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

Macquarie River and Marshes Quarterly Snapshot – March 2025

Waterbirds

The fourth and final 2024–2025 Macquarie Marshes waterbird survey was completed in February 2025. A total of 34 waterbird species were recorded. Inundation was variable across the 13 wetland sites.

Some sites were dry in the east and south of the Macquarie Marshes, while others (Louden's Lagoon, Sinclair's Lagoon, and Horseshoe Lagoon) were inundated and full of birdlife.

New flows were arriving from upstream rainfall into Buckiinguy Swamp in the southern Marshes, where more than two hundred straw-necked ibis (*Threskiornis spinicollis*), white-necked herons (*Ardea pacifica*) and masked lapwings (*Vanellus miles*) were feeding nearby.

Two of the 34 waterbirds recorded are listed species – the brolga (*Grus rubicunda*) (NSW Government list) and sharp-tailed sandpiper (*Calidris acuminata*) (Commonwealth Government list).

The largest counts observed at any individual survey site were straw-necked ibis (190 birds), grey teal (*Anas gracilis*) (228), royal spoonbill (*Platalea regia*) (230) and Australian pelican (*Pelecanus conspicillatus*) (85). Five waterbird species were observed at 50 per cent or more of the survey sites in the February surveys: Eastern great egret (*Ardea alba*), Australian white ibis (*Threskiornis moluccus*), royal spoonbill, white-faced heron (*Egretta novaehollandiae*) and Pacific black duck (*Anas superciliosa*).

Broods (groups of young being cared for by adults) of royal spoonbills and black swans (*Cygnus atratus*) were recorded.

With the drying back of some wetland areas and mud starting to appear, a few counts of small wading birds that prefer mudflats, such as dotterels (11), stilts (12), and sandpipers (2), were recorded.

The data from the four completed Flow-MER surveys, together with existing NSW Department of Climate Change, Energy, the Environment and Water (NSW DCCEEW) ground survey data, will allow researchers to study changes in species composition in relation to the season, water use, weather conditions and water in the landscape to inform environmental water decision-making.

The survey was conducted by the NSW DCCEEW on behalf of the University of New South Wales (UNSW).

Variable water inundation was observed across the Macquarie area during the waterbird survey (Photos: NSW DCCEEW).

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

Native fish

The first annual Macquarie River and Marshes fish sampling survey under the Flow-MER program was undertaken at 20 sites between Burrendong Dam and the Macquarie-Barwon River confluence in February and March 2025.

Conducted by the New South Wales Department of Primary Industries and Regional Development (NSW DPIRD) on behalf of the University of New South Wales (UNSW), 14 fish species were captured, including 10 native fish species and four introduced species.

The composition and abundance of species across the 20 sites were varied.

The sampling indicated there was breeding of Murray cod during Spring and Summer 2024 – the last breeding season – in the Macquarie River between Narromine and Gin Gin. Murray cod abundance in the river downstream of the town of Warren was relatively low.

Similarly, golden perch abundance was greater upstream of the Macquarie Marshes. These were mature fish, primarily around 380mm long.

There was minimal recruitment of common carp, with minimal young-of-year found, indicating low levels of breeding over spring/summer.

The findings will be compared with past and future survey results to understand changes in native fish population structure, abundance, diversity, recruitment and condition, to determine how environmental water benefits native fish.

A few of the fish sampled during the survey included (clockwise from top left) a fingerling Murray cod, an adult Murray cod and a Murray-Darling rainbowfish (Photos: NSW DPIRD)

The data Flow

Working at a computer analysing data might not sound quite as exciting as getting out and working in the beautiful wetlands and waterways of the Macquarie River and Marshes. But data analysis is an essential component of understanding changes in the landscape to improve environmental water outcomes.

Andres Sutton, the newly appointed Remote Sensing Analyst for the UNSW Flow-MER team, has been hard at work compiling, processing and analysing satellite data of the Macquarie River and Marshes catchment.

The data processed includes inundation maps and annual inundation dynamic maps (inundation start and duration) over seven years (2017–2024).

Surface water extent in waterbird survey sites in Macquarie River and Marshes was also studied at two scales: waterbird survey site and wider landscape scale (including all survey sites).

The UNSW Flow-MER team are utilising data from two Earth observation satellite programs - Sentinel-2 and Landsat - that monitor changes in the Earth's land surface conditions. The programs provide a data archive that assists people across the globe in making informed decisions about Earth's natural resources and the environment.

Developed and operated by the European Space Agency, Sentinel-2 consists of twin satellites that constantly orbit Earth, and the Landsat program, which is jointly managed by NASA and the U.S. Geological Survey (USGS), has a series of Earth-observing satellites.

The programs offer complimentary benefits. Running since 1972, the Landsat program provides the longest continuous record of Earth's land surfaces, while Sentinel-2 offers more frequent revisits (it takes a complete picture of the planet every five days) and additional spectral bands.

Both programs offer their images and data online and free of charge via:

- Sentinel-2 - browser.dataspace.copernicus.eu
- Landsat - earthexplorer.usgs.gov

Next up, the team will analyse the water flow and connectivity of short-term inundation data collected by the UNSW CES Flow-MER team over the last several months and study the drivers (eg. land use changes, environmental flows, etc) of long-term trends.

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

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