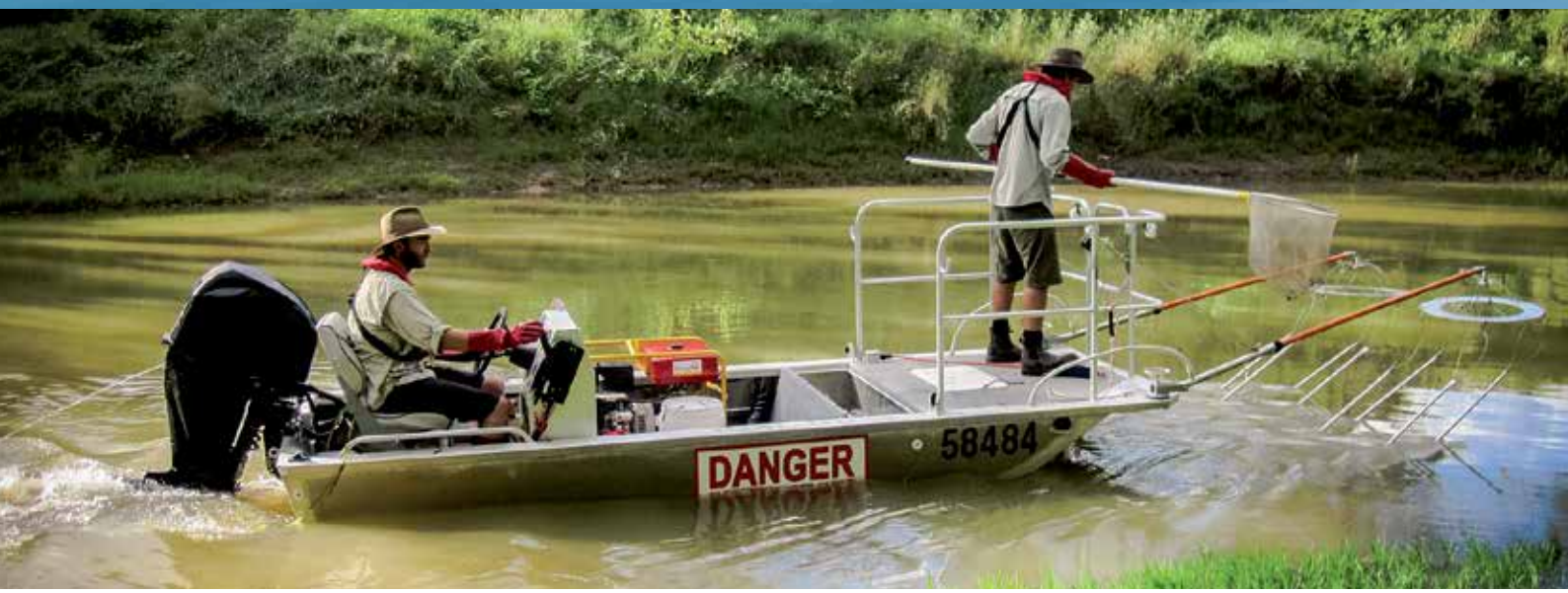
NATIONAL CARP CONTROL PLAN
RESTORING NATIVE BIODIVERSITY

THE NATIONAL CARP CONTROL PLAN

PROGRESS REPORT – SEPTEMBER 2018



NATIONAL COMMUNITY ENGAGEMENT FINDINGS

Almost 1500 people have participated in the stakeholder and community meetings organised as part of the National Carp Control Plan (NCCP) stakeholder engagement program. There have been 73 stakeholder workshops and community meetings held in carp-affected areas in Queensland, New South Wales, the ACT, Victoria and South Australia during 2017 and 2018.

Participants have included community members, recreational users of waterways, environmental advocates, farmers and irrigators, water authority representatives, commercial fishers, business owners, tourism operators, traditional owners, natural resource management representatives and representatives from other local, state or federal government agencies.

Nationally, the aspects of most interest or concern to participants included:

- **the impact the possible virus release might have on water quality;**
- **the economic impact on industry; and**
- **the proposed clean-up strategies being considered as part of the plan.**

For stakeholders in Queensland and Victoria in particular, measures to promote the recovery of rivers was important.

A summary of the consultation meetings will be detailed in a report to be published on the NCCP website (www.carp.gov.au).

The meetings form part of a broader stakeholder and community engagement program that includes stakeholder and community presentations, social research surveys, industry event attendance and targeted engagement with key affected industries.

Dedicated channels continue to provide opportunities for community and stakeholder feedback including email, phone and the new Your Say Carp website (https://yoursay.carp.gov.au) where people can share comments, ask questions and raise concerns.

Participants in the consultation program and members of the wider public will be invited to provide feedback to the draft NCCP recommendations report for governments when released.

Visit: https://yoursay.carp.gov.au
Email: carp@frdc.com.au
Call: 1800 CARP PLAN (1800 2277 7526)

OPTIONS TO MAKE USE OF CARP BIOMASS

Large-scale commercial opportunities and smaller local clean-up options are both being examined through research designed to find ways to use carp biomass that might succumb to cyprinid herpesvirus 3 (carp virus), if approved for release.

The project, 'Assessment of options for utilisation of virus-infected carp', involves laboratory-based processing trials, as well as commercial-scale trials, to determine the viability and market demand for producing carp-based products including fertilisers, compost, fishmeal and aquaculture feed ingredients.

Lead researcher Janet Howieson, from the Curtin University School of Molecular and Life Sciences, says the objective is to provide the NCCP with a range of efficient, effective and appropriate uses for carp biomass, and to carefully explore the viability of as many options as possible.

"The research is designed to deliver detailed cost–benefit analyses of the various carp utilisation processes being investigated including attention to harvest strategies, transport logistics and fish quality at various locations," Janet Howieson says.

"Identifying local solutions and a community-based approach to using carp biomass is a key component of the project."

On-farm composting

Composting of fish frames and whole carp is being trialled at Camperdown Compost's licensed facility in southern Victoria and is overseen by company director Tony Evans.

This is a proof-of-concept trial to evaluate the practicality of composting large quantities of dead carp on local properties, close to the actual site of a fish kill. The trial is using cloud-based software that monitors all movement of materials and details site conditions and assembly of composts.

The trial was designed by soil scientist Declan McDonald, from SESL Australia, and is modelled on mortality composting in the chicken industry undertaken as a biosecurity response by the Victorian Government in 2014.

In the carp trial, fish biomass was laid out in rows and effectively sandwiched between layers of a carbon-based material in proportions designed to optimise the composting process.

Four carbon-source combinations have been tested – compost, compost and sawdust combined, sawdust, and straw. Materials

were selected for their availability and their compatibility for composting with fish. Key criteria include their capacity to soak up leachate from decomposing fish (preventing access to underlying soil or groundwater), and their effectiveness as a biofilter to control odour.

Declan McDonald will conduct the final evaluation, which will include laboratory analysis of composts against the Australian Standard. Full nutrient analysis will also be completed to evaluate the potential benefit to any fertiliser program.

Riverside treatment

Trialling an even smaller-scale approach is long-time recycling and zero-waste advocate Gerry Gillespie from the company Returning Organics to Soil, based in Queanbeyan, NSW.

His technique uses an inoculant that triggers fermentation – or hydrolysis – breaking down proteins into peptides and amino acids, separating solids from the liquid. The same process is used in tofu and cheese making, producing curds and whey.

In his carp trial, Gerry Gillespie combined 250 kilograms of minced biomass with molasses, water and an inoculant to kickstart fermentation. The resulting product can be used as a liquid fertiliser or soil conditioner.

Gerry Gillespie says the Australian National University will analyse the trial results for the NCCP. This process targets fish kill clean-ups from waterways that might be hard to reach with larger equipment, and can use carp at any stage of decomposition.

It would also allow local communities to adopt a stretch of river, much like organisations adopt areas of highway roadsides for litter clean-ups.

A macerating machine can be mounted onto a trailer and used to break down carp on location. Minced carp and other ingredients can then be mixed in 1000-litre drums, which can be moved to a more convenient location while the hydrolysis occurs, and the final product used as a fertiliser.

Commercial processing

A similar enzyme hydrolysis process is also being trialled on a commercial scale at SAMPI in Port Lincoln, SA, successfully breaking down 10 tonnes of carp biomass into a liquid product.

The SAMPI process includes heat treatment, and is already used to process about 2000 tonnes of waste from the processing of Southern Bluefin Tuna and Yellowtail Kingfish each year.

This resulting product is an organically certified hydrolysate used as soil a conditioner or an aquafeed ingredient, which are marketed in Australia and overseas.

Existing facilities at the SAMPI plant could be scaled-up to process additional quantities of fish. Staff have also suggested a mobile plant as a possible option.

Biogas option

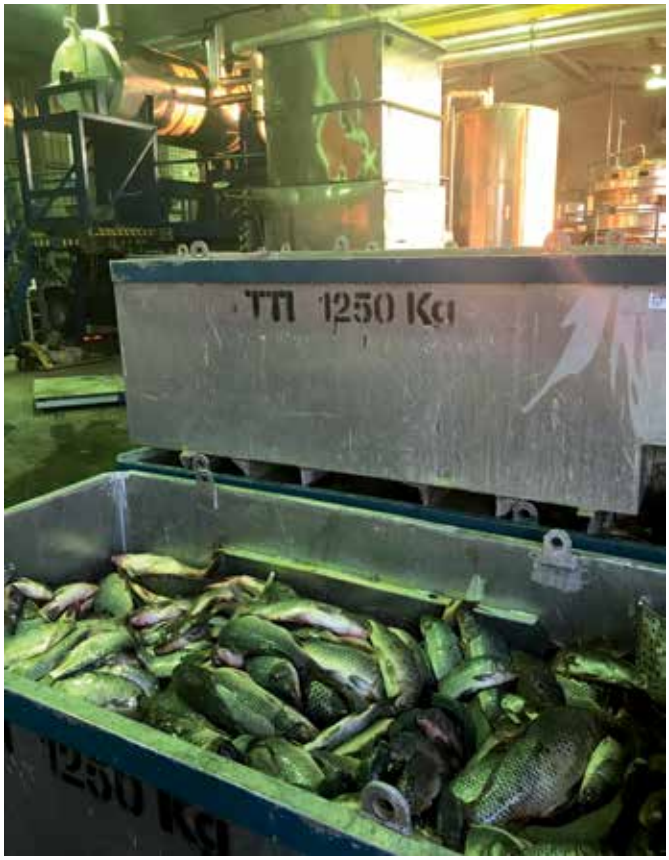
In Shepparton, Victoria, Goulburn Valley Water (GVW) is part of a coalition of interests investigating another industrial-scale trial option: the production of biogas.

Large-scale fish kills in the Goulburn River and Murray Rivers have the potential to affect the quality of the water GVW draws from these rivers for its town supplies.

The Shepparton research is investigating reclaiming the water content from carp and processing it through GVW's wastewater treatment plant, which incorporates a biogas facility. Carp are more than 90 per cent water by weight.

Liquid extracted from carp has been tested and is compatible with other liquids treated at the GVW wastewater treatment plant. Gas generated from the treatment process is used to generate electricity, which is sold into the national power grid.

An initial trial attempted to simply squeeze the liquid out of the fish under pressure at facilities adjacent to GVW's wastewater treatment plant, operated by project partner Veolia, an international environmental waste-management firm specialising in liquid waste management. However, the carp withstood the pressure of Veolia's press.



The researchers moved the fish to a hammermill press at the nearby Western Composting Technologies, which deals with green and food waste streams. But the carp again remained intact.

This has led the research team to a local knackery and to rendering plants, trialling other technologies that may help process and re-use carp biomass.

The Shepparton trial has produced some berley for recreational fishing. But if the virus is released this would not be a viable product; end uses that re-introduce affected carp biomass back into the river food chain will not be permitted.

Researchers in Shepparton remain confident that an efficient way to separate the liquids from the fish solids will emerge, with further investigation into centrifugal separation and agitation processes underway.

RESEARCHERS REPORT ON PROGRESS

More than 70 members of the NCCP team gathered in Adelaide in May to provide research updates and develop strategies to integrate research findings among interdependent projects. The team also began drafting the NCCP plan and operations strategy.

The NCCP operations team presented a case study on the Lachlan catchment, in NSW, to demonstrate how research outputs could be used to plan the release of the virus and clean-up activities. This case study highlighted gaps in operational knowledge and generated discussion about data-sharing strategies and further research needed.

Biomass estimations

Field sampling for the carp population and biomass project has been completed and modelling for 12 key habitat types has begun. This will inform epidemiological modelling, identifying relationships between habitat types, carp populations and disease spread.

Preliminary estimates show carp populations vary considerably. Some locations have low populations that have relatively little environmental impact. At other locations populations are catastrophically high and thus identified as 'hot spots' in planning potential virus release and clean-up strategies.

Water quality

Fish kills can present a serious ecological risk. Increasing organic inputs into waterways can quickly create oxygen-depleted (hypoxic) conditions that are ideal for development of toxic blue-green algae (cyanobacteria) outbreaks.

Modelling of river sites, integrating flow, temperature and depth data, will help identify key risk areas for blue-green algae outbreaks and priorities for clean-up efforts to reduce water quality and ecological risks.

Epidemiological modelling

Preliminary epidemiological modelling has integrated hydrological and environmental data from the Lachlan catchment with carp behaviour and demographic data and the reported qualities of the carp virus.

Results indicate that in order to achieve high impacts on carp populations, the release of the carp virus must take place under a specific set of conditions.

Optimal conditions for infection occur when water temperatures of between 18°C and 28°C coincide with spring spawning aggregations. High carp density increases skin-to-skin contact and the fishes' immunity is very low during spawning.

Running virus release scenarios through the model over a 15-year time period identified a '20:80' relationship between the timing of release and impact on carp populations.

In about 20 per cent of release scenarios – those with optimal infection conditions – high (80 per cent) knockdown was predicted.

Where release timing did not meet optimal conditions, in about 80 per cent of scenarios, a low (20 per cent) knockdown was predicted.

This modelling demonstrates that 'carpegeddon' scenarios are highly unlikely, and that timing will be critical for a successful release strategy.

Costs and benefits of virus release

Experts in plant and animal ecology, water quality, risk evaluation and non-market benefits participated in a detailed survey followed by workshops in July to help predict likely ecological responses to reduced carp biomass.

Participants developed conceptual maps of key ecological processes and system relationships to explore medium and long-term future scenarios under varying degrees of carp control, from no control to near eradication.

This work helps to inform 'non-market values' of carp control, which is a key part of a cost–benefit analysis project.

The value of potential ecological changes can be gauged by including these in surveys presenting a series of economic choices for community members and governments to make.

HOW CAN YOU GET INVOLVED?

The NCCP has been consulting extensively with communities across areas affected by carp. This work will continue in 2018.

The project team wants to understand your local waterways, what's important about them and how you use them, and your concerns and questions so that they can be addressed in the plan.

For more information contact the National Carp Control Plan team at:
carp@frdc.com.au

To stay up to date with progress and submit comments online:

www.carp.gov.au

1800 CARPPLAN