



**Shepparton Irrigation Region
Implementation Committee**

**Water, Land and People
Annual Report
2005-2006**



**GOULBURN
BROKEN**
CATCHMENT
MANAGEMENT
AUTHORITY

For further information contact:

Peter Howard

Goulburn Broken Catchment Management Authority
Shepparton Irrigation Region Implementation Committee
C/o Department of Primary Industries
255 Ferguson Road
Tatura
Victoria 3616

Phone: (03) 5833 5343
Fax: (03) 5833 5299
Email: peter.howard@dpi.vic.gov.au

Published by
Goulburn Broken Catchment Management Authority
PO BOX 1752
Shepparton
Victoria 3632

Find more information about the Goulburn Broken Catchment Management Authority on the web at:
www.gbcma.vic.gov.au

Acknowledgment

This project is funded as part of the Goulburn Broken Catchment Management Authority Regional Catchment Strategy in the Shepparton Irrigation Region and is provided with support and funding from the Australian Government and Victorian Government through the National Action Plan for salinity and water quality and the Natural Heritage Trust. This project is delivered primarily through partnerships between the Department of Primary Industries, Goulburn-Murray Water, Department of Sustainability and Environment, the Goulburn Broken Catchment Management Authority, North Central Catchment Management Authority and other bodies.



Departments of
Sustainability and Environment
Primary Industries



Disclaimer

The information contained in this report is offered by the State of Victoria, solely to provide information. While the information contained in this report has been formulated with due care, the State of Victoria, its servants and agents accept no responsibility for any error, omission, loss or other consequence which may arise from any person relying on anything contained in this paper.

Contents

OUR REGION - OUR PEOPLE	2
The Shepparton Irrigation Region	2
Our People	2
What Do We Do?	2
Issues	3
Who Pays?	3
Our Organisation - Community Engagement	5

CHAIR'S REPORT	7
-----------------------------	----------

PROGRAM REPORTS.....	9
Executive Officer's Report	9
Environment Program.....	9
Farm Program	12
Surface Water Management Program	15
Sub-surface Drainage Program	16
Waterways Program	18
Research Program	21
Biodiversity Program	26
Tackling Pests Program	26
Monitoring Program	27
Program Support	27

APPENDICES	31
Outputs Achieved 2005-2006	31
Salinity Targets Achieved Since 1989.....	32
Budget & Final Expenditure 2005-2006	33
Summary of Cost Share	34
Community Salinity Grants	35
Salt Disposal Report 2005-2006	36
Presentations and Publications.....	37
Committees and Working Group Members 2005-2006	40
Program Staff 2005-2006.....	43

ABBREVIATIONS.....	45
---------------------------	-----------

ACKNOWLEDGEMENTS.....	46
------------------------------	-----------



OUR REGION - OUR PEOPLE

The Shepparton Irrigation Region

The Shepparton Irrigation Region (SIR) covers over 500,000ha and occupies approximately one third of the Goulburn Broken Catchment, the eastern area of the North Central Catchment and forms part of the Murray-Darling Basin.

The SIR includes the municipalities of City of Greater Shepparton, Moira Shire and Campaspe Shire and the major rural centres of Shepparton, Cobram, Echuca, and Kyabram.

The townships of Mooroopna, Cobram, Rochester, Numurkah, Tatura, Nathalia, Stanhope, Lockington, Murchison, Colbinabbin, Tongala, Strathmerton, Katamatite, Undera, Girgarre, and Katandra also lie within the SIR boundary.

The irrigated area of 317,000ha within the SIR utilise approximately 1.5 million megalitres of water each year and in 2005-2006 produced the gross value of production calculated at approximately \$1.38 billion. The main primary industries are horticulture, dairying, cropping, viticulture, wool, forestry and grazing.

The SIR is the centre for major food processing industry that contributes significantly to Victoria's export earnings. Companies include Kraft Foods, Fonterra Cooperative Group (Bonlac), Snow Brand Australia, Cedenco, Simplot Australia, Nestlé Australia, Unifoods, Henry Jones Foods, Tatura Milk, Murray-Goulburn, Meiji-MGC Dairy Company, SPC Ardmona, Campbells Soups Australia and Girgarre Country Foods.

Capital investment in food processing over the past 5 years has been in excess of \$600 million. Infrastructure investment by Goulburn-Murray Water alone totals \$2.6 billion.

Our People

The SIR's population is over 115,000 people and includes over 7000 rural properties, with over 20% of those being of a multicultural background.

Our region is home to the largest Indigenous population outside of metropolitan Melbourne. Cultural and linguistic diversity is a feature of the region where well established communities, primarily as a result of Southern European post-war migration, co-exist with more recently arrived communities from countries such as Iraq, Iran and India.

What Do We Do?

The SIR IC is part of the corporate and business management structure of the Goulburn Broken Catchment Management Authority (GB CMA). The GB CMA also directly manages the Biodiversity, Floodplain and River Health and Water Quality programs in the SIRCIS. The SIR IC has representatives on Co-ordinating Committees in each of these programs.

The SIR Implementation Committee (SIR IC) has the prime responsibility to deliver the program of natural resource objectives of the Shepparton Irrigation Region Catchment Strategy (SIRCIS)

The SIRCIS is a 30-year strategy that provides the framework for land, water and biodiversity management. The strategy aims to improve the condition of natural resources in the SIR for current and future community. The SIRCIS has been underway since 1989 with the whole community working in cooperation to achieve goals in the strategy.

Under the Catchment and Land Protection Act 1994 the strategy is reviewed every five years with an extensive review of natural resource management programs engaging in consultation with community based committees, State agencies, partner organisation and Local Government.

Issues

Salinity

Salinity has increased in the SIR through rising watertables and salt mobilisation, resulting in significant environmental, social and economic losses. Clearing of land and inefficient application of irrigation water has increased watertable levels. Salt mobilised by rising watertables is exported to the River Murray yearly with adverse impacts to downstream communities in the Murray-Darling Basin. Research and Development, together with the on-ground works undertaken by the Farm, Sub-surface Drainage and Community Surface Water Management programs are the major thrust against salinity under the SIRCIS in reducing accessions to groundwater and other salinity threats.

Water Quality

Contaminants including salt, nutrients from irrigation drainage, sewerage treatment plants, sediment mobilisation, urban stormwater and intensive animal industries affect the Water Quality in the SIR. The management of these contaminants is being addressed under action programs within the Catchment Strategy.

Native Biodiversity

An improvement in information available has led to a stronger understanding of the importance of biodiversity to natural and productive systems. All actions that impact on land and water impact on native biodiversity. The Catchment Strategy aims to ensure that all impacts are considered in decision-making and that biodiversity needs are an integral part of all the SIR's natural resource management programs.

Riverine Health

Storing and delivering water for urban and agricultural use has dramatically altered flow patterns of our rivers and creeks and had a direct impact on the region's aquatic biodiversity, quality of water and the waterway environment. The SIRCIS programs target threats to stream health - erosion, sedimentation and salinisation; effects from agriculture, land clearing and urbanisation; changes

to stream environment including introduction of exotic flora and fauna, de-snagging, construction of dams and barriers; river regulation and water extraction; poor river frontage management.

Pest Plant and Animals

Pest plants and animals have a negative impact on biodiversity ecosystem function and the productive capacity of the land and water resources. The SIRCIS targets declared noxious weeds such as Paterson's Curse, prairie ground cherry, silver leaf nightshade, blackberry, sweet briar, St. John's wort, Chilean needlegrass, African lovegrass and hardhead thistles. Priority pest animal species are foxes and rabbits and in the waterways European Carp are a major problem, causing turbidity, damage to stream habitat and depletion of native fish populations.

Climate Change - Greenhouse Gas Emissions

Climate change has implications for the long-term sustainability of our economy and community. The region has opportunities to assist in reducing greenhouse gas emissions that are consistent with salinity, biodiversity and water quality programs. Through revegetation programs and enhanced agricultural practices multiple benefits can be achieved.

Who Pays?

Annually, the SIR IC attracts funding of close to \$18 million with the majority of this funding going directly to on-ground works projects. The SIRCIS is funded jointly by the regional community, the Victorian, Commonwealth and Local Governments.

The SIRCIS is an integrated program of works with funds sourced from a wide area.

Regional Community

The regional community has a major commitment to implementation of the SIRCIS, both to capital projects and ongoing operation and maintenance. In 2005-2006, this was estimated at over \$40 million.

Government Funding

Government funding is provided through annual integrated budgets for the SIRCIS prepared on the basis of bids submitted by the SIR IC.

Industry Funds

Private industry also plays a significant role in the program. Powercor Australia provides substantial support to the Sub-surface Drainage Program in the form of a rebate on the cost of a pole and substation. SPC Ardmona contributes significantly to the East Shepparton Salinity Project.

Our Partners

Goulburn-Murray Water

Goulburn-Murray Water (G-MW) manages water storages and the supply and drainage channel infrastructure in the SIR. G-MW is the major partner in the delivery of the Salinity Program under the SIRCIS through the Sub-surface Drainage and Community Surface Drainage Programs.

Department of Primary Industries

The Department of Primary Industries (DPI) is responsible for delivering the key objectives of the SIRCIS in natural resource management. The DPI implements the Farm and the Environmental Protection Programs and, in conjunction with G-MW, the Community Surface Drainage and Sub-surface Drainage Programs.

Local Government

Local Government is a key partner, providing Statutory and Strategic Planning, participating in cost-sharing for the Catchment Strategy and providing a link with the broader community. Local Government jointly with the GB CMA funds a coordinator to ensure that the partnership operates effectively. This involves the Municipalities of the City of Greater Shepparton, the Moira Shire and the Shire of Campaspe.

Goulburn Valley Water

Goulburn Valley Water (GVW) provides urban water supply and wastewater services in the SIR. GVW in conjunction with the GB CMA works to minimise phosphorous (to <1 mg/L) exports from wastewater treatment plants to our river systems, improved water quality and for full reclaimed water re-use to land. GVW develops waste management plans in line with Government requirements and implements these plans to meet State Environment Protection Policy (Waters of Victoria) and the SIRCIS standards.

GVW also houses the Catchment Stormwater Officer who works in conjunction with GB CMA and all local councils throughout the SIR and catchment to improve stormwater quality through a range of structural and non-structural measures.

Goulburn Murray Landcare Network

The Goulburn Murray Landcare Network (GMLN) is a voluntary community-run forum, networking 35 landcare groups in the SIR. A sound relationship has been established between the GMLN and the SIR IC. A number of projects are also undertaken by the GMLN in partnership with the GB CMA.

The GMLN coordinates and funds regional projects such as Community Monitoring, the Drainwatch Program, the Stormwater Weed Rural Extension Program, Local Area Plans and Group Project Support. It also conducts an annual regional bus tour and Primary School Education Program. These projects enhance the high level of community participation in natural resource management.

Ethnic Council of Shepparton and District Inc

The Ethnic Council of Shepparton and District Inc (Ethnic Council) represents more than 26 culturally and linguistically diverse communities who live across the region. Formed in 1991, this strong relationship supports and services the needs of these communities in land management issues. The 60 member Ethnic Council is represented on committees and in policy development by specialist staff from within the Ethnic Council and Agencies.

SIR Farm Forestry Network

The SIR Farm Forestry Network (SIRFFN) facilitates and coordinates development and management of Private Forestry and Eco Services in the SIR. The SIRFFN works with landholders to integrate private forestry into local farming systems and rural landscapes for improved investment, social and environmental outcomes. There is a representative from the SIR IC on this program and it is closely linked to environmental and farm tree projects.

Murray Dairy

Murray Dairy was established to lead the economic and social development of the dairy industry in northern Victoria and southern NSW. This is achieved by investing industry Research & Development funds in research programs and regional development activities that benefit all stakeholders of the dairy industry and the broader community.

Murray Dairy with its partners, including the SIR IC, invests around \$2 million annually on natural resource management research and development.

Our Organisation - Community Engagement

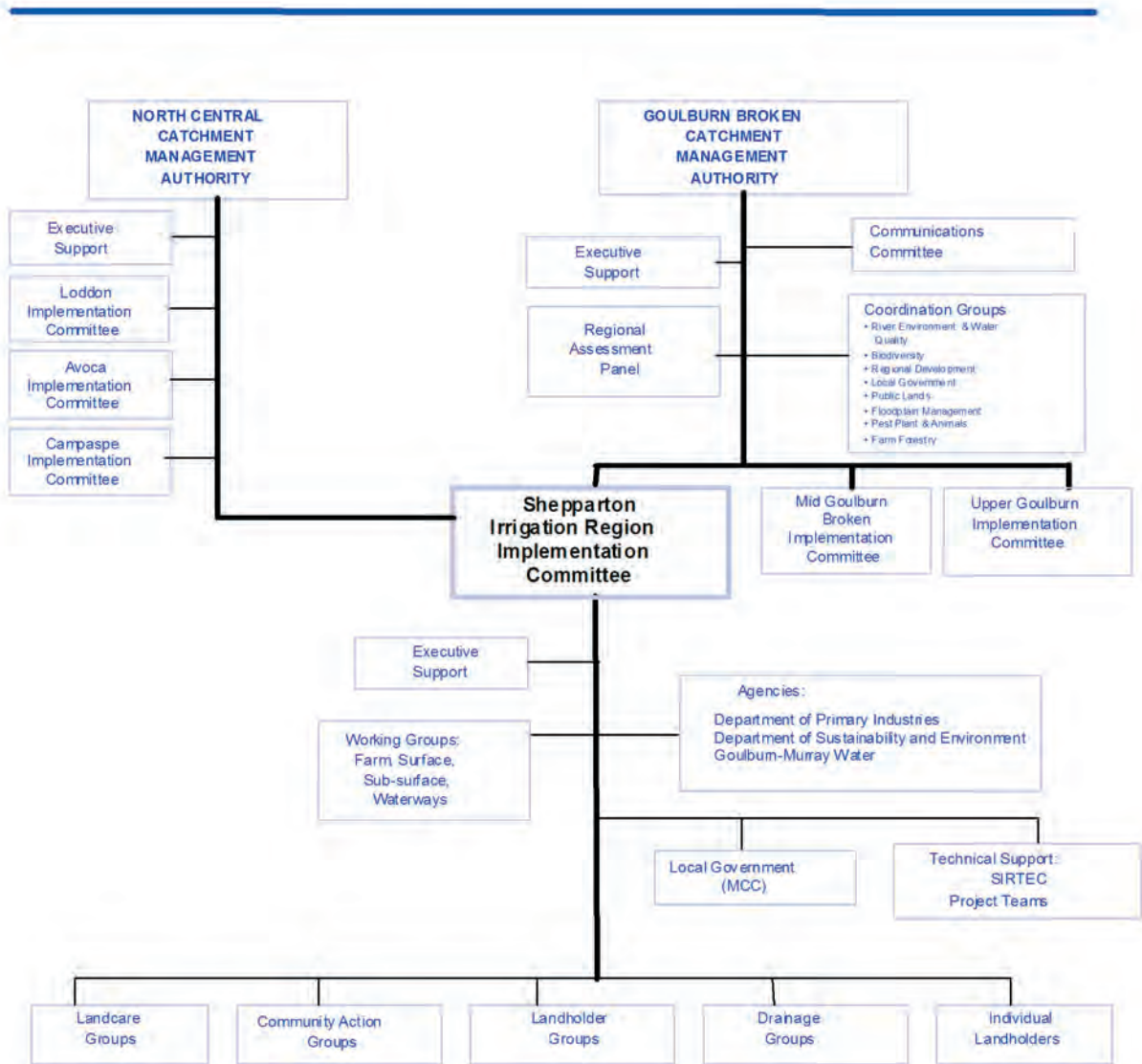
Members of the SIR IC are nominated because of their specific skills and their links to community networks. The SIR IC meets on a six week cycle throughout the year and is made up of eight community representatives and representatives from partnership agencies ie. DPI, DSE and G-MW.

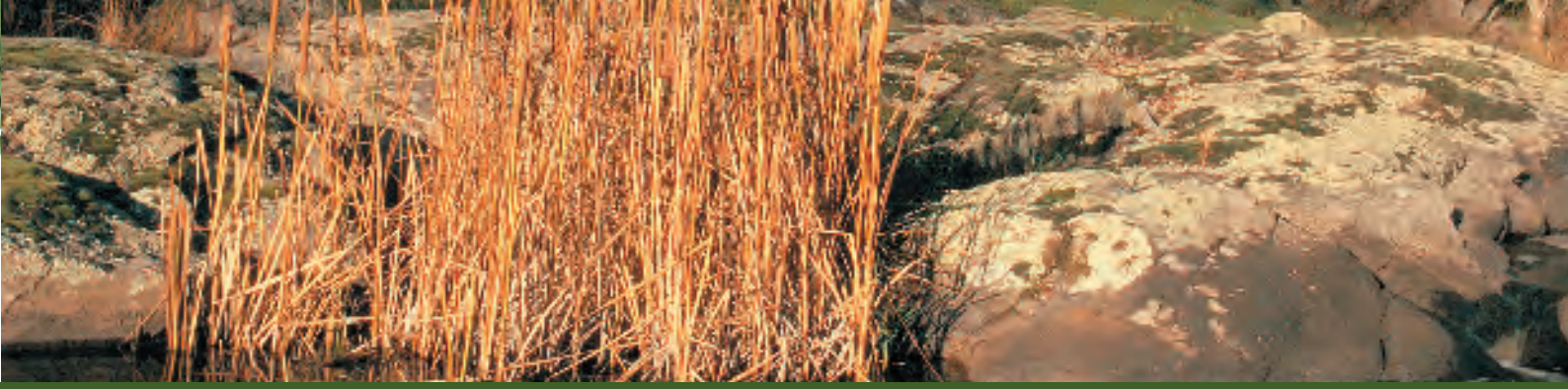
Working Groups have also been established for the four action program areas overseen by the SIR IC: Farm and Environment; Surface Water Management; Sub-surface Drainage and Waterways. Working Groups comprise community representatives (including representatives from each of the four Goulburn-Murray Water Service Committees, Victorian Farmers Federation, Local Government, environmental groups and agency representatives.

These groups manage all aspects of the particular program - budget allocation, works programs, monitoring, policy development and research. They address issues in detail so that the SIR IC can operate effectively and strategically. This process ensures strong input from all stakeholders in the partnership.

The SIR IC is supported by an Executive Support Team, which provides executive and technical advice for the implementation of the Catchment Strategy. Agency staff also provide technical input through the SIR Technical Support Committee, (SIRTEC) the working groups and specific project teams. This seemingly complex structure is essential to ensure community input and ownership of the SIR Catchment Strategy as it continues to evolve during its implementation.

Diagram 1. Management Structure for the Shepparton Irrigation Region Catchment Implementation Strategy





CHAIR'S REPORT



Peter Gibson
Chair

Shepparton
Irrigation
Region
Implementation
Committee

I am proud to report on the excellent results that the Shepparton Irrigation Region Implementation Committee (SIR IC) has achieved through the past twelve months. The outcomes are particularly impressive considering the challenges the community as a whole has faced during another very dry year across the region.

Our committee relies on the strong commitment from its community representatives and the dedication of the staff of DPI, DSE, G-MW and GVW. The strong relationship has continued to evolve during this sixteenth year of works to control salinity and improve irrigation water use efficiencies.

Committee members also represent the community as members of the various working groups that report to the Implementation Committee. They are also part of a close partnership with the Landcare groups, the Goulburn Murray Landcare Network (GMLN) and the Local Area Plan Groups.

This strong Community and Agency partnership forms an integrated approach to tackling the key natural resource issues and protecting our important natural assets across the SIR.

2005-2006 Highlights

- Achievement of all works with budget cover.
- Survey of dairy farmers in the Central Goulburn Irrigation Area shows 91% have irrigation re-use systems with 79% using these systems at most irrigations.
- Drain flow leaving the SIR is less than 3% of water delivered into the SIR. This is the fifth year running that the SIR has kept below long-term nutrient targets.
- 513,000 ML environmental allocation used to flood RAMSAR-listed Barmah-Millewa Wetland triggering a major bird, fish breeding event. Environmental flows also occurred at Brays, Reedy and Kinnairds wetlands.
- Mid-term review of the Water Smart Farms program provided a favourable report on the effectiveness and accountability of the implementation of the SIR Catchment Strategy. The mid term National Action Plan for Salinity and Water Quality (NAP) review also reports favourably on SIR activities.
- Third review of the SIR Catchment Implementation Strategy. This will feed into the GB CMA RCS in 2008 and the Victorian Sustainable Irrigation Strategy.
- Planning Scheme amendment for Murray Valley Drain II gazetted after five years of review.
- Waterway Management Plan completed for the lower Broken Creek. Following completion of the lower Broken Creek Strategy in 2004-2005 a detailed works and activity plan is developed.

- Stage Three and Drain Three of the Muckatah Surface Water Management System launched. They are part of a system that will eventually serve 60,000ha. Stage Three cost \$2.7 million and is 13.3km long. Drain Three cost \$824,000 and is 3.7 km long. Campaspe 3A Primary Surface Water Management System launched. Campaspe 3A services a catchment of 3,000ha.
- The Hon. Peter McGauran, Minister for Agriculture, Fisheries and Forestry, officiated at a celebration acknowledging sign off on the 100th Automatic Irrigation Grant in the SIR and 15 years of Incentives for Private Groundwater Pumps in the SIR.

I would personally like to commend the continued work of my fellow Committee members: Ann Roberts, Peter McCamish, Russell Pell, Allen Canobie, Steve Farrell, Nick Roberts and Nick Ryan and Agency members Terry Hunter, Bruce Cumming and Tony Long and thank them for their hard work and personal contribution.

Additionally, I would like to pay a special tribute to our Executive Officer Ken Sampson for his leadership and support. His commitment to the high level of active community participation and the partnership relationship between agencies is of vital importance. We are indeed fortunate to have Ken's immense knowledge and dedication to his role in assisting the Committee to achieve its objectives. Many thanks Ken.

Peter Gibson

Chair - Shepparton Irrigation Region
Implementation Committee



The Shepparton Irrigation Region Implementation Committee

PROGRAM REPORTS

Executive Officer's Report



Ken Sampson
Executive Officer

Shepparton
Irrigation
Region
Implementation
Committee

The year 2005-2006 has been one of achievement and progress in the implementation of the Shepparton Irrigation Region component of the Goulburn Broken Regional Catchment Strategy.

The partnership program with the Catchment and Water group of DSE is delivered with our regional partners in G-MW, DPI and DSE. The progress towards our targets for on-ground works continues to be impressive.

The support given by agency staff and the regional communities has been enthusiastic and dedicated towards achieving positive results.

Outcomes for the individual programs are detailed in the individual project reports.

Shepparton Irrigation Region Catchment Strategy Programs

- Environment Program
- Farm Program
- Surface Water Management Program
- Sub-surface Drainage Program
- Waterways Program
- Monitoring Program
- Program Support
- Research Projects
- Biodiversity Program
- Tackling Pests Program

Environment Program

Program Goal: To prevent and, where possible rehabilitate the natural environment of the Region from loss or serious damage from high Watertables and salinity.

To protect and enhance natural assets and their ecosystem processes and functions in a way that provides benefits for native biodiversity, social and economic aspects.

Activities and achievements

The Environment Program has managed a range of projects to protect and enhance natural features in the SIR. These include:-

- Environmental Incentives
- Environmental Management Systems
- Performance Standards for Natural Features
- Development of Management Plans for Wetland and Terrestrial Features
- Implementation of Recommendations

Environmental Incentives have provided support to protect over 72ha of remnant vegetation and 87ha of revegetation for corridors and understorey. Examples of some of the incentive works are:-

- Revegetation of a corridor on private land, that links a section of the Broken-Boosey State Park to the Numurkah Natural Features Reserve,
- Completion of 42ha of direct seeding, over six sites, with generally good germination rates,
- Over 13ha of remnant Plains Woodland protected on one site south of Stanhope,
- Continuing works in the Strathmerton area to protect and enhance habitat for the endangered Grey-crowned Babbler.

Both the Environmental and Tree Growing Incentives have facilitated the revegetation of native vegetation with approximately 51% being planted by direct seeding and 34km of fencing to protect native vegetation remnants and fence corridors.

Local Area Plan sub-catchments continue to account for 36% of all incentive payments and works.

Each of the ten catchments in Victoria have appointed Environmental Management Systems (EMS) Pathways Officers. The Environmental Protection Program supports the one for the Goulburn Broken Catchment. The project aims to introduce the concept of EMS across Victoria and to help landholders commence self-assessment of their enterprises to ensure continued production of high quality agricultural produce.

Closely linked to the EMS project is the development of Best Management Practices for Natural Features in the SIR. This project has produced drafts of 17 pamphlets, each of which describes a different threat to natural features and how to move towards best management practice. A draft handbook with more detailed information has also been produced. The pamphlets are intended to be given to landholders, while the handbook is primarily for extension officers to use. Presentations have been made to SIRTEC and the SIR IC. Reviews of the information contained in both are currently underway to ensure the latest and most accurate information.

The Environmental Protection Program continues to develop management plans for public land reserves and this year a plan for the Congupna Bushland Reserve has been signed off and will provide a clear view of what the needs and priorities are. A draft of the Cantwells' Bushland Reserve, (renamed Millewa Nature Conservation Reserve), has been produced and an updated draft of the Wyuna River Reserve plan has also been produced. Both plans are currently being reviewed by stakeholders prior to completion.

A draft Kanyapella Basin Management Plan has also been prepared. It has had technical review and has been presented to both SIRTEC and the SIR IC and is awaiting feedback from those forums.

As part of the Murray Valley Drain II process, a management plan is being prepared for Greens

Swamp near Picola. Consultants are developing this plan.

Brays Swamp had an Environmental Water Allocation delivered and Reedy Swamp filled after good rains raised the water levels. Monitoring indicated that Reedy Swamp had an estimated 4,000-6,000 Sacred and Straw-necked Ibis nesting and egg laying. Other species recorded were Royal Spoonbills with breeding plumage, Great Egrets, Australasian Shovellers, Blue Billed Ducks, Freckled Ducks, Cormorants and Darters. Swans, Black Ducks and little Pied Cormorants were recorded breeding at Brays and Pink Eared Ducks and Australasian Shovellers were sighted also.

Boundary fencing was completed at Mansfield Swamp. A new outlet structure was constructed at Reedy Swamp. Control of Patterson's Curse continued at the Peter Kennedy Reserve, Muckatah and planting of about 1,000 trees, shrubs and understorey by the Landcare Group, with assistance provided by the Environmental Protection Program staff.

The seven environmental monitoring sites were monitored twice, in August '05 and March '06. No major changes in data were recorded. Work is being done to update the data base to include ants as indicator species of site conditions.

Approximately 35 statutory planning cases were dealt with throughout the year with about 50% of the cases in the Greater Shepparton City Council and the remainder more or less split evenly between Moira and Campaspe shires. The cases involve subdivisions, certification of Whole Farm Plans, new developments, eg. buildings, dams, quarry activities, centre pivots and Planning Scheme amendments. All recommendations ensure the protection of surface water, ground water and soil.

Two Sub-surface Drainage Scheme environmental assessments were completed for Public Salinity Control Pumps. There were 26 final alignment checks and re-alignment assessments completed. Three site assessments ensured Surface Water

Management Works conformed to the requirements of the Environmental Protection and Biodiversity Conservation Act.

A review of the Environmental Assessment Guidelines was conducted to further align them with "Victoria's Native Vegetation Framework, Framework for Action". A presentation was made to the Stanhope Depression Panel Hearing to a Surface Water Management Scheme.

The "High Value Environmental Features (HVEF) for Groundwater" project was conducted as part of the Five Year Review for the Sub-surface Drainage Program and entailed assessing high value environmental features in the SIR and identifying groundwater threats. One hundred and six sites were located, mapped and assessed for habitat quality using a modified "habitat hectares assessment sheet". Bore data for the sites was also collected using depth to watertable and salinity readings to assess the groundwater threat. The data was put through an environmental risk assessment to calculate which of the highest value sites were most threatened by groundwater.

Development of an Environmental Impact Assessment for the Sub-surface Drainage Program was also part of the Five Year Review of the Sub-surface Drainage Program. This found that 3,000ha of natural features in the SIR had been protected by groundwater pumping.

Biodiversity Action Planning (BAP) is a project that aims to identify all the high value environmental features in a particular area, map them, conduct a habitat quality assessment and bird counts and then come up with recommendations for management. It is a way of prioritising on-ground works to target the highest priority sites. There are six BAP landscape zones in the SIR. The Yarrowonga zone is the first plan to be completed. Central Creek Landscape Zone has a draft out and work has commenced on the Barmah Landscape Zone plan.

Funding was obtained to commence implementation works in the Central Creek zone resulting in :-

- 11 grants processed,
- 15 site visits,

- 8 presentations to groups in and around the area
- production of a Bush-stone Curlew pamphlet,
- preparation of a poster on threatened species in the SIR,
- 30ha of remnant native vegetation protected and 6ha planted,
- one of the areas of remnant vegetation protected was 20.4ha of Plains Woodland with good understorey and Curlews present.

Members of the Environmental Protection Program staff were called upon to assist with fire suppression efforts at the Anakie, Kinglake and Yea-Murrundindi fires, along with attendance at local SIR fires. The plague locust outbreak saw a significant contribution in assisting control measures at Swifts Creek and a contribution was also made to helping control the fruit fly outbreak in Shepparton.

The GB CMA has established the Broken-Boosey Conservation Management Network (CMN) with DSE funding, to foster environmental protection and enhancement works, on private land around the Broken-Boosey State Park and Natural Features Reserves. The main project has been to get as many landholders in the area to be part of a fox baiting program, to improve breeding success rates for Bush-stone Curlews and Brolgas. Both these birds nest on the ground and foxes predate on eggs and chicks. With assistance from staff, the program was quite successful and did help reduce fox numbers in the area.

Staff are producing a Flora Identification booklet that provides photos of a range of native vegetation in the SIR and information about a variety of species has been prepared and presented to SIRTEC and SIR IC. The booklet will be available to the public once publishing requirements are met.

A Five year review of the SIR Environmental Protection Program has commenced consisting of an audit of the 2001 review, collation of outputs and activities from the past five years and a look at how the Irrigation Futures work can be incorporated.

Farm Program

Program Goal: To reduce groundwater accessions, soil salinisation and water-logging on farms.

Activities and achievements

Whole Farm Planning Project

The Whole Farm Planning Project achieved a total of 104 completed Whole Farm Plans covering an area of 6,234ha and for which landowners paid \$529,844. The reduction in number, down 26 on the previous year and the budgeted figure of 143, could be due to the effects of prolonged drought, a decrease in commodity prices, especially milk prices which in turn impacted on landowner finances throughout 2005-2006.

Grants totalling \$256,163 were paid to landowners to assist in preparing Whole Farm Plans and this was below the budgeted target of \$300,000. A total of 63 grants were paid to landowners who had their plans certified by Local Government, resulting in 61% of all Whole Farm Plans completed in 2005-2006 being certified, a very slight increase from 59% in 2004-2005.

During 2005-2006 a survey of landowners that had completed broad-acre Whole Farm Plans through the Whole Farm Plan project in the previous five years was conducted. The survey revealed that landowners are very positive about the processes employed in preparing the plans and the financial incentive provided. They believe that the incentives should continue. Encouragingly, 91% of those surveyed said they would encourage others to undertake a plan if asked for their opinion.

A project to evaluate the horticultural Whole Farm Plan project was also completed. A qualitative in-depth interviewing technique was used to collect the thoughts and feelings towards the program from 10 landowners that had previously undertaken a horticultural Whole Farm Plan. The project found that all of the landowners who had implemented their plan partially or entirely, were using it for post-implementation purposes.

“It just makes it so much easier. If I had to go and buy another property today, the first thing I would probably do is get a Whole Farm Plan”.

A comment made during the interviews 2005-2006.

The landowners said that they were happy with the processes used to develop their Whole Farm Plan and the incentive available.

Drainage Re-use System Project

A total of 70 drainage re-use systems were installed as part of the incentive scheme in 2005-2006 servicing 4,742ha. Since the incentive scheme started in 2001-2002, a total 9.36% of the irrigated area of the Goulburn Broken component of the SIR is serviced by a drainage re-use system.

Landowners were paid a total of \$1,601,502 for the installation of 70 drainage re-use systems on their properties. Grants totalled \$724,046. This was above the budgeted target of \$650,000. Earthworks cost \$239,848, and \$326,957 for pumps and motors. Electricity cost \$121,241.



Re-use system installed with assistance from the drainage re-use project

Automatic Irrigation Project

In 2005-2006, fourteen landowners received grants for the installation of automatic irrigation to cover an area of 577ha. Landowners paid a total of \$204,751 for installation and received grants totalling \$71,546.

Project staff organised three automatic irrigation farm walks in the SIR with more than 60 landowners participating.

In May 2006 the GB CMA celebrated the one hundredth Automatic Irrigation Grant to farmers in the SIR. John Wenske was the 100th person to receive a grant for the installation of automatic irrigation equipment.

“I can irrigate with four clicks of the mouse, ... there is no need to constantly check the progress of water down the bays. This allows us to do other things and we don't have to wake up in the middle of the night to change the water.”

John said to the gathering of people gathered to celebrate the 100th automatic irrigation grant.



John Wenske explaining the benefits of automation

Goulburn-Murray Water Farm Program Extension Services

Goulburn-Murray Water (G-MW) plays an important role as a key partner involved to ensure sustainable and safe groundwater management as a consideration in the development of Whole Farm Plans. G-MW provide technical advice for Whole Farm Plan referrals on issues relating to natural drainage for the Municipalities across the region.

G-MW project staff contribute to the overall extension services provided under the Catchment Strategy by promoting Catchment Strategy implementation, pamphlet preparation, leading and assisting in field days, tours & presentations and providing technical support to community groups. In addition, G-MW, as the lead agency responsible for the Sub-surface Drainage Program provide advice on groundwater, salinity and groundwater pumping.

Goulburn Broken Water Quality/Nutrients Program

GB CMA Water Quality Nutrient Project has been involved in the development of Whole Farm Nutrient Management Plans. These plans have taken farm nutrient management to a higher level by incorporating an array of nutrient components such as effluent, feedpads, nutrient budgeting and mapping as a “whole farm systems” approach rather than focusing on isolated nutrient issues.

Local Area Plan Program

The range of activities the Local Area Plan groups have undertaken, have varied between each group. Some common themes include roadside management, public land projects, educational activities and remnant vegetation projects.

- The Nathalia group ran three environmental education days during August and October as part of their, “Wet, Wild and Wasted” and “Survivor” programs. The days were a success and demonstrated the strong partnerships formed between the Local Area Plan group and the various agencies involved.

- The Nanneella and Timmering Action Group hosted an “Our Farm, Our Future, Our Family” farm succession planning workshop in November 2005. The day involved 12 farming families from the area and was run in conjunction with GVAgcare.
- The Muckatah, Naring and Invergordon Landcare Groups received funding in November for the control of weeds (Paterson’s Curse, blackberry and sweet briar rose). Mapping of sweet briar rose, blackberry and feral fruit trees in the Invergordon area was completed for the second year. It was noted that previous spraying was very successful with substantial lowering of blackberry.
- Over 30 facilitators, coordinators and group members, from all eight Local Area Plan groups in the SIR, met in February 2006 to discuss the implementation of their plans and share stories of achievements at a “Local Area Plan Get Together”. The meeting encouraged Local Area Planning groups to learn from the successes and challenges of others.
- The Nanneella Bushland Reserve Committee of Management completed rabbit control on the reserve and involved four other landholders.
- Muckatah Landcare Group identified three new native plants on the Peter Kennedy Grasslands Reserve.
- The Dhurringile group launched the Crouching Emu Project. This project aims to create an environmental corridor along Dhurringile Road between the Midland Highway and Toolamba/Rushworth Road.

Efficient Irrigation Technologies to Match Soils and Dairy Farming Systems

The Farm Program is working in close partnership with the research project entitled “Efficient irrigation technologies to match soils and dairy farming systems” to develop web-based extension materials for landowners in the SIR to help adopt appropriate technology in their properties.

The project organised a farm walk in March 2006 to provide an opportunity for landowners to discuss the installation and operation of centre pivot irrigation systems.



Farm walk, inspecting pivot irrigation in dairy farming

The project has identified catchment planning issues that will address the implications of pressurised irrigation systems on the natural resource issues.

The key issues are:

- Impacts of sprinkler irrigation on green house gas emissions.
- Impacts of sprinkler irrigation on power supply infrastructures.
- Water savings and reductions in deep drainage achievable under sprinkler irrigation.
- Policy recommendations relating to surface runoff under sprinkler irrigation systems.
- Impact on required surface and sub-surface drainage works in irrigation areas as a result of the uptake of sprinkler irrigation.

This information will help the Farm Program make informed decisions on investments in pressurised irrigation systems.

Surface Water Management Program

Program Goal: By 2020, improve the health of natural resources and reduce the risk to investment in the Shepparton Irrigation Region, by providing an appropriate surface water management service in areas where the total benefits, including economic, social and environmental benefits exceed the costs.

Activities and achievements

Current Climate and Challenges

Many challenges were faced by landowners within the SIR during the last financial year, with environmental conditions such as the drought, corresponding with low water allocations, impacting on the Surface Water Management Program. These environmental conditions have seen a reduction in the interest generated for removal of irrigation induced rainfall runoff.

Achievements

Whilst interest in survey and design through to construction of these systems was somewhat reduced, the program was still able to make progress towards implementing the Surface Water Management Strategy. Throughout the 2005–2006 financial year, 6.3km of Community Surface Water Management Systems (CSWMS) were built protecting 392ha of land. The Primary Surface Water Management Scheme (PSWMS) constructed 11km of service. From a design perspective, 30km of both PSWMS and CSWMS were completed as well as one pump station design.

In addition to the above outputs the program oversaw the construction of two Drainage Nutrient Removal Incentive Scheme storages, totalling 235ML of storage.

In order to ensure that all these Surface Water Management Systems were being constructed with environmental consideration, the Environmental Management Program were engaged to undertake 45–50 environmental negotiations and realignment issues. Along with these the Environmental Protection Program staff updated the Environmental Assessment Guidelines for Surface Water Management Systems.

Policy Implementation and Development

Whilst on-ground outputs for the program were slightly down, 2005-2006 was an opportunity for development of a number of new policies within the program, with a view to accelerating the outputs of the program. New policies were developed around the extension of some PSWMS with a view to shortening the length of some of the larger CSWMS, as a way of increasing landholder support by reducing the costs involved. A new version of the Surface Water Management Systems – Guidelines for Design was also finalised, which included the use of batter stabilisation as a technique to reduce nutrients from the drainage network entering the river system. This new technique was trialled on one of the new CSWMS, as well as sections of the PSWMS.

This year, we also began implementing the Memorandum of Understanding for Irrigation Drainage and Water Quality (IDMOU), signed last year. This included the development of operational plans for the proposed Stanhope Depression Drain, and a 'decision support system' trial at Broken Creek and Loddon River based upon ecological risk assessment principles. This system will be used in 2006-2007 to set targets for irrigation drainage water quality and management action in the North Central and Goulburn Broken CMA regions.

Community Engagement

The above works and policies are a result of the great work that my fellow landowners and employed staff have undertaken to progress the SWMP forwards. I would like to take this opportunity to thank all the people involved throughout the year, especially my fellow SIR IC members, members representing the Water Services Committees and those nominated community representatives. Much of the success of the program in 2005-2006 must be attributed to the on-ground staff responsible for ensuring the works are completed. To the staff from the Primary and Community Surface Water Management Program, led by Carl Walters and Daryl Eaton from G-MW and Sandra Schroen and Mark Paganini from the DPI, I congratulate you on your efforts this year in what has been a testing time.

Whilst these testing times have been difficult for landowners and staff involved in the program, there are still many challenges facing the program which will be tackled over the next few years. Work this year has commenced on a review of the Surface Water Management Strategy, which will look at the progress of the program over the past five years and set some direction for the program over the next five years leading into the next review. The current climatic conditions have ensured changes to the way the program operates and a change back to normal conditions will see many of these changes implemented in the next few years. The continual creation of Primary Surface Water Management Systems throughout the SIR will ensure that when conditions become favourable, the community side of the program will be set to implement many on-ground works.

Acknowledgements

Finally I would like to commend everyone who has had involvement with the program throughout the year, either directly or indirectly, but a big thank you must go to all the stakeholder agencies involved: DPI – Community Surface Water Management Program and Environmental Protection Program, G-MWV, Aboriginal Affairs Victoria, Environmental Protection Authority, Local Governments and SIR IC who continue to ensure the success of the program.



Allen Canobie

Chair - Surface Water Management Working Group

Sub-surface Drainage Program

Program Goal: To, where possible and justified, protect and reclaim the Shepparton Irrigation Region's land and water resources from salinisation through management of the Region's groundwater.

Activities and achievements

Overview

The Sub-surface Drainage Program (SSDP) took a proactive approach in 2005-2006 to retain:

- The rate of implementation of works with the development and implementation of a promotional program to raise interest in the Farm Exploratory Drilling Scheme which included articles and advertisements in local newspapers and field days.
- Momentum with the SSDP Research and Investigation Strategic Plan. This saw the implementation of 23 projects (including six new projects) with three projects being completed.

A highlight during the year was the celebration of 15 years of the private groundwater pumping program attended by the Federal Minister for Agriculture, Fisheries and Forestry the Honourable Peter McGauran. The celebration was combined with the achievement of the 100th automatic irrigation grant through the Farm Program.

The SSDP continues to develop the effectiveness of the Sub-surface Drainage Working Group (SSDWG) through ensuring that meetings are structured in a way to maximise the contribution of working group members in providing the strategic direction for the SSDP. A field trip to the Girgarre Evaporation Basin was organised and provided new and old members with an appreciation of some issues facing the SSDP.

The Sub-surface Drainage Coordinating Committee continues to coordinate the technical and strategic aspects of the program and support the SSDWG.

Public Groundwater Pumps

No feasibility level investigations were completed in 2005-2006, however two were in progress.

Three public pump sites were completed and handed over for management by G-MW. Construction commenced at two sites. No designs were completed.

The total salt load for disposal from the three completed sites was 948 tonnes, with a disposal impact of 0.099 EC. The rated area for the three sites was 433 ha.

Private Groundwater Pumps

Farm Exploratory Drilling Service (FEDS) investigations progressed at a moderate level of activity.

Investigations were completed on 41 pasture properties, with the following outcomes:

- 8 were successful in locating private groundwater pumping sites
- 18 were unsuccessful, but identified potential public pump sites
- 12 were unsuccessful, with very limited or no pumping potential

Private groundwater pumping has been promoted to Local Area Plan groups, and five of the investigations completed during 2005-2006 were on properties within Local Area Plan areas.

A further 27 investigations were commenced on properties, with works still in progress (none in Local Area Plan Areas).

No horticultural property investigations were completed although one investigation was in progress.

Capital Grants for Sub-surface Drainage

In 2005-2006, nine new systems and two upgrades were completed. The total grant payments made by GB CMA for "Installation and Upgrading of Groundwater Pumps" was \$171,151.

- Twelve pasture property grant payments were made to 11 individual landholders.
- Six grant payments for Private Exploratory Drilling were made.
- No horticultural property grant payments were made.

Winter/Spring Salt Disposal Management

Flow conditions in the River Murray and Broken Creek during winter/spring 2005 did not reach the trigger levels for disposal to commence.

Extension

DPI Groundwater staff worked with G-MW staff to develop a program of promotion activities for the SSDP throughout the year.

- Five groundwater theme brochures have been produced and distributed to groundwater users in the SIR.
- A simple salinity converter bookmark was produced which converts salinity readings of parts per million to Electrical Conductivity. This was circulated to all groundwater users with their groundwater sample bottle.
- A SSDP display was set up at the Goulburn Valley Machinery and Field Days in April 2006.
- A groundwater pump field day was held in February 2006 at Peter Gibson's property at Nanneella to handover Public Salinity Control Pump No: RO107.
- There was a celebration in May 2006 to recognise the achievements of 15 years of the private groundwater pump program. Federal Minister for Agriculture, Fisheries and Forestry the Honourable Peter McGauran was the guest speaker at this event, which was held on the property of local Tatura landowners John and Kerrie Poppa.
- The evaluation project looking at groundwater user attitude, behaviour and perceptions on groundwater management which is incorporated into the licence renewal process is continuing.

SIR Groundwater Management Plan

The following activities were undertaken:

- 2003-2004 Annual Report to Minister completed.
- Development of regional salinity limits for fruit crops completed.
- Development of improved data management systems completed.
- Development of management procedure completed.
- Management handed from G-MW Salinity Unit to G-MW Diversions Operations Unit completed.
- 2004-2005 Groundwater usage was assessed.
- Annual collection of groundwater samples from private pumps undertaken.

Waterways Program

Program Goal: To implement the objectives of the Goulburn Broken Regional River Health Strategy (2005-2015), a strategy that builds on existing river-related action plans, implementation plans and strategic documents, supported by a series of sub-strategies and discussion papers, to achieve the vision for Goulburn Broken Catchment rivers and streams:

VISION: ‘.....Healthy rivers, streams, wetlands, floodplains and adjacent land that support a vibrant range and abundance of natural environments, provides water for human use, sustains our native flora & fauna and provides for our social, economic and cultural values.....’

The Goulburn Broken Regional River Health Strategy aims to achieve four main objectives for the rivers and streams of the Goulburn Broken Catchment:

- *Enhance and protect the rivers that are of highest community value (environmental, social and economic) from any decline in condition;*
- *Maintaining the condition of ecologically healthy rivers;*
- *Achieving an ‘overall improvement’ in the environmental condition of the remainder of rivers;*
- *Preventing damage from inappropriate development and activities.*

Activities and achievements

Finalisation and Ministerial endorsement of the Goulburn Broken Regional River Health Strategy.

This year saw the completion and endorsement of the Goulburn Broken Regional River Health Strategy. The strategy was a major achievement, involving partner agencies and the community. It will guide River Health priorities over the next decade. A mid-term review of this strategy will be undertaken in 2010 where a detailed evaluation of the progress towards the stated goals and objectives will be undertaken.

Lower Broken Creek Waterway Management Plan

Following the successful completion of the Lower Broken Creek Strategy in 2004-2005 a detailed works and activity plan was developed for this important reach of stream. The plan reaffirmed the range of values generated in this system and provides a spatial analysis of threats to the system. This will be a key planning document in the years to come.

“RiverConnect” for Shepparton Region

“Riverconnect” is a joint concept by local natural resource management partners, Local Government and the community to highlight the values of the Goulburn and Broken Rivers in Shepparton and to encourage involvement in on-ground actions and awareness of the values these rivers provide to the local community.

Social studies: Attitudes to the Broken River – A social survey conducted in Benalla, Shepparton and Environs

A key to implementing River Health initiatives is community understanding, support and involvement. To improve our understanding of community attitudes this project was initiated to analyse how people in the local region feel about matters relating to the Broken River Basin and reveal how the community behave with respect to the river.

Key findings will be integrated into the implementation program and in the preparation of communications strategies in future years.

Monitoring

The River Health and Water Quality program participated and initiated a number of Monitoring Programs in the year. These range from snapshot monitoring through to detailed river assessments. Examples include:

- Monitoring the movement of native fish communities following the construction of Fishways on the Broken River;
- Monitoring the recruitment and movement of native fish communities in the lower Broken Creek;
- Establishment of benchmark surveys to assess changes to flora, fauna, water quality and channel morphology following changes to flow regimes in the Broken and Boosey Creeks;

Index of Stream Condition Sentinal Sites

The Index of Stream Condition (ISC) Sentinal Sites program consisted of two separate programs of ISC sites:

- 'sentinel' sites were initially assessed during 2004. The purpose of carrying out the reassessment of these sites is to detect any potential annual variations in condition scores.
- 'new' sites within the GB CMA region. Many of these sites are located on tributaries of waterways that were assessed in the 2004 round of ISC assessments. The information collected from these assessments will be used to benchmark the condition of additional reaches of stream not previously assessed within the Goulburn Broken Catchment.

Environmental Flow Determinations

Environmental Flow Determination studies were initiated for Seven Creeks to assist future planning for provision and delivery of key flow requirements for river health outcomes. Flow components together with a range of complimentary actions (riparian improvement, instream diversity and water quality) will lead to protection and enhancement of priority river reaches.

Water for the Environment

A major highlight in 2005-2006 was the largest release of water for the environment in Australia's history (approximately 510 GL), within the River Murray which produced significant environmental return for the Barmah Forest Wetland. Although at least 95% of the water returns to the river and is therefore available for downstream diversion over 55% of the wetland system was inundated. Fantastic results have been had, including:

- the re-establishment of a significant egret colony for the first time in 40 years;
- excellent native (and unfortunately exotic) fish breeding;
- good frog breeding response; and
- profuse flowering in Moira Grass plains and associated wetland community.

The results of the impact have been assessed through a variety of monitoring programs, including regular joint DSE and GB CMA aerial inspection of colonial-nesting waterbird activity and through active ground-truthing surveys.

River Health Knowledge

A range of River Health Knowledge workshops and forums were held within the catchment as part of the GB CMA knowledge exchange and capacity building program. Highlights included:

- Current research in the GB CMA region;
- Fish communities in the Goulburn River
- Sub-regional GB CMA/Murray Darling Freshwater Research Centre workshop - sharing knowledge of current research projects, frameworks and policies
- GB CMA River Health and Water Quality Program Workshop (covering Occupational Health and Safety, history of river health, impacts of willow sawfly, indigenous culture and future planning)
- Ecological Monitoring of the Broken Creek
- Impacts of managed flows on fish spawning and recruitment

Waterwatch

The Waterwatch program has been increasing community awareness and understanding of water issues in the Goulburn Broken catchment for over 10 years.

In 2005-2006 almost 5000 students participated in Waterwatch activities ranging from testing water quality and sampling macroinvertebrates to creating posters and murals for Waterweek competitions. Catchment Capers has continued with 34 schools committed to an eight month program investigating water issues in their catchment.

The community monitoring program has collected data from 250 sites through 15 networks. More than 1500 results have been entered onto the Waterwatch web-based database through its web site. An initiative in 2005-2006 has been to value-add the data through the production of comprehensive reports. The reports provide a summary of data collected and an analysis against State Environment Protection Policy (waters of Victoria) guidelines.

National Waterweek again provided an opportunity to showcase water resources in the catchment. Boat cruises, river and wetland walks, movies and competitions continued to be popular and a canoe trip on Lake Nagambie was a welcome addition to the activities. The inaugural Waterweek Awards were well attended with presentations made to competition winners and agency sponsored award winners. The GB CMA award for Outstanding Commitment to the Environment was won by Mr Don Harrison of Katunga. The 2006 festival will build on the success of 2005 and continue with the theme of "Water: The Future is in our Hands".

Water Quality Action Plan

The review of the Water Quality Strategy commenced in 2005-2006. The review aims to provide an overview of the progress of programs with respect to their water quality objectives. The review will be aligned with the five year Catchment Strategies review, currently being undertaken in the SIR.

The development of a Water Quality Plan is ongoing with the GB CMA continuing to work with neighbouring Catchment Management Authorities to develop a plan that is consistent across the catchment and aligns with the Regional River Health Strategy.

Wetlands

Planning for the protection of wetlands was given more focus in 2005-2006. Strategically, a draft methodology to rank identified wetlands and wetland systems across the Goulburn Broken region has been developed. This was supported by detailed implementation plans and mapping projects:

- "Wetland System Implementation Plan" - Broken, Boosey and Nine Mile Creeks
- Wetland Management Plan for Greens Swamp
- Design of a bio-remediation wetland and bird hides for Gemmills Swamp.

Barmah Water Management Plan and associated projects

Refinement of the hydraulic model ('training' phase), plus determining percentage of water that returns to river system after passing through the Barmah-Millewa wetlands;

- The Issues and Options report has been finalised. Additional supportive information is being sought which will utilise the recently completed vegetation mapping and hydraulic model outputs;
- The Monitoring report has been finalised, and is now being incorporated into the revised Barmah-Millewa Icon Site Plan and the MDBC Outcomes Framework document;
- The Consultation Strategy report is near completion.

Barmah Icon Site Management Plan

The next iteration of the Barmah Icon Site Plan commenced in conjunction with representatives from the DSE. Representatives from the GB CMA continued an involvement in the Coordinating Committee and the Technical Advisory Committee.

Heritage Assessments (SIR)

Following discussions with representatives from Aboriginal Affairs Victoria (AAV) the individual roles of the GB CMA and AAV with respect to Heritage Assessments has been clarified. GB CMA staff will increase their involvement in the Surface Water Management Program, as managed by the DPI.

Heritage Values - Field Assessments

A number of sites have been assessed for indigenous heritage as part of the Waterway Program. This process has provided team members with a greater insight into heritage sites and indigenous values. Formal and informal presentation on this component of our activity has been promoted through the River Health team, the SIR IC and the GB CMA Board.

Azolla Management

Broken Creek often displays extensive growth of the floating fern Azolla which is implicated in contributing to the poor water quality in the creek. This study, undertaken by the Murray Darling Freshwater Research Centre, completed a review of the current literature on the growth and ecology of Azolla, assessed the current condition of the Broken Creek (including factors that lead to Azolla growth), developed a conceptual model describing the factors that may be leading to the outbreaks and decline of Azolla and made management recommendations for the potential control of Azolla.

Weed Booklet

A GB CMA (aquatic and riparian) weeds booklet was prepared to assist landowners and agencies identify weeds which impact on the quality of riparian lands and instream habitats.

Research Program

Program Goal: The research projects summarised here seek and find new knowledge. This new knowledge supports the ongoing implementation and evolution of the Shepparton Irrigation Region component of the Goulburn – Broken Catchment Strategy. The overall program goal is to ensure sound and up-to-date Science continues to underpin the catchment strategy. It also supplies scientific analysis of issues and needs arising in the region to support decision-making. It also provides a training opportunity for young scientists in land and water management issues in a key irrigation region of Victoria. This work is carried out by research scientists and technical staff based at Tatura in the Department of Primary Industries. It is a key partnership between the Goulburn Broken Catchment Management Authority and State Government.

Activities and achievements

Improved Water Use Efficiency through Better Farm Groundwater Management Practices.

Project Summary:

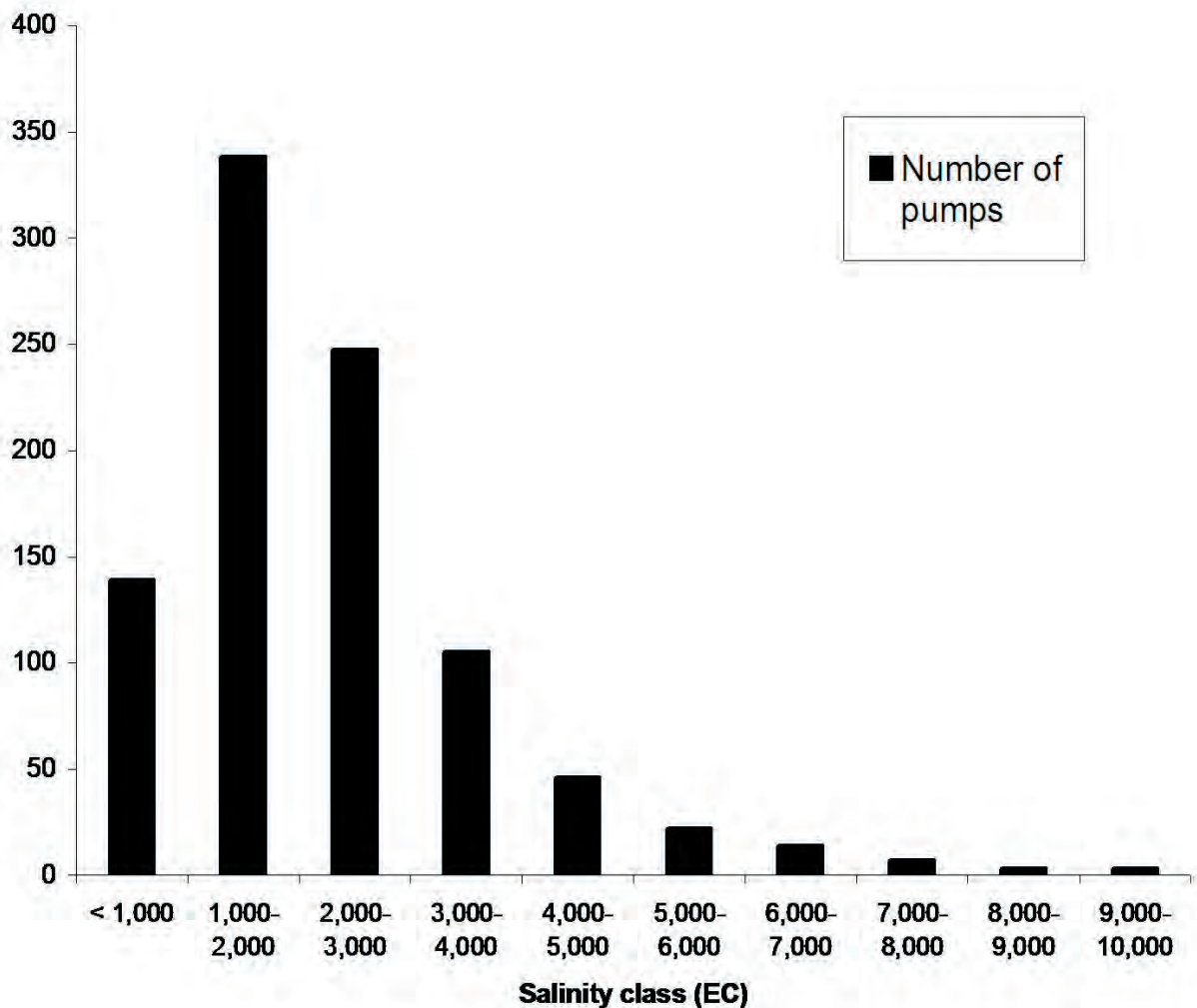
To improve regional water use efficiency by improving the sustainable beneficial use of the shallow groundwater resource underlying the Shepparton Irrigation Region. In particular, the projects aim to document how irrigators make decisions on when, how and where to use groundwater within their farming system. However, the sustainability (salinity management) goals of the catchment strategy and the decisions on farm groundwater use are sometimes in conflict. This research project probes these issues with the goal of finding ways to manage these trade-offs. This knowledge will help fine tune the management of the regional shallow groundwater resource through development of new Best Management Practices for shallow groundwater use.

Activities and achievements

Activity this year focussed on taking the results from the stage 2 study to the Sub-surface Drainage committees (community and technical support)

to develop a suite of best management practices (BMPs) for private groundwater pumps. This has included presentation of issues critical to future management and discussions of current groundwater use practices. Groundwater use in respect to current license conditions, usage observed during the 2002-2003 drought season and regional trends in groundwater usage and salinity were also presented. It also considered the potential role of market mechanisms in improving the management and utilisation of the shallow groundwater resource.

A workshop was held in April with a range of regional stakeholders to develop an understanding of how the various factors identified influence actual groundwater use. This resulted in a list of driving (positive) and restraining (negative) forces being identified. From these, BMP's will be developed and discussed for documentation in the final report of the project, to be completed by December 2006.



Graph showing the number of private groundwater pumps within each 1000 EC salinity range in the Shepparton Irrigation Region. 95% of the 1170 licensed pumps in the SIR are less than 5000 EC.

Principles for Promoting Innovative Policy Initiatives such as Market Based Instruments

The Project Leader, Geoff Kaine, and research staff, Megan Higson worked with both GB CMA and NC CMA on this project. Funding was provided through Victorian Water Trust and the project duration was July 2005 to June 2006

Project Summary:

Natural resource policy is in a continual process of change as policy makers seek ever better ways of achieving environmental objectives in regard to water quality, salinity, nutrient run-off and biodiversity. Some changes in policy reflect incremental refinement, others involve major investments in the development of innovative policy instruments, such as market-based instruments.

The development and promotion of novel policy instruments to increase the rate of progress towards achieving environmental and economic objectives is of value to CMAs and Government agencies.

However, developing and implementing such policy or market based instruments must be understood within the context of the complexity of the institutional environment into which they are being introduced. It means choosing and implementing the right mix of instruments and requires agreement between, and coordination among, a number of organisations. This study has investigated how the process of formulating and implementing innovations in natural resource policy instruments would be more effective if the organisations involved had better insights into their consequences.

Three key aspects of this study are:

1. The use of innovation theory to identify principles for systematically and deliberately managing the implementation of innovative policy instruments.
2. Using three case studies to illustrate the application of these principles.

3. Use of both case studies and innovation theory to develop guidelines to facilitate the implementation of innovative policy instruments.

Integrating Information Systems for Water Resources Management in Northern Victoria

The Project Leader, Andrew McAllister worked with research staff: Elizabeth Morse-McNabb, Richard Maxwell, Jodie Ridges and collaborators DPI – Catchment and Agriculture Services, DSE, GB CMA, NC CMA, and G-MW. Funding was sourced through Victorian Water Trust and the project duration was July 2004–June 2006.

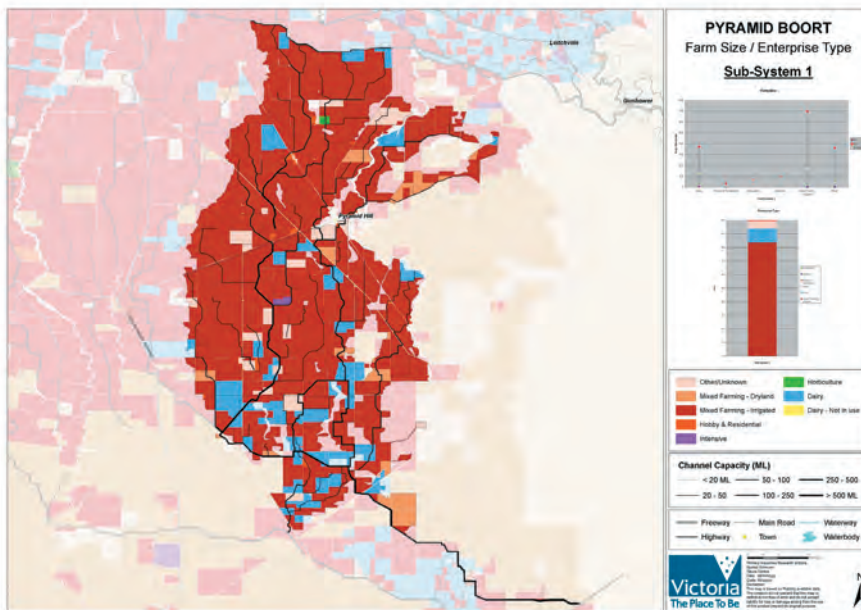
Project Summary:

Irrigation regions in Northern Victoria are confronting major land use change driven by water resource, infrastructure and land degradation issues. The 2002-03 drought, water markets, ageing infrastructure and the White Paper water reforms are all current drivers of significant change in the irrigation industries in Northern Victoria. As a result, the demand for information products that integrate natural resource information with the corporate data-sets of water authorities, including assets and customer information, has increased dramatically. In addition, remote sensing technologies now offer a range of ongoing monitoring options that enable assessment of changes in water use and management across large spatial extents.

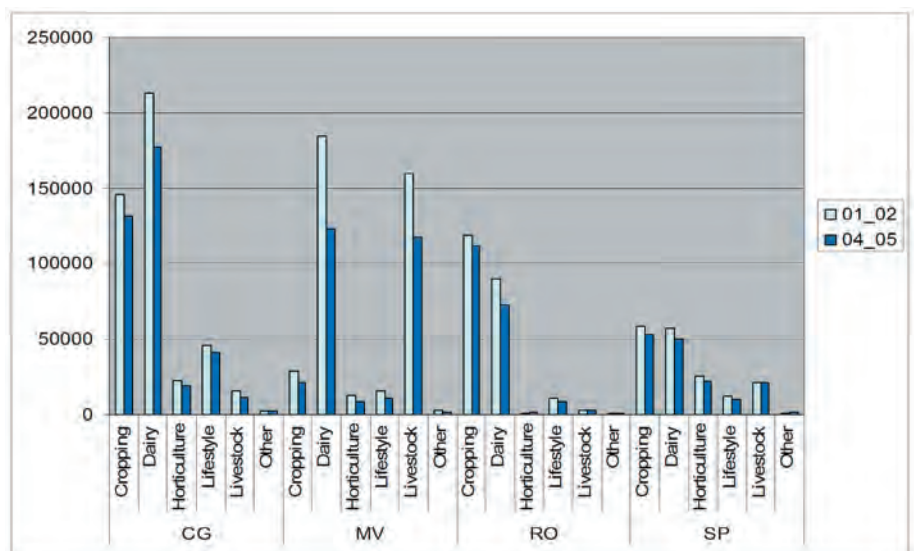
This project has sought to develop a comprehensive information framework to support the prediction, monitoring and evaluation of the impacts of water movement and use within the irrigation areas of Goulburn Broken and North Central Catchments. Key achievements of this project have been:

- A review of information needs and current systems development for DSE (ie. Water Register), G-MW (ie. asset management) and CMAs to ensure the information systems developed meet their organisational requirements and compliment existing systems.

- Development of an information framework that enables the spatial integration of key information sources and technologies including land use (Australian Department of Agriculture Fisheries and Forestry Bureau of Rural Sciences catchment scale land use mapping), agricultural enterprise (Valuer General datasets), land management (Australian Bureau of Statistics and DPI survey information), water industry business information and monitoring data (monitoring points and remotely sensed information).
- The uptake of the concepts and information developed by a range of projects and programs operating in the water sector these include such important regional programs as:
 - G-MW Reconfiguration Program
 - DSE/G-MW water use licensing
 - Channel Automation–Linking Farm, Catchment and Total Channel Control
 - DSE Water Use Efficiency Benchmarking
 - Irrigation Futures
 - Irrigation Farm Survey
 - Socio-economic impacts of water-trading



Farm Sizes and Enterprise Types for Pyramid-Boort Irrigation sub-system



Change in Water Use (ML) by Enterprise by Irrigation Area in the SIR (2001-02 – 2004-05)

Irrigation Futures of the Goulburn Broken Catchment

The Project Leader, QJ Wang and research staff, Leon Soste (Operational manager), David Robertson, Robert Chaffe; with technical staff: Sherridan Watt collaborated with the DSE Community Engagement Network on this project.

Project Summary:

Irrigation is vital to the economy of the Goulburn Broken catchment. Gross farm gate value of production from irrigated agriculture was \$1.35 billion in 2000. Investment in farm and processing infrastructure is about \$100 million per annum. Irrigation is big business, but it is also facing major challenges.

The Goulburn-Murray irrigation system needs substantial renewal in the next 20 years. Initiatives to increase environmental flows, and potential for reduced rainfall from climate changes, will impact on the water available for irrigation. Demands for responsible management of natural resources to meet the social, economic and environmental aspirations of the community are increasing.

To address these challenges, the Irrigation Futures project seeks to bring together the key stakeholders in irrigated agriculture and the regional community, to develop a shared vision for, and to make informed choices about, the future of irrigation in the Goulburn Broken catchment.

The detailed project objectives are to:

- Facilitate the development by key stakeholders of a shared vision for the future of irrigation in the Goulburn Broken catchment over the next 30 years.
- Identify scenarios of major constraints, opportunities and regional response options.
- Understand the social, economic and environmental consequences of various scenarios through impact assessment, using the best available knowledge.
- Facilitate consensus on the preferred regional options for future irrigation.
- Develop a methodology that can be applied elsewhere in Australia.

Major activities and achievements of this study to date include:

- Run workshops with over 120 regional stakeholders
- The project team has engaged with regional stakeholders in irrigated agriculture to capture regional aspirations for irrigated agriculture over the next 30 years
- Identified challenges and opportunities that the region will have to face during that period
- Developed four plausible scenarios of how the future for the region might unfold
- Developed strategies for dealing with those challenges and opportunities.

The outputs from the regional engagement process have been documented, and sent to regional agencies and interest groups. They provide an important resource for future planning in the region. The outputs then fed into Stage Three.

Communication of these outputs is being carried out through information updates to Irrigation Futures Forum participants, and briefings to stakeholders such as G-MW, GB CMA, participating Local Government organisations, Members of Parliament and major community groups.

Biodiversity Program

Activities and achievements

The GB CMA Biodiversity Program has seen a continuation of focus on Biodiversity Action Planning (BAP) during 2005-2006 in the SIR. BAP is a process that seeks to implement biodiversity conservation principles set out in the Victorian Biodiversity Strategy, by bringing it to the sub-catchment/landscape scale. To plan and implement BAP, the Goulburn Broken Catchment has been divided into 21 Landscape Zones based on social and biophysical characteristics. Within the SIR, BAP has been developed in close collaboration with, and implemented by the staff working on the Environmental Protection Program.

During 2005-2006 work has concentrated on developing an Action Plan for the Timmering and Western Goulburn Landscape Zones. This has involved identifying the 'assets' (areas of remnant vegetation on public and private land, including wetlands, grasslands and bushland), the diversity of vegetation types present across the landscape zone, and notable native flora and fauna. The key 'threats' to these assets (eg fox predation, excessive grazing pressure, weed invasion etc) were also documented, as well as actions which are designed to redress or abate these threats.

All remnants have been mapped (using aerial photos) and 100 sites were selected for ground-truthing to verify their presence and gain an overview of their biodiversity values and threats.

Notable plants identified as being a feature of the Yarrowonga Landscape Zone include a number of endangered species such as Yarran, Small-leaf Bluebush, Spiny salt-bush, Small Scurf-pea and Mueller's Daisy. Important birds include Superb Parrot, Bush-Stone Curlew, Barking Owl, Grey-crowned Babbler, and Brolga.

Communicating the results of this work has involved a number of meetings with and presentations to community groups, including information provided

to Local Area Planning Groups. This process was guided by the development of a comprehensive communications plan using a 'Bennett's Hierarchical Framework' by staff within the Environmental Protection Program.

Complete Biodiversity Action plans for this and other Landscape Zones will be prepared and distributed to local groups, Local Government and State Government agencies over the next couple of years. The information contained therein will enable groups and individuals to better target their works and other initiatives to key assets and threats. Strategic and statutory planning by Local Government and similar agencies (eg water authorities) will be greatly assisted by the availability of BAP.

The Superb Parrot Action Group continues to deliver excellent outcomes for the SIR and the Superb Parrot. The Barmah Forest and surrounds are key habitat for this bird, which is nationally endangered. The only breeding population in Victoria occurs here. Being ground feeders also, they are easy prey for foxes and cats. A key activity of the Superb Parrot Action Group is the revegetation of corridors with suitable forage plants. Although the parrot nests in hollows on mature River Red Gums, it feeds outside the forest on native shrubs and grasses found on roadsides and other remnant vegetation. Encouragingly, Superb Parrots have readily adopted the revegetated areas (52ha in 2005-2006) as additional foraging areas.

Tackling Pests Program

Activities and achievements

The Goulburn Broken Pest Plants and Animals program has undergone significant change during 2005-2006. A major review of pest plant management priorities has occurred following the completion of phase one of the Victorian Noxious Weeds Review. The Pest Plant Program now places a high emphasis on species regarded as new and emerging in the region, followed by more established

species deemed to be a high priority in a state context (Victorian Priority Weeds).

New and emerging weed species considered to be the highest priority for the region are those scheduled in the Catchment and Land Protection Act as State Prohibited species. In the SIR, these include 'camel thorn' and 'ivy-leaf sida'. Nine infestations of State Prohibited species were located and treated across the SIR during 2005-2006 and management plans are in place for their ongoing treatment.

Victorian Priority Weeds in the Goulburn Broken catchment include gorse, serrated tussock, ragwort and blackberry, with a large proportion of the DPI extension and compliance program directed to these species. In the SIR during 2005-2006, the focus was on blackberry, (although many sweet briar infestations were also treated as part of the program as the two species often infest the same areas and are treated using the same techniques).

During 2005-2006, over 40,000ha of private land was inspected by DPI staff to assess priority weed infestations. As a result, 253 landholders were requested to undertake weed management works through the issue of a Work Plan Agreement.

There were 43 landholders who failed to comply with a Work Plan Agreement and were subsequently issued with a Land Management Notice under the Catchment and Land Protection Act. All Land Management Notices were complied with to the satisfaction of the inspecting officer.

A number of significant changes also occurred in the delivery of the pest animal management program during 2005-2006. New commercially manufactured 1080 bait products were introduced for both rabbits and foxes and baits are now ordered through a state-wide hotline service.

Monitoring Program

Program Goal: To understand the water quality and quantity characteristics of surface drainage and ground water systems. To detect trends in water quality and quantity over time and identify areas requiring further investigation. To identify progress in achieving catchment strategy targets.

Activities and achievements

Surface Water

Monitoring of Surface Water Management Systems for flow and quality continued throughout the year. Flow and salinity were continuously monitored while nutrients, suspended solids, turbidity and pH were tested fortnightly. Biological monitoring was also undertaken in streams near three surface drain outfalls.

Analysis of all data was undertaken, published and reported to stakeholders.

The five-year rolling average phosphorus load continued to decline and remained below the target value for reduction of nutrient loads from irrigation drains.

Groundwater

Routine bore monitoring, database input and bore maintenance continued. Analysis of groundwater from a selection of public groundwater pumps also continued

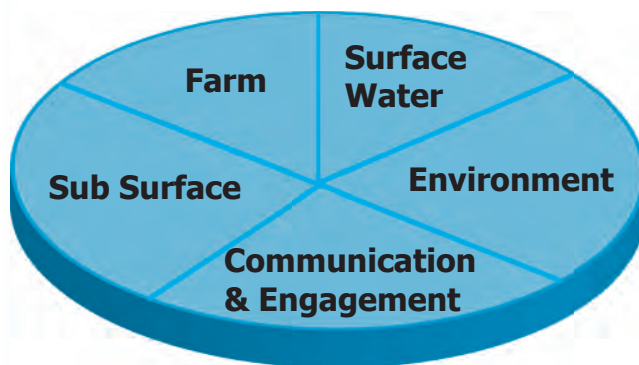
Program Support

This component of the SIR Catchment Implementation Strategy provides an overall framework to manage and coordinate delivery of all programs. Staff in this program provide administrative and technical support to all processes of the Catchment Strategy and partners.

Salinity Program Management - Department of Primary Industries

The Department of Primary Industries, Sustainable Irrigated Landscapes-Goulburn Broken program (formally Sustainable Irrigated Agriculture and Land Management) is critical to maintaining ongoing community support, participation and confidence in catchment management across the Shepparton Irrigation Region.

The people in the Sustainable Irrigated Landscapes-Goulburn Broken program have a strong commitment to the aims of the Regional Catchment Strategy that is oversighted by the Goulburn Broken Catchment Management Authority.



Sustainable Irrigated Landscapes-Goulburn Broken teams work together to deliver key parts of the GB CMA Regional Catchment Strategy

Communication and Engagement Team

People work with groups and networks to improve communication and engagement processes internally and externally to Sustainable Irrigated Landscapes-Goulburn Broken. A focus is given to improving communication with groups including women; indigenous and migrant based communities. This benefits these groups and the Shepparton Irrigation Region Catchment Strategy by improving involvement of these communities in catchment management activities.

A key role of the Communication and Engagement Team has been supporting modernisation of irrigation infrastructure in the Shepparton Irrigation

Area, in particular the East Shepparton horticultural area. This work will continue to evolve as works accelerate.

Community Surface Water Management Program

People in this program work with landowner communities and government agencies to improve regional drainage within the SIR.

Farm Team

Local Area Planning

People use innovative processes to effectively engage geographically located communities which have been assigned a high priority within the SIR.

Sustainable agriculture and water use efficiency

Working with private landowners, people support development and implementation of sustainable action plans and works using facilitation, communication and incentive methods to achieve change.

Sub-surface Drainage Extension

People run projects enhanced by strong community and agency interaction to better manage and protect groundwater resources within the region.

Environmental Management Program

People in this work group provide services to the community to protect and enhance bio-diversity within the region primarily on private land. These activities are carried out consistent with the GB CMA priorities.

The Evaluation Advisory Team

This team is represented by people from across Sustainable Irrigated Landscapes-Goulburn Broken. The Evaluation Advisory Team aims to develop and foster a culture of evaluation to demonstrate impact, improvement and appropriateness of extension in facilitating a positive change in the Goulburn-Broken Catchment. One of the major achievements was coordination and planning for the review of all programs under the SIR Catchment Implementation Strategy.

The focus and achievements of the Sustainable Irrigated Landscapes-Goulburn Broken program are underpinned by a strong partnership approach for achieving natural resource management gains. The partnership approach continues with collaboration, cost-sharing, shared decision-making, integration and an inclusive approach across agencies and communities.

Goulburn-Murray Water Program Management

Staff provide support to the SIR Catchment Implementation Strategy by ensuring the coordination of many functions including management of existing works and delivery of strategic planning projects.

Staff also supported promotion and communication of Catchment Strategy objectives through production of annual reports, performance indicators, media information and contribution to catchment partnerships.

Catchment Strategy Coordination

This key function ensures that maximum value is gained from the public funds allocated to the SIR IC and closely monitors the achievements and progress of the SIRCS.

The SIR IC attracted an integrated budget of close to \$18 million in 2005-2006. Funding was coordinated across some 50 projects and three agencies. The success of the program requires strong liaison and cooperation between agency staff to ensure works are completed on time and within budget allocations.

Community Education - Community Salinity Grants

The Community Salinity Grants program has been successfully administered across the Goulburn-Broken Catchment since 1986. It began before the Shepparton Salinity Pilot Program Advisory Committee launched the Shepparton Irrigation Region Land & Water Management Plan in 1989, and has been embraced by the current, broader, Regional Catchment Strategy introduced by the GB CMA.

The purpose of the Community Salinity Grants program is to encourage non-profit organisations to undertake activities that increase the community's awareness and understanding of salinity related issues in the catchment.

In 2005-2006, there were 16 successful grant applications in the SIR receiving a total of \$25,117.

Landcare and Local Area Planning – development

The SIR Landcare Award aims to reward a voluntary Landcare member from the SIR who has shown commitment to Landcare in the area over a period of time. Landcare volunteers ensure a sustainable future for their environment and business through weed control, remnant vegetation protection, wetland enhancement, revegetation to promote biodiversity and salinity education. This award has been developed to enable recognition of the accomplishments of Landcare members within the Shepparton Irrigation Region.

Craig Tuhan (pictured) of the Girgarre Stanhope Landcare Group was announced as the recipient of the 2005 Shepparton Irrigation Region Landcare Award at the Shepparton Irrigation Region Implementation Committee meeting in Tatura on the 9th of December 2005.



Local Area Plans will accelerate the implementation of the SIR Catchment Implementation Strategy in high priority areas. Local Area Plans form the next phase of the already highly successful community consultation and empowerment approach built for the development and implementation of the Catchment Strategy.

Municipal Coordination

The Municipal Catchment Coordinator has been employed in the Shepparton Irrigation Region since 1990. The role of the Municipal Catchment Coordinator is to ensure that Local Government is an active partner in delivery of the SIR Catchment Implementation Strategy. Further, the Municipal Catchment Coordinator demonstrates the importance of linkages between programs and Local Government.

The Municipal Catchment Coordinator provides liaison between the City of Greater Shepparton, the Shires of Campaspe and Moira and the GB CMA to communicate, coordinate and facilitate a working relationship which is regarded as one of the best examples of community-driven natural resource management in the nation.

New challenges are always emerging, many of them driven by the increasing role of local government in natural resource management. The Municipal Association of Victoria's (MAV) Victorian Local Government Environmental Management Survey - 2006, found municipalities spend almost \$600 million dollars a year on 25 different types of environmental programs. Much of this work is done outside the regional catchment investment process managed by the GB CMA, so coordination is essential to make best use of resources and achieve consistent outcomes.

Another major issue is alignment of catchment and municipal planning, particularly in issues such as land capability, riparian and biodiversity management. To this end, work commenced this year on a Local Government addendum to the regional catchment strategy, specifically to support councils in their decision-making processes.

This was also the year of Local Sustainability Accords - agreements between the State Government and municipalities about priorities for environmental sustainability. Five pilot accords are nearing completion, with the roll-out to more than 60 other councils to occur in the coming year. Municipalities in the SIR are well placed to develop

their accords because, with the support of GB CMA, most of the necessary resources are already available. Again, however, there is a great need to coordinate this activity to ensure outcomes are consistent with the SIRCS.

APPENDICES

Outputs Achieved 2005-2006


Standard GB Threat or Impact Managed	Output	Shepparton Irrigation Region		
		Target*	Achieved	% achieved
Threat				
Land and water use practices				
Stock grazing (ha = terrestrial; km = riparian)	Fence terrestrial remnant vegetation (ha)	77	145	189
	Fence wetland remnant(ha)	13	6	43
	Fence stream/river remnant (ha)	33	32	98
	Off-stream watering (no)	48	11	23
	Binding Management Agreement (license, Section 173, covenant) (ha)			
Induced Threat				
Saline water and high watertables				
<i>Surface water</i>	Landform/lasergrading (ha)	7,700	7,700	100
	Drain – primary (km)	8	11	138
	Drain – community (km)	12	6	53
	Weir – replace (no)	0	0	
	Farm reuse system (no)	55	70	127
	Drain – additional water diverted from regional drains (ML)	570	235	41
	Irrigation systems – improved* (ha)	7,700	7,700	100
	Pasture – plant (ha)	0	0	
<i>Sub-surface water</i>	New groundwater pumps – public (no)	2	3	150
	New groundwater pumps – private (new and upgrade no)	10	11	110
	Volume water pumped (ML)	1,400	1,800	129
	Tile drains – install (ha)	0	0	
	Revegetation - Plantation / Farm Forestry (ha)	0	0	
Nutrient-rich & turbid water & suspended solids	Waste water treatment plants - install (no)	0	0	
	Stormwater management projects (no)	0	0	
In-stream and near-stream erosion	Bed and Bank protection actions (km)	7	7	99
	In-stream & tributary erosion controlled (km)	0	0	
Changed flow pattern	Water allocated - eg wetlands (ML)	0	0	
Weed invasion	Weeds – woody weed management (ha)	15	27	180
	Weeds – aquatic weeds controlled/eradicated (km)	0	33	
	Landholders complying with requirements under CALP Act in targeted areas (%)	95	100	105
	Targeted infestations of weeds in high priority areas covered by control programs (ha)	46,801	41,342	88
Impact				
Habitat loss - terrestrial	Revegetation - plant natives within or next to remnants (ha)	54	93	171
	Revegetation - plant natives away from remnants (ha)	90	75	83
Habitat loss – in-stream	Fish release (nos)	0		
	Vertical slot fishway (no)	0		
	Rock ramp fishway (no)	0		
	Fish barrier removal (no)	2	3	125
	Establish SEAR (Significantly Enhanced Aquatic Refugia) (no)	1	0	0
Habitat loss – wetlands	Reinstate flood regime	0		
	Construct new wetland (ha)	2	0	0
Habitat loss – Threatened species	Threatened Species Recovery Plan and Action Statements (no projects)	0		
Planning	Whole Farm Plans (no)	153	104	68

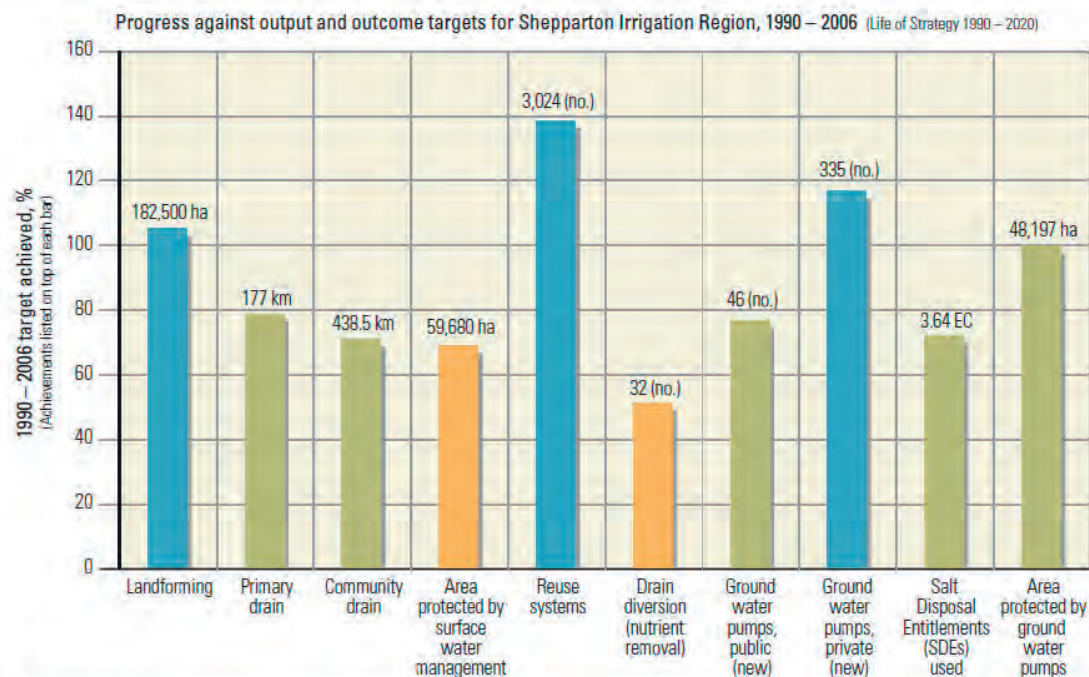
Salinity Targets Achieved Since 1989

Several actions to combat land salinisation and waterlogging have a negative impact on river salinity. However, the actions need to be completed as a package simultaneously to warrant investment from landholders. The net result is progress towards Regional Catchment Targets. These are listed as 'accountable actions' on the Murray Darling Basin Commission Salinity Register.

The levels of government funding have declined in real terms since targets were set in the 1990 SIR Land and Water Salinity Management Plan (SIRLWSMP). At the current rate of investment implementation targets will not be met until approximately 2030 (rather than 2020 as forecast in the 1990 SIRLWSMP).

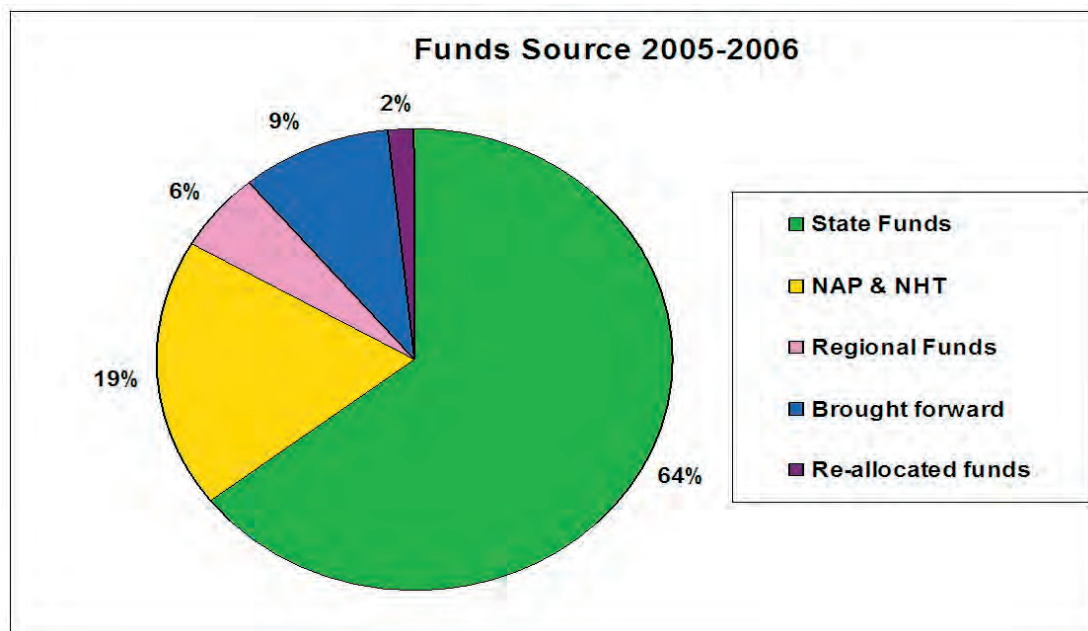
Achievement since Strategy start (1990)

Progress towards Resource Condition Targets 



Budget & Final Expenditure 2005-2006

Programs	State Funds \$'000s	Federal Funds \$'000s	Regional Funds \$'000s	Brought forward \$'000s	Re-allocated funds \$'000s	Total Budget funds \$'000s	Program Expenditure \$'000s
Tackling Pests	184	0	0	0	0	184	184
Environment	270	400	0	-7	0	663	826
Farm	1,454	626	0	237	26	2,343	1,963
Surface Water Management	1,894	2,323	75	186	0	4,478	5,477
Sub-surface Drainage	1,387	873	777	59	0	3,096	2,728
Monitoring	161	167	111	0	0	439	373
Program Support	1,639	1,694	30	665	26	4,054	4,491
Waterways	825	700	0	397	-368	1,554	1,669
Research	0	390	0	134	0	524	524
Biodiversity	0	160	0	0	0	160	160
Total SIRCS Program	7,813	7,334	993	1,671	-316	17,336	18,134



Summary of Cost Share

Partners	Annual Expenditure 2005-2006 \$	Accumulated Expenditure \$
Government	18,134,000	252,306,500
Community	37,463,210	641,944,070
Total	55,597,210	893,250,570

Note: estimates for water quality and waterways were included for the first time in the 1999/2000 report.

Government Expenditure

Includes expenditure of funds from budget allocation, plus funds transferred into the Strategy during the year. The total amount for the year was for works related to the SIRCIS.

Government expenditure has been obtained from reports on each project, provided by relevant agency. Appropriate managers, subject to verification certified the expenditure reports as correct by audit.

Community Expenditure

Regional community and landholder expenditure was derived from a survey of farmers within the SIR, and from records of government administered assistance programs.

Accumulated Expenditure

Accumulated expenditure is expressed in 2005-2006 dollars. Previous expenditure was adjusted by applying the Victorian CPI increase of 3.8% in 2005-2006.

Community Salinity Grants

Community Salinity Grants were established in 1986 to help raise awareness and understanding of salinity.

Grants are available for salinity education and demonstration projects undertaken by schools, farmers and community groups in the Goulburn Broken catchment. The scheme encourages projects that are related to local salinity management plans and strategies. Groups may apply for a grant up to a maximum of \$8,000.

Grants paid in the Shepparton Irrigation Region

Group	\$
Broken Creek Improvement Landcare Group - Nathalia	1,005
Bunbartha Kaarimba Landcare Group	987
Goulburn Broken Waterwatch – Goulburn Valley Water	5,000
Goulburn Murray Landcare Network	1,600
Goulburn Murray Landcare Network	1,251
Kyabram Secondary College	700
Mooroopna Park Primary School	1,200
Sacred Heart Primary School, Tatura	2,000
Shire of Campaspe - Campaspe Landcare Network	5,420
St. Augustine's P-10 School	810
St. Joseph's College, Echuca	800
St. Mary of the Angels Secondary College Nathalia	300
Midland Cluster Primary School – Undera Primary School	420
Wanganui Park Secondary College, Shepparton	680
Wyuna Landcare Group Inc	2,944
Total Grants paid in the Shepparton Irrigation Region 2005-2006	\$25,117

Salt Disposal Report 2005-2006

Progressive Uptake of Salt Disposal Entitlements in the SIR

Activity	Uptake of Salt Disposal Entitlements (EC)			
	Pre-1991	Total to 2004-2005	Uptake in 2005-2006	Total to 2005-2006
Primary Drains	0.055	0.444	0.000	0.444
Community Surface Drains	0.008	0.097	0.001	0.098
Public Groundwater Pumps		1.494	0.028	1.522
Private Groundwater Pumps		1.279	0.142	1.421
Horticultural Sub-surface Drainage	0.030	0.156	0.000	0.156
Total	0.093	3.470	0.171	3.641

*Includes pre-1991 impacts

Note: There was no disposal opportunity for private or public groundwater pumps during the 2005 winter-spring period. Therefore, of the potential 3.099 EC disposal from groundwater pumps, none occurred from private pumps and virtually none from public pumps. In addition, very little disposal from horticultural systems occurred, and drain flows to the River Murray continued to remain low.

Presentations and Publications

Environment

Publications

- Draft High Value Environmental Features for Sub-surface Drainage
- Draft Environmental Impact Assessment of Sub-surface Drainage
- Draft Flora of the Shepparton Irrigation Region
- Environmental Management Plan for the Congupna Bushland Reserve
- Draft Environmental Management Plan for the Millewa Nature Conservation Reserve
- Draft Environmental Management Plan for the Wyuna River Reserve
- Draft Environmental Management Plan for the Kanyapella Basin
- Yarrawonga Landscape Zone Biodiversity Action Plan

Presentations

- “High Value Environmental Features for Groundwater and the Environmental Assessment Process” and “Delivering and monitoring the impacts of Environmental Water Allocations for wetlands”, Catchment Partners Day at Tatura.
- “Managing Wetlands and the Development of Performance Indicators for Natural Features in the SIR”; to “Linking the Sciences of Research and Extension” Conference in Bendigo.

Articles and Radio Presentations

- Regular newspaper articles to the popular Bush and Land column in the Country News on topics such as direct seeding, wetlands management, weed control, protecting remnants, indigenous plants and highlighting individual species such as Royal Spoonbills, Pobblebonk frogs and the Dollar bird.
- Three ABC local radio interviews on managing wetlands, flowering Grey Box and direct seeding.

Sub-surface Drainage

Publications

- 2004-2005 Public Pump Key Performance Indicator Annual Report
- FEDS Promotion Material – Update of pamphlets,

Presentations

- 15 Years of Private Groundwater Pumping Incentives in the SIR Celebration at Poppa’s property, Tatura
- Site at Stanhope Dairy and Machinery Field Days to promote FEDS program

Waterways

Publications

- Weed Booklet - A Goulburn Broken Catchment Management Authority (aquatic and riparian) weeds booklet was prepared to assist landowners and agencies identify weeds which impact on the quality of riparian lands and instream habitats.
- Abel, N., Roberts, J., Reid, J., Overton, I., O’Connell, D., Harvey, J. and Bickford, S. (2006). Barmah Forest: a review of its values, management objectives, and knowledge base. A report to the Goulburn Broken Catchment Management Authority, Shepparton, Victoria.

- Abuzar, M. and Ward, K.A. (2006) Flood and vegetation mapping in the Barmah-Millewa Forests during October–November 2006 using satellite remote sensing technology. Report prepared for Goulburn Broken Catchment Management Authority. Department of Primary Industries, Tatura, Victoria.
- Berrill, G. (2006). Gemmills Swamp Wildlife Reserve Master Plan. Report to the Goulburn Broken Catchment Management Authority, Parks Victoria and the Greater Shepparton City Council. Thompson Berrill Landscape Design.
- Carr, G.W., Moysey, E.D., Mathews, S., Frood, D., White, M.D., McMahon, J., and Griffioen, P. (2006). Wetland Implementation Plan – Peatland and Spring-Soak Wetlands. Report to the Goulburn Broken Catchment Management Authority. Ecology Australia.
- Daryl Nielsen, Sue Botting and Wayne Tennant (2006), Re-snagging the Broken, Poster presentation to ASL conference, Albury 2006
- DSE and GB CMA. (2006). Asset Environmental Management Plan: Barmah Forest Icon Site 2006. Department of Sustainability & Environment, Benalla, and Goulburn Broken Catchment Management Authority, Shepparton.
- GBCMA. (2006). Priority Wetland in the Goulburn Broken Catchment. Goulburn Broken Catchment Management Authority, Shepparton, Victoria.
- Gigney, H., Petrie, R., Gawne, B., Nielsen D. and Howitt, J. (2006) The Exchange of Organic Material between the Murray River Channel and Barmah-Millewa Forest during the 2005/2006 Floodplain Watering. A report prepared for MDBC and GBCMA by the Murray-Darling Freshwater Research Centre.
- Hale, J. Roberts, J., Butcher, R. and Kobryn, H. (2006). Broken Boosey and Nine Mile Creeks Wetland Implementation Plan. Report to the Goulburn Broken Catchment Management Authority. Regional Ecosystem Services.
- Jane Doolan, Wayne Tennant, Elyse Reithmuller, Paul Bennett, Mick Murphy, Greg Peters and Chris Chesterfield, (2005), CPR for Rivers – The Victorian River Health Program’s approach of Caring, Protecting and Restoring. Presentation to the International Rivers Symposium, Brisbane 2005
- Lewin, K. (2006). Moodies Swamp Water Management Recommendations. Report to the Goulburn Broken Catchment Management Authority. Sinclair Knight Merz.
- McCarthy, B., Nielson, D., Baldwin, D. and Meredith, S. (2005). Barmah Wetland System Environmental Monitoring Program. Part A: Background Information. Report to the Goulburn Broken Catchment Management Authority. Murray-Darling Freshwater Research Centre.
- McCarthy, B., Nielson, D., Baldwin, D., Meredith, S., Roberts, J., King, A., Reid, J. and Ward, K. (2006). Barmah Wetland System Environmental Monitoring Program. Part B: Monitoring Program. Report to the Goulburn Broken Catchment Management Authority. Murray-Darling Freshwater Research Centre.
- McKenzie, L. (2006). Barmah Wetland Community Engagement and Communications Strategy. Report to the Goulburn Broken Catchment Management Authority. Impress Publicity.
- Peter Cottingham, Dugald Black, Stephen Blockwell, Brian Bycroft, Rhys Coleman, Jess Drake, Natasha Herron, Stuart Hoverman, Ed Pikusa, Glen Scholz, Wayne Tennant, Simon Treadwell (2006), Partner User Requirements Restoration planning and prioritisation tools project, eWater Cooperative Research Centre Project P6
- Peter Cottingham, Glen Schulz, Wayne Tennant and Natasha Herron (2006), Overview of the restoration planning and prioritisation tools project, eWater Cooperative Research Centre, Melbourne
- Ward, K.A. & O’Connor, P.G. (2006) Adaptive monitoring of an Environmental Water Allocation in the Barmah wetlands for adaptive management: 2005-06. Goulburn Broken Catchment Management Authority, Shepparton, and Department of Sustainability & Environment, Tatura.

- Ward, K.A. (2005). Water management in the changing Barmah-Millewa wetlands. Proceedings of the Royal Society of Victoria 117(1): 77-84. ISSN 0035-9211.
- Water Technology. (2005). Barmah-Millewa Forest Hydrodynamic Model. Report to the Goulburn Broken Catchment Management Authority.
- Wayne Tennant and John Pettigrew (2006) Environmental impacts of Water Trading with-in the Murray Darling Basin – A Scenario for the lower Goulburn River, Presentation to ANCID Conference, Darwin 2006

Monitoring

Publications

- SKM (2006), Shepparton Irrigation Region and Campaspe West Drain Nutrients Annual Review 2004/05 (C806 & T035)
- Ecowise Environmental (2005), Biomonitoring of the Impacts of Discharges from Irrigation Drains 2004/05

Research

Publications

- Morris, M and Gill, B (2005). Towards Best Management Practices for Groundwater Pumping and Re-use in the Shepparton Irrigation Region. Department of Primary Industries technical report.

Presentations

- Presentation of the Stage 2 report “Towards Best Management Practices for Groundwater Pumping and Re-use in the Shepparton Irrigation Region” to Sub-surface Drainage Working group in December 2005
- Workshop using a ‘Driving and Restraining Forces’ format was run in April 2006 to provide the foundation for finalising the development of Best Management Practices.

Committees and Working Group Members 2005-2006

Shepparton Irrigation Region Implementation Committee Members

Voting Members Community Representatives	Non-Voting Members Agency Representatives	Executive Support Agency Staff
Russell Pell - (Chair) Numurkah Peter Gibson (Deputy Chair) Nanneella Allen Canobie - Numurkah Stephen Farrell - Echuca Peter McCamish – Ardmona Nick Ryan – Lancaster Ann Roberts – Shepparton Nick Roberts – Tatura	Bruce Cumming - DPI Terry Hunter – G-MW Tony Long - DSE	Ken Sampson – GB CMA Peter Howard – GB CMA Pam Collins – DPI Ross Plunkett – G-MW David Lawler – DPI Alex Sislov – DPI Geoff Lodge – DPI Colin James - GB CMA Wayne Tennant- GB CMA

Attendance Record

Name	05-5	05-6	05-7	05-8	06-1	06-2	06-3	06-4
Russell Pell	Yes	Yes	Apol	Yes	Apol	Apol	Yes	Apol
Steve Farrell	Yes	Apol	Yes	Yes	Yes	Apol	Yes	Yes
Allen Canobie	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Ann Roberts	Yes	Apol	Yes	Yes	Yes	Apol	Apol	Yes
Peter McCamish	Yes	Yes	Apol	Yes	Yes	Yes	Yes	Yes
Nick Roberts	Yes	Yes	Yes	Apol	Yes	Yes	Apol	Apol
Peter Gibson	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Nick Ryan	Apol	Yes	Apol	Apol	Yes	Yes	Apol	Yes

Working Group Members

Group	Voting Member	Non-Voting Member
SIR Technical Support Committee (SIRTEC)	Allen Canobie – SIR IC Russell Pell – SIR IC Ken Sampson – GB CMA Ross Plunkett – G-MW Peter Dickinson – G-MW Greg Smith – G-MW Bruce Cumming – DPI Geoff Lodge – DPI David Lawler – DPI Steve Lottkowitz – DPI Wayne Tennant – GB CMA Colin James – GB CMA Bruce Gill - DPI	Peter Howard – GB CMA Pam Collins – DPI Corresponding Members Grant Jones – EPA Laurie Gleeson – GVW Peter Gray – NVFGA
Budget Sub-Committee	Allen Canobie Peter McCamish Peter Gibson Steve Farrell	Ken Sampson – GB CMA Peter Dickinson – G-MW Greg Smith- G-MW James Burkitt – G-MW Peter Howard – GB CMA Pam Collins – DPI
Sub-surface Drainage Working Group	Kevin Chapman Ian Whatley George Trew Bruce Cumming Peter McCamish Peter Dickinson Brian Gledhill Alan Strang Heather du Vallon Gordon Weller Rein Silverstein Peter Gibson	Terry Hunter - G-MW Jen Pagon/Terry Batey- DPI Bruce Gill - DPI Ken Sampson – GB CMA Colin James – GB CMA

Surface Water Management Working Group	Allen Canobie Geoff Witten Peter Gibson Ron Brooks Mick Trevaskis Hank Sanders Stephen Farrell	Mark Paganini – DPI Ken Sampson – GB CMA Pam Collins – DPI Colin James – GB CMA
Farm Working Group	John Cornish John Pettigrew Jim McKeown Ann Roberts Ian Klein Les Langley Ashley Walker Peter Gibson Rien Silverstein Roger Wrigley Bruce Cumming Alan Lavis George Trew Vera Fleming	Ken Sampson – GB CMA David Lawler – DPI Colin James – GB CMA
Waterways Working Group	Russell Pell Ron Pearce Allen Sutherland Bill Probst Tait Hamilton Nick Roberts	Bruce Cumming – DPI Silvio Fontana – GB CMA David Trickey – Parks Vic Alex Sislov – DPI Ken Sampson - GB CMA Peter Howard – GB CMA Colin James – GB CMA

Program Staff 2005-2006

SIR IC acknowledges the valuable contribution and dedication of the staff of our partnership Agencies throughout the past year.

Tackling Pests

Drew Gracie	DPI
Greg Wood	DPI

Biodiversity

Tim Barlow	GB CMA
------------	--------

Environment

Fiona Copley	DPI
Jo Deretic	DPI
Nickee Freeman	DPI
Rebecca Heard	DPI
Dan Hunter	DPI
Suzanne Johnstone	DPI
Allison McCallum	DPI
Neil McLeod	DPI
Andrew Morrison	DPI
Joel Pike	DPI
Alex Sislov	DPI
Kathryn Stanislawski	DPI

Farm

David Lawler	DPI
Clair Haines	DPI
Alan Lavis	DPI
Rebecca Lukies	DPI
Rabi Maskey	DPI
Chelsea Nicholson	DPI
Chris Nicholson	DPI
Libby Reynolds	DPI

Surface Water Management

John Bouchier	DPI
Shane Byrne	DPI
Leith Chalmers	DPI
Georgie Fraser	DPI
Liz Maclean	DPI
Emily Maher	DPI
Kym Ockerby	DPI
Mark Paganini	DPI
Jen Pagon	DPI
Sandra Schroen	DPI
Jaclyn Tomlinson	DPI
Sue Ward	DPI
John Tunn	AAV
Michael Green	AAV
Daryl Eaton	G-MW
Carl Walters	G-MW
Sam Green	G-MW
John Owen	G-MW
Chris Guthrie	G-MW
Robert O'Meara	G-MW

Sub-surface Drainage

James Burkitt	G-MW
Brendan Cossens	G-MW
Leanne Dempster	G-MW
Peter Dickinson	G-MW
Stephen Fiess	G-MW
Terry Hunter	G-MW
Chris Howard	G-MW
Samantha Longley	G-MW
Ray Modystack	G-MW
Helen O'Dwyer	G-MW
Chris Solum	G-MW
Melissa Turpin	G-MW
Andy Yeomans	G-MW
Clair Haines	DPI
Martin Brownlee	G-MW/SKM

Monitoring

Pat Feehan	G-MW
Stephen Lawless	G-MW
Rod McQueen	G-MW
Mark Newton	G-MW
Erin Simpson	G-MW
Greg Smith	G-MW

Program Support

Lyndall Ash	DPI
Raechel Ballinger	DPI
Terry Batey	DPI
Candy Carter	DPI
Pam Collins	DPI
Bruce Cumming	DPI
Julie Engstrom	DPI
Olive Monticello	DPI
Rhonda McKie	DPI
Malwinder Pandher	DPI
Rachael Spokes	DPI
Ken Sampson	GB CMA
Andrea Smith	GB CMA
Peter Howard	GB CMA
Colin James	GB CMA

Waterways

Simon Casanelia	GB CMA
Jim Castles	GB CMA
Silvio Fontana	G-MW
Christine Glassford	GB CMA
Fleur Jaques	GB CMA
Tony Kubeil	GB CMA
Scott Morath	GB CMA
Gordon O'Brien	GB CMA
Tom O'Dwyer	GB CMA
Justin Sheed	GB CMA
Wayne Tennant	GB CMA
Guy Tierney	GB CMA
Lou Torelli	GB CMA
David Trickey	DPI
Richard Warburton	GB CMA
Keith Ward	GB CMA
Corey Wilson	GB CMA

Research

Susan Barker	DPI
Matthew Bethune	DPI
Kim Broadfoot	DPI
Peter Clayton	DPI
Tony Cook	DPI
David Cornwall	DPI
Ruth Duncan	DPI
Bruce Gill	DPI
Richard Maxwell	DPI
Andrew McAllister	DPI
Brijesh Mehta	DPI
Mike Morris	DPI
Brian O'Meara	DPI
David Robertson	DPI
Leon Soste	DPI
Ninghu Su	DPI
Alister Terry	DPI
Sonia Wakenshaw	DPI
John Ford	DPI
Fiona Johnson	DPI
Melinda Leth	DPI
Ruth Lourey	DPI

ABBREVIATIONS

AAV	Aboriginal Affairs Victoria
ANCID	Australian National Committee on Irrigation and Drainage
CaLP	Catchment and Land Protection
CMA	Catchment Management Authority
CRC	Cooperative Research Centre
DPI	Department of Primary Industries
DSE	Department of Sustainability & Environment
EMS	Environmental Management System
EPA	Environment Protection Authority
FEDS	Farm Exploratory Drilling Scheme
GIS	Geographical Information System
GMLN	Goulburn Murray Landcare Network
G-MW	Goulburn-Murray Water
MDBC	Murray-Darling Basin Commission
NHT	Natural Heritage Trust
RCS	Regional Catchment Strategy
SIR	Shepparton Irrigation Region
SIR IC	Shepparton Irrigation Region Implementation Committee
SIRCIS	Shepparton Irrigation Region Catchment Implementation Strategy
SIRTEC	Shepparton Irrigation Region Technical Support Committee
SKM	Sinclair Knight Merz
SPC	Shepparton Preserving Company
SSDP	Sub-surface Drainage Program
SSDWG	Sub-surface Drainage Working Group

ACKNOWLEDGEMENTS

A number of people have assisted Ken Sampson in the preparation of the 2005-2006 Implementation Committee Annual Report. The efforts of these people and their staff have been greatly appreciated.

Implementation Committee

Peter Gibson, Chair

Peter McCamish, Deputy Chair

Implementation Committee Members

Goulburn Broken Catchment Management Authority

Peter Howard

Wayne Tennant

Carl Walters

Department of Primary Industries

Lyndall Ash

Raechel Ballinger

Terry Batey

Sheree Burke

Bruce Cumming

Bruce Gill

Rebecca Heard

David Lawler

Goulburn-Murray Water

Peter Dickinson

Terry Hunter

James Burkitt

Daryl Eaton

Greg Smith

Photographs used in the Annual Report were gratefully received from the staff of Goulburn Broken CMA, Department of Primary Industries and Goulburn-Murray Water staff.

The GIS Group at DPI Tatura produced maps used in this report.

