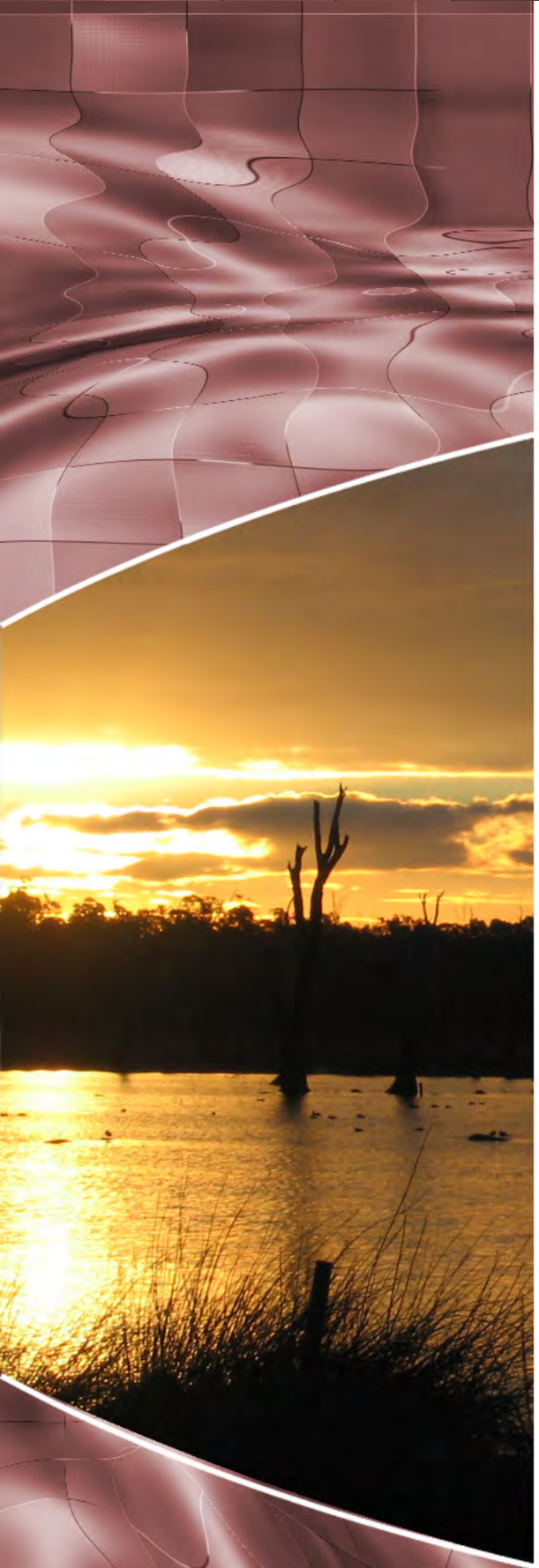

Shepparton Irrigation Region
Implementation Committee

Water, Land and People

Annual Report

2006-2007

GOULBURN BROKEN
CATCHMENT MANAGEMENT AUTHORITY

Published by the 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

ISSN: 1440 - 981X

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Partnership Statement
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.

Department of Sustainability and Environment
Department of Primary Industries

Contents

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 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 2006-2007 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 to 25% of 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.

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 Implementation Committee (SIR IC) is part of the corporate and business management structure of the Goulburn Broken Catchment Management Authority (GB CMA). The GB CMA also is directly responsible for the management and implementation of the Biodiversity, Floodplain and River Health and Water Quality programs in the SIR. The SIR IC has representatives on Coordinating Committees in each of these programs. The SIR IC has the prime responsibility to deliver the program of natural resource objectives of the Shepparton Irrigation Region Catchment Implementation 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 and has been underway since 1989 with the whole community working in cooperation to achieve SIRCIS goals.

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 organisations 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. Annually, salt mobilised by the rising watertables is

exported to the River Murray 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 Water Quality in the SIR. Management of these contaminants is being addressed under action programs within the SIRCIS.

Native Biodiversity

An improvement in information available has led to a stronger understanding of the importance of biodiversity to both our natural and productive systems. All actions that impact on land and water impact on native biodiversity. The SIRCIS aims to ensure that all impacts are considered in decision-making and that biodiversity needs are integral to 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 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; and poor river frontage management.

Pest Plants 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 needle grass, 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 2006-2007, this was approximately $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 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 for the East Shepparton Salinity Project.

Our Partners

Goulburn-Murray Water
Goulburn-Murray Water (G-MW) manages water storages, the supply channel and drainage 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 Water Management 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 Environment Programs and, in conjunction with G-MW, the Community Surface Water Management and Sub-surface Drainage Programs.

Local Government
Local Government is a key partner, providing Statutory and Strategic Planning, participating in cost-sharing for the SIRCIS 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 <1mg/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 standards of State Environmental Protection Policy (Waters of Victoria) and the SIRCIS.

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 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 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 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 and 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

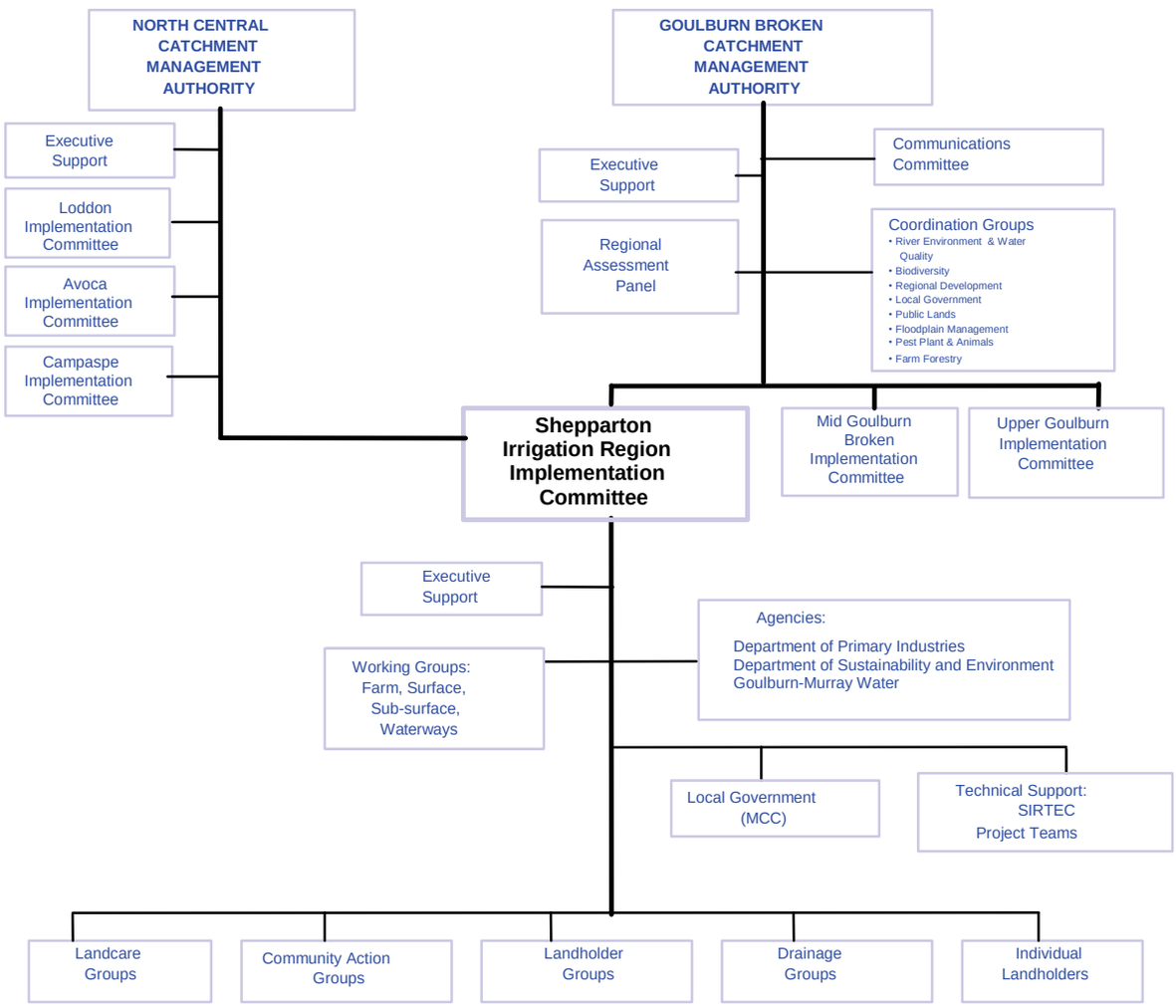
Members of the SIR IC are nominated because of their specific skills and their links to community networks. The SIR IC meets on a six week cycle throughout the year and is made up of eight community representatives and representatives from partnership agencies ie. DPI, Department of Sustainability and Environment (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 G-MW 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 SIRCIS. 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 SIRCIS as it continues to evolve during its implementation. The SIRCIS signifies a true partnership between the local community and all levels of government – State, Federal and Local. The management structure for the SIRCIS is presented in "Management Structure for the Shepparton Irrigation Region Catchment Implementation Strategy", next page.

Management Structure for the Shepparton Irrigation Region Catchment Implementation Strategy



CHAIR'S REPORT

Peter Gibson
Chair

Shepparton Irrigation Region Implementation Committee

Once again the Shepparton Irrigation Region Implementation Committee has achieved major progress through the past twelve months. The outcomes the Committee and its partner Agencies have achieved are particularly impressive considering the challenges the community as a whole has faced during the continuing drought across the region.

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

I would like to thank Russell Pell, Ann Roberts and Nick Roberts who retired from our committee at the beginning of the year to continue other challenges. In doing so we welcomed John Gray, Helen Reynolds and Roger Wrigley who bring a range of new skills and experience to our deliberations.

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 Landcare groups, Goulburn Murray Landcare Network (GMLN) and Local Area Plan (LAP) 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.

2006-2007 Highlights

- Once again we held a very successful Catchment Partners Reporting Day – 'Don't be bored with groundwater'.
- Irrigators continued to implement farm works to improve irrigation efficiency despite the drought. Irrigators completed 152 Whole Farm Plans, constructed 70 re-use systems, installed 11 automatic irrigation systems and 16 groundwater pumps with assistance from our program.
- 68% of the SIR is covered by a Whole Farm Plan.
- 57,700ha of the SIR has been protected by expansion of the groundwater pumping network.
- We have commenced a review of the success of the Local Area Plan Program.
- Drain flow leaving the SIR in 2006-2007 virtually ceased. This is the sixth year running that the SIR has kept below long-term nutrient targets.
- The Victorian Government $1 billion commitment to the Foodbowl Modernisation Project. We look forward to linking the implementation of the SIR Catchment Implementation Strategy to this project in coming years.
- The SIR IC completed and reported on a project for the Victorian Water trust entitled 'Linking Farms, Catchment and Channel Automation'.
- The GB CMA continues to lead from the front with its research and development. At the Australian National Committee on Irrigation and Drainage (ANCID) Conference in Darwin in October 2006, seven research papers and two posters were presented – a major input.
- The successful Drought Employment Program which employed 72 drought affected farmers, farm workers and farm service providers for up to six months this year. The Victorian Government provided just over $3 million in initial funding for 2006-2007 and the program will continue in 2007-2008 with an additional

$1 million from the sale of environmental water reserves released from Eildon to irrigators in February 2007.

- The release of 2.7GL of environmental water released into the Broken Creek to manage azolla and low dissolved oxygen.
- The further development of the RiverConnect project. This involves a wide range of stakeholders, including the indigenous community and Local Government.
- Third review of the SIRCIS and continues with major progress into the program reviews. This will feed into the Goulburn Broken Regional Catchment Strategy in 2009 and the Victorian Sustainable Irrigation Strategy.
- A major review of the assumptions underlying the impact of our accountable actions on River Murray salinity was completed and submitted to the Murray Darling Basin Commission.

I would personally like to commend the continued work of my fellow Committee members : Helen Reynolds, Peter McCamish, Allen Canobie, Steve Farrell, John Gray, Nick Ryan and Roger Wrigley 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 thank our Executive Officer Ken Sampson for his continued leadership and support. His commitment to the high level of active community participation and the partnership relationship between Agencies is very important. Many thanks Ken.

Peter Gibson
Chair - Shepparton Irrigation Region Implementation Committee

The Shepparton Irrigation Region Implementation Committee
L-R: Chairperson, Peter Gibson; Nick Ryan; Ken Sampson (GB CMA Executive Officer); John Gray; Helen Reynolds; Allen Canobie; Roger Wrigley; Peter Howard (GB CMA); Terry Batey (DPI); James Burkitt, (G-MW); Stephen Farrell.
Absent: Bruce Cumming, (DPI); Tony Long, (DSE); Terry Hunter, (G-MW).

Absent from main picture: Implementation Committee Member Peter McCamish

PROGRAM REPORTS

Executive Officer's Report

Ken Sampson
Executive Officer

Shepparton Irrigation Region Implementation Committee

The year 2006-2007 has been one of achievement and progress in the implementation of the Shepparton Irrigation Region component of the Goulburn Broken Regional Catchment Regional 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.

Future Directions

Major new challenges will face the Shepparton Irrigation Region Implementation Committee from 2007 with the release of the next stage of the State Government's Our Water Our Future water policy plan. The focus is still on water savings but, in response to drought and climate change, has an increased emphasis on securing water for urban communities.

For the irrigation sector the package of reforms known as the Food Bowl Modernisation Project, consists of a program of works to upgrade ageing and inefficient irrigation infrastructure. Works will be implemented over five to eight years with the aim to increase the efficiency of delivery systems.

In June, 2007 a $1 billion commitment was made by the Victorian Government for the Food Bowl Modernisation Project. This will fund Phase One of the two-phase project. The project once fully implemented, targets water savings of approximately 450GL by the end of 2015. The first 225GL will be split ⅓ : ⅓ : ⅓ between Melbourne: Environment: Irrigators and the rest 50:50 between the environment and irrigators.

Whilst the Food Bowl Modernisation Project has specific water savings targets, the modernisation of irrigation infrastructure also provides long-term commitment to the region's industries and will be a basis for regional growth and renewal.

These major changes in water policy mean that the SIRCIS and its main delivery programs need to evolve once again.

Shepparton Irrigation Region Catchment Strategy Programs

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

Environment and Biodiversity Programs

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

Activities and achievements

Environmental and Tree Growing Projects

The Environmental and Tree Growing Projects have provided advice to landholders throughout

the SIR relating to protection, enhancement and revegetation of native vegetation. Staff provided support to protect over 48ha of remnant vegetation (including 5.6ha of wetlands) and over 85ha of revegetation for corridors and understorey. Examples of some of the incentive works include:

- Completion of 53.8ha of direct seeding, including a saline trial site with CSIRO and the GB CMA Biodiversity Program.
- The construction of 3km of fencing to protect 12.6ha of Plains Woodland remnant (near Cobram) which is home to the vulnerable Tree Goanna (Varanus varius).
- Fencing to protect 10.0ha of Riverine Chenopod Woodland remnant, in the Picola area. This remnant is used by a group of Grey-crowned Babblers (Pomatostomus temporalis), which are endangered in Victoria. The site is also protected by a Trust for Nature conservation covenant.
- Fencing to protect 3.7ha of Riverine Chenopod Woodland remnant and 1.5ha of Wetland near Strathmerton. These sites are also protected by Trust for Nature conservation covenants and there are plans for direct seeding in Spring 2007.

Both the Environmental and Tree Growing Incentives have facilitated the revegetation of native vegetation with approximately 60% being planted by direct seeding and 25km of fencing to protect remnants and fence corridors.

Local Area Plan sub-catchments continue to account for over 30% of all incentive payments and works.

Environmental Management Plans – Wetland and Terrestrial

Design and development of Environmental Management Plans for priority wetland and terrestrial sites in the SIR is an important value-adding tool to support improved water management. Environmental Management Plans are developed with input and strong collaborative processes across multiple agencies. Key partners are DPI (leading development of the plans), DSE, G-MW, Parks Vic, GB CMA and community groups as parties ultimately responsible for implementing management plan recommendations and works.

The Kanyapella Basin Management Plan has been in the development phase for several years and with final review by all key stakeholders, was signed off at the April 2007 SIR IC meeting. The management plan represents an important milestone in the management of the Kanyapella Basin area – the plan covers some 2950ha and will bring together government agencies and community groups in ongoing management.

The Mansfield Environmental Management Plan has also been completed and is due for sign off in September 2007 by SIR IC. 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 of these plans are under review by stakeholders and it is hoped to have these signed off by the end of 2007.

As part of the Murray Valley Drain 11 process, a draft management plan has been prepared for Greens Swamp near Picola. This plan is being presented to landholders that have freehold title over Greens Swamp. Staff provided technical advice and on-ground support for the consultants Sinclair Knight Merz to develop this plan and liaise with landholders.

The development and sign-off of Environmental Management Plans allows the GB CMA and SIR IC to support provision of Environmental Water Allocations (EWA). Given the severity of the drought and the scarcity of water, no EWAs were delivered this year. Monitoring reports for Reedy and Brays Swamps were prepared (as a result of EWAs received in 2005-2006) to demonstrate the bird life and macro-invertebrates that inhabit these swamps when EWAs are delivered.

Terrestrial and Wetland Management Plans contain actions for the management of the sites by all stakeholders. EWA delivery is an example of an implementation action undertaken at wetland sites

(e.g. at Brays Swamp and monitoring the results and in-flows into Reedy Swamp).

Environmental Assessments

Two Environmental Assessments for Community Surface Water Management Schemes were completed. There were approximately 68 final and re-alignment assessments completed to ensure surface water management works conformed to the requirements of the Environmental Protection and Biodiversity Conservation Act 1999.

High Value Environmental Features

The High Value Environmental Features project was conducted as part of the Sub-surface Drainage Program Five Year Review. It involved an assessment of high value environmental features in the SIR and prioritising those threatened by groundwater. 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.

The results from this project have been presented to SIRTEC, SIR IC, the Catchment Partners Day and the Farm and Environment Program Working Group. The key results are that there are eleven high value sites that have a very high priority for groundwater control. A number of other high value sites did not have watertable data available but are of concern and require further data collection.

Biodiversity Action Planning

The Biodiversity Action Planning project is a way of prioritising on-ground works to target the highest priority sites and promote a strategic landscape plan. There are six Biodiversity Action Planning Landscape Zones in the region, with the Yarrawonga Landscape Zone the first Conservation Plan to be completed. Plans for Central Creek, Barmah and Western Goulburn Landscape Zones have been developed, with final drafts prepared for both Timmering and Southern Goulburn Landscape Zones. Funding has also been obtained to develop a small trial Biodiversity Action Planning project in the Barmah Landscape Zone to assist with implementation. Staff also represented the SIR on the Goulburn Broken Biodiversity Action Planning Steering Committee.

Permanent Habitat Protection (Trust for Nature)

Trust for Nature is a not-for-profit group with statutory capacity to place covenants on land of high conservation value. Although legally known as a restrictive covenant, the landholder and Trust for Nature staff jointly develop a management plan to promote continued protection and improvement of the site's ecological values. The establishment of these conservation covenants contributes substantially to the GB CMA targets for improved vegetation quality. During 2006-2007, landholders and Trust for Nature permanently protected 143ha of significant bushland, wetland and grassland across the SIR.

Superb Parrot Project

The Superb Parrot is an endangered bird, endemic to south-eastern Australia and listed under the Commonwealth's Environment Protection and Biodiversity Conservation (EPBC) Act. In Victoria, it is restricted to the Barmah region where some 200-400 birds are known to occur (numbers vary in different years according to mortality and breeding success). Whilst large old River Red Gums provide essential breeding sites (hollows), one of the main requirements is foraging habitat provided by a shrubby understorey in box woodland. The Superb Parrot Group has been active for many years promoting awareness of the foraging needs and encouraging landholders to undertake direct seeding and revegetation to supplement available habitat. Owing to the severe dry conditions over 2006-2007, only 13 of the 40ha revegetation target was achieved. Never-the-less, interest in the welfare of Superb Parrot remains high, with 45 people turning out for the annual monitoring count.

Threatened Species Recovery Plan Implementation and Monitoring

In addition to the Superb Parrot work outlined above, the DSE undertake a range of activities on behalf of the SIR IC to implement actions

recommended in recovery plans for terrestrial and aquatic flora and fauna. During 2006-2007, this work included monitoring populations of Prasophyllum hygrophyllum, Swainsona plagiotropis, Swainsona murrayana, and Myriophyllum porcatum. In addition to annual monitoring, propagation trials and fencing to protect sites from inadvertent damage were implemented. A number of projects on threatened fish were conducted.

Environmental Management Systems

An Environmental Management Systems (EMS) Pathways Officer for the Goulburn Broken Catchment in 2006-2007 was supported for six months in 2007 by funding from the EMS Pathways Project. 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. A number of workshops have been run, particularly in the dryland to inform groups of the EMS process.

Performance Standards for Natural Features

This project has produced drafts of 17 terrestrial pamphlets, each of which describes a different threat to natural features and how to move towards best management practice. A draft handbook for terrestrial features 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 SIR IC. The information contained in both the pamphlets and the booklet is currently being reviewed to ensure the latest and most accurate information. When completed, these performance standards and the operational guidelines will help guide best performance of managing natural features in the SIR.

Mandatory Monitoring

Mandatory Monitoring was undertaken once in 2006-2007 at the seven allocated sites, including four terrestrial sites and three wetland sites. Ongoing collation of data is stored for each site, including photo-points, species presence and absence and water/macro invertebrate (where applicable) sampling.

Statutory Planning

Over 500 Statutory Planning cases were dealt with throughout the year with about 50% of the cases in the City of Greater Shepparton and the remainder split between Moira and Campaspe Shires. The cases involved aspects such as subdivisions, certification of Whole Farm Plans, new developments (e.g. buildings, dams, quarry activities and centre pivot irrigation systems) and Planning Scheme amendments. All cases involved development of recommendations to ensure the protection of surface water, ground water and soil. Staff also undertook Native Vegetation Retention cases for DSE because of their commitments to the fires over Summer and consequent backlog of cases. This was funded for four months.

Landscape Restoration Project

Funding was obtained from the research arm of DPI (PIRVic) for three months for one staff member to undertake a scoping study for a Landscape Restoration Project. This project involved examining ways of achieving landscape scale change. An issues table has been developed to help identify priority areas for investigation, the issues were examined and data collated for the GB CMA. Information has been provided to PIRVic and the project has been completed.

Acoustic Monitoring Project

Staff supported a PIRVic project to compare acoustic recording techniques, using the Vegetation Quality Assessment techniques used in both the Biodiversity Action Planning and High Value Environmental Features projects. The task involved spending several hours on one day, putting acoustic recorders out at 14 sites that had already been manually assessed. Manual assessment involved conducting a Vegetation Quality Assessment. PIRVic analysed the data and made comparisons between the two methods and organised a workshop to report on progress with the Acoustic Monitoring Project. Stuart Gage from Michigan State University, a representative from Queensland University of Technology and others from CMAs and DPI attended the workshop. The results indicated a good correlation between both methods. A presentation to the workshop on the Vegetation

Quality Assessment Process was undertaken including a field trip to Doctor's Swamp. PIRVic staff were very appreciative of the support for the project and provided some funding towards staff resources.

Five Year Review Process

A review of the SIRCIS Environment Program has been conducted 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 into future activities. The review process has involved several workshops looking at future impacts and getting input from the steering committee. A draft report has been presented to the Farm and Environment Program Working Group and SIR IC for comment.

Primary Elements Award

The Environment Program staff were awarded the Sustainability Initiative Award for the DPI Primary Elements Awards 2006. The award was received for the range of environmental activities, planning and implementation that the group conducts in the SIR including collaboration with a range of internal and external stakeholders. Each team member received a framed certificate in recognition of their efforts and were given recognition in the DPI News and Primary Source web site.

Biodiversity Celebration Day

A Biodiversity Celebration Day held at Drumanure, on the Nine-Mile Creek, Broken Boosey State Park on Thursday 14th September was very successful. The day titled 'Biodiversity – Working Together' showcased community and agency people sharing information on a range of biodiversity projects. The day attracted more than 80 people interested in biodiversity management and included presentations (including the launch of the Yarrawonga and Central Creek Biodiversity Action Plans), lunch, guided walks, children's activities and displays, with input from over ten agencies/organisations, numerous community groups and landholders. An evaluation indicated that the day was a useful and positive experience and more opportunities will be identified to build on this experience. As part of this day, eight posters, one television interview, several newspaper/media releases, a formal invitation, displays and a DPI News article were produced.

Flora Identification Booklet

The SIR Flora Identification booklet was launched in April 2007 at a GMLN meeting. Program staff developed the booklet and the GMLN funded the printing through the SIR IC. The booklet provides descriptions and photographs of a range of native vegetation in the SIR, including trees, shrubs, grasses and groundcovers. The booklet has been compiled from photographs taken by staff over a number of years, with a number of staff since 2001 contributing to the development of the booklet.

Farm Program

Program Goal: *To reduce groundwater accessions, soil salinisation and waterlogging on farms.*

Activities and achievements

Whole Farm Planning Project

A total of 152 Whole Farm Plans were completed covering an area of 8,421ha during 2006-2007. This number was higher than the previous year's figure of 104 plans completed and the budgeted figure of 150.

Whole Farm Plans were prepared for two horticultural properties covering 95ha and 150 broadacre properties over 8,326ha. Over 70% of the irrigated area of the SIR has now been Whole Farm Planned. A total of 50 plans were completed in areas covered by Local Area Plans, covering 2,710ha. There were 127 Whole Farm Plans commenced in 2006-2007. This figure was lower than the previous year's figure of 141.

Grants totalling $286,692 (excluding GST) were paid to landowners for preparing their Whole Farm Plans. This was below the budgeted target of $300,000. Landowners paid $635,526 (excluding GST), for the preparation of these plans. A total of 101 grants were paid to landowners for having their plans certified by Local Government, resulting in 66% of all plans completed in 2006-2007 being certified, an increase from 60% in 2005-2006.

Drainage Re-use System Project

A total of 63 drainage re-use systems were installed as part of the Drainage Re-use System Project in 2006-2007 servicing 3,507ha. Since the project started in 2001-2002, a total 10.64% of the irrigated area of the Goulburn Broken component of the SIR is serviced by a drainage re-use system installed as part of this project. A total of 20 drainage re-use systems were installed in areas covered by a Local Area Plan servicing over 1,283ha.

Grants totalling $593,711 (excluding GST) were paid to landowners for installing drainage re-use systems. This was below the budgeted target of $650,000. When separated into the three components of the grant, expenditure was as follows: $210,546 for earthworks, $273,070 for pumps and motors, and $110,095 for electricity. Landowners paid $1,147,167 (excluding GST) for the installation of the re-use systems on their properties. There was an increase in the average grant payment from $10,344 in 2005-2006 to $10,601 in 2006-2007.

Automatic Irrigation Project

A total of 11 grants have been paid as part of the Automatic Irrigation Project covering an automated area of 570ha. This number was lower than the previous year's figure of 14 systems installed and the budgeted figure of 19. Over 2.3% of the irrigated area of the SIR has now had an Automated Irrigation System installed with assistance from this project. A total of six systems were completed in areas covered by Local Area Plans, covering 310ha.

Farm Program Review

The Farm Program Review was conducted to assess the performance of the Farm Program for the period July 2001 to June 2006 against the targets that have been set as part of the SIRCIS. This review has focussed on the effectiveness and the efficiency of the Farm Program in delivering the activities. The effectiveness of the program is measured by how well the intended targets, outputs and outcomes of the program have been achieved. To determine the efficiency of the program, the delivery process of the program has been examined and has focused on the satisfaction level of participants with the Farm Program. The review has found that the Farm Program has been successful in meeting the targets set and in some cases exceeding these targets. There has continued to be a high level of satisfaction by landowners to Farm Program activities. The review has found that the use of extension projects and financial incentives has been an important factor in the success of Farm Program activities.

The review showed that the government and community have played a significant role in working together to bring about irrigation efficiency in the area. It also indicates that the investment by the government to the program has led to major improvements in water use efficiency and has leveraged a huge investment in improved water management by landowners. The strengthening of this partnership approach between the government and the community has been recognised and acknowledged in the review.

One of the significant changes to the Farm Program since the previous review in 2000 has been the introduction of water use efficiency as an important driver in the projects being implemented. The Farm Program now includes projects to encourage the development and use of drainage re-use systems and automatic irrigation systems. While these projects are compatible with management practices of the previous drivers of minimising salinity and control of nutrients from leaving properties, water use efficiency also raises landowner awareness of the need to manage irrigation water efficiently.

The Local Area Plan project, while not clearly increasing SIRCIS activities, has brought about an increased capacity of the community in these local catchments to develop and implement activities in their communities.

The Farm Program has been pro-active in working in partnerships with other programs to bring about synergy to achieve outcomes relevant to the goals of the program. The involvement of the Farm Program in the "Efficient Irrigation Project" has been hailed as a model for further projects with a research and extension partnership.

The review has forecast what changes the Farm Program will need to be aware of and respond to in the immediate future. The Farm Program has worked with the "Irrigation Futures in the Goulburn Broken Catchment" project conducted by the DPI. That work shows that there is likely to be a large change in the way landowners will manage their land and water in the future. A major challenge for the Farm Program is to work towards the smooth transition of the water reform changes that will come into effect from July 2007 and the Farm Program Review concludes with a series of recommendations that address these issues for the future of the Farm Program.

Development of Irrigation Development Guidelines

The Farm Program has had an important role in the development and implementation of Irrigation Development Guidelines since their inception in the GB CMA area in 1998. The key purpose of the Irrigation Development Guideline process is to identify and minimise the risk of any adverse side effects of irrigation on the environment and third parties.

Since 2004 the Farm Program has taken on a greater role through the provision of an Irrigation Development Coordinator for the SIR to oversee the implementation of these guidelines. The primary role is to assist landowners through the Irrigation Development Guideline process by being the single point of referral for the landowner when dealing with other agencies. They also ensure that the guidelines are being consistently applied. These guidelines are triggered when an irrigation development is proposed on land that has not been irrigated previously.

The Farm Program has taken a leading role in the revision and modification of the existing guidelines both at a catchment and State level, to ensure that they reflect the changes outlined by the Minister for Water in the water reforms to be introduced in July 2007.

With the introduction of water-use licences in 2007, these guidelines will be applied to:

- Existing irrigation properties where redevelopment of the property will require an alteration to an existing water-use licence,
- Properties being developed to include irrigation and a new water-use licence will be required.

Changes in Community Capacity through Local Area Planning

As part of the Farm Program Review, reviews have also been conducted in the eight Local Area Plans being implemented in the SIR. This evaluation investigated the impact of Local Area Plans on accelerating the implementation of the Goulburn Broken Regional Catchment Strategy, with work also carried out to determine changes in community capacity as a result of Local Area Planning. The results of this evaluation have shown overwhelmingly that in the two to five years since the launch of the Local Area Plans, the capacity of the communities involved has increased.

The Local Area Plan project team developed a tool to describe and measure community capacity in the Local Area Plans. Semi-structured interviews were conducted with members from all eight groups and the questions were based on the tool developed.

Respondents generally felt that they were proud of their efforts in developing and implementing their plans, and that their skills and confidence had grown as a result of the process. Each group discussed the opportunities Local Area Planning provided them to nurture leaders within their communities and were positive about their ability to move forward and continue implementation of their plans into the future. Such a response was viewed as a real success of the project, particularly given the relatively short timeframes, with further work planned on evaluating these changes into the future.

Efficient Irrigation Technologies to Match Soils and Dairy Farming Systems

The Farm Program has continued to work in collaboration with the DPI PIRVic team in this project. The project aims to develop information to support both farmers and catchment planners to make informed decisions on when to invest in border-check and sprinkler irrigation systems.

The project worked towards achieving the following objectives:

- To maximise the environmental and economic benefits returned from private investment in dairy farm irrigation system infrastructure.
- To maximise the impact of policy initiatives aiming to improve the efficiency of water use on dairy farms through changes to farm irrigation system infrastructure.
- This involved undertaking market research to understand information needs, conducting lysimeter and farm experiments to quantify potential water savings under centre pivot and border-check irrigation.

The project, which started in July 2003 and ended in December 2006, produced two main outcomes:

- Web-based Irrigation System Selection and
- Design guidelines which are aimed to assist landowners and service providers to make informed decisions on when to invest in farm irrigation infrastructure. The guidelines can be found on the DPI web site:

www.dpi.vic.gov.au

Follow the links by clicking on:
Victorian Resources Online / VRO site map (in left hand list)/ Land and Water Management / Irrigated Agriculture / Irrigation Technology / Irrigation Systems Selection and Design Guidelines
Scroll down to the bottom of the page and click on the link to:

Irrigation Systems Selection and Design Guidelines

Developing these guidelines involved extensive consultation and testing with landowners and service providers. A focus in developing these guidelines was to provide local information. Discussion papers were prepared to assist catchment planners develop policy to ensure targeted public investment in farm irrigation infrastructure.

The implications of pressurised irrigation systems on the natural resource issues were developed and presented as discussion papers to the GB CMA.

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.

The natural resource issues identified and addressed in this project have been used to update the SIRCIS. This information will help the GB CMA make informed decisions on investments in pressurised irrigation systems.

Picture: Kaye Darveniza, MLC, Parliamentary Secretary to Minister Hon. John Brumby, Regional Development launched the web-based guidelines in Shepparton in March 2007.

Tackling Pests Program

Activities and achievements

In recent years, the focus of DPI pest management programs has changed considerably, particularly in the area of weed management. There is now a strong emphasis in DPI weed management programs on the management of new and emerging species and species that are known to present a high threat to regional assets.

The DPI Pest Plants program regards State Prohibited weeds as the highest priority and aims to eradicate them wherever they occur in Victoria. During 2006-2007, nine ivy-leaf sida infestations and one camel thorn infestation were treated in the SIR. Inspections of adjoining properties were also undertaken, but no new infestations were found.

As part of the Weed Alert project, inspections of 25 retail nurseries across the SIR were conducted during 2006-2007, to ensure prohibited or high threat plants were not being offered for sale. Extension information was provided to nursery owners and no prohibited plants were detected.

Due to extreme drought conditions and low irrigation allocations, and following consultation with SIR IC, compliance activities targeting blackberry and sweet briar were scaled down during 2006-2007. Extension activities continued through the reconfigured Rural Extension Program, focusing mainly on satellite infestations in areas that have been involved in previous compliance programs. Despite dry conditions, landholder participation levels were still high, which is commendable under the circumstances.

DPI pest management staff and SIR IC will continue to monitor the drought situation and will resume blackberry compliance programs when it is considered appropriate.

The introduction of new commercially prepared 1080 poison baits for both rabbits and foxes occurred last year and these baits have proven their effectiveness. Baits are purchased through a more efficient state-wide hotline service, which has freed up pest management staff considerably, enabling more time to be spent in the field. More fox baits were sold in the Goulburn Broken catchment during 2006-2007 than in any year previously.

A project to out-source 1080 bait sales from DPI to commercial retail outlets is progressing well. It is anticipated that commercially prepared 1080 baits will be available from retail outlets across the state by January 2008.

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

Primary Surface Water Management Highlights

- A total equivalent length of 6.5 km was constructed which included works on Muckatah Drain 8, Mosquito Stage 10, Stanhope Stage 1 and Murray Valley Drain 11 Stage 1A.
- G-MW consultants designed an equivalent length of 24 km of drain, and works continued, or commenced, on a number of Drainage Course Declarations.
- Investigation into a Wetland Management Plan for both Green's Swamp and the depression upstream of the swamp commenced within the Murray Valley Drain 11 catchment.
- An application for a combined Planning Scheme Amendment and Planning Permit for the Mosquito Drain 40 Primary Surface Water Management System was submitted to the Greater Shepparton City Council in June.
- A review of the initial design of the Kanyapella Basin environmental works was carried out by G-MW and works are expected to commence in 2007-2008.

- An investigation commenced into how environmental flows could be directed into Bray's Swamp from Mosquito Drain 24. The outcome was to lower the existing overflow spillways and install an automated Penstock gate on the structure downstream of the spillways. This work will commence in 2007-2008.

Irrigation Drainage Memorandum of Understanding

As part of the Irrigation Drainage Memorandum of Understanding the Decision Support System (DSS) for setting both water quality and management action targets and the finalisation of the format of Catchment and Asset Operation Plans was the highest priority during 2006-2007. The Rapid Resource Condition DSS was completed for the entire Broken Creek Catchment which includes Muckatah, Barmah-Nathalia, Tallygaroopna and Invergordon sub-catchments. Total Phosphorous and Suspended Sediment were identified as the key water quality factors that impact on the health of the Broken Creek.

Community Surface Water Management Grants

Targets

- Construction of 3.3 km of Community Surface Water Management System.
- Initiation, and Survey and Design of a number of Community Surface Water Management Systems.
- Transfer of Community Surface Water Management Systems from City of Greater Shepparton to G-MW.

Progress Towards Targets

- Completion of Deakin 16P Survey and Design.
- Initiation of Community Surface Water Management Systems:
  - Muckatah 15P
  - Muckatah 18P
  - Muckatah 22P
  - Muckatah 2/3P and 3/8P.
- Reinitiating of Mosquito 8/25P.
- Transfer of ownership of Rodney 1/6P, Rodney 2/6P and Ardmona 7/11P Community Surface Water Management Systems from the City of Greater Shepparton to G-MW.

Picture: 'Drainage in a drought' - John Bourchier at the Australian National Committee on Irrigation and Drainage (ANCID) conference in Darwin in October.

Increasing Water Use Efficiency through Strategic Water Harvesting – Drainage Nutrient Removal Incentive Scheme

Scheme Background

The Drainage Nutrient Removal Incentive Scheme (DNRIS) was introduced in April 1998 to encourage landowners to construct strategically located storages (drainage nutrient removal systems) to collect and use regional drainage water. The water and nutrients collected can be used productively and are not lost to areas of the catchment where they may cause problems such as blue green algae blooms. These storages can increase the volume of water available to the landowner and reduce the amount of nutrient rich water entering our waterways.

Targets - Long term

- Increase the amount of nutrient-rich water diverted from regional drains and used productively on farm by 25%.
- Capture 10,000 ML of water savings from regional and farm drainage to be used for maximum public benefit.
- Improve irrigation management across 50% of the newly drained SIR in the next five years.
- Contribute significantly to the Goulburn Broken Water Quality Strategy goal of reducing phosphorous and nitrogen drain loads by 50% by 2016 through decreasing the amount of poor quality (high nutrient/salt) water leaving the catchment and flowing into environmentally sensitive waterways.

Targets - Short term

- Construct five storages per year providing a storage capacity of approximately 3,600 ML.
- Divert 7,200 ML of water from the regional drainage system to prevent flows into the River Murray and improve water use efficiency on 4,500ha of irrigated land.
- Retain 3.5 tonne of phosphorous and 14.0 tonne of nitrogen within the SIR catchment.
- Improve water use efficiency on individual properties, save irrigation water for other uses such as environmental flows and protect the catchment from poor quality drainage water.

Progress Towards Targets

The drought conditions experienced in the SIR over the past few years have resulted in lower than average water allocations and rainfall. This has put economic pressure on irrigators and has resulted in a reduced uptake of the DNRIS.

In 2006-2007, one storage was constructed under the incentive scheme. It was a 75 ML storage in the Murray Valley on Stage 4 of the Muckatah Primary Surface Water Management System. This was well below the expected 2006-2007 total of four storages and the short term target of five storages constructed per year under the incentive scheme. Two landowners had applications for the incentive approved by the Surface Water Management Working Group in 2006-2007, both in the Murray Valley. There were two approved applications in the Central Goulburn area that were carried over from 2005-2006, one of these applications was cancelled in April of 2007 due to the potential cost of construction and the other is carried over to the 2007-2008 financial year.

Since the scheme commenced 33 high flow storages have been built with assistance from the DNRIS in the SIR, within the GB CMA area, with a storage capacity of 5,803 ML. Grant expenditure is outlined in "DNRIS Grant Expenditure 2006-2007" below.

DNRIS Grant Expenditure 2006-2007

Month	Expected Construction			Actually Constructed				
	Number	Grants $'000	ML	Number	Grants paid	GST	Total Cost Landowner (estimates)	Total ML
July	0	0	0	0	0	0	0	0
August	1	20	75	0	0	0	0	0
September	0	0	0	0	0	0	0	0
October	0	0	0	0	0	0	0	0
November	1	20	215	0	0	0	0	0
December	0	0	0	1	20	2	90.5	75
January	0	0	0	0	0	0	0	0
February	0	0	0	0	0	0	0	0
March	0	0	0	0	0	0	0	0
April	1	20	570	0	0	0	0	0
May	0	0	0	0	0	0	0	0
June	1	20	100	0	0	0	0	0
Totals	**4**	**80**	**960**	**1**	**20**	**2**	**90.5**	**75**

DNRIS System Monitoring

Water Service Area	ML Capacity Constructed	Volume Diverted ML	Salt Saved (tonnes)	Phosphorous Saved (tonnes)
Central Goulburn	1,968	85	n/a	n/a
Murray Valley	2,390	600	n/a	n/a
Shepparton	1,295	70	n/a	n/a
Rochester	150	n/a	n/a	n/a
Total	**5,803**	**755**	n/a	n/a

Note: Volume diverted data (as at September 2007) was not obtained from all 33 storages, therefore figures are not exact for each Water Services Area

Drainage Nutrient Removal Incentive Scheme Results 2006-2007

Landowners with systems constructed with the assistance of the DNRIS were contacted to determine the volume of water collected and used for irrigation during the year.

The severe drought conditions of 2006-2007 resulted in very limited opportunities for high-flow diversion across the SIR. At the end of year almost all storages constructed with the support of the incentive were dry. Consequently, sampling and measuring of salt and phosphorous concentrations was not undertaken.

Issues Impacting on DNRIS High-Flow Storage

A small number of landowners reported cracking in the walls of their storages, as a result of the ongoing severe dry conditions and the storages remaining close to empty for the past 12 months. These cracks are not expected to create problems when the storages are filled again, but landowners are conscious of monitoring the stability of their storages. In the past 12 months, one landowner applied beaching (rock armouring) to one dam wall (primarily to reduce the erosion from wave action) and another undertook some remodelling of one dam wall and is considering installing drippers around the walls to keep the walls moist during dry conditions.

Other Project Team Activities

- Monthly reporting on the DNRIS was included in the Community Surface Water Management Program monthly report.
- Project staff continued to be a member of the Community Monitoring (Drainwatch) Steering Committee (Goulburn Murray Landcare Network run committee under the Waterwatch program).
- A review and update of the DNRIS Guidelines was completed.

Geographic Information Systems

This year has seen the continued use of Geographic Information Systems (GIS) to map where storages have been constructed within the SIR in relation to G-MW Water Services Committee boundaries and Local Area Plan boundaries. At present 10 of the 33 constructed storages fall into Local Area Plan boundaries.

DNRIS Local Area Plan Figures

	Actual – since 1998		
Local Area Plan	Number	Storage ML	Total Incentive Cost (Incl GST) $
Bunbartha/ Karimba/Zeerust	2	180	33,307
Nathalia & District	4	1050	66,000
Cornella	0	-	-
Dhurringile & District	0	-	-
Invergordon	1	150	22,000
Nanneella	0	-	-
Muckatah / Naring	2	140	43,517
Wyuna	1	250	20,000
TOTAL	**10**	**1770**	**$184,825**

Conclusion

Interest in the DNRIS program fell during 2006-2007, due to the lower than average water allocations and the drought conditions experienced across the SIR. Three approved applications are current into the 2007-2008 financial year. A review of the DNRIS will be conducted during 2007-2008 to determine its ongoing viability.

Environmental Assessment for Primary and Community Surface Water Management Systems

Project Target

Provide support, comment, reporting and report compilation from an environmental assessment perspective to the Primary and Community Surface Water Management Program and the Sub-surface Drainage Program, as required.

Primary Program

- Greens Swamp Management Plan.
- Assisted in the development and overseeing of the writing of the Green Swamp Management Plan with consultants Sinclair Knight Merz (SKM), Tatura. Assisted in field work (transects) document comment, editing, landholder visits and explanation and final individual landholder works agreements.
- Primary Surface Water Management System landholder visits.
- Approximately 32 landholder or site visit days/half days conducted with G-MW and SKM on Murray Valley 11, Mosquito 40, Mosquito 36, Mosquito 22. These visits consisted of discussion with landholders re final design, alignment, placement, environmental issues, structures, revegetation.
- Completed 21 Final Alignment Checks and Realignment Checks that involved a response to G-MW. Majority of responses from Murray Valley 11, Muckatah Stage 8, Old Deakin 5P.
- One Property Vegetation Plan completed jointly with DSE Benalla on Muckatah Main.
- Two Surface Water Management System Planning Scheme Amendment Reviews conducted: Mosquito 40 and Deakin 16.

Community Program

- Two initial Environmental Assessments completed using the new format being a 20-page document with several maps and associated text: Muckatah 4/8P and Muckatah 15P.
- Community Surface Water Management Planning Works.
- 15 Community Surface Water Management System realignment, landholder meetings, site inspections.
- Community Surface Water Management Program Planning Day.

Irrigation Drain Management

Targets

- Drain Management & Water Quality Coordination - Support Irrigation Areas; input to Drainwatch; participate in working groups.
- Irrigation Drainage Memorandum of Understanding implementation - Decision Support Systems for Key Performance Indicators & Management Actions and Catchment Asset Operation Plans; Murray Valley Drain 13 project.
- Installation of flow meters on drainage diversion pumps (approximately 10).

Progress Towards Targets

- Supported Irrigation Areas in drain diversion management; input to Drainwatch community monitoring program; input to Surface Water Management Systems review; review of drainage diversion agreements status; participated in working groups.
- Implementation of Irrigation Drainage Memorandum of Understanding Decision Support System in Broken Creek catchment. Initial work on SIR Catchment Assessment Operational Plan to commence after final sign-off of Stanhope Catchment Assessment Operational Plan. Barmah-Nathalia Catchment Assessment Operational Plan to be done in conjunction with SIR Catchment Assessment Operational Plan.
- Flowmeters were purchased and installed on drain diversion pumps.

- The total metered volume diverted from drains was 15 GL, and it was estimated that a further 4 GL was diverted through unmetered drainage diversion installations. High flow diversions accounted for approximately 1 GL of the total diverted.
- 15.5 GL was diverted from monitored drains compared to 3.2 GL outfalled, that is: 83% of the potential drain outfall was diverted (compared with Water Quality Strategy target of 50%).

Co-ordination and Support for Community Surface Water Management Systems

Project Targets

- Provide technical support for the Community Surface Water Management Program as required.

Progress Towards Targets

- Attendance and input at various meetings including Community Surface Drainage Co-ordinating Committee, Technical Liaison Groups, Community Surface Water Management Systems Operating Group.
- Continual monitoring of design guidelines.
- Provision of technical advice to DPI Surface Water Management Officers and Community Surface Water Management Groups.
- Completion of Shepparton Drain 3B/11P G-MW Community Surface Water Management System.
- Transfer of ownership of Rodney 1/6P, Rodney 2/6P and Ardmona 7/11P Community Surface Water Management Systems from the City of Greater Shepparton to G-MW.

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.*

Program Mission: *"To work with community to provide innovative groundwater and salt management services which support sustainable agricultural practices and protect environmental assets across targeted areas of the Shepparton Irrigation Region."*

Team Leader Report

The Sub-surface Drainage Program demonstrated its adaptive approach by responding to the changing needs of the program and its partners. This flexibility saw:

- The implementation of drought response incentives in the Private Groundwater Pump Capital Grants program;
- The development of a proposed Regional Working Group to consider Groundwater & Salinity Management in the GB CMA area (and Coordinating Group that provides support to the Working Group);
- The removal of private groundwater pump winter salt disposal.

The continuing importance of the Sub-surface Drainage Program was recognised through completion of the Sub-surface Drainage Program Five Year Review. The major theme of the SIR Catchment Partners Celebration Day 2006 was titled 'Don't be Bored with Groundwater', which concentrated on presentations from the Sub-surface Drainage Program and other SIR IC programs and how they relate to the Sub-surface Drainage Program.

Activities and achievements

Public Groundwater Pumps

No feasibility level investigations were completed in 2006-2007, however two were in progress.

The construction of two sites was still in progress.

Private Groundwater Pumps

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

Investigations were completed on 47 pasture properties, with:

- Eleven being successful in locating private groundwater pumping sites;
- Twelve being unsuccessful, but identified potential public pump sites.

Private groundwater pumping was promoted to Local Area Plan groups and three of the investigations completed during 2006-2007 were on properties within Local Area Plan areas.

- A further 17 investigations were commenced on properties, with works still in progress (none in Local Area Plan areas).
- One unsuccessful Horticultural property investigation was completed. Zero investigations are in progress.

Capital Grants for Sub-surface Drainage

In 2006-2007, 13 new systems and three upgrades were completed. The total grant payments made by the GB CMA for the installation and upgrading of groundwater pumps was $345,167.42.

- Nineteen pasture property grant payments were made to 18 individual landholders.
- Nine grant payments for Private Exploratory Drilling were made.

The program introduced an amended process to include drought response funding. No Horticultural property grant payments were made.

Strategic Plan Support

Sub-surface Drainage Program Research and Investigation Strategic Plan Annual Report and Newsletter 2005-2006 was produced. Consultancy Panel renewed. Management and support provided as required. Sub-surface Drainage Program Five Year Review completed. Management of Grouped Salt Projects ongoing.

Strategic Plan Implementation

Thirteen projects and three project plans were completed.

Winter/Spring Salt Disposal Management

Salt disposal from private shallow groundwater pumps was terminated due to findings from DPI project GI 02 025 Review of the Sub-surface Drainage Program SIR Salt Disposal Budget.

River Murray trigger levels were not reached and therefore no disposal from public salinity control pumps was available.

Committee Support

Management and attendance/support was provided as required. Supported the development of the Regional Sub-surface Drainage Working Group.

The function of the Sub-surface Drainage Working Group is to be replaced in 2007-2008 by the Groundwater & Salinity Management Working Group.

Extension

'Drought' was the major focus for extension within the Sub-surface Drainage Program.

A brochure titled "Management Strategies for groundwater use in drought conditions" was produced and circulated to all groundwater users.

There was a focus on one-on-one consultation with groundwater users this year, to specifically focus on individual groundwater management issues from the drought.

Enquiries for information about potential groundwater aquifers from landowners increased significantly with consultants, Sinclair Knight Mertz, Tatura, providing advice from test bores to individual landowners. There was also a significant increase in landowners wanting their water tested for salinity.

The Sub-surface Drainage Program had a display at the Goulburn Valley Dairy and Machinery Field Days at Stanhope in April 2007.

The evaluation project looking at groundwater user attitude, behaviour and perceptions on groundwater management as incorporated into the licence renewal process continued.

Management and Coordination

Program management and technical activities for the management of the Sub-surface Drainage Program were provided. This included the development of business management systems, systems for new consultancy agreements, development and training. Ongoing management of Occupational Health and Safety requirements for the Sub-surface Drainage Program was also undertaken.

Picture: Exploratory drilling

Picture: Header line and well-point installation

Picture: John Avard receiving a Certificate of Appreciation for his involvement in the Sub-surface Drainage Working Group over the last 5 years. Receiving his gift and certificate from Bill O'Kane (CEO of GB CMA) and John Pettigrew (GB CMA Director).

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.*

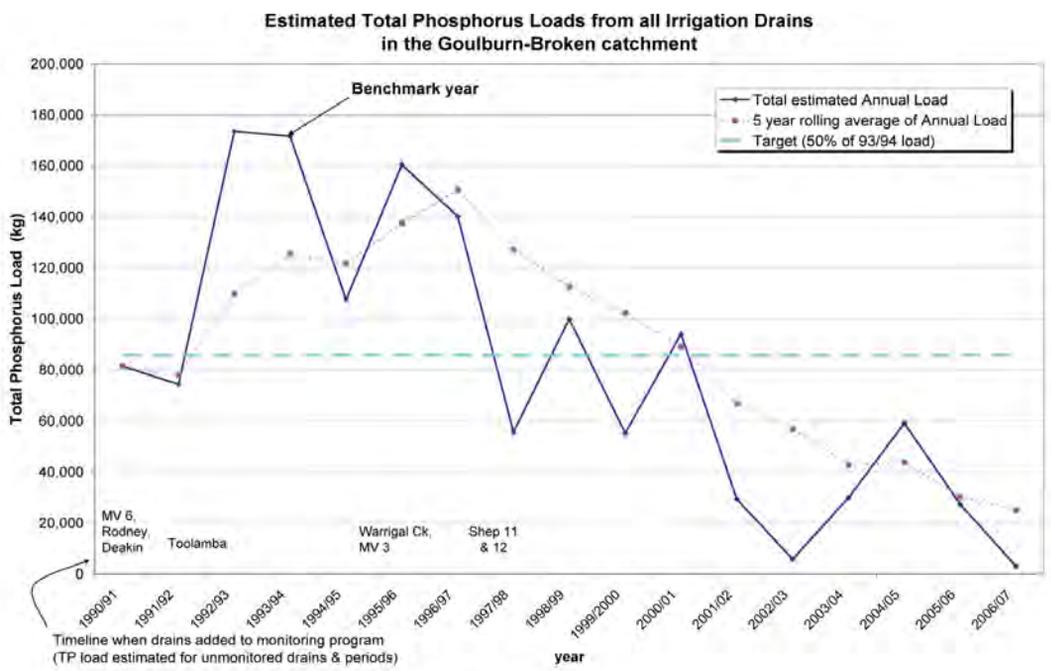
Activities and achievements

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

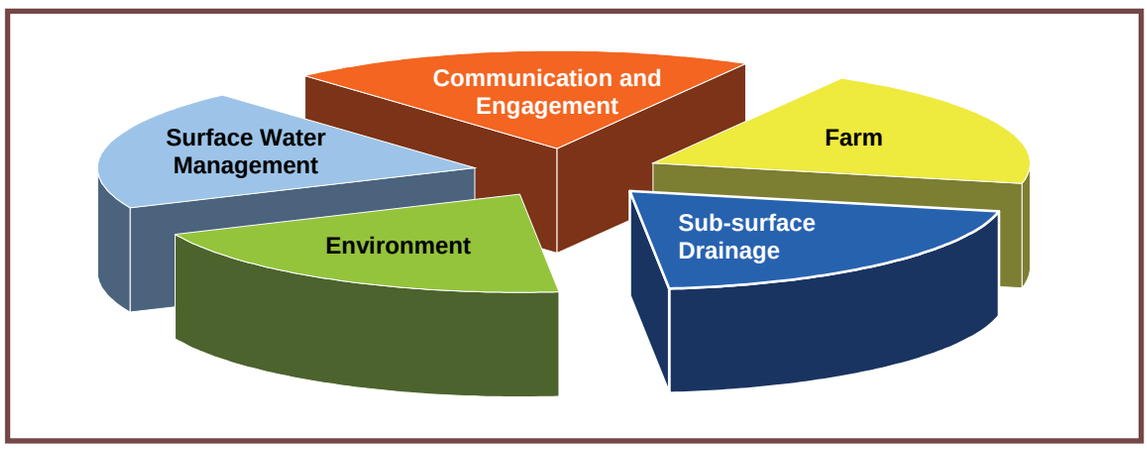
Program Goal: *To provide the framework to manage and coordinate the Shepparton Irrigation Region Catchment Implementation Strategy.*

The Program Support component of the SIRCIS 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 SIRCIS partners.

Salinity Program Management, Department of Primary Industries

The Department of Primary Industries, Sustainable Irrigated Landscapes-Goulburn Broken program (DPI-SILGB) is critical to maintaining ongoing community support, participation and confidence in catchment management across the SIR. DPI-SILGB teams work together to deliver key parts of the GB CMA Regional Catchment Strategy.

The people in the DPI-SILGB program have a strong commitment to the aims of the SIRCIS that is oversighted by the GB CMA.
At the time of writing this report, there is rapid change in Government policy with regards to land and biodiversity and specifically water as a State and national issue. The worst drought on record (1996 to present) has increased pressure on Government and communities to balance rural, urban, industry and environmental needs for what has become Australia's most precious resource - water.



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

The integrated management and delivery of the SIRCIS, the focus on review and improvement, staff capabilities, value for investment and delivering multiple outcomes are key strengths. Such attributes need to be built on when meeting the challenges of:

- designing new projects in an uncertain and changing policy and funding environment;
- driving research and development and strengthening links between research and extension sciences;
- providing demonstrable evidence that Government investment in the region makes for good policy;
- maintaining strong partnership between Government and community.

The Foodbowl Modernisation Project promises future change in the management and delivery of water across the region. DPI will continue to position itself as a key service provider in driving change at the farm scale (increasing productivity and sustainability) while contributing to strategy and knowledge development.

The focus and achievements of the DPI-SILGB 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.

Communication and Engagement Team

People work with groups and networks to improve communication and engagement processes internally and externally to DPI-SILGB. A focus is on improving communication with groups including women; indigenous and migrant-based communities. This benefits these groups and the SIRCIS by improving involvement of these communities in catchment management activities.

A key role of the Communication and Engagement Team has been supporting modernisation of the Shepparton Irrigation Area, in particular the Shepparton-East horticultural area. This work will continue to evolve in the next few months 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 Program Extension

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

Environment Program

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

Evaluation Advisory Team

This team is represented by people from across DPI-SILGB. 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 SIRCIS.

Goulburn-Murray Water Program Management

Staff have provided support to the SIRCIS by ensuring the coordination of many functions including management of existing works and delivery of strategic planning projects.

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

Shepparton Irrigation Region Catchment Implementation Strategy Coordination

The SIRCIS Coordination is a key function that ensures maximum value is gained from the public funds allocated to the SIR IC and closely monitors the achievements and progress of the SIRCIS.

The SIR IC attracted an integrated budget of close to $18 million in 2006-2007. 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 community awareness and understanding of salinity related issues in the catchment.

In 2006-2007, there were 25 successful grant applications in the SIR receiving a total of $30,000.

Landcare and Local Area Planning Development

Landcare is supported and developed by SIR IC and the SIRCIS. 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 SIR.

Tom Dumaresq, a landowner from North West Mooroopna, (see picture) was selected as the winner for his vast experience and innovative

approach to revegetation, his dedication to the North West Mooroopna Landcare group, to watertable monitoring and for many years of service to the Goulburn Valley Tree Group. In further support of his nomination Tom was also acknowledged for his generosity and readiness to share his revegetation knowledge over the years.

Picture: Tom Dumaresq, (R) winner of the 2006 SIR Landcare Award, pictured here receiving his award with Federal Member for Murray, Dr Sharman Stone, (L), and Peter Gibson, Chair of the Shepparton Irrigation Region Implementation Committee (C).

Local Area Plans will accelerate the implementation of the SIRCIS in high priority areas of the Region. 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 SIRCIS.

Municipal Catchment Coordination

The Municipal Catchment Coordinator has been employed in the SIR since 1990. The role of the Municipal Catchment Coordinator is to ensure that Local Government is an active partner in delivery of the Regional Catchment 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 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 Catchment Management Authorities. 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 SIRCIS, 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 SIRCIS.

Research Program

Program Goal: *The research projects for 2006-2007 summarised here seek and find new knowledge to support 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, up-to-date Science underpins the catchment strategy. A notable feature of the program of work this year has been a predominant focus on two key issues facing irrigated agriculture and the region; namely Irrigation Water-use Efficiency and The Changing Irrigation landscape. Continuing low rainfall seasons are driving rapid change in the irrigated*

part of the catchment, hence the shifting focus of the research efforts.
A range of science disciplines at Tatura and within the state wide Primary Industries Research Division supply scientific analysis of issues and needs arising in the region. This supports both decision making processes and also provides a training opportunity for young scientists in land and water management issues in a key irrigation region of Victoria. It is a key partnership between the Goulburn Broken Catchment Management Authority and State Government.

Activities and achievements

Irrigation Water Use Efficiency Benchmarking

The Project Leader, Andrew McAllister and research staff, Elizabeth Morse-McNabb, Des Whitfield, Lucy Finger, Masoud Edraki, Hayley Rokahr and Daniella Csaky worked with DPI – PIRVic and DSE – Water Sector Group on this project. Funding was provided through Victorian Water Trust, DPI Agriculture Development program 1 and the project duration was January 2004 to December 2008.

Background

Over past decades there has been increasing pressure for greater Water Use Efficiency in Victoria's agricultural industries. In 2004, farm Water Use Efficiency indicators were published and a framework for benchmarking farm Water Use Efficiency for irrigated industries within Victoria's major irrigation regions was developed. This study has sought to review and implement the proposed Water Use Efficiency benchmarking framework within the northern irrigation regions. The project objective is to benchmark Water Use Efficiency on farms in all metered irrigation regions in Victoria and develop a framework for an on-going Water Use Efficiency Benchmarking program.

A number of organisations currently collect water use and production data for irrigated agriculture in various regions and industries. However, existing data collection programs have shortcomings; the scale of reporting is too large, data may not be sufficient to enable the evaluation of necessary Water Use Efficiency indicators and data may only be collected for one region of the state. This project has also focused on linking these existing programs by developing data sharing arrangements.

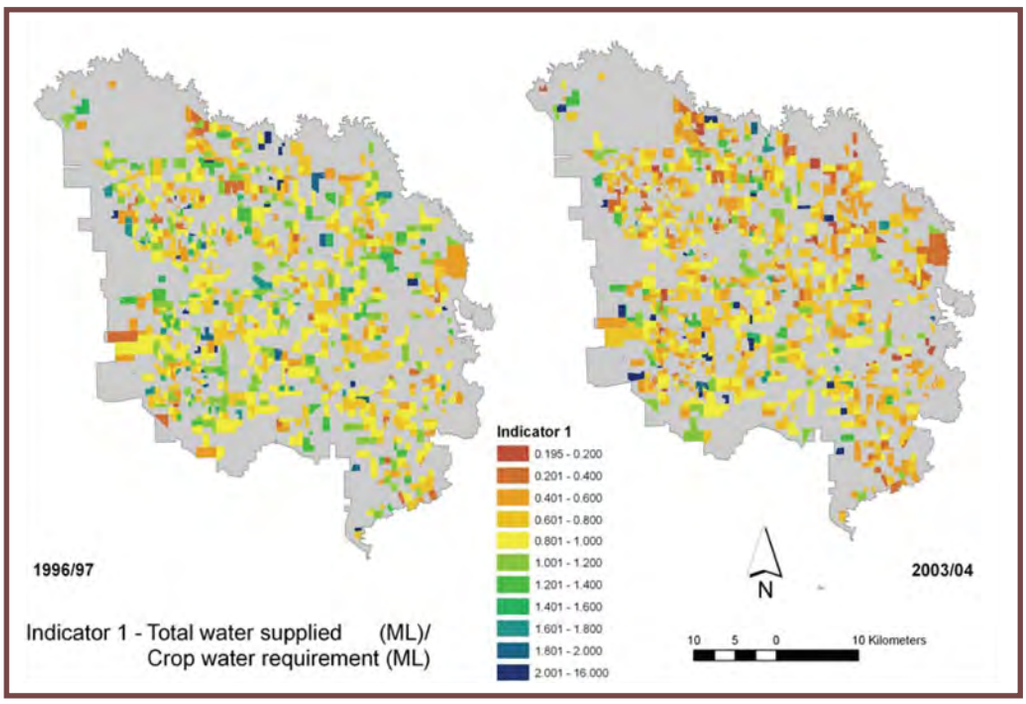
Results, Implications and Benefits

Satellite remote sensing and G-MW's water use database were used to identify areas of irrigated pasture and associated water use in the Central Goulburn Irrigation District. The Water Use Efficiency indicators for the 1996-1997 and 2003-2004 irrigation seasons were calculated for approximately 800 dairy farms in the Central Goulburn Irrigation District and the map below demonstrated the output for Indicator 1, (total water supplied and crop water requirement) in the Central Goulburn.

Project Impact and Key Directions

The project outputs have already had a significant impact on the perception of water use in the Dairy Industry in Northern Victoria. This work has shown that at a regional scale and on an irrigation season basis, dairy properties are not overusing water. This benchmarking process will be extended to all irrigated regions Statewide as a two-stage program to improve understanding of Crop Water Use. This will improve the ability to derive realistic estimates of crop water use for the major irrigated land uses that occur within Victoria and to develop and implement remotely sensed approaches to deriving crop water use.

Ancillary to this work is the development of a Land Use Information System to monitor these indicators over time. This requires a current picture of land use and irrigated enterprise to be available. Work will also progress the development of a prototype Water Use Efficiency reporting system to make the information products available.



Spatial distribution of results for FI-1 across dairy properties in the Central Goulburn Irrigation Area for the 1996-1997 and 2003-2004 irrigation seasons.

Efficient Irrigation Technologies to Match Soils and Dairy Farming Systems

The Project Leader, Matthew Bethune, research staff, Abdi Qassim, Benny Selle and QJ Wang; worked with Product Development Staff, Rabi Maskey, Alan Lavis and Technical Staff Peter Clayton, Brian O'Meara, Tony Cook and Sherridan Watt on this project. Funding was provided through Dairy Australia (including Murray Dairy), DPI – Agriculture Division, and DSE – Catchment and Water Division. The project ran from July 2004 to December 2006.

Background

The prosperity of the irrigated dairy industry depends on our ability to use limited water resources more efficiently. Research at DPI Tatura has shown that replacement of border-check irrigation systems with sprinkler irrigation systems on dairy farms in some environments can reduce water use, increase production and be cost effective. However:

- General access to information about appropriate selection, design and management of sprinkler irrigation systems is not available to farmers, irrigation designers and advisers in Victoria.
- There are no measures of the economic and environmental benefits that broad scale use of efficient sprinkler irrigation systems on dairy farms will deliver to catchments. Such information is required for catchment planners to be able to assess the likely impact of policy initiatives related to farm irrigation system infrastructure.

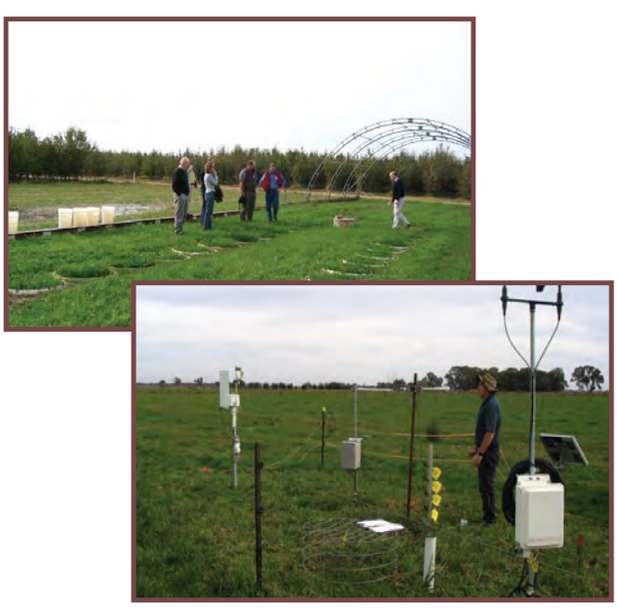
Project Outline

The project objectives were achieved through the delivery of a suite of information and support products to dairy farmers, irrigation advisers, system designers and catchment planners as follows:

- An Information Booklet summarising recent investigations into the applicability of alternative irrigation systems on dairy farms.
- A set of Irrigation System Selection and Design Guidelines that provide direction for farmers going through the process of selecting an appropriate irrigation system for their requirements.
- A Catchment Planning Information package

that quantifies the seasonal water balance under dairy farm border-check and sprinkler irrigation systems for a range of soil and watertable conditions across the SIR. Economic data quantifying the energy requirements of sprinkler irrigation systems are also included.

These information and support products were developed from existing data sources and an extensive experimental and modelling program. A lysimeter experiment (see picture), measuring the seasonal water balance and pasture production on different regional soil types under border-check irrigation, was supplemented by farm-based measurement of border-check and sprinkler system seasonal pasture production and water balances (see picture). Numerical and economic modelling was used for the seasonal data to prepare information required to make decisions about irrigation system infrastructure investment at a farm and catchment scale.



Top Picture: Lysimeter experiment
Bottom Picture: Field measurement site

Results, Implications and Benefits

The "Guidelines for Irrigation System Selection and Design" has been packaged as a web-based information system and CD. The guidelines aim to guide farmers (and those advising them) through a complex decision-making process in a logical manner and consequently enable them to make sound investments into farm irrigation infrastructure. We completed testing the prototype and it is available for general access.

Farmers, designers and irrigation advisers are the target audiences for the Information Booklet and the Guidelines for Irrigation System Selection and Design. Irrigation designers are the target audience for the Decision Support System for Irrigation System Design. Catchment planners are the target audience for information that quantifies the economic and water balance impacts of the broad scale use of sprinkler irrigation systems.

An extension specialist led the development of these products, which involved consultation with dairy farmers, irrigation advisers and designers and catchment planners. A series of workshops finalised the design of the products.

A study has been completed quantifying the impacts on energy use and greenhouse gasses resulting from uptake of centre pivot irrigation. This work involved comparing total energy use during manufacture, installation and operation of a border-check and centre pivot irrigation system. The centre pivot irrigation system has a 5.5 times greater total life cycle energy requirement than a border-check system. A centre pivot requires three times greater construction and installation energy requirements and 22 times greater energy requirements to operate the system, compared to border-check system. This means that converting from border-check to centre pivot irrigation would increase greenhouse gas emissions by 2-3 tonnes of carbon dioxide per hectare per year.

Spatial Market Segmentation and Healthy Landscapes Framework Project

The Project Leaders, Andrew McAllister and Chris Linehan and Research Staff, Elizabeth Morse-McNabb and Ben Rowbottom worked with G-MW, DPI CAS, and DPI PIRVic on this project. Funding

was provided through GB CMA and NC CMA and the project ran from July 2006 to June 2008.

Background

Natural resource management outcomes often require landholders to change their current practices. To aid this process natural resource managers such as DPI, DSE and CMAs invest in interventions such as extension and incentives. By understanding the context of the landholders, it is possible to understand and segment the 'market', allowing better targeting of extension and incentives programs.

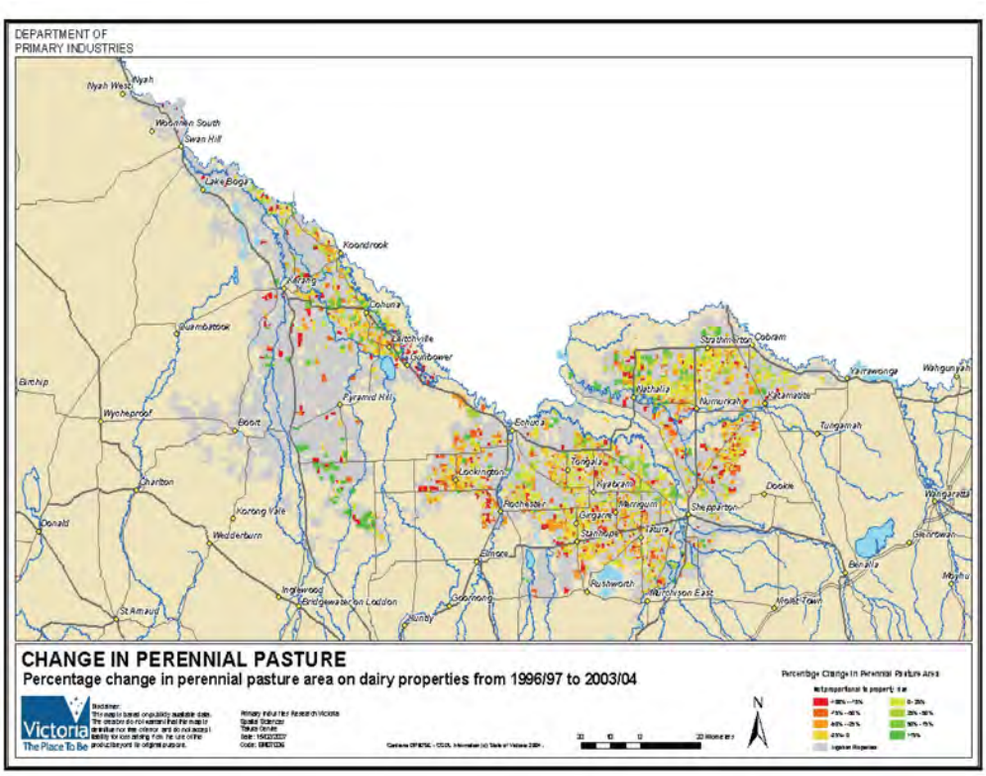
DPI Spatial Sciences Group has a range of land use and irrigation databases that enable the provision of property based contextual information such as irrigated land use area, water use, soil types and main enterprise. This land and water information is able to be integrated to identify changes in land use. Understanding the drivers of change in land use and the impact of this change on natural resource management practices and catchment condition of the SIR is vital in determining appropriate policy and extension interventions.

Project Objectives

By combining spatial data and social context, the project is developing a methodology to enable spatial segmentation of the market for targeting of DPI, DSE and GB CMA investment. This project builds on centre pivot irrigation system spatial market segmentation work completed last year to expand the methodology to encompass additional issues. This project also developed an adaptive information model that combined a range of data sources to allow for continued identification and validation of natural resource management spatial markets. This method allows catchment program managers to visually compare the effectiveness of interventions to produce natural resource management outcomes.

Results, Implications and Benefits

This project in 2006-2007 developed and refined a technique for mapping the location of landholders that would benefit from adopting a new practice or technology. The DPI Spatial Sciences Group has developed a range of land use and irrigation databases that enable property-based contextual information (such as perennial pasture cover, irrigated area, soil types, water use, water trade) to be mapped in a catchment. An example of a map of the change in perennial pasture is given below.



A complete loss of perennial pasture is shown as bright red. Inversely a new area of perennial pasture in the 2003-2004 season is shown as bright green. Light orange and light green are areas of relative stability during the time frame.

Water trading behaviour between 1996-1997 and 2003-2004, across the North Central and Goulburn Broken Catchment Management Authority regions

Segment	Description
Segment One – Temporary Sellers	• 17% service holders. • Have on average sold a significantly larger proportion of temporary water relative to their original entitlement. • Decreased perennial pasture.
Segment Two – Temporary Buyers (Small)	• 20% service holders. • Have on average bought a significant proportion of temporary water relative to their original entitlement. • Did little permanent buying or selling.
Segment Three – Not Trading (Nothing)	• 53% service holders. • Have done relatively little water trading compared to other segments. • Fine tuning.
Segment Four – Temporary Buyers (Large)	• 5% service holders. • Have bought a significantly larger proportion of temporary water relative to their original entitlement, a lot more than Segment Two. • Decreased perennial pasture. • More active than Segment Two in water market.
Segment Five – Permanent Buyers	• 1% service holders. • Have brought a significantly larger proportion of permanent water relative to their original entitlement, compared to other segments. • Increased perennial pasture.
Segment Six - Permanent Sellers	• 4% service holders. • Have sold a significantly larger proportion of permanent water relative to their original entitlement, compared to other segments. • Large decrease in perennial pasture.

The combination of spatial analysis techniques with practice change research techniques has resulted in the development of an overview of land and water movement for the previous 10 years at a property level. Practice change analysis was undertaken to define market segments within the Dairy Industry for landholder behaviour in the water market. Data for both the Shepparton and the North Central Irrigation Regions has been analysed and six market segments have been identified based on water trading behaviour.

Project Impact and Key Directions

Subsequent work in this area will further refine the Dairy Industry segmentation using interview and survey methodologies that support the application of the spatial data. The method will allow the GB CMA to visually compare the effectiveness of policy interventions within a catchment, thereby providing a means of demonstrating their impact in a transparent and accountable way.

This project draws on our expertise in farming systems, marketing theory and spatial sciences to

develop a method that can be used by CMAs to allow the spatial targeting of DPI, DSE and CMA investment. The method will allow CMAs to visually demonstrate the impact of policy interventions within a catchment.

Irrigation Futures of the Goulburn Broken Catchment

The Project Leader QJ Wang and Research Staff Leon Soste (Operational Manager), David Robertson, Robert Chaffe, and Technical Staff Sherridan Watt worked with the DSE Community Engagement Network on this project. Funding was provided through Goulburn Broken Catchment Management Authority, National Action Plan for Salinity and Water Quality, Goulburn-Murray Water, Co-operative Research Centre for Irrigation Futures, Land and Water Australia, Victorian Department of Primary Industries, and the Victorian Department of Sustainability and Environment. The project ran from July 2003 to June 2007.

Background

The Goulburn Broken Catchment is known as the Food Bowl of Victoria. Irrigated agriculture is a major business engine within the Goulburn Broken region, producing more than $1.2 billion at the farm gate in 2001-2002. The region faces significant challenges and opportunities. Issues such as free-trade agreements, climate change, water reform, and technological developments will have a significant influence on the future. It is therefore critical that the region develops a sound plan to strategically position itself for irrigation in the future. The Goulburn Broken Irrigation Futures project was established in 2003 to assist the regional community to plan for the future. It did this using a scenario planning approach in collaboration with the region's stakeholders. This has now been completed in the fourth and final year of the study.

Project Findings and Implications

The project was undertaken in four stages. Stages One to Three were as follows:

Stage One: Project development (2003-2004)

Stage Two: Capturing community perspectives (2004-2005)' Irrigation Futures Forums'

Stage Three: Detailed analysis of how the region would manage the external scenarios developed in Stage 2 (2005-2006)

The final stage of this project, Stage Four: Enabling change (2006-2007), involved working with over 50 staff in regional organisations and groups to build the learning from the project into their business and strategic plans. The organisations and the major strategic plans in the region were:

- the development of G-MW's Strategic Overview of Service Needs for the SIR;
- the five-year review of the SIRCIS; and
- the development of the Rural Strategy for the Campaspe, Moira and Greater Shepparton Local Governments.

Picture: Project staff and representatives from regional organisations involved in the Irrigation Future project

The project has produced output at three levels to enable users to access material in different ways.

- The four scenarios, which describe the evolution of plausible alternative futures for the region, are designed to enable users to consider alternative possible futures and how they may impact on their business or organisation.

- The broad implications of the scenarios are designed to enable users to readily identify strategies to maintain and increase the attractiveness of the region and consider how to build those strategies into their business or organisation.
- The implications of the scenarios for specific issues are tailored recommendations for individual organisations in the region.

One example of the project findings and how they are being adopted is:

- The region has an extensive network of irrigation water supply infrastructure that has the ability to deliver water to the vast majority of properties in the region. However, much of this infrastructure is degrading and nearing the end of its design life. The scenarios highlight that water availability for irrigation may change significantly in the future due to variability and change in climate as well as potential changes in water policy. Water trade may also affect the amount of water used in the region and its spatial distribution. Therefore, there is great uncertainty in the size and location of the irrigated area and amount of water used in the future. There may even be periods of rapid contraction and expansion of irrigation. Thus there is a need to build flexibility into irrigation infrastructure, so that it is adaptable to future demands. Flexibility may be achieved through innovative system configurations, distribution technologies, a mix of infrastructure ownership, and improved management systems.

  To assist G-MW to implement this learning, the project team has initiated a further investigation aimed at providing a Handbook of Flexible Technologies for Irrigation Infrastructure. This will provide a conceptual framework for the provision of flexibility in irrigation infrastructure, and identifies the range of technologies available for the provision of flexibility in irrigation infrastructure.

Where To From Here

A key output from the project is the report "Scenarios of the future: Irrigation in the Goulburn Broken region". It provides the principal regional-level output from the Goulburn Broken Irrigation Futures project.

This includes background information on the catchment, the four Scenarios, their broad implications for the region, and strategies for the region to protect and strengthen the features that make it attractive for investment and living. It is intended to be a living document which is continually used and updated by agencies, industry associations and enterprises within the region.

Policy Instrument Choice Framework

A Policy Instrument Choice Framework has been developed to help policy practitioners from natural resource organisations such as State government and CMAs to select a package of policy instruments that achieve outcomes effectively and efficiently. To develop this framework we reviewed a number of existing frameworks and funding guidelines that policy practitioners have used when selecting instruments. We found that these frameworks placed an emphasis on efficiency at the expense of flexibility. As a consequence, we concluded that the existing frameworks were of limited value when policy practitioners were faced with a high level of uncertainty about the responses of landholders and institutions to new policy instruments. Consequently we perceived there was a need to develop a new framework - the Policy Instrument Choice Framework (PCF) - for choosing policy instruments that enabled both efficiency and flexibility to be considered.

The PCF has been trialled on case studies from the Water $mart Farms Program as implemented in the SIR to evaluate the usefulness of the framework. The trial to date has shown that the PCF is valuable in:

- Helping policy practitioners to systematically rationalise the selection of policy instruments by identifying and explaining

variations in landholder and institutional behaviour;
- Identifying circumstances when policy instruments may need to be modified to achieve an outcome;
- Identifying when a package of complementary policy instruments may be required, and
- Identifying information gaps that are strategically critical to the successful implementation of policy instruments.

Waterways Program

Program Goal: *Protection and enhancement of the environmental, economic, recreational and aesthetic values of the rivers and waterways (stream health). Protection of public and private assets from stream-related impacts.*

Activities and achievements

Regional River Health Strategy

The Waterways Program in the SIR is part of the Regional River Health Strategy for the Goulburn Broken Catchment. The River Health Strategy plans to improve river health by determining environmental flow needs and changing river flow regimes, particularly in the Goulburn River, Broken River, Yea River, Seven Creeks, Broken Creek and King Parrot Creek. The Regional Catchment Strategy plans to improve the condition of 70 percent of wetlands by 2030.

The lower Goulburn River and the lower Broken Creek have been identified as key risk areas for serious environmental damage. These risks are therefore being actively managed. Dissolved oxygen levels in the lower Broken Creek have been maintained more consistently at higher levels. Monitoring systems to detect environmental health changes on an annual basis are not in place but are being developed for the major regulated river systems.

Lower Broken Creek Waterway Management

Management of flows in the lower Broken Creek continued in conjunction with G-MW, minimising azolla build-ups, limiting low dissolved oxygen problems, and providing fish passage. Flows were diverted from and returned to the River Murray, bypassing Barmah Choke and providing environmental benefits in Broken Creek with minimal loss of water. Flushes were provided from the Goulburn system to manage azolla build-ups.

Of the 30,000 ML Goulburn Water Quality Allowance, 2,703 ML were required to provide flushes in Broken Creek. The Victorian Government sold 7,000 ML of this allowance, late in the irrigation season, to help water users cope with the lowest Goulburn system water availability on record. Funds from the sale of the water are being used to accelerate river health and water quality projects in the Catchment.

Further investigations into the extent of the aquatic weed, Cabomba caroliniana (common names: cabomba, fanwort) in the Broken River and Broken Creek were conducted.

Azolla Management

A study of the ecological processes in Broken Creek commenced to better understand the processes generating low dissolved oxygen levels and potential mitigation measures.

A trial of mechanical removal of azolla from the Broken Creek was completed and successfully demonstrated the ability to remove azolla.

Wetlands

The GB CMA in partnership with the Greater Shepparton City Council, Parks Victoria and Friends of Gemmill's Swamp was awarded a community water grant to help fund the construction of a bio-remediation wetland to treat stormwater before it enters Gemmill's Swamp.

Bird hides for Gemmill's Swamp were constructed under the Drought Employment Program.

A number of priority wetlands have been fenced to improve management.

Priority wetlands in the Catchment have been identified, based on their conservation significance and threats, to inform resource decision-making and guide the allocation of limited resources.

A Wetland Implementation Plan for lower Broken to Goulburn River commenced.

The Kanyapella Wetland Management Plan was completed. This will assist landowners and agencies identify weeds.

Environmental Flows

Given the potential for severe drought in 2007-2008, the GB CMA participated in planning how to share the potentially very limited available water. This included preparing a GB CMA dry inflow contingency plan which identified the critical environmental assets that needed to be protected under a survival scenario.

Expert advice was obtained on the potential impacts of low flows on the Goulburn River below Goulburn Weir as part of the dry inflow contingency planning.

A study into the environmental implications of high summer flows in the Goulburn River below Goulburn Weir was completed, setting limits to flows for different environmental impacts and levels of risk.

A review of the Lower Goulburn Waterway Plan and a review of the Kialla Streams Plan were completed.

Studies were conducted on:

- constraints to delivery of environmental flows in the Goulburn River and to the River Murray, finding that flooding and high summer river flows were significant constraints.
- the interaction between environmental flows and flooding. This included obtaining comprehensive land surface elevation data for the Goulburn River and its floodplain.
- the monitoring program to determine ecological response to environmental flow releases in the Goulburn River, Broken River and Broken Creek.

The environmental condition of the Broken and Boosey Creeks (as part of the assessment of the environmental impacts associated with the Tungamah Pipeline) was further benchmarked.

An environmental flow determination for the upper Broken and Boosey Creeks was completed. Hydraulic modelling of flooding in the Barmah Forest progressed, with improved elevation data captured by airborne laser scanning and field surveys.

Barmah Forest Environmental Management Plan

In conjunction with Yorta Yorta students, a waterbird survey was carried out in Barmah Forest, resulting in the first recording of Brolga presence.

The Barmah Forest Environmental Management Plan was updated, a new blueprint plan developed for future directions prepared, and a new vegetation monitoring program implemented.

Weeds Booklet

A weeds booklet was prepared to assist landholders and agencies identify weeds which impact on the quality of riparian lands and in-stream habitats. This information will be incorporated into the overall Goulburn Broken Weed booklet currently being reprinted as a third edition.

RiverConnect - Shepparton Region

A number of projects have been achieved through the RiverConnect Project including:

- The GB CMA hosted 15 Australian National

University fine art students, who visited Shepparton and depicted the Goulburn River through various art mediums. The work was presented during Water Week;
- Rehabilitation at Jordan's Bend, Shepparton, started after bushfires in December;
- An audit of the secondary school curriculum in Shepparton and Mooroopna explored how schools use the Goulburn River as a resource and how it can be better utilised in the future;
- Students worked at Jordan's Bend and Reedy Swamp as part of the Victorian Certificate of Applied Learning;
- An Indigenous Oral History Project began; and
- Drought Employment Program crews carried out works in the RiverConnect area including woody weed removal, spraying, building bird hides and collecting rubbish.

Monitoring

Snapshot monitoring and detailed river assessments were undertaken and include:
- Monitoring native fish movement in the lower Broken Creek and following construction of fishways on the Broken River;
- Monitoring flora, fauna and water quality and channel morphology following flow regime changes in the Broken and Boosey Creeks;
- Monitoring Victoria's 'Index of Stream Condition'.

Water Quality in Rivers and Streams

Elevated nutrients have been identified as a high priority issue for water quality in the Goulburn Broken Catchment because they stimulate excessive algal growth.

Phosphorus loads are an important indicator of water quality in rivers and streams. This is because phosphorous loads are a limiting factor in the development of toxic blue-green algal blooms and flow-dependant blooms of the aquatic plant azolla. Azolla blooms have been linked to fish deaths in the Broken Creek.

Estimated total phosphorus loads discharged from irrigation drains are still below the long-term target. This correlates with substantially lower volumes of drain flows. Statistical and trend analysis of irrigation drainage water quality and quantity, which has been undertaken every two years, shows significant decline in flows and nutrient loads leaving drains.

A Water Quality plan is being developed in consultation with other CMAs and the DSE. The plan will align with the Regional River Health Strategy.

Excavation work for the stormwater treatment wetland at Gordon Drive (Kialla Lakes) has started. Stages one and two are being delivered in partnership with the Greater Shepparton City Council.

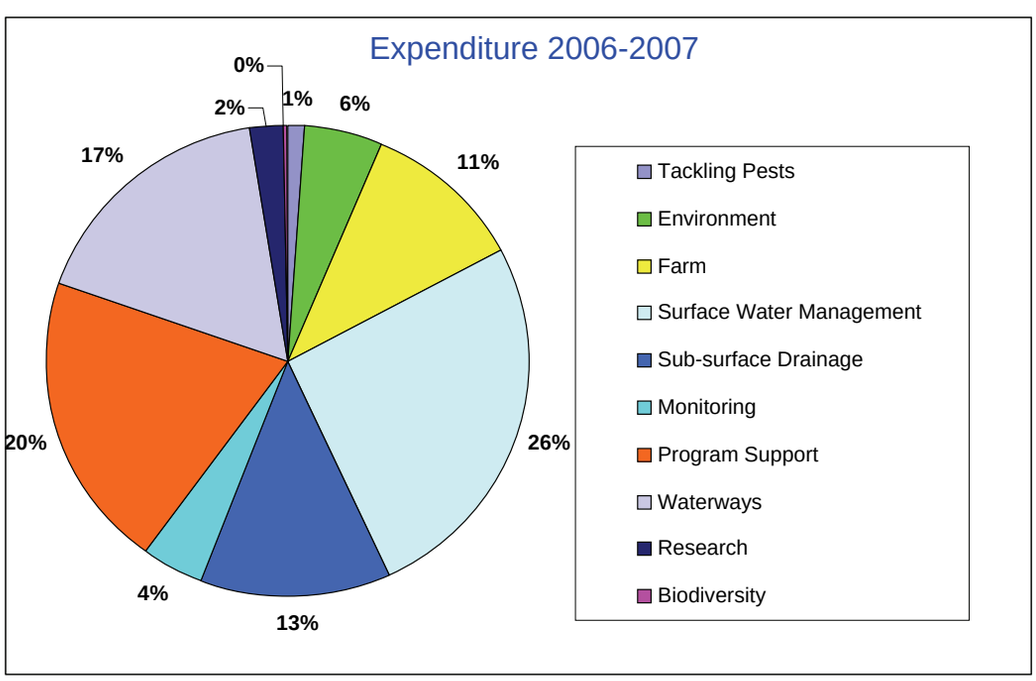
APPENDICES

Outputs 2006-2007

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)	44	41	93
	Fence wetland remnant(ha)	12	7	58
	Fence stream/river remnant (ha)	8	269	3,363
	Off-stream watering (no.)	21	10	48
	Binding Management Agreement (license, Section 173, covenant) (ha)	100	143	143
Induced Threat				
Saline water and high watertables				
Surface water	Landform/lasergrading (ha)	7,700	4,490	58
	Drain – primary (km)	8	6	75
	Drain – community (km)	9	0	0
	Farm reuse system (no.)	55	56	102
	Drain – additional water diverted from regional drains (ML)	570	75	13
	Irrigation systems – improved (ha)	640	570	89
Sub-surface water	New groundwater pumps – public (no.)	2	0	0
	New groundwater pumps – private (new and upgrade no.)	20	16	80
	Volume water pumped (ML)	1,400	3,302	236
Nutrient-rich & turbid water & suspended solids	Stormwater management projects (no.)	2	0	0
In-stream and near-stream erosion	Bed and bank protection actions (km)	19	0.12	1
	In-stream & tributary erosion controlled (km)	0	1.2	
Weed invasion	Weeds – aquatic weeds controlled/eradicated (km)	36	2	6
	Targeted infestations of weeds in high priority areas covered by control programs (ha)	200	9,637	4,819
Pest animals	Area of high priority rabbit infested land that are covered by control programs (ha)	7	0	0
	Area of high priority fox infested land covered by control programs (ha)	8,000	38,800	485
Impact				
Habitat loss - terrestrial	Revegetation - plant natives within or next to remnants (ha)	125	177	142
Habitat loss – in-stream	Fish barrier removal (no.)	2	5	250
	Establish SEAR (Significantly Enhanced Aquatic Refugia) (no.)	1	0	0
Habitat loss – Threatened species	Threatened Species Recovery Plan and Action Statements (no. projects)	2	2	100
Planning	Whole Farm Plans (no.)	153	152	99

Budget & Final Expenditure 2006-2007

Programs	State Funds $'000s	Federal Funds $'000s	Regional Funds $'000s	Brought forward $'000s	Reallocated $'000s	Total funds $'000s	Expended $'000s
Tackling Pests	173					173	173
Environment	330	650		-35		944	978
Farm	1,107	461		288	240	2,096	1,874
Surface Water Management	2,002	2,741	319	-39	-96	4,927	4,579
Sub-surface Drainage	1,975	495	105			2,575	2,257
Monitoring	229	120	222			571	718
Program Support	1,618	1,454	55	97	16	3,239	3,621
Waterways	2,332	700		82		3,114	3,010
Research		390				390	390
Biodiversity		160				160	65
Total	**9,766**	**7,171**	**701**	**393**	**160**	**18,191**	**17,666**



Summary of Cost Share

Partners	Annual Expenditure 2006-2007 $	Accumulated Expenditure $
Government	17,666,000	277,794,001
Community	37,463,210	699,307,546
Total	**55,129,210**	**977,101,547**

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.

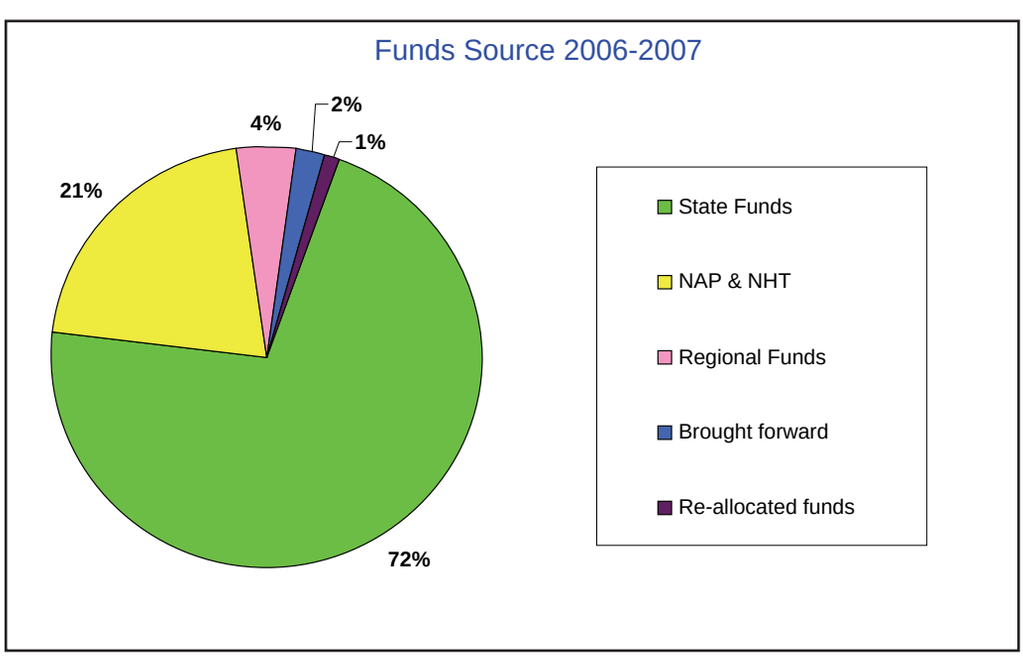
Government expenditure has been obtained from reports on each project, provided by relevant agency. Appropriate managers, subject to verification certified the expenditure reports as correct by audit.

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 2006-2007 dollars. Previous expenditure was adjusted by applying the Victorian CPI increase of 3.1% in 2006-2007.



Catchment Education and Awareness Grants

Catchment Education and Awareness Grants were established in 1986 to help raise awareness and understanding of salinity.

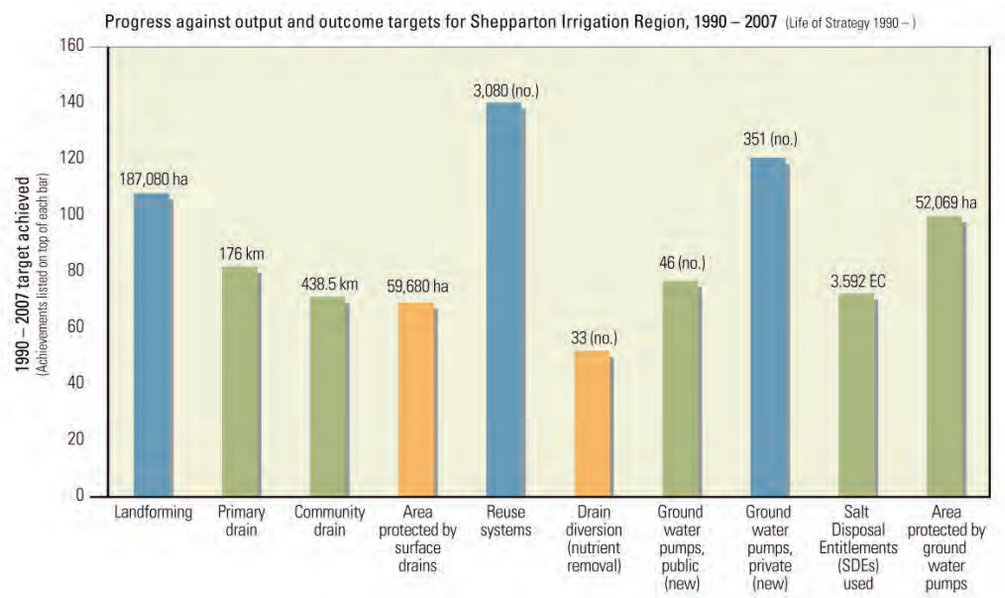
Originally called "Community Salinity Grants", the program has funding for catchment education and demonstration projects undertaken by schools, farmers and community groups in the Goulburn Broken catchment. The scheme encourages projects that are related to local salinity management plans and strategies. Groups may apply for a grant up to a maximum of $8,000. The groups which were successful in receiving a Catchment Education Awareness Grant for 2006-2007 are shown.

Group	$
St Mary of the Angels Secondary College Nathalia	215
Midland Cluster Primary School – Undera Primary School	750
Toolamba Primary School	3,942
Goulburn Murray Landcare Network	2,000
St. Joseph's College, Echuca	960
Rushworth P-12 College	800
Katamatite Primary School	500
Merrigum Community Group Inc	1,120
Stanhope Primary School	520
Wanganui Park Secondary College	215
Wyuna Landcare Group Inc	300
Katandra West Landcare Group	800
Shepparton Mooroopna Urban Landcare Group	200
Nanneella Estate Primary School	300
Nanneella & Timmering Action Group	1,080
Nanneella & Timmering Action Group	1,040
Nanneella & Timmering Action Group	278
Cobram Primary School	1,000
Greater Shepparton City Council	3,000
Goulburn Broken Waterwatch – Goulburn Valley Water	3,000
Goulburn Broken Waterwatch – Goulburn Valley Water	3,900
Broken Creek Improvement Landcare Group - Nathalia	650
Broken Creek Improvement Landcare Group - Nathalia	1,800
Invergordon Landcare Group – Invergordon Primary School	690
Greater Shepparton City Council	1,300
Total Grants paid in the Shepparton Irrigation Region 2006-2007	**$30,000**

Implementation 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 we will not meet implementation targets until approximately 2030 (rather than 2020 as forecast in the 1990 SIRLWSMP).



Salt Disposal Report

Progressive uptake of Salt disposal entitlements to June 2007*

Activity	Uptake of Salt Disposal Entitlements (EC)			
	Pre-1991	Total to 2006-2007	Uptake in 2006-2007	Total to 2006-2007
Primary Drains	0.055	0.077	0.000	0.077
Community Surface Drains	0.008	0.157	0.000	0.157
Public Groundwater Pumps		1.682	0.000	1.522
Private Groundwater Pumps		1.449	0.068	1.682
Horticultural Sub-surface Drainage	0.030	0.159	0.000	0.517
Total	**0.093**	**3.524**	**0.068**	**3.592**

* Includes pre-1991 impacts.

** Note: The impact of incrieasing dryland salinity in the Goulburn Broken Catchment is now on the MDBC Register as 3.592 EC or $931,684 with no mechanism for reassessment from the benefit of on-ground works.

Committees and Working Group Members 2006-2007

Shepparton Irrigation Region Implementation Committee Members

Voting Members Community Representatives	Non-Voting Members Agency Representatives	Executive Support Agency Staff
Peter Gibson (Chair) Nanneella Peter McCamish (Deputy Chair) – Ardmona Allen Canobie - Numurkah Stephen Farrell – Echuca Nick Ryan – Lancaster **Retired September 2006** Russell Pell Ann Roberts Nick Roberts **Appointed September 2006** John Gray - Toolamba Helen Reynolds – Congupna Roger Wrigley – Wangaratta	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	06-5	06-6	06-7	06-8	07-1	07-2	07-3	07-4
Peter Gibson	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Stephen Farrell	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Allen Canobie	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Peter McCamish	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Apol
Nick Ryan	Yes	Yes	Apol	Yes	Yes	Apol	Yes	Apol
Russell Pell	Yes	Yes	Retired					
Ann Roberts	Apol	Apol	Retired					
Nick Roberts	Apol	Apol	Retired					
Roger Wrigley	-	-	Yes	Yes	Yes	Yes	Yes	Yes
John Gray	-	-	Yes	Yes	Yes	Yes	Yes	Yes
Helen Reynolds	-	-	Yes	Yes	Yes	Yes	Apol	Yes

Working Group Members

Group	Community Member	Agency Representative
SIR Technical Support Committee (SIRTEC)	Peter Gibson – SIR IC Allen Canobie – SIR IC Peter McCamish – SIR IC	Ken Sampson – GB CMA James Burkitt – G-MW Peter Dickinson – G-MW Greg Smith – G-MW Carl Walters – G-MW Bruce Cumming – DPI Geoff Lodge – DPI David Lawler – DPI Steve Lottkowitz – DPI Bruce Gill – DPI Pam Collins – DPI Wayne Tennant – GB CMA Gordon O'Brien – GB CMA Colin James – GB CMA Peter Howard – GB CMA Grant Jones – EPA

Group	Community Member	Agency Representative
Budget Sub-Committee	Peter Gibson Stephen Farrell Peter McCamish Roger Wrigley	Ken Sampson – GB CMA Chris Howard – G-MW James Burkitt – G-MW Peter Howard – GB CMA Pam Collins – DPI
Sub-surface Drainage Working Group	Peter McCamish (Chair) Peter Gibson Ian Whatley John Horder Kevin Chapman George Trew Brian Gledhill Heather duVallon Bo Silverstein Brian Gledhill Alan Strang	Martin Brownlee- SKM Ken Sampson – GB CMA Colin James – GB CMA Bruce Cumming - DPI Terry Hunter – G-MW Bruce Gill - DPI
Surface Water Management Working Group	Allen Canobie (Chair) Geoff Witten Peter Gibson Ron Brooks John Horder Mick Trevaskis Hank Sanders Stephen Farrell George Trew Glen McAliece	Mark Paganini – DPI Ken Sampson – GB CMA Pam Collins – DPI Colin James – GB CMA
Farm & Environment Program Working Group	Roger Wrigley (Chair) John Gray Helen Reynolds Graeme Talarico Graham Lawless George Trew John Hewlett Rien Silverstein John Laing Gerado Fasano Athol McDonald Alfred Heupermann Bill Probst	Chris Nicholson - DPI David Lawler – DPI Bruce Cumming - DPI Alan Lavis- DPI Ken Sampson – GB CMA Colin James – GB CMA
Waterways Working Group	Russell Pell (Chair) Nick Ryan Roger Wrigley Terry Court Tait Hamilton Ian Howley Lanie Pearce Bill Probst Peter Sargent Alan Sutherland	Wayne Tennant – GB CMA Gordon O'Brien – GB CMA Bruce Cumming – DPI Alex Sislov – DPI Silvio Fontana – G-MW David Trickey – DPI Fisheries Ken Sampson - GB CMA Peter Howard – GB CMA Colin James – GB CMA

Presentations and Publications

Environment Program

Publications and Radio Presentations

- Bush and Land column in the Country News on a range of topics relating to biodiversity management.
- ABC radio interviews (e.g. habitat for birds, Painted Snipe and direct seeding).
- Primary Voice Article published "What's in a wetland?" by Jo Deretic Summer Edition 2006.
- Land and Water Article published "Wetland Management is much more than "Wet and forget" by Jo Deretic May 2007.

Groups hosted by Project Staff during the year

- Presentation to new GB CMA Board Members at Reedy Swamp by Jo Deretic September 2006.
- Presentation and tour hosted by Jo Deretic and Alex Sislov for Chinese International Students at Mansfield Swamp.
- Jo Deretic hosted a group from St Marys Primary School at Cussen Park October 2006.
- Jo Deretic hosted Notre Dame College Year 9-10 Students in February 2007.

Presentations

- High Value Environmental Features for Groundwater.
- Vegetation Quality Assessments.
- Environmental Assessment Process.
- Delivering and monitoring the impacts of Environmental Water Allocations for wetlands.
- Presentations on Managing Wetlands and the Development of Performance Indicators for Natural Features in the SIR - Linking the Sciences of Research and Extension Conference in Bendigo.

Surface Water Management Program

Publications

- General Guidelines for Grants.
- Priority Ranking Policy Paper.
- Sunset Clause Policy.
- SIL-GB Stories 2007.

Presentations

- Kym Ockerby Australian National Committee on Irrigation and Drainage (ANCID) conference in Darwin in October. 'Strengthening Indigenous Relationships in the Community Surface Water Management Program' – Paper and presentation.
- John Bourchier at Australian National Committee on Irrigation and Drainage (ANCID) conference in Darwin in October. 'Drainage in a drought' – Poster presentation.
- Management Actions Assumptions Paper for the Goulburn-Broken Catchment.

Tours

- Hosted Minister for Agriculture Bob Cameron to view and discuss the construction of the Shepparton 3V/11P Community Surface Water Management System. There were opportunities for radio, print and tv media coverage.
- Community Surface Water Management Program staff toured West Gippsland CMA area, focussing on the Maffra Irrigation District and the Yarram Area.
- Murray Irrigation Limited staff tour.

Sub-surface Drainage Program

Publications

- Pumping up the Message - groundwater extension in the Shepparton Irrigation Region Author Clair Haines, Rabi Maskey and James Burkitt. Conference Abstract accepted for the 2nd International Salinity Forum.
- Running low on water? Groundwater is an option for some Author Clair Hains; Target 10 Communicator June 2007.
- How's your groundwater holding up under these dry conditions? Author Clair Haines.
- Land and Water Management Update - Country News.
- Management Strategies for groundwater use in drought conditions. Author Terry Batey; Brochure.
- Burkitt J & Finlayson D, 2006. Simply Predicting Changes in Shallow Groundwater Salinity. 10th Murray Darling Basin Groundwater Workshop, Canberra, September 2006.

Presentations

'Blue Sky Presentations':

- Review of the SSDP/SIR Salt Disposal Budget (DPI).
- Public Pumps Under Different Climatic Regimes (DPI).
- The need for Salt Disposal Entitlement in the SIR (G-MW).
- Presentations and attendance at MDBC Groundwater Workshop in Canberra September 2006
- Submission of abstracts for ANCID 2007 & International Salinity Conference - Adelaide 2008.
- SIR Catchment Partners Celebration Day 2006, Major theme: 'Don't be Bored with Groundwater' Included presentations on:
    - Subsurface Drainage Program Overview (Steve Feiss, G-MW)
    - Management of Salt within the SIR (James Burkitt, G-MW)
    - Knowledge integration in Salt Management (Ruth Duncan, DPI)
    - Review of Subsurface Drainage Program Monitoring Needs (Lisa Menhenett, SKM)
    - Key Performance Indicators of the Subsurface Drainage Program (Ian Oppy, G-MW)
    - The Assessment of High Value Environmental Features in the SIR (Neil McLeod, DPI).

Groups hosted by Project Staff during the year

- University of the Third Age tour of Girgarre Evaporation Basin.

Monitoring

Publications

- SKM (2007), Shepparton Irrigation Region Drain Nutrients Annual Review 2005/06 (C806).
- Ecowise Environmental (2006), Biomonitoring of the Impacts of Discharges from Irrigation Drains 2005/06.

Program Staff 2006-2007

The 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
Jim Castles	GB CMA
Kate Brunt	GB CMA
Vanessa Keogh	GB CMA
Tony Kubeil	GB CMA
Carla Miles	GB CMA

Environment

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

Farm

David Lawler	DPI
Julie Engstrom	DPI
Alan Lavis	DPI
Rebecca Lukies	DPI
Rabi Maskey	DPI
Chelsea Nicholson	DPI
Chris Nicholson	DPI
Libby Reynolds	DPI
Gemma Beard	DPI

Surface Water Management

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

Sub-surface Drainage

Terry Hunter	G-MW
Peter Dickinson	G-MW
David Douglas	G-MW
Stephen Fiess	G-MW
Ed Thomas	G-MW
James Burkitt	G-MW
Chris Howard	G-MW
Cassie Warren	G-MW
Ray Modystack	G-MW
Chris Solum	G-MW
Cynthia Ng	G-MW
Chelsea Nicholson	DPI
Clair Haines	DPI
Martin Brownlee	G-MW/SKM

Monitoring

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

Program Support

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

Research

Matthew Bethune	PIRVic
Kim Broadfoot	PIRVic
Daniella Csaky	PIRVic
Robert Chaffe	PIRVic
Peter Clayton	PIRVic
Tony Cook	PIRVic
David Cornwall	PIRVic
Ruth Duncan	PIRVic
Masoud Edraki	PIRVic
Lucy Finger	PIRVic
Bruce Gill	PIRVic
Hayden Lewis	PIRVic
Chris Linehan	PIRVic
Richard Maxwell	PIRVic
Andrew McAllister	PIRVic
Brijesh Mehta	PIRVic
Mike Morris	PIRVic
Elizabeth Morse-McNabb	PIRVic
Brian O'Meara	PIRVic
Abdi Qassim	PIRVic
David Robertson	PIRVic
Hayley Rokahr	PIRVic
Ben Rowbottom	PIRVic
Benny Selle	PIRVic
Leon Soste	PIRVic
QJ Wang	PIRVic
Sheridan Watt	PIRVic
John Ford	CAS
Megan Higson	CAS
Fiona Johnson	CAS
Geoff Kaine	CAS
Melinda Leth	CAS
Ruth Lourey	CAS

Waterways

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

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
DNRIS	Drainage Nutrient Removal Incentive Scheme
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

ACKNOWLEDGMENTS

A number of people contributed to the preparation of the 2006-2007 Shepparton Irrigation Region Implementation Committee Annual Report. The efforts of these people and their staff have been greatly appreciated.

Implementation Committee
Peter Gibson, Chair
Implementation Committee Members

Goulburn Broken Catchment Management Authority
Peter Howard
Colin James
Tim Barlow
Wayne Tennant
Fleur Baldi

Department of Primary Industries
Lyndall Ash
Raechel Ballinger
Terry Batey
Bruce Gill
David Lawler
Rebecca Heard

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 Catchment Management Authority, Department of Primary Industries and Goulburn-Murray Water.

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