Shepparton Irrigation Region
Implementation Committee

Water, Land and People

Annual Report
2007-2008

GOULBURN BROKEN
CATCHMENT MANAGEMENT AUTHORITY

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

Acknowledgment
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Black swans and cygnets at Reedy Swamp - (Photo by Paul O'Connor, Department of Sustainability and Environment)

Contents

OUR REGION - OUR PEOPLE

The Shepparton Irrigation Region

The Shepparton Irrigation Region 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 Shepparton Irrigation Region includes the municipalities of the City of Greater Shepparton, Moira Shire and Campaspe Shire and the major rural centres of Shepparton, Cobram, Echuca and Kyabram. The townships of Mooroopna, Numurkah, Tatura, Nathalia, Stanhope, Murchison, Colbinabbin, Tongala, Strathmerton, Katamatite, Undera, Girgarre, and Katandra also lie within the Shepparton Irrigation Region boundary.

In 2007 agreement was reached between the North Central Catchment Management Authority (NC CMA) and the Goulburn Broken Catchment Management Authority (GB CMA) for the Shepparton Irrigation Region Implementation Committee to administer Natural Resource Management incentives in the districts surrounding Echuca, Rochester and Lockington. This has resulted in a consistent delivery of Natural Resource Management initiatives across neighbouring areas.

The irrigated area of 317,000ha within the Shepparton Irrigation Region utilise approximately 1.5 million megalitres of water each year. The gross value of agricultural production in 2005-2006 was $1.38 billion. This accounts for 14.9% of Victoria's gross value of agricultural production. The main primary industries are horticulture, dairying, cropping and grazing.

The Shepparton Irrigation Region is the centre for major food processing industry that contributes 25% of Victoria's export earnings. Companies include Kraft Foods, Fonterra Australia, Snow Brand Australia, Cedenco Australia, Simplot Australia, Nestlé Australia, Henry Jones Foods, Tatura Milk Industries, Unilever Australasia, Murray-Goulburn Cooperative, SPC Ardmona (a division of Coca-Cola Amitil), Campbells Soups Australia and Girgarre Country Foods (a division of HJ Heinz Company).

Agricultural commodities

Category	*Gross value ($M)*	*Percentage of total*
Milk	552.67	40.2
Fruit	299.12	21.7
Vegetables	63.47	4.6
Cereals, pasture, legumes, oilseeds and other crops	226.85	16.5
Livestock slaughterings	217.2	15.8
Wool and egg production	16.48	1.2
Total	1,375.79	100

Source: ABS, 71250DO031_200506: Small Area Data, Australia, 2005-06 (Reissue 6/6/2008) (Additional Datacubes)

Our people

The Shepparton Irrigation Region'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 Australian population outside 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 Shepparton Irrigation Region Implementation Committee 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 Shepparton Irrigation Region. The Shepparton Irrigation Region Implementation Committee has representatives on Coordinating Committees in each of these programs. The Shepparton Irrigation Region Implementation Committee has the prime responsibility to deliver the program of natural resource objectives of the Shepparton Irrigation Region Catchment Implementation Strategy.

The Shepparton Irrigation Region Catchment Implementation Strategy 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 Shepparton Irrigation Region for current and future community and has been underway since 1989 with the whole community working in cooperation to achieve Shepparton Irrigation Region Catchment Implementation Strategy 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 Shepparton Irrigation Region 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 Shepparton Irrigation Region Catchment Implementation Strategy 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 Shepparton Irrigation Region. Management of these contaminants is being addressed under action programs within the Shepparton Irrigation Region Catchment Implementation Strategy.

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 Shepparton Irrigation Region Catchment Implementation Strategy aims to ensure that all impacts are considered in decision-making and that biodiversity needs are integral to all the Shepparton Irrigation Region'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 Shepparton Irrigation Region Catchment Implementation Strategy 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 Shepparton Irrigation Region Catchment Implementation Strategy 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 Shepparton Irrigation Region Implementation Committee attracts funding of close to $15 million with the majority of this funding going directly to on-ground works projects. The Shepparton Irrigation Region Catchment Implementation Strategy is funded jointly by the regional community, the Victorian, Commonwealth and Local Governments. The Shepparton Irrigation Region Catchment Implementation Strategy 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 Shepparton Irrigation Region Catchment Implementation Strategy, both to capital projects and ongoing operation and maintenance. In 2007-2008, this was approximately $40 million.

Government funding

Government funding is provided through annual integrated budgets for the Shepparton Irrigation Region Catchment Implementation Strategy prepared on the basis of bids submitted by the Shepparton Irrigation Region Implementation Committee.

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 (a division of Coca-Cola Amitil) contributes significantly to the East Shepparton Salinity Project.

Our partners

Department of Sustainability and Environment

The Department of Sustainability and Environment is Victoria's lead government agency for sustainable management of water resources, climate change, bushfire, public land, forests and ecosystems. It is the peak funding body of the GB CMA of which the Shepparton Irrigation Region Implementation Committee is a part. The Department of Sustainability and Environment is responsible for the conservation and sustainability of Victoria's natural environment, biological diversity and cultural heritage.

Department of Primary Industries

The Department of Primary Industries designs and delivers government policies and programs that enable Victoria's primary and energy industries to sustainably maximise the wealth and wellbeing they generate. The Department of Primary Industries is responsible for delivering the key objectives of the Shepparton Irrigation Region Catchment Implementation Strategy in natural resource management. The Department of Primary Industries implements the Farm and Environment Programs. In conjunction with Goulburn-Murray Water, the Department of Primary Industries also implements the Community Surface Water Management and Sub-surface Drainage Programs.

Goulburn-Murray Water

Goulburn-Murray Water manages water storages, the supply channel and drainage infrastructure in the Shepparton Irrigation Region. Goulburn-Murray Water is the major partner in the delivery of the Salinity Program under the Shepparton Irrigation Region Catchment Implementation Strategy through the Sub-surface Drainage and Community Surface Water Management Programs.

Local Government

Local Government is a key partner, providing Statutory and Strategic Planning, participating in cost-sharing for the Shepparton Irrigation Region Catchment Implementation Strategy and providing a link with the broader community. Local Government, jointly with the GB CMA, funds a Municipal Catchment 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 provides urban water supply and wastewater services in the Shepparton Irrigation Region. Goulburn Valley Water, in conjunction with the GB CMA, works to improve water quality, minimise phosphorous (to <1mg/L) exports from wastewater treatment plants to our river systems, and for full reclaimed water re-use to land. Goulburn Valley Water 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 Shepparton Irrigation Region Catchment Implementation Strategy.

Goulburn Valley Water also houses the Catchment Stormwater Officer who works in conjunction with GB CMA and all local councils throughout the Shepparton Irrigation Region 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 Shepparton Irrigation Region. A sound relationship has been established between the GMLN and the Shepparton Irrigation Region Implementation Committee. 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.

Shepparton Irrigation Region Farm Forestry Network

The Shepparton Irrigation Region Farm Forestry Network (SIRFFN) facilitates and coordinates development and management of private forestry and Eco Services in the Shepparton Irrigation Region. 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 Shepparton Irrigation Region Implementation Committee 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.

Our committee - community engagement

Members of the Shepparton Irrigation Region Implementation Committee are nominated because of their specific skills and their links to community networks. The Shepparton Irrigation Region Implementation Committee meets on a six week cycle throughout the year and is made up of eight community representatives and representatives from partnership agencies i.e. Department of Primary Industries, Department of Sustainability and Environment and Goulburn-Murray Water.

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

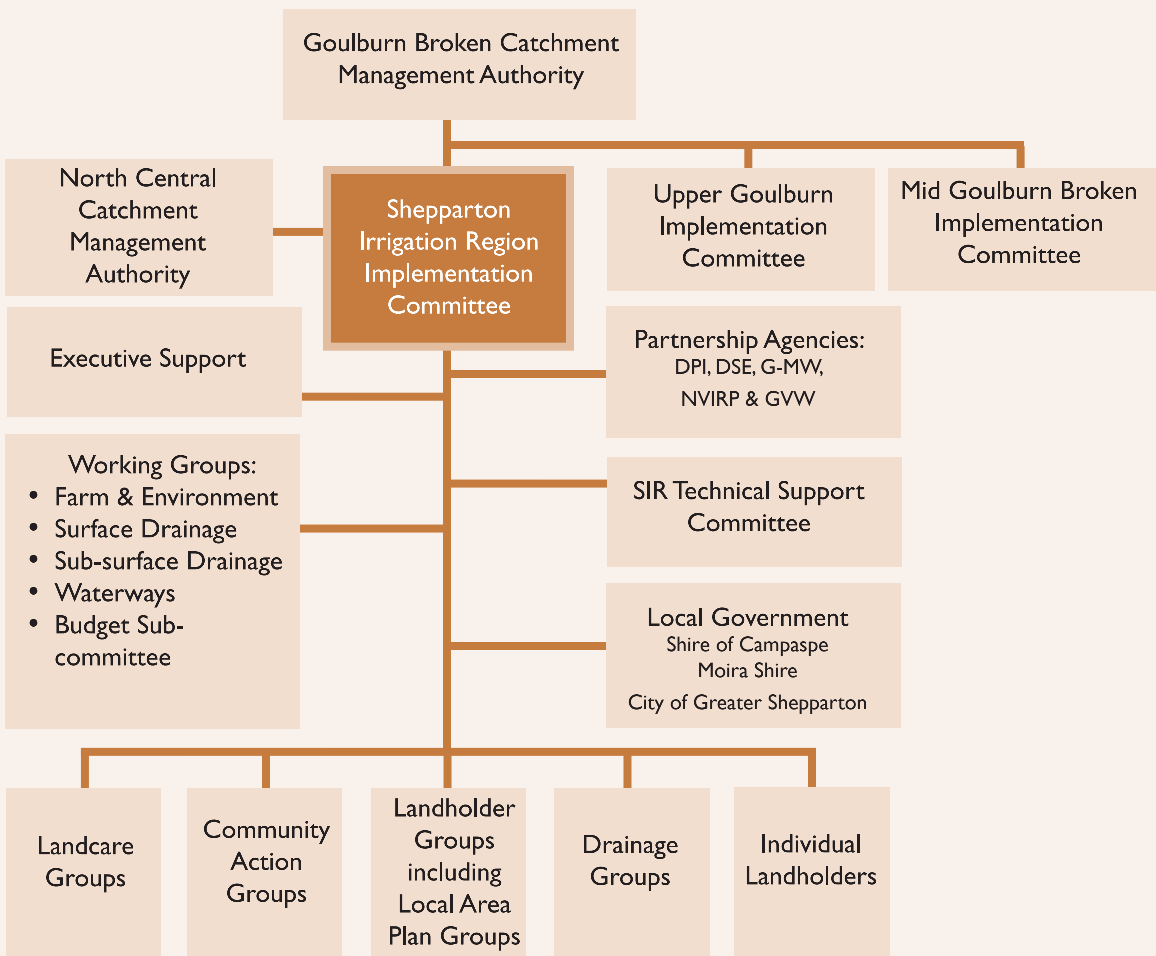
These groups manage all aspects of the particular program - budget allocation, works programs, monitoring, policy development and research. They address issues in detail so that the Shepparton Irrigation Region Implementation Committee can operate effectively and strategically. This process ensures strong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

The Shepparton Irrigation Region Implementation Committee is supported by an Executive Support Team, which provides executive and technical advice for the implementation of the Shepparton Irrigation Region Catchment Implementation Strategy. Agencies also provide technical input through the Shepparton Irrigation Region 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 Shepparton Irrigation Region Catchment Implementation Strategy as it continues to evolve during its implementation.

The Shepparton Irrigation Region Catchment Implementation Strategy signifies a true partnership between the local community and all levels of government – State, Federal and Local. The management structure for the Shepparton Irrigation Region Catchment Implementation Strategy is presented in "Committees, Agencies, Community Groups – Shepparton Irrigation Region Catchment Implementation Strategy Partners", below.

Shepparton Irrigation Region Implementation Committee

Committees, Agencies, Community Groups
Shepparton Irrigation Region Catchment Implementation Strategy Partners



Note: Sub-surface Drainage Working Group reformed as the Groundwater and Salinity Management Working Group in September 2007.

CHAIR'S REPORT

Peter Gibson
Chair

Shepparton Irrigation Region Implementation Committee

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

Our committee relies on the strong commitment from its community representatives and the dedication of the staff of the Department of Primary Industries, Department of Sustainability and Environment, Goulburn-Murray Water and Goulburn Valley Water. The strong relationship has continued to evolve during this eighteenth year of works to control salinity and improve irrigation water use efficiencies.

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

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

I would personally like to commend the continued work of my fellow Committee members: Allen Canobie, Steve Farrell, John Gray, Peter McCamish, Helen Reynolds, Nick Ryan and Roger Wrigley together with Agency members Terry Hunter, Bruce Cumming and Tony Long and thank them for their hard work and personal contribution.

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

Peter Gibson
Chair - Shepparton Irrigation Region Implementation Committee

2007-2008 highlights:

- Environmental water delivered to Reedy Swamp (544 ML); Kinnairds Swamp (413 ML), and Black Swamp (90 ML);
- Works completed to improve delivery of environmental flows to Brays Swamp;
- One hundred and forty-five Whole Farm Plans prepared and 48 re-use dams installed. Twenty-one groundwater pumps installed (20 private and one public) protected a further 3,237ha. Equivalent of nine kilometres of primary drains completed. Storage for 200 ML (one system) was constructed through the Drainage Nutrient Removal Incentive Scheme;
- Eight automatic irrigation systems installed servicing 442ha taking totals to 127 systems and 7,631ha;
- Environmental and tree-growing projects protected 48ha of terrestrial remnant vegetation and revegetated 94ha for corridors and understorey;
- Drought Employment Program crews fenced 165km (1,856ha) of streamside native vegetation;
- The Committee working hard to align implementation of the Regional Catchment Strategy with Northern Victoria Irrigation Renewal Project (NVIRP). Policy response research into the project during its proposal stage (as the Food Bowl Modernisation project) undertaken by Practice Change Team. Linking farm irrigation needs with irrigation delivery infrastructure being built through NVIRP is also a major focus;
- Irrigation infrastructure information atlas completed and being used to help modernisation;
- Regional Irrigation Development Guidelines completed;
- Reports on best management practices for farm groundwater use prepared;

- As part of the Irrigation Drainage Memorandum of Understanding, a catchment and asset operation plan for the whole of the Shepparton Irrigation Region and the Barmah-Nathalia sub-catchment continued to be developed;
- Management plans developed for Mansfield Swamp, Wyuna River Reserve, Millewa (ex-Cantwell's) Nature Reserve and Nanneella Bushland;
- Over 500 statutory planning cases addressed;
- Five programs making up the Shepparton Irrigation Region Catchment Strategy reviewed. Strategy expected to be updated late 2008;
- Yeilma project continues to be a shining example of how Indigenous Australians can lead the management of culturally and environmentally significant properties to benefit all Australians;
- Muckatah Depression primary surface water management scheme construction was completed with many partners. Area covers 60,000ha;
- Victorian Certificate of Applied Learning 'partner' award for the RiverConnect Project.

Future challenges

In June 2007, the Victorian Government, in response to a proposal put forward by the Goulburn Valley Food Bowl Group, announced a $4.9 billion project to substantially upgrade the state's irrigation infrastructure.

The Food Bowl Group's proposal arose from concerns that water being sold out of the region was adversely affecting the agricultural sector's competitive strength. The irrigation infrastructure was ageing and had become inefficient. The system, mainly built for soldier settlements over the last century, was no longer competitive with other locations for large-scale, irrigated agriculture. The advent of water trading had also negatively impacted. The Group advocated that the irrigator community – financially weakened by a decade of drought – was in no position to make the investment the system required.

The Food Bowl Group proposed to the Victorian Government that:
- It should substantially invest in the irrigation infrastructure in return for a one-third share of the water savings that would result from increased efficiency;
- Establish a new statutory authority, responsible for the implementation of the Modernisation Program.

The new authority, to be known as the Northern Victoria Irrigation Renewal Project, (NVIRP) is required to deliver a modernised irrigation system supply network in the Goulburn Murray Irrigation District (GMID). Stage One is a $1 billion investment by the Victorian Government in partnership with Melbourne Water and Goulburn-Murray Water.

The project will impact irrigation practices, land use and the environment across the Shepparton Irrigation Region. In the coming year the Shepparton Irrigation Region Implementation Committee will be heavily involved in working with our agency partners and landholders throughout the implementation of this significant program.

ACTIVITIES and ACHIEVEMENTS

Executive Officer's Report

Ken Sampson
Executive Officer

Shepparton Irrigation Region Implementation Committee

The implementation of the Shepparton Irrigation Region component of the Goulburn Broken Regional Catchment Strategy in 2007-2008 has seen achievement and progress.

The partnership program with the Catchment and Water group of the Department of Sustainability and Environment is delivered with our regional partners in the Department of Sustainability and Environment, Goulburn-Murray Water and the Department of Primary Industries. The progress towards our targets for on-ground works continues to be impressive.

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

Outcomes for the individual programs are summarised below and are further detailed in the individual project reports.

The Drought Employment Program continued to have a positive impact across the Environment and Waterways programs.

Shepparton Irrigation Region Implementation Catchment Strategy Programs:

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

Environment and Biodiversity Programs

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

The Environment Program is a component of the Farm and Environment Program and a key delivery program for the Shepparton Irrigation Region Catchment Implementation Strategy. The Environment Program supports the main action programs including: Sub-surface Drainage, Farm, Surface Water Management and Waterways.

The Environment Program provides a key service to the Sub-surface Drainage and Surface Water Management Programs in particular by providing Environmental Assessments of planned and completed works.

The Environment Program has increasingly been involved in protecting natural assets through the modernisation and reconfiguration project, and ensuring that the natural assets of our catchment are incorporated into day-to-day farm management.

Activities and achievements

Environmental and Tree Growing Projects

Environmental and Tree Growing Project incentives have provided support to protect 58.87ha of remnant vegetation (including 10.87ha of wetlands). A total of 19.20km of fencing was erected to protect remnants and revegetation corridors/clumps. Examples of remnant vegetation protection/revegetation works include:

- Construction of 2,270m of fencing to protect 5.4ha of Shallow Sand Woodland remnant on one property in the Strathmerton area. The fencing protects habitat for Bush Stone-curlews (Burhinus grallarius) and Grey-crowned Babblers (Pomatostomus temporalis);
- Protection of 2.5ha of Plains Woodland remnant on one property in the Tallygaroopna area, through the establishment of 275m of fencing. This remnant vegetation is regularly used as a nesting site by a pair of Bush Stone-curlews;

A reasonable amount of threatened fauna sites (12.8ha) were potentially protected through the incentive programs. Grey-crowned Babbler, Tree Goanna (Varanus varius), Bush Stone-curlew and Superb Parrot (Polytelis swainsonii) are the main threatened fauna species protected or potentially being protected through the

projects. A total of 9.15ha of wildlife corridors were also established across the Shepparton Irrigation Region, to improve threatened species habitat.

Examples of revegetation works include:

- The enhancement of a 4.5ha Riverine Chenopod Woodland remnant through the revegetation of 3,600 indigenous plants on one property in the Numurkah area. The remnant is permanently protected by a Trust for Nature Conservation Covenant;
- The revegetation of 3.4ha with 4,290 indigenous plants to establish wildlife corridors on one property in the Strathmerton area. The wildlife corridors will help to facilitate the movement of Grey-crowned Babblers between remnant vegetation patches.

Local Area Plan (LAP) sub-catchments are accounting for approximately one third (33.1%) of all incentive payments and on-ground works. This figure is very similar to last year and seems to be settling into a pattern for activity in LAP areas.

Environmental assessments

Four environmental assessments for Community Surface Water Management Schemes were completed. There were approximately 30 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.

Three Primary Surface Water Management Schemes were supported by Environmental Assessment staff. These were Murray Valley 11, Deakin 16 and Mosquito 36. There were 25 final alignment checks completed.

Five Year Review

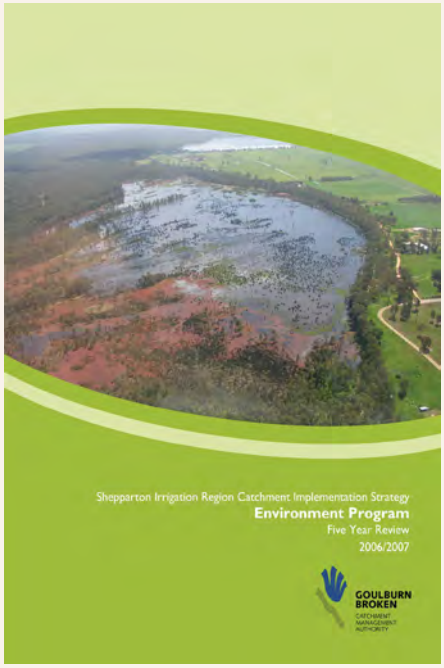
A Five Year Review of the Shepparton Irrigation Region Environment Program was completed and included an audit of the 2001 review and the collation of outputs and activities from the past five years. The review provided the Environment Program with implementation targets for the next five years and a number of recommendations to implement. The review also provided an analysis of the work over the previous five years. The findings of the review are summarised below:

1. The Environment Program has made a significant contribution to the economic benefits to the region. The benefits are described below:

- The benefit:cost ratio of the Environment Program is 1:1.53 with an Internal Rate of Return of 8.3 percent.
- The ratio of the Present Value of Total Government Costs and Total Private cost is $2.1 million:$0.72 million or 2.92:1 or 74 percent Public:26 percent Private. This indicates that government and community are partners in the investment of biodiversity protection and enhancement.

2. The social implications of the program include group activities such as tree planting days, Landcare and Local Area Plan activities; preparation of Environmental Management Plans. Through these activities the community has gained a better understanding of the importance of protecting and enhancing native vegetation.

3. The Environmental Performance of the Environment Program is judged by the strength and assessment of each program's incorporation of protecting and enhancing biodiversity features across the region.



The Environment Program Five Year Review

Development of Environmental Management Plans for wetland and terrestrial features

Design and development of Environmental Management Plans for priority wetland and terrestrial sites in the Shepparton Irrigation Region 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 Department of Primary Industries (leading plan development), Department of Sustainability and Environment, Goulburn-Murray Water, Parks Victoria, GB CMA and community groups.

The following Wetland and Terrestrial Environmental Management Plans were developed in consultation with stakeholders:

- Mansfield Swamp;
- Wyuna River Reserve;
- Millewa (previously known as Cantwells);
- Nanneella Bushland.

In 2007-2008 the wetland priority list changed from individual plans to a systematic approach (approved by Shepparton Irrigation Region Implementation Committee on 27th July 2007). This systematic approach will make bidding for Environmental Water for the wetlands more strategic and assist with the development, negotiation and sign-off of the plans. This approach also takes into consideration the benefits of a landscape-scale approach, as per the biodiversity action planning principles.

The development and sign-off of Management Plans allows the GB CMA and the Shepparton Irrigation Region Implementation Committee to support provision of Environmental Water Allocations. Given the severity of the drought and the scarcity of water, no Environmental Water Allocations were delivered this year. Monitoring reports for Reedy and Brays Swamps document the bird life and macro-invertebrates that inhabit these swamps when Environmental Water Allocations are delivered.

Terrestrial and Wetland Management Plans contain actions for the management of the sites by all stakeholders. Environmental Water 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).

Wetland Management Group

A 'Wetland Management Group' was formed in February 2008. Terms of reference were drawn up inviting stakeholders from Department of Sustainability and Environment, Department of Primary Industries, Parks Victoria, Yorta Yorta, Landcare, Goulburn-Murray Water, Field and Game Australia and the GB CMA.

The first Wetland Management Group meeting occurred on 20th March and the group has since met quarterly. The Wetland Management Group reports to the Shepparton Irrigation Region Implementation Committee via the Waterways Working Group.

Environmental Water Allocation Projects

Environmental Water Allocations in 2007-2008 looked scarce at the beginning of the season. A bid for Brays Swamp was submitted to the Shepparton Irrigation Region Implementation Committee in August 2007, but did not go ahead due to the landowner utilizing the wetland as a stock containment area. An announcement from the Murray Darling Basin Commission in early March 2008 detailed that water from the Living Murray Initiative was available for Northern Victorian Wetlands. A bid for 2 GL of Environmental Water was submitted to the minister and was secured by the GB CMA from the Victorian Flora and Fauna Bulk Entitlement.

Wetlands were prioritized according to their potential water delivery mechanism and their ability to be used as a drought refuge for fauna and flora species. Bids for environmental water were submitted for Reedy Swamp, Mansfield Swamp, Kanyapella Basin, Kinnairds Wetland, Black Swamp and Moodies Swamp. Reedy Swamp, Kinnairds Wetland and Black Swamp were successful in receiving an Environmental Water Allocation. Moodies Swamp received 50 ML of excess irrigation water.

Black Swamp

Black Swamp obtained an Environmental Water Allocation of 90 ML. Water was delivered via a pump which was installed at Nine Mile Creek. Water delivery occurred from the 6th of May – 15th of May. Funding of the pump was donated by the GB CMA with a cost of approximately $12,000 for pump hire and diesel. The GB CMA used a Digital Elevation Model on the wetland and has estimated that it is holding 58 ML of water with the rest being lost into the soil profile. There has been a good response with vegetation in the wetland.

Reedy Swamp

An Environmental Water Allocation of up to 500 ML began being delivered in late April 2008 via Channel 19/12 and Drain 3 inlet structures. Approximately 15-20 ML/day of water entered the wetland via the Drain 3 inlet. Water delivery ceased on June 5th.

The Department of Primary Industries Environment Team have conducted monitoring at Reedy Swamp on a fortnightly basis using photo points, acoustic monitoring techniques, water quality and macro invertebrate samples as indicators of the wetland health and changes over time. This monitoring will occur until December 2008. A review of the data collected and water availability in the wetland will be conducted in January 2009. A decision on the continuation of monitoring after December 2008 will be made at this time.

Since the delivery of water into the area, approximately 3000 birds have resided at the wetland. Swans have built nesting platforms and have begun laying eggs and ducks have been displaying courtship behavior. The White Bellied Sea Eagle (classified as Vulnerable on under the Environment Protection and Biodiversity Conservation Act) has returned.

The acoustic monitoring data has detected the Southern Boobook Owl, Tawny Frogmouth Owls, a Powerful Owl (classified as Vulnerable under the Environment Protection and Biodiversity Conservation Act), Little Grass Birds, Whistling Kite, Swans, Teals, Black Ducks and Wood Ducks. Site observations of Hardhead Ducks, Shovellers and the Peregrine Falcon have also been noted. Frogs such as the Common Froglet, Spotted Marsh Frog, Plains Froglet and Plains Brown Tree Frog have also been detected in the wetland using the acoustic monitoring method.

Environmental Water Allocation monitoring

Reedy Swamp received an Environmental Water Allocation of up to 500 ML. Monitoring at Reedy Swamp commenced in late April when water delivery began. The monitoring, which will be conducted every fortnight over the coming months, will utilise surveying techniques such as Acoustic Monitoring, Photo-points, Macroinvertebrate Sampling and Water Quality.

This is the first time acoustic monitoring has been used with an Environmental Water Allocation in the region. Acoustic Monitoring is a relatively new technique that utilises automated acoustic monitors to gather data via the soundscape without human presence during critical time periods. The recorders have been set to take a 30 second sound recording every hour for a 24 hour period. Sounds are stored and analysed and provide excellent insight into species recorded at the site.

Reedy Swamp

Kinnairds Wetland

An Environmental Water bid of 500 ML for Kinnairds Wetland was approved in late April 2008. Environmental Water was delivered via the Muckatah Depression which passes through the wetland. Water delivery began in the first week of May and finished on June 6th. Approximately 413 ML entered the swamp in total.

Monitoring of the site showed swans nesting and birds such as Hoary-headed Grebe, Australasian Shovellers, Shelducks, Grey Teal, Hardhead Ducks and Black Ducks making the wetland their home. Brolga were sighted at Kinnairds Wetland on the 8th July 2008. Native Plants such as common 'nardoo' have also reappeared in the wetland after inundation of the area.

Environmental Water Allocation Calculations

Environmental Water Allocation calculations in megalitres (ML) were updated for each priority listed wetland in the Shepparton Irrigation Region. Basic calculations of a water body are determined by calculating Area x Depth (capacity), however this can vary for each wetland type due to its vegetation composition, soil composition, soil cracking and permeability, inflows and outflows from the wetland, air space, and evaporation whilst filling and when full.

Goulburn-Murray Water provided technical support in providing a revised method of calculating the likely volume of water required by priority wetlands across the Shepparton Irrigation Region in support of any application for Environmental Water Allocations.

Biodiversity Action Planning

Biodiversity Action Planning is a structured approach to identify priority biodiversity features in the region and establish priorities for biodiversity conservation. Sites have been mapped at the landscape level, surveyed (to assess habitat quality and bird presence) and data developed on aspects of each priority site (e.g. Ecological Vegetation Class, threats, threatened species and flora and fauna). Recommendations for management are developed in consultation with the community to increase biodiversity values.

This project provides 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 being 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.

During 2007–2008, the Department of Primary Industries delivered a project designed to enhance the integration of Biodiversity Action Planning (BAP) into more traditional farm extension activities. An area of high conservation value in the Barmah BAP zone was identified and targeted with a concentrated effort to create a biolink between the Goulburn River and Broken Creek. Environmental incentives were offered to 10 landholders across the project area, to protect 111ha of remnant vegetation and revegetate 34ha with indigenous vegetation.

Biodiversity Month

The Biodiversity Celebration Day held at Luckes, on the Broken Creek, Nathalia in September was very successful. The second year of the annual event titled: 'Biodiversity – Working Together' was a showcase of community and agency people sharing information on a range of biodiversity projects.

The day attracted more than 70 people interested in biodiversity management and included presentations, lunch, guided walks, children's activities and displays, with input from over 10 agencies/organisations, numerous community groups and landholders. An evaluation indicated that the day was a useful and positive experience and further events in the catchment are planned.

Allen Canobie – Guest Speaker at Biodiversity Celebration Day, September 2007.

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 Shepparton Irrigation Region 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.

A High Value Environmental Features Steering Committee was established to oversee this project. One of the directives of this committee was to establish a trial groundwater pump site at the Millewa Nature Conservation Reserve (south west of Echuca). The selection of Millewa Nature Conservation Reserve as a priority site allowed for commencement of exploratory works (drilling) to establish the level of salinity threat. Further exploratory works will continue into the 2008-2009 year with the Sub-surface Drainage Program through Goulburn-Murray Water.

Statutory Planning

Statutory Planning activities involve the development of recommendations to ensure the protection of surface water, groundwater and soil where aspects such as subdivisions, certification of Whole Farm Plans, new developments (e.g. buildings, dams, quarry activities and centre pivot irrigation sprinkler systems) and Planning Scheme Amendments. Over 500 Statutory Planning cases were dealt with throughout the year with about 50 percent of the cases in the Greater Shepparton City Council area and the remainder split between Moira and Campaspe Shires.

Floodplain Ecology Course

Two meetings have been held to progress planning for the Floodplain Ecology Course as funded through the GB CMA Biodiversity Program. This course is planned for November 2008 in the Echuca/Barmah area and is intended to increase land manager awareness of aspects of Floodplain Ecology/Dynamics (e.g. vegetation, flooding regimes).

Mandatory Monitoring

Mandatory Monitoring was undertaken once in 2007-2008 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/macroinvertebrate (where applicable) sampling.

Mandatory monitoring at Kinnairds Wetland

Drought Employment Program

The GB CMA Drought Employment Program participants have completed approximately 23km of fencing, protecting over 459ha of vegetation. This included 4.6kms of fencing of a large component of land at Kanyapella Basin to protect the site from wandering stock.

Modernisation

The Environment Program has been involved in assessment of potential environmental issues regarding the irrigation modernisation projects for both Food Bowl and Accelerated Project (Shepparton Irrigation Area and Central Goulburn Channels 1-4).

This has included representation on steering committees and workshops including SIRTEC, the Food Bowl Modernisation Environmental Referrals Steering Committee, Regional Workshops and Northern Regional Sustainable Water Strategy Workshops. This latter workshop included investigation into wetlands within the Shepparton Irrigation Region and how they may be affected by climate change and changes in water delivery.

Permanent Habitat Protection (Trust for Nature)

Permanent habitat protection is obtained through placing covenants on land of high conservation value. A not-for-profit group called "Trust for Nature" has the statutory capacity to put Conservation Covenants in place. Although legally known as a restrictive covenant, Conservation Covenants are entered into voluntarily. The restrictions and future management regimes for the covenant are negotiated by the landholder and Trust for Nature together to ensure that the nature conservation goals for the land are consistent with the landholders' future wishes for that parcel. The establishment of these Conservation Covenants contributes substantially to the GB CMA targets for improved vegetation quality.

During 2007-2008, Trust for Nature negotiated the permanent protection of 95ha of significant bushland and wetland across the Shepparton Irrigation Region, including the purchase of two properties for addition to the Broken Boosey Conservation Management Network and the Lower Goulburn River National Park. Numerous properties were visited, involving the assessment of several hundred hectares of remnant vegetation and the provision of management advice, which will hopefully translate into permanent protection in the future.

Trust for Nature staff were also instrumental in negotiating a change in tenure for 1400ha of land owned by Goulburn-Murray Water at Kanyapella Basin which has now been incorporated into the Kanyapella Wildlife Area. Trust for Nature undertook management planning visits to ten properties in the 2007-2008 year. They also continued to be actively involved in the Broken Boosey Conservation Management Network and the Kinnairds Wetland Management Committee.

Threatened Species Recovery Plan implementation and monitoring

The Department of Sustainability and Environment undertake a range of activities on behalf of the Shepparton Irrigation Region Implementation Committee to implement actions recommended in recovery plans for terrestrial and aquatic flora and fauna. During 2007-2008, this work included monitoring populations of Prasophyllum hygrophyllum, Swainsona plagiotropis, Swainsona murrayana, Sclerolaena napiformis and Myriophyllum porcatum. In addition to annual monitoring, propagation trials and fencing to protect sites from inadvertent damage were implemented. Seed of S. plagiotropis, S. murrayana, and Sclerolaena napiformis has been collected and propagated at the Euroa Arboretum.

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. This has yielded dividends for the Superb Parrot birds with increasing numbers being sighted outside the breeding season, indicating more resources are becoming available in the area.

Despite the dry conditions, 51ha of foraging habitat was re-established by the Superb Parrot Group, which involved direct seeding and tube-stock planting involving some 80 community members. In addition 25 people participated in the annual population census of Superb Parrots in the Barmah area, which located some 267 birds, slightly up on 2006–2007.

Farm Program

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

Activities and achievements

Whole Farm Plan Project

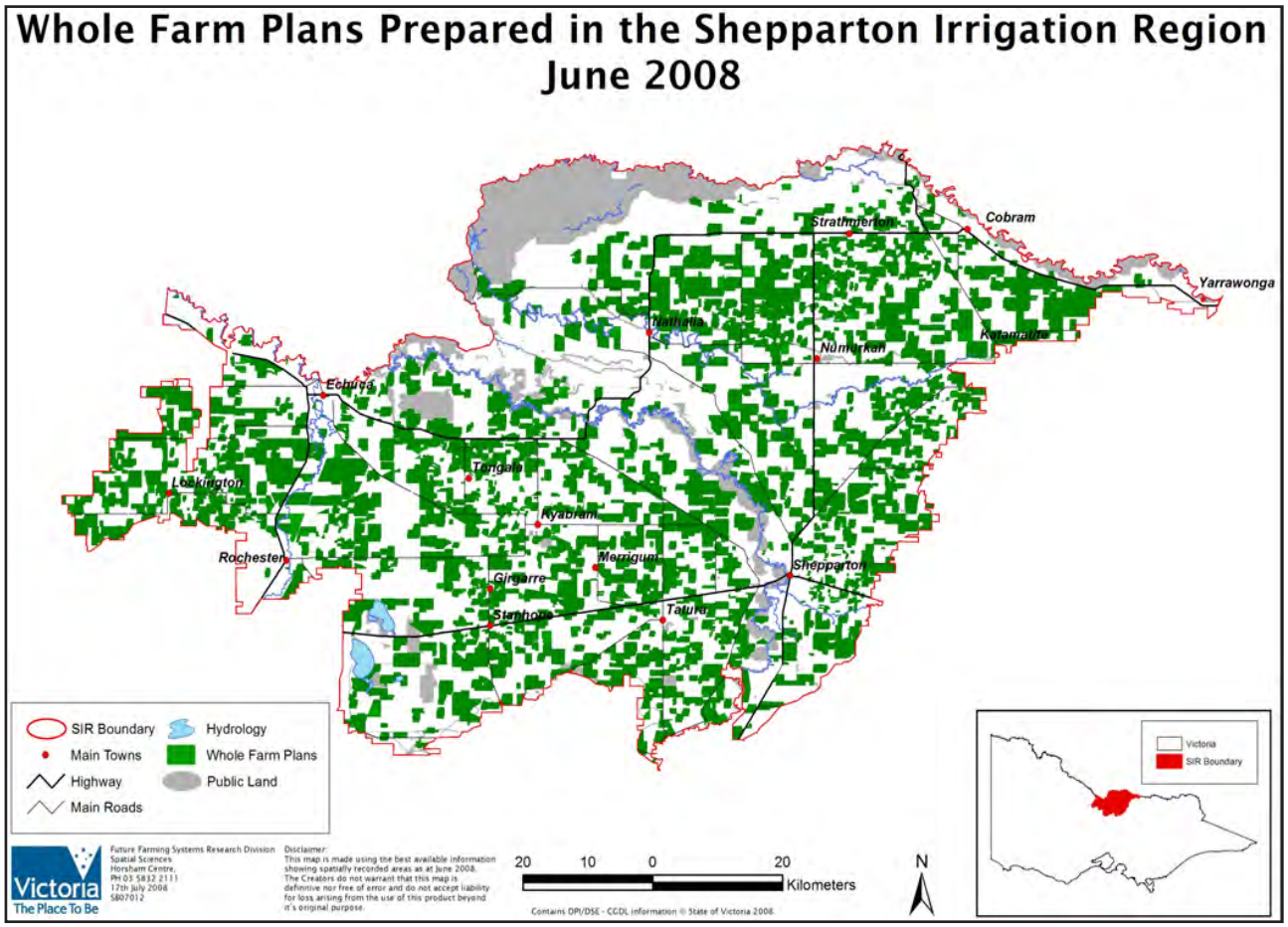
A total of 150 new Whole Farm Plans were completed covering an area of 11,575ha during 2007-2008. In addition five Modernised Existing Whole Farm Plans were prepared covering 278ha. These plans were prepared in response to modernisation activities on properties where a Whole Farm Plan had been prepared previously. In 2007-2008, the Whole Farm Plan Project was modified to allow landowners of properties where a Whole Farm Plan had been prepared previously, to make another application for a grant to amend their existing plans to adapt to changes in irrigation supply infrastructure.

Whole Farm Plans were prepared for 12 horticultural properties covering 468ha and 138 broadacre properties over 11,107ha. Over 73.9 percent of the irrigated area of the Shepparton Irrigation Region has now been 'Whole Farm Planned'.

A total of 54 plans were completed in areas covered by Local Area Plans, covering 4,389ha.

In 2007-2008, 225 Whole Farm Plans were commenced. This figure was higher than the previous year's figure of 127 and was a result of increased activity due to modernisation activities.

Grants totalling $468,276 (excluding GST) were paid to landowners for preparing their Whole Farm Plans. This was above the budgeted target of $300,000. Landowners paid $861,138 (excluding GST), for the preparation of these plans. A total of 93 grants were paid to landowners for plans certified by Local Government.



Location of Whole Farm Plans prepared from 1987 to June 2008

Irrigation Area	No	Area (ha)	Grant	Grant GST	Total Cost	Cost GST	FA*1	Plan Cert*2	Irrigation Area %	Irrigation Area (ha)
Murray Valley	855	64624	$1,760,001	$73,131	$3,645,806	$146,923	15	219	83	77,886
Murray Valley Horticulture	21	1136	$82,098	$6,912	$168,693	$13,935	0	1	32	3,524
Rochester –SIR-GB	183	18173	$510,230	$25,772	$1,074,213	$50,691	2	21	88	20,570
Rochester -SIR-NC	523	31293	$843,653	$36,625	$1,752,406	$73,575	3	65	76	41,142
Central Goulburn	1136	73570	$2,138,946	$92,172	$4,532,474	$179,005	24	325	64	115,009
Central Goulburn Horticulture	52	2458	$166,249	$6,930	$357,666	$14,250	0	5	54	4,582
Shepparton	509	30223	$913,166	$46,209	$1,799,479	$87,023	13	206	61	49,146
Shepparton Horticulture	117	3537	$182,508	$5,019	$368,875	$10,244	4	3	71	4,994
GB CMA Diverters	83	9018	$233,228	$8,483	$502,269	$14,299	2	4		
TOTAL	3479	234032	$6,830,078	$301,252	$14,201,881	$589,945	63	849	73.9	316,853

Whole Farm Plan totals by Irrigation Area, From 1990 to 30 June 2008
*FA*1: Financial Assessment of implementing a Whole Farm Plan - Plan Cert*2: Plan Certification, local council planning approvals obtained*

Whole Farm Plan referrals

Whole Farm Plans are referred to Goulburn-Murray Water by the local shires under Section 52 or Section 55 of the Planning and Environment Act. A total of 113 plans were referred to Goulburn-Murray Water with a number being amended plans caused by consultation regarding modernisation of Goulburn-Murray Water assets.

Drainage Re-use System project

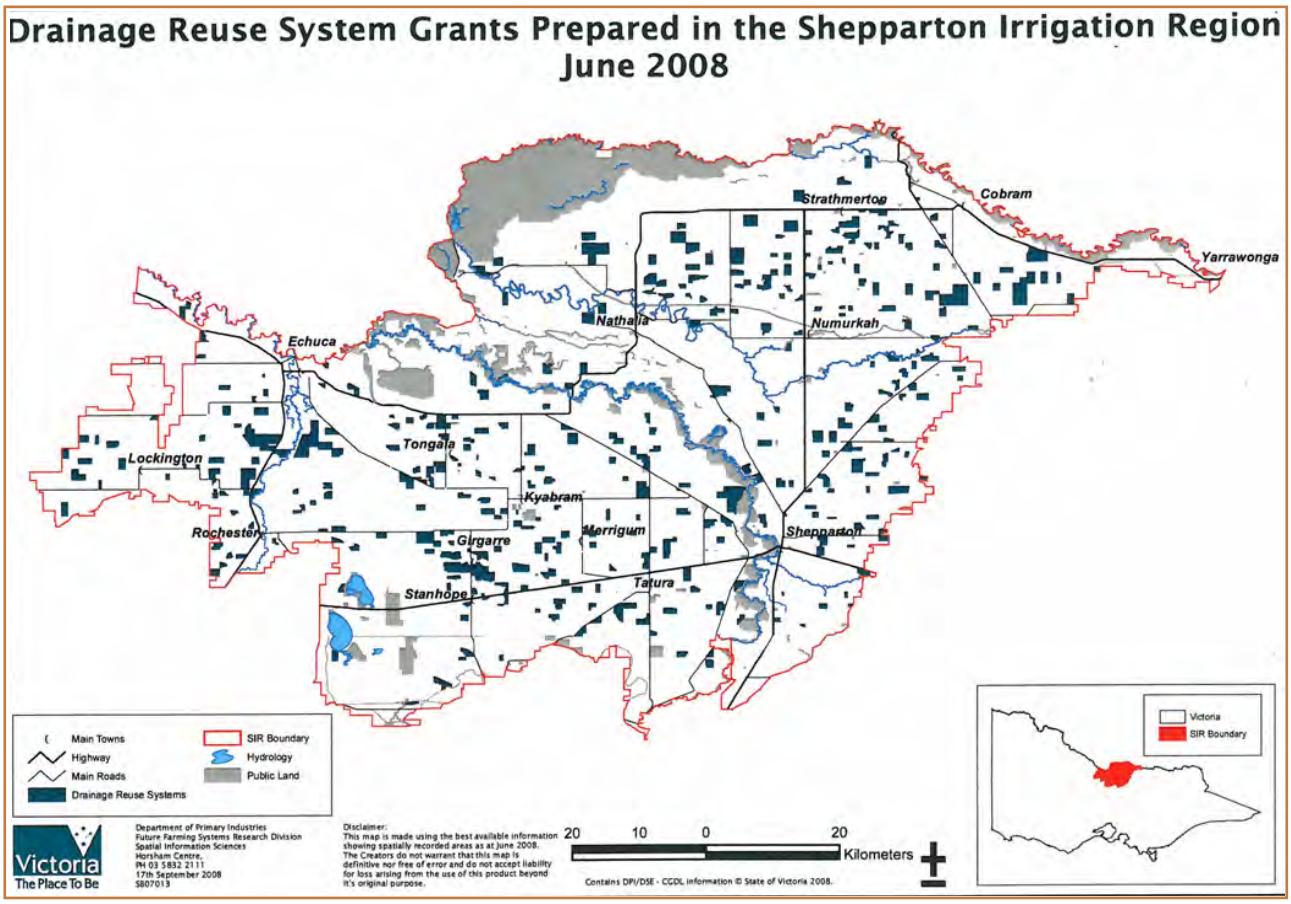
A total of 48 drainage re-use systems were installed as part of the Drainage Re-use System Project in 2007-2008 servicing 2,703ha. This was a decrease on the 56 systems installed in 2006-2007.

Since the project started in 2001-2002, a total 11.62 percent of the irrigated area of the Goulburn Broken component of the Shepparton Irrigation Region is serviced by a drainage re-use system installed as part of this project. A total of 16 drainage re-use systems were installed in areas covered by a Local Area Plan servicing over 1,008ha.

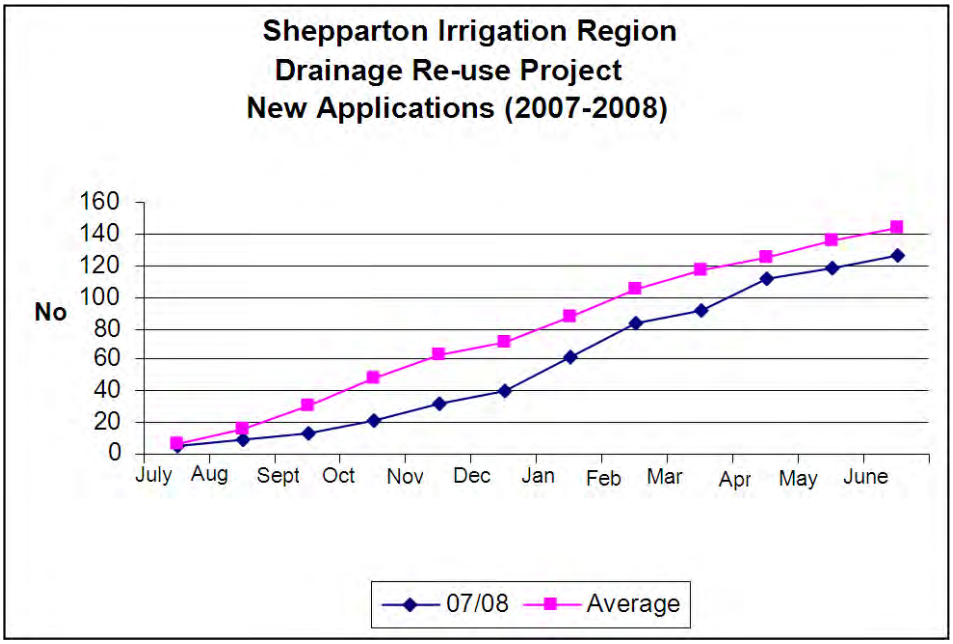
Some interesting facts relating to drainage re-use systems installed in 2007-2008 are:

- Of those landowners that installed a drainage re-use system as part of this project, 12 (or 25%) chose to connect the installation to electricity.
- The average time taken from application to payment of a grant following installation was 17 months.
- The average grant payment was 47.08 percent of the total costs.

Grants totalling $501,753 (excluding GST) were paid to landowners for installing drainage re-use systems. This was below the budgeted target of $650,000. When broken down into the three components of the grant, expenditure was as follows $185,423 for earthworks, $247,016 for pumps and motors, and $69,314 for electricity. Landowners paid $1,065,713 (excluding GST) for the installation of the re-use systems on their properties. There was a slight reduction in the average grant payment from $10,601 in 2006-2007 to $10,453 in 2007-2008.



Location of Drainage Reuse Systems installed



New applications for Drainage Reuse Systems

Automatic Irrigation Project

A total of eight grants have been paid as part of the Automatic Irrigation Project covering an automated area of 442ha. This number was lower than the previous year's figure of 11 systems installed and the budgeted figure of 19.

Over 2.4 percent of the irrigated area of the Shepparton Irrigation Region has now had an automated irrigation system installed with assistance from this project. A total of three systems were completed in areas covered by Local Area Plans, covering 137ha.

The Automatic Irrigation Incentives in different Irrigation Areas are given in the table below.

The total number of automatic irrigation systems completed in the GB CMA area with assistance from the incentive scheme is 127, automating 13,927ha, and is 2.4 percent of the irrigated area.

Irrigation Area	*No*	*Property Area ha*	*Area Auto ha*	*Property Grant*	*Outlets Grant*	*Total Grant*	*Total Cost*
Murray Valley	51	5,298	3,822	$252,343	$17,294	$269,638	$ 786,733
Rochester-SIR-GB	7	1,323	426	$34,997	$1,000	$35,997	$ 80,450
Rochester-SIR-NC	5	581	135	$30,000	$3,000	$33,000	$ 105,421
Central Goulburn	37	4,238	1,517	$200,587	$12,500	$213,087	$ 601,764
Shepparton	27	2,487	1,732	$120,192	$4,500	$124,692	$ 269,101
TOTALS	**127**	**13,927**	**7,632**	**$638,120**	**$38,294**	**$676,415**	**$1 ,843,468**

Total Automatic Irrigation Incentives at the end of June 2008 by Irrigation Area.

LAP AREA	*No*	*Property Area (ha)*	*Area Auto (ha)*	*Property Grant*	*Outlets Grant*	*Total Grant*	*Total Cost*
Wyuna	5	427	103	$27,205	$1,000	$28,205	$ 94,256
Nanneella	5	1,173	346	$26,346	$1,000	$27,346	$ 58,996
Cornella	-	-	-	$-.00	$-.00	$-.00	$-.00
Invergordon	8	475	445	$42,735	$-.00	$42,735	$69,036
Bunbartha, Kaarimba, Zeerust	-	-	-	$-.00	$-.00	$-.00	$-.00
Dhurringile	4	256	121	$14,568	$2,000	$16,568	$29,634
Nathalia & District	8	701	563	$33,302	$3,918	$37,220	$76,396
Naring, Muckatah	11	1,684	1,309	$50,968	$4,500	$55,464	$142,945
TOTALS	**41**	**4,717**	**2,887**	**$195,124**	**$12,418**	**$207,538**	**$471,262**

Automatic Irrigation Incentives in Local Area Plan areas

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 Guidelines 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 Shepparton Irrigation Region to oversee the implementation of these guidelines. The Irrigation Development Coordinator 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. The Coordinator also ensures 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; and
- properties being developed to include irrigation where a new Water Use Licence will be required.

Modernisation and reconfiguration

The Farm Program assisted in conducting irrigation assessments on properties on the Central Goulburn number 2 channel. These irrigation assessments were part of the process Goulburn-Murray Water undertook to determine and solve outstanding issues.

The irrigation assessments included some surveying of the outlets at the service points for the properties and then farm channels, bays, and bay outlets. This information was then used to identify ways in which problems can be rectified. It is anticipated that a system of irrigation assessments will be undertaken on properties that have existing irrigation supply issues before the mechanical "Dethridge" wheels are replaced with electronically controlled flow meters.

Local Area Plan Projects - Group Activities

Education and school-based activities

- A Bush Tucker Education Day was celebrated in Katamatite on Friday 7/9.
- Merrigum Primary School students participated in a tree planting and environmental education morning at the Merrigum Bushland Reserve on Thursday, 13/9.
- Nathalia Local Area Plan held their Wet, Wild and Wasted Day on 17/9.
- Invergordon Primary School held its first Environmental Education day: "Fish, frogs, fauna and fun!" on Friday 26/10.
- Nathalia Local Area Plan 'Survivor' Environmental Education Day, 30/10 in Barmah Forest.
- Dhurringile Local Area Plan "Natural Treasures" Environmental Education Day, Gemmill's Swamp for Mooroopna Primary School, Friday 13/6.

Celebration of Local Area Planning

- The Dhurringile Landcare 2008 Calendar has been completed through the combined efforts of the Dhurringile Local Area Planning, Landcare and the Crouching Emu Project.
- Dhurringile Local Area Plan presented at Shepparton Irrigation Region Implementation Committee on 28/3. Wendy D'Amore, Community Coordinator, spoke about the Crouching Emu project as well as the various Environmental Education programs delivered by the group in conjunction with primary schools from Murchison, Toolamba, Dhurringile and Tatura.

Public land projects

- Merrigum Community Group, with Merrigum Landcare group, held a Community Planting Day on 16/9 with 20 people planting about 500 shrubs and grasses.
- The launch of the Shire of Campaspe's walking trail brochure for the Nanneella Bushland Reserve was held on 17/10. Peter Gibson officiated and Doug Small led the way on one of the walks through the Reserve.

Remnant vegetation management

- The Muckatah Surface Water Management System Revegetation Program fencing is to be completed throughout March and April. This is an on-going project supported by EnviroFund and aims to get over 3000 plants in the ground by the end of 2008.

Cornella Local Area Plan Implementation Committee - Bus Trip to Woods Point

On 7th April, a group of seven from the Cornella Local Area Plan Implementation Committee headed off from Colbinabbin on a trip to follow the Goulburn River to the top of the Catchment culminating at Woods Point.

Cornella Local Area Plan bus trip participants

Other

- A community meeting was held in Old Toolamba on 7/2 to discuss beautifying a neighbourhood walking track and surrounds through a 'weeds removal and education' program in collaboration with Dhurringile Landcare and Local Area Plan group and the Department of Sustainability and Environment.
- Wyuna Local Area Plan group workshop on 6/2 to identify the high priority issues to be addressed by the group in the next 12 months. Fourteen new and/or emerging issues were identified.
- On 8/2 the Dhurringile Landcare Group and Toolamba Primary School installed 15 nesting boxes along Orr Road. The day attracted media attention from both WIN News and the Shepparton News.
- The Nanneella and Timmering Action Group held a Special Meeting on 6/3 with a view to rationalising resources. There are 12 separate group/organisations within the Nanneella and district area, covering everything from sport, community support, education, environmental, social to historical and infrastructure. The group met again on 17/4 and decided to meet bi-monthly as a six month trial.
- The Cornella Local Area Plan bus trip took seven participants along the Goulburn River all the way up to Woods Point on 7-8/4.
- Invergordon Local Area Plan group is working with the Department of Primary Industries Agribusiness group and Shires of Moira, Campaspe and Loddon to plan a "Diversifying Agriculture" seminar for later in the year.
- The Katamatite Action Group met on 10/6 to discuss the opportunity of amalgamating with the Muckatah, Katamatite and Naring Local Area Plan group. The two groups will work together due to the large cross-over in aims and key projects.
- Wyuna Local Area Plan met on 4/6 to progress discussions regarding the future of the group. A final decision about their future will be made at the end of the year.
- Cornella Local Area Plan met on 10/6. Andrew Pearson presented a copy of the Draft Lower Cornella Creek Waterway Action Plan to the group for comment.
- Bunbartha Kaarimba Zeerust Local Area Plan met on Monday 16/6. Most of the meeting was dedicated to an Action Planning session.

Tackling Pests Program

Activities and achievements

During 2007-2008, the pest plant component of the Department of Primary Industries Invasive Pests program continued to focus on the management of new and emerging species and species that are known to present a high threat to regional assets.

State Prohibited weeds are considered to be the highest priority for the program and three State Prohibited species are either known to be present or have been previously recorded in the Shepparton Irrigation Region. All sites are inspected each year and where infestations are located, they are treated by registered contractors. The aim of the program is to eventually eradicate all known infestations from the region and ultimately, the state.

During 2007-2008, twenty ivy-leaf sida infestations and one camel thorn infestation were treated in the Shepparton Irrigation Region. Surveillance inspections were also undertaken on all adjoining properties, but no new infestations were found.

In May it was discovered that another State Prohibited species, Mexican feather-grass, was on sale in stores across Victoria owned by a number of major retail chains. A large scale investigation and recovery program was put in place, which involved inspections of hundreds of stores across the state, including some in the Shepparton Irrigation Region. A number of plants were seized from stores in Echuca and Shepparton and destroyed. Surveillance is continuing.

Compliance activities targeting the more established weeds, blackberry and sweet briar on private land in the Shepparton Irrigation Region were again reduced during 2007-2008 due to drought conditions and low water allocations. Significant works by Goulburn-Murray Water continued along channel reserves and a large number of roadside infestations were treated through the State Government's Good Neighbour Program.

On the pest animal front, some significant changes occurred on 1st January 2008, when commercially prepared 1080 poison baits for both rabbits and foxes became available from retail outlets across the state. Previously, these baits had to be purchased from the Department of Primary Industries offices at specified times, which often made it difficult for landholders and tied up a considerable amount of Department of Primary Industries staff time. The new arrangement increases landholder access to 1080 baits, requiring only a visit to their local accredited farm supply store.

To support the commercialisation of 1080 baits, training workshops were conducted across the state, including venues in the Shepparton Irrigation Region, to provide all landholders the opportunity to obtain an Agricultural Chemical Users Permit, which is a pre-requisite for the purchase of 1080 baits.

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 9km was constructed which included works on Muckatah Drain 8, Muckatah Stage 4, Mosquito Stage 10, Stanhope Stage 1 and Murray Valley Drain 11 Stage 1A;
- Goulburn-Murray Water consultants designed an equivalent length of 20km 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 continued within the Murray Valley Drain 11 catchment.
- The Planning Scheme Amendment and Planning Permit for the Mosquito Drain 40 Primary Surface Water Management System was approved and gazetted in May;
- A Cultural Heritage Management Plan for Kanyapella Basin was completed and submitted to the Yorta Yorta Regional Aboriginal Party in May. Approval of the Cultural Heritage Management Plan is required prior to levee works;
- Works to enhance environmental flows into Brays Swamp from Mosquito Drain 24 were completed. Existing upstream overflow sills were lowered and a 'SCADA' controlled gate was installed on the restricting structure;

- A technical review of the Primary Surface Water Management System Design Guidelines was completed.

Irrigation Drainage Memorandum of Understanding

Work on the implementation of the Irrigation Drainage Memorandum of Understanding (IDMOU) in the catchment focused on completing water quality target setting for irrigation drainage in the Broken Creek catchment using the Resource Condition and Management Action Decision Support System (DSS). "Total phosphorous" and "suspended solids" are the key irrigation drainage-related water quality parameters.

Work also continued on the development of a Catchment and Asset Operation Plan (CAOP) for the whole of the Shepparton Irrigation Region and the Barmah-Nathalia sub-catchment.

Coordination and support for Community Surface Water Management Systems

Target

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

Progress

- 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 the Department of Primary Industries Surface Water Management Officers and Community Surface Water Management Groups;
- Muckatah 4P has received 100 percent support from landholders to proceed to construction. This will be part Goulburn-Murray Water Community Surface Water Management System and part flexible spur under the Water Act. Construction is expected to commence mid 2008-2009;
- Transfers of the management of a number of Community Surface Water Management Systems from the City of Greater Shepparton to Goulburn-Murray Water have been completed (Rodney 1/6P, Rodney 2/6P and Ardmona 7/11P). Finalisation of Ardmona 1BP, Ardmona 1CP and Ardmona 7P is expected in 2008-2009.

Community Surface Water Management Incentives

Targets

- Construction of 3.3km 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 Goulburn-Murray Water.

Progress

- Initiation of Community Surface Water Management Systems;
  - Muckatah 4/8P;
  - Muckatah 18P;
  - Muckatah 22P;
  - Muckatah 2/3P; and
  - Muckatah 3/8P;
- Review of design for Mosquito 8/25P following renewed interest from the community, particularly VicRoads and City of Greater Shepparton from a roadside drainage management perspective;
- Commencement of construction of Muckatah 2/8P under Landholder Management;
- "Notice 2s" signed for Goulburn-Murray Water to construct, own and maintain Muckatah 4P;
- 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 Goulburn-Murray Water.

Policy development

- The definition of a "rural house block" property within the context of the Community Surface Water Management Program has been revised as a result of unbundling. The revised policy allows the more practical incorporation of lifestyle properties into the Surface Water Management Program.
- The "Boring Under Trees" paper was finalised and endorsed. This allows boring under trees to be considered as an alternative to removal. The decision process to remove a tree or not, considers the significance of a tree (including the cultural, archaeological and social values).

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 landowners 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 percent;
- Capture 10,000 ML of water savings from regional and farm drainage to be used for maximum public benefit;
- Improve irrigation management across 50 percent of the newly drained Shepparton Irrigation Region in the next 5 years;
- Contribute significantly to the Goulburn Broken Water Quality Strategy goal of reducing phosphorous and nitrogen drain loads by 50 percent 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 Shepparton Irrigation Region 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

The drought conditions experienced in the Shepparton Irrigation Region over the past few years have resulted in below average water allocations and drain flows. This has put economic pressure on irrigators and has resulted in a reduced uptake of the Drainage Nutrient Removal Incentive Scheme.

A 200 ML storage was constructed on Murray Valley Drain 3 in 2007-2008 under the Drainage Nutrient Removal Incentive Scheme. The target in 2007-2008 was two storages constructed. No new applications under the Drainage Nutrient Removal Incentive Scheme were approved, while one ongoing application was carried over into 2008-2009.

Since the scheme commenced the total number of high flow storages built in the Shepparton Irrigation Region, within the GB CMA area, with assistance from the incentive scheme is 34, with a storage capacity of 6,003 ML. Grant expenditure is outlined below.

Month	Expected Construction			Actually Constructed				
	Number	Grants $'000	ML	Number	Grants paid $'000	GST $'000	Total Cost Landowner (estimates) $'000	Total ML
July	0	0	0	0	0	0	0	0
August	0	0	0	0	0	0	0	0
September	1	20	200	0	0	0	0	0
October	0	0	0	0	0	0	0	0
November	0	0	0	0	0	0	0	0
December	0	0	0	0	0	0	0	0
January	1	20	570	0	0	0	0	0
February	0	0	0	1	20	2	290	200
March	0	0	0	0	0	0	0	0
April	0	0	0	0	0	0	0	0
May	0	0	0	0	0	0	0	0
June	0	0	0	0	0	0	0	0
Totals	2	40	770	1	20	2	290	200

Drainage Nutrient Removal Incentive Scheme Grant Expenditure 2007-2008

Drainage Nutrient Removal Incentive Scheme results 2007-2008

At the completion of the 2007-2008 financial year, the majority of landowners with systems constructed with the assistance of the Drainage Nutrient Removal Incentive Scheme were contacted to determine the volume of water collected and used for irrigation during the year.

As for 2006-2007, the past financial year saw a range of minimal to no high-flow drain diversion for landowners with storages constructed under the Drainage Nutrient Removal Incentive Scheme. Sampling and analysis of salt and phosphorous concentrations of water held in storage was not undertaken, as the majority of the storages were dry. A small number of Murray Valley high-flow diverters pumped small volumes (10 to 20 ML) during the year. Generally, this water had not been utilised on farm, being lost to evaporation.

Water Service Area	Constructed capacity: ML	Volume diverted: ML	Salt saved (tonnes)	Phosphorous saved (tonnes)
Central Goulburn	1,968	0	n/a	n/a
Murray Valley	2,590	60	n/a	n/a
Shepparton	1,295	0	n/a	n/a
Rochester	150	n/a	n/a	n/a
Total	6,003	60	n/a	n/a

Drainage Nutrient Removal Incentive Scheme System Monitoring

Note: Volume diverted data (as at September 2008) was not obtained from all 33 storages, therefore figures are not exact for each Water Services Area

Other project team activities

- An economic review of the Drainage Nutrient Removal Incentive Scheme was undertaken in 2007-2008, with a number of recommendations made in areas such as targets, incentive rates and ensuring the Drainage Nutrient Removal Incentive Scheme is included as a component of the next Community Surface Water Management Program review. This will be presented to the Shepparton Irrigation Region Implementation Committee for comment and endorsement early in 2008-2009.
- Monthly reporting on the Drainage Nutrient Removal Incentive Scheme 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 (a GMLN run committee under the Waterwatch program).

Geographic Information Systems

This year has seen the continued use of Geographic Information Systems (GIS) to map where storages have been constructed within the Shepparton Irrigation Region in comparison to Water Services boundaries and Local Area Plan boundaries. At present 10 of the 34 constructed storages fall into Local Area Plan boundaries.

Local Area Plan	*Actual – since 1998*		
	No	*ML of Storage*	*Total Incentive Cost (includes GST)*
Bunbartha/ Karimba/Zeerust	2	180	$33,307.49
Nathalia & District	4	1050	$66,000.00
Cornella	0	-	-
Dhurringile	0	-	-
Invergordon	1	150	$22,000.00
Nanneella	0	-	-
Muckatah/ Naring	2	140	$43,517.86
Wyuna	1	250	$20,000.00
TOTAL	10	1770	$184,825.35

Drainage Nutrient Removal Incentive Schemes in Local Area Plan areas.

Conclusion

Interest in the Drainage Nutrient Removal Incentive Scheme remained low during 2007-2008, primarily due to the ongoing drought conditions. The Drainage Nutrient Removal Incentive Scheme is likely to remain as a low priority for irrigators until the drought ends, farm businesses are under less financial stress and the frequency of high-flow events in the drainage network increases.

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 progress

Murray Valley 11

- 12 Landholder visits with consultants and/or Goulburn-Murray Water;
- Provided support to Goulburn-Murray Water with regards to landholder issues throughout the catchment. Production of the Murray Valley Drain 11 Final Alignment booklet included native vegetation removal and offset mapping in accordance with Department of Sustainability and Environment regulations;
- A letter was drafted in reference to the Environment Protection and Biodiversity Conservation Act (EPBC) to prevent alignment changes which would impact significantly on the vulnerable plant 'water milfoil';
- Successful negotiation to place a wetland on the Moira Shire Native Vegetation Offset Registrar for future revegetation works.

Deakin 16P Extension

- Scheme has proceeded to Planning Scheme Amendment stage. Final Alignment booklet updated to reflect changes;
- Report written in conjunction with Goulburn-Murray Water seeking a decision on whether an Environmental Effects Statement (ESS) would be required for this system. Submission withdrawn, no ESS required.

Mosquito 36

- Negotiations with Goulburn-Murray Water held on-site to retain single row planted vegetation and one very large remnant grey box eucalypt. Recommendations made to ensure the alignment did not encroach upon the vegetation.

Net-Gain Accounting

- On-going liaison with Department of Sustainability and Environment to get up to speed on our Native Vegetation Framework obligations/requirements.

25 Final Alignment Checks

- Majority of responses from Murray Valley 11, Mosquito 36, Mosquito Stage 9 and Deakin 16.

Community Program progress

Initial Environmental Assessments

- Four initial Environmental Assessments completed (20 pages with several maps and associated text): Muckatah 2/3P, Muckatah 3/8P, Muckatah 18P and Muckatah 22P.

Community Surface Water Management Planning Works

- Thirty Community Surface Water Management System landholder meetings, site inspections and alignment checks.

Other

- Updated the Environmental Review of the Muckatah Catchment report for the Community Surface Water Management Program.

Irrigation Drain Management

Targets

- Drain management and water quality coordination - support Irrigation Areas; input to Drainwatch and IDMOU; participate in working groups.

Progress

- Supported Irrigation Areas in drain diversion management; input to Drainwatch community monitoring program; input to DNRIS review; participated in working groups;
- The total metered volume diverted from drains was 7 GL, and it was estimated that a further 1.5 GL was diverted through unmetered drainage diversion installations. High flow diversions accounted for less than 0.5 GL of the total diverted;
- 7.5 GL was diverted from monitored drains compared to 3.1 GL that "outfalled" past the irrigation network. In other words, 71% of the potential drain outfall was diverted (compared with Water Quality Strategy target of 50%).

Barry Miller accepting a plaque from Minister Helper on behalf of the Muckatah Community Drainage Group – 19 March 2008.

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

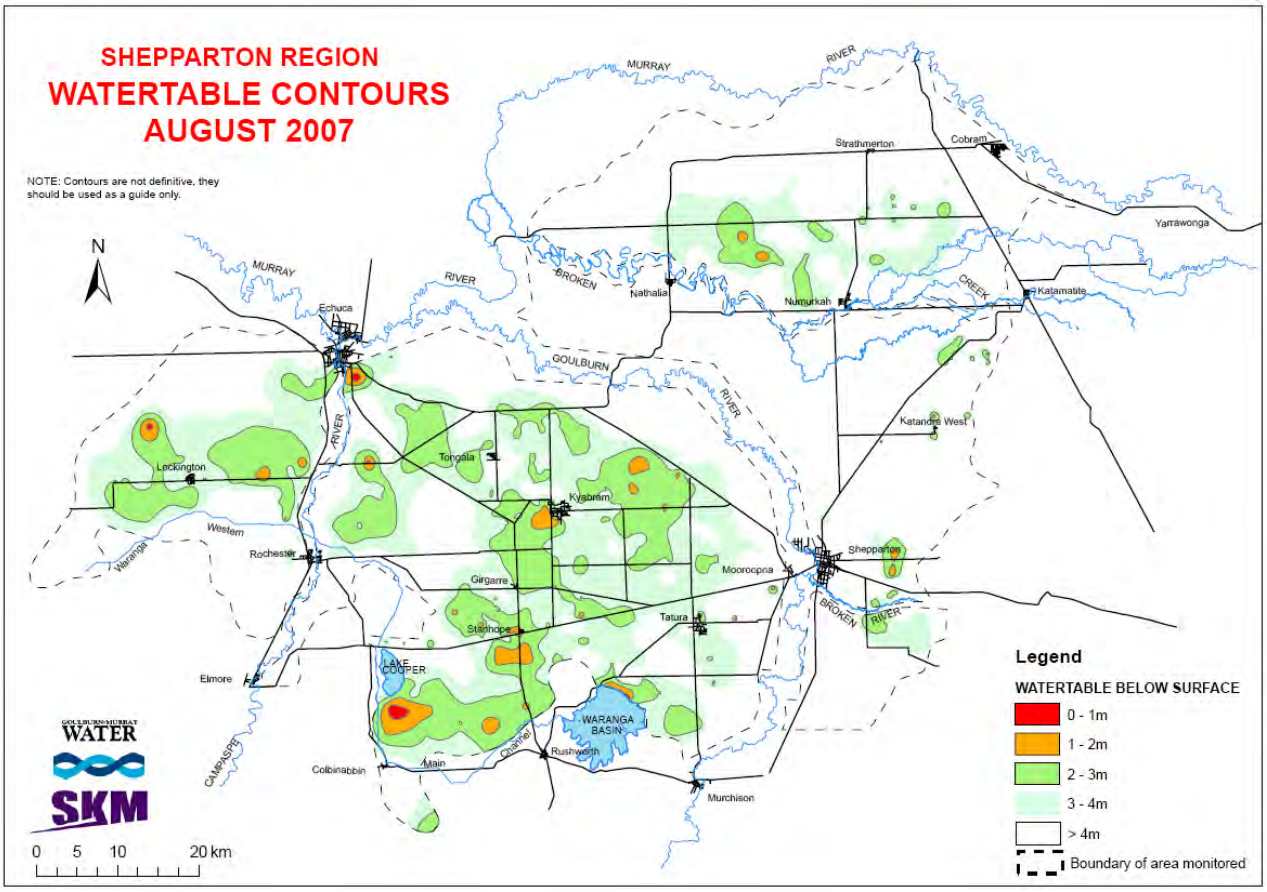
The combined results of Catchment Strategy implementation, the ongoing dry conditions and the improvements to irrigation efficiency and infrastructure has led to a significant reduction in general watertable levels across the Shepparton Irrigation Region. The reduced accessions are evident in the August 2007 watertable map.

The program has reacted to the changing conditions by altering its focus more towards maintaining the private pumping program, the protection of environmental assets, strategic reviews of programs and maintaining capability.

A 'Blue Sky' workshop on the implications of the reduction in general watertable levels across the Shepparton Irrigation Region produced a planned approach to investigate how the region may react to future climatic changes and therefore assist in the planning for the future directions of the Sub-surface Drainage Program.

Despite the challenging circumstances, the Sub-surface Drainage Program has been able to continue to implement planned works and adapt its programs to meet the requirements of key stakeholders.

The Subsurface Drainage Working Group was reformed as the Groundwater and Salinity Management Working Group in September 2007.



August 2007 Watertable map

Activities and achievements

High Value Environmental Features Project

Target

The directive of this committee is to establish a trial pump site at the Millewa Nature Conservation Reserve.

Progress

The selection of Millewa Nature Conservation Reserve (south west of Echuca) as a priority site allowed for commencement of exploratory works (drilling) to establish the level of salinity threat. Exploratory drilling and assessment work was completed and assisted in determining pump establishment. Further exploratory works will continue into the 2008-2009 year.

Public Groundwater Pumps

No feasibility level investigations were completed in 2007-2008, and two were in progress.

One pump was commissioned with one still in progress.

Private Groundwater Pumps

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

Investigations were completed on 44 pasture properties:

- six investigations were successful in locating private groundwater pumping sites;
- thirteen investigations were unsuccessful, but identified potential public pump sites.

Private groundwater pumping has been promoted to Local Area Plan groups, and five of the investigations completed during 2007-2008 were on properties within Local Area Plan areas.

A further seven investigations were commenced on properties, with works still in progress (one in Local Area Plan areas).

One unsuccessful horticultural property investigation was completed. No investigations are in progress.

Capital Grants for Sub-surface Drainage

In 2007-2008, 17 new systems and three upgrades were completed. The total grant payments made by GB CMA for the Installation and Upgrading of groundwater pumps was $405,284. The following provides a summary:

- Pasture property grant payments were made to 20 individual landholders;
- Seven grant payments for Private Exploratory Drilling were made;
- No horticultural property grant payments were made.

Strategic Plan support

The Sub-surface Drainage Program Research and Investigation Strategic Plan Annual Report for 2006-2007 was produced. Management and support were provided as required. The Grouped Salt Projects was used to coordinate Sub-surface Drainage Program inputs to strategic plan projects relating to salt management.

Strategic Plan implementation

Four projects and two stand alone sub projects were completed.

Winter/Spring salt disposal management

The termination of salt disposal from private shallow groundwater pumps was endorsed by the Shepparton Irrigation Region Implementation Committee and the Victorian Salt Disposal Working Group.

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

Committee support

Management and attendance/support provided as required to Shepparton Irrigation Region Implementation Committee, SIRTEC and Working Groups. Development and implementation provided to the regional Groundwater and Salinity Management Working Group.

Extension

An information kit for the community members of the Groundwater and Salinity Management Working Group was developed.

Management and coordination

Provision of Sub-surface Drainage Program management. This includes:

- Management, reporting and program coordination of Sub-surface Drainage Program;

- Ongoing development of business management systems;
- Systems for new consultancy agreements;
- Development and training;
- Management of Occupational Health and Safety requirements for Sub-surface Drainage Program.

Public Groundwater Pumps – feasibility investigations

Targets

- Complete two feasibility investigations for the year;
- Complete one final rating for the year.

Progress

- Zero feasibility investigations completed;
- Two feasibility investigations in progress - on hold;
- Zero final ratings of pumps completed;
- Zero final ratings of pumps in progress.

Public Groundwater Pumps – pump site installation

Target

- Commission two sites.

Progress

- Commissioning of one site.

Farm Exploratory Drilling Service

Targets

- Coordinate extension, administrative and prioritisation activities for the FEDS program in accordance with current Shepparton Irrigation Region Implementation Committee principles;
- Provision of drilling, testing and analytical services to facilitate the location, implementation and on-farm integration of sub-surface drainage works (pasture program);
- Coordinate and administer horticultural FEDS program;
- Provision of field works for horticultural FEDS program.

Progress

- Individual pasture property investigations;
- Forty-four completed, six successful;
- Thirteen unsuccessful but identified potential public pumping sites;
- Seventeen unsuccessful with limited or no pumping potential;
- One unsuccessful but identified a low volume pumping site;
- Seven in progress;
- Group pasture property investigations;
- No group works undertaken;
- Horticultural property investigations;
- One unsuccessful investigation completed;
- Zero in progress;
- Overall in Local Area Plan areas;
- Five completed;
- One in progress.

Administration of Capital Grants and Incentives for Sub-surface Drainage Works

Targets

- Management and administration of capital grants for groundwater pumping systems on pasture properties and for private exploratory drilling grants;
- Management and administration of horticultural capital grants;
- Implementation of grant assessment pump tests;
- Develop and implement drought response processes into incentives framework.

Progress

- Pasture property grants;
- Seventeen new systems complete;
- Twelve new systems in progress;
- Three upgrades complete;
- Five upgrades in progress;
- Total grant payments made by GB CMA $405,284 (includes $11,189.53 for private exploratory drilling grants);
- Horticultural property grants;
- Zero new systems complete;
- Zero grant payments made;
- Zero new systems in progress;
- Overall in Local Area Plan areas;
- One new system completed;
- Zero new systems in progress;
- Zero upgrades completed;
- Zero upgrades in progress.

Capital Grants for Salinity Control Works - Grants

Target

- Budget of $350,000.

Progress

- Total amount paid in Grants was $405,284 comprising;
- Twenty Capital Grants payments made to 20 individual landholders totalling $394,094.71;
- Seven Private Exploratory Drilling payments totalling $11,189.53.

Strategic Plan support

Targets

- Preparation of the Sub-surface Drainage Program Research and Investigation Strategic Plan Annual Report and Newsletter 2006-2007;
- Development and Management of the Sub-surface Drainage Program Research and Investigation Strategic Plan.

Progress

- Sub-surface Drainage Program Research and Investigation Strategic Plan Annual Report and Newsletter 2006-2007 produced;
- Consultancy management and support provided as required;
- Presentations and promotion of the Sub-surface Drainage Program Five Year Review;
- Management of Grouped Salt Projects ongoing.

Strategic Plan implementation

Target

- Complete four Sub-surface Drainage Program Research and Investigation Strategic Plan projects in 2007-2008.

Progress

- Eighteen projects were progressed over the 2007-2008 financial year;
- Four projects were completed;
- Evaporation basin design, ownership and promotion (GG03 030);
- Deep lead impacts on shallow groundwater (GG03 047);
- Review of salt conveyance practices (GG05 026);
- Phase A operation principles (GG06 034);
- Two stand-alone sub-projects were completed;
- Investigation of new technologies – GEM2 Electromagnetic Testing (GG03 045);
- Salt audit model – operational guide (GG03 048a);
- Twenty-one new issues were identified. Of these, 13 new issues were identified and assessed as sufficiently important to warrant inclusion in the Sub-surface Drainage Program Research and Investigation Strategic Plan.

Salt disposal management

Targets

- Inputs to salt disposal management and reporting;
- Removal of salt disposal from private pasture pumps.

Progress

- Input to Victorian Salt Disposal Working Group meetings;
- Input to Victoria's Murray Darling Basin Commission Basin Salinity Management Strategy Annual Report 2006-2007;
- The removal of salt disposal from private pasture pumps was endorsed by Shepparton Irrigation Region Implementation Committee and the Victorian Salt Disposal Working Group;
- Inputs to ongoing development and maintenance of Goulburn Broken Salinity Register.

Committee support

Targets

- Management and support for the newly created Groundwater and Salinity Management Working Group meetings;
- Input and support for other Shepparton Irrigation Region Catchment Implementation Strategy committees.

Progress

- Management and attendance/support provided as required;
- Development and coordination of the Regional Groundwater and Salinity Management Working Group;
- Involvement with Shepparton Irrigation Region Implementation Committee, SIRTEC, Farm and Environment Working Group, Budget Sub Committee, GB CMA Partnership and Combined Partners meetings.

Extension

Targets

Provision of the following groundwater and Sub-surface Drainage Program extension services:

- Promote Shepparton Irrigation Region Catchment Implementation Strategy work;
- Provide advice on groundwater, salinity and groundwater pumping;
- Support Shepparton Irrigation Region Implementation Committee Farm Program Working Group and the Groundwater and Salinity Management Working Group.

Progress

- Development of an information kit for the community members of the Groundwater and Salinity Management Working Group.

Management and coordination

Targets

- Management and coordination of the Sub-surface Drainage Program.

Progress

- Provision of program management and technical activities for the management of the Sub-surface Drainage Program. This includes:
- Management, reporting and program coordination of Sub-surface Drainage Program;
- Ongoing development of business management systems;
- Development of Environmental Management Plan for the Sub-surface Drainage Program;
- Systems for new consultancy agreements;
- Development and training;
- Management of Occupational Health and Safety requirements for Sub-surface Drainage Program.

Groundwater and Salinity Management Working Group members at the inaugural meeting, 4th September 2007.

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.

Regional River Health Strategy

The Waterways Program 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 the Goulburn River, Broken River, Seven Creeks and Broken Creek in the Shepparton Irrigation Region. 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.

Activities and achievements

Environmental flows and water supply performance

With little water in storage, the 2007-2008 year included significant drought management activities. In particular, significant flow reductions in the lower Goulburn River and Broken Creek were possible if the year was severely dry. The active support of Goulburn-Murray Water in organising and delivering flows was vital to achieving the best environmental outcomes from the limited water available.

The Goulburn River minimum flows at McCoys Bridge were reduced from 400 ML per day to 250 ML per day by Ministerial Qualification of Rights from 1 July 2007 to 17 September 2007 (when allocations on the Goulburn system reached 20 percent of high reliability water shares). Rain in the first half of July resulted in flows not dropping below the normal minimum flows until 28 August. They then dropped to reach the qualified minimum flows in mid-September, and then steadily recovered back to normal minimum flows by 23 October. Given the relatively short period of reduced flows, no obvious impacts of the flow reduction were noticed. Broken Creek flows were actively managed to minimise the risks to the native fish populations. Some 70 ML per day of through-flow was generally provided from the River Murray through the Goulburn-Murray Water Murray Valley channel system for the whole year (to 15 May 2008).

In August, a trial was undertaken by the Arthur Rylah Institute for Environmental Research to determine the behaviour of fish in Broken Creek if the creek was dried out under extreme drought conditions. A weir pool was temporarily drained, but the fish did not respond to the draining nor move to a safer location.

No major azolla blooms occurred in Broken Creek, but local build-ups in the creek were managed by Goulburn-Murray Water by manipulating weir heights and flows.

Some 1,878 ML of Goulburn River water quality allowance was used to manage Broken Creek water quality problems and 10,000 ML was sold by the Victorian Government to Coliban Water to provide drought water supply to Bendigo and associated towns.

In April and May, water from the Murray Flora and Fauna Bulk Entitlement was released into Reedy, Black and Kinnairds wetlands to provide for strategic drought refuge to wetland dependant plant and animals, primarily waterbirds.

Dry inflow contingency plans were also developed for the 2008-2009 year for key rivers and wetlands.

Works and extension

The impact of drought on native fish communities and water quality at priority sites within the catchment were monitored. This included establishing real time water quality monitoring at Goulburn Weir; monitoring the effectiveness of fishways on the Broken Creek; completing a bathometric survey (underwater mapping) of the lower Goulburn River; assessing the impact and movement of native fish during low flow in the Broken Creek; further drought planning and a study of the ecological processes in Broken Creek to better understand how low dissolved oxygen levels are generated and what potential mitigation measures there might be.

The regulator controlling flow into the Black Swamp Complex has been upgraded to help restore a more natural flooding regime.

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

Relationships, partnerships and community capacity

A 3rd Edition of the GB CMA aquatic and riparian weeds booklet was completed to assist landowners and agencies identify weeds which impact on the quality of riparian lands and in-stream habitats.

Knowledge

To assist the development of the Northern Region Sustainable Water Strategy, the GB CMA developed broad interim environmental flow recommendations for the lower Broken Creek. The recommendations will aim to maintain or improve the condition of aquatic dependent ecological assets in the creek.

Flow and wetting regimes were established on key wetland systems along the Broken Creek, including the Black Swamp Complex and Moodies Swamp.

A study into the interaction between environmental flows and flooding continued with development of a hydraulic model and mapping of floodplain assets well underway.

A monitoring program to determine the ecological response to environmental flow releases in the Goulburn River, Broken River and Broken Creek continued.

The assessment of the environmental impacts associated with the Tungamah pipeline (on the Broken and Boosey Creeks) continued. These systems are now ephemeral after 100 years of continued flow.

Hydraulic modelling of flooding in the Barmah Forest progressed.

Biodiversity and Indigenous communities at Barmah

Yeilma project

The Yeilma project is a shining example of how Indigenous people can lead the management of culturally and environmentally significant properties to benefit all Australians.

The project also represents tangible reconciliation between Indigenous people and the wider community and is evidence of improving understanding and partnerships between the Yorta Yorta indigenous people, the GB CMA and the Australian Government.

Yeilma is a property on a wetland alongside Australia's iconic River Murray and it is surrounded by the largest red gum forest in the world. The property was purchased by the Yorta Yorta people, the traditional owners of the region, through the Indigenous Land Corporation Fund in 2001.

Yeilma was used by the previous property owners as a productive cattle producing business. It was gazetted as a farming property in the late 1800s. The downside to the business was the impact on the wetland and the surrounding environment.

GB CMA and the Yorta Yorta people recently submitted a successful Australian Government funding application. The application includes priorities for improved use of the property that are consistent with Yorta Yorta's environmental concerns and long-term vision for the whole area. Activities to date include:

- Willow – stem injection;
- Patersons Curse – spraying;
- Fencing – internal and external;
- Various works undertaken by employees under the Drought Employment Program;
- Development of a master plan, which will include identification of potential business enterprises.

Drought Employment Program

The main Drought Employment Program in 2008 was a six month initiative that employed 80 of the region's drought affected farmers, farm workers and drought affected individuals to carry out projects and works that provided an environmental benefit.

The funding for this project was provided by the State Government as part of the drought response package, and allowed for employment costs to be covered as well as materials for project implementation. The flexibility of the project was its greatest strength, where projects that had struggled to be done under the grants programs could be delivered through direct employment of workers.

Over 40,000 hours of on-ground work was completed as part of the program through direct supervision by GB CMA Waterways staff and also through the participation of the partner agencies including Department of Sustainability and Environment, Department of Primary Industries, Goulburn-Murray Water, Parks Victoria, Trust for Nature and several local governments.

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.

Groundwater

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

Shepparton Drain Nutrients - mandatory

Targets

- Coordinate project;
- Fortnightly water sampling and field measurements at 15 sites;
- Laboratory analysis of all samples;
- Analyse and report on 2006-2007 monitoring data;
- Biological monitoring (report on 2007).

Progress

- Quarterly calculation and reporting of phosphorus loads against strategy targets continued during 2007-2008. Coordination of analysis reports. Manage contractors and database. Periodic data reviews/ checks;
- Water samples and field measurements taken from drains fortnightly;
- Samples analysed for nutrients, suspended solids, pH, turbidity, etc. Chlorophyll-a monitoring continued at Deakin Drain and Murray Valley Drain 6 sites. Data management;
- Report drafted for 2006-2007 review and analysis;
- 2007 biomonitoring sampling, analysis and reporting completed.

Drain flow leaving the Shepparton Irrigation Region in 2007-2008 was 0.5 percent of water delivered into the Shepparton Irrigation Region.

Phosphorus export from drains in 2007-2008 was similar to 2006-2007, the lowest on record.

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

Drainwatch monitoring site

Sub-surface drainage biophysical

Targets

- Monitor drains, channels and streams for the Shepparton Irrigation Region Catchment Implementation Strategy;
- Monitor investigation bores, public pumps, shallow groundwater bores, environmental assets monitoring bores.

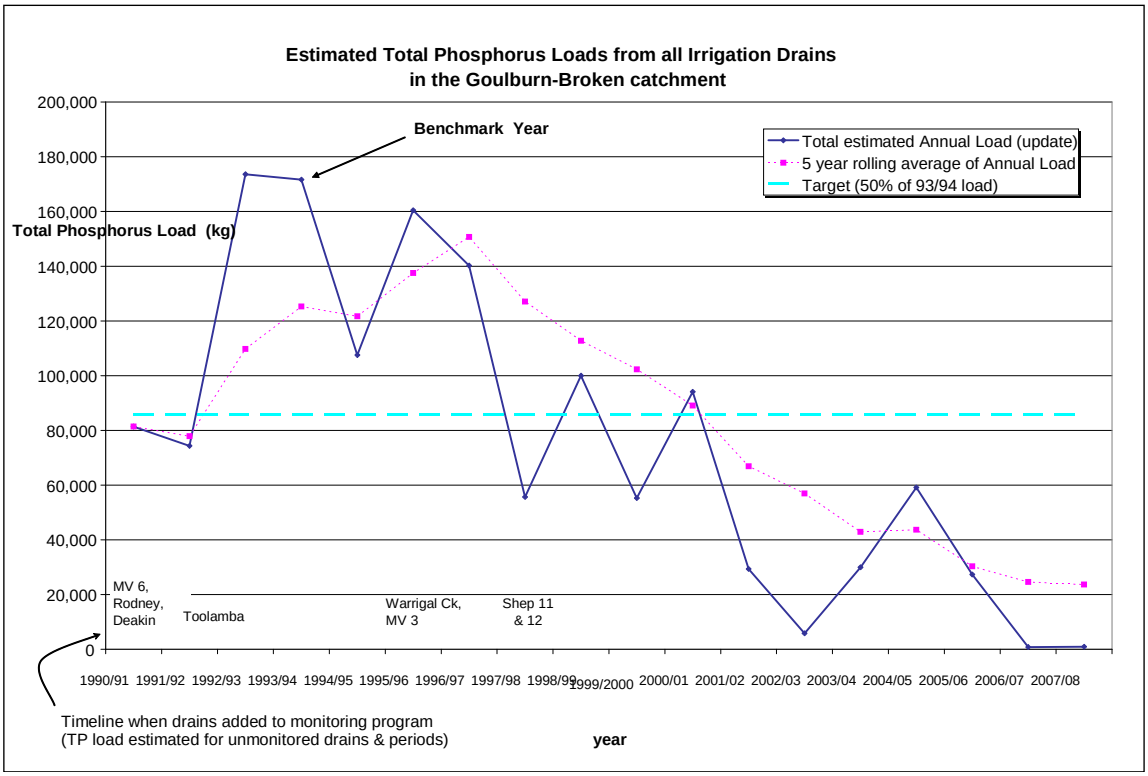
Progress

- Continued monitoring of channels, drains and streams as required. Continued data analysis for the update of annual reporting;
- Continued monitoring of bores and public pumps as agreed under the Shepparton Irrigation Region Catchment Implementation Strategy.

Sub-surface Drainage Program performance

Target

- Completion of the Sub-surface Drainage Program Key Performance Indicator Report for 2006-2007.



Estimated Total Phosphorous loads from irrigation drains

Progress

- Sub-surface Drainage Program Key Performance Indicator Report for 2006-2007 completed.

Program Support

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

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

Salinity Program Management, Department of Primary Industries

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

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

Community Surface Water Management Program

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

Farm Team

Local Area Planning

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

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.

Environmental Management Program
People in this program provide services to the community to protect and enhance bio-diversity within the region primarily on private land. These activities are carried out consistent with the Goulburn Broken Catchment Management Authority priorities.

Goulburn Murray Water Program Management

Staff provide support to the Catchment Implementation Strategy by ensuring the coordination of many functions including management of existing works and delivery of strategic planning projects. Staff also support promotion and communication of Catchment Implementation Strategy objectives through production of annual reports, performance indicators, media information and contribution to catchment partnerships.

Catchment Implementation Strategy Coordination

This key function ensures that maximum value is gained from the public funds allocated to the Implementation Committee and closely monitors the achievements and progress of the Catchment Strategy.

The Implementation Committee attracted an integrated budget of close to $16 million in 2007-2008. 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

Catchment Education and Awareness Grants

The Catchment Education and Awareness 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 Goulburn-Broken Catchment Management Authority.

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

See appendices for full list of successful groups in the 2007-2008 grants program.

Collier McCracken from the Goulburn Murray Landcare Network receiving a cheque from the Chairperson of the Shepparton Irrigation Region Implementation Committee (SIRIC) Peter Gibson at a presentation held at the City of Greater Shepparton on Friday 2nd May.

Landcare in the Shepparton Irrigation Region

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

Landcare volunteers were recognised for their contribution to natural resource management at the 2007 Shepparton Irrigation Region Landcare Award on October 13th.

Steven Mills, Chair of the Goulburn Broken Catchment Management, presented Jenny and Earle Phillips a certificate, an accommodation voucher for two at The Odd Frog in Bright and a gourmet hamper of local produce.

During a special celebration ceremony held at Kyabram Fauna Park, Jenny and Earle Phillips of the Wyuna Landcare Group are announced as Landcare Award winners by Steve Mills

Municipal coordination

Formal links with Local Government has been a key strategy of the Shepparton Irrigation Region since 1989. This link, through the role of the Municipal Catchment Coordinator supports an effective partnership between the municipalities of Greater Shepparton City Council, Shire of Campaspe, Moira Shire Council and the Shepparton Irrigation Region Implementation Committee. The Municipal Catchment Coordinator provides a liaison and coordination role to strengthen common ownership and commitment to natural resource management and regional development issues across the Shepparton Irrigation Region and to facilitate local government participation in the delivery of the Shepparton Irrigation Region Catchment Implementation Strategy and vice versa.

Key activities for this reporting period included:

- A coordinated response to the State Government's Green Paper on Land & Biodiversity, which highlighted the value of the Municipal Catchment Coordinator position and Steering Committee, and the success of other partnership projects, such as the Goulburn Broken Roadside Biodiversity Risk Management Protocols, Conservation Management Networks and the Drought Employment Program
- Alignment of catchment and municipal planning through the advancement of the Local Government Addendum to the Regional Catchment Strategy and the commencement of the Campaspe, Greater Shepparton and Moira Regional Rural Land Use Strategy.
- Council briefings and SIRIC meetings held with each municipality.

Research Program

Program Goal: The research projects for 2007-2008 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 the completion of several longer duration studies and a continuing emphasis on the two key issues of irrigation water use efficiency and the changing irrigation landscape. Ongoing low rainfall seasons continue to drive rapid change in the irrigated part of the catchment, and shortage of water across the state has focussed even more attention on irrigation practice, hence the shifting focus of the research efforts.

In late 2007, the Department of Primary Industries Research Division morphed into the Future Farming Systems Research Division. This has increased research emphasis on understanding how farming systems operate and respond to change. For the Shepparton Irrigation Region, scientists at the Department of Primary Industries supply scientific analysis and understanding of issues and needs arising in the region and provide a mutually beneficial partnership between the GB CMA and Victorian Government. This partnership continues to support decision-making processes, maintain regional scientific expertise, as well as provide training opportunities for young scientists in land and water management issues in a key irrigation region of Victoria.

Activities and achievements

Best Management Practices for farm groundwater use

The Project Leaders, Mike Morris and Bruce Gill, with research staff, Ruth Duncan worked with the Department of Primary Industries CAS (Terry Batey) on this project. Funding was provided initially through Department of Sustainability and Environment under a program called 'Water for Growth'. This project ran from 2003 to 2008.

Background

Groundwater pumping is essential for salinity management in the Shepparton Irrigation Region. Water is also an increasingly valuable production input. This project sought to identify whether greater irrigation water use efficiency could be achieved through improved shallow

groundwater utilisation in the Shepparton Irrigation Region.

The main objectives were to improve understanding of the:

- risks and benefits of shallow groundwater use;
- salinity and water resource limitations and implications of greater use; and
- socio-economic drivers behind groundwater use practices in the region.

Gaining this improved understanding has enabled the formulation of Best Management Practice guidelines for shallow groundwater use in the region.

Project findings and implications

An early application of findings from the study was to use a review of the technical basis for the 800EC salinity and 3 ML/ha volumetric limits for groundwater re-use guidelines. The review concluded that the principles underpinning the 800EC and 1700EC limits were well-founded and that these limits should be maintained. The review also provided some technical basis upon which a higher salinity limit for groundwater irrigation of lucerne was developed. However, it also recommended that the blanket 3 ML/ha volumetric limit be replaced by site specific licence conditions and an evidence-based, adaptive management approach.

Overall, the study provided an understanding of the complex biophysical, institutional and socio-economic factors that influence current management practices for shallow groundwater use in the Shepparton Irrigation Region. The information developed will be a resource to help inform regional policy development and community decisions about shallow groundwater resource use and management in the Shepparton Irrigation Region into the future. During the course of the study, the impacts of drought and longer term climate change on the availability and ready access to shallow groundwater was also observed. While groundwater is a valuable short term drought reserve, the lack of recharge of the shallow groundwater system has highlighted its limitations.

Where to from here

Over the past decade, the shallow groundwater system has changed from a salinity hazard, to a valuable conjunctive water resource, to a potentially limited and risky water resource due to the declining watertable and limited channel supply for dilution. This study captures valuable shallow groundwater resource knowledge that will be essential in seeking ways to adapt the management and policy framework for shallow groundwater in the catchment strategy and groundwater licensing framework as future climate driven changes unfold.

Farm salinity management (Mt Scobie partial conjunctive groundwater re-use study)

Project Leader Bruce Gill and research staff Alister Terry, together with field support from Graeme Phyland, have been working with the cooperation of the landholder Lewis Watson to gather and analyse groundwater and salinity data for this study. Funding is from Department of Sustainability and Environment and the GB CMA.

Background

Partial conjunctive groundwater re-use was investigated at Mount Scobie on a commercial dairy farm. A groundwater pump established in 1999 protects about 60ha of the farm by extracting an average of 60 ML of 10dS/m (10,000EC) groundwater per year. Of the total pumped volume of groundwater, approximately 35 ML is diluted with channel water and used on pastures. The other 25 ML is used undiluted to irrigate a 4ha salt tolerant tree lot established within the area of influence of the pump.

The project has undertaken detailed analysis of the results of eight years operation to seek answers as to the sustainability of the practice and the fate of the average 60 tonnes/hectare of salt in the groundwater that is deposited under the trees. The data collected to date was analysed to test the main hypothesis 'that the salt is being concentrated into a high salinity 'plume' in the soil and groundwater under the tree block and will migrate back towards the pump, thus developing a new dynamic equilibrium within the system'.

Groundwater pump shed with Mount Scobie in the background

Project findings and implications

While the results are not conclusive, the project continues to provide new insights into the sustainability of this high salinity re-use system. In the critical aspect of soil salinity, there has been a significant increase in root-zone soil salinity for the tree plantation area while soil salinity under the remainder of the farm has remained low.

Whether the partial conjunctive re-use system is sustainable or not in the long-term cannot be definitively answered yet because of the confounding effect of the drought. Long-term sustainability of the system depends on the soil/water matrix under the trees remaining at a level that is not toxic to them. The system will only be sustainable if the tree area can reach a state of equilibrium where the amount of salt added through irrigation with highly saline groundwater, is balanced by the amount of salt leached away from the tree root zone. While additional drilling has confirmed that there is good aquifer connection between the trees and pump, substantial rain is needed to provide sufficient leaching to prevent soil salinities under the trees from continuing to rise. Under current conditions, the trees face an uncertain future.

In respect to the regional need to implement similar systems to manage salt where groundwater salinities are too high to allow off-site disposal, the study results indicate that if watertables are low and dry conditions prevail, there is little need for the partial conjunctive re-use systems like Mt Scobie to be used elsewhere in the foreseeable future.

Where to from here

With continuing drought changing the operating environment in which the original project was designed, the continuing operation of the system needs to be carefully considered. It is intended to complete a full report in 2009 with clear direction about the future of the study.

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 Goulburn-Murray Water, Department of Primary Industries Catchment and Agricultural Services, and Department of Primary Industries PIRVic on this project. Funding was provided through GB CMA and NC CMA and the project concluded in June 2008.

Background

Natural resource management outcomes often require landholders to change their current practices. To aid this process, natural resource managers such as the Department of Primary Industries, Department of Sustainability and Environment 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.

Department of Primary Industries 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 Shepparton Irrigation Region 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 investment of the Department of Primary Industries, Department of Sustainability and Environment and GB CMA. 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 two year project began in 2006-2007 to develop and refine a technique for mapping the location of landholders that would benefit from adopting a new practice or technology. This study has developed and demonstrated a method for identifying trading segments in the market for irrigation water in both the North Central and Shepparton Irrigation Regions. The method is based on categorising the transaction in the water market into a conveniently small number of types. This categorisation

provides a stable platform for identifying and interpreting trading segments in the highly dynamic water market. The method, by integration with spatial mapping techniques, also allows individual members of trading segments to be located in the landscape.

Project impact and key directions

The project has demonstrated that spatial land cover and water use data can be used to link variations in land cover with water use and water trading by dairy farmers. Importantly, the study has demonstrated how quantitative data on spatial land cover and water use can be combined with qualitative data to explain water trading behaviour by dairy farmers. This combined analysis allowed us to identify different types of trading, to map where the different types were occurring and to explore why they were happening.

The results indicate that where the behaviour of farmers is strongly influenced by elements in their farm context that are measurable and documented (such as water entitlements and/or area of perennial pasture), different farm contexts can be identified across landscapes using spatial mapping techniques. This means, in principle and in the right circumstances, the spatial effects of policy instruments can be identified.

Future research could:

- Investigate land cover change over shorter intervals and link this with appropriate water trading data;
- Explore water trading on an annual basis to establish seasonal trading patterns. This may assist understanding and identifying the conditions that motivate irrigators to switch between the identified segments over time. This could then be used to investigate how drought or water reform would affect water trading by irrigators, or to identify trading patterns that indicate irrigators are likely to leave the industry;
- Explore regional trends in land cover and market segments. While at a catchment scale water trade segments appeared randomly distributed this may not be the case at a local or pod scale;
- Explore whether there is any relationship between landholder demographics and enterprise characteristics and water trade segments;
- Explore whether there are differences in market segments and sizes between different industries.

Impacts of water trade on agricultural ecosystems

The Project Leader is Mike Morris (Dr Matthew Bethune to December 2006) and research staff: Dr Thabo Kumaran and Dr Benny Selle. The project was funded by the Department of Primary Industries–Agriculture Division, Department of Sustainability and Environment–Sustainable Irrigation and Water Smart Farms Research and Development Program, the GB CMA and the NC CMA.

Background

The management of irrigation induced salinity is fundamental to ensuring irrigated land remains productive and to minimise the environmental impacts of irrigation. National water reform facilitates the operation of efficient water markets and the opportunities for trading, within and between States and Territories. This project is investigating the relationship between productivity and salinity aspects of irrigation activities resulting from water trade in northern Victorian landscapes. While past studies have investigated the impacts of existing irrigation activities, no system exists to account for the salinity impacts of rapid spatial and temporal changes in water use patterns.

The Basin Salinity Management Strategy 2001-2015, is a commitment by the Australian Government and the State Governments of Victoria, New South Wales, South Australia, Queensland and the Australian Capital Territory for an integrated approach to salinity management of the River Murray. The salinity impacts of water trade have been identified as an 'Accountable Action' to be registered under the Basin Salinity Management Strategy.

Victoria currently accounts for the salinity impacts of permanent water trade into the Mallee CMA region annually, however trade of permanent water into and out of other regions is not currently accounted for, nor are the impacts of any temporary trade. The Murray Darling Basin Commission has initiated development of a conceptual framework to estimate salt credits/debits arising from trade in water allocations for the Mallee and Riverine Plains zones. To support this, Victoria needs to develop an improved understanding of regional landscape and farm processes that drive irrigation induced salinity impacts. This information would assist CMAs in meeting accountability arrangements for management of salt credits. This project will deliver new information and technical support to guide state and regional policy.

Project objectives

- To create new knowledge and tools that enable regional and state policy stakeholders to confidently assess the salinity impacts of the future changes in irrigated land use and management wrought by agricultural commodity and water markets.
- To achieve coordinated management of the salinity impacts of irrigated agriculture on the River Murray and its major tributaries in Victoria.
- To balance productivity and environmental outcomes generated by water trade into and out of regions in northern Victoria.

Project outline

This three year project is focused on the Victorian Riverine Plains and started in July 2006. The Victorian Salt Disposal Working Group acts as the project steering committee.

In Year 1 of the project (2006-2007), the team examined the Torrumbarry Irrigation Area and developed a systems representation of the linkages between agricultural productivity, water trade and salt mobilisation. The focus has been on the Barr Creek catchment, historically the largest single source of salt load from the Riverine Plains. The work included reviewing available data, previous and current studies.
In Year 2 (2007-2008), the team focussed on data analysis, modelling and reviewing available models for the Barr Creek catchment and the Shepparton Irrigation Region to quantify salinity impacts of water use. This included reviewing previous and current studies and communicating and discussing key project results with stakeholders such as CMAs, operational managers and technical specialists.

In Year 3 (2008-2009), the project will develop spatially distributed models for the Barr Creek catchment and prepare a discussion paper for the relevant CMAs. This paper will outline necessary modifications and improvements to current approaches for assessing impacts of water trade on both the water market and agricultural productivity.

Results, implications and benefits

For the Barr Creek catchment, spatially lumped data analyses and modelling have shown that under the conditions that prevailed from 1975 to 2004, rainfall rather than irrigation governed salt mobilisation from the Barr Creek catchment. The developed conceptual model consistently explains most of the variation in monthly salt load from the Barr Creek catchment over this period using rainfall and the Deep Lead pressure. The influence of irrigation was very small compared to rainfall.

In contrast to the Barr Creek catchment, where salt is primarily exported by a slowly changing groundwater seepage process, salt export from the Shepparton Irrigation Region is mainly driven by rapidly changing surface runoff and groundwater pumping processes. In the Barr Creek catchment, monthly data adequately represents relatively slow variations in groundwater seepage, but the Shepparton Irrigation Region model requires daily data to represent the rapidly changing runoff and pumping processes that dominate its salt mobilisation. The Shepparton Irrigation Region can also be categorised as a catchment that discharges low salt loads per unit area, whereas the Barr Creek catchment discharges high salt loads per unit area.

Based on the findings in the Barr Creek catchment and the Shepparton Irrigation Region, the study concludes that models available for Barr Creek catchment and Shepparton Irrigation Region cannot reliably or confidently quantify the salinity impact of irrigation activity due to large uncertainties inherent in the estimations of salt load impacts. It appears that these models cannot be used to account for the salinity impact of water trade as required under the Basin Salinity Management Strategy of the Murray Darling Basin Commission.

There is greater potential for improvements in model predictions and understanding through the application of spatially distributed models in this catchment. Spatially distributed models are required to represent spatial dynamics within the catchment, to gain more understanding of the shorter time-step catchment response to irrigation and to answer within-catchment management questions.

Meeting infrastructure renewal information needs

Project Leader Andy McAllister and Research Staff, Elizabeth Morse-McNabb, Hayden Lewis, Richard Maxwell, Susan Robson, Tracey Davies, Wendy McAllister, Mohammad Abuzar, Georgina Nunn, and Scott Tonkin have worked with the GB CMA, NC CMA, Department of Sustainability and Environment and Goulburn-Murray Water.

Background

Food Bowl Modernisation, or Northern Victoria Infrastructure Renewal Project (NVIRP), is the latest in an ongoing program of infrastructure renewal and reconfiguration triggered originally by the Department of Sustainability and Environment White Paper "Our Water, Our Future". Throughout this program Spatial Sciences at Tatura has been providing a range of products, research services and advice to Department of Sustainability and Environment, Goulburn-Murray Water and CMAs. Examples of this work are:

- The Goulburn-Murray Water Strategic Overview of Services Needs –"The Atlas";
- Spatial Market Segmentation and Healthy Landscapes Framework Project.

Current modernisation initiatives involve an increasingly complex array of renewal programs which need to be supported by good spatial data.

Program activities

The Spatial Sciences group at Tatura has been engaged by Department of Sustainability and Environment, Goulburn-Murray Water, the GB CMA and NC CMA to contribute to the strategic planning occurring around modernisation in several ways. Three main activities include:

Activity 1: Understanding irrigators in an era of change

The Spatial Sciences group, in conjunction with Goulburn-Murray Water and Department of Primary Industries-Farm Services Victoria (Practice Change), has developed a range of Geographic Information System (GIS) layers to describe the distribution and characteristics of irrigation enterprises. The project focuses on Goulburn-Murray Water irrigation planning units (pods) and their relationship to existing and proposed infrastructure changes. This was initially done for case study pods but is to be applied across all pods in the Goulburn-Murray Water system. The work supports proper investigation of the impacts of the Northern Victoria Irrigation Renewal Project and the broader application of a connections decision tree. A highlight of 2007-2008 was the development of information and mapping products to support the survey program being conducted by the Department of Primary Industries Practice Change in selected pods within the Central Goulburn Irrigation Area.

Activity 2: Regional information systems

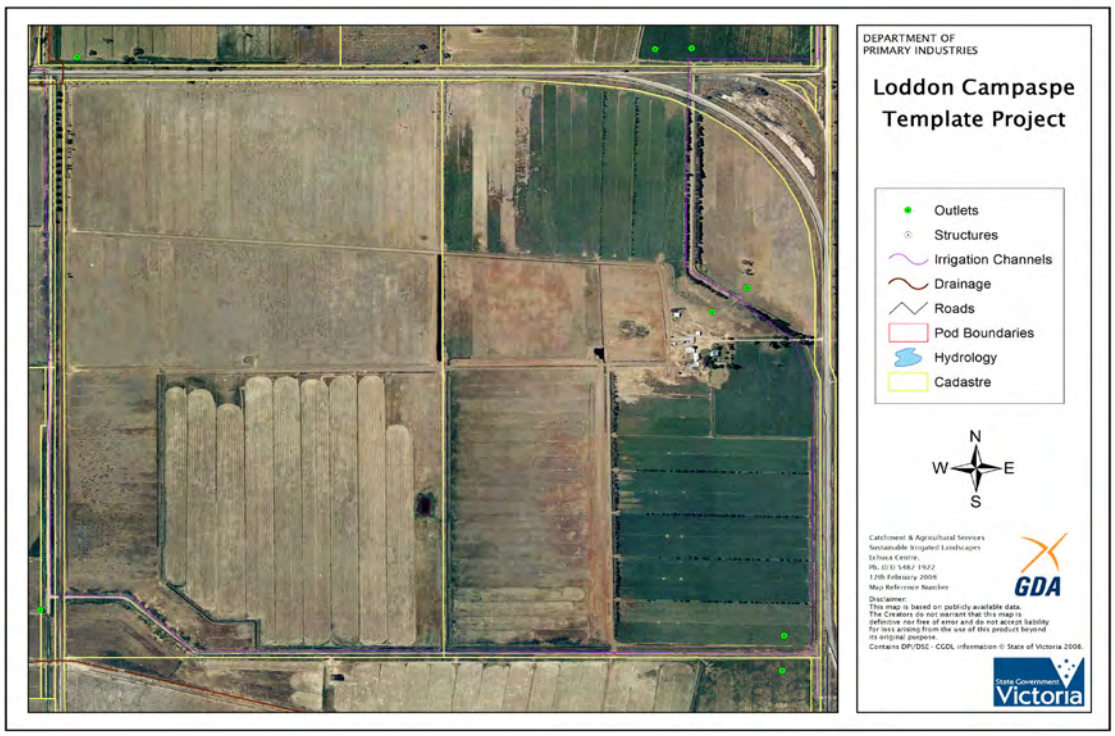
The Spatial Sciences group, in collaboration with Goulburn-Murray Water, Department of Sustainability and Environment and local government, has driven the development and support of a common information base, to support the strategic and operational needs of the various organisations involved in modernisation. Highlights for 2007-2008 include a series of collaborative meetings and workshops with Goulburn-Murray Water to facilitate data sharing and to develop the concept of a regional approach to information systems.

Activity 3: GIS support to Farm Services Victoria (FSV)

Geographic Information Systems (GIS) play a vital role in implementing the Shepparton Irrigation Region Catchment Implementation Strategy. With ongoing development of GIS software, migration from ArcView to ArcGIS has started and tools to enable this are in development. Migrating to ArcGIS will make it easier and quicker to produce high quality spatial products and ensure that staff are mapping and collecting project information to a high standard. This upgrade and migration of our software and datasets has been critical in enabling the Shepparton Irrigation Region Catchment Implementation Strategy program staff to keep pace with the modernisation and reconfiguration programs occurring in the Shepparton and Kerang regions.

Key achievements for 2007-2008 include:

- Data Management – provided new native vegetation extent and ecological vegetation class layers, used for the modernisation project and mobile mapping projects;
- Technical Support – provided staff with help through the technical support line or face-to-face, answering questions about data or software. This included Spatial Sciences staff visiting the Echuca site;
- Project Support – provided GIS support to the Modernisation Project and other Shepparton Irrigation Region Catchment Implementation Strategy programs. This included the development of tools to support various projects following discussions about the requirements of each (e.g. data, support, tools and training);
- Spatial products – completed the Northern Victoria Irrigation Renewal Project Modernisation Impact Maps, ethnicity maps for Shepparton East, mapping incentive sites for the Farm Program and data interrogation for the Drainage (catchment) Evaluation Spreadsheet Model.



A modernisation impact map

Practice Change Research

The proposed Food Bowl modernisation initiative offers opportunities to achieve water savings that will provide environmental benefits, as well as benefits for urban and agricultural water users. To achieve these benefits, the Shepparton Irrigation Region Implementation Committee and partners needed to consider how these changes affect the current programs and the Shepparton Irrigation Region Catchment Implementation Strategy objectives. The Department of Primary Industries Practice Change Research team undertook three projects enabling the Shepparton Irrigation Region Implementation Committee and partners to develop policy responses and policy instruments that account for the landholder, organisational and technical implications the proposed changes create.

Policy Choice Framework

The Shepparton Irrigation Region Implementation Committee works in partnership to implement policy and programs that support sustainable irrigation in the Shepparton Irrigation Region. One of the fundamental challenges for people that design and implement policy is to obtain, with limited resources, behavioural change at a desirable scale and rate.

The Shepparton Irrigation Region Implementation Committee and the Department of Sustainability and Environment funded the Department of Primary Industries Practice Change Research team to develop a Policy Choice Framework to assist policy and program managers to review and select policy instruments to achieve sustainable irrigation outcomes in the Shepparton Irrigation Region. The Policy Choice Framework provides a systematic way of selecting a mix of policy instruments for achieving an outcome accounting for both technical suitability and fit with landholder and organisational context.

Application of the Policy Choice Framework to the Food Bowl modernisation initiative supported the Shepparton Irrigation Region Implementation Committee and partners to consider and develop policy responses in light of the proposed changes.

Understanding landholders in an era of regulatory change

The Practice Change Research team undertook a case study, investigating two areas within the Shepparton Irrigation Region associated with the Food Bowl modernisation initiative. Through the application of the I3 Framework (Murdoch et al 2006), the case study provided insights into landholder attitudes and the factors that influence these responses.

Case study findings showed that the on-farm implications shared strong links between enterprise needs and current level of service delivery, the ability to get irrigation water onto and across a property ('commandability') and options for individuals to ensure on-farm reliability in supply. Regarding the Food Bowl modernisation concept and the issue of water savings for all users, some strongly-held attitudes were expressed and shared amongst interviewees. These results are being used to inform the development of appropriate policy responses and programs that will support irrigators in adapting to the required change that complement and enhance delivery of the Shepparton Irrigation Region Implementation Catchment Strategy.

One policy - different organisational responses

In the Shepparton Irrigation Region Implementation Catchment Strategy programs are dispersed across several organisations including Department of Sustainability and Environment, Department of Primary Industries and Goulburn-Murray Water. Each organisation has its own unique context and history in the implementation of policy. This uniqueness means that each may respond to the challenge of implementing new policies in quite different ways.

The Practice Change Research team undertook a case study to understand the organisational implications of the proposed changes as a result of the Food Bowl initiative. The Policy Innovation Framework (Kaine & Higson 2006) was used to explore the key differences in the consequences for the various organisations involved in implementing the proposed changes. This enabled us to identify the consequences for each organisation including building of new competencies, changing cultural values, restructuring, modifying processes of the proposed changes, and the ways in which organisations may influence the implementation of the proposed changes.

These results can be used by the organisations to support their implementation of programs in light of the proposed changes.

APPENDICES

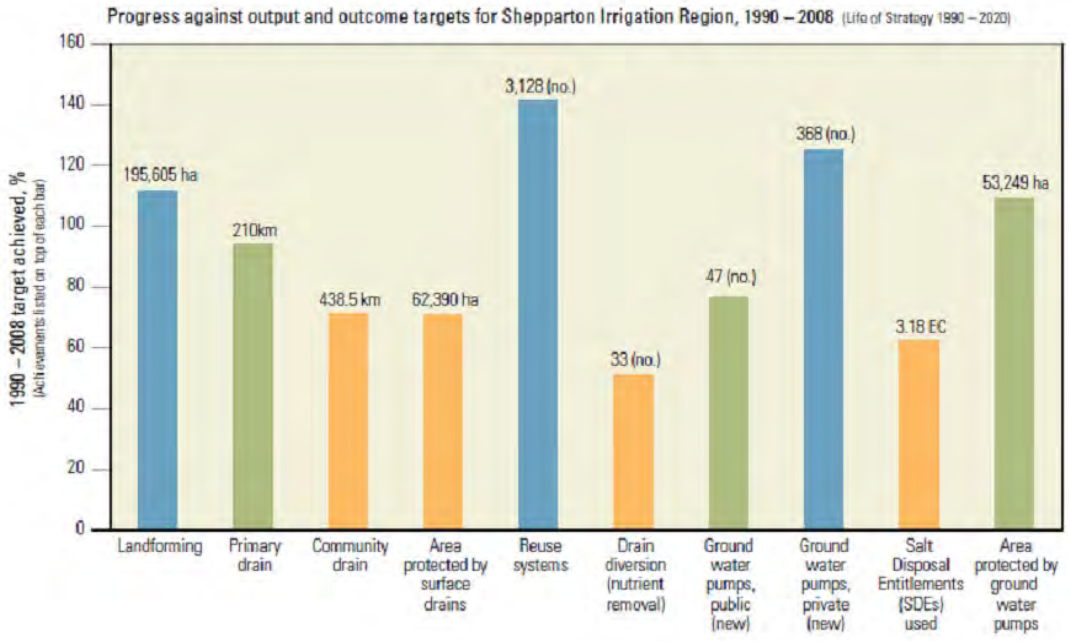
Outputs achieved 2007-2008

Standard 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)	38	48	126
	Fence wetland remnant(ha)	8	285	3,567
	Fence stream/river remnant (ha)	8	1,910	23,880
	Off-stream watering (no.)	20	23	115
	Binding Management Agreement (license, Section 173, covenant) (ha)	100	80	80
Induced threat				
Saline water and high watertables				
Surface water	Landform/lasergrading (ha)	7,700	8,525	111
	Drain – primary (km)	3	9	300
	Drain – community (km)	4	0	0
	Farm reuse system (no.)	45	48	107
	Drain – additional water diverted from regional drains (ML)	570	200	35
	Irrigation systems – improved (ha)	6,840	8,967	131
Sub-surface water	New groundwater pumps – public (no.)	2	1	50
	New groundwater pumps – private (new and upgrade no.)	6	20	333
	Volume water pumped (ML)	1,400	3,237	231
Nutrient-rich & turbid water & suspended solids	Stormwater management projects (no.)	1.0	0.0	0.0
In-stream and near-stream erosion	Bed and bank protection actions (km)	12	0.96	8
Weed invasion	Targeted infestations of weeds in high priority areas covered by control programs (ha)	93	10,501	11,292
Pest animals	Area of high priority fox infested land covered by control programs (ha)	8,000	11,500	144
Impact				
Habitat loss - terrestrial	Revegetation - plant natives within or next to remnants (ha)	98	94	96
Habitat loss – in-stream	Fish barrier removal (no.)	2	5	250
	Establish SEAR (Significantly Enhanced Aquatic Refugia) (no.)	50	30	60
Habitat loss – threatened species	Threatened Species Recovery Plan and Action Statements (no. projects)	8	8	100
Planning	Whole Farm Plans (no.)	155	145	94

Salinity targets achieved since 1989

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

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



Salt Disposal Report

*Progressive uptake of Salt Disposal Entitlements (SDEs) in the SIR to June 2008 **

	Uptake of Salt Disposal Entitlements (EC)			
Activity	Pre 1991	Total to 2006-07	Uptake to 2007-08	Total to 2007-08
Primary Drains	0.055	-0.190	-0.029	-0.220
Community Surface Drains	0.008	-0.389	0	-0.389
Public Groundwater Pumps	0	1.880	0.040	1.920
Private Groundwater Pumps	0	1.684	0	1.694
Horticultural Sub-surface Drainage	0.030	1.178	0	0.178
Total	0.093	3.172	0.011	3.183

* *Includes pre 1991 impacts*

** *Note revised to account for the review. Not yet endorsed by MDBC*

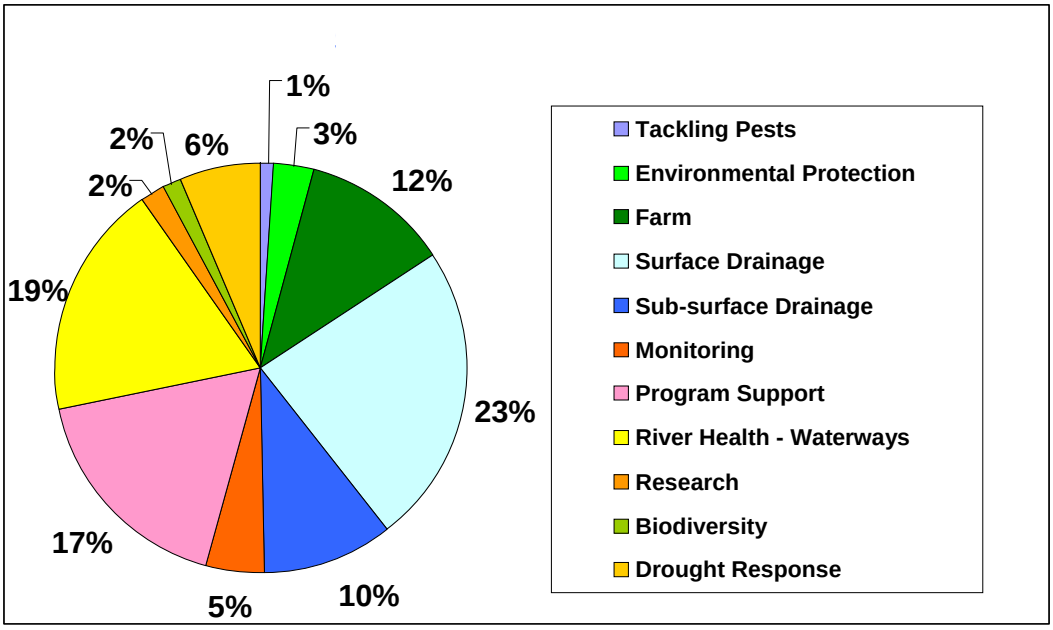
*** *The impact of increasing dryland salinity in the Goulburn Broken Catchment is now on the MDBC register as 3,592 EC or $931,684 with no benefit of onground works*

**** *Revised methodology used in 2006-7 does not match previous Annual Reports*

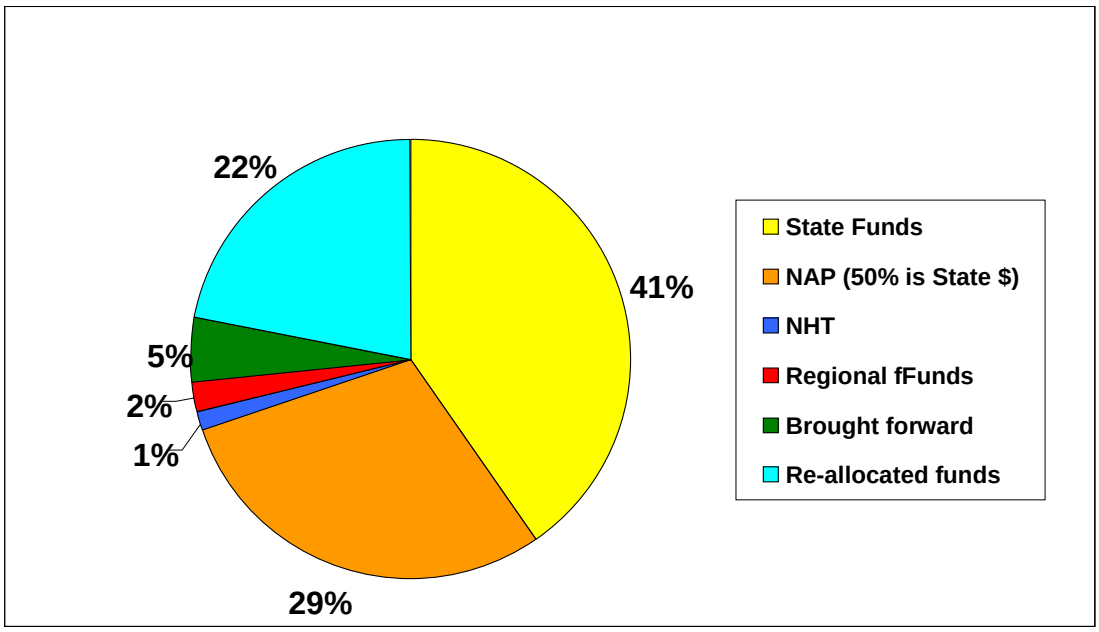
Budget and final expenditure 2007-2008

Programs	*State Funds $'000s*	*NAP (50% is State $) $'000s*	*NHT $'000s*	*Regional Funds $'000s*	*Brought forward $'000s*	*Re-allocated $'000s*	*Total funds $'000s*	*Expended $'000s*
Tackling Pests	173						173	173
Environment	300	280					580	546
Farm	1,215	593			232	392	2,432	2,006
Surface Water Management	943	1,838			123	1,638	4,542	3,3731
Sub-surface Drainage	1,300	291				100	1,691	1,729
Monitoring	196	240		308			744	792
Program Support	1,850	1,243	118	128	246	-32	3,629	2.976
Waterways	334	700				1,680	2,960	3,242
Research		301					301	301
Biodiversity				160	95	33	288	265
Drought Response	450				-153		297	297
Total SIRCIS	6,761	5,486	278	436	865	3,811	17,637	16,057

SIRCIS expenditure 2007-2008



SIRCIS funds source 2007-2008



Summary of Cost Share

Partners	*Annual expenditure 2007-2008 $*	*Accumulated expenditure $*
Government	16,057,000	307,960,731
Community	37,463,210	768,239,595
Totals	53,520,210	1,076,200,326

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 2007-2008 dollars. Previous expenditure was adjusted by applying the Victorian CPI increase of 4.5 percent in 2007-2008.

Catchment Education and Awareness Grants

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

Grants are available for catchment management 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.

Group	$
Broken Boosey Conservation Management Network	8,000
Goulburn Murray Landcare Network	1,200
Goulburn Murray Landcare Network	2,340
Kyabram Landcare Group	150
Kyabram Secondary College	1,317
Stanhope Primary School	609
St. Joseph's College Echuca	1,000
St. Mary of the Angels Secondary College	1,250
Muckatah Landcare Group	506
Natural Resources Conservation League of Victoria	1,000
Goldfields Conservation Management Network	925
Broken Boosey Conservation Management Network	1,850
Broken Boosey Conservation Management Network	8,000
Total Grants paid in the Shepparton Irrigation Region 2007-2008	$28,148

Committees and Working Group Members 2007-2008

Shepparton Irrigation Region Implementation Committee

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 John Gray - Toolamba Helen Reynolds - Congupna Nick Ryan - Lancaster Roger Wrigley - Wangaratta	Bruce Cumming - DPI Terry Hunter - G-MW Tony Long - DSE	Ken Sampson - GB CMA Peter Howard - GB CMA Pam Collins - GB CMA Rachael Spokes - GB CMA Wayne Tennant - GB CMA James Burkitt - G-MW Carl Walters - G-MW/GB CMA David Lawler - DPI Rebecca Heard - DPI

Attendance Record

Name	*07-5*	*07-6*	*07-7*	*07-8*	*08-1*	*08-2*	*08-3*	*08-4*
Peter Gibson	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Peter McCamish	Yes	Apol	Apol	Yes	Yes	Yes	Apol	Yes
Allen Canobie	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Steve Farrell	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
John Gray	Yes	Apol	Yes	Yes	Yes	Yes	Yes	Apol
Helen Reynolds	Apol	Yes	Yes	Yes	Yes	Apol	Yes	Yes
Nick Ryan	Yes	Yes	Yes	Yes	Yes	Apol	Yes	Apol
Roger Wrigley	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Apol

Working Group Members

Group	*Community Members*	*Agency Representatives*
Farm & Environment Program Working Group	Roger Wrigley (Chair) Gerardo Fasano John Gray Alfred Heuperman John Hewlett John Laing Alan Lavis Athol McDonald Ben McCracken Bill Probst Helen Reynolds Rien Silverstein Graeme Talarico	Bruce Cumming - DPI Julie Engström- DPI Rebecca Heard - DPI David Lawler - DPI Allison McCallum - DPI Chris Nicholson - DPI Joel Pike - DPI Ken Sampson - GB CMA Rachael Spokes - GB CMA

Surface Water Management Working Group	Allen Canobie (Chair) Ron Brooks John Horder Hank Sanders Stephen Farrell Glen McAliece Morris Brown Ross Crawford Max Baker	Daryl Eaton - G-MW Greg Smith - G-MW Mark Paganini - DPI Neil McLeod - DPI John Tunn - AAV Elita Briggs - EPA Neville Atkinson - GB CMA Pam Collins GB CMA Ken Sampson GB CMA Rachael Spokes GB CMA

Groundwater & Salinity Management Working Group Note: This was a GB CMA catchment-wide Working Group for 2007-2008 with representatives from Mid-Goulburn Broken IC, Upper Goulburn IC and SIR IC.	Kelvin Bruce David Dore - MGB IC Heather du Vallon Peter Gibson - SIR IC Peter McCamish - SIR IC Menon Parameswaran - MGBIC John Thompson - UGIC Ian Whatley John Wenske	James Burkitt - G-MW Terry Hunter - G-MW Carl Walters - G-MW/GB CMA Terry Batey - DPI Mark Cotter - DPI Rick Felton - DPI Bruce Gill - PIRVic DPI Lillian Parker - GB CMA Ken Sampson - GB CMA Rachael Spokes - GB CMA Consultants Hydro Environmental: Peter Alexander Louissa Rogers Trevor March

Waterways Working Group	Russell Pell (Chair) Terry Court John Gray Tait Hamilton Lanie Pearce Bill Probst Nick Ryan Peter Sargent Alan Sutherland Roger Wrigley	Daniel Haslop - G-MW Melissa Turpin - G-MW David Trickey - DPI Fisheries Neville Wells - DSE Jo Deretic - DPI Andrew Morrison - DPI Jen Pagon - DPI Wayne Tennant - GB CMA Carl Walters -G-MW/GB CMA Tom O'Dwyer - GB CMA Richard Warburton - GB CMA Ken Sampson - GB CMA Peter Howard - GB CMA Rachael Spokes - GB CMA Pam Collins - GB CMA

SIR Technical Support Committee (SIRTEC)	Allen Canobie - SIR IC Peter Gibson - SIR IC Roger Wrigley - SIR IC	Ken Sampson - GB CMA James Burkitt - G-MW Sam Green - G-MW Terry Hunter - G-MW Greg Smith - G-MW Carl Walters - G-MW Bruce Cumming - DPI Terry Batey - DPI David Lawler - DPI Steve Lottkowitz - DPI Jen Pagon - DPI Bruce Gill - DPI PIRVic Fiona Johnson - DPI PIRVic Pam Collins - GB CMA Peter Howard - GB CMA Wayne Tennant - GB CMA Rachael Spokes - GB CMA Elita Briggs - EPA

Budget Sub-Committee	Allen Canobie Peter McCamish Peter Gibson Stephen Farrell	Ken Sampson - GB CMA Chris Howard - G-MW James Burkitt - G-MW Dee Ludlow - GB CMA Megan McFarlane - GB CMA Peter Howard - GB CMA Pam Collins - GB CMA Carl Walters - G-MW/GB CMA

Publications and presentations

Environment & Biodiversity Programs

Publications:

- Bush and Land column in the Country News: "Protecting Bulokes", "Padding paddock trees", "Reserves get a bonus", "Report Dumpings - Wetlands not Wastelands";
- Environmental Management Plan for the Millewa Nature Conservation Reserve;
- Environmental Management Plan for the Wyuna River Reserve;
- Environmental Management Plan for Nanneella Bushland Reserve;
- Environmental Management Plan for Mansfield Swamp.

Presentations:

- Groundwater and Salinity Management Working Group;
- Farm and Environment Program Working Group on the Environmental Assessment process including a tour of the Mosquito 24 catchment;
- The Comparison of two wetland systems fed by Surface Water Management Systems using Macroinvertbrate composition as indicator species" at GB CMA Network Meeting. November 2007;
- Assisted Landlearn students from McGuire College to conduct Vegetation Quality Assessments;
- Secretary of DPI on the Environmental Assessment process which the Environment Team conducts on behalf of SIL-GB;
- SIL-GB on the new 'Initial' Environmental Assessment reports under the "Process Improvement" agenda item;
- Poster to ANCID Conference "Doubling the Drop – Water Share between Agriculture and the Environment", August 2007;
- Poster to ANCID Conference "Sharing the water – Environmental Water Allocations in the Shepparton irrigation Region", August 2007;
- Poster to ANCID Conference "Wanalta Creek Wetlands – Restoration of Ecological Values", August 2007;
- Pamphlet to ANCID Conference – Environmental Water in the Shepparton Irrigation Region, August 2007;
- Australian Entomological Society 38th Annual General Meeting and Scientific Conference – The Comparison of two wetland systems fed by Surface Water Management Systems using Macroinvertbrate composition as indicator species, September 2007 paper;
- Poster for SIL Conference in Lorne. Shepparton Irrigation Region wetlands – Protecting our threatened species, October 2007;
- "Wetlands and surface water management systems in the Shepparton Irrigation Region" to DPI staff at Queenscliff Seminar series with Mark Paganini, January 2008.

Other media:

- ABC radio interviews: habitat for birds, Painted Snipe and direct seeding.

Groups hosted:

- NVIRP Tour;
- Department of Sustainability and Environment Policy Staff;
- Department of Primary Industries Executives - Jo Deretic and Rebecca Heard presented at Reedy Swamp for a Department of Primary Industries Policy Tour on the 17th of April regarding opportunities for the Department of Primary Industries to link with modernisation, specifically in relation to environmental aspects;
- Hosted DEWHA and EPBC group from Melbourne and Canberra – discussing effects of modernisation on wetlands in the Shepparton Irrigation Region. March 2008;
- Hosted CAS directorate staff regarding Reedy Swamp and effects of modernisation;
- Host Wetland Management Group on a quarterly basis;
- Host/Chair Kanyapella Steering Group on a quarterly basis.

Farm Program

Publications:

- Maskey, R and Lawler, D prepared a paper for the Irrigation Association conference, Melbourne, in May. The title paper is "Quantification of the farm water savings with automation". Presented at the conference by Lawler, D.;
- Maskey, R (2008): "Partnership between research and extension: learnings from the 'efficient irrigation technologies' project" paper at a conference held at Ballarat;
- Beard, G (2008) "Local area planning: a collaborative approach to salinity management." at the 2nd International Salinity Forum at the Adelaide Convention Centre.

Surface Water Management Program

Publications:

- Green, S & Alexander, P (2008) "Better Relationships, Better Processes for Water Quality" Poster Format - Enviro 08 (Australasia's Environmental & Sustainability Conference & Exhibition);
- Green, S, Davies, M & Alexander, P (2008) "IDMOU – The key to better relationships and improved water quality target setting in northern Victoria" Irrigation Australia 2008 conference paper.

Presentations:

- Celebration of the Muckatah Surface Water Management System – March 2008. Minister for Agriculture - Joe Helper officiated at the celebration of the completion of the Muckatah Primary Surface Water Management Systems and presented a plaque to Barry Miller in recognition of the Muckatah Community Surface Drainage Group in the implementation of drainage in the catchment.

Sub-surface Drainage Program

Publications:

- Burkitt J & Dickinson P, 2007, River Murray Salinity Impact from Catchment Strategy Implementation in the Shepparton Irrigation Region – Poster, ANCID, Bundaberg;
- Burkitt J & Dickinson P, 2008, Modelling the Salinity Impacts of Catchment Strategy Implementation in the Shepparton Irrigation Region. 2nd International Salinity Forum, Adelaide 2008.

Presentations:

- Blue Sky Workshop;
- Shepparton Irrigation Region Shallow Groundwater and Salinity Management – Dealing with Change;
- 2nd International Salinity Forum, Adelaide 2008. Modelling the Salinity Impacts of Catchment Strategy Implementation in the Shepparton Irrigation Region;
- Ecowise Environmental (2008), Biomonitoring of the Impacts of Discharges from Irrigation Drains 2007.

Waterways Program

Presentations:

- Trust for Nature forum and a native fish management workshop presentation re: Goulburn Broken wetlands and management;
- Field presentations provided at Barmah Forest for Year 11 students from Nathalia and Numurkah secondary schools (including vegetation monitoring activities);
- Field presentation to a Parks Victoria managers forum;
- Field presentation to two separate Chinese delegations in the Barmah wetlands (one group's interest was mainly irrigation and factoring in environmental needs, whilst the other group's interest was in Ramsar wetland management).

Monitoring Program

Publications:

- Sub-surface Drainage Biophysical;
    - G-MW & GHD, 2008, SSDP Key Performance Indicators Annual Report 2006-2007;
- Mandatory Monitoring Program - Surface Water;
    - Stephen Lamb, Greg Smith, GMW (2008), Shepparton Irrigation Region Drain Nutrients Annual Review 2006-2007;
    - Ecowise Environmental (2008), Biomonitoring of the Impacts of Discharges from Irrigation Drains 2007;
    - G-MW, 2008, SSDP Key Performance Indicators Annual Report 2006-2007;
    - Mandatory Monitoring Program - Shepparton Drain Nutrients.

Research Program

Publications:

- Best Management Practices for Farm Groundwater Use;
    - Thayalakumaran T., Selle B., Duncan R., Gill B. (2008) Is groundwater disposal necessary to preserve groundwater resource quality? Paper presented at 2nd International salinity Forum, April 2008, Adelaide;
    - Morris M., Gill B. (2008) Suitable Mechanisms for driving improved groundwater management. Department of Primary Industries technical report;
- Farm Salinity Management (Mt Scobie Partial Conjunctive groundwater re-use study);
    - Project findings presented as a poster/paper at the International Salinity Conference in Adelaide in March 2008;
    - Terry AD, Selle B, Gill BC. 2008. Salt movement under a 'tree plantation' based saline groundwater re-use system. Poster/paper, 2nd International Salinity Forum, April 2008, Adelaide;
    - A report concluding the soil salinity monitoring carried at public groundwater pump Ro107 at Nanneella under the 'Key performance Indicators' project was completed in 2007;
    - Terry AD, Gill B (2008). Shepparton Irrigation Region Public Pumps Key Performance Indicators Project 2007 Annual Report;
- Impacts of water trade on Agricultural Ecosystems;
    - Selle B, Kumaran T and Morris M. (2008) Understanding Salt Mobilisation in the Barr Creek Catchment, Northern Victoria. Conference Proceedings; Water Down Under 2008, incorporating

Partnership Agency Staff 2007-2008

The Shepparton Irrigation Region Implementation Committee 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 Engström	DPI
Alan Lavis	DPI
Rebecca Lukies	DPI
Rabi Maskey	DPI
Chelsea Nicholson	DPI
Chris Nicholson	DPI
Gemma Beard	DPI

Surface Water Management

John Bourchier	DPI
Keith Chalmers	DPI
Liz Maclean	DPI
Mark Paganini	DPI
Jen Pagon	DPI
Sue Ward	DPI
Rochelle Johnson	AAV
John Tunn	AAV
Daryl Eaton	G-MW
Sam Green	G-MW
Chris Guthrie	G-MW
Robert O'Meara	G-MW
Lincoln Wellington	G-MW

Sub-surface Drainage

James Burkitt	G-MW
Peter Dickinson	G-MW
Stephen Feiss	G-MW
Chris Howard	G-MW
Terry Hunter	G-MW
Cynthia Ng	G-MW
Ian Oppy	G-MW
Chris Solum	G-MW
Ed Thomas	G-MW
Cassie Warren	G-MW
Chelsea Nicholson	DPI
Clair Haines	DPI

Monitoring

Anne Graesser	G-MW
Stephen Lamb	G-MW
Rod McQueen	G-MW
Mark Newton	G-MW
Erin Simpson	G-MW
Greg Smith	G-MW

Waterways

Simon Casanelia	GB CMA
Jim Castles	GB CMA
Christine Glassford	GB CMA
Fleur Jaques	GB CMA
Tony Kubeil	GB CMA
Scott Morath	GB CMA
Tom O'Dwyer	GB CMA
Andrew Pearson	GB CMA
Peta Ritchie	GB CMA
Wayne Tennant	GB CMA
Guy Tierney	GB CMA
Lou Torelli	GB CMA
David Trickey	DPI
Mark Turner	GB CMA
Carl Walters	G-MW/GB CMA
Richard Warburton	GB CMA
Keith Ward	GB CMA
Corey Wilson	GB CMA

Program Support

Lyndall Ash	DPI
Raechel Ballinger	DPI
Terry Batey	DPI
Bruce Cumming	DPI
Olive Montecillo	DPI
Rhonda McKie	DPI
Malwinder Pandher	DPI
Pam Collins	GB CMA
Peter Howard	GB CMA
Ken Sampson	GB CMA
Andrea Smith	GB CMA
Rachael Spokes	GB CMA

Research

Department of Primary Industries	Branch:
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
Jean Sandal	PIRVic
Benny Selle	PIRVic
Leon Soste	PIRVic
QJ Wang	PIRVic
Sheridan Watt	PIRVic
Megan Higson	FSR PCR
Fiona Johnson	FSR PCR
Geoff Kaine	FSR PCR
Brigette Keeble	FSR PCR
Helen Murdoch	FSR PCR
Ben Rowbottom	FSR PCR

ABBREVIATIONS

AAV	Aboriginal Affairs Victoria
ANCID	Australian National Committee on Irrigation and Drainage
CaLP	Catchment and Land Protection
CMA	Catchment Management Authority
CRC	Cooperative Research Centre
DPI	Department of Primary Industries
DSE	Department of Sustainability & Environment
EMS	Environmental Management System
EPA	Environment Protection Authority
FEDS	Farm Exploratory Drilling Scheme
GIS	Geographical Information System
GMLN	Goulburn Murray Landcare Network
G-MW	Goulburn-Murray Water
GVW	Goulburn Valley Water
MDBC	Murray-Darling Basin Commission
NHT	Natural Heritage Trust
NVIRP	Northern Victoria Irrigation Renewal Project
PIRVic	Primary Industries Research Victoria (Department of Primary Industries)
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 have contributed to the preparation of the 2007-2008 Implementation Committee Annual Report. The efforts of these people and their staff have been greatly appreciated.

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 staff.

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

Implementation Committee
Peter Gibson, Chair
Roger Wrigley, Deputy Chair
Implementation Committee Members

Goulburn Broken Catchment Management Authority
Peter Howard
Rod McLennan
Wayne Tennant
Carl Walters

Department of Primary Industries
Lyndall Ash
Terry Batey
Bruce Gill
David Lawler
Jen Pagon

Goulburn-Murray Water
James Burkitt
Sam Green
Greg Smith

Consultants and contractors
Sinclair Knight Merz
URS
GHD
Hydro Environmental
Geotech Pty Ltd
TJC Solutions