

Proceedings of the

SECOND AUSTRALIAN STREAM MANAGEMENT CONFERENCE

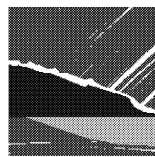
*The Challenge of Rehabilitating
Australia's Streams*

Adelaide, South Australia
8-11 February 1999



Edited by
Ian Rutherford
Rebecca Bartley

Proceedings Presented by



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SECOND AUSTRALIAN STREAM MANAGEMENT CONFERENCE

Sponsored by



Department for Environment
Heritage and Aboriginal Affairs
Government of South Australia



"I would like to welcome all delegates to South Australia for the Second Australian Stream Management Conference. In recent years, there have been many fundamental changes to stream management across Australia, particularly in South Australia.

Since the introduction of the Water Resources Act 1997, the Government of South Australia has provided a framework for major improvements in watercourse management. The establishment of Catchment Water Management Boards in both the metropolitan and regional areas of the State is, for the first time, providing an integrated approach to water quality and supply.

These boards are setting the direction and encouraging significant community involvement in activities such as stream restoration, pollution reduction, wastewater re-use and the sustainable and equitable allocation of finite water supplies.

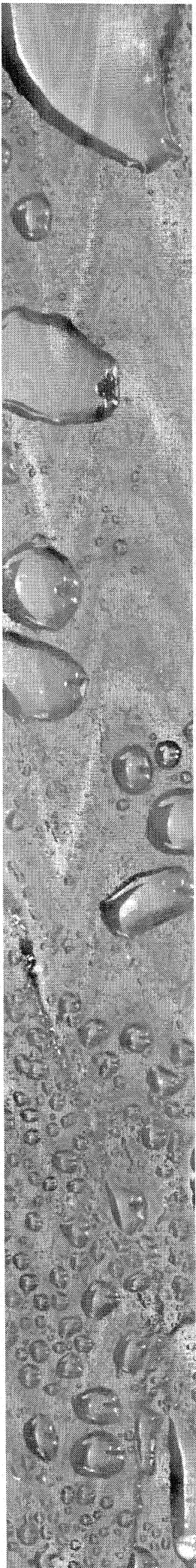
South Australia is leading the way in involving the community in integrated catchment management as is evidenced by the impressive number and scale of on-ground works being undertaken around the State.

The Second Australian Stream Management Conference gives leaders in stream management from around Australia the opportunity to share their experiences and successes. We have the chance to take stock and determine further positive courses of action which will benefit the Australian environment and all those who rely on it for their livelihoods, recreation and well-being.

I look forward to participating in this event and wish all delegates a highly successful and rewarding conference."

A handwritten signature in black ink, appearing to read "Dorothy Kotz".

**HON DOROTHY KOTZ MP
MINISTER FOR ENVIRONMENT AND HERITAGE**



A Welcome from the Federal Government

Dear Delegates,

As the Parliamentary Secretary to the Minister for Environment and Heritage it is my pleasure to outline the Federal Government's commitment to one of our most precious natural resources, our waterways.

We have an extraordinary natural heritage encompassing around 10% of the world's total biodiversity, with an astonishing 80% of our plants and animals unique to Australia, and water is the lifeblood of Australia's 'mega' biodiversity.

The Howard Government understands that now is the time to restore and rehabilitate our natural environment - not tomorrow or the day after.

While many people assume the destruction of our natural resources is largely an historical phenomenon, in fact, it is in the last 50 years that most of the large scale destruction of our native vegetation has occurred. The consequential effect on our waterways, remnant vegetation and biodiversity is only now being fully understood.

That is why the Federal Government has established the \$1.25 billion *Natural Heritage Trust*, the largest environmental rescue package in Australia's history - to protect and restore our fragile natural heritage.

The Trust's 'umbrella' approach incorporates 17 different programs, all strategically integrated to achieve one goal: the protection and rehabilitation of Australia's natural environment and the encouragement of sustainable agricultural production.

Groundbreaking initiatives such as the *National Vegetation Framework*, a Bushcare initiative, aim to achieve the national goal of reversing the long-term decline in the quality and extent of native vegetation cover by June 2001. This is an important example of our integrated approach.

This year, as part of the COAG Water Reform Process, the States, in partnership with the Commonwealth, have an extraordinary opportunity to make real in-roads into achieving ecologically sustainable water resource management.

Of particular interest to this year's conference delegates will be the Trust's \$97 million *Rivercare* initiative, dedicated to improving the health of our national river systems.

One of *Rivercare*'s most innovative programs is *Waterwatch*: a community based project with more than 50,000 men, women and children from around the country monitoring the long-term health of over 4000 waterways and rivers. It is an important initiative, combining the community's local knowledge and expertise with financial assistance from the Federal Government.

I am a Northern Victorian with a life-time of experience with water management and soil salinity problems. I was involved in establishing Saltwatch in the 1980s. I know how powerful these community involving programs are. As the Federal Member representing the people of Murray, stream and water management is the most pressing issue affecting the future of my electorate.

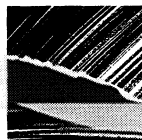
There is still much to do in rehabilitating Australia's waterways. Conferences like this year's, focusing on *The Challenge of Rehabilitating Australia's Streams*, bring together a wealth of expertise and experience, acknowledging our achievements, lessons learnt and the challenges ahead. One of the greatest challenges will be formulating strategies to tackle dryland salinity problems and their impact upon stream systems.

In simple terms, the future health of our waterways depends on it. And Australia depends on you, who have the professional skills and the commitment to do the work.

I am so pleased to be associated with the Second Annual Stream Management Conference.

Sharman Stone MP
Parliamentary Secretary to the Minister for Environment and Heritage
Federal Member for Murray

An invitation...



COOPERATIVE RESEARCH CENTRE FOR CATCHMENT HYDROLOGY

The CRC for Catchment Hydrology is a cooperative venture in public good research established under the Australian Government's Cooperative Research Centre Program.

Our current research programs are:

- Waterway Management (Riparian zones, stream rehabilitation)
- Forest Hydrology (Tree water use, sediment control)
- Salinity (Irrigated, dryland, salt disposal basins)
- Flood Hydrology (Flood estimation and forecasting, stream rating curves)
- Urban Hydrology (Runoff water quality, gross pollutant trapping)

The Centre aims is to put its useful research outcomes into practice as soon as possible. Our monthly newsletter *Catchword*, field days, seminars, videos, technical reports and our reader friendly industry report series are targetted at better land and water management.

The CRC represents a close collaboration between research and industry organisations.

- Bureau of Meteorology
- CSIRO Land and Water
- Department of Land and Water Conservation, NSW
- Department of Natural Resources and Environment, Vic
- Goulburn-Murray Water
- Melbourne Water
- Monash University
- Murray-Darling Basin Commission
- Southern Rural Water
- The University of Melbourne
- Wimmera-Mallee Water

There are also strong cooperative linkages with associated organisations who collaborate in particular CRC projects of interest. The CRC Associates are:

- Department of Natural Resources, Qld
- State Forests of NSW
- Hydro-Electric Corporation Tas.

We invite you to contact us to see how we can assist you to meet the challenges of better land and water resource management

Visit the CRC's website at www.catchment.crc.org.au or contact us below:

David Perry

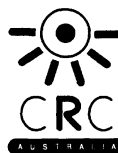
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Established and supported under the
Australian Government's Cooperative
Research Centres program

COOPERATIVE RESEARCH CENTRE FOR

Freshwater Ecology

The CRC for Freshwater Ecology exists to improve the condition of Australia's inland waters through collaborative research, education and resource management.

Web address:

<http://freshwater.canberra.edu.au>



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The Centre addresses issues that are of concern to the water industry:

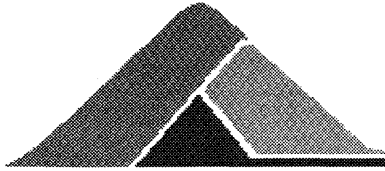
- *environmental flows*
- *ecological assessment*
- *impact of alien species*
- *river & wetland rehabilitation*
- *energy and nutrient dynamics*
- *native fish decline*
- *control of algal blooms*
- *urban water management*

- **Education**— postgraduate, tertiary, schools, community
- **Technology exchange**— links with industry and community

PARTNERS:

- ACT Government
- ACTEW Corporation
- CSIRO Land and Water
- Environment Protection Authority—Victoria
- Goulburn-Murray Water
- La Trobe University
- Melbourne Water
- Monash University
- Murray-Darling Basin Commission
- NSW Fisheries
- Murray-Darling Freshwater Research Centre
- Southern Rural Water
- Sydney Water Corporation
- University of Canberra
- Wimmera-Mallee Rural Water

*for healthy
inland waters*



River Basin Management Society Inc. Reg. No. 11870

The River Basin Management Society was established in 1986 to “advance a balanced approach to land, water and natural resource management on a catchment basis”.

What does the RBMS do?

The Society aims to broaden the knowledge and experience of its members and to foster a better understanding between the many individuals and groups interested in land, water and natural resource management.

By doing so the Society hopes that more informed and balanced decision making will bring sustainable environment benefit to Australia.

How does the Society do this?

It aims to keep members currently aware of what is going on in the field of land and water management:

- by conducting regular seminars & conferences
- by encouraging regional field days & meetings
- by producing a bimonthly newsletter
- by liaising with groups of similar interests
- by providing grants to assist research
- by gathering & disseminating information
- by managing ICM-L, the world's only internet discussion group on catchment management

It also offers help and advice within its expertise to Government and Authorities on development of policies and practices.

Further Information

Further information about the RBMS can be obtained from our web-site at www.vicnet.net.au/RBMS. For telephone enquiries, please call Ron Hodges on +61 3 9802 4859.



An investment that makes our banks secure.

Stream management is an important part of Melbourne Water's Healthy Waterways program which has an annual expenditure of over \$11 million. For further details please call 9235 2156 and ask for a fact sheet on the Healthy Waterways program or visit our internet site. www.melbwater.com.au



Melbourne Water
Managing Our Water Resources

RIVER RESTORATION & MANAGEMENT

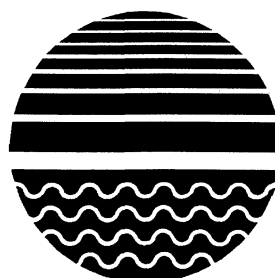
Protecting, restoring and enhancing Australia's rivers

- How can communities and scientists work together to protect, restore and enhance Australia's rivers?
- How do you set priorities for restoring rivers?
- What techniques and strategies are available to restore rivers?
- What are the impediments to undertaking river restoration activities?

Questions such as these are being answered through an exciting and innovative program managed by the Land and Water Resources Research and Development Corporation. The River Restoration and Management Program is investing in activities designed to protect, restore and enhance Australia's rivers. The program seeks to develop knowledge and processes to assist landholders, government agencies, and community groups to undertake river restoration activities.

The Program produces information that is targeted at meeting the needs of different groups. Many different publications and support materials are available, and they range from the highly technical, to newsletters and Issues Sheets that highlight key issues and provide practical advice. If you would like to access some of this information or learn more about this great program – check out the display at the stream management conference or, alternatively, contact LWRDC direct.

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**Land & Water
Resources**
Research &
Development
Corporation

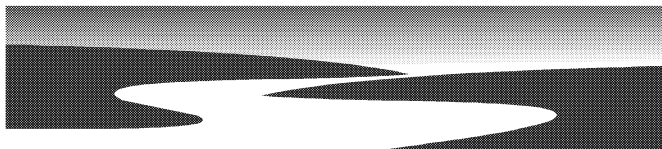
The Torrens Catchment Water Management Board welcomes delegates to the 2nd Australian Stream Management Conference

The Board' award-winning Comprehensive Catchment Water Management Plan sets out a five-year integrated strategy to revive Adelaide's premier waterway and the mixture of physical works, planning measures and major education initiatives are already showing positive results

Delegates will have the opportunity during a tour of the Torrens catchment to see that catchment management approaches taken in South Australia are achieving best practice standards, and could be regarded as world class

Limited numbers of the Board's plan are available to delegates at \$10 a copy

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River Murray Catchment Water Management Board

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rmcwmb@riverland.net.au

The River Murray Catchment Water Management Board is a statutory authority which was set up in September 1997 under the Water Resource Act 1997. The Board consists of nine members appointed by the Minister. The River Murray Catchment Board area extends from the South Australian border to the Murray Mouth at Goolwa in a corridor along the river.

The main role and purpose of the Board is to prepare a Catchment Water Management Plan for its area and Water Allocation Plans for its three prescribed resources being the River Murray, Angas Bremer and Noora.

The River Murray Catchment Water Management Board, Local Action Planning groups and many community members are hard at work protecting the health and quality of the river and its catchment for this and future generations. The Board is the environmental manager for all the Murray in South Australia. The Board's water management and allocation programs will ensure that that our use of the Murray is protected for all users now and in the future and supports the work of community groups across the catchment who are tackling water and land problems at the local level.

The Board is funded by a levy which is collected from urban users and irrigators within its catchment area. The board provides funding to match the Commonwealth's Natural Heritage grants for projects in its catchment and will contribute approximately \$3 million in 1998/99 to such projects.

The Board is proud to be a sponsor of the Second Australian Stream Management Conference.

The Murray-Darling Basin Commission (MDBC) is a partnership between the Commonwealth, New South Wales, Victorian, South Australian, Queensland and ACT governments. The Commission is the executive arm of the Murray-Darling Basin Ministerial Council. The Council aims to:

Promote and coordinate effective planning and management for the equitable, efficient and sustainable use of the water, land and other environmental resources of the Murray-Darling Basin.



Information on the Commission's river management activities can be obtained from its web site (<http://www.mdbc.gov.au>), or by phoning (02) 6279 0100.

Minister's Address



Department for Environment
Heritage and Aboriginal Affairs
Government of South Australia

Water is one of our most precious natural resources. It is an integral part of the environment and of ecological processes on which all life depends. The development of the water resources of this State has resulted in many social and economic benefits. However, it is equally apparent that this development has come at a significant environmental cost, thus indicating that many of our management practices are not sustainable in the long term. Our future prosperity depends on taking new directions, which apply the principles of ecologically sustainable development.



The problems confronting water resources managers in South Australia are not unique to this State. In response to the same type of environmental, economic and social issues, the water industry, both nationally and internationally, is undergoing widespread change. At the national level, the Council of Australian Governments (COAG) agreed in February 1994 to implement a strategic framework for efficient and sustainable reform of the Australian water industry. This agreement is leading to profound change in water management, supply arrangements, pricing and requirements for improved environmental outcomes.

The Government of South Australia is committed to working with the Commonwealth and other State Governments to implement the COAG reforms. Through the *Water Resources Act 1997*, the Government of South Australia has set the framework that legally recognises the 'environment' as a 'user' of water and provided the opportunity for regional communities to manage their water resources. An essential part of ecologically sustainable water resource management is good stream management.

I acknowledge and applaud the efforts being made by all those in the community and government that are involved with the stream management. However, we can not afford to rest on our laurels. We have an historic opportunity to take further positive action to ensure long lasting improvement to our streams.

A handwritten signature in black ink, appearing to read 'Dorothy Kotz'.

Hon. Dorothy Kotz MP
Minister for Environment Heritage and Aboriginal Affairs

Foreword from the Editors

The central theme of this second Australian Stream Management Conference is “The challenge of rehabilitating Australia’s streams”. So, what are some of these challenges? Possibly the most significant challenge is integrating the breadth of issues involved in rehabilitating streams. The diversity of these issues is clearly demonstrated by the variety of topics covered in the 130 or so papers within these proceedings. They range from market mechanisms for selling carbon credits, through to approaches to community involvement, and the hydraulics of rock chutes. How then do we integrate several scientific disciplines with the passion and knowledge of community groups? In addition, how do we meet the challenge of extending our stream rehabilitation efforts to long reaches of stream, and entire catchments?

These proceedings represent our current collective progress towards meeting the challenge of stream rehabilitation in Australia. We were pleased to see authors from outside of southeastern Australia contributing papers. It was also pleasing to see the integration of a number of papers dealing with the ecological, biological and evaluation aspects of stream rehabilitation projects. These issues provide new challenges for stream managers and we hope that the amount of work in these areas continues to expand.

But now to another challenge.....the production of these proceedings! Two reviewers, as well as our own editorial review team have examined each paper in these proceedings. This has been an arduous task for us, the reviewers, and for the authors. However, we believe that the review process has greatly improved the quality of the papers. Most authors accepted the suggestions made by reviewers, however some did not. Nevertheless, we sincerely thank the many people who reviewed papers for the conference.

We would also like to thank people who contributed directly to the production of these proceedings, particularly the dedicated team in the Cooperative Research Centre for Catchment Hydrology: David Perry, Kathryn Jerie, Scott Wilkinson, Lindsay White and Bruce Abernethy who provided great support in producing this volume. Liz Butler (Teaching Services Unit, Monash University) created the design for the conference literature including the proceedings covers, and Monash Printing Services printed the proceedings professionally and most importantly, on time.

We trust the efforts of all these people has culminated in a reference that will assist you in better meeting *the challenge of rehabilitating Australia’s streams*.

Ian Rutherford and Rebecca Bartley

Cooperative Research Centre for Catchment Hydrology
Department of Civil Engineering, Monash University, Victoria
16 December 1998

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