



River Murray Act 2003 Annual Report 2006-2007

Prepared for the South Australian Parliament by the Minister for the River Murray



**Government
of South Australia**

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FOREWORD

The 2006-07 year has been an unprecedented year for South Australia, and the Murray-Darling Basin region in particular. Inflows to the River Murray have been at record lows, air temperatures above average and rainfall in the region sparse. The drought has had, and continues to have, a significant impact on regional communities, industry and the environment.

In response to the drought, the South Australian Government has worked hard to reduce impacts on the community and to ensure that water security is a primary focus. In addition to providing up to date information on water resource conditions, the South Australian Government has set up the SA Drought Link Website and Hotline as single points of contact for people wishing to obtain information about drought related matters.

Despite the drought, progress towards improving the health of the River Murray has occurred in 2006-07 through the *River Murray Act 2003* (the Act).

The Act, which was proclaimed in July 2003, aims to ensure that all reasonable and practicable measures are taken to protect, restore and enhance the River Murray. Both the River Murray and Murray-Darling Basin are of special social, economic and environmental importance to South Australia and their continuing health is of critical importance to the South Australian community.

There has been significant investment and effort across the South Australian Murray-Darling Basin region in 2006-07. Both Government and the community have progressed many projects in the region, particularly relating to the areas of river health, environmental flows, water quality and the human dimensions (the focus of the Objectives for a Healthy River Murray from the Act).

It is with pleasure that I present the *River Murray Act 2003* Annual Report for 2006-2007 which provides information on how the South Australian Government is working to protect, restore and enhance the River Murray for all South Australians.

Hon Karlene Maywald MP

MINISTER FOR THE RIVER MURRAY

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1. INTRODUCTION

The *River Murray Act 2003* was passed in July 2003 as part of the South Australian Government's election commitment to improve the state of the River Murray. The Act aims to ensure that the River and its environs are properly protected from activities occurring within the South Australian Murray-Darling Basin that are likely to have an adverse impact on the health of the River.

The Act builds on existing legislation to better coordinate what is already in place as well as integrate protection of the River Murray into other related South Australian Acts (see Appendix 1). This ensures that the River Murray receives priority consideration in decision-making in South Australia.

Other features of the Act include:

- a 'duty of care' not to harm the River through one's actions, enforceable through River Murray Protection Orders and associated instruments
- various powers of the Minister to undertake activities and carry out works and measures
- the ability for the Minister to register management agreements with landowners
- the establishment of a Joint House Standing Committee of the South Australian Parliament – the Natural Resources Parliamentary Committee
- a regulation making power that will enable the future regulation or prohibition of any identified activity deemed to harm the River, and
- the ability of the Minister to impose conditions on activity authorisations, through the operation of the 'referral' mechanism.

Section 10 of the Act requires the Minister responsible for the administration of the Act, on or before 30 September of each year, to prepare a report on the operation of the Act for the preceding financial year. The Minister must cause a copy of the report to be laid before both Houses of Parliament within six sitting days of the report being prepared. These timelines correspond with timelines for annual reports required under the *Public Sector Management Act 1995*.

The report must include:

- i) information on the implementation of the Act (taking into account the provisions of the Implementation Strategy); and
- ii) information on the extent to which the objects of the Act and the Objectives for a Healthy River Murray are being achieved; and
- iii) report on the following matters for the financial year –
 - a. the referral of matters to the Minister under any related operational Act;

- b. the enforcement of the general duty of care; and
- c. action taken by the Minister or an authorised officer under Part 8 of the Act (protection and other orders).

This annual report relates to the period from 1 July 2006 to 30 June 2007.

2. IMPLEMENTATION OF THE ACT

The aim of the River Murray Act is to achieve a healthy working River Murray in South Australia, ensuring that its use and management are sustainable. To achieve this, the Act aims to ensure that both existing and new activities that may adversely affect the health of the River are undertaken in a way that protects, maintains and improves river health.

The purpose of the Act is to provide coordination of, and fill gaps between the many other Acts applicable to the management of the SA Murray-Darling Basin and its resources. The establishment of the referral mechanism has been central to the integration of the River's interest into the existing legislative base.

Implementation of the Act in 2006-07 has concentrated on publishing and marketing the River Murray Act Implementation Strategy, responding to referrals, developing policies in relation to various aspects of the referral system (in cooperation with other agencies), compliance matters and relationship building with various stakeholders.

2.1 IMPLEMENTATION STRATEGY

Section 21 of the Act requires the Minister to prepare and maintain the *River Murray Act Implementation Strategy* (Implementation Strategy).

In accordance with the requirements of the Act, the Implementation Strategy must –

- set out the priorities that the Minister will pursue in order to achieve the objects of this Act and to further the implementation of the *Objectives for a Healthy River Murray*; and
- set out strategies that the Minister intends to adopt to meet those priorities.

On 5 June 2006, the Minister approved the Implementation Strategy. During 2006-07, copies of the Implementation Strategy were distributed to Department of Water, Land and Biodiversity Conservation offices in Adelaide, Berri and Murray Bridge. Notice of the availability of the Implementation Strategy was published in the *Government Gazette*, *the Advertiser* and in newspapers circulating within the Eastern Mount Lofty Ranges, Riverland and Murraylands regions in March 2007.

The Minister is now required to review the Implementation Strategy at least once in every five years and will provide notice of any amendments through the *Government Gazette*.

2.2 SWITCHING ON PROVISIONS

Section 9 of the Act gives the Minister the ability to impose conditions on activity authorisations, through the operation of the referral mechanism. The mechanism ensures that applications for certain prescribed activities under related operational Acts are referred to the Minister for the River Murray as part of the approval process. The referral mechanism for most of the related operational Acts is only activated when regulations are made (with the exception of the *Mining Act 1971* and the *Petroleum Act 2000* – see section 4 for further information).

An exemption for the requirement to refer certain dredging activities under the *River Murray Act 2003* was gazetted in December 2006 in response to the drought. As a result of the exemption notice, the numbers of referrals received during 2006-07 under existing regulations were slightly lower than 2005-06 figures. Further information on this is provided in section 4.1.

No other new regulations were made in the 2006-07 financial year.

2.3 DELEGATIONS

Section 12 of the Act allows the Minister to delegate functions or powers under the Act or under any related operational Act to a body or person, for the time being, holding or acting in a specified office or position.

Some of the Minister's functions and powers are delegated to positions within State Government departments and statutory bodies, rather than to specific persons. This provides maximum flexibility for officers acting in positions to which functions or powers have been delegated, as they are able to undertake the functions and powers without further authorisation.

The delegations are assigned on a hierarchical basis, with persons at more senior positions being able, in addition to their specific delegations, to exercise all of the functions and powers delegated to subordinate officers.

All delegations are commensurate with the level of knowledge and responsibility required to undertake specific functions. Delegated officers must undertake their functions consistently with the Act.

Most delegations were put in place shortly after the Act came into operation and have been amended over time as required.

2.4 APPOINTMENT OF AUTHORISED OFFICERS

Over 100 officers have been authorised by the Minister under section 13 of the Act. Field officers from several Government agencies and statutory authorities have been authorised. The agencies are:

- Department of Water, Land and Biodiversity Conservation (DWLBC);
- Primary Industries and Resources SA (PIRSA) Fishwatch;
- Environment Protection Authority (EPA); and
- SA Murray-Darling Basin Natural Resources Management Board.

Although no new training sessions were provided specific to the River Murray Act during 2006-07, a number of training sessions were held for officers authorised pursuant to the *Natural Resources Management Act 2004* (which complements the River Murray Act) and included a large number of officers operating in the Murray-Darling Basin area.

The River Murray Act Compliance and Enforcement Guidelines and information sheet (as required under section 14 (11) of the Act), written during 2004-05, remain in force without amendment.

2.5 RAISING AWARENESS

Publications have been produced in previous financial years to assist users of the Act and the general public to understand the Act and its requirements, namely:

- Fact sheets:
 - Overview of the Act
 - General Duty of Care
 - Referrals
- River Murray Act User's First Guide, and
- Exemption of certain outbuildings and farm buildings.

These publications remain in effect and continue to be available on the DWLBC web site, www.dwlbc.sa.gov.au, and in the offices of relevant government agencies and local councils.

No new fact sheets were produced during 2006-07.

2.6 MANAGEMENT AGREEMENTS

Section 18 of the Act allows the Minister to enter into management agreements with owners of land within the Murray-Darling Basin. The potential scope for management agreements is very wide. Management agreements may relate to:

- the conservation or management of water;
- the preservation, conservation, management, enhancement or re-establishment of any aspect of the natural resources of the River Murray; and
- any other matter associated with furthering the objects or objectives of the Act.

The Minister for the River Murray initiated no new management agreements in 2006-07.

3. MEETING THE OBJECTS OF THE ACT AND OBJECTIVES FOR A HEALTHY RIVER MURRAY

The River Murray Act sets out a list of Objects of the Act and Objectives for a Healthy River Murray. The Objects and Objectives seek to protect the River Murray by ensuring that all reasonable measures are taken to safeguard, restore and enhance the River. A complete list of the Objects and Objectives can be viewed in Appendices 2 and 3 respectively.

The Act itself provides both the measures and mechanisms to facilitate protection of the River. Any existing or proposed activities should be undertaken in a way that benefits the River while providing for the economic, social and physical well being of communities, and promoting ecologically sustainable development. Through regulations, referrals, authorised officers, compliance tools and policies implemented pursuant to the Act, the River and its environs can be protected from inappropriate or damaging activities and developments.

There were a large number of programs and projects undertaken in the Murray-Darling Basin during the 2006-07 financial year that acted to further progress the Objects and Objectives. Various government agencies (State, local and the Australian Government), industry groups and community groups have been involved in a broad range of initiatives designed to improve the health of the River. The work being undertaken in the region is significant and a complete list of projects is provided in Appendix 4 of this report.

4. REFERRALS, ENFORCEMENT OF THE GENERAL DUTY OF CARE AND ACTIONS TAKEN

The provisions within the River Murray Act for establishing referrals and the general duty of care are important tools in ensuring the protection of the River Murray.

The referral provisions of the Act require bodies administering related operational Acts to take the River Murray into account in the preparation of plans and undertaking of functions. The bodies must also seek input from the Minister for the River Murray before granting approval for certain types of activities in particular locations. Most of the referral provisions require regulations to be made, which in turn set out the types of activities that need to be referred. As outlined in section 2.2, a limited number of regulations have been made to date. Details of the regulations that have been made can be found in Section 4.1.

The Act also established a duty of care for the River, enforceable by a River Murray Protection Order or Reparation Order. All persons have a general duty of care to take reasonable measures to prevent or minimise harm to the River Murray through actions or activities. A breach of this duty does not constitute an offence but the issuing of a Protection Order or Reparation Order can enforce compliance.

Information on the enforcement of the general duty of care and actions taken during 2006-07 is provided in sections 4.2 and 4.3.

4.1 REFERRAL OF MATTERS UNDER RELATED OPERATIONAL ACTS

The Acts currently requiring referrals are the *Development Act 1993*, *Mining Act 1971*, *Petroleum Act 2000* and the *Harbours and Navigation Act 1994*. The majority of referrals are being generated pursuant to the *Development Act 1993*. In December 2006, an exemption for the requirement to refer certain dredging activities under the *River Murray Act 2003* was gazetted in response to the drought. As a flow on effect, there was a decrease in referrals to the Minister for the River Murray under these Acts during 2006-07 compared to the 2005-06 reporting period.

4.1.1 DEVELOPMENT ACT 1993

Development applications for prescribed activities within the River Murray Protection Area are referred to the Minister for the River Murray. The Minister may direct the relevant authority to refuse the application or may impose conditions of approval if the application is to be approved by the relevant authority.

Development Applications

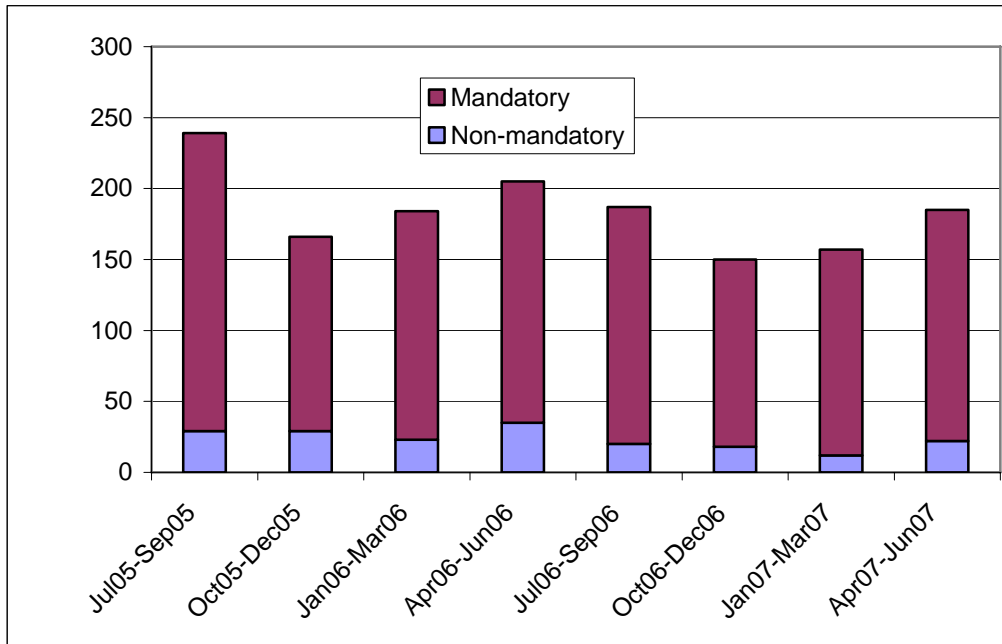
During 2006-07, a total of 607 mandatory referrals were made under the River Murray Act. The exemption of certain dredging activities from the requirement to refer resulted in a further 77 development applications that, were not formally referred to the Minister for the River Murray under item 19 of schedule 8 of the *Development Regulations 1993*. These applications were still referred informally for information however referral fees were not charged.

Of the 607 mandatory applications referred, it is estimated that over half related to dwellings, sheds, garages and outbuildings in the River Murray Protection Area with the remainder relating to land use, river use, water use, alteration to the landscape and/or impacts upon riparian zones, vegetation or biodiversity.

Almost all mandatory referrals had conditions imposed on them by the Minister. While the Minister's delegate negotiated formally with 44 applicants for further information or amendments to applications, additional information was sought informally (via telephone or e-mail) from an additional 20-30% of applicants.

Five hundred and seventy-eight (95.2%) of the mandatory referrals were responded to within required statutory time frames. Future updates to the database used for tracking and recording development applications should see this figure improve further.

In addition to the mandatory and exempted mandatory referrals, 72 non-mandatory referrals were made to the Minister for the River Murray, for additional activities within the River Murray Protection Area or the broader SA Murray Darling Basin. In these cases, recommendations were provided to the referring body for consideration in their decision making process.

Figure 1. Number of Mandatory / Non Mandatory Referrals 2005-06 and 2006-07.**Plan Amendment Reports**

Under the *Development Act 1993* the Minister for the River Murray is referred Plan Amendment Reports (PARs) at several stages of the planning process, including the Statement of Intent phase.

Forty-nine PARs and 33 Statements Of Intent were referred to the Minister for the River Murray during 2006-07. The Minister responded to each of these referrals with comments and recommendations.

During 2004-05 discussions were held regarding the best method for improving the consistency of Development Plans in the South Australian Murray-Darling Basin to bring them in line with the objects and objectives of the Act. This work was initiated during 2005-06 through the Better Development Plans Project run by Planning SA with the first policy amendments included in development plans in 2006-07.

4.1.2 MINING ACT 1971

Under the *Mining Act 1971*, applications, including renewals, within a River Murray Protection Area must be referred to the Minister for the River Murray for:

- exploration licences,
- mining leases;

- miscellaneous purpose licences;
- retention leases; and
- authorisation to use declared equipment;

There were 40 referrals made for a variety of exploration licenses, declared equipment use and mining leases during 2006-07.

4.1.3 PETROLEUM ACT 2000

Under the *Petroleum Act 2000*, Statements of Environmental Objectives, including a revised statement that applies to any part of the Murray-Darling Basin, must be referred to the Minister for the River Murray.

Two items were referred to the Minister during 2006-07.

4.1.4 HARBORS AND NAVIGATION ACT 1994

River events that require a licence under the *Harbours and Navigation Act 1993* and involve a number of motorised vessels as specified in the Regulations, must be referred to the Minister for the River Murray.

No aquatic activity licences were referred during 2006-07.

4.2 ENFORCEMENT OF THE GENERAL DUTY OF CARE

The general duty of care states, “a person must take all reasonable measures to prevent or minimise any harm to the River Murray through his or her actions or activities”. Harm includes risk of harm, future harm and anything declared by regulation to be harm.

A Compliance Officer for the River Murray Act was employed full time during the 2006-07 reporting year. In addition to enforcing the general duty of care principle, the Compliance Officer was involved in educating and raising awareness amongst stakeholders, councils, and Government agencies who have a vested interest in the welfare of the health of the River Murray.

4.3 ACTIONS TAKEN UNDER PART 8 OF THE ACT – PROTECTION AND OTHER ORDERS

Protection Orders may be issued to secure compliance with the general duty of care, a condition of a statutory authorisation or any other requirement. An order may require a person to stop or not initiate a particular activity, to only carry on an activity at a particular time, to take specified action within a certain timeframe, to undertake tests or monitoring or prepare a plan or report. If urgent action is required, an authorised officer may issue an emergency Protection Order. It is an offence not to comply with a Protection Order.

A Reparation Order can be issued if the Minister is satisfied a person has caused harm to the River Murray by contravening the general duty of care, a condition of a statutory authorisation or any other requirement. A Reparation Order may require a person to take particular action to make good any damage or make payments to enable action to be so taken. The Order may include other requirements to prevent or mitigate further harm to the River. An authorised officer may also issue an emergency Reparation Order.

During the 2006-07 reporting year, twenty-eight matters were reported relating to activities that were likely to cause harm to the river. The major area of concern related to the removal of native vegetation, which leads to destabilisation of the riverbank and ultimately causes erosion. Eleven of these matters resulted in requests for voluntary reparation work to be carried out. In each case, reparation work was undertaken in accordance with directions from the Compliance Officer without the need to issue an Order under the River Murray Act. For the remaining reported matters, the Compliance Officer liaised with local Councils and Government Agencies to co-ordinate action under other legislation where it was considered to be more appropriate (i.e. the Development Act).

5. SUMMARY

The *River Murray Act 2003* provided important protection for one of the State's most important natural assets during the 2006-07 financial year. Through the implementation of regulations, referrals, authorised officers, compliance tools and policies implemented pursuant to the Act, the River and its environs experienced increased protection from inappropriate or damaging activities and developments.

In addition to the statutory protection the River Murray Act provided during the last financial year, federal, State and local government bodies worked with the community to instigate many projects and programs in the SA Murray-Darling Basin region that acted to further protect, enhance and restore the natural resources of the area. In general, these projects and programs were based around the key areas of improving water quality, restoring environmental flows and key habitat features, protecting native species, and increasing community involvement in the management of the River

There have been significant achievements made in protecting, restoring and enhancing the River Murray in 2006-07 despite challenges experienced as a result of the prevailing drought conditions. Levels of investment and activity within the region are indicative of the central importance of the River Murray and Murray-Darling Basin to all South Australians.

APPENDIX 1 – RELATED OPERATIONAL ACTS

Aquaculture Act 2001
Coast Protection Act 1972
Crown Lands Act 1929
Development Act 1993
Environment Protection Act 1993
Fisheries Act 1982
Harbours and Navigation Act 1993
Heritage Places Act 1993
Historic Shipwrecks Act 1981
Irrigation Act 1994
Mining Act 1971
Murray-Darling Basin Act 1993
National Parks and Wildlife Act 1972
Native Vegetation Act 1991
Natural Resources Management Act 2004
Opal Mining Act 1995
Petroleum Act 2000
South Eastern Water Conservation and Drainage Act 1982

APPENDIX 2 – OBJECTS OF THE RIVER MURRAY ACT

The objects of the Act are:

- i. to ensure that all reasonable and practicable measures are taken to protect, restore and enhance the River Murray in recognition of its critical importance to the South Australian community and its unique value from environmental, economic and social perspectives and to give special acknowledgement to the need to ensure that the use and management of the River Murray sustains the physical, economic and social well being of the people of the State and facilitates the economic development of the State
- ii. to provide mechanisms to ensure that any development or activities that may affect the River Murray are undertaken in a way that provides the greatest benefit to, or protection of, the River Murray while at the same time providing for the economic, social and physical well being of the community
- iii. to provide a mechanism so that development and activities that are unacceptable in view of their adverse effects on the River Murray are prevented from proceeding, regulated or brought to an end
- iv. to promote the principles of ecologically sustainable development in relation to the use and management of the River Murray
- v. to ensure that proper weight is given to the significance and well being of the River Murray when legislative plans and strategies are being developed and implemented
- vi. to respect the interests and aspirations of Indigenous peoples with an association with the River Murray and to give due recognition to the ability of those Indigenous people to make a significant contribution to the promotion of the principles of ecologically sustainable development in relation to the use and management of the River Murray
- vii. to respect the interests and views of other people within the community with an association with the River Murray and to give due recognition to the ability of those people to make a significant contribution to the promotion of the principles of ecologically sustainable development in relation to the use and management of the River Murray, and
- viii. otherwise to ensure the future health, and to recognise the importance, of the River Murray.

APPENDIX 3 – OBJECTIVES FOR A HEALTHY RIVER MURRAY

River health objectives:

- a) the key habitat features in the River Murray system are to be maintained, protected and restored in order to enhance the ecological processes;
- b) the environments constituted by the River Murray system, with particular reference to high-value floodplains and wetlands of national and international importance, are to be protected and restored;
- c) the extinction of native species of animal and vegetation associated with the River Murray system is to be prevented;
- d) barriers to the migration of native species of animal within the River Murray system are to be avoided or overcome.

Environmental flow objectives:

- a) ecologically significant elements of the natural flow regime of the River Murray system are to be reinstated and maintained;
- b) the Murray mouth should be kept open in order to maintain navigation and the passage of fish in the area, and to enhance the health of the River Murray system and estuarine conditions in the Coorong;
- c) significant improvements are to be made to the connectivity between and within the environments constituted by the River Murray system.

Water quality objectives:

- a) water quality within the River Murray system should be improved to a level that sustains the ecological processes, environmental values and productive capacity of the system;
- b) the impact of salinity on the ecological processes and productive capacity of the River Murray system is to be minimised;
- c) nutrient levels within the River Murray system are to be managed so as to prevent or reduce the occurrence of algal blooms, and to minimise other impacts from nutrients on the ecological processes, environmental values and productive capacity of the system;
- d) the impact of potential pollutants, such as sediment and pesticides, on the environments constituted by the River Murray system is to be minimised.

Human dimension objectives:

- a) a responsive and adaptable approach to the management of the River Murray system is to be implemented taking into account ecological outcomes, community interests and new information that may become available from time to time;
- b) the community's knowledge and understanding of the River Murray system is to be gathered, considered and disseminated in order to promote the health and proper management of the system;
- c) the interests of the community are to be taken into account by recognising indigenous and other cultural, and historical, relationships with the River Murray and its surrounding areas, and by ensuring appropriate participation in processes associated with the management of the River Murray system;

- d) the importance of a healthy river to the economic, social and cultural prosperity of communities along the length of the river, and the community more generally, is to be recognised.

APPENDIX 4 – PROGRAMS AND PROJECTS

The South Australian Government supports a wide range of programs that directly contribute to or complement the Objects of the Act and Objectives for a Healthy River Murray. These programs are listed below against the relevant Objective. Many programs contribute to a number of Objectives, but for simplicity have only been listed under the Objective to which they most clearly relate. Programs have not been listed against the Objects of the *River Murray Act 2003*, as the Objectives provide a more detailed breakdown and encompass programs that relate to the Objects.

1.1 *The key habitat features in the River Murray system are to be maintained, protected and restored in order to enhance ecological processes*

• Chowilla Aquatic Habitats and Fish Communities Project

The Chowilla Aquatic Habitats and Fish Communities Project is a collaborative research project of SA Research and Development Institute (SARDI) and DWLBC that is funded through the Murray-Darling Basin Commission's (MDBC) Living Murray Environmental Works and Measures Program. Key findings in 2006-07 include:

- Chowilla supports a diverse fish community including threatened species such as Murray cod, freshwater catfish and silver perch. There is also evidence of recruitment of most species.
- The most diverse fish assemblages and those that show the greatest size range of species occur in the Chowilla Creek and creeks that join Chowilla directly from the Murray. These creeks have diverse hydraulic environments and abundant in-stream habitat.
- In comparison to reference sites, significantly higher abundances of small and large bodied fish species were collected downstream of major weirs in the Chowilla system during spring/summer.
- Radio telemetry investigations of golden perch movement indicate that golden perch display strong site fidelity within the Chowilla anabranch system and up the River Murray.

The Murray cod population in the Chowilla Anabranch is unique in South Australia with regards to abundance and size of distribution.

• Initiation of the Katarapko Demonstration Reach Project

Demonstration reaches are a new form of integrated action designed to improve river health and therefore native fish populations over a significant reach of river in SA. The Katarapko and Eckert Creek site near Berri, was identified during 2006-07 as a site for integrated action to restore native fish populations and the health of the system that they rely upon. The sorts of actions anticipated to be undertaken by the communities surrounding the site, with financial and other support from the government and business sectors are: habitat improvements such as restoring environmental flows and fish passage, enhanced wetland management, possibly through re-introducing wetting and drying of off channel areas or wetlands, rehabilitation of riparian and floodplain areas, and carp management.

The total area of the proposed Demonstration reach is nearly 9,000 hectares and while the majority of the site lies within the River Murray National Park (Katarapko), or on other Crown land, it also includes land held by the Gerard Aboriginal Reserve and a number of small private holdings. Various baseline studies were completed during 2006-07 including fish surveys, bathymetric mapping and flow assessments.

A number of organisations indicated support for this initiative and have formed a co-ordinating group. This comprises representatives of the following: Department for Environment and Heritage (DEH), SA Murray-Darling Basin Natural Resources Management Board, Department of Water, Land and Biodiversity Conservation (DWLBC), Rural Solutions SA, Friends of Parks Inc, and Banrock Station Wines.

- **Management Plans for National Parks and Wildlife Act Reserves**

Management plans under the *National Parks and Wildlife Act 1972* that relate to a reserve located wholly or partly within the Murray-Darling Basin must seek to further the objects of the River Murray Act. In 2006-07, the Minister adopted the management plan for Totness Recreation Park. Draft management plans are in preparation for 24 other reserves, including Coorong National Park; River Murray Parks (Murray River National Park, Kapunda Island, Maize Island Lagoon, Media Island, Morgan, Pike River, Ramco Point, Rilli Island, Roonka Conservation Parks and Loch Luna and Moorook Game Reserves); Salt Lagoon Island Conservation Park; Billiatt Conservation Park; Karte Conservation Park; Peebinga Conservation Park; Ngaut Ngaut Conservation Park; Danggali Conservation Park; Chowilla Regional Reserve; Chowilla Game Reserve; Pandappa Conservation Park; Mount Boothby Conservation Park; Mowantjie Willauwar Conservation Park; and Poonthie Ruwi-Riverdale Conservation Park.

- **Main Channel Habitat Identification and Fish Species Association for the River Murray in SA**

The main channel habitat identification and fish species association project aims to assess the various types of habitats available for fish along the Lower Murray in SA and identify any assemblage of species that is specific to these habitat types. The project was initiated during 2006-07 and aims to result in a GIS database that shows the distribution and extent of habitat types in relation to fish assemblage data. This information will allow natural resource managers to better target the restoration and protection of habitats that is necessary for the maintenance of native fish populations in South Australia, and to ensure that native fish populations are sustainable.

- **Operation of Barrage Fishways**

The Lower Murray Barrages separate the freshwater Lower Lakes from the estuarine waters of the Coorong. As a part of the Sea to Hume Dam fishway program, fishways have and continue to be constructed at the Murray Barrages. These fishways partially restore connectivity between these environments for freshwater and estuarine fish. In the face of drought conditions during 2006-07, the barrage fishways have provided a mechanism for maintaining a low-level of environmental integrity within the Coorong, by providing low-volume environmental flows, during times of minimal freshwater inflows from the Murray-Darling Basin while also providing an opportunity to investigate the biology of the native fish such as common galaxias,

Galaxias maculatus, and *congolliis*, *Psuedaphritis urvili*. Such knowledge will be used to inform water-efficient operation of the barrage fishways in order to deliver the best ecological outcomes (with regards to freshwater and estuarine fish) from barrage water releases.

The project is a collaborative effort between South Australian Research and Development Institution (SARDI) and DWLBC and was funded by the MDBC Living Murray Environmental Works and Measures Program.

- **Paiwalla – Resnagging Project**

The Paiwalla resnagging project aims to re-introduce up to 10 large eucalypt snags to the Lower Murray and is being undertaken by the Mannum to Wellington Local Action, Planing Group and Greening Australia (SA) at Paiwalla, upstream from Murray Bridge.

The first of its kind in South Australia, the project is undertaken as part of the Australian Government Recreational Fishing and Community Grants Programme. The snags are being installed along the edges of the main river channel adjoining the Paiwalla Wetlands. The purpose of the project is to re-establish breeding sites and habitat for larger territorial native fish such as the Murray cod and callop. Riparian rehabilitation involving the removal of willows and replacement with native species will complement the in-stream habitat rehabilitation.

An assessment of fish community structure in the Lower Murray River near Paiwalla was conducted by SARDI in July 2006, funded by the MDBC and managed by Primary Industries and Resources SA (PIRSA) Rural Solutions. A report has been published on this work and is available on the SARDI website.

The project brings together a diverse group of stakeholders including Greening Australia (SA), the South Australian Murray Darling Basin Native Fish Strategy Coordinator (PIRSA), SARDI Aquatic Sciences, the Boating Industry Association of SA, the SA Recreational Fishing Advisory Council, Transport SA, the Wetlands Habitats Association, the Mannum to Wellington Local Action Planning Group and the local Indigenous community.

- **River Murray Environmental Watering Plan and Prioritisation Framework**

The River Murray Annual Watering Plan for 2006-07 was developed by South Australia's newly established River Murray Environmental Manager in early 2006. The Plan proposed a number of watering projects to be undertaken during 2006-07, including weir pool raisings, watering of priority sites on the Chowilla floodplain, further watering of River Red Gum sites on the floodplain, and fishway releases. Unfortunately, the Plan was suspended due to low inflows into the Murray-Darling system as a consequence of the continuing drought across the Murray-Darling Basin. Water was made available for Living Murray projects through the Murray-Darling Basin Commission's Living Murray Initiative, which included a donation of water from the Minister for the River Murray.

The River Murray Floodplain Prioritisation Project (FPP) was finalised in early 2007 and has identified priority floodplain areas at a broad scale that will be the focus of flow manipulation in the future. The FPP will provide a sound basis for decision-making regarding environmental flows and floodplain restoration.

- **State Biosecurity Strategy**

Biosecurity is a cross-sectoral issue, with environmental, economic and social impacts caused by a wide range of invasive species, including weeds, vertebrate pests, insects and pathogens. A draft biosecurity strategy for South Australia was prepared during 2006-07 to address invasive species management issues across state government agencies.

A cross-agency steering committee has established working groups to address strategy objectives of interagency arrangements, risk management, capabilities, communication and awareness, monitoring and surveillance, management of data, planning processes, science-based decision making, social and community pest impacts, funding and resources. The finalisation of the strategy in 2007-08 will include consideration of the national AusBIOSEC intergovernmental arrangements currently under development.

1.2 The environments constituted by the River Murray system, with particular reference to high-value floodplains and wetlands of national and international importance, are to be protected and restored

- **CLLAMM ecology**

SARDI is a partner in the collaborative research program for the Coorong, Lower Lakes and Murray Mouth (CLLAMM) ecology. The \$2.2 million project is funded by the Commonwealth Science and Industrial Research Organisation (CSIRO) National Flagship Program: Water for a Healthy Country. Other partner organisations include University of Adelaide, Flinders University, Australian Water Quality Centre, DEH and DWLBC. This multi-disciplinary project aims to develop system understanding, models and tools for assessing the effectiveness of interventions to improve ecological function of the Coorong, Lower Lakes and Murray Mouth ecosystems.

A portfolio of research projects have been developed under four themes:

- key species responses
- productivity and tropho-dynamics
- dynamic habitat, and
- CLLAMM futures (ecosystem response to future scenarios).

Field sampling has been underway since October 2006.

- **Coorong and Lakes Alexandrina and Albert Ramsar Site Revegetation and Habitat Protection**

The Goolwa to Wellington Local Action Plan has continued to deliver an on-ground works devolved grant scheme during 2006-07, which aims to protect and restore

valuable habitat within the Coorong and Lakes Alexandrina and Albert Ramsar site. Grants have been focussed on assisting protection and restoration of habitat that occurs on private land.

- **Coorong and Lakes Alexandrina and Albert Ramsar Site Ecological Character Description**

A final report of the Coorong and Lakes Alexandrina and Albert Ramsar Site Ecological Character Description was released in November 2006. The report documents the ecological character of the Coorong and Lakes Alexandrina and Albert Ramsar site. The report concluded that there has been a significant change in the ecological character of the Coorong and Lakes Alexandrina and Albert Ramsar site since it was listed in 1985. The document provides details of the significant ecological communities, threats to them and provides limits of acceptable change for significant species. This document will provide managers and planners with essential information for assessing potential impacts of developments and management initiatives.

- **Chowilla Floodplain Icon Site**

Although the current drought is causing significant stress to the floodplain environment, significant progress has been made at the Living Murray Chowilla Floodplain Icon Site over 2006-07. This has included the following:

- watering 11 high priority Red Gum and Black Box sites
- approval for works and/or detailed design at a number of existing regulator sites
- detailed groundwater and salinity impact assessments undertaken, and
- a pilot bore hole for a deep injection groundwater disposal trial has been completed. Plans for an injection trial are in progress.

- **Community Wetland Management**

In 2006-07 the SA Murray-Darling Basin Natural Resources Management Board continued to contribute funding to wetland management projects run by community groups. Following the completion of baseline surveys in over 60 River Murray wetlands the focus has moved to preparing best practice wetland management plans for a subset of these wetlands. Community grant funding from the Natural Resources Management levy and National Action Plan has been made available to community groups to commence implementation of on-ground works.

- **Katarapko Eckert Creeks Demonstration Reach for Native Fish**

To guide the development and implementation of the Demonstration Reach project, the Department for Environment and Heritage developed a project management MOU with the following organizations: SA MDB NRMB, DWLBC, Rural Solutions SA, Friends of Parks Inc and Banrock Station Wines. A project steering group comprising community and government representatives was established during 2006-07 to assist in implementing the project.

- **Lower Lakes, Coorong and Murray Mouth (LLC&MM) Icon Site**

Developments at the Living Murray LLC&MM Icon Site during 2006-07 have included the following:

- production and implementation of an ecological monitoring framework according to Living Murray targets
- completion of studies into barrage flows releases and into the movement of migratory fish in response to fishway flows
- production of the second version of the LLC&MM Environmental Management Plan and the Interim Blueprint for future Icon Site flow management and project delivery
- detailed design and approval for a fish friendly regulator for Hunter's Creek.

- **New Conservation Park along the Murray**

The Waikerie Forest Reserve (31.5 hectares) was dedicated as a reserve during 2006-07 under the National Parks and Wildlife Act as the Ramco Point Conservation Park.

- **Perpetual Lease Accelerated Freeholding Project**

The Perpetual Lease Accelerated Freeholding Project is administered by the Department for Environment and Heritage and seeks to return (where possible) high conservation value wetland areas to the Crown to facilitate future improved management regimes.

- **Rehabilitation of Lower Murray Reclaimed Irrigation Areas**

During 2006-07, 1000 hectares of land was rehabilitated in the Lower Murray Reclaimed irrigation Area. Rehabilitation and restructuring of the Lower Murray Reclaimed Irrigation Areas has a number of important benefits:

- more efficient use of water through the rehabilitation of existing infrastructure (including the provision of meters)
- improvements in water quality through improvements in drainage, and
- restructuring of dairy farm configuration to provide an economic basis consistent with overall changes in the dairy industry.

Significant progress was made in 2006-07. Achievements included:

- all irrigation areas are now privately operated with five former government districts converting during the year
- 23 of the 24 irrigation districts/private irrigators signed their Rehabilitation Funding Deed with the Minister for the River Murray for their on-ground works
- 99% of meters had been installed by 1 July 2007 (with most of the remainder being programmed for completion by the end of July 2007), and
- an equivalent of 1,200 ha out of a total of 4,051 ha was rehabilitated during 2006-07, with irrigators programming their drainage works for completion by 30 June 2008.

Notable activities during 2006-07 that were associated with this rehabilitation included:

- a water quality report showing a marked reduction in pollutants entering the River
- introduction of on-farm Environmental Improvement Management Plans

- ninety-nine percent of exits and land purchase assistance completed
- the permanent closure of 50 redundant levee bank sluices (out of an estimated 100)
- an ongoing personal well-being program for irrigators managed by the local GP network in Murray Bridge.

- **River Murray Forest**

The River Murray Forest is a multi-agency project that provides a strategic approach to landscape revegetation with multiple benefits to the environment. Despite the drought causing delays to the implementation phase of the project, progress has been achieved during 2006-07. A steering committee has been established in conjunction with the SA Murray-Darling Basin NRM Board and a project manager has been appointed.

An evaluation of public land for potential forest plantings has been initiated. Two initial sites have been identified totalling approximately 1500 hectares and initial seed collection has been undertaken.

A tender process for plantings on private land in 2008 has also been developed. This tender process has involved the development of tender specifications and associated legal arrangements to support 'Kyoto compliant' plantings that are suitable as carbon offsets.

- **Riverland Ramsar Site Management Plan**

DEH is drafting a management plan for the Riverland Ramsar site, in cooperation with landholders and the community. As part of this process, and to address community concerns, a proposal to realign the Ramsar site boundary to reflect the ecological boundary of the wetland using the 1956 flood level has been developed. The boundary realignment process has gone through an extensive Federal Government and community consultation process and this has delayed the release of the draft management plan.

- **Wetland Management Plans for National Parks and Wildlife Act Reserves and Crown Land**

DEH developed draft wetland management plans for 14 wetlands located within National Parks and Wildlife Reserves and Crown Land along the River Murray from Chowilla to Morgan during 2006-07.

1.3 The extinction of native species of animal and vegetation associated with the River Murray system is to be prevented

- **Development of the national recovery plan for Murray Cod (*Maccullochella peeli peeli*)**

A draft national recovery plan for Murray cod has been developed by the Department of Sustainability and Environment (Victoria). PIRSA/SARDI has been engaged in the development of the plan and facilitated a consultation process within SA government agencies including DEH and DWLBC.

The project, funded by the MDBC Native Fish Strategy, will address several high priority knowledge gaps and actions identified at the 2005 workshop on 'Native Fish and Wetlands in the Murray-Darling Basin'. Briefly, it aims to evaluate aspects of the construction and configuration of wetland carp exclusion screens to inform the development of operational standards to govern their future construction, use and management within the Murray-Darling Basin. This project supports one PhD candidate and involves communication activities by the Native Fish Strategy Co-ordinator for SA. Carp exclusion screens are physical barriers of variable mesh size and design that are placed across inflow points with a view to excluding large fish from entering or exiting a wetland.

- **'Integrated Carp Management' Demonstration Project at Banrock Station**

This project, funded by the Murray Darling Basin Commission Native Fish Strategy, is envisaged to be the first to model, quantitatively measure and demonstrate the effects of carp on the aquatic environment, and the benefits of their removal. There are three components:

1. use an integrated approach to remove carp from an identified carp 'hot spot'
2. measure the response of native fish, macroinvertebrates, submerged vegetation, and water quality to carp removal, and
3. communicate the key results as widely as possible.

The project forms a collaboration between SARDI, the Murray-Darling Fish Research Centre, the Environment Protection Authority (EPA), PIRSA Fisheries, the SA Murray-Darling Basin Natural Resources Management Board, Banrock Station, regional Local Action Planning groups and other stakeholders.

- **Monitoring of native fish populations in the SA Murray-Darling Basin**

PIRSA funds a fishery independent sampling program to collect information (basic biology and performance indicators) for stock assessment of key native fish species (Murray cod and callop). Monthly field monitoring with the assistance of ex-commercial fishers has established a dataset for callop in regard to spatial and temporal patterns in size/age structure and information on aspects of reproductive biology. This information will assist PIRSA in sustainably managing the fishery and further assist other projects seeking to improve native fish stocks in the SA part of the River Murray. Additional resources will be required to collect additional information for Murray cod in order for a comprehensive stock assessment of this species to be conducted.

- **PhD Projects investigating carp ecology and management**

Two PhD projects concerning the ecology and management of carp in South Australia began in May 2006. One project is evaluating the migratory and jumping behaviour of common carp at wetland inlets for the development of an efficient trapping system. The other is evaluating aspects of the construction and configuration of carp screens to inform the development of operational standards that govern their construction, use and management within the Murray-Darling Basin.

Field sampling for both projects occurred weekly during mid-August to mid-November 2006 at six wetlands along the lower South Australian Murray. Significant numbers of fish have been found using these wetlands including some threatened species that are either State or Nationally listed or rarely found within wetlands including Murray catfish, short-finned eel, Murray cod and lamprey. The data is awaiting analysis and comparison with environmental parameters.

- **Projects investigating the ecology of *Ruppia megacarpa* in the Coorong**

Two complementary projects have been funded to investigate the ecology of *Ruppia megacarpa* in the Coorong:

- Monitoring *Ruppia megacarpa* in the Murray Estuary and North Lagoon of the Coorong – The Living Murray Program has provided funding to SARDI Aquatic Sciences to undertake a project that will investigate the impact of barrage releases on the population dynamics of *Ruppia megacarpa* in the Murray Estuary and North lagoon of the Coorong.
- E-water Cooperative Research Centre (CRC) Impacts of Sub-lethal salinities on *Ruppia megacarpa* – The E-water CRC has funded SARDI Aquatic Sciences to undertake a project to investigate the impacts of sub-lethal salinities on the germination, growth and reproductive output of *Ruppia megacarpa*.

Information from these two projects will be used to formulate a model that predicts *Ruppia megacarpa* biomass, reproductive output and survival under different salinity regimes and will be used to help determine environmental flow provisions for estuaries, specifically the Coorong.

- **Small Bodied Native Fish Rescue Projects**

The River Murray below Lock 1 and the Eastern Mount Lofty Ranges contain the highest diversity of river/wetland fishes in the Murray-Darling Basin. Included in the region are five fish species that are found nowhere else in the Basin, and four species protected under State (*Fisheries Act 1982*) or Federal (*Environment Protection and Biodiversity Conservation Act 1999*) legislation. Ongoing drought conditions and lowered lake levels threaten these fishes, with a possibility of local extinction, without intervention. Hence, DEH and PIRSA have undertaken a project in conjunction with the SA Murray-Darling Basin Natural Resources Management Board and Native Fish Australia (SA) to collect specimens of Yarra Pygmy Perch (*Nannoperca obscura*) and Purple Spotted gudgeon (*Mongurnda adspersa*) from the Lower Murray and hold them in aquaria and holding tanks to ensure their safety until water levels return to normal in the lower Murray.

- **South Australian Freshwater Fish Action Plan**

An initial list of South Australian threatened freshwater fish was prepared by the DEH Threatened Species Schedule Subcommittee (TSSS) in 2003 and revealed that over half of the State's 58 native freshwater fish species were threatened. In addition, a large proportion of the listed species were considered highly threatened, requiring urgent attention to prevent their loss from the state.

The seriousness of the situation resulted in the TSSS investigating strategies to increase awareness about the plight of freshwater fish in SA. The preparation of an Action Plan was considered one of the most appropriate ways to address the varied and often specific issues relating to freshwater fish conservation, particularly as such a plan would provide valuable background information and also strategies for the recovery of each taxon.

This project draws on previous work by collating and interpreting species information (eg. distribution) into species based action statements, as well as providing an overarching structure (e.g. background to fish and aquaculture habitats, broad threatening processes, regional and species priorities) to produce the draft 'Action Plan' document for public comment by mid 2007.

- **Spawning migrations and attractant flows: Achilles' Heel Exploitation of Innate Carp Behaviours**

In mid-2006, SARDI Aquatic Sciences secured a 3-year Invasive Animals CRC-funded project to develop and evaluate wetland carp separation cages incorporating a 'pushing trap' component, and to test attractants to exploit the sensory abilities of carp by attracting them into traps.

This project includes research and development effort aimed at modifying the separation cage design to:

1. ensure successful operation at wetland inlets with flow control structures installed
2. evaluate the relative efficiencies of traditional 'jumping traps' versus 'pushing traps' and
3. identify sensory attractants for carp.

Carp separation cages currently only exploit the jumping abilities of carp at river fishways, by drafting them into separate holding cages from which they can be harvested.

- **Threatened River Murray Fauna Recovery Program**

A Threatened River Murray Fauna Recovery Program is currently in place. To date the program has prepared and commenced implementation of four recovery plans for priority species. These are the nationally listed Regent Parrot and Golden Bell Frog and the regionally significant Carpet Python and Bush Stone-curlew. Current projects include habitat restoration planning for Regent Parrots, habitat and distribution studies for Golden Bell Frog and Bush Stone-curlews and community surveys of current Carpet Python distribution. In addition, plans are underway to establish a Native Fish Recovery Group to implement the State Native Fish Action Plan.

1.4 Barriers to the migration of native species of animal within the River Murray system are to be avoided or overcome

- **Fishways**

Fishways have been integrated into construction plans for capital works at Chowilla and Lock 1, Blanchetown. Fishways are structures that allow native fish to move through or around large engineered structures (either upstream or downstream, or from river pool to river channel and back).

- **Sea to Hume Dam Fishway Program and Assessment**

Dams and weirs often prevent successful migration of native fish species by blocking pathways to spawning habitats and feeding areas. This has contributed to substantial declines of native fish species, especially in the Murray-Darling Basin.

In order to rehabilitate the native fish communities of the Murray-Darling Basin, the Murray-Darling Basin Commission has committed to a multi-million dollar program to construct 11 fishways and restore access to over 2,000 km in the River Murray from the Hume Dam to the Sea. To determine the success of the construction program, a tri-state monitoring team was assembled (New South Wales, South Australia and Victoria) to ensure the construction program is successful.

In the first five weeks of operation over 18,000 fish from eleven species were trapped whilst migrating through the first completed fishway at Lock 8 (near Wentworth). Small fish species, such as carp gudgeon, Murray rainbowfish and un-specked hardyhead, were previously thought not to be migratory, but several thousand were trapped within the fishway. This discovery represents new biological information and new fishways are being designed to cater for these species.

Ultimately the study has identified that the Murray fishways are meeting their unique design requirement of passing both small and large fishes (from 40 to 1030 mm long) through or around large engineered structures.

2.1 Ecologically significant elements of the natural flow regime of the River Murray system are to be reinstated and maintained

- **Aquifer Recharge, Storage and Recovery**

Planning is underway for a number of Aquifer Recharge, Storage and Recovery projects across metropolitan Adelaide and the State. The projects are designed to augment local supplies and further reduce South Australia's reliance on the River Murray.

- **Living Murray Initiative - Water Recovery**

DWLBC has continued to work on recovering 35 gigalitres of water as part of South Australia's commitment to the MDBC Living Murray Initiative 'First Step' Decision, to return 500 gigalitres of additional flow to the River Murray for environmental purposes by 2009. Strategies to achieve the 'First Step' need to focus on influencing other states, both through a 'demonstration effect' of exemplary behaviour in the State and through maximising the State's influence in Basin-wide decision-making. An example of this is the recent decision by the Murray-Darling Basin Ministerial Council to enter the water market to purchase from willing sellers, an initiative which is supported by the South Australian Government.

At a local level, South Australia has continued to implement its 'First Step' Water Recovery Package, to recover 35 gigalitres of water from within South Australia. Feasibility assessments have been completed including considering market purchase of water from willing sellers, and investing in improved on-farm infrastructure for water recovery. Work is also progressing on measures to improve wetland management resulting in evaporative savings. The entry of 13 gigalitres of water onto the MDBC Eligible Measures Register was another major milestone for 2006-07.

South Australia is continuing to work with interstate partners in assessing water recovery proposals and preparing investment agreements for interstate water recovery initiatives. The Victorian Goulburn Murray Water Recovery proposal is underway, with South Australia actively involved as an investor. Work has also commenced, with Victoria, on the preparation of the Lake Mokoan investment agreement and negotiations are continuing with New South Wales for their Proposal B water recovery package for the Darling Anabranch.

- **Meter Implementation Plans for the Murraylands**

The *Murraylands Meter Implementation Plan* was drafted during 2006-07. The plan identifies three priority areas to meet the objectives of the *South Australian Licensed Water Use Metering Policy*. A schedule to offer licensees ownership of existing Government meters will take effect in 2007-08 and involves an incentive scheme to maximise uptake of the offer.

- **Rainwater Tank Plumbing Rebate Scheme**

The Government introduced the Rainwater Tank and Plumbing Rebate Scheme on 1 July 2006. Under the scheme, up to \$500,000 per year for four years will be available for plumbing a rainwater tank into homes built prior to 1 July 2006. The scheme

provides homeowners with an incentive to utilise onsite water resources that in turn reduces reliance on mains water sourced from the River Murray.

Following an initial review of the scheme, the cap for individual rebates was doubled to a maximum of \$800 up from \$400 per household in April 2007.

- **South Australia's National Water Initiative Implementation Plan**

Significant progress toward the implementation of National Water Initiative (NWI) commitments was made during 2006-07. Interstate water trading arrangements were agreed with New South Wales and Victoria that will enable an expansion of water trade in the southern Murray-Darling Basin. The South Australian Parliament passed a Bill to amend the *Natural Resources Management Act 2004* to further separate water rights in June 2007. The amendments improve the specification of water rights and will support expanded interstate water trading arrangements.

South Australia also contributed to the development of the new National Framework for Reporting on Performance of Urban Water Delivery and reported against the framework for the first time. The first report, for performance of urban water utilities in 2005-06, was published in May 2007.

- **Temporary Water Authorisations for the Eastern Mount Lofty Ranges**

Seven hundred temporary water authorisations were issued for the Eastern Mount Lofty Ranges in 2006-07. Authorisations enable existing users to continue to operate during the Notice of Prohibition that will remain in place until the Minister for Environment and Conservation adopts a water allocation plan for the region. Existing users are authorised on the basis of their irrigation activities in the three years prior to the Notice of Prohibition.

- **Water Proofing Adelaide**

The *Water Proofing Adelaide, A Thirst for Change 2005-2025* strategy released in July 2005 included 63 strategies for the management, conservation and development of Adelaide's water resources to 2025.

Implementation of the strategies will provide 37 gigalitres per annum from water conservation initiatives, and 33 gigalitres per annum from stormwater, roof runoff and recycled water by 2025.

The majority of strategies are being implemented through various activities. Some of these include:

- implementation of the State Government's policy requiring rainwater tanks to be plumbed into most houses built after July 2006, and
- enactment of the Water Efficiency Standards and Labelling Act 2006 passed in June 2006 .

The *Local Government (Stormwater Management) Amendment Act 2007* was passed in April 2007, and establishes the Stormwater Management Authority and stormwater

funding arrangements, and encourages better stormwater planning including a provision for incorporating multiple objectives of stormwater management into decision making.

- **Water Allocation Plans for the Eastern Mount Lofty Ranges**

Prescription of water resources in the Eastern Mount Lofty Ranges followed extensive consultation with the community and industry groups including public meetings, open house forums, industry meetings and information packages.

In the Eastern Mount Lofty Ranges the allocation, transfer and management of water will be guided by water allocation plans being developed by the South Australian Murray-Darling NRM Board. Development of the water allocation plans will involve extensive consultation.

Concept statements for the water allocation plans for the Eastern Mount Lofty Ranges have been approved. The statements set out the proposed content of each plan as well as the proposed public consultation process for the draft plan.

Two Water Allocation Planning Advisory Committees have been established in the Eastern Mount Lofty Ranges including members from industry and the community.

- **Wastewater Re-use**

SA Water has been involved in the design, planning and delivery of several wastewater re-use schemes (e.g. reticulation of re-used water from Bolivar Waste Water Treatment Plant to parts of Northern Adelaide for non-potable uses such as landscaping), which has the effect of reducing metropolitan Adelaide's reliance on the River Murray for non-potable water supply.

2.2 The Murray Mouth should be kept open in order to maintain navigation and the passage of fish in the area, and to enhance the health of the River Murray system and estuarine conditions in the Coorong

- **Murray Mouth**

The drought conditions being experienced in the Murray-Darling Basin continued throughout 2006-07 resulting in South Australia receiving significantly reduced flows throughout the year. Dredging is vital for maintaining an open channel for tidal flows to help maintain the health of the Coorong. At the end of June 2007, a total of 4.8 million cubic metres of sand had been removed since the project commenced. Dredging will need to be continued until at least late Spring 2008 and for a further 12 months if conditions remain dry.

Access for boats to navigate past the Murray Mouth exclusion zone was closed for Winter on 29 April 2007. Passage for vessels was maintained during the Summer period from the 2006 October long weekend to the end of April 2007 school holidays. It is anticipated that boat access will again be provided during the forthcoming summer.

2.3 Significant improvements are to be made in the connectivity between and within the environments constituted by the River Murray system

- **Interstate Water Trading Agreements**

The National Water Initiative identified expanded interstate and intrastate trade in water entitlements as a key initiative to improve water resources management across the country and required South Australia, New South Wales and Victoria to implement expanded trade across the southern Murray-Darling Basin by June 2005.

South Australia has had effective interstate water entitlement trade in place since 1983 however interstate trade has been limited to a trial project, beginning in 1998, along the main stem of the River Murray conducted under the provisions of the Murray-Darling Basin Agreement.

The expansion of interstate trade in water entitlements beyond this trial has been limited by the existing legislative requirements in each of the states and it was not possible to meet the deadline set out in the National Water Initiative. The southern Murray-Darling Basin states agreed to implement revised compatible legislation that would permit this proposed expansion of trade but it was clear that this could not be put in place before 1 July 2007 at the earliest.

In order to progress this issue on an interim basis while the necessary legislative and administrative changes were being negotiated and implemented, the relevant Ministers from NSW, Victoria and SA agreed in May 2006 to implement a Pilot Tagged Trade program. It was agreed that this program would allow licencees to 'permanently' trade water entitlements using an ongoing temporary trade process. Different legislation in each of the jurisdictions has meant that this could only be achieved through a series of bilateral agreements between the states.

A bilateral agreement was signed between SA and NSW in November 2006 and between SA and Victoria in April 2007. These agreements required very minor changes in regulations under the *Natural Resources Management Act 2004*, which have been gazetted. A similar agreement was also negotiated between NSW and Victoria.

The necessary legislative changes to permit expanded permanent interstate trade in water entitlements as required under the National Water Initiative have been passed in South Australia and ongoing administrative arrangements to facilitate this trade will be implemented as soon as practicable.

- **Living Murray Icon Sites**

South Australia's water recovery measure called 'Securing Government Held Water' was entered onto the MDBC Eligible Measures Register for The Living Murray in February 2007. This measure will recover a long-term average of 13 gigalitres of water for the environment that has historically been used for irrigation and other consumptive uses. This measure will recover nearly 40 percent of South Australia's current water recovery target of 35 gigalitres and was the first water to be made

available for environmental watering under the Living Murray Initiative, being used at the Living Murray icon sites in 2006-07. Investment in the measure by other jurisdictions has been negotiated and the measure will be fully implemented early in the next financial year.

- **National Plan for Water Security**

On 25 January 2007, the Prime Minister announced a \$10 billion, ten-point National Plan for Water Security to improve irrigation and water efficiency and to address over-allocation of water in rural Australia. Key elements of the plan include:

- nationwide investment in irrigation infrastructure to line and pipe delivery channels
- a nationwide programme to improve on-farm irrigation technology and metering
- the sharing of water savings on a 50/50 basis between irrigators and the Commonwealth, leading to greater water security and increased environmental flows
- expanding the role of the Bureau of Meteorology to provide better water data for decision-making
- a new set of national governance arrangements for the Basin
- a sustainable cap on surface and groundwater use in the Basin
- addressing water over-allocation in the Basin, and
- major engineering works at key sites.

The South Australian Government played a lead role in securing major changes to the Prime Minister's final proposal, particularly at a meeting of First Ministers on 23 February 2007. This led to important outcomes for the River Murray and the State, including the negotiation of a draft Commonwealth Water Bill and Inter-Government Agreement, which addresses the requirements for South Australian support originally set by the Premier in February 2007, for example:

- a model of governance which includes the establishment of an independent, expert-based Authority
- limited and transparent decision-making powers by the relevant Commonwealth Minister over the Authority, and
- preservation of South Australia's existing entitlement flow of 1 850 GL per annum.

3.1 Water quality within the River Murray system should be improved to a level that sustains the ecological processes, environmental values and productive capacity of the system

- **Draft Code of Practice – *Vessel and Facility Management: Marine and Inland Waters***

The Environment Protection Authority (EPA), in partnership with relevant industry groups has been finalising a draft code of practice during 2006-07 titled *Vessel and Facility Management: Marine and Inland Waters*.

Negotiations on both content and implementation issues for the draft code of practice include:

1. final recommendations for greywater discharge
2. the development of world first treatment technology for greywater
3. regulation strategies and partnerships with Transport SA
4. audits of houseboats for blackwater retainment systems
5. investigation of licensing of slipways and marinas along the River Murray
6. the design and positioning of pump-out stations
7. the development and assessment of various related planning policies and development assessments.

- **River Murray and Lower Lakes Catchment Risk Assessment for Water Quality**

The EPA, in partnership with the South Australian Murray Darling Basin Natural Resources Management Board and SA Water, completed the third stage of the River Murray and Lower Lakes Catchment Risk Assessment for Water Quality project in 2006-07. The final report was published and circulated to stakeholders in June 2007.

The information gathered by the River Murray and Lower Lakes Catchment Risk Assessment Project has since been used by responsible agencies and the community to prioritise risks and develop and implement water quality management strategies to address the risks identified.

Funding obligations for the implementation of the project have required implementation plan actions. Management strategies for five priority projects were identified during Stage three of the project.

The five priority rollout projects include:

- Implementation of the National Water Quality Management Strategy, developing regionally specific Environmental Values and Water Quality Objectives for the SA Murray-Darling Basin Natural Resources Management Board region.
- Development of a Catchment Water Quality Model for sub-catchments to the River Murray in the SA Murray-Darling Basin Natural Resources Management Board region.
- Environment Protection (Water Quality) Policy Education and Enforcement Program
- Stormwater Discharge Monitoring and Capital Works Program, focused towards high-risk SA water off-takes along the River Murray in SA.
- Wastewater Disposal Improvement Program – assessing the potential environmental impacts of unlicensed wastewater disposal sites along the River Murray in SA.

Work began on these projects during the latter part of the 2006-07 financial year.

3.2 *The impact of salinity on the ecological processes and productive capacity of the River Murray system is to be minimised*

- **Bookpurnong Salt Interception Scheme**

The new Bookpurnong Salt Interception Scheme between Berri and Loxton was officially opened on Thursday 14th September 2006 by the Premier and the Minister for the River Murray. The scheme consists of 22 bores pumping a total of about 50 litres per second and has been designed to intercept the current salt load reaching the river of about 60 tonnes per day. It has sufficient pipeline capacity to cope with an expected 220 tonnes of salt per day by 2040 and additional bores will be installed progressively as required over that time.

- **Determining the Impact of Salinity and Hydrology on Larval Fish Recruitment in the Chowilla Anabranh System**

This project entails research into the community composition and spatial and temporal variation of larval fish in lotic and lentic waters of the Chowilla Anabranh system. The project is funded by the National Action Plan for Salinity and Water Quality through the DWLBC Centre for Natural Resources Management.

- **Influences of Salinity and Water Quality on the Recruitment Dynamics of Fishes in the Lower River Murray – Larval Distribution in Relation to Habitats**

This two year project funded by the National Action Plan for Salinity and Water Quality through the Centre for Natural Resources Management (SA) involves bi-weekly larval sampling during the spring/summer season at selected sites within the main channel of the River Murray, using day and night plankton tows, larval drift nets and light traps across a range of habitat types.

A PhD candidate is currently working in conjunction with this project. As part of this work, laboratory trials have been conducted on salinity tolerance of critical life stages for key species, including callop, silver perch, freshwater catfish, flathead, dwarf flathead gudgeon, rainbow fish and carp gudgeon.

- **Land and Water Management Plan (LWMP) Case Studies**

2006-07 has seen the Land and Water Management Plan (LWMP) Case Studies consolidated with three of the four irrigator committees moving from the establishment phase to revision of LWMPs to meet the guidelines. In addition, three of the four case study districts have responded enthusiastically to the technical support offered and have carried out significant on-ground work. The Bookpurnong-Lock 4 Environmental Association were the first to commence work and have encouraged a majority of irrigators in the district to participate in the trial of on-farm irrigation recording and evaluation software. This is also true of the Pike River and Murtho Road irrigators, but to a lesser degree. All four LWMP case study committees have encouraged irrigators in their district to participate in training courses offered by the SA Murray-Darling Basin Natural Resources Management Board.

Two of the committees have endorsed these training courses by including goals in their draft LWMP's that aspire to having 100% of irrigators in the district attend the courses.

3.3 Nutrient levels within the River Murray System are to be managed so as to prevent or reduce the occurrence of algal blooms, and to minimize other impacts from nutrients on the ecological processes, environmental values and productive capacity of the system.

- **Drought Response Monitoring**

SA Water has initiated an enhanced amoeba, salinity and algal monitoring program to ensure the continuous supply of potable water under the unprecedented circumstances of the current drought. The monitoring will act as an early warning to impending water quality issues and assist in the management of those water supply systems likely to be affected.

Together with water sampling, the enhanced algal monitoring program initiated by SA Water also utilises high-resolution digital aerial imagery to help in the early detection of algal blooms in the Murray River as well as other related floodplain management issues. This involves flying the river at an optimum altitude (3 750 feet) in a specially fitted aircraft with both high resolution digital still and video cameras to rapidly survey the length of the river and create a GIS registered record that can be checked for discoloured water indicating the presence of blue-green algae. The program has been undergoing successful trials which include ground-truthing water sampling since February 2007. In addition to the algal monitoring benefits of this aerial photography, the footage is particularly useful in identifying illegal discharges and isolated algal blooms outside SA Water's jurisdiction, illegal water harvesting and the connectivity of wetlands to the river and there has been interest from other government agencies to use this aerial footage to conduct compliance monitoring.

3.4 The impact of potential pollutants, such as sediment and pesticides, on the environments constituted by the River Murray system is to be minimised

- **Off-take Exclusion Zones**

Work has been initiated to investigate the feasibility of establishing, and subject to this assessment, action the establishment of a series of exclusion zones for certain types of development and activities around drinking water supply off-take points along the River Murray. SA Water is taking the lead on the Project and DWLBC is involved as a key project partner. The project will also involve working closely with several other agencies, including the EPA, Department for Transport, Energy and Infrastructure, Planning SA, the SA Murray-Darling Basin Natural Resources Management Board and relevant River Murray councils.

- **Re-use of stormwater and drainage water**

During 2006-07 the SA Murray-Darling Basin Natural Resources Management Board invested in three wastewater reuse projects.

- **Stormwater management**

During 2006-07 the SA Murray-Darling Basin Natural Resources Management Board invested in stormwater improvement projects.

4.1 A responsive and adaptable approach to the management of the River Murray system is to be implemented taking into account ecological outcomes, community interests and new information that may become available from time to time

- **Drought Response Planning**

Drought response planning for 2006-07 included environmental impact assessment for the Milang to Clayton pipeline, preliminary assessment of the environmental impacts of a proposed temporary below Wellington, including the preparation of appropriate referral documents under the *Environment Protection and Biodiversity Conservation Act*, and the temporary closure of two wetlands near Waikerie, Jaeschke and Ross Lagoons, as part of the River Murray drought response.

- **Drought Response Measures**

During 2006-07 DWLBC provided critical scientific, technical and administrative support to a range of measures and investigations undertaken by the government as part of its short-term, emergency response to the drought. These efforts included:

- enabling licensed River Murray water users to carryover into 2007-08 up to 50% of their restricted volume for 2006-07 that was unused;
- requesting River Murray Water (in the Murray-Darling Basin Commission) to adjust River Murray flows to South Australia across the period February to May 2007 inclusive primarily to maintain the water level as high as possible in the Lower Lakes during the main irrigation season;
- temporarily closing off 27 regulated wetlands from the main river channel to reduce both the water lost through evaporation and the risk of water quality issues from highly saline and nutrient-rich water from these wetlands draining back into the river. Further unregulated water bodies, including Lake Bonney, have been, or are to be, temporarily disconnected. This work is being managed by the River Murray Environmental Manager, located with the SA Murray-Darling Basin Natural Resources Management Board;
- streamlining the approval process for applications to undertake emergency dredging to lengthen or deepen existing water supply channels or commercial ramps and jetties (in partnership with local councils and Aboriginal communities);
- providing ex-gratia relief to water licence holders in the SA Murray-Darling Basin Natural Resources Management region equivalent to 40% of the water levy payable by each licence holder;
- waiving fees normally attached to the transfer of water purchased by licensed water users to top up restricted use to 100% of their usual entitlement;
- revising water level and salinity models for the River Murray and Lower Lakes in partnership with the Murray-Darling Basin Commission; and
- providing additional compliance and enforcement effort along the River Murray.

- **Implementation Strategy for the State Natural Resources Management Plan 2006**

During the course of the 2006-07 financial year a great deal of work was undertaken to develop and progress the implementation strategy for the *State Natural Resources Management Plan 2006*. In particular, a major survey across all government organisations with links to natural resources management was undertaken in the last quarter of 2006 to collect information on roles, priorities and barriers. This base information has been revised and confirmed with each organisation with its purpose to eliminate duplication, make good any gaps and provide a clear understanding of the roles and responsibilities for progressing the strategies and milestones defined in the *State Natural Resources Management Plan*.

- **Inter-agency River Murray Working Group**

An inter-agency working group was formed in early 2005 to provide a forum for discussion and resolution of environmental and planning related issues relating to the River Murray in order to facilitate greater coordination of the functions and responsibilities of relevant government agencies.

- **Ongoing Monitoring of the Lower Lakes and Coorong**

Extensive monitoring including water levels, water quality, salinity, and ecology has been enacted on an on-going basis. Selected sites were upgraded with telemetered capability, with data managed and delivered through conventional and web-based systems. A program to complete the update of the monitoring stations in the Lower Lakes and extend the monitoring into the Coorong is currently underway, with funding from the Murray-Darling Basin Commission. Detailed monitoring of water quality, mudflats, birds, native fish and grazing within the Coorong and Lakes Ramsar Site has also been undertaken during 2006-07.

- **Review of the *Natural Resources Management Act 2004***

In accordance with statutory requirements, a review of the operation of the *Natural Resources Management Act 2004* was undertaken and forwarded to the Minister for Environment and Conservation during 2006-07. The review, which included a targeted consultation process, made 63 specific recommendations to improve the operation of the Act and its administration.

- **Review of Irrigation Legislation**

A review of the *Irrigation Act 1994* and the *Renmark Irrigation Trust Act 1936* is being undertaken to assess the Acts against contemporary water resources management objectives and to ensure full compliance with the National Water Initiative. A discussion paper was released for targeted consultation during 2006-07 and an options paper developed on the basis of the issues identified during the consultation.

- **River Murray Environmental Manager**

During 2006-07, the role and functions of the South Australian River Murray Environmental Manager were finalised and established within the SA Murray-Darling Basin Natural Resources Management Board.

The Board assumes the function of River Murray Environmental Manager (RMEM) to provide clear accountability for delivering environmental flow outcomes for the River Murray in South Australia. The RMEM will have a key strategic planning and decision-making role for environmental water delivery and management. The RMEM will also have an important role in the facilitation of on-ground projects. The RMEM also serves as South Australia's Living Murray Icon Site Manager.

- **Riverland Integrated Strategic Tourism Strategy**

The *Riverland Integrated Tourism Strategy* addresses one of the key goals of the *South Australian Tourism Plan 2003-08*, which is to 'enhance the River Murray experience'. The Strategy is a collaborative initiative between key regional stakeholders, the SA Tourism Commission and DEH.

The Strategy aims to achieve realistic growth in tourism in the region – consistent with the Riverland community's aspirations. It is a summary of what has been learnt from substantial economic, market, resource, social, landscape, environmental and planning policy investigations.

The Strategy recognises the importance of also aligning key strategic recreational and water management initiatives within the Riverland. These include the *Water Catchment Management Plan for the River Murray*, the *Biodiversity Plan for the South Australian Murray-Darling Basin*, the *SA Murray-Darling Basin Natural Resources Management Plan and Investment Strategy*, *A Sustainable Recreation Strategy for the River Murray and Lower Lakes in South Australia*, and the *Riverland Open Space, Sport and Recreation Strategy*.

- **Scum Booms**

'Scum booms' are a new water quality protection measure that was implemented over the summer of 2006-07 along the river to prevent blue-green algae entering water supply off-takes. The 'scum booms' act as curtains that prevent the accumulative of very high surface concentrations of blue-green algae adjacent to where point water is withdrawn to supply.

4.2 *The community's knowledge and understanding of the River Murray system is to be gathered, considered and disseminated in order to promote the health and proper management of the system*

- **NRM Volunteer Committee**

The SA Natural Resources Management Council established the Natural Resources Management Volunteer Committee in November 2006 to meet Goal 3 of the State Natural Resources Management Plan. The committee is skill-based and members from across the natural resources management sector were appointed following a wide call for nominations. The committee is influencing and providing strategic direction for volunteer activities in natural resources management, exploring and supporting mechanisms best carried out at a state level and influencing a consistent state-wide approach in the support provided to volunteer groups.

The Committee's priority during 2006-07 has been working with regional Natural Resources Management boards to build a statewide recognition scheme. It has established the Premier's Natural Resources Management Awards that will run concurrently with the bi-annual State Landcare Awards and will culminate in a presentation ceremony in October 2007.

- **Native Fish Strategy Presentation**

The Native Fish Strategy Coordinator provided a range of talks to the community and professional organisations throughout the year regarding the status of native fish and the Native Fish Strategy, including a Native Fish Awareness Week in March. Native Fish Awareness Week included a series of site visits and public presentations to the community designed to raise knowledge of the issues facing native fish in SA

- **National Parks and Wildlife Consultative Committees**

Consultative Committees for the Murraylands and Coorong and Lower Lakes continued to provide avenues for community input into the management of parks and reserves during 2006-07.

4.3 *The interests of the community are to be taken into account by recognising Indigenous and other cultural, and historical, relationships with the River Murray and its surrounding areas, and by ensuring appropriate participation in processes associated with the management of the River Murray system*

- **Building Community Capacity and Support for NRM in the South Australian Murray-Darling Basin**

This project continued during 2006/07 to provide resources that enable community groups and individuals to further develop their understanding and capacity to play a meaningful role in natural resource management in the South Australian Murray-Darling Basin. The project employs a team of officers with a complementary skills base to provide effective linkages between the community, government and industry.

- **Catchment Care**

This is a major community education and engagement project. Catchment Care involves:

- Water quality monitoring with 13 community groups and 42 schools at 90 sites.
- Quality control and data systems for community water quality monitoring.
- Delivering education sessions on water quality and catchment health to around 2800 students.
- Building teachers' capacity for environmental education through professional development sessions and writing four 'Teacher Resources Packs'.
- Holding forums for environmental education providers and teachers, to improve delivery and integration of environmental education in the South Australian Murray-Darling Basin. Recommendations from these forums, including mapping and printing resources, are now being progressed by working groups.
- Working in partnership with the Lions Club of Berri, Glossop High School and Berri Barmera Local Action Planning Group to develop interpretive signs about the environmental values and issues at Martins Bend.
- Mentoring students on the OzGreen MyRiver program, which involved water quality testing, identifying values, issues and concerns about the River Murray, and developing local action plans to achieve a vision for a healthy River.

- **Friends of Riverland Parks**

Supported by DEH, this community group has undertaken a range of on-ground monitoring and rehabilitation programs, including surveys of Regent Parrots, Bush-stone Curlews, pythons, possums and rabbits, and revegetating areas of Murray River National Park.

- **Indigenous Engagement**

The First Peoples of the River Murray are negotiating Indigenous Land Use Agreements over Crown Land with DEH and will soon commence in regard to National Parks and Wildlife Act Reserves.

- **Indigenous Partnerships Project**

During the 2006/07 financial year, the Indigenous Partnership project continued in the lower part of the region. Just recently a new coordinator has been appointed to take over the leadership of this project with the hope of expanding it to other regions within the Murray-Darling Basin catchment.

- **Living Murray Cultural Heritage Surveys**

DEH has been working with the *Living Murray* Chowilla Icon Site Project Team and the SA Murray-Darling Basin Natural Resources Management Board to respond to Indigenous cultural heritage surveys being undertaken on the Chowilla Game Reserve regarding activities being undertaken as part of the Chowilla Icon site.

- **River Murray Licensing Project**

The DEH River Murray Licensing Project aims to identify and license all structures in the River Murray Protection Area previously built without formal approval. Licensing commenced in 2005-06 and has continued during the 2006-07 year. It is anticipated the project will be completed within the next 12 months.

- **River Murray Youth Council**

Development of a youth council that addresses the management of the River Murray and the role of the youth is continuing. The Council builds capacity, developing informed and active young leaders who can influence their generation. The Council attended and presented at the International River Health Conference and the OzGreen MyRiver conference in Goolwa. A junior youth environment group has also been established to open a pathway between primary and secondary school students.

4.4 The importance of a healthy River to the economic, social and cultural prosperity of communities along the length of the River, and the community more generally, is to be recognised

- **Maritime Heritage Program**

This program protects and enhances community awareness of maritime heritage, including heritage along the River Murray. In 2006-07 information on maritime heritage sites was refined, updating the on-line GIS intergovernmental 'Coast Maps' and public access 'Atlas of South Australia' was updated and an audit undertaken of the maritime heritage interpretive signs along the 'River Boat Trail'.

- **River Murray Canoe Trails**

Canoe Trails are being developed within the River Murray National Park to increase public awareness of the significance of wetland areas and to sustainably manage canoe access to the environment. DEH has actively contributed to the planning and management of canoe access in a sustainable manner on and off reserves within the River Murray National Park. This includes site hardening, where access points from the river campsites have been upgraded to reduce the risk of erosion. In addition, the River Murray Canoe Trail directional signage program has been completed, in conjunction with the South Australian Tourism Commission Sustainable Recreation and Canoe SA.

- **River Murray Drought Team**

In 2006-07, the River Murray and wider Murray-Darling Basin experienced the most severe drought on record, with serious implications for many River Murray water users in South Australia and in upstream states. This led to significant water management problems for South Australia and unique challenges for management of the river.

In order to best manage the River Murray and related issues through these unprecedented conditions, DWLBC established a River Murray Drought Team. This team consisted of personnel with expertise in the areas of River Murray water

resources management, licensing, water trading, media and communications and natural resources management law.

The team provided information, advice and other practical assistance to drought-affected communities and individuals. It also provided technical support and advice to the Minister for the River Murray and Minister for Water Security, the State Government's Water Security Task Force, and other government agencies.

The River Murray Drought Team facilitated communications and community engagement programs. As part of these programs, the Government appointed the Hon Dean Brown and Hon Neil Andrew as Community Liaison Managers to provide a conduit between the Government and communities along the River Murray and Lower Lakes during the drought. The team provided technical support and advice to these managers.

- **River Murray Drought Communications and Community Engagement Program**

The reduced amount of water available in the River Murray during 2006-07 led to strong demand for regular information from all sectors of River Murray users and other affected stakeholders. The DWLBC River Murray Drought Team developed and executed an extensive communication program to meet this demand for information.

This communication program included: briefings and meetings with stakeholder and community groups; production and distribution via email networks and public meetings of frequently asked questions and answer documents on key issues (including water restrictions, a proposed temporary weir near Wellington and temporary closures of wetlands); print and radio advertising; regular articles posted on the Drought Link website and SA Drought E-Newsletter; information about the River Murray available via the SA Government Drought Hotline 180 20 20; and contributions to two series of public meetings hosted by the SA Murray-Darling Basin Natural Resources Management Board (in River Murray towns in November 2006 and June 2007).

River Murray drought pages on the department's website were also kept up to date with the latest information. These pages can be accessed via the following link: www.dwlbc.sa.gov.au/murray/rivercond/index.html

- **Sustainable Recreation Support**

Implementation of the 'Sustainable Recreation Strategy for the SA River Murray and Lower Lakes' continues through the employment of a Sustainable Recreation Coordinator. The project seeks to facilitate changes in attitude and behaviour, by encouraging respect for, and minimising recreational impacts on the riverine environment. Current initiatives include the restoration of existing degraded sites and the prevention of further damage and planning for new recreation areas or activities.

- **The River – Life on the Murray-Darling**

DEH has loaned artefacts from the *Water Witch* shipwreck (lost at Moorundie in 1842) to the Australian National Maritime Museum for a travelling exhibition: *The River – Life on the Murray-Darling*. The exhibition opened at the South Australian Maritime Museum in Port Adelaide, running from October 2006 to February 2007. With funding

from the Visions of Australia Touring Exhibition Program, the exhibition is currently touring the river regions of South Australia, Victoria and New South Wales, visiting Morgan, Deniliquin, Hay, Griffith, Sydney, Wagga Wagga and Albury before finishing in Canberra in November 2008.

- **Water Conservation Community Education**

SA Water embarked on a major program of community education to inform the public about restrictions and permanent water conservation measures. This included the “Slow the Flow” TV, radio, press and bus back advertising, a “Slow the Flow” brochure delivered to all homes in South Australia, a range of fact sheets, SA Water website updates, presentations to community and interest groups and a two day gardening industry and community event at the Adelaide Botanic Gardens. To support this campaign, SA Water also employed dedicated water conservation officers, established a 1800 hotline on water conservation, initiated a rebate scheme for water efficient household items, and formed partnerships with the Botanic Gardens of Adelaide and the Nursery & Garden Industry Association (South Australia) to educate the community about water-wise gardening. This work has continued throughout 2006-07.