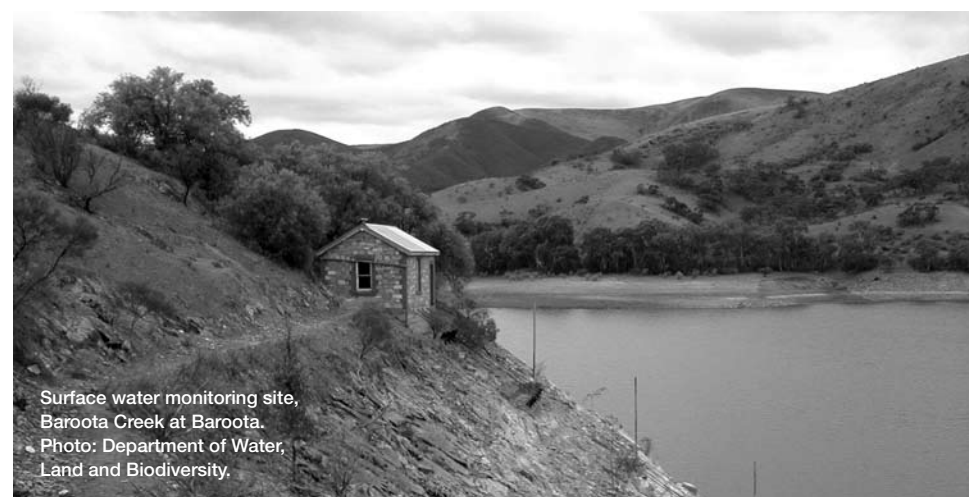
- evaluate the status of permanent pools along the Wakefield and Broughton Rivers, including the Hill River and Hutt River sub-catchments, based on the exchange between surface water and groundwater; and
- determine the resilience of resident macro-invertebrates.

In 1998, the State Government funded a survey of permanent pools in the Clare Valley that identified about 250 sites scattered along the Hutt, Hill and Wakefield Rivers.

A follow-up survey in April 2008 found only 64 pools within the same survey area, representing an 83 per cent loss, most likely due to the reduced rainfall and lower groundwater levels resulting from extended drought conditions.

Dr George said it was likely water in the remaining permanent pools comes from deep fractures in the aquifer.

She said such a reliance on groundwater could affect the number and types of invertebrates that live in the pools. Early indications are that there is considerable number and diversity of aquatic species in these systems, but this is the subject of further research.



Surface water monitoring site, Baroota Creek at Baroota.
Photo: Department of Water, Land and Biodiversity.

Baroota water use prohibition

A Water Allocation Plan for the Baroota Prescribed Water Resources Area will be prepared by the Northern and Yorke NRM Board during 2009.

The Plan will help ensure that Baroota's limited water resources are managed in a way which balances the needs of long-term economic, environmental and social sustainability.

Key elements of the planning process will involve technical studies to:

- learn more about the characteristics of the Baroota catchment;
- determine its capacity to meet environmental and commercial needs.

Baroota water users and the wider community will be consulted in the development of the Plan.

Meanwhile, the prohibition on water use in the Baroota area has been extended by the Minister for Environment and Conservation Jay Weatherill for a further two years until 1 August 2010.

This means that taking water is prohibited, except where written authorisation has been obtained.

The prohibition does not apply to domestic purposes or watering stock other than stock subject to intensive farming. Water for fire-fighting, public road works, or reticulating supplies of potable water for townships in the area is also exempt.

For more information please contact the Board's NRM Officer (Water) Jennifer Munroe on 8636 2361.

Coastal strategy on track

The Northern and Yorke NRM Board and Central Local Government Region have teamed up to help protect the regional coastline.

Extending from Middle Beach on the east of Gulf St Vincent to Two Hummock Point south of Blanche Harbor, the coast runs for 1380km.

Part of the overall strategy is Rural Solutions SA Coast Care officer Deb Allen's production of two comprehensively researched and written manuals on motor vehicle access and signage.

The manuals incorporate many of the objectives and actions identified in the Coastal Motor Vehicle Access Management Strategy, the Northern and Yorke Natural Resources Management Plan and the Department for Environment and Heritage Planning guide.

Program manager Anita Crisp said a database of council-managed coastal land will be established.

"Information will be collated on coastal land parcels managed by local council in the Northern and Yorke region.

"On-site inspections of land will identify the current status of the land, including number

of vehicle tracks, pedestrian access points, existing infrastructure and analysis of current recreational use."

Strategies will be created to provide appropriate levels of management for conservation, habitat protection and recreational use.

In addition a draft road and track access plan will be developed for each site.

This will include speed restrictions for beach driving sites, mapping and signage requirements and the identification of conservation areas.

Signage plans for each site will be implemented and a 'Code of the Coast' interpretive sign for consistent use throughout the region will be developed.

Community consultation is a key factor.

The management team will work closely with the community to refine draft plans for each site.

On-ground works in coordination and installation of signage, fencing and other access management works will be undertaken when the plans are finalised.

Coast watch on climate change

Southern Yorke Peninsula has been identified as one of six priority areas to come under the focus of a national coast vulnerability study undertaken by the Department of Climate Change.

Other priority areas are Kakadu, Pimpana River on the Gold Coast, the Hunter River region, Tasmanian coasts and the Pilbara.

All six sites for the case study were chosen for their distinct and unique ecosystems and fragility to climate change.

In consultation with State and Territory governments, the Department of Climate Change is assessing risks to the national coastal zone from climate change, including implications of rising sea levels.

It will also provide decision makers with a better understanding of potential costs.

A 'first past' analysis on the risks facing the nation's coastal zone and key assets, such as coastline, biodiversity, settlements and infrastructure, is due to be completed in 2009.

It is proposed that the entire Australian coastline and islands will be mapped and photographed.

In addition the vulnerability of coastal biodiversity to climate change is also being assessed by the CSIRO's Division of Marine and Atmospheric Research.

Coastal ecosystems, such as beaches, estuaries, wetlands, dune vegetation, mangrove, salt-marsh, seagrass, rocky reef, coral reef and macro-algae will all come under the scientific microscope.



Photo: Thierry Laperousaz, SA Museum

Big team effort

A Memorandum of Understanding has been reached for a collaborative approach to the managing of natural resources in Gulf St Vincent.

Three NRM Boards – Northern and Yorke, Kangaroo Island and Adelaide and Mount Lofty Ranges – recently met to thrash out details of how they will work together to conserve and manage Gulf St Vincent.

Key goals include sharing knowledge, the pooling of resources and facilitating expertise in ecological, political and cultural heritage across the Gulf.

Strategic action will be consistent with long-term priorities, NRM goals and the application of management approaches based on ecosystem features.

Appropriate resources will be provided for the development of the whole of Gulf St Vincent.

In addition, a co-ordinated cross-regional NRM approach to the development of marine planning for the Gulf will be undertaken.

And the parties agree to promote a shared vision for use, management and conservation of the Gulf.

Marine and coastal interest groups will be actively involved in the process.



Point Pearce Primary School students planting their memorial garden.

Point Pearce students plant memorial garden

The Point Pearce Primary School has established a memorial garden, dedicated to the indigenous descendents of the region.

Reception to Year 2 school students and staff, together with TafeSA students planted endemic plant species under a collaborative project with the Aboriginal Lands Trust.

The 15m by 3.5m area of land at the school was planted with a huge variety of native plants, including Callitris and Allocasuarina (Sheoaks), Pittosporum (wild apricot), Hardenbergia, Dianella and Rhadodia.

ALT land management officer Roger Rigney said, "Permanent plaques, with the inscription of the names of families, were installed in memory of those people who lived and worked at Point Pearce community.

"Planting was as much a social event as a working-bee, bringing people of all ages together."

Mr Rigney said some of the plants had not survived in the on-going drought this summer, but another planting is planned to take place this winter.

"We will plant more established plants this time as the drought had a devastating effect on the seedlings we planted. Many of the plants died.

"The garden will be monitored by a conservation land management team," he said.

"It's a place where the community can visit to remember and reflect," he added.

The Northern and Yorke NRM Board provided funds for the plants.

Davenport's water saving measure

Davenport' Aboriginal community has created a unique method to save an estimated 58,000 litres of water each year.

About 500 metres of chainmesh fencing has been built around the two detention ponds to prevent debris and animals contaminating the water.

Potentially this will reduce the cost of water to the community by an estimated 58,000 litres annually.

While the extended drought has hampered the effectiveness of the program to reduce water contamination in Davenport, the little 100-strong community on the fringe of Port Augusta, it will provide on-going future water and cost-saving benefits.

Aboriginal Landcare Trust Landcare co-ordinator Mr Chris Rains said the Davenport community contributed \$15,269 towards a total bill of \$34,870 to complete the project.

"The fencing helps prevent wind-blown debris and feral animals polluting the water.

"Before this project was completed the water was unsuitable for any purposeful irrigation.

LYNNE WALDEN

General Manager, NYNRM, Crystal Brook

I have worked with the Northern and Yorke NRM Board for just over 12 months, and in that time have found the concept of 'natural resources management', and the role of NRM Boards is not clear to many people.

Natural Resources Management (or 'NRM') recognises that we all depend on the natural assets of water, land biodiversity, coasts and marine areas to survive physically, economically and socially, so we have a responsibility to adopt management practises that will ensure their long term viability.

NRM faces considerable challenges, not least of which is climate change. It is vital that globally and regionally, communities develop the necessary knowledge and tools to adapt to climate change and the potential impact on agriculture, irrigation, fisheries, tourism and recreation, conservation and economic development.

As a Board, the business of NRM also presents a raft of challenges including the ongoing need to secure adequate funds to undertake high priority works. The State NRM levy provides funding for the Board to fulfil its responsibilities under the NRM Act to play an active role in the management of natural resources within the region. In addition, the Board is continually sourcing additional income to meet its growing list of priorities. During the past four years, we have accessed both State and Federal Government funding programs of over \$20m to support many NRM projects throughout the region. However, the current economic crisis will limit our ability to secure such funds, as the number of applicants increases and the expected reduced size of funding pools.

In addition, changes to current funding programs will impact on the way the Board approaches NRM in the future. Previously, the Australian Government's funding program criteria was much broader and encouraged smaller and more diverse projects. Today, its *Caring for Country* program has a more structured business approach with specific investment targets based on 'landscape scale' projects. Applicants must demonstrate that their projects will involve other partners and provide value for money.

This means the Board may be unable to access funds for all of its regional NRM priorities. This presents a real dilemma, but we will continue to source other investment opportunities and work with our stakeholders to secure the best outcomes for the region.

In terms of strategic priorities, the Board has working since 2006 on the development of a regional NRM Plan. Now in draft form, the Plan outlines the current state of our natural resources, and goals and targets needed to sustain them. Development of the Plan has included workshops, meetings and planning sessions involving scientists, technical experts, Board members, Group members, staff and the wider community.

As for the Board itself? We have two levels of representation. At the strategic level are 9 Board Members whose role is to determine the organisation's overall direction. During the year four new Board Members, Parry Agius, Jayne Bishop, Kathie Bowman and Jackie O'Reilly were appointed. They bring considerable skills and experience to the task at hand. One of our members, Parry Agius, resigned in January 2009 and this position is currently being filled.

The Board is supported by three subregional NRM Groups which provide a vital link between the community and the Board. The main role of these NRM Group Members is community liaison. NRM Group members advise the Board about local 'on ground' issues and help increase the awareness of NRM activities. They also provide input to planning, promote the adoption of better management practices by businesses, and encourage volunteer involvement in NRM projects.

The success of NRM, however, depends on all of us. It relies heavily on our capacity as individuals and communities to understand and implement sound environmental practices in all aspects of our lives. The Board is always seeking ways to increase the level of participation and volunteering in regional NRM projects. There are several local, State and Australian awards which recognise the NRM endeavours of individuals and community groups. They include our the Northern and Yorke NRM Board Quiet Achiever Award; the Premier's NRM Award; National McKell Medal; and National Landcare Awards. Further information and nominations forms are available from our website at www.nynrm.sa.gov.au, or phone one of the Board offices (see contact details on page three of this edition of Yakka).



TIM COLLINS

Department for Environment and Heritage, Clare

With climate change expected to have an increased impact on rural communities over the coming decades, planning based on sound scientific data is needed to ensure that our region's rural and urban communities and environments remain viable in the face of increasing pressure on our natural resources.

This pressure is evident in demands placed on our diminishing water reserves, increased development in fragile coastal environments, degradation of remnant natural vegetation in agricultural areas, and more frequent extreme weather events resulting in soil erosion and fires.

The Northern and Yorke NRM Board provides a forum to bring together diverse organisations and individuals to collectively develop solutions to the problems we face.

Some of the positive results coming from Board programs are the threatened species programs operating in the Mid North, the increasing number of landowners setting aside remnant native vegetation under conservation agreements, and the Biodiversity and Endangered Species Team, a community volunteer group that undertakes a range of monitoring and management activities aimed at improving the condition of natural resources in the Mid North.

ANITA CRISP

Central Local Government Region, Crystal Brook

Northern and Yorke Natural Resource Management Board and the Central Local Government Region of Councils are currently reviewing a list of agreed priorities for future collaboration.

The activities were initially developed by the fifteen local Councils represented by the Central Local Government Region and presented to the NRM Board in 2007, identifying areas of specific Council support and action sought, including:

1. Better and more relevant communication with Councils on natural resource management activity being undertaken by the Board in each district
2. Vegetation management on roadsides and community lands
3. Water resource management and sustainable supplies, including support for regional implementation of the ICLEI Water Campaign
4. Coastal management
5. Pest plant and animal control
6. Salinity management, particularly in relation to road and engineering works and development proposals
7. Development of eco-sensitive tourism and recreation facilities and ventures
8. Climate change and the need for a collaborative approach between NRM, Local Government and Regional Development partners.
9. Clarity and better alignment between land use and development planning.
10. Implementation of these priorities will help improve coordination and effectiveness of the management of our region's natural resources.

Above: Northern and Yorke NRM Board community representatives, from left: Jane Bishop, Neville Wilson, Jackie O'Reilly, Presiding Member Merv Lewis, General Manager Lynne Walden, Kerry Ward, Helen Thomas, Rick Wilkinson, Kathy Bowman.

BOB MCLENNON

Department of Water, Land and Biodiversity Conservation Adelaide

With 30 years experience in the water industry with the SA Government, I bring specific experience in water management to the Board, together with many years experience in senior government administration.

My first 17 years were with the former Engineering and Water Supply Department and subsequently SA Water working initially in the water and wastewater treatment area. The latter years within SA Water were spent managing major projects mainly associated with wastewater (or pre-loved treatment and reuse).

In 1992, I joined the Environment Protection Authority when it first started in South Australia, staying with them for about eight years and working mainly on air and water quality monitoring, improvement and management.

Eight years ago, I joined the former Department for Water Resources when it commenced. This department subsequently became the Department for Water Land and Biodiversity Conservation (DWLBC).

My role within DWLBC is related to water allocation and the management of prescribed water resources within South Australia.

JOHN CORNISH

Primary Industry and Resources, Adelaide

Final figures for SA harvest

Tuesday March 10, 2009

South Australia's estimated crop production has finished at 4.93 million tonnes for season 2008.

The State's total crop area is 4.01 million hectares.

Author of the report, Rural Solutions SA's Peter Fulwood said farmers were now hoping for good rains in the next six weeks.

"The area of crop this year is not expected to change significantly from last season. After the hot conditions experienced in many parts of the State in early February, and minimal rainfall, growers are now holding out for a good opening to the season," Mr Fulwood said.

He said paddock feed remains adequate in most areas with stock numbers relatively low, however feed levels have declined over the past month.

"While cereal stubbles are still providing some feed, many pasture paddocks are largely grazed out and some supplementary feeding has commenced," he said.

The full report will be available this afternoon at www.pir.sa.gov.au/cropeport.

KERRY WARD

Vigneron, Clare

I am a vigneron from Clare with experience in Local Government, soil conservation, animal and plant control and water resource management. However I have a keen interest in all aspects of natural resource management.

The most time consuming of my work with the Board has been in sustainable water resource management. The Clare Water Allocation Plan (WAP) has been reviewed

and amended and is nearing completion. Studies that include an assessment of the farm dams in the region as well as ecological assessments of the smaller catchments have been completed.

Exciting projects assessing the current state of the surface water and groundwater resources and their dependent ecosystems will happen in the next few months. There a couple of research projects undertaken by Flinders University that I have been able to assist.

These have involved a study of the ephemeral pools in the Wakefield and Broughton catchments and an assessment of the macro invertebrates (such as yabbies, water beetles, back swimmers and tadpoles) at four sites.

Water resources and the animals, plants and people that depend on them are facing serious declines in quantity and quality of those resources. Studies undertaken for the Clare water allocation plan show there has been a 60% reduction in surface water flows in the Wakefield and Broughton catchments in the last 15 years. Because of the connectivity between surface water and groundwater, similar reductions in groundwater recharge can be expected. We must manage for these declines.

We cannot wait any longer for a miraculous recovery in rain fall, because if we do whole systems could collapse.

JACQUI O'REILY

Horticulture, Small Business and Engagement, Wirrabara Forest

For 25 years I have lived in the Northern and Yorke region, of which the last 15 have been spent developing an organic horticulture property in Wirrabara Forest. Here, I am committed to improving the quality and productivity of the soil.

For as long as I can remember, I have had a taste for food, and the quality of that food has shaped my life. As a youngster I gained experience in working on farms, when farmers still milked and dressed livestock, and modern day processed foods were not available. Later I studied land management, questioning contemporary practices and learning the value of an ecologically rich environment.

Soil nutrition is the key to many land management issues, as well as plant, animal and human health. Soil in good health absorbs and holds water for improved crop growth, nutrition and taste. What we put in is what we get out. I would like to see more people thinking about their actions and looking to balance or offset their impacts.

People are an underestimated component of our natural resources and poor commodity prices for agricultural produce, means producers incomes do not keep up with the average wage. Rising costs see landowners struggling to find the extra capital needed to commit to their property's long term viability. NRM needs caring, thoughtful people and I am delighted to be involved in working to improve our country for all - human, animal and the land itself.

I look forward to increased community engagement, to meeting, supporting, and encouraging people to understand that even small things make a difference in sustaining a socially, economically and naturally vibrant region.

HELEN THOMAS

Farmer, Manoora

Better pest eradication is achieved when landholders work together. Current Board programs underway to control rabbits and wheel cactus demonstrate what can be achieved with a bit of coordination. However, NRM resources don't stretch far enough for the Board to do it all. Any groups which come together with a focus on achieving more for our environment will find plenty of support from the Board.

I would like to encourage landholders to get neighbours together to control foxes this year. Baits are readily available from Board offices and our authorised officers are only too happy to turn up anywhere at a designated time to dispense them to landholders and run through the necessary paperwork. Foxes can roam over large areas and baiting a whole district is far more effective.

Not only do foxes eat lambs but also a myriad of native animals. They have also been blamed for spreading a number of nasty weeds. Hence, even those landholders who don't have lambs should consider baiting as a worthwhile community service.

Another important plus for coordinating fox baiting is dog owners need only be vigilant for a concentrated period. Off-target damage is a sensitive issue and if mishandled could lead to the withdrawal of accreditation of 1080 poison for foxes. If this occurs, both farmers and the environment will be placed in a difficult position.

Foxes are becoming an increasing problem in townships. Controlling foxes in towns is fraught with problems and requires a lot of consultation. Keeping numbers down in rural areas where they are easier to control assists in township control.

Dog owners must take responsibility for their animals and realise that any inconvenience caused by baits being laid in an area is for a worthwhile cause.

There are many areas in which much more can be achieved through the power of groups. Fox control is a simple one we can all get behind.

NEVILLE WILSON

Farmer/Deputy Mayor, Merriton

The Northern and Yorke NRM Board has taken many steps forward since its inception, but significant challenges still lie ahead for all of us if we are to achieve long term sustainability for our natural resources.

A key challenge for the Board is managing and educating community members about the important part they play in making a difference to our sustainable environment. The custodians of significant natural environmental areas must manage and sufficiently resource appropriate care and control of this land.

With the urban fringe progressively encroaching into our rural areas, new landholders need to be educated on their sustainable environmental obligations. Imagine trying to encourage a landholder to instigate environmental improvements to his property when directly through the fence a the neighbouring property owner says that resources are not available to do anything!

The Board also has considerable financial responsibility attached to the NRM levy, and must ensure it continues to justify the way it is spent. The original intent of developing a single, autonomous region Board was to make the best decisions for the region it represents.

Many more challenges are before the Board. However it is imperative that the thousands of voluntary hours of work by the the region's committed former Animal and Plant Control and Soil Conservation Boards in managing our fragile environment is continued.

RICK WILKINSON

SA Coast Protection Board, Point Turton

I nominated for the Northern and Yorke NRM Board because, at the time, I was the Director of Development and Community Services with the District Council of Yorke Peninsula which has over 475 km of Coast line

I was born and bred on Yorke Peninsula, had 38 years in Local Government including 12 years as CEO of the Warooka Council, and was a member of Coast Protection of SA, a position I still hold today, and thought I had something to offer particularly on coastal issues.

Living at Point Turton meant more than a two and a half hour drive to get to meetings at Crystal Brook. However, the community needed to be represented seeing considerable amounts of the NRM levy today comes from this region which has many of the environmental assets that need to be looked after and protected for future generations to enjoy .

I was also concerned about the many water issues that needed to be addressed and highlighted in the regional NRM Plan, in order to obtain Federal funding which could help Local Government connect all the coastal towns in the Northern and Yorke region to effluent or water reuse schemes. Climate change will affect the way we think about the challenges it will bring such as coastal erosion

Naturally this could take 10 to 20 years to put in motion, but the preservation of both our gulfs is the life blood of aquaculture and tourism. I am also concerned about protecting the rural industries. The Board's role is to help reduce the amount of noxious weeds and pests which in turn promotes more sustainable farming in the Mid North and Yorke Peninsula

However, now that I am retired from Local Government, I can invest more time in functions other than the monthly Board meetings! If any members of the public would like me to bring their concerns to the Board, I am very happy to help them now and in the future .

KATHLEEN BOWMAN

Farmer, Orraroo

I've always considered myself a working farmer, not just because I've been driving tractors since the age of about 13, but because it's my only real occupation. I've never written 'home duties' in the occupation space of any form I've ever filled in. I've always been a 'farmer'. So it's not surprising that I've taken such an interest in what makes our farm tick, what makes it profitable and what state we leave it in for the next generation.

We've practiced stubble retention since 1983, when, after the disastrous '82 drought, we sowed all our stubbles again with no need to burn. I think we've only burnt in two paddocks since for rye grass control. We've been no tilling since 1997 when we purchased, in my opinion, the best piece of equipment we've ever had on the place, a Flexicoil airseeder with press wheels. Our previous problems with emergence in our heavy red soils have disappeared – now if we could only get that elusive rain in Spring!

The state of our soils is paramount to our success, and their condition both from soil tests and their 'feel' is directly parallel to the length of time we've had stubble retention in practice. The country we've purchased since 1983 is lagging behind our original holding so we reckon we're on the right track.

Although we were almost total croppers for a while, variable rainfall has meant a change in enterprise mix and our stock have become very important to us. I've always enjoyed the stock work, the cattle especially. With our sheep for meat flock purchased over the last 18 months, it makes use of our sheep yards again after a lull of 10 years.

Our biggest challenge is to use our natural resource (our land) in the most sustainable manner but still make a profit in difficult climatic circumstances.



Whipbird wizards

Officially, the rare male Western Whipbird's call is whit-chee-a-wheer-chwit. To which the equally rare female replies chwik-it-up.

For Gordon and Margaret White of Marion Bay, the Western Whipbird's signature tune is nothing like it looks here on paper. "But it is a very distinctive call," Gordon says. "Once you hear it, it is imprinted on your mind."

There is a good chance that Gordon and Margaret have heard the Western Whipbird's call more than anyone else. Dedicated volunteers for the environment of Yorke Peninsula's Bottom End since they moved there permanently from O'Halloran Hill in 2000, they have spent hundreds of hours recording the bird in and around Innes National Park.

Almost every day for nearly two months, the couple set up six tape recorders in mallee woodlands. Every 45 minutes, they turned over the tapes. They took notes, then went home and listened to the tapes. Their logbook shows Gordon invested 241 hours in the Western Whipbird, Margaret 92 hours, and five friends another 25 hours.

"Quite a few hours," Gordon observes now, and in that time they recorded and identified 10 calls. Their data and recordings, for the Adelaide Zoo and University of Adelaide, are used for conservation of Whipbirds.

Along with their volunteer work propagating and planting, weeding, fencing, painting and clearing walking trails, their efforts have been recognised with an NYNRM Quiet Achievers Award.

The couple appreciates the acknowledgment of their environmental commitment, but as Gordon says, "I don't think any volunteer does it for awards. You do it without really thinking about it. You do it because someone has to do it. In our case we have a general interest in birds, animals, trees, the sea.

"We could live in the middle of Rundle Street, and we'd still be interested in the environment. We just like watching nature."

Before retirement, Gordon, an electrical appliance technician, and Margaret worked together in business. "We had busy lives when we were working," says Margaret. "When you retire you can't stop being busy, so we make ourselves useful outdoors. Because we were in business, we're also used to doing things together."

Both members of the active Friends of Innes National Park group, they can spend up to six hours a day, five days a week on volunteer work, depending, as Gordon says, "on how much there is to do". Although their survey is over, they still keep eyes and ears open for the Western Whipbird.

Rangers inside Innes National Park hear it only rarely, and see it even less. Despite their aural familiarity, Gordon and Margaret White have seen it only once. It was in the old town of Inneston, purely by accident, and just for two or three seconds.

"It had a little olive coppery green crest, dark markings under its chin and a white flash under its eyes," Margaret says. "It wasn't as big as a blackbird, but bigger than a willy wagtail. We couldn't believe our eyes at first. It was amazing."

And well worth all the couple's hours of effort for their local environment.