

## River Biological Monitoring Project

## Fact Sheet

### Background

Declining water quality in the River Murray became a major concern in the late 1970s. The River Murray Commission (now Murray–Darling Basin Authority (MDBA)) established the River Murray Water Quality Monitoring Program (WQMP) in 1978 to periodically assess and report on the water quality of the River Murray. A long-term project to collect physico-chemical parameters at 36 sites along the River Murray and the lower reaches of its tributaries was initiated. To complement this project, the River Murray Commission started a biological monitoring program in 1980. The primary aim of the program was ‘to systematically sample and record the aquatic macroinvertebrate communities of the rivers to complement the existing physical and chemical data and to provide an additional aid for detecting and interpreting changes in water quality and environmental condition in the River Murray and its tributaries’. The MDBA’s Basin-wide environmental watering strategy which builds on the Basin Plan has a focus on achieving long term enduring environmental changes through a Basin-wide perspective. The River Murray biological monitoring program provides an ideal mechanism to measure the positive impact of environmental watering on instream biota of the River Murray system.

### Objectives

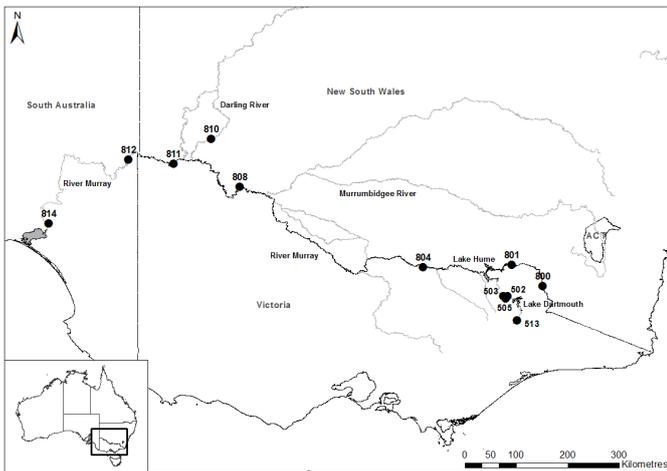
- To provide long term baseline biological information for the rivers, collected using standardised methods to facilitate comparisons regionally and nationally.
- To provide the basis for assessment of the health of the river ecosystems such that spatial and temporal patterns in river health can be assessed.
- To provide biological data to inform reporting, standards and guidelines for management and policy decision making, and development and evaluation of water quality management strategies for rivers.
- To maintain a voucher collection of preserved macroinvertebrate taxa as a reference for the conservation of rare and endangered aquatic species.



### Contact

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River Murray biological monitoring sites

### Sites

Under the current program monitoring occurs at 12 sites; 7 sites on the River Murray from site 800 at Bigga in the upper Murray valley to site 814 at Woods Point, South Australia (2500 km downstream); 1 site on the Darling River at Burtundy to assess the influence of the northern basin streams and 4 sites in the Mitta Mitta River sub catchment (502–513) to monitor the effect of Dartmouth Dam on biological communities.



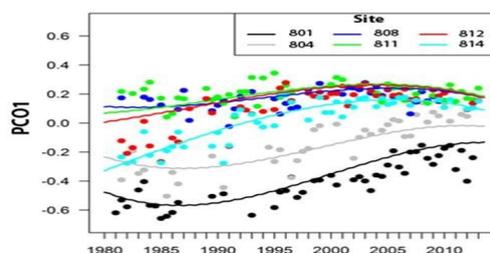
River Murray macroinvertebrates, clockwise from top left: Introduced snail, *Physa acuta*; Little Clam mussel, *Corbiculina* sp.; Caddis-fly *Notalina bifaria*; Freshwater prawn, *Macrobrachium australiense*; Dragonfly larva of *Austrogomphus australis*; Chironomid larvae.

### Unique value

The River Murray biological monitoring project is unique; it covers over 2500 km of river length and has been operating since 1980. This project has been fundamental in describing the biodiversity of macroinvertebrate fauna, gauging the distribution of endangered species, evaluating the spread of invasive species, and determining the health of the rivers in response to climate, flow, water quality and river management changes.

Analysis of the data has revealed a substantial decline in biological health throughout the River Murray between 1996 and 2010; the period also referred to as the millennium drought. During this period species that are associated with poor water quality, habitat and flow conditions (typically considered ‘weedy species’) increased in diversity and abundance while sensitive species declined. These data also provided valuable insight into the likely response of the River Murray fauna under predicted conditions of reduced water availability and elevated stream temperatures.

Two key areas for development are envisaged for the future, which will bring major benefits to the biological monitoring programs of the MDBA, and the wider management/scientific community. One is to develop predictive modelling capabilities based on the biological and water quality monitoring programs. The other is the development of a DNA database of the macroinvertebrate communities of the Murray–Darling Basin.



Principle coordinate ordination (PCO) indicating the change in the macroinvertebrate communities along the River Murray over time. The trajectories suggest homogenization of communities since 1980, with a slight shift back toward the earlier state following the flooding in 2010.