

# **Alliances with irrigation communities for better river management**

C.M. Norwood

Murray Irrigation Limited, 443 Charlotte St Deniliquin NSW Australia 2710  
(E-mail [catherinen@murrayirrigation.com.au](mailto:catherinen@murrayirrigation.com.au))

## **Abstract:**

Irrigation corporations such as Murray Irrigation Limited are moving beyond the scope of their own operations to participate more widely in issues related to river health. This paper outlines the motivating factors which have led Murray Irrigation to commit significant resources to initiatives aimed at improving the health of the river and floodplain in and adjacent the company's area of operations. Agricultural based improvements have focused on complying with government regulations and improvements to the operating efficiency of the irrigation supply and drainage system. Additionally, improved land management practices on-farm are being addressed through the successful implementation of the Murray Land and Water Management Plans. New alliances developed outside the traditional operating scope of the company have involved Murray Irrigation in projects which demonstrate that a management approach can provide significant environmental outcomes such as restoration of farm wetlands and protection of forests from unseasonal flooding. The active involvement of irrigation communities and irrigation companies such as Murray Irrigation in the future of river management offers a powerful ally in achieving a sustainable future for both our rivers and our communities.

## **Keywords**

Biodiversity, consultation, irrigation, land use, water management

## **INTRODUCTION**

Irrigation communities are developing proactive alliances with a range of organisations to address river health issues. In the past irrigation organisations have generally focused on issues related directly to the practices of irrigated agriculture, the pricing of water supply and the operation of supply and drainage systems,

However in Australia over the past three years in particular there has been an increasing focus on the need for improved environmental flows, most likely at the cost of diversions for irrigated agriculture. This has led irrigation organisations such as Murray Irrigation Limited to consider more closely issues related to river health and flows which have traditionally been outside the scope of their operations. Their response has included much greater participation in public debate about what constitutes a healthy river, as well taking part in a range of related research and practical projects such as watering of farm wetlands and assisting with the management of river flows.

Murray Irrigation Limited, in southern NSW, is typically the largest single water diverter from the Murray River each year. The company represents 1600 family farm businesses, and provides irrigation services to 2400 landholdings covering 748,000ha. Murray Irrigation was formed when the government owned NSW Murray Irrigation Area and Districts were privatised in 1995 and ownership was transferred to irrigators. It is the largest privatised irrigation company in Australia with infrastructure worth more than \$400 million.

## **PRACTICES TO ASSIST SUSTAINABLE RIVERS**

Initiatives to address operational improvements, water use and drainage issues and their impact on river health have been driven by regulatory processes as well as the desire of irrigators and their communities to preserve the long term sustainability and productivity of the region.

### **Regulatory approaches**

Murray Irrigation holds a NSW Irrigation Corporation Water Management Works Licence for the diversion of water and supply to shareholders and has a NSW Environment Protection Licence for the discharge of water from stormwater escape channels. These licences require stringent monitoring and reporting on almost 3000 kilometres of irrigation supply channels and 1300 kilometres of stormwater escape channels. Discharges are monitored for flow and salinity, with regular readings for turbidity. Chemical monitoring is undertaken in the spring months when farm chemicals are used, with a chemical contingency plan in place to isolate any contaminated water. The company has 200 remotely monitored sites, 15 of which continuously monitor water quality. Improved farm management practices and lower allocations have resulted in improvements to the quality, and reductions in the quantity of water leaving the irrigation system in recent years (Murray Irrigation Ltd, 2003). A wide range of other monitoring is also undertaken, including biannual watertable levels and regular groundwater quality testing, with a network of almost 1500 peizometers throughout the company's area of operation. Licence requirements include comprehensive, audited annual reporting. Copies of these reports are made available publicly and are also posted on the company's website.

### **Operational issues**

Murray Irrigation has made a major investment over the past nine years to improve the operational efficiency of the supply and drainage system, and to minimise the immediate and downstream impacts of irrigation. Tighter controls on the channel system, the introduction of automation and remote telemetry have also improved delivery efficiency and reduced discharges back into the river and creek system. Almost \$3.5 million has been spent on seepage control to reduce watertable accessions, reduce losses and improve delivery efficiency. The company has been involved in a four year Open Channel and Seepage Control Project co-ordinated through the Australian National Committee on Irrigation and Drainage (ANCID), with 10 other partners including other irrigation companies, Land and Water Australia and the Murray Darling Basin Commission. The \$2.5 million project was carried out over four years, with three stages: identifying channel seepage; methods of mediating seepage; and developing a web based decision support system at <http://ancid.org.au/seepage/> to help with seepage measurement, remediation and management. This project won the Institute of Engineers Australia 2004 Salinity Prize.

### **Land use initiatives - Murray Land and Water Management Plans**

Collectively, the company and its irrigators have been proactive in the development of the Murray Land and Water Management Plans (LWMPs) to address natural resource management issues. The Murray LWMPs are a \$498 million, 30 year initiative between landholders, Murray Irrigation, local, state and federal governments to address the long term productivity and sustainability of the region. The significant threat of broadscale landscape degradation resulting from rising watertables was a catalyst for development of the plans over five years prior to formation of the company in 1995. A bottom up approach was used involving extensive landholder consultation, working groups of irrigator and community representatives, with support from government agricultural and water agency staff.

The LWMPs' main objectives are to reduce groundwater recharge, to prevent the further rise of watertables and associated soil salinity, protect and enhance the region's natural biodiversity,

reduce or prevent impacts on downstream water users, achieve increasing agricultural productivity, and stabilise the regional economy and community. Implementation has been linked to Murray Irrigation's operating licences. Since plan implementation began the area of land threatened by high watertables has declined from 114,000ha in 1994 to 14,000ha in August 2003. Murray Irrigation believes this is due to the combination of drier climatic conditions, low annual irrigation allocations and the successful implementation of the Murray LWMPs. Since implementation of the Murray LWMPs began more than \$51 million of government funding has been provided, and landholders have contributed \$228 million in the same period.

The key strategies of the LWMPs include improving farm practices, water management and local biodiversity through whole farm planning, irrigation recycling, construction of storages, active vegetation management, landholder and community education. They address the quality and quantity of water discharged from the irrigation system by requiring landholders to provide on-farm storages to hold and re-use irrigation tail water and stormwater. The extensive network of district stormwater escapes has been expanded to improve drainage and prevent waterlogging and watertable accessions. Whole farm planning ensures that storages and recycling systems are only constructed where soils prove suitably impermeable. Murray Irrigation has now commissioned research to identify how LWMP initiatives are contributing to improvements in the salt loads in the shallow watertable entering the Murray River system. The research project is called *Hydrologic and economic appraisal of regional groundwater and salinity management actions in the Murray Valley*, and is being undertaken by the CSIRO's Division of Land and Water.

### **Consultation**

The Land and Water Management Plans were developed with considerable grass roots consultation. Landholders and agency staff remain involved in the continuing refinement of the LWMPs and their implementation. Murray Irrigation's directors and staff participate in a wide range of community consultation forums, at local, regional, state and national level. These include the Barmah Millewa Forum, Murray Darling Basin Ministerial Council Community Advisory Committee, Murray Lower Darling Community Reference Panel, Murray Catchment Management Advisory Board and State Water Customer Service Committee. This involvement has helped to develop the company's broader outlook about what can be done to address river health issues.

### **Biodiversity**

For the past three years Murray Irrigation has been involved in the wetland watering on private property project, to address the issues of biodiversity and floodplain health. The project is run by the NSW Murray Wetlands Working Group, in conjunction with participating landholders and Murray Irrigation. The irrigation supply system is used to deliver environmental water to wetlands, ephemeral creeks, streams and flood runners on the floodplain which have been cut off from their natural water sources as a result on changing land use practices and built infrastructure including channels, drains, roads and levees. When the project began in 2001/02 there were 11 sites involved. This increased to 28 sites in 2002/03 and 42 sites in 2003/04. The results of the project have been positive, with growing landholder awareness about wetland and floodplain health, and positive biological responses from the wetlands watered (*Nias et al., 2003; Norwood and Marshall 2004*).

Another project aimed at improving local biodiversity has been the collection of native fish for breeding. The irrigation supply system often traps native fish which are left stranded during winter when the irrigation system is closed. Murray Irrigation staff have helped NSW Fisheries to harvest these stranded fish which are used to improve the diversity of the gene pool in fish bred for restocking of local waterways. The company also sponsors fish restocking programs carried out by local fishing clubs.

### **River and water management**

Geographically Murray Irrigation is well placed to assist with initiatives for the Barmah Millewa Forest and the Koondrook Perricoota Forest on the Murray River, both of which are Ramsar listed sites and have been named as icon sites in the Living Murray Initiative. The company's point of supply at Lake Mulwala is upstream of the Barmah Millewa Choke – the narrowest point of the Murray River. At times Murray Irrigation provides its main supply channel, the Mulwala Canal, to carry water from the Murray which would otherwise overflow the river banks at the choke causing unseasonal forest flooding. Last year the Perricoota Escape at the end of the Mulwala Canal was certified as an accredited escape and work is proposed to increase the capacity of the escape to help circumvent the choke and further reduce unseasonal forest flooding. Water from the Mulwala Canal is returned to the Murray River just upstream of Torrumbarry Weir. Survey work has been completed with options to provide additional capacity of up to 200ML/d.

The company has also recently participated in a research project to further improve the management of rain rejection flows which cause unseasonal flooding of the Barmah Millewa Forest. Partners in the project included the Murray Darling Basin Commission, NSW Department of Land and Water Conservation, Victorian Department of Natural Resources and Goulburn Murray Water. The cost benefit analysis finalised last year provides a number of options some of which would require Murray Irrigation's involvement (Sinclair Knight Merz, 2003). Discussions with government are continuing to implement the best solution.

### **REVIEWING THE EVIDENCE OF RIVER HEALTH**

Murray Irrigation's area of operations takes in an extensive network of rivers and creeks connected to the Murray River system. The residents of the region are concerned about maintaining the health of their environment, while at the same time wanting to maintain their access to water for irrigation at existing levels. The Murray River system inherited today is highly regulated river system, with significant built, social and economic capital. The floodplain the river once served has been greatly reduced through land clearing and the expansion of agriculture and the construction of hundreds of levees. There have already been significant efforts to minimise the negative impacts of irrigation and to improve river health by the regional irrigation community. Locals have experienced improvements in a number of commonly cited key indicators, including fish numbers and salinity levels.

Calls to increase environmental flows for the river represent a direct threat to the livelihoods of irrigators and to the social fabric of their communities. At the same time claims of a 'dying river' are at odds with their own experiences. For this reason Murray Irrigation has become even more involved in the debate about river health, what constitutes a "healthy river" and evaluation of the evidence supporting claims of health or sickness. The company commissioned a review of the Murray Darling Basin Commission's key Living Murray Initiative scientific reports. This review has raised significant concerns about the reliance on modelling and expert opinion as the foundation for calls to increase environmental flows. It has also highlighted existing research which identified 22 activities threatening the river and floodplain ecosystem, only seven of which related to flow, and only two of which related to reduced river flows (Benson et al., 2003; Benson 2004).

Murray Irrigation believes that the approach of the Living Murray Initiative has given undue weight and credence to flow related solutions. Given the high cost to regional communities of a "more water" river health strategy, the company advocates greater consideration be given to the full range of issues affecting river health. A more objective assessment of the 22 threats is required to weigh

the relative costs and benefits of addressing each, and to spend the available funding where the best outcomes can be achieved. Murray Irrigation is actively seeking opportunities to participate in the process to support better informed decision making, rather than simply criticising from the sidelines. This commitment includes the development of a water monitoring program to be carried out by company staff, linking with state and national water quality testing programs which can contribute real data about the health of local waterways to the river health debate, rather than modelled supposition. Environment services staff comprise 12 per cent of Murray Irrigation's labour force, providing an experienced resource with an understanding of the region's natural resource dynamics. Additional relevant expertise is also available within the company's engineering and water distribution services.

Murray Irrigation's experience with the wetland watering program and manipulation of channel flows to assist the Barmah Millewa Forest, also shows the potential for 'managed' improvements without the need for significant alterations to Murray River flow volumes. One such project currently being evaluated is the Torrumbarry Cutting proposal which could provide significant health benefits for the Koondrook-Perricoota Forest, the NSW portion of the Gunbower-Perricoota Forest on the Murray River. In conjunction with the NSW Department of Infrastructure Planning and Natural Resources, Murray Irrigation is helping to evaluate the potential of assisted flooding in this forest. Construction of a cutting would allow water into the forest with normal flow levels in the Murray River of between 6,000ML/d and 8,000ML/d, and achieve levels of inundation which would otherwise require a major flood of 30,000ML/d (Murray Irrigation Ltd submitted). The potential health benefits include a significant improvement to the ecosystem function of the forest by restoring a more natural flooding regime to up to 80% of the forest area. It would optimise the use of water to maintain and improve the health of this significant forest and wetlands and the productivity of the timber resource. The social and economic costs of such a project are minimal, with the potential for widespread environmental benefits, including the re-use of existing environmental flows from the Barmah-Millewa Forest and Goulburn River system.

## **CONCLUSION**

There is a great deal at stake in the river health debate, for both communities and the environment. Efforts to maintain and improve a health river and floodplain within the Murray Irrigation area of operations include local actions taken on-farm by irrigators, to bigger picture proposals for long term water data collection and engineering works for improved water management. The active involvement of irrigation communities and irrigation companies such as Murray Irrigation in the future of river management offers a powerful ally in achieving a sustainable future for both our rivers and our communities. It is an opportunity to combine agricultural management with projects and practices which reflect a more integrated view of the connection between irrigation and the river systems which provide vital water supplies.

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