

Making a living from the Macquarie Marshes – coping with decisions upstream

Garry Hall

Introduction

I live in the Macquarie Marshes, supplied by the highly regulated Macquarie River, in the northern part of the Murray–Darling Basin. The Macquarie Marshes are an incredible ecosystem that supports spectacular biodiversity that is highly dependent on the floods (Fig. 16.1). The large Burrendong and Windamere dams control the flows in the river, from ~260 km directly to the south-east, upstream of our cattle property in the Macquarie Marshes. These dams have captured the flows that we relied on for making our living and diverted this predominantly upstream of the Macquarie Marshes to irrigated agriculture. Plants in the Macquarie Marshes mainly grow in spring and summer, providing a high protein diet for our cattle. We rely primarily on the water in the Macquarie River because its floods produce our productive pastures of aquatic plants, such as water couch (*Paspalum distichum*). This growth translates into an economic equation, critical for our livelihood. Land that is flooded can support four times more cattle than land not flooded; the more flooded land, we have the higher our income and, conversely, the less flooded land, the more our profitability declines (Fig. 16.2). We breed our cattle in the Macquarie Marshes and then sell male progeny (weighing 400–450 kg) to feedlots, where they are fattened for the markets.

Living in the Marshes

The Macquarie River floods the Macquarie Marshes, through its various creeks and streams, before flowing through to the Barwon–Darling River. The floods usually come in the winter and spring, inundating our country and sustaining our livestock through the summer. The Marshes are less than 200 000 ha, with ~90% of this area privately owned. The grazing properties cover 2000–30 000 ha and, as well as supporting many different vegetation communities, are also where many of the large breeding colonies of waterbirds breed (e.g. straw-necked ibises (*Threskiornis spinicollis*), intermediate egrets (*Ardea intermedia*) and rufous night herons (*Nycticorax caledonicus*)), when there is enough flooding (Kingsford and Auld 2005; Bino *et al.* 2014). These breeding colonies, augmented by colonies on the nearby Macquarie Marshes Nature Reserve, comprised the major criterion for the Macquarie Marshes becoming listed as a wetland of international importance under the Ramsar Convention.

The Macquarie Marshes are much smaller than they used to be, before the dams were built (Kingsford and Thomas 1995; Ren *et al.* 2010). They started to decline when the Burrendong Dam was completed in 1967. This was when decisions were made upstream by

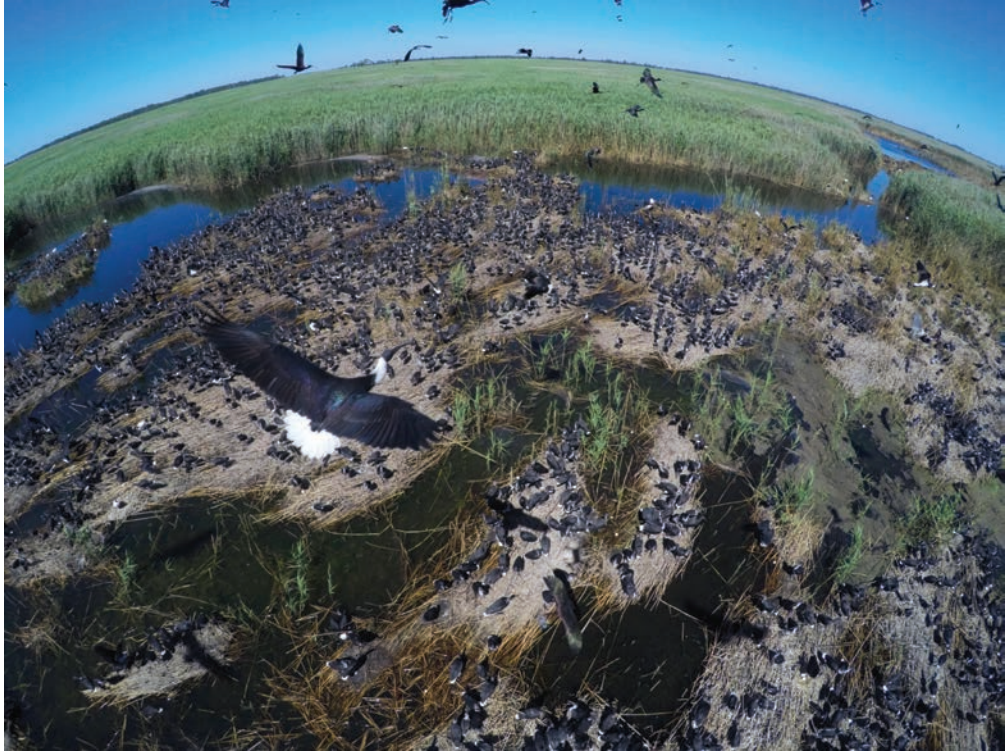


Fig. 16.1. The magnificent Macquarie Marshes in flood, an amazing natural ecosystem extending in all directions and supporting spectacular biodiversity, including waterbirds which breed in large numbers, such as these straw-necked ibises and different vegetation communities (photo, N. Moir).

governments oblivious to the long-term ecological and social consequences on the Marshes. The environmental and economic impacts on Marsh graziers increased in the 1970s and 1980s, before reaching a high level and remaining at this level in the late 1980s, when irrigation development peaked. The annual average flow of the Macquarie was estimated to be 470 000 ML, but the New South Wales government still issued 898 793 ML in licences, including the environmental allocation (Johnson 2005). This meant that, in average years, irrigation licence holders could only be expected to receive ~51% of their allocation. The impact on our livelihoods, and other graziers in the Marshes, was dramatic (Fig. 16.2). The social structure of the community altered considerably in the 1990s, as many landholders no longer had sufficient income to remain viable, given the size of their properties. Some properties were amalgamated and others were run by absentee land owners. This meant fewer people fighting for the marshes and the viability of our livelihoods.

Less frequent and less extensive flooding meant that the Marshes got progressively drier (Thomas *et al.* 2011). They became more difficult to flood as the dry periods got longer, increasing the times between floods (CSIRO 2008). The Macquarie Marshes were often wet and occasionally dry, but now they are often dry and occasionally wet. Their flooding and drying patterns have switched. This has had a huge impact on the plants that grow in the



Fig. 16.2. Most (~90%) of the Macquarie Marshes is privately owned with most used for grazing cattle production. Floods are critical for productivity, increasing income and supporting the social community but these have declined with the building of Burrendong Dam upstream, which allows diversion of much of the Macquarie River's flow to irrigation (photo, D. Herasimtschuck).

frequently flooded parts of the wetland. These were the areas that we and other graziers relied on for our productivity and sustainability, but they are no longer productive because the country does not flood or floods less often (Figs 16.1 and 16.2). These changes have had a major social, economic and environmental impact on our lives. The floods that shaped the Marshes have changed. We still get the occasional big floods and small floods, but the medium floods are either captured in the large dams or diverted upstream for irrigation. These dependable medium floods provided much of the productive vegetation for our cattle (Fig. 16.2).

These impacts on our livelihoods and the Macquarie Marshes environment have sometimes produced acrimonious debate within the agricultural industry (Kingsford 1999), although the science is clear. At various times the landholders in the Macquarie Marshes have been accused of further degrading the wetland by overgrazing. Some even argue that this is the main cause of environmental decline, contrary to scientific evidence and our local experience. Cattle were grazed in the Macquarie Marshes from the 1850s (Fig. 16.2), but the system only began to degrade significantly in the late 1980s. There are areas in the Macquarie Marshes Nature Reserve, now more than 20 years without grazing, where the floodplain vegetation has been destroyed and there are large areas of river red gum hundreds of years old that have died (Catelotti *et al.* 2015).

In 2012, we thought that the future for the Macquarie Marshes looked brighter for the first time in nearly four decades, with the implementation of the Murray–Darling Basin Plan

(Murray–Darling Basin Authority 2012). At the very least, we hoped that increasing environmental flow water to the Macquarie Marshes would halt the long-term environmental and economic decline. The Murray–Darling Basin Plan established the Commonwealth Environmental Water Holder, with a role to purchase water and manage environmental water in the Macquarie River. In addition, the New South Wales Government also purchased environmental water and managed environmental flows. There is now more than 300 000 ML of environmental flow held in environmental licences for the Macquarie River when all the upstream dams are full. In 2016, the Murray–Darling Basin Authority reviewed the Basin Plan target of returning 390 GL/year of water from irrigation and other efficiency measures to the environment (Murray–Darling Basin Authority 2016b), concluding that this measure should be reduced by 70 GL. For the Macquarie River, there was an absurd conclusion that the system had too much environmental water (12 000 ML/year, (Murray–Darling Basin Authority 2016a), raising the prospect that environmental water bought by governments would be sold back to the irrigation industry. This decision flies in the face of recent rapidly accumulating peer-reviewed science about the state of the Marshes (Thomas *et al.* 2011; Bino *et al.* 2015; Catelotti *et al.* 2015), which received no reference in the Northern Basin Review (Murray–Darling Basin Authority 2016b). Just as problematic, this assessment focused primarily on socio-economic assessments of the irrigation industry, largely ignoring the impacts of reduced flooding on floodplain graziers (Murray–Darling Basin Authority 2016c).

Our community

Hard-won gains in improved environmental outcomes did not happen by accident. Our dedicated local community, individuals in government, non-government organisations and scientists have forced major policy and management changes. In particular, it became clear that the Macquarie Marshes Nature Reserve was affected by the changes to flooding regimes and so we landholders of the Macquarie Marshes worked closely with the New South Wales National Parks and Wildlife Service to fight for the Marshes.

I have been involved in the water debate all my life. The Macquarie Marshes Environmental Landholders Association has provided a strong voice, particularly through the McLelland, Fisher and Jones families and other community members. We are entering a new phase, with generational change, but new challenges still constantly appear. We are fortunate because our elders are lending their experience to our energetic youth. There is always another fight for our Macquarie Marshes, forced by another potential, subtle change in water policy. Decisions continue to be largely made upstream, with major ramifications for our Marshes and livelihoods. This is a never-ending struggle in the Macquarie River. In 2017 there will be a review of the water sharing plan, with the Commonwealth long-term environmental watering plan under development; both are critical for the sustainability of the Macquarie Marshes.

Conclusion

We are the custodians of the wonderful Macquarie Marshes, which not only sustain us and our livelihoods but also have an incredible biodiversity. We have learnt much about

government decision-making, environmental degradation, partnerships and how to influence decisions to improve the sustainability of the Macquarie Marshes. It is clear that diverting water for irrigation started slowly in the Macquarie River but then rapidly developed, with devastating consequences for the Marshes and our livelihoods. This decision was made predominantly by the New South Wales Government and its water agency in particular, influenced by landholders wishing to diversify into irrigation and often supported by local government. The large dams were the cause and continue to affect the river and its sustainability. Landholders in the Macquarie Marshes have had to cope with this upstream decision and its consequences. We have come together and demanded change, sustained by our passion for the sustainability of our river, the Macquarie Marshes and our livelihoods. We who live in the Macquarie Marshes have learnt much and can teach others. When people talk about ‘a little bit of irrigation’, this can mean a small pump of a few centimetres, but the pumps can then increase to metres in diameter. Once they start, they won’t stop. Be careful who you trust. Be wary of consultants and experts that can be bought. Don’t leave anything to hearsay; collect all the current data you can now before development starts. But also remember that there are equally many to be trusted who are primarily committed to public good ideals and environmental sustainability.

References

- Bino G, Steinfeld C, Kingsford RT (2014) Maximizing colonial waterbirds’ breeding events using identified ecological thresholds and environmental flow management. *Ecological Applications* **24**, 142–157. doi:10.1890/13-0202.1
- Bino G, Sisson SA, Kingsford RT, Thomas RF, Bowen S (2015) Developing state and transition models of floodplain vegetation dynamics as a tool for conservation decision-making: a case study of the Macquarie Marshes Ramsar wetland. *Journal of Applied Ecology* **52**, 654–664. doi:10.1111/1365-2664.12410
- Catelotti K, Kingsford RT, Bino G, Bacon P (2015) Inundation requirements for persistence and recovery of river red gums (*Eucalyptus camaldulensis*) in semi-arid Australia. *Biological Conservation* **184**, 346–356. doi:10.1016/j.biocon.2015.02.014
- CSIRO (2008) ‘Water availability in the Macquarie-Castlereagh. A report to the Australian Government from the CSIRO Murray-Darling Basin Sustainable Yields Project’. CSIRO, Canberra.
- Johnson WJ (2005) Adaptive management of a complex social-ecological system: the regulated Macquarie River in south-eastern Australia. Masters of Resource Science thesis. The University of New England, Australia.
- Kingsford RT (1999) Counting the costs on wetlands of taking water from our rivers: the Macquarie Marshes as a test case. In *Preserving Rural Australia*. (Eds AI Robertson & R Watts) pp. 125–143. CSIRO Publishing, Melbourne.
- Kingsford RT, Auld KM (2005) Waterbird breeding and environmental flow management in the Macquarie Marshes, arid Australia. *River Research and Applications* **21**, 187–200. doi:10.1002/rra.840
- Kingsford RT, Thomas RF (1995) The Macquarie Marshes and its waterbirds in arid Australia: a 50-year history of decline. *Environmental Management* **19**, 867–878. doi:10.1007/BF02471938
- Murray-Darling Basin Authority (2012) *Murray-Darling Basin Plan*. Murray-Darling Basin Authority, <<https://www.legislation.gov.au/Details/F2012L02240>>.
- Murray-Darling Basin Authority (2016a) *Basin Plan Amendments*. *Northern Basin Review*. Murray-Darling Basin Authority, Canberra, <<http://www.mdba.gov.au/sites/default/files/pubs/773-BP-amendments-nbr-snapshot-24%20Feb.pdf>>.

- Murray-Darling Basin Authority (2016b) *Environmental Outcomes of the Northern Basin Review*. Murray-Darling Basin Authority, Canberra, <http://www.mdba.gov.au/sites/default/files/pubs/NBR-environmental-outcomes-Oct-16-v2_1.pdf>.
- Murray-Darling Basin Authority (2016c) *Northern Basin Review – Technical Overview of the Social and Economic Analysis*. Murray-Darling Basin Authority, Canberra, <<http://www.mdba.gov.au/sites/default/files/pubs/NB-social-economic-technical-overview%20final-Dec16.pdf>>.
- Ren SQ, Kingsford RT, Thomas RF (2010) Modelling flow to and inundation of the Macquarie Marshes in arid Australia. *Environmetrics* **21**, 549–561. doi:10.1002/env.1002
- Thomas RF, Kingsford RT, Lu Y, Hunter SJ (2011) Landsat mapping of annual inundation (1979–2006) of the Macquarie Marshes in semi-arid Australia. *International Journal of Remote Sensing* **32**, 4545–4569. doi:10.1080/01431161.2010.489064