## THE MIGHTY MUSSEL PROTECTING POPULATIONS FOR THE FUTURE

Freshwater mussels are important to rivers, creeks and wetlands in the Murray-Darling Basin. They act as a natural filter to improve water quality, are a crucial food source for fish and other animals and are a culturally important resource for traditional owners.

Extreme drought and high summer temperatures between 2017 and 2020 resulted in large numbers of freshwater mussels dying in drying rivers in NSW. Not much is known about the ability of freshwater mussels to survive drying rivers at different temperatures.

This research project was commissioned and funded by the Commonwealth Environmental Water Office (CEWO) and undertaken by NSW DPI Fisheries in collaboration with Murdoch University. The project will help us deliver water for the environment to better support mussel populations, with a specific focus on the **River Mussel (***Alathyria jacksoni***)** and the **Floodplain Mussel** (*Velesunio ambiguus*).

> The results identified that Floodplain Mussels could survive for months under drying conditions in certain circumstances when temperatures were

cooler, although River Mussels could only survive for weeks under the same conditions. Increasing temperatures rapidly decreased survival times to just days for both species.

## Both species of freshwater mussel are extremely vulnerable when rivers dry out during intense drought or periods of low flow. In the interest of preserving mussel populations in the long-term, complete drying out of mussel habitat should be avoided at any time.

If habitats supporting critical Floodplain Mussel populations are at risk of drying, these events should be confined to the cooler months of the year; when air temperatures are less than 30°C. Complete drying of these habitats should be conservatively managed during cooler months and extend for no longer than 20 days to avoid mass death events.

## **RECOMMENDATIONS FOR MANAGEMENT OF FRESHWATER MUSSELS**

Protecting mussel populations requires a joint effort from water and land managers and planners on the following actions:

- Identify the location of the current critical populations of River and Floodplain Mussels
- Avoid complete drying of mussels and their habitats at any time
- Maintain river flows for critical populations of River and Floodplain Mussels
- Review the current conservation status of the mussels, including comparing current with historical distribution and abundance
- Identify and prioritise future mussel habitats and migration pathways of mussel fish-hosts
- Protect and enhance vegetation that shades mussel habitat
- Develop river flow targets to support critical life stages of mussels, including reproduction, dispersal and settlement opportunities
- Further research into the impact of river drying on the behaviour, survival and life stages of River and Floodplain Mussels







