

PROVIDING PASSAGE FOR THREATENED SILVER PERCH AT BALRANALD WEIR

overview of the project

One of the most significant environmental impacts of weirs is that they prevent the movement of native fish, many of which need to migrate along rivers to breed. In 2003 an innovative new design of fishway known as a Deelder Lock was trialled within an ineffective fishway at Balranald Weir on the lower Murrumbidgee River. The fishway was manually operated in a similar manner to a navigation lock for boats — a chamber on the downstream side of the weir fills with water until the level is equal to the upstream water level at which point the fish are released from the chamber.

Biological monitoring during the trial period showed the lock to be highly successful in allowing the passage of a wide range of species over the weir. Over 13,000 fish were observed using the weir during 96 days of sampling. This project provided the opportunity for the full automation of the lock, and the ability to remotely control operations through integration with the existing telemetry system.



The new Deelder Fishlock at Balranald Weir

how the project was carried out

The project was a collaborative effort between Balranald Shire Council, the Department of Primary Industries and State Water Corporation to deliver environmental benefits to the Murrumbidgee River.

Automation of the fish lock required the purchase of control equipment, the development of software and computer code to control the lock operations, the upgrade of communications equipment and the integration of the fish lock operation into the remotely-operated control system at the site. A software specialist was engaged to write the computer scripts needed to integrate the lock into the communication system.

outcomes now and in the future

The project has delivered an automatic fishway that re-opens more than 160 kilometres of the Murrumbidgee River for native fish. This section of river contains extensive areas of habitat necessary for spawning and recruitment of native fish.

It is the first Deelder fish lock to have been automated in the world, allowing the fishlock to be remotely controlled from State Water's office in Leeton, around 270 kilometres from the site. The lock sets a new benchmark for fish passage at low weirs. Similar fish locks are now under construction on the Murray River in South Australia based on the model developed and refined at Balranald Weir. This technology can be applied at any dam or weir up to six metres in height, provided mains power is available at the site.



New water level sensor

This project also developed infrastructure that will enable an automated fish counting system to be installed at the weir. This will allow real-time data to be recorded on the number of fish using the lock on a daily and seasonal basis. The development of the monitoring system is currently being facilitated by the Department of Primary Industries with support from the Murray Darling Basin Commission.

benefits, challenges & lessons learned

The largest challenge faced by this project was the establishment of communications at the site. Initially it was assumed that the existing facilities at Balranald Weir would be able to accommodate the operation of the fish lock. However it was found that State Water needed to negotiate access to communication towers owned by other agencies. This resulted in unforeseen costs being added to the original project budget and delayed the start of the project by 15 months. Other delays to the project occurred when State Water staff were required to respond to other higher priority demands due to the severe drought conditions that existed at the time.

This project has made significant advances in the current knowledge on fish passage restoration. The fish lock at Balranald Weir provides improved fish passage for a much wider range of species and size classes than the previous fishway that existed at the site. In particular it provides improved passage for small species such as Australian smelt, Murray rainbowfish and Western carp-gudgeon that were previously observed accumulating downstream of the weir. The project has confirmed that the Deelder fishlock is a low-cost and practical option that can be used to reinstate fish passage at other existing ineffective fishways throughout New South Wales and the Murray-Darling Basin.