



NATIONAL CARP CONTROL PLAN
RESTORING NATIVE BIODIVERSITY

THE NATIONAL CARP CONTROL PLAN

PROGRESS REPORT - SEPTEMBER 2017

INFORMATION GATHERING UNDERWAY

The National Carp Control Plan (NCCP) has moved into a new phase of knowledge generation. This involves:

- establishing expert advisory groups to guide the project to underpin the NCCP's governance structure;
- progressing the legislative approval processes that would be required to release the carp virus; and
- launching an ambitious cross-disciplinary research program.

The **Science Advisory Group (SAG)** (established December 2016) combines jurisdictional representation with expertise across relevant biophysical science disciplines, as well as the social sciences, economics and emergency response. The SAG has oversight of the NCCP research program, while remaining alert to emerging research needs.

The **Policy Advisory Group (PAG)** (established January 2017) combines jurisdictional representation with expertise in the regulatory and legislative dimensions of environmental management, fisheries management and biological control. The PAG is coordinating a Strategic Assessment under the *Environment Protection and Biodiversity Conservation Act 1999*.

The **Operations Working Group (OWG)** (established July 2017) comprises experts in logistics, water management, infrastructure management, environmental assessments, key stakeholder engagement, governance and policy. This group will collaboratively drive development of the NCCP.

The **Communications Working Group (CWG)** (established July 2017) comprises communications specialists from the public and private sectors. It will provide a coordinated approach to NCCP communications activities.

Researcher collaboration

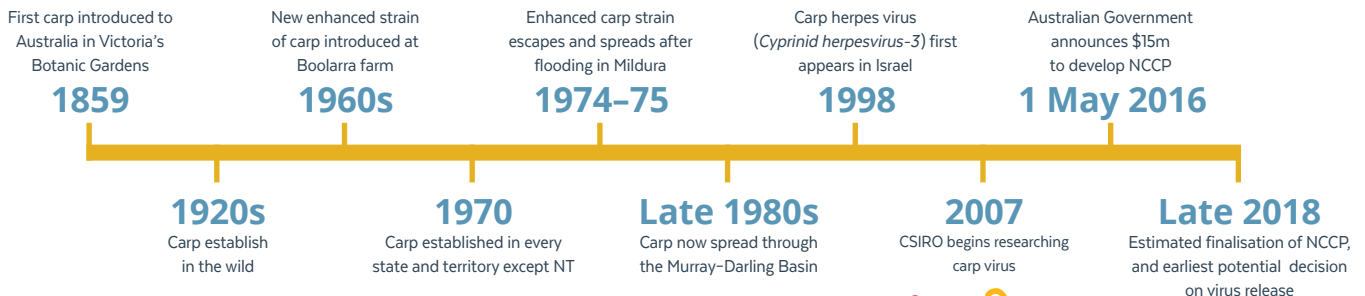
In July 2017, NCCP researchers and partner agency representatives met in Canberra to explore opportunities to maximise the research program's efficiency and value. The workshop provided the opportunity for researchers to establish working relationships and to identify common needs and opportunities between projects.

With such a complex and interdependent research agenda, it is vital for project synergies to be exploited. For example, one opportunity identified on the day is for economists and social scientists to pool expertise and resources to maximise the efficiency and relevance of data collection. These working relationships will continue to develop as the project proceeds.

The NCCP will continue work to ensure that decision-making on carp biocontrol is informed by world-class research and enhances the natural, social and economic values of Australia's aquatic ecosystems.

For more information go to: www.carp.gov.au

AUSTRALIAN CARP TIMELINE



ANSWERING THE BIG CARP QUESTIONS

With a new research agenda given the tick, the National Carp Control Plan is pushing ahead to answer the big questions by the end of 2018.

Invasive European Carp (*Cyprinus carpio*) occupy huge swathes of Australia's freshwater habitats, muddying water, destroying aquatic plants and out-competing native fish. Controlling these pests will require meticulous planning and rigorous research focused on several key questions.

Answering those questions is the goal of the National Carp Control Plan (NCCP)'s research agenda, which is exploring the viability of releasing a species-specific carp virus that could kill up to 70 per cent of this species.

The NCCP Strategic Research and Technology Plan will guide research investment for the NCCP over 2017–19. Approximately \$5.5 million will be invested, with \$500,000 held back to fund any new research priorities that emerge as the project progresses. This is likely, given the pioneering nature of the NCCP.

The research plan has been developed by the NCCP's Science Advisory Group, which is made up of representatives from all affected states and territories. It provides expertise on aquatic ecology, fish virology and epidemiology, water management, social science and human health.

The group has mapped out the work that needs to be undertaken by the end of 2018 to address the priority knowledge gaps and risks of possible implementation of the NCCP.

Much of this work is already underway. The research plan has organised it under three themes, each of which has identified priority areas for research so that an informed decision can be made on the potential release of the carp virus.

1. Environment

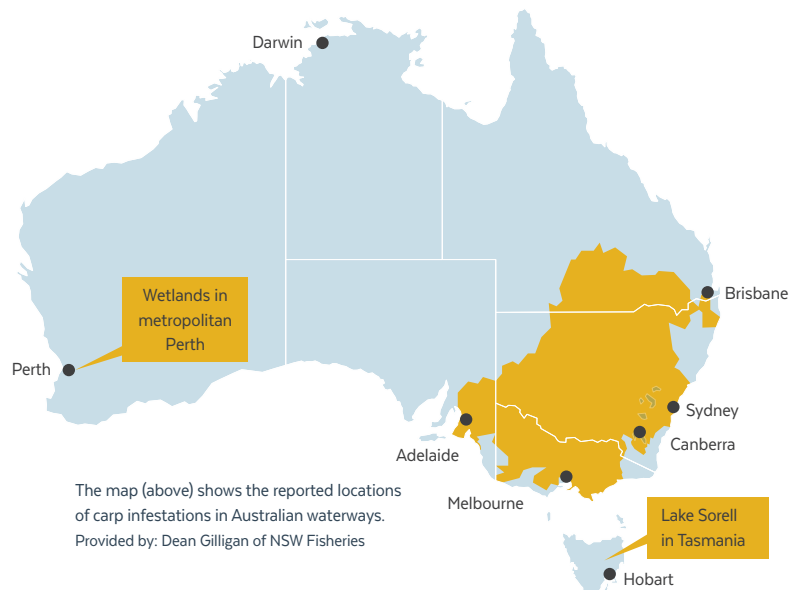
Completing non-target species susceptibility trials

Research is ongoing to test the susceptibility of species other than carp to the virus.

CSIRO has already tested the effect of the virus on 13 native bony fish species (including Murray Cod, Silver Perch, Golden Perch, eels and catfish), Rainbow Trout, lampreys, freshwater yabbies, two frog species, one lizard species, a freshwater turtle species, as well as on chickens and mice.

A new round of non-target species testing will focus on fish from the taxonomic orders Osteoglossiformes (sarotogas or bony-tongues), Synbranchiformes (swamp eels) and Beloniformes (needlefish, halfbeaks).

CARP DISTRIBUTION IN AUSTRALIA



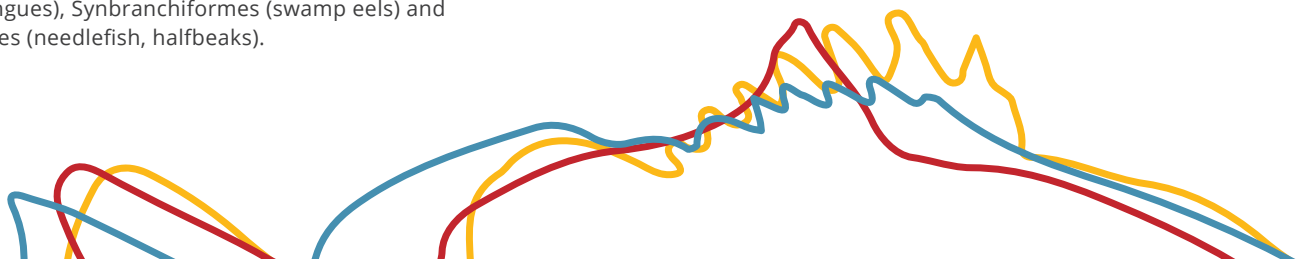
Species from all three orders inhabit freshwater and estuarine environments along the northern periphery of the distribution of carp in Australia. Testing these fishes' susceptibility to the carp virus will therefore help to ensure that a broad and representative range of fish species that could potentially encounter the virus or infected carp in the wild are tested. An additional two species of particular conservation importance in Western Australia – Salamanderfish and Nightfish – will also be tested.

Understanding efficacy under real-world conditions

The research plan will continue to improve epidemiological modelling to generate more accurate predictions of virus transmission and the capacity to effectively kill carp at varying densities and under a range of environmental conditions.

This knowledge will enable formulation of virus release strategies and will also help in planning clean-up activities.

Additional research will focus on development of cost-effective methods to accurately measure the virus's spread through wild carp populations, enabling scientists to understand and exploit the evolving host-virus relationship.



Predicting ecological responses

Work to understand the ecological impact of the virus release and carp deaths includes:

- investigating responses of other invasive fish species to carp reduction;
- understanding how to prevent or manage algal blooms;
- understanding the risk of anoxia from dead carp in main river channels and shallow wetlands; and
- understanding impacts of different carp biomass levels on water quality post-release.

Establishing benefits and costs of the NCCP

This research area will put together a detailed benefit-cost analysis, quantifying the value of the likely social, economic and ecological benefits of the NCCP, and developing detailed costings for its implementation.

2. Communities

Identify and manage risks

Social, economic, and ecological risk assessments will explore potential challenges and strategies to manage these challenges, including:

- risks to communities relying on water sources subject to carp biocontrol;
- risks of unfounded negative attitudes towards the NCCP, and effective engagement strategies to address them;
- impacts on water treatment plant efficiency;

- risk of unplanned human spread of the virus post release;
- risks to businesses reliant on carp;
- risks for ornamental koi enthusiasts;
- risks to the life cycle of key native species; and
- risks to international trade of native fish or other commodities.

Understanding stakeholder attitudes towards the NCCP

This research priority will undertake surveys to understand communities' attitudes towards the NCCP, and develop strategies to identify and address any community concerns, and effectively engage with stakeholders and the general public.

3. Informing possible implementation

Integrated program development

Management strategies will be developed to assess and enhance the effectiveness and feasibility of virus release and clean up. Effective options for secondary carp control measures will also be studied, including sex-biasing programs such as Daughterless Carp and Trojan Y, as well as preparation for their deployment.

Informing release and clean-up strategy

One of the most important questions to be answered is how carp killed by the virus can be cleaned up. This research area will develop estimates of carp biomass, run trials of clean-up methods, investigate potential uses for harvested carp biomass after the virus is released, and develop tools that can be made available to stakeholders and communities to help monitor the spread of the virus.

NCCP RESEARCH PROGRAM DECISION-MAKING PROCESS



Research projects

Here is a list of the projects currently funded under the NCCP Strategic Research and Technology Plan. These investigations cover the main issues around potential use of carp biocontrol in Australia, ranging from epidemiology of the carp virus to clean-up strategies and social dynamics.

Preparing for carp herpesvirus: carp biomass estimate for eastern Australia

Principal investigators: Jarod Lyon and Ivor Stuart, Arthur Rylah Institute and La Trobe University
FRDC project: 2016-153

Impact costs of carp and expected benefits from carp control in the Murray–Darling Basin

Principal investigators: Peter Chudleigh, Agtrans Research and Consulting, and Jeff Bennett, Environmental and Resource Economics
FRDC project: 2016-132

Social, economic, and ecological risk assessment for use of *Cyprinid herpesvirus 3* (CyHV-3) for carp biocontrol in Australia

Principal investigator: Peter Caley, CSIRO
FRDC project: 2017-054

Development of strategies to optimise release and clean-up strategies underpinning possible use of *Cyprinid herpesvirus 3* (CyHV-3) for carp biocontrol in Australia

Principal investigator: Luiz Silva, Charles Sturt University
FRDC project: 2016-158

Investigation of nutrient interception pathways to enable circumvention of cyanobacterial blooms following carp mortality events

Principal investigator: Justin Brookes, University of Adelaide
FRDC project: 2017-056

Expanded modelling to determine anoxia risk in main river channel and shallow wetlands

Principal investigator: Justin Brookes, University of Adelaide
FRDC project: 2017-055

Assessment of options for utilisation of virus-infected carp

Principal investigator: Janet Howieson, Curtin University
FRDC project: 2016-180

Building community support for carp control: understanding community and stakeholder attitudes and assessing social effects

Principal investigator: Jacki Schirmer, University of Canberra
FRDC project: 2016-152

Development of hydrological, ecological, and epidemiological modelling to inform a CyHV-3 release strategy for the biocontrol of carp in the Murray–Darling Basin

Principal investigator: Peter Durr, CSIRO
FRDC project: 2016-170

Cyprinid herpesvirus 3 and its relevance to humans

Principal investigator: Katrina Roper, Australian National University
FRDC project: 2016-183

Completion of non-target species testing for teleost Orders Osteoglossiformes, Belontiiformes, and Synbranchiiformes, WA endemic species salamanderfish (*Lepidogalaxias salamandroides*) and nightfish (*Bostockia porosa*), and silver perch (*Bidyanus bidyanus*)

Principal investigator: Kenneth McColl, CSIRO
FRDC project: 2016-169

COMMUNITY FORUMS

The NCCP team will be running community forums in regional and urban centres during 2017 to provide a chance for people to ask questions, raise concerns and discuss how they might be involved.

There will be approximately 30 forums in total, across the Natural Resource Management Zones where carp is a problem. Presentations will be posted online for those who cannot make it to the forums.

These events will provide an opportunity for the NCCP team to explain the process, what it knows and what it needs to know more about. It will be a great opportunity for people to have input into the development of the final recommendation.

For more information go to: www.carp.gov.au

HOW CAN YOU GET INVOLVED?

During the two years of the NCCP's development, the NCCP project team will speak to stakeholders and visit regional centres to provide updates on the progress of the plan and gather community feedback.

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 CARPLAN

