Australian Government
Commonwealth Environmental Water Holder
FLOW Monitoring Evaluation Research
UNSW SYDNEY

Macquarie River and Marshes Quarterly Snapshot – September 2024

The Macquarie River and Marshes Area incorporates critical wetland and river assets including the Macquarie Marshes, one of the largest and most important wetlands in the Murray–Darling Basin, extending over 200,000 hectares, approximately 19,000 hectares of which are Ramsar-listed.

New to the Commonwealth Environmental Water Holder's (CEWH) Flow-MER program in 2024, the Macquarie River and Marshes Area extends downstream of Lake Burrendong, to the junction of the Barwon–Darling River system. It includes the mainstem Wambuul/Macquarie River including all creeks and rivers through the Macquarie Marshes and adjacent wetlands and floodplain.

The system relies on natural flooding and water from various sources including environmental water holdings, unregulated flows and local rainfall. Much of the flow in the Macquarie River is maintained by Burrendong and Windamere dam releases.

The Marshes include flood-dependent vegetation including extensive areas of common reed, water couch and river red gum forests.

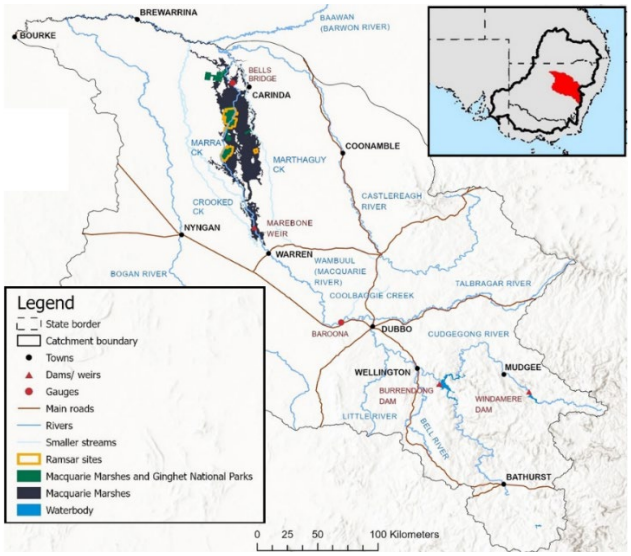
This vegetation is critical in supporting large waterbird breeding rookeries that occur during large-scale flooding. The Marshes is one of the key wetland sites for nesting waterbirds in the Basin and also an important site for the endangered Australian painted snipe and threatened Australasian bittern.

The Wambuul/Macquarie River supports 24 native fish species, including threatened species the Murray cod, silver perch, trout cod and freshwater catfish.

The Marshes, which is made up of freshwater channels, small lagoons and streams, with seasonal and ephemeral swamps and floodplains, includes the Macquarie Marshes Nature Reserve. Much of the remaining area - some Ramsar-listed – is owned and managed by private landholders predominantly engaged in livestock production.

The landholders are represented by the Macquarie Marshes Environmental Landholders Association who have a strong focus on the long-term conservation of the Marshes.

The CEWH and NSW environmental water managers work collaboratively with the Macquarie-Cudgegong Environmental Water Advisory Group (EWAG) to plan and manage water for the environment in the Macquarie.



Macquarie Valley showing major rivers, creeks and Marshes
Inset: Location of Macquarie catchment within Murray–Darling Basin.

University of New South Wales

The University of New South Wales (UNSW) Centre for Ecosystem Science has been engaged by the CEWH to conduct Flow-MER activities in the Macquarie River and Marshes Area from July 2024 to June 2029.

The project team is led by UNSW's Professor Richard Kingsford, who works with researchers and other specialists to undertake the work. These specialists include representatives from the NSW Department of Primary, Industries and Regional Development (NSW DPIRD); NSW Department of Climate Change, Energy, the Environment and Water; NSW National Parks and Wildlife Service and local Wayilwan Aboriginal People.

Top image: Macquarie Marshes, August 2024.

The Flow-MER Program team acknowledges the Aboriginal communities of the Murray–Darling Basin and pays respect to Elders past and present. We acknowledge Aboriginal People as the Traditional Owners of the land, water and sky Country across the Basin and value the expertise, wisdom and enduring connections that have informed their care for Country over millennia. We recognise the intrinsic connection of Aboriginal People to Country, and we value the enduring cultural, social, environmental, spiritual, and economic connection to the rivers, wetlands, and floodplains of the Basin. Artist: Rebecca Salcole

Flow-MER Themes

Native vegetation

Our native vegetation studies aim to understand how water for the environment contributes to water-dependent vegetation communities by maintaining and/or improving diverse vegetation; the extent and condition of woody and non-woody vegetation; and the condition of lignum shrublands.

Study methods include field quadrats and transects, satellite imagery and some drone imagery.

In 2024–2025 we will focus on selecting field and research sites, and vegetation surveys.

Native fish

The native fish work aims to understand how water for the environment contributes to population structure, abundance, diversity, recruitment and condition.

Sampling will be conducted annually in Autumn at 20 sample sites along the Wambuul/Macquarie River and Marshes. Electrofishing and fyke netting (to collect freshwater catfish) will be used.

In 2024–2025, key activities will be fish community sampling and monitoring, monitoring of Murray cod and golden perch stocking outcomes, and water quality measurements. Fish movement research will also be undertaken. Acoustic tags will be implanted into golden perch to extend previous research and utilise an existing acoustic telemetry network.

Waterbirds

Our waterbird studies aim to understand how water for the environment contributes to abundance and species diversity; breeding occurrences; and providing and supporting habitats.

The team will undertake four sets of repeat ground-based field surveys at 10 sites and annual Spring aerial and ground surveys. Acoustic recorders will monitor the presence of waterbird species outside of specific surveys.

This first year will focus on the field surveys and install water depth loggers and acoustic recorders.

L-R: Jonathon Doyle and Doug Reeves (NSW DPIRD) undertaking Flow-MER fish movement fieldwork in August 2024 (Photo: NSW DPIRD).

River flows and connectivity

Our river flow and connectivity studies aim to understand how water for the environment influences flows, hydrological connectivity, and biotic indicators (eg. waterbirds and fish).

The team will use a range of data sources including satellite imagery to capture inundation; existing river gauges to capture flows; and water depth loggers.

In 2024–2025 we will establish a data archive and set up the technology infrastructure and software resources required to manage and analyse satellite imagery, inundation models, and gauge and logger data.

Cultural outcomes

The Wayilwan people led by Danielle Flakelar are the cultural advisors for the MR&M Flow-MER program. They will support relationship building between Aboriginal People with connection to Country and UNSW staff. Cultural advisors will work with Aboriginal People with connection to Country to:

- Facilitate knowledge sharing between Aboriginal People, and between Aboriginal People and UNSW staff
- Identify opportunities and activities to support the values and aspirations of Aboriginal People
- Facilitate opportunities for Aboriginal People to be involved in the design and implementation of Flow-MER projects and activities.

In working together, UNSW will support the protection of Indigenous Cultural and Intellectual Property (ICIP) and Indigenous Data Sovereignty rights as appropriate for the Aboriginal People we work with.

More information

Visit www.flow-mer.org.au or contact the UNSW's Flow-MER Communications Officer, Jane Howard on jane.howard@unsw.edu.au

UNSW Centre for Ecosystem Science