Tiny ear bones reveal the facts about carp

Fish earbones, or otoliths, are becoming more widely used in understanding fish ecology. Microscopic analysis of their growth rings can reveal the age of fish, similar to tree rings, just on a much smaller scale. In very young fish the otoliths can be used to backdate age to the day of hatching, for older fish, to the year.

This information is used by environmental water managers to understand the timing of spawning activity, and the response to natural and managed flood events. This ageing technique is also useful for native fish.

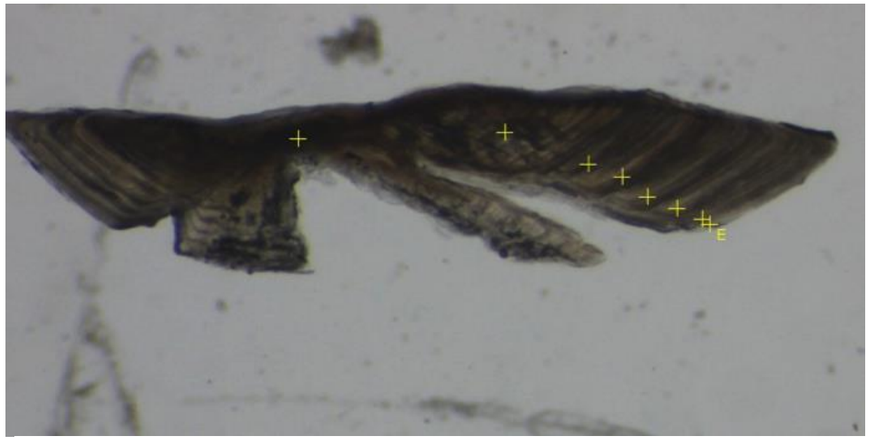
A few hundred carp were collected from Gunbower Forest wetlands during 2014 and 2015, and were sent off to have the ear bones (otoliths) extracted. We had a number of very small carp analysed for daily ageing, and the larger ones for annual ageing.

A birth date was estimated for the small carp, which allows us to look back at what flows were happening in and around Gunbower Forest at the time. All of the adult samples of carp were estimated to be between four and 16 years old, indicating that they were spawned well before the first operation of the Hipwell Road regulator, to deliver environmental water in 2014.

Analysis of juvenile samples collected in November 2014 and 2015 suggest that they were hatched over a two-week period in late September, during the environmental watering event.

Further chemical signature analysis will allow us to determine whether the carp were spawned on the floodplain or drifted in from Gunbower Creek. To do this we need to look at the chemical make-up of the water in the creek versus the floodplain and compare it to the chemical signatures identified in the otoliths.

Further sampling and ageing like this could provide us with useful data to inform population modelling and help in the fight against carp.



Example of a cross-section of an otolith – estimated to be six years old.

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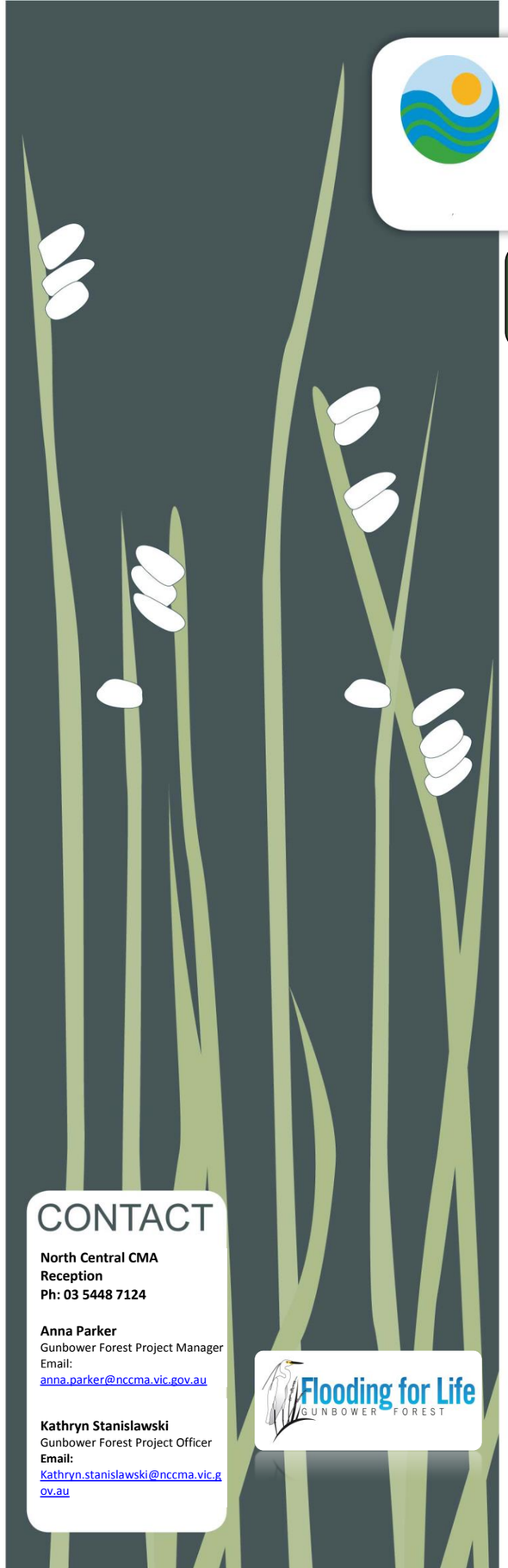

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Flooding for Life GUNBOWER FOREST

NORTH CENTRAL Catchment Management Authority
Connecting Rivers, Landscapes, People

COMMUNITY NEWSLETTER

Edition 14: Winter 2016

Welcome to the winter edition of the Gunbower Island Community Newsletter. This edition features updates on a biodiversity survey, flows in Gunbower Creek, a fish ageing study and World Fish Migration Day .

Wet conditions bring flooding in Gunbower Forest

Above-average rainfall and flooding in Victoria's High Country is providing an unexpected boost to Gunbower Forest.

Without river regulation, the recent rains would have resulted in Gunbower Forest benefitting from flooding inflows since June. Harvesting water in dams has kept flow in the Murray River much lower, so inflows through the creek lines has only just begun to occur.

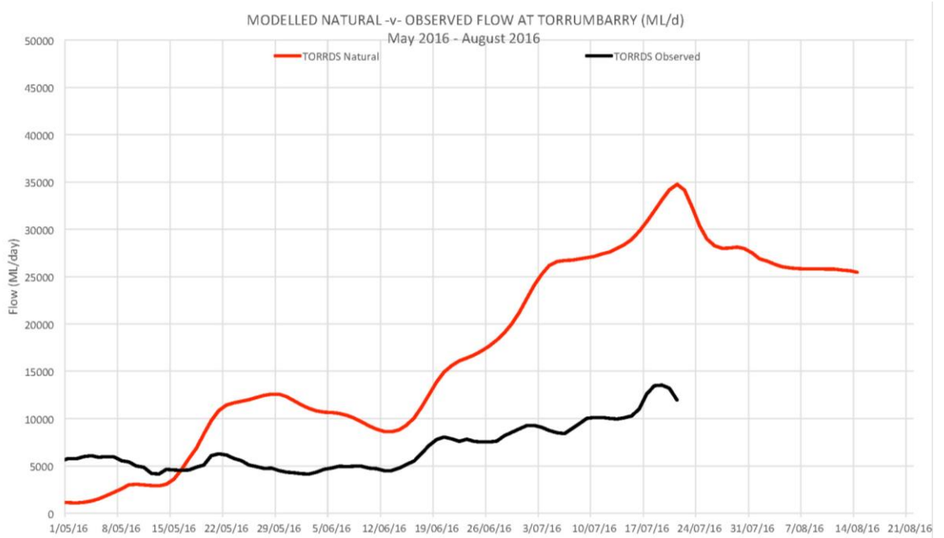
With the likelihood of ongoing flood conditions, North Central CMA will work closely with ecologists, land managers, environmental water holders and water authorities to consider the potential to 'piggy back' onto the natural flooding. The environmental water would be used to extend the duration of the event to maximise environmental outcomes, such as allowing waterbirds to complete their breeding.

The flood water falls under the unregulated flow entitlement and is water that has flowed into the Murray River downstream of Lake Hume and cannot otherwise be captured in storage.

"This type of flooding event brings natural cues into play," says North Central CMA Project Manager, Anna Parker.

"It will give native fish the opportunity to move onto the floodplain to feed and breed before returning to the river. It will also provide habitat for waterbirds and possibly trigger a waterbird breeding event."

Carbon and nutrient cycling is another important process that occurs with large flooding events. Carbon cycling involves bringing 'good nutrients' from the forest floodplain into the river, which helps with reducing the risk of severe blackwater events and provides food for native fish.



Modelling from the MDBA, which shows predicted natural inflows against observed flows at Torrumbarry Weir.

Fish Migration Day

Community members, North Central CMA staff and fish ecologists recently joined together for a fishway tour to mark World Fish Migration Day.

The tour visited three fishways constructed on major barriers in the Little Murray River and the lower Loddon-Pyramid Creek system, and complementary works to recover native fish populations.

"Our event was one of over 400 held across the globe, creating awareness about the importance of open rivers and migratory fish," North Central CMA Project Officer, Peter Rose said.

"Many of our native fish, like golden and silver perch, need to move large distances as part of spawning migrations."

Fish ecologist Dr Ivor Stuart provided some great commentary on cutting-edge fisheries research, including the use of otolith (fish ear bone) chemistry to determine the origins of wild golden perch.

The tour of the Box Creek regulator and fish lock construction site was a highlight for the group – seeing the scale of the works and learning how a fish lock operates.

The event also aimed to build support for the Native Fish Recovery Plan – Gunbower and lower Loddon, of which fishway construction is a key component.

"A key part of the Native Fish Recovery Plan is to connect more than 200km of stream and wetland habitats by constructing fishways that allow fish to freely move past barriers such as weirs," Peter said.

Fish Migration Day tour members visit the Kerang Weir fishway.

Pilot survey of forest fauna

A pilot monitoring program has helped the North Central CMA find out more about the kinds of animals that make Gunbower Forest their home.

Most of the recent monitoring in Gunbower Forest has focused on fish, birds and vegetation. These species are great ecological heath indicators but we are always interested in finding out more information about other animals that live in the forest.

The North Central CMA recently partnered with the Arthur Rylah Institute for Environmental Research, to conduct a series of short biodiversity surveys. Researchers used a range of techniques, including bird surveys, reptile searches, automated cameras, bat detectors and song meters at 12 sites across Gunbower Forest.

A total of 73 species were recorded including 47 birds, six mammals, 11 bats and nine reptiles. This represents only 26% of the species known to occur on Gunbower Island.

The pilot survey will provide a baseline for future similar surveys of Gunbower Forest and will help to identify differences in the fauna between areas of the forest that have experienced different levels of flooding or environmental watering over the last decade.

A wedge-tail eagle recorded by automated cameras. Photo by Geoff Brown, ARI.

Barapa Landcare Awards finalists

Good luck to the Gunbower-based Barapa Water for Country project team, who are finalists in the National Landcare Awards on 22 September.

The group won the Indigenous Land Management section of the State Landcare Awards in August last year (pictured below), and are now nominated for the National award.

The Barapa Water for Country Project has identified, mapped and recorded the cultural values of Gunbower Forest. This information can be used by North Central CMA and Barapa to ensure the rich cultural and spiritual values of the Forest can be represented in environmental watering plans. To read more and to vote for Barapa in the People's Choice award, please visit http://www.nationallandcareconference.org.au/awards/

The Barapa group with their State Landcare Award.

New Gunbower signage

Look out for new interpretive signage in Gunbower Forest that highlights the values that make the forest special, along with providing information on some of the projects that help to protect these values.

The signage forms a trail from the entrance to the forest at Cohuna to the environmental infrastructure at Hipwell Road. The signage design features interactive components, including QR codes to scan with your mobile phone to access more information.

One of the new signs in Gunbower Forest at Hipwell Road.

BUFFEL GRASS ON THE MARCH

A new incursion of buffel grass (Cenchrus ciliaris), an undeclared weed in Victoria, has been detected and subsequently treated by VicRoads along the Murray Valley Highway about 33kms north of Echuca.

Buffel grass is a highly invasive introduced grass that is an aggressive coloniser with the potential to dramatically change landscapes with consequential impacts on native flora and fauna.

Landholders and the broader community should be vigilant and report sightings of the plant immediately to relevant authorities.

More information and assistance with Buffel grass identification can be found at http://pir.sa.gov.au/__data/assets/pdf_file/0011/240023/buffel_grass_fsheet.pdf

Victorian sightings can be notified to Bec James on rebecca.james@delwp.vic.gov.au or Adrian Martins 03 5448 7124 info@nccma.vic.gov.au

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