SOUTH AUSTRALIAN
SELECT COMMITTEE
on the
MURRAY RIVER

FINAL REPORT

July 2001
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FOREWORD

The Select Committee on the Murray River is pleased to table its Final Report.

The River Murray is vitally important to the quality of life enjoyed by all South Australians. South Australia would be in a precarious position indeed if we could not rely on a secure supply of water from the River Murray.

Through this Select Committee, the South Australian Parliament has successfully managed to bring together members from various political persuasions and remove the politics to prepare a consensus report that outlines a direction for the future use and management of the River Murray in South Australia.

Much has been spoken and written about the sharing, management and use of the land, water and other environmental resources of the River Murray and the wider Murray-Darling Basin. The large body of evidence received by the Select Committee is testimony to this statement.

Members of the Select Committee regard themselves as fortunate to have had the opportunity to observe the unique natural beauty of the Murray-Darling Basin, gain an appreciation for the complexities associated with the management of this multi-faceted resource and meet with a range of people from across the Basin who depend on the Basin’s natural resources for their well being.

During this inquiry, the Select Committee has become increasingly conscious of the fact that while development of the Basin’s resources has delivered considerable economic and social benefits, these benefits have come at a very significant environmental cost, at both a State and Basin-wide level. The magnitude of this cost is well established in South Australia and the middle reaches of the Basin, but only now becoming apparent in the upstream reaches. If we want the Murray-Darling system to continue to provide economic and social benefits into the future we must change our current approach to the sharing, management and use of the Basin’s natural resources.

Having said this, the Select Committee acknowledges that many significant changes have been achieved. There is, however, much more to be done. The new Integrated Catchment Management (ICM) framework, developed by the Murray-Darling Basin Ministerial Council is recognised by the Committee as another important step along the path of change.

Particularly encouraging in the ICM framework is its commitment to establish targets for catchment health.

This report contains 96 recommendations, and these are relevant at both a State and Basin-wide level. The Select Committee believes that action on all recommendations is essential to improving the health and management of the River Murray, especially in South Australia.

In formulating its recommendations, the Select Committee identified a number of underlying themes:

- **Adaptive management**
  
  Our current approach to the use and management of the Basin’s natural resources is not sustainable. Resource management must undergo fundamental change, and this can only be based upon the best available scientific knowledge. As new information becomes available, there will be a need for further change.

- **Commitment**
  
  There are no quick fixes. Improving the health of the Murray-Darling system and moving towards sustainable development will require a long-term commitment by communities and governments.
• **Partnerships**

No one individual State government, industry group, catchment organisation, research body or conservation group has the necessary skills, expertise or resources to improve the health of the Murray-Darling system. The forging of strong, transparent and accountable partnerships at all levels and across all jurisdictions is essential.

• **Investment**

Current levels of investment are inadequate to combat the scale of the natural resource and environmental degradation impacting on the health of the Murray-Darling Basin.

The River Murray and its environs are the most important natural resource in South Australia. Its economic, social and environmental values affect the lives and well-being of every South Australian. The River Murray in South Australia is indeed ‘a lifeline’ whether it be as a source for a potable water supply; for irrigated horticulture; for dairy farming or for its unique biological resources that support tourism and a variety of recreational activities.

Achieving the ecologically sustainable development of the State’s water resources is vital to South Australia’s future prosperity. Nowhere is this outcome more important than in the South Australian Murray-Darling Basin.

The tabling of this report brings the work of the Select Committee on the Murray River to an end, but it also marks the beginning of a new era. The era needs to be focussed on achieving the sustainable management and use of the resources throughout the Murray-Darling Basin.

The Select Committee would like to take this opportunity to formally acknowledge those organisations and individuals that have provided evidence or given their time to appear as witnesses before the Committee.

We would also like to acknowledge the commitment, dedication and skills displayed by the Committee’s Research Officer and Secretary in preparing this report.

In commending this report to the House we encourage all members of Parliament to familiarise themselves with its contents.

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**Hon David Wotton MP**
**Chairman**
**Select Committee on the Murray River**
**House of Assembly**
**July 2001**

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**Hon Mark Brindal MP**
**MINISTER FOR WATER RESOURCES**

**Vini Ciccarello**
**MEMBER FOR NORWOOD**

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**Kris Hanna**
**MEMBER FOR MITCHELL**

**John Hill**
**MEMBER FOR KAURNA**

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**Peter Lewis**
**MEMBER FOR HAMMOND**

**Karlene Maywald**
**MEMBER FOR CHAFFEY**

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South Australian Select Committee on the Murray River
Final Report – 2001
PRIORITY RECOMMENDATIONS

The Committee has developed detailed recommendations addressing all major issues affecting the River Murray, particularly those of specific relevance to South Australia (see Recommendations). However, recognising that there are many demands to be met with limited resources, the Committee has also identified 10 priority action areas to provide clear and immediate direction for future management of the region.

1. SALINITY / ICM / WATER ALLOCATIONS / WETLANDS

- The Committee recommends that the South Australian Government take all necessary action to ensure that:
  - South Australia’s salinity obligations under the Salinity and Drainage Strategy are in balance by December 2002 (see Section 4.2).
  - South Australia’s targets for catchment health under the Murray Darling Basin Ministerial Council’s Integrated Catchment Management Policy Statement are defined by December 2002.
  - Policies to address the current imbalance between South Australia’s water allocations and the Cap on water use are in place and being implemented by 2003.
  - Works and water management policies to re-establish wetting and drying cycles for more than 50 per cent of South Australia’s highest priority wetlands along the River Murray are implemented by 2006.

2. WATER MANAGEMENT

The Committee recommends that:

- The Murray-Darling Basin Ministerial Council develop and implement a joint Basin-wide program which will increase the median flow at the Murray Mouth by an additional one percent per year over 20 years between now and 2025. The focus of this plan should be to:
  - reduce evaporative losses from the major regulating storages
  - improve water distribution infrastructure, and
  - improve on-farm water management practices.
  (Median flows at the Murray Mouth for the 1993/94 level of development should be used as the benchmark to evaluate the program.)
- Funding of the joint program be shared equally (50:50) between the partner states and the Commonwealth Government. Each state’s contributions to the program to be determined in proportion to water use.

3. LOWER MURRAY RECLAIMED IRRIGATION AREA

The Committee recommends that:

- The South Australian Government establish, in partnership with the irrigation industry and local irrigators, a demonstration swamp to assess the capability and suitability of ‘sprayline’ irrigation technology.
- The South Australian Government acknowledge that the rehabilitation of the Lower Murray Reclaimed Irrigation Area is a high priority and commit the necessary resources to complete rehabilitation of this area by 2005.

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\(^1\) Targets for catchment health relate to aspects of water quality, water sharing, riverine ecosystem health and terrestrial biodiversity.
4. MURRAY-DARLING BASIN COMMISSION

The Committee recommends that:

- The Murray-Darling Basin Ministerial Council give consideration to the composition of the Murray-Darling Basin Commission with the aim of changing it to an independent, expert (skills-based) Commission. The Commission must contain skills in ecology and natural resource management, irrigation technology, engineering, finance and business administration, resource economics, law, regional development and public administration.
- The structure of the new Commission be:
  - an independent President
  - six Commissioners who between them have extensive experience and/or qualifications in the disciplines of ecology and natural resource management, irrigation technology, engineering, finance and business administration, resource economics, law and regional development
  - a senior bureaucrat from each of the Murray-Darling Basin Initiative partners
  - Chair, Community Advisory Committee (non-voting member)
  - Chief Executive Officer, Office of the Murray-Darling Basin Commission (non-voting member).
- The model used to appoint Directors to Research and Development Corporations under the Commonwealth’s *Primary Industries and Energy Research and Development Act, 1989* be applied to the appointment of Commissioners, with responsibility for the selection process delegated to the Chair, Murray-Darling Basin Ministerial Council.
- The appointment process, where possible, seek to obtain a reasonable geographic spread of Commissioners from across the various Basin states.

5. WATER TRADE

The Committee recommends that:

- The Murray-Darling Basin Ministerial Council through the Commission resolve the environmental and administrative issues identified by the Pilot Interstate Water Trading project, and then adopt the necessary policies and processes to facilitate permanent water trading across the entire Basin. These policies and processes should be formalised under Schedule E to the Murray-Darling Basin Agreement.
- The South Australian Government establish a National Water Exchange to oversee the administration and management of the water market in the Murray-Darling Basin and foster the development of market based mechanisms in other areas of natural resource management, such as carbon credits and salinity credits.

6. WATER CONSERVATION

The Committee recommends that:

- By 2004, the South Australian Government develop and commence implementation of an integrated water management strategy for metropolitan Adelaide that will reduce water diversions from the River Murray for Adelaide’s water supply by 50 per cent of the current level of diversions over a twenty year timeframe.
- The Commonwealth Government introduce tax changes that will permit private investment in accredited water saving devices and technology to be 100 per cent tax deductible in the year of expenditure.

7. WATER QUALITY

The Committee recommends that:
• The South Australian Government work in partnership with local councils to remove all remaining effluent ponds from the River Murray floodplain by January 2005.
• The River Murray Catchment Management Board work in partnership with Local Government to control stormwater runoff and leakage from septic tanks in rural towns.
• The South Australian Government in cooperation with the Murray-Darling Basin Commission initiate investigations that will direct irrigation drainage water to disposal basins outside of the riverine environment and lead to the progressive decommissioning of floodplain drainage basins.

8. SNOWY MOUNTAINS HYDRO-ELECTRIC SCHEME CORPORATISATION AND ENVIRONMENTAL FLOWS

The Committee recommends that:

• All stakeholders exercise due diligence in achieving the environmental flow objectives for the Snowy River by ensuring that the health of the River Murray system and security of water supply is not compromised.
• Commonwealth, NSW and Victoria not proceed with corporatisation until the Murray-Darling partners have reached agreement on the changes required to the Murray-Darling Basin Agreement. Actions to finalise Snowy corporatisation arrangements should not be implemented before complementary amendments to the Murray-Darling Basin Agreement are agreed by all parties to that agreement.
• All parties accept that the environmental flows debate has moved on, from an emphasis on the Snowy, to a realisation that environmental flows are necessary for both the Snowy and the Murray-Darling Basin. The needs of both river systems are inextricably linked. It makes no sense to treat the Snowy environmental needs in isolation from those of the Murray. All parties need to promote a joint approach to the pursuit of water savings for environmental flows for both the Snowy and the Murray. The most effective way to do this is to integrate the pursuit of savings for the Snowy and the Murray in the one entity.
• In order to ensure an integrated approach to the pursuit of environmental water for both the Snowy and the Murray, the Committee recommends that a single body be established by a single agreement of all Murray-Darling partners instead of the current proposal for a Joint Government Enterprise.

9. FUNDING ADMINISTRATION AND PROGRAM DELIVERY

The Committee recommends that:

• Within the Murray-Darling Basin, the Murray-Darling Basin Ministerial Council and Commission assume responsibility and accountability for the administration and allocation of environmental and natural resource management investment under programs such as the Natural Heritage Trust and National Action Plan for Salinity and Water Quality.

10. MONITORING AND REVIEW

The Committee recommends that:

• The South Australian Parliament establish a Standing Committee for Water Resources to ensure that the Parliament has oversight of issues associated with the management and use of all water resources in South Australia.
• The new Standing Committee for Water Resources be required to provide the Parliament with a biennial report on the implementation of this Committee’s recommendations and other matters.
RECOMMENDATIONS

In addition to the priority recommendations the Select Committee has developed a wider collection of recommendations. The Committee believes that effective implementation of all recommendations will, over time, lead to a significant improvement in the condition and health of the land, water and other environmental resources of the South Australian Murray-Darling Basin and the wider Murray-Darling system.

Institutional frameworks

This section of the report outlines a range of institutional changes that the Committee believes are necessary to deliver integrated catchment management within the South Australian Murray-Darling Basin. Figure 1 illustrates the proposed new integrated catchment management framework for the South Australian Murray-Darling Basin.

INTEGRATED CATCHMENT MANAGEMENT

The Committee recommends that:

1. With the exception of the timetable for setting targets, the ICM framework outlined by the Murray Darling Basin Ministerial Council in the ICM Policy statement be adopted as the way forward to address environmental and natural resource issues impacting on the Basin’s sustainability.

2. The South Australian Government adopt a similar approach to that of the ICM framework to apply across the entire State.

3. The South Australian Government initiate legislative change that will support physical catchment boundaries to delineate suitable scale planning and management units for the administration and delivery of all environmental and natural resource management programs.

4. The South Australian Government demonstrate Basin wide leadership and seek to accelerate the ICM target setting timetable by defining and adopting South Australia’s targets for catchment health by December 2002.

5. A lead Minister responsible for the SA Murray-Darling Basin should be appointed by the government of the day and work with the ministerial portfolios for environment, water, natural resources, planning and regional development to deliver integrated catchment management in the SA Murray-Darling Basin.

6. The South Australian Government establish a high level River Murray Coordinating Committee to:
   - oversee and coordinate the implementation of an integrated catchment management framework in the South Australian Murray-Darling Basin
   - advise the Minister in relation to the planning, development and management of the South Australian Murray-Darling Basin’s natural resources
   - assist the Minister to develop measures for the equitable, efficient and sustainable use of the South Australian Murray-Darling Basin’s natural resources
   - give effect to any policy or decision of the Minister.

7. The River Murray Coordinating Committee (RMCC) should report to the Minister responsible for the South Australian Murray-Darling Basin.

MURRAY-DARLING BASIN AGREEMENT

The Committee recommends that:
8. The Murray-Darling Basin Ministerial Council initiate a comprehensive consultative review of the Murray-Darling Basin Agreement which will have specific regard to:

- water-sharing principles and provision of water for the environment
- financial and cost-sharing arrangements
- integrated catchment management
- decision making processes of the Murray-Darling Basin Commission and Ministerial Council
- the boundary of the Murray-Darling Basin as defined by Schedule B to the Agreement.

**RIVER MURRAY CATCHMENT WATER MANAGEMENT BOARD**

The Committee recommends that:

9. The River Murray Catchment Water Management Board’s resource planning functions and powers, where necessary, be expanded to include those relevant to soil conservation, native vegetation management and animal and plant control under the respective South Australian statutes. This may require legislative change.

10. To reflect the change in functions and powers, the Board be renamed the River Murray Catchment Management Board (RMCMB). This may require legislative change.

11. The new River Murray Catchment Management Board would report to the lead Minister responsible for the South Australian Murray-Darling Basin and be the dedicated regional authority for the delivery of integrated catchment management programs.

12. A senior member of the River Murray Co-ordinating Committee (RMCC) be a member of the new River Murray Catchment Management Board.

**LOCAL GOVERNMENT**

The Committee recommends that:

13. The new River Murray Catchment Management Board establish strong working partnerships (including economic cost-sharing) with all local government authorities in the region and actively engage local government in regional catchment management and planning processes.

14. Local Government should be encouraged over time to align existing Council boundaries with the boundary of the River Murray Catchment Management Board.

**LOCAL ACTION PLANNING GROUPS**

The Committee recommends that:

15. The new River Murray Catchment Management Board provide Local Action Planning Groups with administrative support and a base level of operational funding.

16. The current Local Action Planning framework be reviewed with a view to rationalising the number of Local Action Planning Groups operating within the South Australian Murray-Darling Basin.

17. The role of Local Action Planning Groups be redefined to become Local Action Planning and Implementation Groups to reflect a change from planning to on-ground action, conditional on them complying with project implementation standards which are focussed on defined outcomes.

18. One of the key roles of the new River Murray Catchment Management Board and the River Murray Co-ordinating Committee be to ensure that Local Action Planning and Implementation Groups have direct access to professional and technical expertise within government.
Figure 1 - Proposed integrated catchment management framework for the SA Murray-Darling Basin.
Salinity

**SALINITY AND DRAINAGE STRATEGY**

The Committee recommends that:

19. The South Australian Government seek the support and commitment of additional national financial resources to accelerate implementation for the current program of salt interception works agreed under the Salinity and Drainage Strategy.

**DRAFT BASIN SALINITY MANAGEMENT STRATEGY**

The Committee acknowledges and supports:

20. The shared target under the Draft Basin Salinity Management Strategy of less than 800 EC 95 per cent of the time at Morgan.

The Committee recommends that:

21. Prior to South Australia Government agreeing to new arrangements under the Basin Salinity Management Strategy, the salinity modelling used to predict future salt loads from the Mallee zone be better researched, reviewed and independently validated.

22. Salinity benefits to be derived from changes to the seasonal management of flow to South Australia and a reduction in Basin-wide diversions be given stronger consideration in the final Basin Salinity Management Strategy.

The Committee notes that the Draft Basin Salinity Management Strategy proposes to continue the principle, established under the Salinity and Drainage Strategy, that each State is accountable for off-setting the salinity impacts of new development (post-1988) on the River and recommends that:

23. All partner governments accept shared responsibility for offsetting the salinity impacts as a consequence of decisions on land and water use over the past 150 years of development (that is, the ‘legacy of history’ salinity impacts).

24. In keeping with the National Action Plan framework, that the Commonwealth contribute 50 per cent of the capital costs of all new projects to offset the ‘legacy of history’ salinity impacts, with the remaining 50 per cent (that is, capital, operating and maintenance costs) to be shared equally between New South Wales, Victoria and South Australia.

**SOUTH AUSTRALIAN RIVER MURRAY SALINITY STRATEGY**

The Committee recommends that:

25. As a matter of high priority, the South Australian Government define areas of low, medium and high salinity impact risk, as proposed in the recently released River Murray Salinity Strategy.

26. The South Australian Government under the River Murray Salinity Strategy develop and implement effective planning and administrative policies and processes to:

- ensure that all irrigators are accountable for the salinity impact resulting from their irrigation practices
- manage ‘ribbon’ irrigation development adjacent to the River Murray
- direct all future irrigation development to areas of low salinity impact risk
- encourage existing irrigation development to move from areas of high impact to areas of low impact.
27. As a matter of high priority, the South Australian Government allocate additional resources towards finalising and implementing Land and Water Management Plans in South Australia.

28. The South Australian Government develop strategic alliances with the private sector that will foster research and development into new salt-based industries.

**NATIONAL ACTION PLAN FOR SALINITY AND WATER QUALITY (NAP)**

The Committee recommends that:

29. The Murray-Darling Basin Ministerial Council and Commission must be actively and directly involved in planning and co-ordinating the implementation of actions under the NAP in the nine priority catchment areas within Murray-Darling Basin.

30. The Murray-Darling Basin Ministerial Council assume responsibility for the administration and delivery of NAP funding for salinity and water quality initiatives in the nine priority catchments within the Murray-Darling Basin.

**The Cap**

The Committee recommends that:

31. The Commonwealth Government, through the Murray-Darling Basin Ministerial Council, the Council of Australian Governments (COAG) Water Reforms and National Competition Policy processes, prevail on all Basin states to:
   - finalise the details and implementation of the current Cap on water diversions in the Murray-Darling Basin
   - initiate investigations to determine the level of water diversions that will result in median flows at the Murray Mouth being restored to at least 40 per cent of natural median flows
   - develop and implement policies that will achieve considerable water savings and improve on-farm irrigation practices.

**Environmental flows and the riverine environment**

The Committee recommends that:

32. As a matter of high priority, the South Australian Government direct the Department for Water Resources and the River Murray Catchment Management Board to prepare and implement a flow management strategy for the River Murray.

33. South Australia Government seek assurances from the Murray-Darling Basin Ministerial Council and Commission that the activation of water for environmental purposes in upstream States will not have a detrimental impact on flows reaching South Australia.

34. The Murray-Darling Basin Ministerial Council establish a ‘Water Conservation Trust’ for the Lower Murray-Darling to which water will be allocated for environmental and system maintenance purposes.

35. The Water Conservation Trust be managed by an independent Water Conservation Trust Board which reports directly to the Murray-Darling Basin Ministerial Council.

36. The Ministerial Council specify the criteria (that is, skills and expertise) against which appointments to the Water Conservation Trust Board should be assessed.

37. The model used to appoint Directors to Research and Development Corporations under the Commonwealth’s *Primary Industries and Energy Research and Development Act, 1989* should be applied to the appointment of Directors to the Water Conservation Trust Board.
Board. Responsibility for the selection process should reside with the Chair, Murray-
Darling Basin Ministerial Council.

38. The Water Conservation Trust Board be supported by the Environmental Manager
located within the Office of the Murray Darling Basin Commission.

39. The Murray-Darling Basin Ministerial Council direct the Commission to undertake a
comprehensive review of all existing operating rules within the Murray-Darling system to
identifying changes to flow management that will:
- reconnect the floodplain with the main river channel in the Lower Murray-
Darling, and
- restore small and medium flow events to the River Murray in South Australia.

WETLAND MANAGEMENT
The Committee recommends that:

40. The South Australian Government establish a new River Murray Wetlands Management
Committee to address the long standing issues associated with management of River
Murray wetlands and provide relevant direction and support to Local Action Planning and
Implementation Groups. The activities of the Committee should be coordinated and
overseen by the River Murray Co-ordinating Committee.

41. Responsibility for improving the management of wetlands be clearly assigned within
government and over sighted and driven by the River Murray Co-ordinating Committee.

42. The South Australian Government, in consultation with the new River Murray Catchment
Management Board and the Local Action Planning and Implementation Groups
(LAPIGs), invest in new wetland management officers for the region who will work
directly with the Board and LAPIGs to provide the necessary technical and scientific
support to restore high priority wetland ecosystems.

Community involvement
The Committee recommends that:

43. The South Australian Government establish a South Australian Community Advisory
Forum (SACAF) as the peak community body in South Australia. The SACAF will provide
advice on issues relating to the sustainable management of the environmental and
natural resources of the South Australian Murray-Darling Basin to the:
- new River Murray Catchment Management Board
- Community Advisory Committee, and
- Minister responsible for the SA Murray-Darling Basin.

44. Membership of the SA Committee Advisory Forum be comprised of South Australia’s
representatives on the Murray-Darling Basin Community Advisory Committee, the
Chairperson from each of the South Australian Local Action Planning and
Implementation Groups, and representatives from each of the Murray-Darling
Association zones within South Australia.

Water use and management

FLOW AND RIVER REGULATION
The Committee recommends that:

45. The Murray-Darling Basin Ministerial Council instruct the Murray-Darling Basin
Commission to conduct an audit of infrastructure to:
• determine whether the purpose of existing infrastructure could be expanded from that of simply providing a stable pool for consumptive extraction to also provide enhanced environmental outcomes
• identify items of existing infrastructure that are surplus to river regulation requirements which should be decommissioned
• prepare a program of works that will reduce evaporative losses from the system (that is, regulating storages) and improve water management within the system.

WATER ALLOCATIONS AND METERING
The Committee recommends that:

46. The South Australian Government initiate through the River Murray Catchment Management Board's Water Allocation Plan policies to address the current imbalance between South Australia's water allocations and the maximum permissible water use under the Murray-Darling Basin Cap.

47. The water allocations reclaimed be re-allocated to the Water Conservation Trust for the Lower-Murray Darling.

48. Metering of the Lower Murray Swamps Irrigation Area be an integral component of that area's rehabilitation.

49. The Murray-Darling Basin Ministerial Council establish a Basin-wide policy framework for water management that will result in application of volumetric water allocations across the entire Basin.

WATER USE
The Committee recommends that:

50. Irrigators be encouraged and assisted to achieve more efficient on-farm irrigation practices.

51. All irrigators report their water use efficiency against targets of 85 per cent efficiency.

52. The South Australian Government and the new River Murray Catchment Management Board work with irrigators to ensure 80 per cent of South Australia's irrigators achieve best practice irrigation management by 2005 and 100 per cent of irrigators by 2010.

53. The Murray-Darling Basin Ministerial Council agree to a policy that all water diversions from the rivers and tributaries of the Murray-Darling Basin (excluding stock and domestic) be metered by 2005.

IRRIGATION WATER SAVINGS
The Committee recommends that:

54. The Murray-Darling Basin Ministerial Council, as part of its environmental flows program, undertake a comprehensive and transparent Basin-wide investigation into water savings to be achieved through the rehabilitation of the major irrigation water delivery systems and improved on-farm irrigation practices.

DROUGHT MANAGEMENT STRATEGY FOR MURRAY-DARLING BASIN
The Committee recommends that:

55. The South Australian Government encourage the Murray-Darling Basin Ministerial Council to prepare a drought management strategy for the Murray-Darling Basin.
Biodiversity

The Committee recommends that:

56. The South Australian Government through the Department for Environment and Heritage conduct a biological survey of the River Murray corridor as a matter of high priority.

57. The River Murray Catchment Management Board, within its Catchment Management Plan, outline a plan of action for the control of threatening processes to habitat areas within the South Australian Murray-Darling Basin.

58. The Commonwealth Government make considerable new national investment available to landholders and community groups across the region to control threatening processes, such as pest plants and animals, and protect and manage areas of remnant native vegetation for conservation purposes.

59. The South Australian Government conduct a review of cost-sharing arrangements under the various programs for land, water and biodiversity management within the South Australian Murray-Darling Basin.

Land management

LAND USE PLANNING POLICIES AND ZONING

The Committee recommends that:

60. As a matter of high priority, the South Australian Government initiate with the relevant local government authorities and the River Murray Catchment Management Board a comprehensive regional review of development policies, water management policies and land use zoning within the River Murray corridor and its surrounding environs.

Research and development

The Committee recommends that:

61. The South Australian Government establish a Centre of Excellence that will bring a range of relevant research and development expertise (for example, CSIRO, Cooperative Research Centres, Research and Development Corporations) together under an integrated salt management program to:
   - foster and support regional development in new salt based industries, such as inland saline aquaculture and salt harvesting
   - develop new, commercially viable farming systems for low rainfall areas which will reduce the rate of groundwater recharge
   - breed new varieties of salt-tolerant crops.

62. Research and development initiatives such as the Mallee Sustainable Farming Project be encouraged and supported.

Investment in the Murray-Darling Basin

NATIONAL RIVER MURRAY FUND

The Committee recommends that:

63. The Commonwealth Government give serious consideration to the establishment of a 20-year National Murray-Darling Basin Fund for public investment in works and measures that will restore the ecological health of the Murray-Darling system and maintain agricultural productivity.
CAPACITY BUILDING
The Committee recommends that:

64. The South Australian Government’s employment policies reflect greater government investment in water, environmental and natural resource management expertise and ensure that South Australia has the capacity to fulfil its legislative and administrative responsibilities in the longer term.

COST-SHARING ARRANGEMENTS FOR ON-GROUND WORKS
The Committee recommends that:

65. The South Australian Government, through the Murray-Darling Basin Ministerial Council, undertake a Basin-wide review of the effectiveness and suitability of current cost-sharing arrangements for on-ground works under programs such as the Natural Heritage Trust.

Inland fishery
The Committee recommends that:

66. The South Australian Government in cooperation with the Murray-Darling Basin Commission initiate a program of works that will restore effective fish passage from the Murray Mouth to the South Australia - New South Wales border.

67. The Committee, on the basis of evidence presented to it, concurs with the findings of the Environment, Resources and Development (ERD) Committee and recommends that the South Australian Government implement all of the ERD Committee’s recommendations (see Appendix C).

DRAFT NATIVE FISH MANAGEMENT STRATEGY FOR MURRAY-DARLING BASIN
The Committee recommends that:


Communication, education and information sharing
The Committee recommends that:

69. The lead Minister in South Australia table the Committee’s report at the next meeting of the Murray-Darling Basin Ministerial Council for consideration.

70. The South Australian Minister for Water Resources should promote this report for educational purposes.

COMMUNITY FORUM
The Committee recommends that:

71. The Murray-Darling Basin Ministerial Council direct the Murray-Darling Basin Commission to convene a Basin-wide forum to consider the recommendations outlined in this report.
1 INTRODUCTION

1.1 Appointment of Committee
On Thursday 18 November 1999 the House of Assembly passed a resolution, (on the motion of Mr Hill, Member for Kaurna), for the appointment of a Select Committee on the Murray River to investigate and make recommendations on various issues concerning the River Murray.

1.2 Terms of Reference
The terms of reference for this Select Committee are as follows:

To consider and report on the following matters of importance in relation to the Murray River with particular reference to –

(a) the state of the environment of the Murray River particularly as it affects South Australia and including –
   i environmental and economic flow management, and;
   ii riparian and flood plain management;
(b) economic values and sustainability;
(c) river regulation and State and Federal controls; and
(d) any other relevant matters.

1.3 Membership
The House of Assembly appointed the following Members to the Committee –

Hon Mark Brindal MP (Minister for Water Resources) *
Ms Vini Ciccarello (Member for Norwood)
Mr Kris Hanna (Member for Mitchell)
Mr John Hill (Member for Kaurna)
Hon Dorothy Kotz MP (Minister for Local Government) **
Mr Peter Lewis (Member for Hammond)
Ms Karlene Maywald (Member for Chaffey)
Hon David Wotton (Member for Heysen)

* Appointed from 28 March 2000
** Appointed until 28 March 2000

Following a change in membership to the Committee, the Hon David Wotton was elected as Chairman on 12 April 2000.

Mr David Pegram was initially assigned as Committee Secretary and subsequently replaced by Mr Paul Collett on 13 March 2001.

On 15 February 2000, the Committee appointed Mr Mark Faulkner as Research Officer.

1.4 Committee Powers
Pursuant to House of Assembly Standing Order 335 the House determined that the Committee “have power to send for persons, papers and records and to adjourn from place to place.”
1.5 Chairman's vote

While the Chairman of a Select Committee does not have a deliberative vote, pursuant to Standing Order 328 the Chairman “has a casting vote only” in the event of an equality of votes.

1.6 Disclosure of Evidence

**ADMISSION OF THE PUBLIC AND MEDIA.**

In accordance with Standing Order 338, members of the public and media were able to be present at Committee meetings, except when deliberative.

**DISCLOSURE OF EVIDENCE.**

On Thursday 30 March 2000, the House of Assembly resolved to suspend Standing Order 339 thereby allowing the Committee to disclose evidence prior to reporting its findings. Accordingly the Committee passed the following motion:

> That, unless otherwise agreed, all meetings of the Select Committee at which evidence is presented be open to the Media and public and the evidence may be disclosed. In addition, all evidence given to date, other than that given in camera, be authorised for release.

> The Committee also reserved the right to hear evidence in camera and withdraw leave for the release of evidence at any time.

**TRANSCRIPTS OF EVIDENCE ON THE INTERNET.**

At its meeting on Tuesday 27 June 2000, the Committee resolved to allow for the official transcripts of evidence taken from witnesses to be published on the parliamentary web site. The transcripts can be viewed at: http://www.parliament.sa.gov.au – click on the “Hansard” then choose “Committees” followed by “Select Committee on the Murray River”.

1.7 Conduct of Inquiry

During the course of this inquiry, the Committee received 94 written submissions and 85 papers and publications from various representative individuals and organisations. These individuals and organisations are recognised in Appendix A of this Report.

The Committee also received verbal evidence from over 75 witnesses representing various private, association/organisation and government concerns. These witnesses are detailed in Appendix B.

Over a 20 month period, the Committee met on 36 occasions including 4 separate site visits to Albury, Canberra, Bourke and the Lower Murray.

Finally, the Committee tabled an Interim Report in July 2000, which overviewed the evidence given at that time without making any conclusive finding or recommendation. This Report incorporates all evidence and submissions received during the whole of the inquiry, not withstanding they may have been referred to on a previous occasion.
2. BACKGROUND

2.1 Key achievements to date

There have been many achievements associated with improving the management of the natural resources of the Murray-Darling Basin. These achievements may vary in magnitude and significance, but each plays an important part in moving towards ecologically sustainable development of the Basin’s natural resources.

With the current focus on the problems confronting the River Murray and the Murray-Darling Basin, the Select Committee believes that it is important to step back and reflect upon the key achievements that have been made. Recognising these achievements provides a basis from which we can move forward. This section provides an overview of key achievements since 1985.

**MURRAY-DARLING BASIN MINISTERIAL COUNCIL**

The Murray-Darling Basin Ministerial Council was established in 1985, comprising ministers holding land, water and environment portfolios within the governments of South Australia, New South Wales, Victoria, Queensland and the Commonwealth. An Australian Capital Territory minister is a non-voting member of the Ministerial Council by a Memorandum of Understanding (MOU). Establishment of the Council marked a significant shift in approach to the management of natural resources in the Murray-Darling Basin. The predominant focus on water sharing and management has now given way to an understanding that to reduce the risk to water supplies and ecosystem health, we need to manage the natural resource base of the whole basin – an integrated catchment approach.

**CONTINUOUS WATER ACCOUNTING**

In 1988, the Ministerial Council agreed to continuous water accounting between New South Wales and Victoria. The Commission now keeps account of how much water these States use whilst ensuring that South Australia’s legal entitlements under the Murray-Darling Basin Agreement are fully protected.

**SALINITY AND DRAINAGE STRATEGY**

The Salinity and Drainage Strategy came into effect in January 1988, although the Ministerial Council did not formally adopt it until April 1989. The Strategy (a schedule to the Murray-Darling Basin Agreement) provides a framework for joint action by the New South Wales, Victorian, South Australian and Commonwealth governments to effectively manage water-logging and land salinisation in the irrigation districts of the Murray Valley in New South Wales and Victoria and River salinity in the Lower Murray-Darling. Under the Strategy, South Australia is accountable for putting in place measures that will offset the impact of post-1988 irrigation development on River salinity.

The Strategy was a world first. It incorporated cross-jurisdictional trading in pollution rights for works and measures that would either reduce or increase River salinity. The Strategy is based on a balance between engineering (salt interception schemes, such as Woolpunda and Waikerie) and non-engineering (land and water management plans) solutions. Since its inception, the Strategy has reduced salinity in the River Murray at Morgan by approximately 60 EC units. This is over and above gains brought about by changes to operating procedures at two major water storages - Menindee Lakes and Lake Victoria. These changes have removed very large peaks in River salinity and provided an additional net salinity improvement of approximately 28 EC units at Morgan.
NATURAL RESOURCES MANAGEMENT STRATEGY - INTEGRATED CATCHMENT MANAGEMENT

The Murray-Darling Basin Commission institutionalised the concept of community-driven integrated catchment management across the entire Murray-Darling Basin through the Natural Resources Management Strategy in 1989. Through this initiative, Catchment Management Committees have been established for each major river in the Basin. Working in partnership with governments, these committees design and implement on-ground works to address a range of natural resource issues in their respective catchments.


THE ‘CAP’

Following an audit of water use in the Murray-Darling Basin, the Murray-Darling Basin Ministerial Council agreed in 1995 to an interim cap on all diversions from the Basin’s rivers at 1993-94 levels of development. The interim cap was subsequently made permanent in December 1996. This decision, now commonly referred to as ‘the Cap’, was one of Council’s most important initiatives. It seeks to obtain a balance between the consumptive and instream uses of the Basin’s water resources, and provides some margin of safety for any further changes that may have an adverse impact on water quality (such as dryland salinity). In 1996, the Ministerial Council also directed that the Cap be reviewed by June 2000.

INTERSTATE WATER TRADING – PILOT PROJECT

In November 1997, the Murray-Darling Basin Ministerial Council agreed to the establishment of a pilot project that would introduce trade in permanent interstate water property rights in the Mallee region – from Nyah to the Barrages. By facilitating such trade, the project sought to promote increased water use efficiency. It also aimed to assist the irrigation industry to become more economically sustainable by facilitating the movement of water from low-value irrigation activities to higher-value irrigation developments that are subject to environmental controls, such as Irrigation and Drainage Management Plans (IDMP).

Preliminary data from the pilot project shows that water is moving from low-value to higher-value irrigation activities, with South Australia being a major beneficiary. Since the project started in 1998, more than 10 gigalitres of water has been traded with 8.7 gigalitres of water traded into South Australia.

NATURAL HERITAGE TRUST FUNDING

The Murray-Darling Basin Initiative has been a major beneficiary of funding for natural resource management under the Natural Heritage Trust and other natural resource programs.

Since the inception of the Natural Heritage Trust program in 1997-98, South Australia, has attracted more than $7 million per annum for natural resource management activities within the Murray-Darling Basin.

BASIN SALINITY AUDIT

The 1999 Basin Salinity Audit revealed that without further intervention dryland salinity poses a rising threat to very important land and water resources, regional biodiversity and public and private infrastructure. Whilst these findings are sobering, the Audit itself rates as a major achievement. As a consequence of the Audit, there is greater recognition and understanding of the salinity problem, how it occurs and what is needed to address it effectively. Points highlighted by the Audit include:
• The threat posed by salinity is more widespread and severe than previously recognised.
• Recent investment in salinity management has been in the right direction but insufficient to stabilise salinity at current levels.
• The scale of the problem and the interrelationship between causes and effects reinforces the importance of an integrated catchment management approach.
• New salinity management initiatives need to provide policy and management elements which are flexible enough to accommodate local variations in impacts and costs, and the capacity of communities and governments to respond.
• We know that we have time to address the salinity issues confronting the Basin.

2.2 About the Murray-Darling Basin

The Murray-Darling Basin is Australia’s largest river system covering an area of more than one million square kilometres, equivalent to 14 per cent of Australia’s landmass (Figure 2). On a world scale the Murray-Darling ranks fifteenth in terms of length and twenty-first in terms of area. While on these criteria, it is a major river system, it is small in terms of its discharge. Median annual outflow at the Murray Mouth, under natural conditions, is 11 880 gigalitres per year.

![Map of the Murray-Darling Basin](source: MDBC, 2001)

Figure 2 - Map of the Murray-Darling Basin.

Source: MDBC, 2001
The Basin is defined by the catchment areas of the Murray River and Darling River. The Darling is the longest river in Australia measuring 2,740 km from its source to its confluence with the Murray at Wentworth. The Murray is 2,530 km long from its source in the Australian Alps to its mouth on Encounter Bay in South Australia.

The Basin extends over three-quarters of New South Wales, approximately two-thirds of Victoria, fifteen per cent of Queensland and seven per cent of South Australia and the entire Australian Capital Territory (excluding Jervis Bay) (Table 1).

The Murray Darling Basin has 26 major catchment areas. The Upper Murray, Murrumbidgee and Goulburn catchments account for 45.4% of the Basin’s total mean annual runoff but only 11% of its area. In contrast, the Darling group of rivers contributes 31.7% of the Basin’s mean annual runoff from 60.4% of its area.

Table 1 – Area and mean annual water outflow of the Murray-Darling Basin as a percentage of each Basin State.

<table>
<thead>
<tr>
<th>State</th>
<th>Total areas of States (km²)</th>
<th>Area in MDB (km²)</th>
<th>% of States in MDB</th>
<th>% of area of the MDB</th>
<th>% of mean annual outflow</th>
</tr>
</thead>
<tbody>
<tr>
<td>New South Wales</td>
<td>802 081</td>
<td>599 873</td>
<td>74.79</td>
<td>56.65</td>
<td>46.6</td>
</tr>
<tr>
<td>Victoria</td>
<td>229 049</td>
<td>130 474</td>
<td>59.96</td>
<td>12.32</td>
<td>36.6</td>
</tr>
<tr>
<td>Queensland</td>
<td>1 776 620</td>
<td>260 011</td>
<td>14.63</td>
<td>24.55</td>
<td>14.9</td>
</tr>
<tr>
<td>South Australia</td>
<td>984 395</td>
<td>68 744</td>
<td>6.98</td>
<td>6.49</td>
<td>0</td>
</tr>
<tr>
<td>Australian Capital</td>
<td>2 367</td>
<td>2 367</td>
<td>100.00</td>
<td>0.22</td>
<td>1.9</td>
</tr>
<tr>
<td>Totals*</td>
<td>3 794 512</td>
<td>1 061 469</td>
<td>-</td>
<td>100.00</td>
<td>100.00</td>
</tr>
</tbody>
</table>

* - excludes Jervis Bay

Approximately 86% of the Basin contributes virtually no runoff to the river systems, except during extreme rainfall events.

Economic values

AGRICULTURE

Agriculture, including irrigation, is the Basin’s major land use and the major economic activity, valued at approximately $10 billion per annum. This is approximately 40 per cent of the gross value of Australia’s total agricultural production.

MINING AND MINERALS PRODUCTION

Mining and minerals production is important to many locations within the Basin. Overall, the industry is worth $1.66 billion, just over five per cent of the Australian total.

FORESTRY

There is no specific data available concerning the overall value of forestry production in the Murray-Darling Basin. The only indicators are provided by two categories of the manufacturing industry – wood and paper products. In 1991-1992, these industry categories had turnovers of $601.1 million and $617.0 million, respectively. A significant part of the paper products group is accounted for by the newsprint mill at Albury.
TOURISM AND RECREATION
The Murray-Darling Basin’s natural environment – especially its water resources - and the many economic activities provide the basis for tourism and recreation, an industry valued at over $3.44 billion a year.

MANUFACTURING INDUSTRY
The manufacturing industry is a significant activity in the Murray Darling Basin, in terms of numbers of establishments, employment, turnover, and range of activities. It is dominated by activities associated with the Basin's resource-based industries, in particular agriculture and, to a lesser extent, forestry and mining. Such enterprises (for example, abattoirs, wineries, flour mills, and saw mills) are scattered throughout the Basin, close to the sources of their raw materials.

In 1991-92, for the whole of the Murray-Darling Basin, there were some 3280 manufacturing 'locations' (essentially establishments), employing over 62 400 people, with a turnover (essentially sales of goods produced) of over $10,750 million (6.4 per cent of the Australian total).

ELECTRICITY GENERATION
The Basin occupies a unique place in Australian electricity generation in that it contains over three-quarters of the mainland's Hydro-electric Power (HEP) stations. The Snowy Mountains Hydro-electric Scheme is the largest scheme accounting for 71.7% of mainland’s capacity and 69.5% of the electricity generated from mainland hydro stations. There are another 25 HEP stations in the New South Wales and Victorian parts of the Basin with an additional five stations planned or proposed. Almost all of these are owned and operated by private companies.

Social values

POPULATION
At the 1996 Census, the Murray-Darling Basin had an estimated population of 1 956 765 (compared with 1 899 081 in 1991), 10.94 per cent of the total Australian population. External to the Basin another million people are heavily dependent on the River Murray for their water supply.

ABORIGINAL AND EUROPEAN HERITAGE

Aboriginal heritage
The Murray-Darling River system has been important to Aboriginal people for the entire period of their habitation of Australia. There are at least 10 000 known Aboriginal sites in the Basin, from all phases of their occupation, with the rivers and flood plains being of particular importance. Many are of great scientific value and of considerable significance to Aboriginal peoples.

Aboriginal history extends over 45 000 years. Archaeological evidence from shell middens, quarries, rock shelters with archaeological deposits (for example, stone artefacts), open camp sites, rock paintings and engravings, burial grounds and the sacred and ceremonial sites are found throughout the Basin. Lake Mungo and other lakes of the Willandra system contain evidence from around 40 000 years ago. For example, in 1994, the lowering of water levels in Lake Victoria for maintenance purposes, revealed more than 10 000 Aboriginal burials dating back between 3000 and 4000 years, one of the largest burial sites ever discovered.

Of more recent origin are the many carved and scarred trees from which such things as bark canoes, shields, boomerangs and carrying dishes were cut. These are to be found along
most of the Basin's waterways. Many of the Aboriginal sites are listed on the Register of the National Estate.

**European heritage**

The rivers of the Murray-Darling Basin hold great significance in terms of Australia's European heritage and have played an important role in European exploration and settlement. The use of the rivers for transportation made a major contribution to the settlement of the Basin and the development of the pastoral industry, especially from the 1850s. Paddle steamers supplied the towns and stations with their needs and carried wool and other products to markets. Goolwa, Morgan, Echuca and Bourke were major river ports, many features of which can still be observed today. Shipwrecks and other historical sites along the Basin’s rivers can also be found.

The goldrushes of the 1850s have also left their mark on many parts of the Basin's landscape. In terms of heritage resources, this is especially true of a number of towns, such as Bendigo, Beechworth, Adelong, Peak Hill, and Sofala (Australia's oldest surviving gold town). Hill End, a gold rush village 80 kilometres north of Bathurst, remains almost untouched by modern development and is now an Historic Site.

Much of Australia's history as a federation is associated with Canberra especially in terms of such buildings as Old Parliament House, the Australian War Memorial, and Anzac Parade. In many of the towns and rural locations, as well as the local museums, there are commercial, government, and rural buildings of historical significance and heritage value.

The Basin is an integral part of Australia's history and a vast and rich historical storehouse.

**Environmental values**

**WETLANDS**

The Murray-Darling Basin is estimated to contain over 30 000 wetlands, most of them on private land.

A 1986 study along the River Murray between its mouth to Lake Hume, together with the anabranch system of the Edward and Wakool rivers, revealed over 7000 wetlands, covering over 222 000 hectares. Most are small, with 83 per cent being 10 hectares or less in extent. Twenty seven wetlands extend over 500 hectares and account for 36 per cent of the total wetlands area.

Australia wide, 49 wetlands have now been recognised as being of international significance and are listed under the 1971 Convention on Wetlands of International Importance (the Ramsar Convention). Ten of these wetlands are in the Murray-Darling Basin.

**FLORA AND FAUNA**

At the time of European settlement the range of species included 85 mammals, 367 birds, 151 reptiles, 24 frogs and more than 30 fish species. Although some have become extinct and others are threatened, the Murray-Darling Basin is one of Australia's most important biodiversity regions.

**PARKS AND RESERVES**

Many of Australia's most significant natural heritage features are preserved in national parks located in and on the borders of the Murray-Darling Basin. They encompass a great diversity of environments and many species of flora and fauna, some unique to locations within the Basin, ranging from areas of rainforest in the Great Dividing Range in Queensland, to the high alpine areas of the Snowy Mountains, to the arid areas of the far west. In total, the national parks and other reserves cover over seven million hectares, little more than seven per cent of the Basin's total area. Some of the parks contain areas of international
significance. For example, the Willandra Lakes National Park in New South Wales is on the World Heritage list, the Kosciusko and Hattah-Kulkyne national parks are Biosphere Reserves and the Coorong National Park is listed as a wetland of international importance under the Ramsar Convention.

2.3 South Australia’s portion of the Murray-Darling Basin

The South Australian portion of the Murray-Darling Basin covers 70,000 square kilometres or the equivalent of seven per cent of the State (Figure 3). This area is divided into three distinct landscape units: the riverine corridor (5%), the Eastern Mount Lofty Ranges and Murray Plains (15%), and the Murray Mallee (80%). The Eastern Mount Lofty Ranges includes 13 sub-catchments that drain to the River Murray and Lake Alexandrina.

The length of the River Murray from the border with Victoria and New South Wales to its mouth near Goolwa is 640 kilometres. The river corridor includes more than 250 wetland complexes, two of which – Coorong and Lower Lakes, and Chowilla Floodplain System - are of international significance.

Figure 3 - Map of South Australian portion of the Murray-Darling Basin.
Source: Department for Water Resources (SA).
The River Murray is South Australia's largest reliable surface water resource and is central to the social and economic development of the region and State. Irrigated horticulture and agriculture industries using River Murray water have contributed to the South Australian economy since the late nineteenth century. Major industries include wine grapes, dried fruits, citrus, almonds, stonefruits, dairying and vegetable crops. Irrigation development has grown to more than 52 000 hectares using less than 500 gigalitres of River Murray water per annum.

In 1996/1997, the gross value of agricultural production, including value adding, was in excess of $700 million per annum or more than a quarter of the State’s total. In addition, dryland agriculture - cereal crops and livestock grazing - within the South Australian Murray-Darling Basin is estimated to be worth another $52 million per annum. Other important industries in South Australia such as manufacturing and recreation and tourism are either highly dependent or totally dependent on River Murray water. These industries are major employers within the State and estimated to contribute another $13 billion and $130 million per annum, respectively, to the State’s economy.

River Murray water is distributed via an extensive network of pipelines across the State. The water needs of approximately 95 per cent of the State’s population are met, at least in part, by the River Murray. On average, the River Murray supplies approximately 40 per cent of Adelaide’s annual water supply. During dry years the River Murray’s contribution to Adelaide’s water supply can rise to as much as 90 per cent.

Within the South Australian Murray-Darling Basin there is more than 700 000 hectares of conservation reserve. These reserves are spread across various landscape units and include Bookmark Biosphere Reserve, Billiatt, Ngarkat, Brookfield and the Coorong conservation parks.
3. ADMINISTRATIVE AND INSTITUTIONAL ARRANGEMENTS

Management of the Murray-Darling Basin’s natural resources involves a large number of organisations. These include government, industry and community groups, all of which operate at various levels – Basin wide, State, regional, local. This section seeks to identify the various statutory and non-statutory organisations and clarify their respective roles and responsibilities. Figure 4 is a schematic diagram showing various organisations involved in natural resource management activities across the South Australian Murray-Darling Basin.

![Schematic diagram of various organisations involved in natural resource management in the Murray-Darling Basin.]

**Figure 4 – Schematic diagram of the various organisation involved in natural resource management in the Murray-Darling Basin.**

NB
SCB – Soil Conservation Boards
APCB – Animal and Plant Control Boards
3.1 Murray-Darling Basin Initiative

The Murray-Darling Basin Initiative is the largest integrated catchment program in the world, covering an area of over one million square kilometres. The Initiative was established by the Murray-Darling Basin Agreement, which was signed by the Governments of the Commonwealth, New South Wales, Victoria, and South Australia in 1987. Queensland became a party to the Agreement in 1996 under specific terms set out in Schedule D to the Agreement and the Australian Capital Territory became a participant in 1998.

The 1992 Agreement was recognition of the fact that no one government or group of people was able to deal with the Basin’s emerging problems and that the existing management arrangements were not able to adequately address these problems. Furthermore, the involvement of the community, through the Community Advisory Committee and Natural Resources Management Strategy, recognised that the task was not one that governments could fulfil on their own.

The Initiative has had a number of distinctive phases. Its inception focussed on promoting the principles of integrated catchment management and the development of joint community and government structures. More recently emphasis has been placed on the development and implementation of strategic, large-scale integrated catchment management plans and concentrating resources in areas of greatest need. The joint community and government structures remain as key mechanisms for implementing the integrated catchment management plans.

3.2 Murray-Darling Basin Agreement

The 1992 Murray-Darling Basin Agreement provides the framework for the sharing and management of the resources of the Murray-Darling Basin. It is given effect through the Murray-Darling Basin Act 1993.

The purpose of the Agreement is:

\[
\text{to promote and co-ordinate effective planning and management for the equitable, efficient and sustainable use of the water, land and other environmental resources of the Murray-Darling Basin.}
\]

The 1992 Murray-Darling Basin Agreement, is the most recent in a series of Agreements, It has evolved from a focus on water sharing arrangements toward an integrated approach to the management of the resources of the Murray-Darling Basin. This latest Agreement builds on previous arrangements and establishes a partnership between the Commonwealth, New South Wales, Victorian, South Australian and Queensland governments. This partnership is commonly referred to as the Murray-Darling Basin Initiative.

The are a number of very important elements to the Agreement from South Australia’s perspective. One of these is a provision for a minimum entitlement flow to South Australia of 1850 gigalitres per annum.

3.3 Murray-Darling Basin Ministerial Council

The Murray-Darling Basin Ministerial Council is the primary body responsible for formulating policy and providing the direction necessary to implement the Murray-Darling Basin Initiative. The Ministerial Council’s main functions\(^2\) are to:

- consider and determine major policy issues concerning the use of the Basin’s land, water and other environmental resources

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\(^2\) MBDC 2000a p8

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• develop, consider and authorise (as appropriate) measures to achieve the purpose of the Agreement.

The Ministerial Council comprises those Ministers holding land, water and environment portfolios with the governments of New South Wales, Victoria, South Australia, Queensland and the Commonwealth. Up to three Ministers from each Government may sit on the Ministerial Council. The Australian Capital Territory (ACT) participates in the Initiative via a Memorandum of Understanding. Under the Memorandum, the ACT Government can take part in the planning and management of the Basin’s environmental resources, but not be involved in water management of the River Murray system. The ACT Government Minister is a non-voting member of the Ministerial Council.

### 3.4 Murray-Darling Basin Commission

The Murray-Darling Basin Commission is the executive arm of the Ministerial Council and is responsible for:

- managing the River Murray and the Menindee Lakes system of the lower Darling River
- advising the Ministerial Council on matters related to the use of the water, land and other environmental resources of the Murray-Darling Basin.

The membership of the Commission comprises an independent President and two Commissioners from each of the Initiative partner Governments (except the ACT which has one Commissioner) who between them represent water, land and environmental resource management interests for their respective jurisdictions. Each partner government also appoints Deputy Commissioners. Commissioners are generally chief executives or senior executives of government agencies responsible for land, water and environmental resources.

The functions of the Commission are to:

- advise the Ministerial Council in relation to the planning and development and management of the Basin’s natural resources
- assist the Ministerial Council in developing measures for equitable, efficient and sustainable use of the Basin’s natural resources
- coordinate the implementation of, or, where directed by the Ministerial Council, to implement, those measures, and
- give effect to any policy or decision of the Ministerial Council.

To achieve this, the Commission works cooperatively with partner governments, committees and community groups to:

- develop and implement policies and programs aimed at the integrated management of the Murray-Darling catchment, and
- manage and distribute the water resources of the River Murray system in accordance with the Murray-Darling Basin Agreement.

### RIVER MURRAY WATER BUSINESS

The Murray-Darling Basin Commission fulfils its water sharing and supply responsibilities through the internal business unit, River Murray Water. River Murray Water manages the river system to ensure that the available water is shared and supplied to South Australia, Victoria and New South Wales in accordance with the Murray-Darling Basin Agreement. It carries out this role through three main processes:

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3 Ibid p10

4 MDBC 1992
• assessing future availability of water
• accounting for actual use of water, and
• regulating river flows to meet environmental and user needs.

**BASIN SUSTAINABILITY PROGRAM**

The Murray-Darling Basin Commission delivers its natural resource management responsibilities through the Basin Sustainability Program.

This program, established by the Ministerial Council in 1996, is a critical aspect of the Murray-Darling Basin Initiative and is the planning, evaluation and reporting framework for the Natural Resources Management Strategy.

The program has clearly defined objectives, key result areas and performance indicators to guide and report on all natural resources investments in the Basin. Key result areas are:

• sustainable agricultural activity
• water quality, and
• nature conservation.

### 3.5 Community Advisory Committee

The Community Advisory Committee is an important component of the Murray-Darling Basin Initiative under the Murray-Darling Basin Agreement, reporting directly to the Ministerial Council. It advises the Ministerial Council whilst also providing a two-way channel of communication between the Ministerial Council and the wider Basin community.

More specifically, the Community Advisory Committee’s terms of reference are to advise the Ministerial Council and the Commission on:

• natural resource management issues referred to the Committee by the Ministerial Council or the Commission, and
• the views of the Basin’s communities on matters identified by the Committee as being of concern.

The Community Advisory Committee comprises an independent Chairperson and 26 members, namely:

• 21 state representatives chosen on a catchment/regional basis, seven from New South Wales, five from Victoria, four from South Australia, four from Queensland, and one from the Australian Capital Territory
• a representative from each of four special-interest, ‘peak’ organisations (National Farmers Federation, Australian Conservation Foundation, Australian Local Government Organisation, and Australian Landcare Council), and
• a representative of the Aboriginal communities.

### 3.6 Legislative framework

The use, allocation and management of the natural resources of the Murray-Darling Basin are controlled by several pieces of legislation in South Australia. With respect to the management of water resources in South Australia, the principal statute is the *Water Resources Act 1997*. Other important South Australian statutes associated with protection, conservation and management of the land, water and other environmental resources of the South Australian Murray-Darling Basin include:

• *Animal and Plant Control (Agricultural Protection and Other Purposes) Act 1986*
• *Crown Lands Act 1972*
3.7 State agencies

A large percentage of State Government agencies are involved in managing the natural resources of the Murray-Darling Basin in one way or another. Below is an overview of the roles and responsibilities of the various agencies.

DEPARTMENT FOR WATER RESOURCES

The Department for Water Resources is the lead agency for the policy, management and administration of the State’s water resources under the Water Resource Act 1997. Important functions include water allocation and licensing, compilation and maintenance of information of the water resources of the State and implementation of the Council of Australian Governments (COAG) Water Reforms. The Department for Water Resources has a significant focus on securing the supply of good quality water for South Australia from the Murray-Darling Basin system.

The Department for Water Resources is responsible for coordinating South Australia’s input to the Murray-Darling Basin Initiative.

PLANNING SA (DEPARTMENT FOR TRANSPORT, URBAN PLANNING AND THE ARTS)

Planning SA is responsible for administering the Development Act, 1993. Under that Act, Planning SA prepares and maintains the Planning Strategy which provides strategic directions for planning and development in South Australia. The Development Act also requires that each local council prepare a Development Plan for its area, against which development proposals are assessed. Land management through land use planning and development controls is a critical factor in good catchment management.

PRIMARY INDUSTRIES AND RESOURCES SA

Primary Industries and Resources SA (PIRSA) is responsible for fostering sustainable economic development throughout South Australia. PIRSA seeks to achieve this by providing irrigation and dryland farmers with advice on good land and water management practices. PIRSA also provides support to Landcare groups and Soil Conservation Boards.

PIRSA provides professional and administrative support to the Soil Conservation Council established under the Soil Conservation and Landcare Act, 1989; the Animal and Plant Control Commission established under the Animal and Plant Control (Agricultural and Other

PIRSA is also responsible for administering inland and marine fisheries under the Fisheries Act, 1982.

DEPARTMENT FOR ENVIRONMENT AND HERITAGE
The Department for Environment and Heritage (DEH) is responsible for administering water resource management obligations under the Environment Protection Act, 1993. These obligations are primarily concerned with protecting of water quality and controlling or minimising waste discharges.

DEH is also responsible for administering the Native Vegetation Act, 1991 and the National Parks and Wildlife Act, 1972. It does this by providing professional and administrative support to the Native Vegetation Council and the National Parks and Wildlife Council.

SOUTH AUSTRALIAN WATER CORPORATION
The South Australian Water Corporation is responsible for the provision of public water supplies and the collection, treatment and disposal of sewage. One of the Corporation’s primary objectives is to ensure that South Australia’s water and wastewater services are operated in a way that provides continuous high quality supply, protects the health of the public and minimises environmental impact.

The South Australian Water Corporation is a user of River Murray water resources and is licensed to divert a nominal 180 gigalitres per annum of water for metropolitan and country water supply purposes.

River Murray Operation Unit
In South Australia, the River Murray Operations Unit of the South Australian Water Corporation has assumed the responsibilities of the construction authority under the Murray-Darling Basin Agreement. This Unit is responsible for the construction, operation and maintenance of Murray-Darling Basin Commission assets from Lock and Weir 9 to the Barrages at the Murray Mouth.

3.8 Statutory bodies

RIVER MURRAY CATCHMENT WATER MANAGEMENT BOARD
The River Murray Catchment Water Management Board was established under the Water Resources Act 1997 in September 1997. The Board’s boundaries have recently been reviewed and expanded to take in both riverine and dryland areas of the South Australian portion of the Murray-Darling Basin. This change has aligned the Board’s boundaries more closely with those of the South Australian Murray-Darling Basin as defined under the Murray-Darling Basin Agreement (Figure 5).

The Board has wide-ranging responsibilities and powers under the Act, including the ability to raise funds for activities to improve the health of the catchment and the condition of its water resources through a water resources levy. The Board must work to achieve the objects of the Act, including:

- recognising the need to protect water resources and associated ecosystems from degradation
- restoring those resources where they have already been degraded
- maintenance or improvement in water quality
- identifying opportunities for developing alternative sources of water, such as reclaimed effluent and stormwater
• encouraging members of the community to take an active part in water resource planning and management
• promoting public awareness of the importance of River Murray water and the sustainable use of these resources.

Figure 5 – Map showing the boundary of River Murray Catchment Water Management Board within the SA Murray-Darling Basin.

Source: Planning SA
Specific functions of the Board include:

- prepare and implement a catchment water management plan for the region, and
- prepare water allocation plans for its prescribed water resources that will guide and integrate the management of the region’s water resources to achieve the object of the Act.

**WATER RESOURCES MANAGEMENT COMMITTEES**

Within the boundary of the River Murray Catchment Water Management Board are four prescribed water resources under the *Water Resources Act 1997*:

- the River Murray Prescribed Watercourse
- the Angas-Bremer Prescribed Wells Area
- the Mallee Prescribed Wells Area, and
- the Noora Prescribed Wells Area.

Two Water Resources Planning Committees have been established under the Water Resources Act to prepare water allocation plans for the Mallee and Angas-Bremer Prescribed Wells Areas.

**SOIL CONSERVATION BOARDS**

Soil Conservation Boards (SCBs) have been established across the agricultural and pastoral areas of South Australia under the *Soil Conservation and Landcare Act, 1989*. The boundaries of 10 separate Soil Conservation Boards are either entirely or partly within the South Australian Murray-Darling Basin: the Coorong and Districts, Southern Hills, Murray Mallee, Murray Plains, Eastern Districts, Central Hills, Northern Hills, Lower North, West Broughton and North-east Pastoral (Figure 6).

Under the Act, the Boards are required to prepare a district plan describing best practice land management for soil conservation and rehabilitation within their board area. Evidence presented to the Committee shows that a number of the Boards have been very active in seeking to address a range of natural resource management issues and encouraging the adoption of sustainable land management practices.

### 3.9 Local Government

Local Government plays a significant role in water resources management. Local Government is empowered under the *Local Government Act 1999* to administer various aspects of land use planning and development controls under the *Development Act 1993*. Under the Development Act each Local Council has to prepare a Development Plan that is consistent with the objects of the Development Act. These Plans provide the policy framework for decision making on development applications. Local Councils through the administration of their respective Development Plan’s can have a major influence on controlling activities that affect natural resources and in turn impact on the health of the catchment and its water resources.

There are 17 Local Government areas either entirely or partly within the South Australian Murray-Darling Basin (Figure 7).
Figure 6 – Map showing boundaries of Soil Conservation Boards within the SA Murray-Darling Basin.

Source: Planning SA
Figure 7 – Map showing Local Government boundaries within the SA Murray-Darling Basin.

Source: Planning SA
3.10 Local Action Planning Groups

Within the South Australian portion of the Murray-Darling Basin, 11 Local Action Planning Groups have been established (Figure 8). All 11 Groups have now completed their Local Action Plans. Local Action Planning is a Murray-Darling Basin Initiative designed to enable communities and governments to work in partnership to address a variety of natural resource issues within the Murray-Darling Basin.

The Local Action Planning process provides the opportunity for everyone with an interest in the health of the Murray-Darling Basin to become involved. The Local Action Planning Groups provide advice to the Natural Heritage Trust Board on priority actions for funding in their local area.

Figure 8 – Map showing the boundaries for Local Action Planning Group within the South Australian Murray-Darling Basin.

Source: Planning SA
4. **KEY ISSUES**

4.1 **Institutional framework**

**Murray-Darling Basin Initiative**

Evidence to the Committee has highlighted that the Murray-Darling Basin Initiative is acclaimed internationally and regarded as one of the best working examples of inter-jurisdictional processes designed to achieve the sustainable use and management of environmental and natural resources. Governance of the Initiative is through two key bodies the Murray-Darling Basin Ministerial Council and the Murray-Darling Basin Commission.

Evidence to the Committee also suggests that, despite its achievements, the Initiative has some constraints that may impact on the ability of Initiative partners to effectively and efficiently manage the resources of the Murray-Darling Basin in the future. These constraints include:

- specific limitations regarding water-sharing arrangements under the Murray-Darling Basin Agreement,
- the structure and composition of the Murray-Darling Basin Commission.

**WATER SHARING ARRANGEMENTS**

The Committee has been informed that the water-sharing arrangements under the Murray-Darling Basin Agreement have remained essentially unchanged since the 1915 River Murray Waters Agreement.

Under these arrangements South Australia does not actually own any of the water contained within the Murray-Darling Basin system. New South Wales and Victoria share the water resources equally but must provide South Australia with a minimum entitlement (that is, 1850 gigalitres per year).

The Committee is concerned that when these arrangements were defined, the resource management philosophy was focussed on navigation and development of the Basin’s water resource with little regard to the long term health of the river system or the needs of the environment.

**MURRAY-DARLING BASIN COMMISSION MEMBERSHIP**

Evidence presented to the Committee has indicated that appointments to the Murray-Darling Basin Commission are generally senior bureaucrats, heads of relevant agencies from the respective jurisdictions. The appointment of senior bureaucrats has been by tradition, not as a requirement under the Murray-Darling Basin Agreement. While members bring their own skills to the Commission, it is not an expert or a skill-based Commission.

A further issue is that under existing arrangements Commissioners have dual responsibilities - to their minister (or jurisdiction) and to the Commission. In the context of the Agreement, Commissioners should act in the best interests of the Basin. However, in evidence presented, it has been suggested that the Commission shadows the political debate at the expense of a direct focus on formulating good policy advice that is in the best interests of the Basin’s resources. Furthermore, evidence suggests that this emphasis on political aspects has unduly impacted on the quality and timeliness of advice the Commission provides to the Ministerial Council.

Evidence has prompted the Committee to question the structure and membership of the Commission. Two options are:
1. a Commission that has the potential to temper its advice on the basis of its knowledge of the politics within respective jurisdictions, or

2. a Commission that is a skill-based expert Commission providing the Ministerial Council with advice without ‘fear of favour’ that is focussed on achieving the sustainable development of the Basin’s natural resources.

The Committee regards the current situation as unacceptable. Any potential for the Commission to temper its policy advice to the Ministerial Council as a consequence of its knowledge of the politics of the day must be eliminated.

The Committee believes that current arrangements regarding the Commission’s membership reflects a period when the Commission was the peak decision making body in the Basin. This is clearly no longer the case. The reshaping of the former River Murray Water Agreement to the Murray-Darling Basin Agreement led to the establishment of the Murray-Darling Basin Ministerial Council in 1985. This also changed the role of the Commission from that of peak decision-maker to key policy advisor. As a key advisory body, the Commission must have the ability to provide policy advice to the Ministerial Council that is focussed on achieving the sustainable development of the Basin’s natural resources.

Having considered this issue at length, the Committee is of the opinion that the current arrangements with respect to the structure and composition of the Commission should be changed.

Integrated Catchment Management

INTEGRATED CATCHMENT MANAGEMENT IN THE MURRAY-DARLING BASIN 2001-2010

In June 2001, the Murray Darling Basin Ministerial Council released the policy statement Integrated Catchment Management in the Murray-Darling Basin 2001-2010. The ICM policy statement outlines a framework and joint commitment by the community and governments on the future management of the natural resources of the Murray-Darling Basin. Specifically, the policy statement says:

We the community and governments of the Murray-Darling Basin commit ourselves to do all that needs to be done to manage and use the resources of the Basin in a way that is ecologically sustainable.

This new Integrated Catchment Management Policy statement renews and builds on a 1990 commitment by the Murray-Darling Basin Ministerial Council to manage the Basin’s resources through an integrated catchment management approach. The new Integrated Catchment Management framework is based on targets for catchment health and improving the way we organise communities, institutions and governments to meet the challenges and opportunities of the future.

The ICM policy statement makes the point that the health of the Basin is under threat and that we cannot protect all of the Basin’s resources if we continue to use them as we do now. The Basin community and governments must decide what they want.

The Committee strongly supports the ICM framework.

DRAFT INTEGRATED NATURAL RESOURCES MANAGEMENT BILL 2001

In February 2001, the South Australian Government released a Draft Integrated Natural Resources Management Bill 2001. The objects of the Bill are to:

- promote and facilitate integrated and sustainable management of the State’s natural resources, and
• provide arrangements to involve the community in the development and implementation of regional initiatives to improve the management of the State’s natural resources.

The objects of the Bill will be achieved by:

1. establishing an Integrated Natural Resources Management Board or Ministerial Board
2. requiring the Ministerial Board to prepare a State Natural Resource Management Plan
3. establishing Integrated Natural Resource Management Regions
4. establishing Integrated Natural Resource Management Groups
5. requiring Integrated Natural Resource Management Groups to prepare Natural Resource Management and Investment Strategies for their regions.

Whilst the Committee supports the underlying intent of the Bill, the mechanisms by which the Bill seeks to achieve its objects are not supported. In particular, the Committee believes the proposal to establish Integrated Natural Resource Management Groups at the regional level will lead to duplication, wasted resources and further confusion in the community.

STATUTORY AUTHORITIES REVIEW COMMITTEE

Earlier this year the Statutory Authorities Review Committee (SARC) completed an inquiry into Animal and Plant Control Boards and Soil Conservation Boards. The Committee notes the SARC’s report, in particular the recommendations that:

1. Soil Conservation and Animal and Plant Control Boards be amalgamated to form Land Management Boards
2. Land Management Boards and Catchment Water Management Boards should be key players in the Integrated Natural Resource Management Groups and should work closely together to ensure an holistic approach to natural resource management in South Australia, and
3. following the establishment of Integrated Natural Resource Management Regions and Groups, existing Boards, committees and community groups involved in natural resource management should be encouraged to explore any possible voluntary rationalisation.

The Committee also notes evidence to the SARC from Mr John Wills, Senior Authorised Officer, Mount Lofty Ranges Animal and Plant Control Board who told the Committee how he saw the future of natural resource management boundaries in South Australia:

…..I point out that the water catchment boards are based on water catchment areas; in other words, they are geographic, they are fixed and they cannot be changed. Animal and Plant Control Boards are based purely on funding, on where the money comes from, and that could be changed. Soil Conservation Boards are based on whatever they think is a fair thing. I do not think there is any geographic or funding basis, so they can be changed.

If we push all the garbage aside and look at it on logical grounds, we have to look at catchments. I have nutted my head around this for months and I cannot think of any other possibility. I am talking about the Torrens, the Onkaparinga, the Para, the Murray on the other side, and the Fleurieu catchments, etc. No matter which way we go, there are difficulties, but it seems to me that the thing that is fixed in concrete, that we cannot change, are the catchments. That is where the biodiversity is, where
the water flows, where everything happens. I think it has to be worked on the catchments.  

River Murray Catchment Water Management Board

**BOARD’S BOUNDARY AND MEMBERSHIP**

Evidence made available to the Committee highlighted recent changes to the Board’s boundary and the proposal to change the membership of the Board to ensure that it has the necessary skills and capacity to address both riverine and dryland issues. The Committee supports these changes. The Committee regards this development as a significant first step towards delivering an integrated catchment management framework within the South Australian Murray-Darling Basin.

**COMMUNICATION AND LIAISON**

The Committee is concerned by evidence suggesting that the working relationship between the Department for Water Resources and the River Murray Catchment Water Management Board is not as strong as it could be. Furthermore, evidence indicates that within the Board there is frustration regarding its current level of involvement in policy development at the State and Basin level.

**ROLES AND RESPONSIBILITIES**

There are many organisations involved in various aspects of the natural resource management of the South Australian portion of the Murray-Darling Basin. Evidence presented to the Committee has highlighted the current level of bureaucracy within the South Australian Murray-Darling Basin (refer Figure 4). The Committee has heard that the roles and responsibilities of various organisations are unclear and that there is widespread confusion amongst groups and the wider community.

The Committee is concerned that under current arrangements the South Australian Murray-Darling Basin region does not have a single organisation that has the charter to provide a regional focus for the delivery of integrated catchment management.

This situation needs to be resolved if we are to maximise the environmental and natural resource management gains to be derived from major policy announcements, such as the Murray-Darling Basin Ministerial Council’s Integrated Catchment Management Policy statement and the Prime Minister’s National Action Plan for Salinity and Water Quality.

The Committee acknowledges the existence of the Interim Integrated Natural Resources Management Group within the Basin. However, it believes that formal establishment of this Interim Group will only add another layer to what is an already overly bureaucratic resource management framework. Action needs to be taken to simplify, wherever possible, the current bureaucracy associated with the natural resource management planning and the delivery of environmental and natural resource management programs.

It has been suggested to the Committee that under Section 61 the Water Resources Act, 1997 a Catchment Water Management Board may be delegated the functions of any other natural resource management Act. In this context, the Committee believes that an expanded River Murray Catchment Water Management Board (with its capacity to generate its own financial resources) presents an ideal opportunity to streamline the current administrative arrangements and deliver a truly integrated catchment management framework within the South Australian Murray-Darling Basin.

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5 Report of the Statutory Authorities Review Committee’s Inquiry into Animal and Plant Control Boards and Soil Conservation Councils p132
Local Government

Local Government has an important role to play in achieving the sustainable use and management of the Basin’s resources. The Committee is concerned by evidence that suggests local government, with a couple of notable exceptions, is not a visibly active participant in the management of the Basin’s resources.

The Committee is pleased to note that recent evidence contained within the Basin Sustainability Program report for 2001/2002 to 2003/2004 shows that local government investment in the South Australian Murray-Darling Basin is projected to more than double compared to the preceding three year period.

State government agencies and the River Murray Catchment Water Management Board must seek to develop strong working partnerships that actively support Local Government’s full participation in natural resource management.

LOCAL GOVERNMENT BOUNDARIES

There are 17 separate local government areas within the South Australian Murray-Darling Basin. In some instances the area of a Council within the Basin is extremely small. This makes it difficult to manage from a natural resource management perspective.

The Committee would like to see Councils work through a process of boundary reform over time to remove these anomalies which potentially impede integrated catchment management.

Local Action Planning Groups

Evidence made available to the Committee has highlighted the good work being undertaken by the eleven Local Action Planning Groups operating within the South Australian Murray-Darling Basin.

The Local Action Planning, a Murray-Darling Basin initiative, represents the only truly integrated catchment management framework operating within the South Australian Murray-Darling Basin. Local Action Plans, prepared by these Groups provide the framework for applying an integrated approach to the management of environmental and natural resource management issues at a local scale. Collectively, these plans outline a range of actions for addressing land degradation across the entire South Australian Murray-Darling Basin.

What has become clear to the Committee is that these Groups are not receiving the necessary level of support or recognition that they deserve or require from State agencies or the River Murray Catchment Water Management Board.

Key issues of concern to these groups are security of funding for on-ground works, operational funding support, employment arrangements for project officers working with these Groups and access to technical and professional expertise within State agencies.

The Committee believes the ongoing operation of these groups is essential. A base level of operating funding to cover administrative costs needs to be made available to these Groups.

Evidence has highlighted that the project officers supporting these Groups are often the people that enable LAPs to function. A number of Groups have identified that the employment arrangements under one or two year contracts often result in officers looking for alternative employment opportunities with improved job security. The consequence of this is that when a change in project officer occurs, groups lose momentum with their energies being diverted away from achieving on-ground action towards obtaining new professional and technical skills to drive their initiatives. Groups feel they are continuously having to ‘recreate the wheel’ which is compromising their ability to deliver tangible results on the ground.
The Committee is concerned about the number of Local Action Planning Groups that currently operate within the SA Murray-Darling Basin. The Committee believes that the process of reviewing support arrangements should also consider rationalising the number of these Groups.

4.2 Salinity

Salinity has long been recognised as one of the most critical issues facing the Murray-Darling Basin. The Select Committee has heard from a number of witnesses that salt is a natural feature of the Murray-Darling Basin and has accumulated in the Basin’s landscape over geological time. The Basin’s exceptionally flat terrain, low rainfall and high evaporation have combined to concentrate salt in the soil profile and groundwater system. Each year around one million tonnes of salt carried in rainfall is deposited across the Basin.

Human-induced land use change, such as irrigation and native vegetation clearance, has altered the hydrological balance. As a result:

- shallow groundwater aquifers have gradually filled and mobilised salt to the land surface
- the rate of saline groundwater discharge into the Basin’s rivers has increased, and
- altered flow regimes and the quantity and quality of water remaining in the Basin’s rivers.

Vegetation clearance and its replacement with annual crops and pastures allows more rainfall to leach past the root zone of plants, increasing the recharge rate of natural saline groundwater aquifers. The consequent rise in groundwater is a slow process with the time taken to reach the land surface varying according to rainfall and the original groundwater depth. In some regions, such as the Riverine Plains of the Murray-Darling Basin, dryland salinity occurs within decades. Elsewhere, particularly in the Mallee regions, the recharge is still to reach the regional groundwater table. Consequently, the full effect on the landscape and the river system is yet to be seen.

River regulation and the diversion of water for consumptive purposes have further compounded the problem. Irrigation development and inefficient irrigation practices have not only altered river flows, but have also altered groundwater levels, particularly under irrigation areas, and increased the natural discharge rate of saline groundwater to the River.

Murray-Darling Basin Salinity and Drainage Strategy

The Murray Darling Basin Salinity and Drainage Strategy came into operation in 1988. This Strategy was a response to emerging water-logging and land salinisation in the irrigation districts of the Murray Valley in New South Wales and Victoria and the prospect that river salinity in the Lower River Murray at Morgan would increase by between 30 and 75 EC units within 30 years. The Strategy provided for a range of measures including a change in river operations to improve dilution flows, and jointly funded engineering works and non-engineering solutions such as Land and Water Management Plans. The Strategy’s overall aim or target was to achieve a net reduction in river salinity of 80EC units at Morgan.

There are a number of key elements to the Salinity and Drainage Strategy. They are:

- the states of New South Wales, Victoria and South Australia would be responsible for managing the impact of its actions on river salinity (that is, new irrigation development post-1988)
- no actions that increase salinity are allowed unless they are offset by works to ameliorate them
• the Commission adopted an interim objective to maintain salinity levels at Morgan at less than 800EC units 95 per cent of the time.

A recent review of the Salinity and Drainage Strategy reveals that we have made a number of significant achievements, but there is a lot more to be done to control rising river salinity. The review shows that since the introduction of the Strategy:

• Five new or enhanced salinity control schemes have been constructed at capital cost of $44 million, with operating and maintenance costs of approximately $1.8 million per year.
• These schemes prevent more than 400 000 tonnes of salt per annum from reaching the River Murray.
• The average salinity for the River Murray at Morgan decreased from 721 EC (pre-strategy period 1975 -1985) to 569 EC (post-strategy period 1993-1999).
• River salinity at Morgan is at less than 800 EC units more than 90 per cent of the time compared to 60 per cent of the time in the pre-strategy period.

The review also revealed that new salinity threats were emerging, particularly from dryland catchments. These salinity hazards, if unchecked, would offset the salinity gains achieved under the Strategy within 20 – 30 years.

SALINITY AND DRAINAGE REGISTER

Under the 1988 Salinity and Drainage Strategy a salinity register was established to monitor accountability arrangements under the Strategy. The register allocated credits for actions that resulted in a net salinity reduction to the River and debits for actions that resulted in an increase in the amount of salt reaching the River. New South Wales and Victoria received 15 EC credits at the commencement of the Strategy. South Australia chose not to be included on the register and undertook to ensure that it would implement the necessary actions to ensure that the salinity impact of post-1988 development on the River was salinity neutral.

The Salinity Audit of the Murray-Darling Basin

The Murray-Darling Basin Ministerial Council’s Salinity Audit was initiated after considering the preliminary findings of the review of the Salinity and Drainage Strategy.

The Audit was commissioned with the aim of compiling a comprehensive account of the main sources of salinity in the Basin and to predict potential salinisation during the coming 20, 50 and 100 years (Figure 9). The Audit draws a number of key findings and indicates that within the Murray-Darling Basin, under current management systems and in the absence of substantial new intervention:

• Three to five million hectares of land will become salinised during the next 100 years to the extent that there will be substantial impacts on water quality, agricultural productivity, the environment and built infrastructure.
• Salt loads from key tributaries on the Basin will more than double during the next 50 years.
• Damage to agricultural productivity and infrastructure in the Basin (roads, buildings, etc) caused by salt, is estimated to increase to between $600 and $1000 million dollars a year during the coming 100 years.
• Increased salinity will have a serious impact on major wetlands such as the Macquarie Marshes, the Great Cumbung Swamp, the Avoca Marshes and the Chowilla Wetlands in South Australia.
• Less than half of the salt mobilised in the Basin is exported through the rivers out to sea. More than half is stored elsewhere in the landscape, mainly in irrigation areas and floodplain wetlands.
Other Audit findings of significant interest to South Australia are:

- Salinity in the River Murray at Morgan will increase by approximately 50 per cent over the coming 50 years, with salinity levels exceeding the World Health Organisation’s desirable level for drinking water approximately 40 per cent of the time.
- While irrigation areas are potentially sources of large volumes of salt, effective management systems are being implemented. Provided the current level of investment continues, they are not expected to be a major source of further increases in river salinity in the future.
- Approximately 60 per cent of the increased salinity predicted for the River Murray below Wentworth will come from dryland sources (rather than irrigation areas), and of that over half (37 per cent) will come from the Mallee region on the lower and middle Murray.

![Figure 9 – Salinity levels for current conditions, 2020, 2050, 2100 at various points along the River Murray under the no-intervention scenario.](image)
Source: Department for Water Resources (SA)

**Draft Murray-Darling Basin Salinity Management Strategy**

The Draft Basin Salinity Management Strategy (BSMS) was released by the Murray-Darling Basin Ministerial Council in September 2000. The Strategy establishes a framework for State salinity strategies, catchment management strategies and land and water management plans to work together to achieve common objectives.

The Draft Basin Salinity Management Strategy outlines a strategic response to the emerging salinity threat that includes:
• a co-ordinated planning and policy framework of State salinity strategies, catchment management strategies and Land and Water Management Plans working towards common objectives
• adoption of water quality targets for catchment management
• a program of landscape change and engineering works to provide greater certainty of outcome, and
• assignment of clear responsibilities and accountabilities for partner governments.

The Draft Basin Salinity Management Strategy seeks to establish salinity targets for the 20 tributary valleys across the Basin, as well as the shared salinity target at Morgan of less than 800 EC units for 95 per cent of the time as the Basin target for 2015. This target is essentially a ‘hold the line’ target against a background trend of increasing river salinity.

The Committee notes that the Draft Strategy retains the principle of accountability established under the 1988 Salinity and Drainage Strategy. The Committee also notes that South Australia will be included on the new salinity registers proposed under the Strategy.

Evidence to the Committee has highlighted that, despite significant actions and achievements, South Australia has not fulfilled its salinity prevention obligations under the Salinity and Drainage Strategy. Recent salt load studies assess the salinity impact of new irrigation development post-1988 due to trade to be an increase in average salinity at Morgan of 30 EC. A preliminary assessment of the salinity impact from conditions placed on development and other works is estimated at between 20-25 EC reduction at Morgan. This evidence suggests that South Australia is in debit. A net salinity impact of between 5-10 EC units needs to be offset. The Committee is aware that there are other actions that are in the process of being assessed, such as changes to wetland management, which may have significant implications for South Australia’s salinity account.

Under the Draft Basin Salinity Management Strategy, South Australia has two years to demonstrate full compliance with the previous Salinity and Drainage Strategy.

Future irrigation development

Irrigation will no doubt continue to be a key component of the region’s economy. Achieving sustainable irrigation development will therefore be critical to the region’s future prosperity.

Evidence presented to the Committee by the CSIRO has indicated that one of the critical factors to consider as part of the overall salinity management response is the location of future irrigation development. As a general rule, the further away from the River future irrigation development occurs the lesser the salinity impact and greater the ability to, if required, control any potential future salinity impact. The CSIRO advocated the identification of zones of salinity impact that could be used to guide future irrigation development within the South Australian portion of the Murray-Darling Basin.

Salt Interception Schemes

Salt Interception Schemes are seen as an integral element of any initiatives aimed at addressing the emerging salt hazard. The CSIRO agrees that salt interception schemes are effective in diverting salt away from the River. However, they should be seen as a short term option, not a solution for salinity management. Fundamental wide spread change to current land use, in particular Mallee farming systems, is essential to providing sustainable solutions to salinity in the South Australian Murray-Darling Basin.

Land and Water Management Plans

Land and Water Management Plans are being developed throughout the irrigated areas of the South Australian Murray-Darling Basin. These plans are a key initiative of the Basin
Sustainability Program and will provide a framework for the delivery of sustainable irrigation land use within these areas.

Land and Water Management Plans are defined as ‘business plans’ developed by the community and agreed to by Government, to improve the sustainability of the land and water resources within a locally specific region. Irrigation and drainage issues such as salt, water logging and nutrient management are the focus for these Plans, but they may also address issues of groundwater recharge and floodplain management. Plans may outline actions aimed at achieving sustainable land and water resource management that include on-farm obligations together with community scale infrastructure development.

Land and Water Management Plans are the preferred approach for supporting sustainable irrigation practices at the district scale in South Australia. Information made available to the Committee indicates there are approximately 16 Land and Water Management Plans at various stages of development within the South Australian Murray-Darling Basin with only one currently at the implementation stage.

Irrigation and Drainage Management Plans
Irrigation and Drainage Management Plans operate at the property scale and provide the framework for irrigators to address on-farm irrigation drainage issues. These Plans are generally prepared as part of the salinity impact assessment process when water is transferred or traded.

When water is transferred to another irrigator, under current government policy an assessment of salinity impacts on the River and floodplain is required. This assessment is commonly referred to as a Zero Impact Assessment. Based on the assessment, an irrigator then enters into a Salinity Prevention Obligations (SPO) agreement, in which the irrigator acknowledges accountability for the salinity impacts of their development and agrees to undertake mitigating action. Through SPOs, irrigators are either individually or collectively accountable for their salinity impacts.

Evidence provided to the Committee suggests only one SPO agreement has been signed, and questions regarding their enforceability under the current legislative framework remain unanswered.

River Murray Salinity Strategy
The Committee notes and supports the River Murray Salinity Strategy recently released by the South Australian Government. The Strategy outlines a strategic framework for salinity management in South Australia. The Strategy establishes a fifteen year vision to maintain salinity levels at current levels in the River Murray in South Australia. This is further supported by a longer term vision to ‘reverse the trend’ and restore a sustainable balance to ensure the economic, social and environmental well being of current and future generations of South Australians.

The Strategy seeks to build on our achievements to date by working towards the following salinity goals:

1. Irrigation will not impact on salinity in the River valley.
2. The health of the floodplain and wetlands will be enhanced and protected from the impacts of salinity.
3. Regional groundwater discharges into the River valley will be managed.

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6 Government of South Australia 2001e
7 Ibid p26
4. Salinity management decisions will be made on the best available knowledge. The Committee supports the adoption of the shared salinity target at Morgan of less than 800 EC units for 95 per cent of the time. It also supports the proposal to adopt additional salinity targets in South Australia at the South Australia – New South Wales border, Berri and Murray Bridge.

The Committee has noted that the Strategy outlines a range of significant policy measures, management principles and milestones but does not provide any information with respect to the cost of implementing the Strategy.

4.3 The Cap

In 1995, the Murray-Darling Basin Ministerial Council agreed to an interim cap on all diversions from the Basin’s rivers. In 1996, the Ministerial Council confirmed a permanent Cap effective from 1 July 1997. This decision was prefaced on a major review of the operation of the Cap by June 2000.

The decision to Cap diversions followed an Audit of water use across the Basin that showed a significant and unsustainable growth in the diversions from the Basin’s rivers. The Water Audit showed a decline in river health and incremental erosion of security of supply for existing water users. Specifically, diversions had increased by nearly eight per cent between 1988 and 1994 with total consumption in 1994 having reached 10 680 gigalitres per annum (Figure 10).

![Figure 10](image_url)  

**Figure 10 – Growth in water use within the Murray-Darling Basin.**  
Source: MDBC
A number of witnesses have presented evidence to the Committee suggesting the Basin-wide Cap on diversions is the single most significant water resource management initiative in the Basin. The introduction of the Cap is regarded by many as an essential first step in establishing management systems to achieve healthy rivers and sustainable consumptive use. The Cap is formally defined as:

*The volume of water that would have been diverted under 1993/94 levels of development. In unregulated rivers this Cap may be expressed as an end-of-valley flow regime.*

The Cap is a control on water use, not on development. It does not stop development that redeployes water toward more efficient uses or products of higher value. The South Australian nominal Cap on diversions from the River Murray is 704 gigalitres per annum.

Some flexibility in the Cap allows for climatic variations from year to year. The South Australian Cap is defined in the following components:

- a fixed allocation of 50 gigalitres per annum for country towns
- a five year non-tradable rolling allocation of 650 gigalitres over the five year period (notional 130 GL per annum) for metropolitan Adelaide
- an average of 524 gigalitres per annum allocation for irrigation including private, industrial, recreation, environment and stock and domestic (which includes 440.6 gigalitres for pumped irrigation allocation and 83.4 gigalitres for Lower Murray swamps).

The Committee has noted that within South Australia controls on diversions from the River Murray have existed since 1919. In effect, under the *Controls of Surface Water Act 1919*, the total volume of allocations has been voluntarily capped since 1968. In 1979, a review of water allocations resulted in a further reduction to allocations. This internal State allocation limit has been maintained and is now enforced under the Cap. This historically responsible approach to water allocation has meant that South Australia has complied with the Cap since its inception.

Evidence to the Committee indicates that the Cap is a very significant achievement from a South Australian perspective for two reasons. Firstly, it has provided a level of security for ‘above entitlement flows’ to South Australia that previously did not exist under the Murray-Darling Basin Agreement. Secondly, the Cap has effectively addressed a long-standing issue concerned with extending the powers of the Murray Darling Basin Commission beyond the four main storages and main stem of the River below these storages. Under the Cap, the Commission, through the Ministerial Council, now has an influence over the management and use of water in the tributaries of the Murray-Darling Basin.

**Review of the operation of the Cap**

The Ministerial Council’s decision to introduce a permanent Basin-wide Cap on diversions included an agreement that the operation of the Cap (not the Cap itself) would be subject to review in 2000.

In March 2000, the Ministerial Council released the *Draft Review of the Operation of the Cap* prepared by the Cap Project Board. Key findings outlined in this report were:

- The Cap has been an essential first step in providing for the environmental sustainability of the river system of the Basin.
- Without the Cap environmental degradation of the river system of the Murray-Darling Basin would probably have been worse.
- There is no certainty that the Cap on diversions at its current level represents a sustainable level of diversions.;
• The Cap has already delivered significant economic and social benefits to the Basin community and the net benefits will increase over time.
• Without the Cap the erosion of security of supply for irrigators and other users would have been significant.
• The Cap has provided a more certain climate for long term investment and development, particularly in high value agriculture and value adding processing, as well as providing benefits to the environment.
• The Cap has provided a mechanism for restraining, in an orderly fashion, growth in diversions while enabling economic development to proceed.
• The Cap has enabled better definition of property rights governing water availability.

Status of the Cap
Since tabling its Interim Report in July 2000, the Select Committee has gathered evidence that arrangements for implementing the Cap have been finalised under Schedule F – Cap on Diversions – to the Murray-Darling Basin Agreement. This means that all partner states have committed to implementing the Cap.

While this is viewed as a positive development, the Committee recognises that this commitment needs to be transferred into tangible actions and outcomes.

The Committee is concerned about evidence that shows Queensland still does not have a Cap on any of their river valleys, despite promises to have Caps in place within two years of when the permanent Basin Cap was agreed in 1996. Furthermore the Committee is concerned about recent reports\(^8\) that estimated growth in on-farm storages in the Condamine-Balonne system for 1999/2000 was more than 200 gigalitres.

The Committee is prepared to acknowledge progress in implementing the Cap has been made. However, the Committee is concerned that more than four years since the Cap was made permanent, no climate adjusted models for evaluating Cap compliance have been finalised or submitted to the Murray-Darling Basin Commission for approval. This is unsatisfactory.

**LOWER MURRAY RECLAIMED IRRIGATION AREAS CAP**
The indicative Cap for Lower Murray Swamps was set at 83.4 gigalitres in 1997, subject to further research into the relationship between climatic factors and diversions for irrigation purposes. This indicative Cap has been reduced to 79.7 gigalitres as a consequence of permanent trade.

Earlier this year, following a major review of water utilisation in the Lower Murray Swamps, the Murray-Darling Basin Ministerial Council agreed to a new Cap of 103.5 gigalitres for the Lower Murray, comprising:

- 9.3 gigalitres per annum for highlands and unrestricted trade
- 72.0 gigalitres for swamp use with unrestricted trade, and
- 22.2 gigalitres non-tradable environmental entitlement.

Evidence provided to the Committee indicates that the revision and finalisation of the Lower Murray Swamps Cap is a significant milestone in the context of overall rehabilitation of the Lower Murray Reclaimed Irrigation Areas.

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\(^8\) MDBMC 2001b
4.4 Community involvement

Community involvement in natural resource management is seen as essential to delivering the equitable, efficient and sustainable use of land, water and other environmental resources.

Evidence to the Committee has highlighted that there is considerable opportunity for community involvement in the management of the Basin’s resources at all levels. This involvement is provided through the Community Advisory Committee at the Basin wide level, the River Murray Catchment Water Management Board and Soil Conservation Boards at a regional level, Local Action Planning Groups, Landcare Groups and other environment groups at a local and property level. Furthermore, programs such as the Murray-Darling Basin Natural Resources Management Strategy, National Landcare Program and the Murray-Darling 2001 Program have provided funding for on ground activities by the Basin community since the early 1990s.

A number of witnesses have indicated that South Australia is indeed fortunate to have a level of community interest in management of the Basin’s resources that is the envy of other Basin states. This is evident considering that daily there are more than 1000 people involved in activities directed at enhancing and managing the Basin’s resources in South Australia.

Of concern to the Committee is the apparent lack of recognition within Government agencies that we have a capable and committed community. Current processes and resources are not able to provide community groups with the level of support they require. The Committee believes that this is an issue demanding immediate attention.

4.5 Environmental flows

The introduction of the Cap signalled the need to strike a balance between consumptive and instream water uses. These instream water uses are commonly referred to as water for the environment or environmental flows. Witnesses to the Committee have indicated that this is the next big step for water resource management in the Murray-Darling Basin and critical to the long term future of both the Basin and the River Murray. Defining the environmental water requirements needed to sustain the ecological processes of the Basin’s river systems will underpin the capacity of current and future generations to respond to issues such as salinity and blue-green algae.

River regulation and consumptive use of water in the Murray-Darling Basin has, and continues to have, a significant impact on river health and the environment. Nowhere is this more evident than at the Murray Mouth. Evidence provided to the Committee has shown that rivers have been altered by significant changes in the annual flow, the distribution of flow through the year and the duration of low flow periods. For example, under natural conditions the median flow to the sea at the Murray Mouth was 11 880 gigalitres per annum. By 1994 this level had declined to 21 per cent of the flow that occurred under natural conditions. Consequently, the Lower Murray now experiences drought like flows in over 60 per cent of years, compared with five per cent of years under natural conditions (Figure 11).

The Committee understands that all Basin states are seeking to manage water resources in a way that recognises the need to provide water for the environment as part of their obligations under the Council of Australian Government (COAG) Water Reforms. While South Australia was initially slow to tackle issues associated with environmental flows, it is now taking a lead role in formulating water management policy associated with delivering environmental flows in the River Murray system.
Figure 11 – Distribution of annual River Murray flow over Barrages.

Source: MDBC

Key Points to Note from this Figure

- Under natural conditions, the flow over the barrages would be less than 4600 GL/year in only 5% of years. (This corresponds with the five severe droughts observed in the last 100 years). To get an indication of how often this flow would occur under 1988, 1994, Limited Intervention and Full Development conditions, the horizontal line at 4600 GL/year should be traced to the right to where it intersects the curves for the four scenarios. Immediately below each point of intersection is the percentage of years in which the flow will occur under that particular scenario.
- The probability of the bottom end of the Murray experiencing drought-like flows has increased from 5% of years to over 60% of years.
- This probability is expected to increase further in the future.
- The median annual outflow is currently less than one quarter of its natural value and is expected to decline further.

Figure 11 – Distribution of annual River Murray flow over Barrages.

Source: MDBC
South Australia, through its conservative water allocation policies leaves approximately 60 per cent of its entitlement flow in the River for river maintenance and environmental flow purposes. This is further augmented by making above entitlement flows unavailable for consumptive purposes.

Environmental water requirements

Expert evidence to the Committee suggests that a river cannot be expected to function effectively with only 20 per cent of its original median flow being discharged to the sea. Evidence suggests that the restoration of river health will require median flows at the Murray Mouth approaching 40 per cent on those that occurred prior to development of the Basin’s water resources. To achieve this outcome it has been suggested that we need to be looking at reducing to a level of development nearer to those observed in the 1970s.9

The defining of the environmental water requirements of the River Murray is an issue of profound socioeconomic, as well as environmental, significance at both State and Basin level. The Committee is aware that some of the preliminary outcomes of work aimed at defining the environmental water requirements for the River Murray. These outcomes suggest that, in Basin-wide terms, the volume of water required to be reallocated to the river system over time is unlikely to be less than 1000 gigalitres.

Water Trust or ‘Account’ for the Lower-Murray Darling

In 1993 the Ministerial Council agreed to establish a water account for the Barmah-Millewa Forest. Each year 50 gigalitres from each of the upstream states is set aside into the Barmah-Millewa account. South Australia also contributes to this account via a reduced reliability of supply.

Evidence provided to the Committee has shown that this original small commitment combined with a sophisticated water accounting system has provided more than 341 gigalitres to the forest in 2000. The ability to prolong the duration of the unregulated flows in the upper river has contributed to the most significant environmental event in the forest in a quarter of a century. The exercise has shown that small, well-managed environmental allocations of water do have the potential to improve the health of the river system.

The Committee is of the opinion that we should be seeking to build on the success of the Barmah-Millewa account and establish a similar water trust or account (that is, 50 gigalitres per annum from NSW, Vic and SA) for the Lower Murray-Darling, including the Lower Darling River. The objective of this water account would be to enhance flooding (both the peak and duration) in the lower river commencing at the junction of the Murray and Darling Rivers near Wentworth.

4.6 Water resources and use

The waters of the Murray-Darling Basin are used for a variety of purposes including irrigated agriculture, urban and industrial water supplies and recreation and tourism. Information to the Committee shows that the total storage capacity of major dams across the entire Murray-Darling Basin is approaching 35 000 gigalitres The volume of water being stored throughout the Basin is now more than twice the natural mean annual outflow from the Basin.

Under the Murray-Darling Basin Agreement, the Murray-Darling Basin Commission is responsible for approximately one third of the total volume of water in storage. There are no major storages in South Australia.

9 Walker Transcript, p411
Evidence to the Committee shows that by 1994 water consumption across the Basin had increased to approximately 10 680 gigalitres per annum. Of this, 95 per cent was being diverted for irrigation purposes (Table 4). Figure 12 illustrates the actual water diverted by each Basin state between 1983/84 and 1999/2000.

**Table 4 – Average actual total water diverted by Basin States between 1988 and 1994.**

<table>
<thead>
<tr>
<th>State</th>
<th>Average actual total water diverted (GL) between 1988 and 1994</th>
<th>Diversion as a % of total Basin diversion</th>
</tr>
</thead>
<tbody>
<tr>
<td>New South Wales</td>
<td>6139</td>
<td>57.4</td>
</tr>
<tr>
<td>Victoria</td>
<td>3662</td>
<td>34.3</td>
</tr>
<tr>
<td>South Australia</td>
<td>574 #</td>
<td>5.4</td>
</tr>
<tr>
<td>Queensland</td>
<td>246</td>
<td>2.3</td>
</tr>
<tr>
<td>Australian Capital Territory</td>
<td>63</td>
<td>0.6</td>
</tr>
<tr>
<td><strong>Total for Basin</strong></td>
<td><strong>10684</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

# - More recent data shows that South Australia’s average water diversions have increased to approx. 596 gigalitres per annum.

**Figure 12 – Annual water use by Basin States between 1983/84 and 1999/00.**
Source: MBDC 2001
SOUTH AUSTRALIA’S GROUNDWATER RESOURCES

Within the South Australian Murray-Darling Basin, there are three prescribed groundwater resources under the Water Resources Act 1997. These are the Mallee Prescribed Wells Area, Angus-Bremer Prescribed Wells Area and the Noora Prescribed Wells Area.

The total available groundwater resource in the SA Murray-Darling Basin is estimated to be 67 gigalitres per annum with groundwater use estimated to be 27 gigalitres per annum\textsuperscript{10}. These groundwater resources are valued for irrigation water supplies and rural stock and domestic water supplies.

Council of Australian Governments water reforms

In 1994, the Council of Australian Governments agreed to a Water Reform Agenda that has had significant implications on the management of water resources in the Murray-Darling Basin. The overall purpose of the reforms is to:

- promote water use efficiency, and
- improve economic returns for the Australian water industry.

Key features of the COAG Water Reform Agenda\textsuperscript{11} include:

- performance monitoring at bulk and retail levels
- prices to be based on consumption (not property taxes) and set to cover all costs of supplying the water
- water rights to be defined in a manner which establishes them as a separate property right from the land
- markets to be set up to allow water rights to be traded freely, and separately from the land
- reduction or elimination of cross-subsidies in water provisions
- allocation of water for the environment
- integrated catchment management as the vehicle for resource management, and
- public involvement and consultation.

Evidence provided to the Committee has shown that since 1994, water resources policy development in the Murray-Darling Basin has been consistent with the COAG Water Reform Agenda.

Snowy Mountains Hydro-electric Authority corporatisation

The Snowy Mountains Hyrdo-electric Scheme is an integral part of water sharing arrangements within the Murray-Darling Basin. The need to share Snowy River water between New South Wales and Victoria led to the creation of two separate, although interconnected, elements of the Snowy Mountains Scheme: the Snowy-Tumut Development which provides flows to the Murrumbidgee River and the Snowy-Murray Development which delivers flows to the River Murray.

Since the Snowy Mountains Scheme came into operation it has released an average of 2410 gigalitres of water per annum. Some 1140 gigalitres per annum of water is diverted west for irrigation purposes from the Snowy River: 580 gigalitres to the Murray side and 560 gigalitres to the Murrumbidgee side. In addition, the Snowy Scheme regulates 620 gigalitres from the Murray catchment and 650 gigalitres from the Murrumbidgee catchment (Figure 13).

\textsuperscript{10} Government of South Australia, 2000c

\textsuperscript{11} Thomas, 1999
Evidence to the Committee suggests that South Australia has gained nothing from the construction of the Snowy Scheme, except for a small benefit in extreme drought years. The Snowy water transfer provides around five per cent of the inflow to the River Murray under average conditions increasing to 33 per cent of the total inflow to the River Murray during dry years.

The Snowy storages have on the other hand enabled the rapid expansion of irrigation in Victoria and NSW during the 1950s through to the 1970s. This rapid expansion in irrigated areas has had a significant impact on South Australia in terms of water quality and quantity.

The Committee recognises that the Snowy River has been impacted by the Snowy Scheme: flows to the sea at Orbost have been reduced by 50 per cent. But flows in the River Murray have suffered a much greater impact as a result of that same Scheme. The increase in water diversions that have been facilitated by the Scheme has seen flows to the sea at Goolwa reduced by 80 per cent.

The extent to which Victoria stood to gain from the Snowy Mountains Scheme is highlighted when you consider clause 12(3) of the Snowy Mountains Hydro-Electric Agreement of 1957. It states:

“That Victoria shall not require any water to be released down the Snowy River from any storage under the control of the (Snowy Mountains Hydro-Electric) Authority, and will accept sole responsibility for the construction, operation and maintenance of any works within that State on the Snowy River or in the Snowy River catchment which are found necessary by reason of the diversion of water from the Snowy catchment into either or both of the Murrumbidgee and Murray Valleys and for any consequences within that State of the loss of water or stream flow due to that diversion”.

SA has argued that we will not accept any reduction in flows, or alteration to the pattern of flows, in the River Murray in SA which results from the provision of environmental flows in the Snowy River and/or corporatisation of the Snowy Mountains Authority.

Evidence to the Committee has highlighted that South Australia has maintained conservative approach to the allocation or River Murray water over many years. For example despite an increase in entitlement flow following the construction of Dartmouth Dam in 1979, no new diversion allocations were made in SA. This approach is in stark contrast to that which...
occurred in NSW and Victoria. The additional flows from Dartmouth, together with the dilution flows that were negotiated under the Salinity and Drainage Strategy, are critical to maintaining acceptable salinity levels in the River Murray in South Australia.

**SNOWY WATER AGREEMENT**

The Committee notes the in-principle agreement on the outcome of the Snowy Water Inquiry between the Commonwealth, New South Wales and Victorian Governments. This water saving agreement provides for the progressive introduction over the next 10 years of:

- 21 per cent average annual flows (ANF), or approximately 240 gigalitres restored to the Snowy (28 per cent remains the final target, but is not part of the first ten years);
- additional flows from foregoing 150 gigawatt-hours per annum of power generation in the Snowy montane rivers;
- a dedicated environmental flow of 70 gigalitres per annum in the River Murray.

Other key aspects of this agreement are:

- water targets to be achieved through water savings or by purchases of water entitlements from in the River Murray, Murrumbidgee and Goulburn-Murray river systems
- New South Wales and Victoria will each contribute $150 million over ten years to achieve these targets and the Commonwealth will contribute $75 million
- water savings will be pooled and distributed on the basis that one gigalitre will be directed to the Murray for every two gigalitres to the Snowy. This distribution will apply until the 70 gigalitres limit for the Murray (subsequent savings would continue to be directed to the Snowy subject to the upper 28 per cent limit)
- a Joint Government Enterprise will be established with a charter to acquire water at least cost irrespective of whether it is sourced from New South Wales or Victoria.

The Committee believes that it is important that the eastern states recognise that, as they consider the diversion of water to the east down the Snowy, the maintenance or improvement in the current River Murray flows will be essential to the South Australian economy and restoration of the river environment.

**SNOWY WATER LICENCE**

The Committee has learnt that the Snowy Water Licence (SWL) has a 75 year life, and during this period it provides Snowy Hydro Limited (the corporatised Snowy Mountains Hydro-electric Authority) with an extremely secure and inviolable right to water from the Snowy Scheme in what can only be described as an ever changing environment.

These arrangements will effectively immunise Snowy Hydro Limited (SHL) from any adjustment or compensation for flows from the Scheme into the River Murray. Over the next 75 years, adjustments of flows from the Snowy Scheme to the Murray will be necessary to compensate for matters such as the emerging environmental flow requirements in the River Murray. The issuance of a water licence for such a long period of time, in such an area of uncertainty, could well be viewed as a subsidy to the electricity interests. The parties to the Murray-Darling Basin Agreement need to consider whether SHL should enjoy such effective insulation from responsibility for the environmental impacts, rather than a SWL which allows for negotiated variations with respect to releases to the Murray without automatic compensation.

**JOINT GOVERNMENT ENTERPRISE**

The Committee is concerned that the current proposal for the Joint Government Enterprise appear to favour the purchase of water entitlements from the River Murray and tributaries.
over investment in water efficiency projects. There is concern that the potential purchase of some hundreds of gigalitres of water entitlements will distort the developing water trading market in the Murray-Darling Basin.

The Commonwealth has agreed to fund savings of up to 70 gigalitres per annum, to be sourced from the Murray-Darling Basin, and to be directed to improve the health of the River Murray. A budget of $75 million has been allocated over ten years to fund these savings. Evidence provided to this Committee would suggest that this level of investment represents a useful start to address a major problem, but the 70 gigalitres needs to be considered in the context of the likely requirements for the Murray. Evidence emerging from scientific investigations into the environmental water requirements for the Murray suggests a more significant volume of water (i.e., at least 1000 gigalitres) will be required as an environmental flow. All governments need to recognise the enormity of the problem, and to face up to the likely costs involved in its solution.

**Losses from the Murray-Darling system**

Evidence provided to the Committee by the Department for Water Resources indicates that large quantities of water are lost from the Murray-Darling system via evaporation and seepage. For example, evaporation losses from the main river channel, wetlands and Lower Lakes in South Australia accounts for as much as 900 gigalitres per annum, with more than 60 per cent or 550 gigalitres being lost from the Lower Lakes alone.

The Committee has been advised that the Murray-Darling Basin Commission have set aside funds to conduct a thorough investigation of options for minimising evaporative losses from the Lower Lakes. Evidence presented to the Committee suggests that evaporative losses from major regulating storages, such as the Menindee Lakes, also warrant further investigation.

**Water allocation, use and metering**

The River Murray in South Australia is a prescribed watercourse under the *Water Resources Act, 1997*. Access to, and use of River Murray water is controlled by water allocation and licences. These controls have been in place to varying degrees since 1919. The allocation of water from the River Murray in South Australia for all purposes, other than stock and domestic, has been effectively capped since 1968. Reviews in 1979 and 1992 (Lower Murray swamps) reduced the volumes allocated to the present level.

Under the Murray-Darling Basin Agreement, South Australia receives a guaranteed entitlement flow of 1850 gigalitres per annum. However, the Committee understands that South Australia generally receives a median flow (measured at the border) of 4100 gigalitres. This additional water is commonly referred to as ‘above entitlement flows’. Figure 14 illustrates how South Australia has allocated available water resources between consumptive and instream uses.
Evidence presented to the Committee shows that all water allocations for consumptive purposes in South Australia represent less than 40 per cent of South Australia’s entitlement flow or 18 per cent of the median flow into South Australia. The rest of the available water is retained in the River to provide for water quality maintenance and ecosystem requirements.

Irrigation

Irrigated agriculture in South Australia is the single largest consumptive use of River Murray water. Evidence presented to the Committee suggests that South Australia’s irrigation areas are some of the most efficient in Australia. This is largely attributed to a sustained investment in the rehabilitation of irrigation areas within South Australia. For example, the Committee understands that the last of the Government Highland Irrigation Areas at Loxton is currently being rehabilitated with works to be completed by 2003. These works are expected to deliver water savings of more than 4 gigalitres, with further environmental benefits anticipated through improved on-farm irrigation management.

Evidence to the Committee has inferred that while we can achieve further water use efficiencies within South Australia, the largest potential water savings to be achieved within the Basin would be through rehabilitating irrigation infrastructure in the eastern States. For example, evidence to the Committee indicates that potential water savings through the rehabilitation of one large irrigation area in the eastern States could equate to the same volume of water currently being consumed by all River Murray irrigators. Clearly this is an issue that the Committee would like to see further investigated by the Murray-Darling Basin Ministerial Council.

Efforts to improve irrigation water use efficiency and reduce the impact of irrigation activity in South Australia include:

- the rehabilitation of irrigation water delivery systems in irrigation areas
- education and awareness programs for irrigators showing best practice irrigation management
- rehabilitation of on-farm irrigation equipment
- development of trade in water allocations.

All water extractions from the River Murray are metered, with the exception of dairies on the Lower Murray swamps. Trials are currently being carried out to determine the most...
appropriate technology for metering extractions in the Lower Murray swamps. Evidence has indicated that meters will be installed as part of the proposed rehabilitation of the Lower Murray swamps water delivery infrastructure and associated on-farm land reforms.

Evidence presented to the Committee shows that the average total consumptive use in South Australia between 1993/1994 and 1997/1998 was 596 gigalitres. Irrigated agriculture during this period has averaged 452 gigalitres or approximately 80 per cent or our permitted use under the Cap. Figure 15 illustrates actual water use for irrigation purposes between 1979 and 1998 against the available water resource during the same period. This information suggests that South Australia has adopted a very responsible approach to water resource management for more than two decades.

Figure 15 - Available River Murray water resource and irrigation use between 1979-80 and 1997-98.

Source: Department for Water Resources (SA)

Policies aimed at encouraging efficient water use have been implemented over an extended period of time. For example, a policy of excess water penalty charges has been adopted to discourage irrigators from taking more water than their allocation.

LOWER MURRAY RECLAIMED IRRIGATION AREA

The Lower Murray Reclaimed Irrigation Area includes 27 reclaimed swamps\(^\text{13}\) covering approximately 5000 hectares of low lying land developed for irrigated pasture in the Lower Murray. The swamps can be found along a 80 kilometre strip of floodplain on either side of the River Murray between Mannum and Wellington, South Australia. Sixty-seven per cent of the area is administered as government irrigation areas while the remaining 33 per cent is managed as private irrigation schemes\(^\text{14}\).

Material presented to the Committee indicates that the Lower Murray swamps support an important milk producing area in the State. The region supplies approximately 22 per cent of

\(^{13}\) This includes one swamp on the Finniss River and three no longer irrigated.

\(^{14}\) Aucote, 1999
South Australia’s milk. Its location gives dairy farmers a competitive advantage over other milk producing areas in the State and is estimated to have a farm gate produce value of $32 million.

Information provided to the Committee shows that a considerable amount of investment, from both Government and the community, aimed at rehabilitating the area has been made. This investment is being directed at addressing issues such as:

- nutrient and bacteria drainage discharges to the river (including removal of regional saline groundwater inflows);
- poor water use efficiency;
- poor water supply distribution infrastructure, and
- devolution of government irrigation areas to self management.

The Lower Murray Irrigation Action Group (LMIAG) has prepared a land and water management plan\(^\text{15}\) for the region to guide the rehabilitation process. The plan to be implemented over 15 years at an indicative cost of $40 million identifies a range of objectives associated with improving the management of the area. Three key objectives are:

1. To rehabilitate all Lower Murray Swamps in 10 years.
2. Improve on-farm irrigation efficiency to 65 per cent.
3. Reduce drainage discharges to the river by 40 per cent.

The Committee has obtained evidence from the Lower Murray Irrigation Action Group that suggests the rehabilitation process has stalled due to delays in defining water allocations and water trading policies, drainage management requirements and cost-sharing arrangements for the areas rehabilitation.

Irrigators have indicated to the Committee that for them to be able to make and informed decision about their futures, in particular whether to sell water and retire land, or remain in the dairying and invest in rehabilitation they need to know:

- their water allocations, and the terms and conditions applying to water transfers
- the costs they will have to bear to comply with drainage management requirements
- the extent of the public funding contribution to their rehabilitation costs
- the proposed terms under which they would take over the irrigation and drainage assets from the government.

The Committee notes that the recent decision taken by the Murray-Darling Basin Ministerial Council concerning the Lower Murray Swamps Cap and recognises that this is a significant step forward in defining the water allocations and water trading policies for the region (refer Section 4.3). However, no information with respect to drainage management requirements and cost-sharing has been made available to the Committee. The Committee urges the Government to take urgent action to resolve these issues and accelerate the rehabilitation process.

**WATER USE EFFICIENCY**

The Land and Water Management Plan for the Lower Murray Reclaimed Swamps Irrigation Areas proposes a program of works to achieve irrigation efficiency of 65 per cent. The Swamps have traditionally been flood irrigated using large volumes of water. Evidence made available to the Committee suggests that the highest net present value for the rehabilitation

\(^{15}\text{Ibid}\)
of the swamps would support the area continuing to be irrigated using flood irrigation techniques with a number of on-farm improves such as laser levelling and improve pasture management.

The Committee has also received conflicting evidence that suggest the rehabilitation of Lower Murray Swamps should not be seeking to essentially retain the status quo but actually achieve water use efficiencies greater than 65 per cent. Evidence suggests that investigation initiated by the proponents for the area’s rehabilitation have failed to give adequate consideration to the use of sprinkler irrigation technologies.\textsuperscript{16}

Evidence presented in a desktop study\textsuperscript{17} of sprinklers versus surface irrigation on the Lower Murray Swamps outlines two perspectives. From a water use perspective:

- Centre pivot and fixed sprinkler scenarios are clearly the more favourable, reducing water use by approximately 15 per cent.
- They have the potential to reduce contaminant transport.
- The best sprinkler option for the swamps is the centre pivot system. It offers the higher returns on investment than the fixed system, uses equivalent water volumes and has equivalent pollutant loads to the fixed system.

The authors of the report then provide an on-farm practical perspective which suggests:

- The flood system easily offers a better return on investment and has the added advantage of the lowest financial outlay.
- Adoption of flood irrigation enables the farmer to stage the development of the system, thereby reducing the impact of the financial outlay.
- The flood system has potential for surface runoff and hence pollution of the main drain; the addition of a reuse system can mitigate this risk.
- There is little doubt that a flood irrigation system would be best for farmers in the short term.

The Committee notes as a concluding comment that:

\begin{quote}
‘the adoption of sprinkler irrigation on the Lower Murray swamps could not be currently recommended with confidence. If reducing water use and pollution of the River Murray were seen to outweigh the financial constraints, a field experiment would need to be conducted to test the belief of the authors that sprinkler systems can achieve desirable outcomes’.
\end{quote}

The Committee has formed the opinion that the need to improve water use and reduce pollution should be paramount in any decision regarding the rehabilitation of the Lower Murray Swamps. The Committee therefore believes prior to the government making any public announcement regarding the level of public investment that a demonstration swamp be established to assess the suitability and capability of sprinkler irrigation technologies in this area.

**Water trading**

Water trading in the Murray-Darling Basin is now a widely accepted component of water management. Trade in River Murray water allocations has been possible within South Australia since 1983.

\textsuperscript{16} Caldecott transcript, p662
\textsuperscript{17} Robertson and Wood, 2001 p5
The 1994 Council of Australian Governments Water Reform Agenda agreed to introduce trading, including cross-border sales, of water entitlements by 1998. The reason behind this reform was that water trading would encourage water to move to its highest value use. This would in turn promote water use efficiency and improve economic returns for the irrigation industry.

Evidence has indicated that the introduction of the Cap of Basin water diversions has had a significant impact on water trading activity. The Cap will ensure that demand to purchase water is met from existing sources and therefore establish a starting point for market driven re-allocation.\textsuperscript{18}

In 1997, the Ministerial Council approved the introduction of a pilot project to allow permanent interstate water trade to take place within the Mallee region of the River Murray systems between Nyah and the Barrages. The aim of the project being to improve the efficiency and effectiveness of consumptive water use in ways that facilitate Basin sustainability but do not increase or accelerate environmental degradation.\textsuperscript{19}

The Committee has obtained evidence that South Australia has been the major beneficiary of the Pilot Interstate Water Trading Project. The trial has been successful in encouraging irrigation water allocations to move towards higher value agricultural products and has increased South Australia’s water entitlements by a net 8.7 gigalitres. This represents a direct private investment of approximately \$8.7 million with potential flow on investment worth more than \$87 million.\textsuperscript{20}

The main reasons why this has occurred are attributed to expansion in the wine and olive industry and the fact that South Australia is the only state that currently permits people to hold water separate from land.

Evidence has also highlighted that while the pilot project is only between Nyah and the Barrages the market is actually trading water from Shepparton to the Barrages. Water from higher up in Victoria is being traded into the trial area with other water then flowing over into South Australia.

Evidence suggests that while we currently have a competitive edge on other States, South Australia could lose a lot of water if we don’t move ahead in terms of improving our systems.\textsuperscript{21}

The report on the Pilot Project highlights that:

- South Australia has fallen behind on its salinity obligations in terms of enforcement
- water trade is incredibly important to South Australia in terms of investment, and
- the registry system and settlement procedures for water trade are inadequate.

It has been suggested to the Committee that South Australia could lead the world and revolutionise water trade by setting up formal arrangements for water trade that are modelled on those we already use for land – the Torrens Title System. Key elements required to achieve this system are:

- establish a central register – this will allow all of us to know who owns water and where it is; the register would comprise certificates of title to water rather than a licensing system;
- registerable interests such as mortgages, salinity prevention obligations could be tied to the water title;
- formal settlement procedures for water transfers using licensed water brokers.

\textsuperscript{18} Blackmore, 1999 p7
\textsuperscript{19} Ibid p8
\textsuperscript{20} Young transcript, p642
\textsuperscript{21} Ibid p643
Evidence provided to the Committee has suggested that to move towards this system the current water licence would need to be separated into three components:

1. The water holding: which is the quantity of water that can be extracted each year and which is a share of the amount of water available from time to time.
2. The conditions on use: these are attached to the water holding.
3. Set of accounts: at the time of allocation or at the start of each water year there is an entry in an account as a credit and as the water is used the account is debited.

The final step in this new water management system is to set up low cost arrangements for trading which could be even operate over the Internet.

The Committee is very supportive of this proposed water management and trading concept and believes that further work should be undertaken to foster its development. South Australia should seek to drive the development of water trading markets across the Basin.

**Urban water supplies**

Documentation presented to the Committee has highlighted that there is considerable opportunity to reduce demand on River Murray water for urban water supplies through the adoption of alternative sources of water and the installation of water saving technologies by both industrial and domestic water users. This warrants further investigation.

**Water quality**

Water quality in the River Murray has been degraded by development within the entire Murray-Darling Basin and the way land has been managed. Water quality of the River Murray, Lower Lakes and streams originating along the eastern side of the Mount Lofty Ranges is generally regarded as moderate to poor. This is due to pollution that enters the rivers and wetlands from a number of sources, which can be divided into two broad categories – point source and diffuse sources.

The major point sources of pollution in the River Murray catchment are:

- irrigation drainage water
- township effluent
- urban stormwater runoff
- marinas and houseboats
- shacks
- intensive animal industries.

The major diffuse sources of pollution in the River Murray catchment include:

- groundwater inflows
- excreta from livestock and other animals
- gully, sheet and stream erosion.

Evidence indicates that the River Murray Catchment Water Management Board through its Catchment Water Management Plan and Local Action Planning Groups through their Local Action Plans are seeking to implement a range of initiatives aimed at controlling both point and diffuse source pollution.
LOWER MURRAY RECLAIMED IRRIGATION AREAS

Of particular interest to the Committee was evidence provided by the Lower Murray Irrigation Action Group concerning the rehabilitation of Lower Murray Reclaimed Irrigation Areas. These areas, between Mannum and Wellington, are regarded as the last major pollution problem for the River Murray in South Australia.

Irrigation areas in this stretch of the River discharge significant volumes of salt, nutrients (nitrogen and phosphorus) and faecal bacteria to the River. Evidence has highlighted that joint action between government and the local irrigation community is seeking to implement a Land and Water Management Plan that will modernise irrigation infrastructure, improve on-farm irrigation and drainage practices and establish a self managing irrigation entity.

Expected environmental outcomes from this action include:

- a reduction in irrigation diversions from the River Murray
- a 40 per cent reduction in the volume of drainage water being returned to the River
- a reduction in volume of nutrient and faecal bacteria loads entering the River.

Implication of Climate Change

Climate change is a global issue of concern to all of us. Evidence provided to the Committee from the most recent scientific assessment of greenhouse based climate change to the earth suggests the water resources of the Murray-Darling Basin will come under increased pressure.

Modelled catchment and hydrological implications for the Macquarie River Catchment in New South Wales are outlined in the Intergovernmental Panel on Climate Changes (IPCC) report. Broadly speaking the climate change effects in this catchment can be used as an indicator of effects expected for the Murray-darling system. This modelling shows, with a degree of uncertainty that by 2030, very large reductions in water flow are possible. Furthermore the study concluded, amongst other things that:

- climate change will place stress on all highly or over-allocated rivers; and
- reductions in water allocations are likely.

Having considered this the Committee has also been informed that there is currently no formal Drought Management Strategy for the Murray-Darling Basin. The Committee believes that such a Strategy should be developed.

4.7 Biodiversity

Biodiversity is defined in the National Strategy for the Conservation of Australia’s Biological Diversity as:

*the variety of all life forms – the different plants, animals and micro-organisms, the genes they contain and the ecosystems of which they form a part. It is not static, but constantly changing through adaptation and threatening processes such as habitat changes or loss and degradation. Biodiversity, the diversity of life, can be considered at three interconnected levels: genetic, species and ecosystem. It covers terrestrial, marine and other aquatic environments.*

Within the Murray-Darling Basin there is a diverse ecology. The river system itself has more than 30 freshwater fish species, numerous species of birds, frogs, reptiles, plants and other

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22 Commonwealth of Australia 1996
fauna. For example, evidence shows that of the 3519 known plant species in South Australia, over 2000 of these occur within the South Australian Murray-Darling Basin.

A Biodiversity Plan for the South Australian Murray-Darling Basin has been developed to provide a regional strategy for promoting conservation, restoration and management of the region’s biodiversity in the longer term. The Plan’s preparation is part of the Biodiversity Planning Program within the Department for Environment and Heritage.

Native vegetation clearance, reclamation of wetlands, degradation of remnant native vegetation, introduced species and disease have reduced the indigenous biodiversity of the region and resulted in regional extinctions of a number of plants and animals. There are 24 nationally threatened plant species within the South Australian Murray-Darling Basin Biodiversity Region, 10 of which have their primary strongholds in this region. Other plants and animals within the region are also considered threatened at the State and regional level.

The biodiversity plan has identified a number of major threats to the region’s biodiversity. These include:

- river regulation and altered flow regimes
- rising saline groundwater levels
- grazing
- introduced plants and animals
- recreational activity
- loss and fragmentation of habitat
- fire
- water pollution (for example, salinity), and
- lack of baseline data.

Several witnesses have expressed concern about the lack of baseline data for the river corridor. The absence of this type of biological data means that our scientific understanding of wetland processes is incomplete. For example, we currently lack the ability to predict the impact of river level manipulation on floodplain biodiversity.

4.8 Wetland management

Wetlands are essential to the maintenance of the hydrological, physical and ecological health of the riverine environment and provide economic, social and cultural benefits to the broader community. Wetlands are often referred to as the ‘kidneys of the river system’, filtering nutrients from the water to contribute to the food chain which supports a large variety of aquatic invertebrates, fish, birds and mammals. However, despite their importance, they have been one of the least valued and most abused of Australia’s natural resources.

Within the South Australian Murray-Darling Basin there are 1100 wetlands in 250 wetland complexes providing an array of wetland habitats in a semi-arid environment. Evidence indicates that most of these wetlands have been degraded through:

- changes to seasonal wetting and drying cycles associated with flooding and drought
- a reduction in the height and frequency of medium and small floods
- a reduction in the frequency and average duration of floodplain inundation
- a change in seasonal flooding from winter and spring towards summer and autumn
- permanent inundation of previously temporary wetlands
- a rise in the level of Lake Alexandrina and its isolation from tidal influences and seawater
an elevation in naturally saline watertables and increased groundwater flows into the River caused by the hydraulic pressure of raised water levels between weirs
• maintaining river levels at or above minimum pool level at each weir and therefore eliminating the effect of drought in the main stream
• other impacts such as land use change, grazing, recreational activities and pest plants and animals.

River regulation has altered the flow regimes in the River Murray and increased the proportion of permanent wetlands at the expense of temporary wetlands. The frequency of floodplain inundation has also decreased. Pressey (1986) identified that about 73 per cent of River Murray wetlands between the South Australian border and the Lower Lakes are now permanently flooded. The lower frequency in floodplain inundation has reduced the number of successful breeding and regeneration events in floodplain biota.

Wetlands along the lower reaches of the River between Mannum and Lake Alexandrina have been highly modified by drainage and irrigation development for agricultural and dairy pasture production. Only 590 hectares of wetlands remain out of an original area of 5800 hectares.

Despite the degradation, evidence has also indicated that the wetlands of the South Australian Murray Valley provide a variety of habitats that continue to support diverse populations of aquatic and riparian plants and animals, and are therefore considered to be of high conservation value.

SOUTH AUSTRALIAN RIVER MURRAY WETLANDS TEN YEAR PLAN AND THREE YEAR ACTION PLAN

The South Australian River Murray Wetlands Ten Year Plan and the Management of Wetlands of the River Murray Valley Draft Action Plan were prepared by the South Australian River Murray Wetlands Management Committee in 1996. Together these plans provide a framework for the management of River Murray wetlands in South Australia and outline a series of recommendations and actions that will enhance the health of more than 30 priority wetlands.

The objectives and recommendations outlined in these documents are consistent with the objectives and actions outlined in the Murray-Darling Basin Ministerial Council’s Floodplain Wetlands Management Strategy for the Murray-Darling Basin and Algal Management Strategy and the Murray-Darling Basin Commission’s Fish Management Plan.

The Committee is concerned by evidence that the Ten Year Plan and Draft Action Plan have been largely ignored by government. In addition, the Committee understands that the River Murray Wetland Management Committee has been disbanded. As a consequence, there is very little support or direction from government to community groups on the management of River Murray wetlands. Even more concerning is information provided to the Committee that there is currently only one dedicated wetlands officer for the entire State within State government agencies.

Notwithstanding the above circumstance, the Committee has been advised that the number of River Murray wetlands under active management is growing as a consequence of the work of environment groups like Wetland Care Australia and Natural Heritage Trust funding made available to Local Action Planning Groups.

While this growth in community support for wetland management projects is encouraging it has been brought to the Committee’s attention that there are a number of unresolved policy and administrative issues which threaten to undermine current community support. These issues include:
• Wetlands water use – There is uncertainty surrounding the provision of water to wetlands and whether a licence to take water for the purpose of wetting intentionally dried wetlands is required.
• Ownership and maintenance of regulating structures – Questions have been raised regarding who owns and is responsible for the ongoing maintenance and operation of new and existing regulating structures.
• Operation of regulating structures – There is uncertainty regarding who is responsible for operation of these structures and how they are to be operated.
• Approval processes – There is uncertainty regarding what approvals, if any, are required to place a structure on a wetland.
• Wetland management plans – There is now process for the review or endorsement of wetlands management plans and they have no legal status.
• Cost-sharing arrangements – There is uncertainty regarding who should pay for the relocation of irrigation pumps from backwaters to the main stream.
• Salinity impact assessment – There is uncertainty about the need to control and manage River salinity impacts (if any) as a consequence of floodplain inundation under the Salinity and Drainage Strategy. Monitoring and review – There is no process or procedure for the systematic collection of data and reporting on changes to managed wetlands.

Due to insufficient evidence available to the Committee, it remains unclear:

• which State government agency is actually responsible for wetland management within South Australia
• what action, if any, is being take to address the issues listed above
• who is driving the implementation of relevant initiatives under the Commission’s Floodplain Wetland Management Strategy and South Australia’s Ten Year Plan and Action Plan.

4.9 Land use change

The Salinity Audit has predicted that dryland areas, in particular the Mallee zone of the Murray-Darling Basin, will become the dominant source of future salt loads to the River Murray. Evidence has suggested that current farming systems are inadequate to intercept a larger percentage of rainfall and reduce the rate of recharge to the groundwater system. It has been suggested that a fundamental change to current farming systems is required. In particular, new farming systems will need to be developed that incorporate perennial deep-rooted vegetation. A number of witnesses have also indicated that strategic revegetation of a large area of the Mallee will be required to prevent leakage and reduce the rate of groundwater recharge to somewhere near that under areas of native vegetation.

In recognition of the emerging salinity threat, it has been suggested to the Committee that a comprehensive socio-economic study of the Mallee region needs to be undertaken as part of any salinity management strategy.

MALLEE SUSTAINABLE FARMING PROJECT

The Mallee Sustainable Farming project is a tri-state research project seeking to develop new farming systems that will increase farm productivity and improve land management practices in the Mallee. The research project is funded by the Grains Research and Development Corporation and the Natural Heritage Trust.

This farmer initiated project covers the low rainfall Mallee regions in South Australia, Victoria and New South Wales. The research project is centred on core research paddocks where crop rotations, fertiliser rates and tillage practices are being assessed for their effects on
crop diseases, soil biota, wind erosion and groundwater recharge. A series of focus paddocks are also being assessed by monitoring the productivity, water use efficiency, erosion and profitability of each paddock.

The research project has identified a number of limiting factors to production, including low water use efficiency on traditional farming systems, poorly performing soils and low soil fertility. A series of promising trials sites aimed at overcoming these limitations have been established.

The Committee believes that this type of research needs to be actively supported and encouraged.

4.10 Inland fisheries management

The Murray-Darling Basin is regarded as Australia’s most productive drainage system which supports a unique community of only 35 native species of freshwater fish. Evidence provided to the Committee suggests that since European settlement, but particularly in the past 50 years, a quarter of the Basin’s 35 native fish species have become threatened nationally.23

The serious decline in both distribution and abundance is attributed to a variety of factors including:

- flow regulation
- habitat degradation
- lowered water quality
- barriers to fish migration (that is, weirs and barrages)
- introduced species,
- over exploitation (for example, commercial and recreational fishing)
- diseases, and
- inappropriate translocation and stocking of native species.

**Fish Management Plan for the River Murray**

Evidence submitted to the Committee indicates that in 1991 the Murray-Darling Basin Commission released a *Fish Management Plan for the River Murray*.

The *Fish Management Plan* provides a framework for remedial action aimed at reversing the decline in native fish populations of the Murray-Darling River system. Responsibility for implementing actions outlined under the *Plan* resides with each of the Basin states. The Committee has not received any evidence about how this *Plan* has been implemented within South Australia.

**Draft Native Fish Management Strategy for the Murray-Darling Basin**

The *Draft Native Fish Management Strategy for the Murray-Darling Basin* aims to improve management of the riverine environment as a whole, to better meet the requirements of native fish and to restore fish populations in balance with other legitimate demands on water resources. This Strategy seeks to build on the framework outlined in the *Fish Management Plan* and extend the principles of the Plan to the entire Basin.

The Draft Native Fish Management Strategy states that “declining fish populations in the Murray-Darling Basin are not the responsibility of any one State or agency and a duty of restoration belongs to all”.

The draft Strategy indicates that there is no central control over fish related activities across the Basin and no formal co-ordinated approach. The draft Strategy encourages policy

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23 MDBC 2000d, p6
makers, agency staff, researchers and the wider community to act cooperatively to implement the Strategies objectives.

The draft Strategy outlines a 10 year program of works and investigations that will initiate long term action towards restoring native fish populations throughout the Basin. The Strategy states that “for this Strategy to be successful there is a need to broaden control and engage more substantial community, senior management and political support for its objectives’.

**SOUTH AUSTRALIAN INLAND WATERS FISHERY**

In South Australia, the Inland Waters Fishery is a multi-species, multi-gear fishery. The fishery encompasses the inland rivers and lakes plus the Coorong region of the State.

The River fishery catch is comprised of four main species: Murray cod, Callop, Bony Bream, and European carp. In 1999/2000, the commercial River Fishery catch was 189 tonnes valued at $794 000. The catch for Murray cod and Callop represent 11 and 21 per cent respectively of the total catch, and 38 and 49 per cent respectively of the fisheries total catch value.

**Status of Murray cod fish stocks**

The Committee is extremely concerned about the findings of the Murray cod Fishery Assessment Report 24 which highlights that:

- Landings of Murray cod have increased substantially since the lifting of the moratorium on the Murray cod fishery in 1994.
- The commercial fishery for Murray cod is dominated by the River Fishery which accounts for 94 per cent of total landings since 1985.
- The current fishery is dependent on a few strong year classes which correspond to the floods of 1989 and early 1990s.

The extremely vulnerable status given to the Murray cod as a consequence of this Fishery Assessment raises serious questions about why more stringent controls over the taking of Murray cod have not been implemented.

**Resource allocation conflicts**

Several witnesses before the Committee have highlighted that issues with respect to access to the fishery resource and controls over commercial and recreational fishers still have not been addressed. These issues are addressed in more detail in the 1999 Environment, Resources and Development Committee’s inquiry into *Fish Stocks on Inland Waters*.

**Carp management**

Evidence provided to the Committee has highlighted that European carp are a problem in the Murray-Darling system. The National Management Strategy for Carp Control indicates ‘there is little doubt that carp are both a contributor to and a symptom of aquatic degradation’.

The aim of the National Management Strategy is to provide direction and focus for a coordinated national approach to control carp. Central to this aim is the premise that the presence of carp will continue to be regarded as a threat, and that carp are to be locally eradicated wherever possible or alternatively controlled as far as realistically possible.

Given this strategic direction, it is of concern to the Committee that there has been some suggestion that efforts to control European carp in the River Murray were not being actively supported or encouraged by restrictions imposed by the *Fisheries Act 1982*. Furthermore, the Committee notes that despite an apparent abundance of carp, total catch of carp in the River Fishery has declined from a high of 190 tonnes in 1992/1993 to only 82 tonnes during

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24 Qifeng Ye, et al, 2000
1999/2000. Incentives aimed at encouraging greater fisher effort towards carp must be considered.

**Inland saline aquaculture**

Inland saline aquaculture has been identified as a viable alternative to traditional farming practices in the Basin. Evidence presented has highlighted that in the Cooke Plain / Coomandook area, where dryland salinity is an enormous problem, a number of innovative farmers have turned a problem into an opportunity and established successful pilot projects producing both food and non-food aquaculture products. Evidence suggests that with the right support and additional research and development this industry has huge growth potential that will not only support regional development but also provide the capital necessary to maintain property viability and implement measures to address land degradation.

**4.11 Investment in the Murray-Darling Basin**

The implementation of the Murray-Darling Basin Initiative is funded through contributions from the various partner states as outlined under the Agreement. The South Australian Government in 1999/2000 contributed $15.73 million to the operation and maintenance of weirs and major storages, and the Murray-Darling Basin Commission’s Basin Sustainability Program and Murray-Darling 2001 Project. South Australia’s contribution to these activities during 2000/2001 increased to approximately $17.34 million.

In addition to these direct financial contributions, the South Australian Government makes additional contributions to other Murray-Darling Basin natural resource management initiatives, such as environmental flows and salinity management through the dedication of staff from the Department for Water Resources, Primary Industries and Resources and SA Water.

**Basin Sustainability Program**

The Basin Sustainability Program (BSP) guides investment in natural resource management in the Murray-Darling Basin to achieve the Murray-Darling Basin Initiative’s goal. This program was established by the Murray-Darling Basin Ministerial Council in 1996 as the planning, evaluation and reporting framework for all natural resource management investment in the Basin. The Basin Sustainability Program is not a funding program but rather a means for focusing government activity and community investment towards common objectives within the Basin. The program targets objectives in three key result areas - sustainable agricultural production, water quality and nature conservation - to be achieved under three sub-programs - irrigated regions management, dryland regions management and riverine environment management.

The program requires the Murray-Darling Basin Commission to prepare a consolidated three year rolling investment plan as a prospectus of potential activities within the Basin. This investment plan brings together all proposed actions identified through Local Action Planning processes across the Basin against the three key result areas. The Basin Sustainability Program Consolidated Investment Plan for 2001/2002 to 2003/2004 shows a total proposed investment of private and public capital of $2.2 billion over the three years, of which $209 million is within the South Australian Murray-Darling Basin.

A number of witnesses have indicated that the limited amount of money currently being invested is the biggest constraint to addressing the natural resource management issues confronting the Basin.
Several witnesses before the Committee suggested that there are a number of additional issues that need to be addressed. These include:

- achieving a significant shift from planning to on-ground action
- ongoing uncertainty with respect to funding programs such as the Natural Heritage Trust
- the need to move from a grants mentality to a stable investment framework for long term outcomes to be achieved
- stronger emphasis on directing investment towards integrated activities that target causes of land and water degradation, not just symptoms or effects.

**Cost sharing arrangements**

The following cost sharing principles for government programs have been adopted by the Council of Australian Governments (COAG):

- The full cost of providing services to specific identifiable beneficiaries or polluters should be recovered by way of charges to them.
- Costs of public benefits or impact management which are unable to be attributed and charged to specific beneficiaries or polluters should be treated as a community service obligation.
- Where costs are subsidised by government, they should be defined explicitly so that unsustainable precedents are not established.

The Committee is aware that the Murray-Darling Basin Ministerial Council has adopted a cost-sharing framework for on ground works in the Basin that are based on the above principles. The development of this framework followed reports that Landcare and other environmental programs had been effective in raising awareness, increasing skills and assisting in farm scale and catchment scale planning, but this had not translated into on ground action at a pace that was likely to have a significant impact on land degradation across the Basin.

Information provided to the Committee has suggested that the current Murray-Darling Basin cost-sharing framework has been effective in accelerating on ground action. However, uptake of improved land and water management practices was still being constrained by issues associated with private and public benefit and who should pay.

It has been suggested that a review of the current cost-sharing framework be undertaken to identify any opportunities for improving or enhancing its application and appeal to landholders.

**Capacity building**

During the course of the inquiry, the Committee has become aware that the knowledge and in-depth understanding of complex management arrangements under the Murray-Darling Basin Initiative are held by a small number of people within State government. The Committee is concerned that this situation could leave South Australia vulnerable and at a distinct disadvantage when seeking to progress issues at the Commission or Ministerial Council level. Consideration must be given to enhancing South Australia’s institutional capacity to deliver and support the scale of change required to address issues of land and water degradation in the South Australian Murray-Darling Basin.
Funding and resources

The degradation of Australia’s natural resource base and environment is a national issue. It has profound economic, social and ecological impacts that are felt by all communities\textsuperscript{25}. The annual cost of degradation in rural landscapes across Australia is at least $2 billion per annum, and this figure is rising. With no action it could rise to over $6 billion within 20 years\textsuperscript{26}.

Information provided to the Committee suggests that the cost of repairing the land degradation in the Murray-Darling Basin could be at least $30 billion\textsuperscript{27}.

The Committee has noted a number of key recommendations within the House of Representatives Standing Committee on Environment and Heritage’s inquiry into Catchment Management. Particularly the recommendations aimed at:

- enhancing tax incentives for landholders on low incomes to participate in landcare activities
- removing the disincentives for the ecological sustainable use of natural resources that exist within the taxation system, and
- the broader application of economic instruments such as water trading rights, salinity credits.

The Committee concurs with the finding in the House of Representatives Standing Committee on Environment and Heritage report that, at present in Australia there is insufficient funding available from the public and the private sector to address the scale of land degradation in the Australian landscape.

The Committee, like the House of Representatives Standing Committee, believes that the concept of a specific tax or levy – similar to that used for the ‘Guns Buyback’ scheme - to pay for public contributions towards addressing land degradation has merit and warrants further investigation.

\textsuperscript{25} Virtual Consulting Group 2000
\textsuperscript{26} Ibid
\textsuperscript{27} House of Representatives Standing Committee on Environment and Heritage 2000 p125
5. KEY FINDINGS

General

- Development of the waters of the Murray-Darling Basin has delivered significant economic and social benefits to the whole of Australia. However, these benefits have also come at a significant environmental cost.
- River regulation and the development of water resources for consumptive purposes have resulted in over 80 per cent of the Basin’s water resources being diverted from the River systems within the Basin. Approximately 95 per cent of the diverted water is used for irrigation purposes.
- Average diversions from the River Murray in South Australia for irrigation purposes are 450 gigalitres per annum, or less than five per cent of total Basin diversions.
- The Basin’s total agricultural production is valued at more than $10 billion per annum. The gross value of agricultural products from the South Australian portion of the Murray-Darling Basin is estimated to be worth more than $750 million per annum, or approximately 25 per cent of the State’s total agricultural production. In addition, the River Murray in South Australia supports manufacturing and tourism activities worth more than $13 billion per annum to the State.
- The River Murray is a major source of water for Adelaide. On average, Adelaide relies on the River Murray for 40 per cent of its water supply, rising to more than 80 per cent in a dry year. Many other areas of the State such as the Upper Spencer Gulf cities of Port Pirie, Whyalla, Port Augusta, the upper South East and Barossa depend almost totally on the River for their domestic and rural water supply.

Institutional frameworks

MURRAY-DARLING BASIN INITIATIVE

- The Murray-Darling Basin Initiative is an extremely important Initiative and is acclaimed internationally.
- The Initiative is regarded as the best working example of an inter-government process capable of addressing issues of common interest associated with the sustainable use, allocation and management of a region’s environmental and natural resources.
- Retaining the integrity and co-operative arrangements of the Murray-Darling Basin Initiative will be essential to addressing the degradation of land and water resources across the Basin. However, the Initiative’s ability to combat the scale of degradation within the Basin will require fundamental change to the water-sharing principles and how the Commission operates.

MURRAY-DARLING BASIN AGREEMENT

- The 1992 Murray-Darling Basin Agreement is an agreement between the governments of New South Wales, Victoria, Queensland, South Australia, the Australian Capital Territory and the Commonwealth that has been ratified and incorporated within the legislation by the Parliament in each jurisdiction.
- The purpose of the current Agreement is to promote and co-ordinate effective planning and management for the equitable, efficient and sustainable use of the water, land and other environmental resources of the Murray-Darling Basin.
- The most recent comprehensive review of the Murray-Darling Basin Agreement was undertaken in the mid to late 1980s.
The fundamental water sharing principles outlined within the Agreement have remained unchanged since the original 1915 River Murray Waters Agreement and as a consequence are more relevant to an era of resource development than sustainable management.

The current Agreement does not adequately encapsulate the fundamentals of integrated catchment management or the Council of Australian Governments (COAG) principles of providing water for the environment.

There is strong support for the unanimous decision making arrangements of the Ministerial Council under the Agreement. However, consideration must be given to relaxing these arrangements to allow a majority decision on some issues.

**Murray-Darling Basin Ministerial Council**

- The Murray-Darling Basin Ministerial Council is the primary body responsible for providing the policy and direction needed to implement the Murray-Darling Basin Initiative. Council’s main functions are:
  - to consider and determine major policy issues concerning the use of the Basin’s land, water and other environmental resources; and
  - to develop, consider and authorise (as appropriate) measures to achieve the purpose of the Agreement.

- The Ministerial Council comprises the ministers holding land, water and environment portfolios within the governments of New South Wales, Victoria, South Australia, Queensland and the Commonwealth. The Australian Capital Territory participates in the Initiative via a memorandum of understanding.

**Murray-Darling Basin Commission**

- Within the Murray-Darling Basin Initiative, the Murray-Darling Basin Commission is responsible for providing policy advice to the Ministerial Council and giving effect to decisions of the Council, and administering the 1992 Murray Darling Basin Agreement, including:
  - the sharing and distribution of the waters of the River Murray
  - overseeing and directing the implementation of approved works and measures, and
  - coordinating efforts towards achieving integrated natural resource management across the Basin.

- Under the Murray-Darling Basin Agreement, the Commission requires two members from each jurisdiction whom between them represent water, land and environment resources management.

- Traditionally, appointments to the Commission have been heads of relevant government departments within each jurisdiction. This is not a requirement under the Agreement.

- Evidence to the Committee has highlighted a flaws in the current approach to Commission appointments, (that is, appointments of departmental heads) and this can impact on the Commission’s ability to fulfil its obligations under the Murray-Darling Basin Agreement.

- Improvements to the governance of the Murray-Darling Basin Initiative will require changes to the structure and composition of the Commission and the process for appointing Commissioners.

**Community Advisory Committee**

- The Community Advisory Committee (CAC) is the peak community body under the Murray-Darling Basin Initiative and is responsible for providing advice to the Murray-
Darling Basin Ministerial Council and Commission on various matters referred to it, and to provide advice on the views of the Basin’s community.

- There is strong support for the Community Advisory Committee as an integral part of the Murray-Darling Basin Initiative. It is recognised as an extremely valuable forum for providing both the Commission and the Ministerial Council with independent advice on issues of community concern.
- The Committee is however, concerned by evidence suggesting the local community did not have an acceptable mechanism to ensure that its issues are forwarded to and discussed by the Community Advisory Committee.

INTEGRATED CATCHMENT MANAGEMENT IN THE SA MURRAY-DARLING BASIN

- The adoption of an integrated approach to the management of the natural and environmental resources of the South Australian Murray-Darling is pivotal to delivering the ecologically sustainable development of the region.
- The Murray-Darling Basin Ministerial Council’s Integrated Catchment Management (ICM) framework is able to provide a sound basis for addressing the land and water degradation within the Basin. It is notable that the new National Action Plan (NAP) for Salinity and Water Quality seems to negate the involvement of the MDBC on the nine NAP catchments which lie within the Basin.
- The principles of integration, accountability, transparency, effectiveness, efficiency, full accounting and informed decision making, outlined in the ICM policy statement, are strongly supported.
- The Committee believes that South Australia’s current legislative framework must be refined to ensure that we have the mechanisms to efficiently and effectively deliver integrated catchment management within the South Australian Murray-Darling Basin.
- The roles and responsibilities of the various natural resource statutory bodies and organisations are either poorly defined or not clearly understood.
- Currently, there is no forum that fosters working partnerships between catchment management, land use planning and economic development organisations in the South Australian Murray-Darling Basin.
- A regional catchment management organisation with a charter to promote and co-ordinate effective planning and management for the sustainable use of the water, land and other environmental resources of South Australia’s Murray-Darling Basin is required.

RIVER MURRAY CATCHMENT WATER MANAGEMENT BOARD

- The decision by the South Australian Government to change and align the boundary of the River Murray Catchment Water Management Board and the boundary of the South Australian Murray-Darling Basin, as outlined under Schedule B to the Murray-Darling Basin Agreement, is supported.
- Questions regarding the scientific rigour surrounding the defining of the current boundary of the Murray-Darling Basin suggest a review and assessment of the Basin’s boundaries should be undertaken.
- The groundwater systems of the Mallee zone and the surface water systems of the River Murray are linked and need to be managed in an integrated manner. The expanded boundary of the River Murray Catchment Water Management Board will enhance its ability to apply an integrated approach to managing the surface and groundwater systems of the South Australian Murray-Darling Basin.
- The charter of the River Murray Catchment Water Management Board needs to be broadened to provide a framework for integrated catchment management.
LOCAL GOVERNMENT

- There are 17 separate Local Government Areas located either entirely or partly within the South Australian Murray-Darling Basin.
- Local Government is the key decision-making body with respect to land-use planning and development and as such has an important role in achieving the sustainable use and management of the South Australian Murray-Darling Basin.
- Local Government must be actively engaged in regional catchment planning and management processes and natural resource program delivery throughout the South Australian Murray-Darling Basin.

LOCAL ACTION PLANNING GROUPS

- Local Action Planning Groups (LAPs) are the only truly integrated catchment management organisations operating in the South Australian Murray-Darling Basin.
- Local Action Planning Groups are a key delivery mechanism for natural resource and environmental management programs in the region.
- Local Action Planning Groups are powerful ‘champions for change’. However, the current level of support (administrative, technical and professional) and existing funding arrangements are two major issues that threatened to undermine the ability of Local Action Planning Groups to achieve significant on-ground, strategic outcomes.
- The key role of Local Action Planning Groups in the delivery and management of natural resource management programs has yet to be recognised by government agencies.

Salinity

- Salt is a natural part of the Australian landscape and the Murray-Darling Basin, over geological time, has been a natural salt trap.
- Human-induced land use change, such as the clearing of native vegetation and its replacement with annual crops and pastures, river regulation and the development of irrigated agriculture, has changed the hydrological equilibrium. This change is now bringing large quantities of salt to the land surface and increasing the discharge rate of highly saline groundwater to the Basin’s river systems.

SALINITY AND DRAINAGE STRATEGY

- Against a background of increasing River salinity, the Murray-Darling Basin Commission prepared the Salinity and Drainage Strategy (1989) which provided a framework for co-ordinated management of River Murray salinity.
- Actions initiated under the Salinity and Drainage Strategy have been effective in controlling River salinity and are regarded as a significant achievement.
- However, new evidence suggests that actions implemented to date have only provided a 20–30 year reprieve against rising River salinity.
- Major capital works such as Salt Interception Schemes are an integral part of the overall salinity management response with a number of new schemes currently under consideration.
- Evidence suggests that policies implemented by the South Australian Government to fulfil its obligations under the Salinity and Drainage Strategy have not yet been sufficient to offset the salinity impacts resulting from post-1988 irrigation development. The SA Government is seeking to address this deficiency as a matter of urgency through its recently released River Murray Salinity Strategy.
• The capacity of government to implement the necessary salinity management policies has been hindered by resource constraints (financial and human).
• Land use planning and water resource management policies are poorly aligned, and this impedes effective control of salinity impacts arising from existing and new irrigation development.
• Land and Water Management Plans (LWMP) and Irrigation and Drainage Management Plans (IDMP) form an important part of the overall strategy to manage the impacts of irrigated land use adjacent to the River Murray at a regional and property level. However, only one LWMP (out of a proposed 16) is at implementation stage, and under current government policy an irrigator is only required to prepare and implement an IDMP when water entitlements are transferred.

THE SALINITY AUDIT
• The Salinity Audit predicts that the rise of groundwater in the Mallee zone will lead to River salinity at Morgan increasing by 82 EC units by 2050. However, a number of questions regarding the validity of the salinity models used to make this prediction remain unresolved.
• There are three major water management options for addressing salinity:
  − Reduce recharge (change irrigation and dryland farming practices; re-establishing deep-rooted perennial vegetation, conservation and regeneration of remnant native vegetation).
  − Reduce discharge (saltland agronomy, drainage of irrigation areas, salt interception and groundwater pumping and new industries such as salt harvesting, inland saline aquaculture).
  − Increase River flows (providing additional water flows from storages to dilute salt loads and allowing or augmenting floods to flush floodplain areas).
• The siting of irrigation is the most significant factor influencing salt discharges to the River and floodplain.
• Evidence indicates that there are currently no commercially viable agronomic options to reduce groundwater recharge in low rainfall areas like the Mallee zone.

DRAFT BASIN SALINITY MANAGEMENT STRATEGY 2001-2015
• The Draft Basin Salinity Management Strategy of the Murray-Darling Basin 2001-2015 proposes a shared salinity target of maintaining River Murray salinity at Morgan, South Australia, at less than 800EC for 95 per cent of the time. Achieving this target will not necessarily protect Adelaide’s water supply, nor will it prevent damage to irrigated crops.
• Under the Draft Basin Salinity Management Strategy, South Australia will be accountable and responsible for offsetting the salinity impact resulting from both future and past irrigation developments.
• The Committee notes that the Strategy seeks to attract investment into forestry and vegetation management for salinity outcomes. While the intent of this approach is supported the Committee is concerned by evidence suggesting broad-scale revegetation could reduce catchment yield and have an detrimental impact on river flow and water quality. The Committee urges the application of the ‘precautionary approach’ to decision making regarding investment in forestry and vegetation management initiatives across the Basin.

RIVER MURRAY SALINITY STRATEGY FOR SOUTH AUSTRALIA
• The Committee notes and supports the strategic policy direction outlined in the recently released South Australian River Murray Salinity Strategy. Implementation of this strategy will have significant implications for all water???
SALT AS A RESOURCE

- Considerable opportunity exists in the area surrounding the Lower Lakes (for example, Hundreds of Brinkley and Seymour) for the development of new salt-based industries, such as inland saline aquaculture and salt harvesting for use in the manufacture of a range of industrial products.

NATIONAL ACTION PLAN FOR SALINITY AND WATER QUALITY

- The National Action Plan (NAP) demonstrates national leadership and, through the provision of new investment, a strong commitment towards addressing the salinity and water quality issues within the Murray-Darling Basin and other regions of Australia.
- Nine of the 20 agreed catchments/regions identified under the NAP are within the Murray-Darling Basin.
- The intention to set clear targets and standards, and to measure performance against them, has strong support.
- Significant concerns remain with respect to how the NAP relates to the Murray-Darling Basin Initiative, in particular the role of the Murray-Darling Basin Ministerial Council and Commission in implementing the NAP.
- Development of Bilateral and Partnership Agreements under the NAP must seek to strengthen and reinvigorate the Murray-Darling Basin Initiative, not undermine or diminish its role or area of responsibility.

The Cap

- The Cap is defined as the volume of water that would have been diverted under 1993/94 levels of development. In unregulated rivers this Cap may be expressed as an end-of-valley flow regime. The Cap is a schedule to the Murray-Darling Basin Agreement and is therefore legally binding on all partners to the Agreement.
- The decision to place a permanent Cap on water diversions from the rivers of the Murray-Darling Basin followed the 1995 audit of water use that showed the rate of growth in water diversions was a threat to river health and the security of supply to existing water users.
- The introduction of the Cap was seen as an essential first step towards achieving a balance between consumptive and environmental uses of the water in the Murray-Darling system.
- A moratorium on water allocations from the River Murray in South Australia has been in place since 1968. Since then, several reviews of allocations have resulted in a net reduction in irrigation allocations of 33 gigalitres (excluding allocation adjustments following interstate trade).
- The Cap is on water use not on development. Development that redeploy water to more efficient use or for products of higher value is encouraged under Cap arrangements.
- South Australia’s entitlement flow under Cap arrangements has safeguarded however, concerns regarding the impact the water use for environmental purposes in upstream states will have on South Australia remain.
- In 1996, South Australia’s total Cap on water use was set at 704 gigalitres per annum (trade unadjusted) with four-component entitlements:
  - Pumped irrigation diversions (440.6 gigalitres per annum)
  - Metro. Adelaide (nominal 130 gigalitres per annum)
  - Country Towns (50 gigalitres per annum) and
Lower Murray Swamps (83.4 gigalitres per annum)\(^\text{28}\).

- In March 2001, the Ministerial Council agreed to an amended Cap for the Lower Murray Swamps. The new Lower Murray Swamps cap establishes a three-component entitlement of 103.5 gigalitres per annum comprising:
  - 9.3 gigalitres per annum for highlands with unrestricted trade
  - 72.0 gigalitres per annum for swamp use with unrestricted trade
  - 22.2 gigalitres per annum non-tradable environmental entitlement.

- South Australia has had a voluntary cap on water allocations since the late 1960s and early 1970s and, along with Victoria, has complied with the Murray Darling Basin Commission’s Cap since its implementation. However, the volume of licensed water allocations in South Australia is in excess of South Australia’s Cap.

- Implementation of the Cap is still to be finalised in Queensland and the ACT, and analytical models (computer simulated models used to determine Cap diversion targets) for New South Wales and Victorian river valleys are still to be endorsed by the Commission.

- A recent review of Cap implementation concluded that the Cap has provided economic and social benefits, such as greater security and restrained growth in diversions, but there can be no certainty that the Cap at its current level represents a sustainable level of diversions.

- Expert evidence suggests that achieving a sustainable level of diversions from the River will require that the Cap on diversions be substantially wound back from the current level of water diversions.

**Environmental flows**

- Environmental water requirements means the water regime needed to sustain the ecological values of aquatic ecosystems, including their processes and biological diversity, at a low level of risk. Basically, the water an ecosystem needs to function effectively.

- The diversion of water for consumptive purposes combined with river regulation has had a major impact on river flows to the point where the median annual flows from the Basin to the sea are only 21 per cent of those that occurred prior to development.

- The lower reaches of the River Murray now experience drought like flows more than 60 per cent of the time, compared with 5 per cent before river regulation and development of the catchment.

- The flow regime for the River has been significantly altered by river regulation and water diversions. This change in volume, timing and duration of flow patterns has had a profound impact on river health and the environment.

- River flow is an important cue for ecological systems and restoration of at least some of the elements on the natural flow pattern will be the key to sustainable management of the River system.

- Natural variability in water level and flow has been removed through river regulation.

- Expert evidence has suggested that a river ecosystem requires at least 40 per cent of its natural flow to function. Restoration of river health in South Australia will require an increase in the volume of water flowing through the system (particularly the small and medium flow events) and changes to river operations within South Australia.

- While our knowledge of the environmental water requirements of the River Murray system is still being developed and refined, available evidence suggests that the river needs:

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\(^{28}\) The Lower Murray Swamps was an interim Cap subject to further assessment.
− 80,000 megalitres per day to cross the Border once every four years on average for up to eight weeks on average, preferably during Spring;
− 110,000 megalitres per day to cross the Border once every five years for up to eight weeks on average preferably during Spring;
− 150,000 megalitres per day across the Border once every ten years for up to eight weeks on average, preferably during Spring.

• Delivery of the above environmental flows would increase South Australia's median flow (measured at the Border) to approximately 7000 gigalitres per annum.

SNOWY MOUNTAINS HYDRO-ELECTRIC SCHEME CORPORATISATION AND ENVIRONMENTAL FLOWS

• The Snowy Mountains Hydroelectric Scheme is an integral part of water-sharing arrangements within the Murray-Darling Basin.

• South Australia has gained nothing from the construction of the Snowy Scheme, except for a small benefit in extreme drought years in the form of drought insurance for the River Murray system.

• The Committee is extremely concerned about recent decisions regarding the corporatisation of the Snowy Mountains Hydroelectric Authority and environment flows for the Snowy River, and the implications of these decisions for the health of the River Murray system.

• The Committee believes that the focus on issues associated with corporatisation and power generation are constraining the ability of the respective governments to adopt a holistic approach to the allocation and management of water resources in both the Snowy and Murray-Darling systems.

Community involvement

• South Australia has a committed and dedicated community that is keen to be part of the solution to improving the health of the River Murray.

• A lack of clear direction and difficulty accessing professional and technical support is hampering the true potential of community groups to deliver change on the ground.

• Recent announcements concerning the future of funding under the Natural Heritage Trust have been welcomed. However, within the community a high level of uncertainty remains regarding funding for natural resource and environmental management programs.

• The Committee is very concerned about evidence highlighting a significant ‘breakdown’ in communication between community groups and various statutory organisations operating within the South Australian Murray-Darling Basin.

Water use and management

FLOW AND RIVER REGULATION

• The Murray-Darling system is a highly regulated river system with numerous dams, reservoirs, weirs, locks and barrages on all major rivers and many tributaries.

• The regulation of the River Murray involves four major storages (Dartmouth, Hume, Menindee Lakes and Lake Victoria), 16 weirs and five barrages.

• Water storage capacity within the Basin is now more than 34 000 gigalitres, or two times the natural mean annual outflow from the Basin of 15 000 gigalitres. These storages are used to regulate water supply and flow in the River.

• River regulation, diversions and storage construction have significantly altered the natural flow patterns and volume of water flowing in the River. As a consequence, the
size, duration and frequency of flood events, particularly small and medium flood events, have been virtually eliminated.

- Operation and construction of the various weirs and storages has focussed, historically, on providing South Australia’s entitlement flow of 1850 gigalitres per annum and servicing the water requirements of irrigation and water supply with little or no regard for the needs of the environment.
- Recognition of the impact river regulation has had on riverine health has prompted a series of investigations and trials to determine whether current regulating structures have the capacity to vary water and flow levels in a way that can deliver significant environmental benefits.

**WATER ALLOCATION AND METERING**

- A wide range of property rights in water exist across the Murray-Darling Basin. These must be reviewed and rationalised by the Murray-Darling Basin Commission.
- A moratorium on water allocations from the River Murray in South Australia has been in place since 1968. Several reviews of allocations since then have resulted in a net reduction in irrigation allocations since 1968 of 33 gigalitres (excluding allocation adjustments following interstate trade).
- South Australia’s licensed water allocations are nominally 766 gigalitres, or 41 per cent of South Australia’s entitlement. Under South Australia’s Cap, overall water use cannot exceed 704 gigalitres, excluding adjustments for trade.
- The River Murray is a prescribed watercourse under the Water Resource Act 1997 with nearly all diversions licensed, the exception being riparian landholders who have a common law right to take water for stock and domestic purposes without a licence.
- All diversions (except those for riparian stock and domestic purposes and the Lower Murray Swamps Irrigation Area) are metered.

**WATER USE**

- Total water diversions in the Murray-Darling Basin for 1999/2000 totalled 9557 gigalitres. This level is the lowest Basin diversion since 1992/1993 and only 73 per cent of the highest Basin diversion of 12 940 gigalitres in 1996/1997. The low level of diversions is attributed to water supply restrictions caused by low initial storage levels in the Goulburn, Murray and Murrumbidgee valleys.
- In 1999/2000, total water diverted was shared between the various partner states in the following proportions: New South Wales (52 per cent); Victoria (35 per cent); South Australia (7 per cent); Queensland (6 per cent) and the Australian Capital Territory (0.3 per cent).
- South Australia under the Murray-Darling Basin Agreement does not own any water but is guaranteed a minimum entitlement flow of 1850 gigalitres per annum. The distribution of South Australia’s entitlement flow is defined within the Agreement. Of the 1850 gigalitres, 696 gigalitres is for dilution and river maintenance purposes.
- In South Australia, average total diversions for consumptive purposes between 1993/1994 and 1997/1998 were 596 gigalitres, or 85 per cent of the South Australia’s nominal Cap. The single largest use of water from the River Murray within South Australia is attributed to evaporation. The five-year average evaporation loss is estimated to be 880 gigalitres per annum, the majority from the Lower Lakes.
- The single largest consumptive use of River Murray water is for irrigation purposes. The total irrigated area is now more than 52 000 hectares (and growing) with more than two-thirds in the Riverland area above Blanchetown.

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South Australian Select Committee on the Murray River
Final Report – 2001
IRRIGATION WATER SAVINGS

- Significant water savings could be achieve through the rehabilitation of irrigation water delivery systems in New South Wales and Victoria.
- South Australia has been investing in the rehabilitation of irrigation supply systems (conversion from channel to pressurised pipeline delivery systems) for more than a decade and has achieved water savings in the order of 10 gigalitres.
- This investment in water delivery infrastructure has facilitated significant private irrigator investment in efficient on-farm water distribution systems.
- South Australia’s River Murray irrigators are recognised as some of the most efficient irrigators nationally and internationally.
- Performance measures to further improve irrigation efficiency are being put in place by the River Murray Catchment Water Management Board through its Catchment Water Management Plan.
- There is currently no clear policy with respect to where or how water savings achieved through the rehabilitation of water delivery infrastructure should be allocated. The main options under consideration are:
  - allocate all savings back to river
  - divide between consumptive and environmental uses according to cost-sharing arrangements, and
  - allocate to consumptive use.
- The Lower Murray Reclaimed Irrigation Area is the last remaining irrigation area to be rehabilitated in South Australia.

WATER TRADE

- Trade in River Murray water allocations has been possible since 1983.
- The Murray-Darling Basin Pilot Interstate Water Trading Project commenced in 1998 with the aim of improving the economic and environmental sustainability of the irrigation industry in the Murray-Darling Basin. This pilot project has allowed 51 trades involving more than 9.5 gigalitres to move between South Australia, New South Wales and Victoria. South Australia has been the major beneficiary with more than 90 per cent of the water traded into South Australia.
- New irrigation development in South Australia is progressively activating ‘sleeper’ and ‘dozer’ water allocations through trade.
- A recent review of the pilot project has highlighted issues associated with administrative procedures and environmental impacts that need to be addressed before the pilot project area is expanded.

WATER CONSERVATION

- Considerable opportunity exists to reduce Adelaide’s dependence on River Murray water through the adoption of currently available water saving technology and a more integrated approach to water resource management in the urban environment.
- Evidence to the Committee has also highlighted a number of areas of interest, such as Menindee Lakes and the Lower Lakes, where there may be exciting potential to conserve water through improved water management practices.

WATER QUALITY

- On a world scale the River Murray is still relatively unaffected by industrial pollutants. When evaluated against Australian Water Quality Guidelines however, the condition of its water is described as poor, mainly due to natural pollutants such as salinity and turbidity.
Major causes of a decline in water quality are reduced flow, increasing salinity discharges, high turbidity, nutrients discharged from agricultural and urban run-off, irrigation drainage and effluent ponds on the floodplain.

Expert evidence indicates that the rate of decline in water quality will accelerate if drastic action is not taken to reduced diversions from the Murray-Darling system.

The Draft River Murray Catchment Water Management Plan proposes a range of measures to improve water quality through control of the various pollution sources.

Proposals to introduce controls over greywater discharge from all inland vessels, particularly houseboats, are noted. However, policy implementation must also include an assessment of alternative management practices and the capacity of existing wastewater disposal facilities to manage the anticipated increase in volumes of wastewater.

High turbidity in the River Murray has been attributed to a change in river operations, with a larger portion of South Australia’s entitlement flow now coming from the Darling River catchment rather than the upper River Murray catchment.

Wetland management

- The South Australian portion of the River Murray contains more than 1100 wetlands within 250 wetland complexes and more than half of these complexes are considered to be of high conservation value.
- The disruption of seasonal wetting and drying regimes has had a significant impact on wetland systems with a large number of wetlands now permanently inundated.
- In 1996, a South Australian River Murray Wetlands Management Ten Year Plan and Action Plan was developed. It is unclear from the evidence provided to the Committee who is responsible for resourcing and co-ordinating the implementation of these plans.
- There are a number of long-standing policy issues concerned with the management of wetland systems that remain unresolved (see Section 4.8).
- Efforts to re-establish natural hydrological regimes at Loveday Wetlands and Lake Merreti are being driven by Local Action Planning and other community groups, with limited direction or involvement from government agencies.
- Evidence indicates that there is only one dedicated wetlands management officer within government for the entire State.
- Clear policies and administrative arrangements for dealing with wetlands management issues need to be developed urgently.

Biodiversity

- The South Australian Murray-Darling Basin region supports a wide variety of habitats and contains highly diverse biological communities.
- Approximately 59 per cent of the Basin is covered by native vegetation. However, only 16 per cent remains in the agricultural region and of this less than half is formally protected in the reserve system.
- Major threats to the region’s biodiversity include salinity, habitat loss and fragmentation, grazing, pest plants and animals, inappropriate fire regimes, river regulation, pollution, land use change, tourism and recreation.
- There has not been a comprehensive biological survey and mapping of the biological diversity within the river corridor.
- The river corridor, Coorong and Lower Lakes, Eastern Hills and Southern Hills are four threatened habitat areas within the South Australian Murray-Darling Basin.
Land management

LAND USE PLANNING
- There is no consistency in land use planning policies for the riverine corridor between Local Government areas.
- We need to develop land use planning and water management policies designed to encourage new irrigation development away from the River and into areas of low salinity impact risk. The Committee notes that this is a key policy commitment in the recently released River Murray Salinity Strategy.

SOURCES OF LAND DEGRADATION
- Soil structure decline, wind and water erosion, pest plants and animals, waterlogging and dryland salinity are the major sources of land degradation in the South Australian Murray-Darling Basin.
- Land degradation remains a significant threat to the viability of farming enterprises throughout the South Australian Murray-Darling Basin.

INTEGRATED LAND MANAGEMENT
- Current farming systems are thought to be inadequate to control groundwater recharge.
- New farming systems that incorporate deep-rooted perennial vegetation will need to be developed to ensure the long-term sustainability of the region’s farming enterprises.
- Considerable opportunity exists to adopt a landscape approach to property management planning and management of protected areas. This approach will progressively re-establish corridors of perennial vegetation across the region to achieve multiple environmental and natural resource benefits (that is, reconnect isolated areas of remnant native vegetation, reduce groundwater recharge, reduce wind and water erosion and improve farm productivity).

Investment in the Murray-Darling Basin

MURRAY-DARLING BASIN INITIATIVE
- Funding for the Initiative is provided through contributions from the various partner states under the Agreement.
- The annual capital and operating budget of the Initiative is currently in the order of $60 to $70 million per annum. South Australia’s contribution to the Initiative for the past two financial years has been approximately $15 million per annum.
- Commission funds are divided between the Basin Sustainability Program and the River Murray Water Business Unit.

NATURAL HERITAGE TRUST MURRAY-DARLING 2001 PROGRAM
- Under the Murray-Darling 2001 Program approximately $347 million has been invested across the Murray-Darling Basin since 1997/1998. Approximately 10 per cent of these funds has been directed towards projects in the South Australian Murray-Darling Basin.
- The Commonwealth Department for Agriculture, Fisheries and Forestry – Australia administers the funds under this program.
**BASIN SUSTAINABILITY PROGRAM**

- The Basin Sustainability Program (BSP) seeks to guide all investment in environmental and natural resource management across the Murray-Darling Basin.
- Rolling Investment Plans prepared under the Basin Sustainability Program are a ‘prospectus’ for investment in natural resource management projects. Anticipated community and government investment between 2001/2002 and 2003/2004 has been estimated at approximately $2.21 billion of which $209 million will be within the South Australian Murray-Darling Basin.

**INVESTMENT FRAMEWORK**

- Current levels of investment are insufficient to effectively address the scale of environmental degradation across the Murray-Darling Basin.
- The investment required to effectively deal with the scale of land and water degradation occurring within the Murray-Darling Basin is beyond the scope of any one government or regional organisation.
- Evidence suggests that the cost of repairing the damage to the Murray-Darling Basin over the next decade will be at least $30 billion\(^{31}\).
- The cost effectiveness of the grants based approach to environmental and natural resource management program delivery needs to be reviewed.
- Reductionist strategies employed by all governments have significantly impacted on the ability of governments to support community groups and effectively administer environmental and natural resource management legislation.

**River Murray inland fishery**

- There are 35 recorded species of native freshwater fish found in the waterways of the Murray-Darling system.
- The best known species are Callop, Murray cod, Catfish and Silver perch. Catfish and Silver perch are now protected due to population decline.
- River regulation, changed flow size, distribution and volume, restrictions to fish passage, decline in water quality, pollution and fishing pressure have all contributed to a decline in fish stocks.
- Conflict between commercial and recreational fishers over the allocation and management of the inland fishery remains unresolved.
- South Australia is the only Australian state that continues to have and operate a commercial inland fishery.
- A recent Fishery Assessment Report\(^{32}\) concluded that the Murray cod is fully exploited. The commercial fishery depends on the River which accounts for 94 per cent of total landings.
- The Committee is extremely concerned at the Fishery Assessment Report’s conclusions that the Murray cod fishery is extremely vulnerable.
- There is serious concern about the increasing catch in the Murray cod fishery which is focussed upon a narrow band of year classes. There has been no significant recruitment events since 1993.
- The current situation closely resembles events leading up to the closure of the Murray cod fishery in 1989 due to stock vulnerability.

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\(^{31}\) House of Representatives Standing Committee on Environment and Heritage 2000. Coordinating Catchment Management p125

\(^{32}\) Qifeng Ye. et al, 2000
• The Inland Fisheries Management Committee are yet to complete a management plan for the River Fishery and the Lower Lakes and Coorong Fishery as required under the Fisheries Act, 1982.

• There is serious concern that there may be a breach of the Commonwealth’s Environment Protection and Biodiversity Conservation Act, 1999 regarding the impacts of fishing activities within RAMSAR wetlands (such as, The Coorong and Lower Lakes, and Riverland).

• The Committee notes that some recommendations contained within the Environment, Resources and Development Committees report on Fish Stocks of Inland Waters have not been implemented.

**Fish Management Plan for the River Murray**

• In 1991, the Murray-Darling Basin Commission prepared a Fish Management Plan for the River Murray.

• The Murray-Darling Basin Commission recently reviewed the 1991 Plan. The outcomes of this review are being used to guide development of the Draft Native Fish Management Strategy for the entire Murray-Darling Basin.

**Draft Native Fish Management Strategy for the Murray-Darling Basin**

• The Draft Native Fish Management Strategy for the Murray-Darling Basin aims to improve management of the riverine environment as a whole, to better meet the requirements of native fish and to restore fish populations in balance with other legitimate demands on water resources. This Strategy seeks to build on the framework outlined in the Fish Management Plan and extend the principles of the Plan to the entire Basin.

• The Draft Native Fish Management Strategy outlines a long term restoration program and provides direction for investment in on-ground management activities and associated research.
**Acronyms**

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<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>ACF</td>
<td>Australian Conservation Foundation</td>
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<tr>
<td>ANZECC</td>
<td>Australia and New Zealand Environment and Conservation Council</td>
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<td>BSP</td>
<td>Basin Sustainability Program of the Murray-Darling Basin Commission</td>
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<td>CAC</td>
<td>Community Advisory Committee of the Murray-Darling Basin Ministerial Council</td>
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<td>COAG</td>
<td>Council of Australian Governments</td>
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<td>CSIRO</td>
<td>Commonwealth Scientific and Industrial Research Organisation</td>
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<tr>
<td>CWMP</td>
<td>Catchment Water Management Plan (SA)</td>
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<tr>
<td>DWR</td>
<td>Department for Water Resources (SA)</td>
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<tr>
<td>EC</td>
<td>Electrical Conductivity (a measure of salt concentration in water)</td>
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<tr>
<td>GL</td>
<td>gigalitres (1,000,000,000 litres)</td>
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<tr>
<td>HEP</td>
<td>Hydro-electric Power</td>
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<tr>
<td>IDMP</td>
<td>Irrigation and Drainage Management Plan (SA)</td>
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<td>Land and Water Management Plans</td>
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<td>MDBMC</td>
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<tr>
<td>ML</td>
<td>megalitres (1,000,000 litres)</td>
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<td>WAP</td>
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## Glossary of Terms

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<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Above entitlement flow</td>
<td>Is the flow of River Murray water into South Australia in excess of our entitlement flow; measured in megalitres (ML).</td>
</tr>
<tr>
<td>Algal blooms</td>
<td>A rapid accumulation of algal biomass (living organic matter) which can result in deterioration in water quality when the algae die and break down consuming the dissolved oxygen in a water body and releasing toxins.</td>
</tr>
<tr>
<td>Anabranch</td>
<td>A section of a river (branch) that leaves the main stream.</td>
</tr>
<tr>
<td>Aquifer</td>
<td>An underground layer of rock or sediment which holds water and allows water to percolate through. There are two types of aquifers, confined and unconfined.</td>
</tr>
<tr>
<td>Barrages</td>
<td>Specifically any of the five low weirs at the mouth of the River Murray constructed to exclude seawater from the Lower Lakes.</td>
</tr>
<tr>
<td>Catchment Water Management Board</td>
<td>A statutory body established under the Water Resources Act 1997 (SA).</td>
</tr>
<tr>
<td>Council of Australian Governments</td>
<td>A council of the Prime Minister, State Premiers, Territory Chief Ministers and the President of the Australian Local Government Association which exists to set national policy directions for Australia.</td>
</tr>
<tr>
<td>Diffuse source pollution</td>
<td>Pollution from sources such as an eroding paddock, urban or suburban lands and forests; pollution that is spread across a wide area an not easily identified or managed.</td>
</tr>
<tr>
<td>Dozer allocation</td>
<td>An allocation that is not fully utilised.</td>
</tr>
<tr>
<td>EC</td>
<td>Electrical Conductivity units. 1 EC unit = 1 micro-Siemens per centimetre, measured at 25 °C. It is used as a measure of the concentration of salt in water.</td>
</tr>
<tr>
<td>Ecologically sustainable development</td>
<td>Using, conserving and enhancing the community’s resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future, can be increased.</td>
</tr>
<tr>
<td>Environmental water provisions</td>
<td>Those parts of environmental water requirements that can be met, at any given time. This is what can be provided at that time with consideration of social and economic impacts and existing user’s rights.</td>
</tr>
<tr>
<td>Term</td>
<td>Description</td>
</tr>
<tr>
<td>------</td>
<td>-------------</td>
</tr>
<tr>
<td>Environmental water requirements (environmental flows)</td>
<td>Environmental water requirements means the water regime needed to sustain the ecological values of aquatic ecosystems, including their processes and biological diversity, at a low level of risk. Basically, the water an ecosystem needs to function effectively.</td>
</tr>
<tr>
<td>Entitlement flow</td>
<td>The minimum monthly flow of River Murray water into South Australia as agreed and outlined in <em>the Murray-Darling Basin Agreement, 1992</em>; measured in megalitres (ML).</td>
</tr>
<tr>
<td>Gigalitres</td>
<td>One thousand million litres.</td>
</tr>
<tr>
<td>Groundwater</td>
<td>Water that occurs beneath the ground surface and which is stored in an aquifer.</td>
</tr>
<tr>
<td>Instream uses</td>
<td>This term relates to the need to allocate water for the environment to ensure ecosystem health and the maintenance of ecological processes.</td>
</tr>
<tr>
<td>Irrigation and Drainage Management Plan (IDMP)</td>
<td>An Irrigation and Drainage Management Plan is a horticultural plan prepared by qualified irrigation consultants at a licensees expense which addresses four major components of irrigated land use – soil types, irrigation system design, water scheduling and drainage.</td>
</tr>
</tbody>
</table>
| Land and Water Management Plans (LWMP) | Land and Water Management Plans provide a framework for the delivery of sustainable irrigated land use within specified irrigation districts. LWMPs aim to achieve five main outcomes:  
  - increased irrigation efficiency  
  - increased adoption of on-farm best management practices  
  - reduced off-site impacts of irrigation  
  - responsible drainage management, and  
  - sustainable new development. |
<p>| Licence | A licence to take water in accordance with <em>the Water Resources Act 1997</em>. |
| Lower Murray | In the context of this report the term Lower Murray means that portion of the River Murray below Mannum in South Australia. |
| Lower Murray-Darling | In the context of this report the term Lower Murray-Darling means that portion of the Murray-Darling system below Wentworth. |</p>
<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prescribed Water Resource</td>
<td>A water resource declared by the Governor to be prescribed under the <em>Water Resources Act, 1997</em> and includes underground water to which access is obtained by prescribed wells. Prescription of water resource requires that future management of the resource be regulated via a licensing system.</td>
</tr>
<tr>
<td>Prescribed Watercourse</td>
<td>A watercourse declared to be a prescribed watercourse under the <em>Water Resources Act 1997</em>.</td>
</tr>
<tr>
<td>Ramsar Convention</td>
<td>This is an international treaty of wetlands titled <em>The Convention on Wetlands of International importance especially as Waterfowl Habitat</em> (Year?).</td>
</tr>
<tr>
<td>Recharge</td>
<td>The process that replenishes groundwater resources, usually by rainfall infiltrating from the ground surface through the soil to the water table and by river water entering the water table or exposed aquifers; the addition of water to an aquifer.</td>
</tr>
</tbody>
</table>
| River Murray Co-ordinating Committee (RMCC) | The River Murray Co-ordinating Committee (proposed) would be made up of the chief executives (or his nominee) from the government portfolios responsible for water; primary industries and resources; environment and heritage; planning; industry and trade and SA Water Corporation. Function as defined under recommendation ??.
| SA Community Advisory Forum (SACAF)       | The SA Community Advisory Forum, (proposed) as the peak community body in SA, would provide advice on issues relating to the sustainable management of the environment and natural resources of the SA Murray-Darling Basin to the:  
  - River Murray Catchment Management Board  
  - Community Advisory Committee, and  
  - Minister responsible for the South Australian Murray-Darling Basin.  
  Membership is defined under recommendation ??.
<p>| Salinity                                  | The concentration of sodium chloride or dissolved salts in water, usually expressed in EC units or milligrams of total dissolved solids per litre (mg/L TDS). The conversion factor is 0.6mg/1TDS = approx. 1EC unit.                                                                                                        |
| Sleeper allocation                        | A licensed allocation that does not have a history of water usage.                                                                                                                                                                                                           |
| Water allocation                          | Means the quantity of water that a licensee is entitled to take and use pursuant to a water licence.                                                                                                                                                                          |
| Water Allocation Plan                     | A plan prepared by a CWMB (ie River Murray) or a water resources planning committee and adopted by the Minister in accordance the <em>Water Resources Act, 1997</em>.                                                                                     |</p>
<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water for the environment</td>
<td>Water for the environment is a catch phrase that can describe both environmental water requirements and environmental water provisions (see environmental water requirements and environmental water provisions).</td>
</tr>
<tr>
<td>Water licence</td>
<td>A licence granted under the Water Resources Act entitling the holder to take water from a prescribed watercourse, lake or well or to take surface water from a surface water prescribed area. This grants the licensee a right to take an allocation of water specified on the licence, which may also include conditions on the taking and use of that water. A licence confers a property right on the holder of the licence and this right is separate from a land title.</td>
</tr>
</tbody>
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The Committee has also received written submissions from the following:

**November 1999 – July 2000**

Aitken, Peter  
General Manager, Environmental Organic Nutrients.

Alford, Terry & Joan

Amber, David  
Coordinator, Narrung Peninsular Dairy Discussion Group.

Arnold, Meredith

Arthur, Brian

Ballantine, Mary-Alice

Bennett, Dr David  
Hassall & Associates Pty Ltd.

Best, Lindsay  
A/Director, Heritage and Biodiversity, Department for Environment and Heritage

Bishop, Jean

Bookmark Biosphere Reserve.

Bottroff, Valorie

Broster, Leon  
General Manager, Murray Darling Association Inc.

Broughton, G R  
General Manager River Murray Catchment Water Management Board, 2 submissions

Burgess, D J  
Chairman Walker Flat and District Progress Association Inc.

Campbell, Michelle  
Project Officer, Berri Barmera Local Action Planning.

Davie, Kathleen

Dixon, Peter  
Secretary Zone 6, Murray Darling Association Inc – Resolutions.

Drechsler, Lisa  
CARE Program Co-ordinator, SA CARE Committee Inc.

Dury, Carl

Edwards, R W

Emerson, Allen

Fisher, Tim  
Co-ordinator, Land & Water Ecosystems, Australian Conservation Foundation.

Forward, Peter  
Manager Salinity Control, SA Water.

Fromm, Rodger  
Chairman, Nildottie, Purnong and Walker Flat Action Group.

Goodman, Todd  
Project Officer, Renmark to the Border LAP Association Inc.

Goss, Kevin  
General Manager, Natural Resources, Murray Darling Basin Commission, (Carp control Co-ordinating Group).

Grant, I  
Executive Officer, The Citrus Board of South Australia.

Grose, P  
President, South Australian Field and Game Association. Barmera Moorook Branch, Inc.

Gruber, Joan  
Including petition with 130 signatories.

Herath, Alan

Hicks, Dennis  
Chairman, Lower Murray Irrigation Action Group Association Inc.

Hodgkins, Tim  
National Chairman, Irrigation Association of Australia.

Horbelt, Paula  
Secretary, Goolwa District Ratepayers and Residents Association Inc.
Horwitz, Dr Pierre  President, Australian Society for Limnology, Edith Cowan University.
Hurley, M J  Chief Executive Officer, The Berri Barmera Council.
Jones, Glen  General Manager, Boating Industry Association of South Australia Inc.
Jones, Henry  President, Southern Fishermen’s Association.
King, Lara  Project Officer, River Murray Urban Users LAP Committee
Lesses, Tina  
Ling, Dr John K  
Loffler, Tom G  3 submissions.
Lucas, Ann  3 submissions:
Mansell, Colin  Hon Secretary, Far West Anglers Association Inc.
Mecham, J B  Secretary, Region 5 Murray Darling Association Inc.
Medelay, Janet  
Morgans, Ian  CEO Wetland Care Australia.
Morley, Amy  Coordinator, Loxton to Bookpurnong LAP Committee
Morris, W D  Secretary Manager, Renmark Irrigation Trust.
Munchenberg, R K & B L  
Mutton, Dennis  Chief Executive, Primary Industries and Resources.
Offler, Bill & Peg  
Perry, Roger  Acting Head of SA Water Services
Petersen, John  Chairman & Jeff Parish, CEO, Central Irrigation Trust.
Pfeiffer, Judy  Project Officer, Murray Mallee Local Action Planning Association Inc.
Pietsch, Gilbert  
Roberts, D A  
Rodgers, B P  Deputy District Manager, District Council of Loxton Waikerie.
Rogers, Geoff  Project Officer, Mid Murray Local Action Plan.
Rosenberg, Lorraine  General Manager, South Australian Fishing Industry Council Inc.
Schiller, Dennis  
Scown, Steve  Director, Scown Consulting.
Seekamp, Jack V  2 submissions.
Singh, Dr K R  former adviser UNDPIWTO.
Teakle, Peter  Recreational Fisher, Member Recreational Fishers Committee (Inland)
Telfer A & Watkins, N  Directors, Australian Water Environments Pty Ltd.
Walker, K F  Associate Professor, The University of Adelaide, Faculty of Science, Department of Environmental Biology.
Warneke, Lee  
Williams, Graham  
Winkles, Leslie  

August 2000 - July 2001

Alexandina Council
Allen, Ms Pam MP  Chair, NSW Select Committee on Salinity;
Bosca, Hon J Della  NSW Special Minister of State;
Caldecott, Ken  Caldecott Nominees Pty Ltd;
Campbell, Michelle  Project Officer, Berri Barmera Local Action Planning;
Cass, Ian  Chesson Park White Suffolk Stud;
Close, Mr  answer to question (Evaporation Rates);
Diprose, David  Senior Manager, Town of Gawler;
Evans, John  A/Group Manager Strategic Services, South Australian Tourist Commission;
Garbutt, Hon Sherryl  Victorian Minister for Environment and Conservation;
Hill, Senator Robert  Federal Minister for the Environment and Heritage;
Jones, Glen  General Manager, Boating Industry Ass of SA Inc;
Kahn, Tim  A/Assistant Secretary, Environment Assessment Branch, Commonwealth Department of the Environment and Heritage.
Kropinyeri, Kevin
Lewis, Sarah  Policy Development Officer, SA Farmers Federation;
Mackie, Barry  CEO, Greening Australia;
Purdie, Rosemary  Director Evaluation and Communication, MDBC;
Riddiford, John  CEO North East Catchment Management Authority;
Riebolge, Robert  Management Consultant
Rosenberg, Lorraine  General Manager SAFIC;
Manager, Tandou Pty Ltd
Thorley, W  Lower Chairman, Murray Irrigation Action Group Assoc.Inc
Trust, Hon Warren  Minister for Agriculture, Fisheries and Forestry;
Welford, Hon Rod  Queensland Minister for Environment and Heritage;
Young, Mike  Ecological Economist, CSIRO  Land and Water

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Blackmore, D J. The Murray-Darling Basin Cap on Diversions – Policy and Practice for the New Millennium
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Williams, Dr John, Deputy Chief CSIRO Land and Water. **The Mighty Murray, State Science Briefing - Adelaide April 11, 2000**

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River Murray Catchment Water Management Board. Draft Water Allocation Plan for the River Murray Prescribed Watercourse
SA Water International, Pola Induc 1
Wetland Care Australia. Coordination of Implementation of Wetland Management Plans
WITNESSES BEFORE THE COMMITTEE.

The following witnesses gave evidence before the Committee –

November 1999 – July 2000:

Adams, Tony   Irrigation Consultant - Department of Primary Industries (Irrigation Crop Management Service);
Angove, Ted   Deputy Chairman - Citrus Board of South Australia;
Arnold, Peter  Member, River Murray Catchment Water Management Board;
Barnett, Steve Senior Geologist, Groundwater Program Department for Water Resources;
Berger, John   Member - Community Advisory Committee - Murray Darling Basin Commission, Lower Murray Catchment;
Birks, Michael Bachelor of Agricultural Science, Hons, Aquaculture Farmer;
Blackmore, Don Chief Executive Officer, Murray-Darling Basin Commission;
Broster, Leon  General Manager - Murray Darling Association;
Broughton, Graham General Manager, River Murray Catchment Water Management Board;
Brown, Wayne  Revegetation Consultant, Rural Solutions - Department for Primary Industries and Resources;
Butler, Peter  Program Manager, Murray Bridge Revegetation Centre - Department for Primary Industries and Resources;
Campbell, Michelle Local Action Planning Officer - Berri Barmera Local Action Planning Committee;
Cann, Julie    Manager, Water Resources Act Administration - Department for Water Resources;
Cole, Phil     Program Manager, Water Management - Department for Primary Industries and Resources;
Coombs, Rod    River Fishery Director - South Australian River Fishery Association;
Dyson, Megan   Executive Adviser – Department for Environment and Heritage.
Fisher, Tim    Co-ordinator, Land & Water Ecosystems, Australian Conservation Foundation;
Harvey, Paul   Manager Intergovernmental Policy, Department for Water Resources;
Jensen, Anne   Director - Wetland Care Australia;
Jessop, Andrew Engineering Manager – Renmark Irrigation Trust;
Kroehn, Ian    Member, River Murray Catchment Water Management Board;
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Mader, Trent   Executive Director - Riverland Development Corporation;
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Morgans, Ian   Chief Executive Officer – Wetland Care Australia
Morley, Amy  Project Manager - Loxton to Bookpurnong Local Action Planning Committee;
Parish, Jeff  Chief Executive Officer – Central Irrigation Trust; Deputy Chair, River Murray Catchment Water Management Board;
Parker, Dr Pamela  Bookmark Biosphere;
Scanlon, John  Consultant, Former Commissioner to the Murray Darling Basin Commission;
Schonfeldt, Claus  Acting Director Environment Policy, Department for Water Resources;
Seekamp, Jack  Researcher;
Sluggett, Trevor  General Manager, Services - Yandilla Park Limited;
Teakle, Peter  Member - Inland Recreational Fisheries Committee;
Telfer, Andrew  Director, Australian Water Environments Pty Ltd;
Tonkin, Bruce  Chairman – Loxton to Bookpurnong Local Action Planning Committee;
Vegter, Michael  Chief Executive Officer, Sunlands and Golden Heights Irrigation Trust;
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Warwick, Shane  President - South Australian River Fishery Association;
Watkins, Nick  Director, Australian Water Environments Pty Ltd;
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**August 2000 - July 2001**

Alvares, Kym  Director, Water Analysis and Audit, NSW Department for Land and Water Conservation
Blazely, Veronica  Director, Natural Heritage Trust Section, Natural Heritage Division, Commonwealth Department of the Environment and Heritage
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Butterworth, Robert  Chief Finance Officer, Policy Coordination Division, Commonwealth Department of the Environment and Heritage
Calaby, Gil  General Manager, Penrice Soda Products;
Caldicott, Ken  Irrigation consultant
Cass, Jan  Vice President Murray and Mallee Local Government Ass and Vice President of the Local Government Ass State Executive;
Chartres, Dr Colin  Chief, Land and Water Sciences Division, Bureau of Rural Sciences.
Close, Andrew  Manager Water Policy, Natural Resources Business, Murray Darling Basin Commission
Cole, Phil  Program Manager, Water Management, Department for Primary Industries and Resources
Dole, David General Manager, River Murray Water Business; Murray Darling Basin Commission

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Heynen, Garth Senior adviser Planning, Local Government Ass

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Hoey, Peter Director, Murray Darling Division, Dept Water Resources; Chairman, SA Environmental Flows Technical Advisory Group

Hooy, Theo Regional Water Initiatives Section, Marine and Water Division, Commonwealth Department of the Environment and Heritage

James, Russel Natural Resource Management Unit, Natural Heritage Division, Commonwealth Department of the Environment and Heritage

Jones, Keith Environment Program Manager, South Australian Wine and Brandy Ass.

Mackie, Barry Chief Executive Officer, Greening Australia

Mavrinac, Gary Team Leader, Country Unit, Planning Amendment Branch, Planning SA;

McCole, Jim Presiding Member, River Murray Catchment Water Management Board;

McKay, Ass Prof Jennifer Director Water Law and Policy Group (University of SA);

Mensforth, Dr Lisa Manager Research Planning and Projects, River Murray Catchment Water Management Board; Member, SA Environmental Flows Technical Advisory Group

Morvelle, Gerry Assistant Secretary, Environment Assessment Branch, Commonwealth Department of the Environment and Heritage

Paton, Dr David Environmental Biology Department; Member, SA Environmental Flows Technical Advisory Group

Patrick, Vic President, South Australian Wine and Brandy Ass.

Scanlon, John Consultant and Lawyer; Former Commissioner to the Murray Darling Basin Commission

Riebolge, Robert Management Consultant

Stringer, Dr Randy Deputy Director, Centre for International Economic Studies (Adelaide University);

Tucker, Brett A/Executive Officer of the NSW Irrigation Committee.

Walker, Ass Prof Keith University of Adelaide; Member, SA Environmental Flows Technical Advisory Group

Williams, Dr John School of Law (Adelaide University)

Young, Mike Ecological Economist, CSIRO Land and Water
Appendix C

Findings and recommendations from the Environment, Resources and Development Committees inquiry into Fish Stock on Inland Waters

Committee Findings

In the course of this Inquiry, the River Murray was the focus of most of the submissions. There were no adverse comments on the Lakes and Coorong fishery. The Committee did not take any evidence on other inland fisheries. There were comments made on the Coopers Creek system and Coongie Lakes and the Committee intends to look at this system in the future.

This Inquiry into the fish stocks of inland waters has revealed that there are many issues involved in the health of the River Murray and its management. The native fish stocks have dramatically reduced over a number of years due to a range of causes.

The River Murray passes through three states. The Committee does not believe that attempts to find solutions to the river’s problems can be achieved by each state working alone. The Committee believes that there should be greater cooperation between states regarding the management of the fishery. It is ten years since Mr Bryan Pierce, Inland Waters Scientist, SARDI, called for:

- A coordinated approach to dealing with the River Murray’s endangered fish species
- A coordinated approach to dealing with habitat/flow improvement relative to demands of our fishes
- A coordinated data collection methodology, centralized research depository and coordinated research plan for the entire basin
- A unified body in charge of overseeing management of the entire River Murray Basin fishery. (1989, p11)

Yet, at a time when the river is in serious decline, there are people in NSW considering the removal of the cap on the amount of water that can be extracted from the river system. The Committee endorses the approach suggested by Pierce above. In addition, it believes that there should be consistency between states with regard to licence fees and compliance fees.

The Committee does not believe that the Fishery Management Committee and the Recreational Management Committee are working as well as they could be. The Committee also questions the value of a group such as RFSAAC. The Committee does not believe that RFSAAC adequately addressed its terms of reference nor came to a satisfactory conclusion for major stakeholders. The Committee was concerned to hear the many complaints regarding a lack of consultation and believes that a system including community consultation should be put into legislation.

The Committee believes that one of the most important questions that this Inquiry raises is whether the River Murray fishery is being managed sustainably. The basis of managing a fishery is the stock assessment data. Without that, it cannot be ascertained whether the inland commercial fisheries and fishing practices are sustainable in perpetuity. The appalling lack of published scientific data on the status of native fish stocks can only suggest that the fishery is being managed without all the necessary information. The Committee believes that there should be yearly stock assessments which are published and which are used to manage the fishery. There should also be a means of assessing the recreational catch and the Committee is pleased to learn of a national survey with this intention.
The Committee believes that it is time to introduce a system that will have a much greater control over the harvesting (both recreational and commercial) of fish from the Murray. The Committee believes that licences and/or a tagging system for recreational fishers and a docket system for commercial fishers should be investigated to determine whether they would be appropriate tools to monitor the catch as well as potentially reduce illegal fishing. The yearly stock assessments could be used to control the harvest in a similar way to a quota system. Poor assessments should mean a closed season for certain species to allow for their recovery.

Illegal poaching has been drawn to the attention of the Committee, and the lack of compliance officers has not helped this situation. There is an urgent need to put more compliance officers in place to help educate and monitor fishers.

Gill nets apparently are a source of conflict as many people commented that they affect other species and drown non-target species if not checked regularly. The Committee believes that there should be an investigation of the appropriateness of the use of gill nets by commercial fishers. The current management arrangements allow for the potential overuse of these nets.

The Committee finds that making commercial licences transferable was an unfortunate decision. It has not been demonstrated to the Committee that the commercial fishery is sustainable into perpetuity, therefore the Committee suggests that there should be an investigation into a fair and equitable way to reduce the number of commercial fishers. The Committee suggests that one way of reducing these numbers would be for the local council and the state government to share the cost of buying out the fishers over a number of years.

The Committee finds that there is a lack of coordination and communication between different organisations doing research on the River Murray. The Committee believes that there should be regular (six monthly) formal meetings for communication regarding research projects and outcomes. The Committee believes that SARDI should coordinate these research forums.

The Committee believes that there is a great need for more resources for SARDI and the Inland Waters research area. Mr Pierce needs to have junior scientists to whom he can transmit some of his wealth of knowledge of the river. He also needs someone to regularly conduct and write up fish stock assessment data. A closer association with other research bodies may help to cover this obvious gap. Postgraduate students could be of assistance and also be assisted if there was greater interaction between SARDI and the University of Adelaide.

The Committee is pleased that Environmental Management Plans and Codes of Practice are being introduced into the commercial fisheries. These need to go further and address such areas as indicators of species decline and the fishers’ response to poor recruitment seasons.

**BACKWATERS**

There was conflicting evidence as to where native fish breed. As has already been mentioned, the Committee believes that commercial licences should be phased out. It does not believe that commercial fishers should be given greater opportunity to harvest native fish and therefore should not gain access to backwaters.

**REACHES**
The Committee has not received any information to adequately justify the distribution of reaches. During the restructure of the fishery, the opportunity could have been taken to spread them more evenly over the length of the river, ensuring that they are not in areas affecting other river users.

The Committee finds that decisions about the River fishery have impacts on areas outside the fishery such as tourism. There appears to be inconsistency in the relocation of the two reaches with little consideration being given to other river users, and little forward planning for carp control.

The Committee is particularly concerned at the lack of consultation over the relocations which has caused considerable ill will between all parties. It is especially concerned that apparently the local aboriginal group was not contacted as the relocation of one reach overlaps an area of significance for aboriginal practices and an aboriginal tourism venture.

**CARP**

The Committee does not believe that the carp in the backwaters are being adequately harvested. This could be resolved in the following way:

Farmers and environmental groups could be given the opportunity to apply to the Department of Environment Heritage and Aboriginal Affairs for temporary licences to harvest carp on their property.

The Committee is impressed with the efforts of the Lakes and Coorong fishers to create ongoing markets for carp. It is aware that these markets then need constant supplies. This may not be guaranteed in South Australia where the carp could be significantly reduced with increased effort. On the other hand, the carp may always be present in the river, therefore it is necessary to have markets available.

The Committee encourages further research into control of the mosquito fish (*Gambusia holbrooki*).

**WATER MANAGEMENT**

The Committee believes that there should be further investigation into the impact of regulated water flows on native fish stocks. The Committee believes that there should be greater cooperation/communication between SA Water and fisheries management to ensure that the impact of regulated flows on native fish is minimised at sensitive times such as spawning.

The Committee finds that current fish ladders are ineffective in enabling fish to move easily past locks. The Committee believes that alternative fish bypass systems should be investigated. The Committee also believes that the Barrage Fish Passage project at Lake Alexandrina should be encouraged.

The Committee is encouraged by the work being undertaken by the Bookmark Biosphere Reserve, Wetland Care Australia, the National Carp Task Force and LAP groups in the reestablishment of wetting and drying cycles and in carp control, and believes that ongoing work should be supported.

*General comments*
The River Murray is suffering from a number of problems related to poor water quality and reduced flows. The Committee has not been convinced that the current regulatory framework for commercial and recreational fishers is sustainable in perpetuity. The Committee is concerned that the restructure of the fishery was based on economic viability with little regard to environmental sustainability. The Committee believes that environmental sustainability should be the priority for any future restructure.

The Committee does not believe that restocking of the river with native fish is beneficial in the longer term due to the problems with a reduced gene pool and the loss of genetic diversity. The Committee believes that fish stocks should be maintained by proper management of the river and the fishery rather than by restocking. The Committee concludes that aquaculture should be the way of the future. Murray cod, catfish, golden perch and silver perch could all be farmed in aquaculture farms outside the riverine environment. Stocking of dams with fingerlings would help to take the fishing pressure from the rivers.

**Recommendations**

The following recommendations apply to the River Murray fishery only unless otherwise stated.

**Stock assessments**

1. The Committee recommends the completion and publication of annual native fish stock assessments by the Department of Primary Industries and Resources.
2. The Committee recommends that decisions related to the annual allowed catch of species should be based on these stock assessments.
3. The Committee recommends the introduction of closed seasons for all native fish species when the stock assessments indicate that numbers are below a certain level.
4. The Committee recommends that additional resources should be allocated to the inland waters research area of SARDI.

**Recreational fishing**

5. The Committee recommends investigating the introduction of a recreational fishers’ licence and/or a tagging system.
6. The Committee recommends that any money raised as a result of the introduction of recreational licences and/or tagging system be returned to the fisheries for:
   a. funding more compliance officers to help reduce the incidence of illegal fishing
   b. inland fisheries research and development
   c. facilities for recreational fishers
   d. funding of public education for fishers as to their rights and obligations, and with regard to fish identification and acceptable fishing methods

**Commercial fishing**

**LICENCING**
7. The Committee recommends the immediate investigation into a fair and equitable way of phasing out the commercial fishers from the River Murray, over a period of no more than ten years. All those who have a vested interest in the future sustainability of the River Murray should be considered to share whatever cost is associated with the phase out.

**MANAGEMENT**

8. The Committee recommends investigating the introduction of a docket system for commercial fishers.

9. The Committee recommends that commercial fishers do not have access to harvesting native fish in backwaters and therefore does not agree with recommendation 13.3 in Paper no. 17.

10. The Committee recommends that commercial fishers be actively encouraged and supported to take up fish farming of native fish species outside the riverine environment.

11. The Committee recommends that reach relocation should only occur with the agreement of the local councils.

**FISHING GEAR**

12. The Committee recommends further investigation into the appropriateness of the use of gill nets for commercial fish harvest. In any event, the number of gill nets currently allowed is grossly excessive.

**Research**

13. The Committee recommends that SARDI take a lead role in coordinating the research effort on native fish.

14. The Committee recommends that more research is undertaken on fish bypass systems at the locks.

15. The Committee recommends an investigation of the value of freshwater aquatic reserves/no-take zones/catch and release zones on the River Murray.

16. The Committee recommends further research into the control of mosquito fish (Gambusia holbrooki).

**General**

17. The Committee recommends further steps should be taken in the progress of the Barrage Fish Passage project at Lake Alexandrina.

18. The Committee recommends that farmers and environmental groups be given the opportunity to apply to the Department of Environment Heritage and Aboriginal Affairs for temporary licences to harvest carp on their property.

19. The Committee recommends a standardisation of the criteria for, and the cost of licence fees and compliance fines between states.
20. The Committee recommends the amendment of the Fisheries Act to require community consultation on issues affecting the management of a public resource such as the river fishery.

21. The Committee recommends the constant monitoring of point sources of pollution along the length of the River Murray in South Australia, with the understanding that they all contribute to the poor water quality which in turn is affecting the native fish stocks.