



FACT SHEET

The National Carp Control Plan

What is the National Carp Control Plan?

Carp are one of the most destructive introduced pest species in Australia and cause major damage to native fish populations and the water quality of our waterways. Different methods have been tried for decades to control carp without widespread success.

However, a new approach is now being considered: a naturally occurring species-specific virus that occurs naturally overseas and has the potential to reduce carp numbers by over 70 per cent. This would help aquatic habitats damaged by carp to recover, allowing native fish, yabbies, crayfish, and even water bird populations to rejuvenate.

A National Carp Control Plan (NCCP) is being prepared to explore the release of the carp virus cyprinid herpesvirus-3, or CyHV-3.

The Fisheries Research and Development Corporation (FRDC) is leading the \$15 million planning process, on behalf of the Australian Government, over two years.

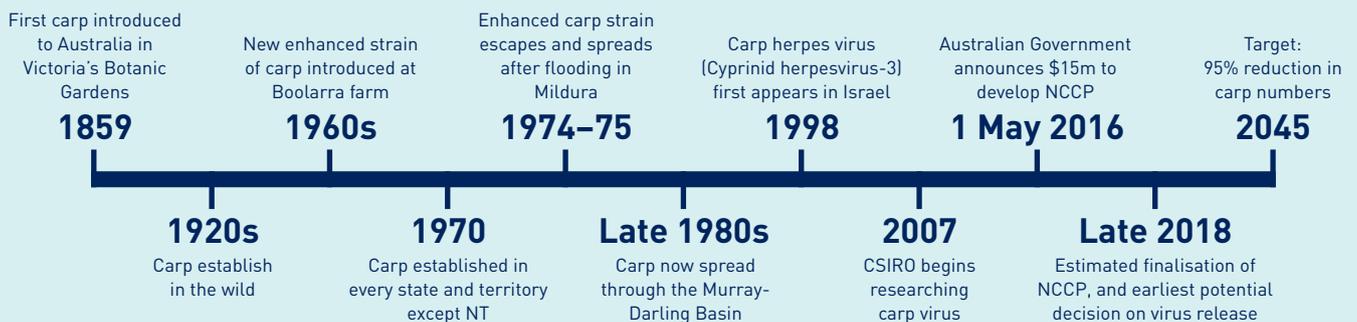
Significant work is needed to make sure the virus is the best option to control carp and that, if it goes ahead, it is as effective as possible.

Developing the NCCP will require:

- accurately assessing the biomass of carp;
- accurately calculating the current economic cost of the effects of carp in the waterways;
- determining the costs involved in releasing the virus and benefits of the release;
- modelling how the virus will spread if it is released to determine the most effective method to distribute the virus; and
- developing strategies to manage disposal of dead carp.

Through the planning process the NCCP project team will consult extensively to keep the community informed of the plan's development. Suggestions and feedback on proposed strategies will be important in shaping the final plan.

At the end of 2018, the FRDC will provide the completed NCCP to the Australian Government, which will then decide whether or not to go ahead with the virus release.



Why are carp a problem?

Carp are an introduced fish species and wild populations first established in Australia's rivers in the 1960s. Since then they have become the dominant species in many rivers and streams.

Carp grow rapidly, mature early, tolerate extremes of both temperature and water quality and can travel long distances. This means they can often out-compete native freshwater fish species, nearly half of which are now listed as rare or threatened under environmental legislation for the Murray-Darling Basin. It is estimated carp now make up 80 per cent of fish biomass in many waterways.

Water quality

Carp are bottom feeders; they stir up sediment in the water, making it muddy or turbid. This reduces the amount of sunlight reaching aquatic vegetation. The sediment also smothers vegetation and native fish eggs, which can impact on food availability and reproduction of invertebrates and small-bodied fish.

Carp also increase nutrient levels in the water by stirring up silt and prey on zooplankton that eat algae, which can increase the frequency and extent of harmful algal blooms.

Economic impacts

The presence of carp is estimated to cost affected communities millions of dollars a year.

By reducing water quality they increase the cost of treating water to make it suitable for human consumption. More than three million people rely on water drawn from the Murray-Darling Basin.

Large numbers of juvenile carp can block irrigation pumps and other equipment. Turbid water also increases wear on this equipment and increases maintenance costs for farmers and water providers dependent on rivers.

By outcompeting native fish, carp pose a major threat to the recreational fishing sector. This sector has been valued at \$1.3 billion in the Murray-Darling Basin alone. If native fish numbers were able to recover, this sector of the economy could increase significantly.

Carp contribute to the water conditions that lead to toxic algal outbreaks in waterways. The algal toxins make swimming, fishing and boating in affected waterways dangerous to human health and can result in lost recreational and tourism opportunities. The FRDC will quantify these costs more precisely as part of the NCCP planning process.

Where are carp impacts worst?

While carp are present in every state and territory except the Northern Territory, they affect the Murray-Darling Basin the most severely. They occupy – and dominate – almost all of the Murray-Darling Basin waterways. There are also isolated populations in Western Australia, Tasmania, south east Queensland and coastal rivers in eastern Australia.

Studies have shown carp numbers tend to be highest in places with high levels of environmental disturbance such as the conditions found in regulated rivers.

Why a virus?

CSIRO research has shown the carp virus has potential to quickly reduce the fish's population, and suppress it for many years. A number of other methods have been tried to control carp in recent decades without widespread success.

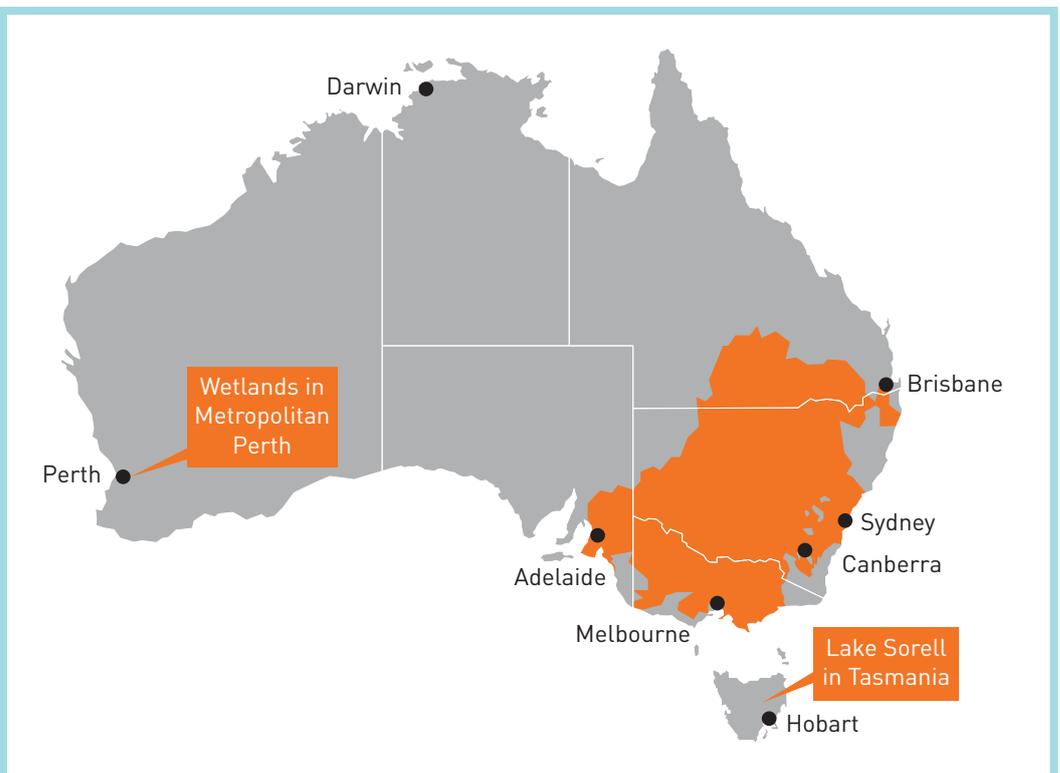
What other options have been explored?

- **Commercial fishing** fills niche markets for human consumption, fish leather, aquaculture feedstock, bait and fertiliser. Local consumer demand for carp is limited to 50-60 tonnes a year. Demand from these niche markets is not enough to make any significant reduction in the current carp population.

Carp distribution in Australia

The map (right) shows the reported locations of carp infestations in Australian waterways.

Provided by: Dean Gilligan of NSW Fisheries.



- **Manual carp removal**, including trapping and controlling access to breeding grounds, has seen some success in Tasmania's Lake Crescent and Lake Sorell. Lake Crescent was declared free of carp in 2007 after 12 years of manual removal work. Carp removal work is continuing in Lake Sorell. The cost of the program to the end of 2013 was \$9.6 million; and
- The **'Daughterless Carp'** and **'Trojan Y'** programs have explored ways to genetically alter fish to produce offspring of only a single sex. This approach does not kill affected fish, but merely pushes a population to extinction by reducing breeding opportunities. But as carp have a lifespan of 35 years, it would take more than a century using this approach by itself to significantly reduce the population. Both show promise, however, and are being investigated as potential long-term control measures in combination with the carp virus.

How does the virus work?

The carp virus is highly contagious for carp and is most effectively transmitted through carp-to-carp contact. The virus will also survive in water without a host for approximately three days.

If the virus is released in Australia, it is expected to initially kill more than 70 per cent of infected carp. Carp that survive will carry the virus for life and, when stressed, may eventually succumb to disease. They will also continue to pass the virus on to uninfected carp. This is expected to help control carp populations for many years after the initial release.

Water temperature

Overseas, the virus is most effective when water temperatures are 18°C to 28°C. At temperatures above 30°C or below 15°C carp can become infected but not die. When temperatures return to the effective range the virus can be reactivated and fish can develop signs of disease.

Signs of infection

The virus damages the kidneys, skin and gills of carp. Damage to the gills is the primary cause of death. After a carp is infected, the virus multiplies in the fish for seven to 12 days, depending on the water temperature.

During this time the fish will develop signs of disease, including darkening of the skin and reddened gills. Infected fish will die as soon as 24 hours after these signs develop.

Is the virus harmful to other species?

The carp virus is highly specific to a single species – common carp. It does affect ornamental koi, which are a brightly coloured strain of carp. It does not appear to affect the closely related goldfish. Australia has no native fish closely related to carp.

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

These species were exposed to 100 to 1000 times the amount of virus required to cause disease in carp, with no evidence of replication of the virus in any of the species tested.

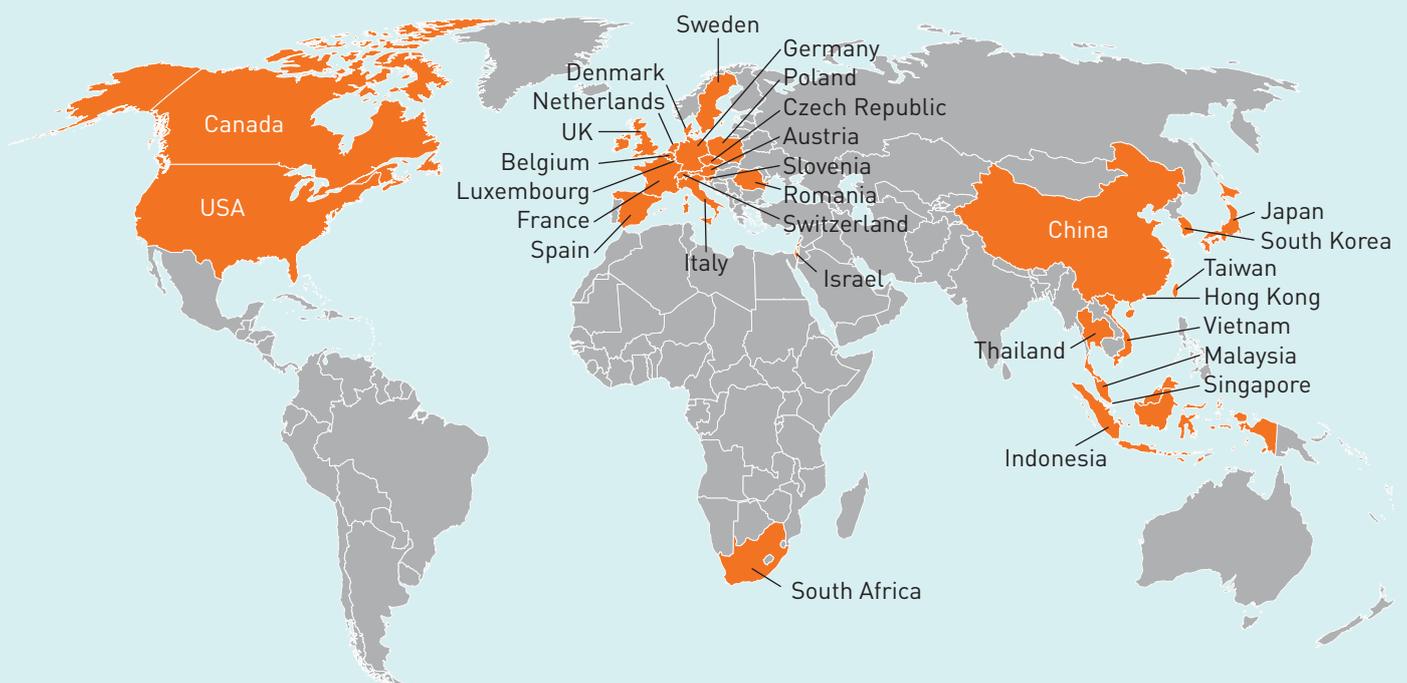
Before the NCCP is finalised, further testing is planned by CSIRO including a small number of native species in Western Australia and Queensland.

Is it harmful to humans?

The carp virus has been present in Israel, Europe, Asia and the UK for several decades, and is now found in 33 countries. The map below shows where the carp virus is known to exist.

Many people have had contact with and eaten infected carp in these countries over many years, but no human health issues have been reported.

Worldwide distribution of carp virus



What do we need to know?

The NCCP needs to identify the economic costs and benefits of releasing the carp virus to inform the Australian Government's decision. To do this, the NCCP project team needs to answer several key questions.

How much carp and where?

The CSIRO developed a trial mathematical model for a virus release in the Lachlan River catchment in NSW. To extend that model to other affected areas we need accurate data on where the carp are concentrated, to see how the virus might spread. This will be part of the NCCP planning.

How to manage?

A large volume of carp is likely to be killed if the virus is released. Determining how to manage this is a key focus for the NCCP. Careful planning, research and stakeholder consultation will investigate possible solutions.

The CSIRO's research in the Lachlan River catchment suggests a staged release of the virus. This would make collecting the dead carp more manageable. Modelling in the Lachlan catchment also suggests that releasing the virus in spring

and early summer in carp breeding sites when the fish are juveniles would allow a concentrated and efficient collection effort. Managing dead carp will be a key focus of research under the NCCP.

How long will the virus control carp?

If the virus is released it is expected to initially kill more than 70 per cent of carp. In the following one to four years the virus and fish will settle into a balance that allows both to survive.

As with myxomatosis and calicivirus in rabbits, the virus will then continue to cause a lower level of mortality in carp, such that the fish's numbers are likely to never recover to their original levels.

The large decline in carp numbers following a possible release of the virus will also provide a window of opportunity to employ supplementary measures to further suppress carp numbers over the long term.

These could include commercial fishing, and also reducing the reproductive capacity of the remaining population using techniques such as the 'Daughterless Carp' and 'Trojan Y' projects and projects to increase populations of native fish.



SOURCE: Tom Chesson

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, or if you would like someone to speak to your community group, contact Tom Chesson at the FRDC's National Carp Control Plan team at carp@frdc.com.au.

To stay up-to-date with progress and submit comments online;



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