

Exploding carp numbers are 'like a house of horrors' for Australia's rivers. Is it time to unleash carp herpes?

January 23 2023, by Ivor Stuart, John Koehn, Katie Doyle and Lee Baumgartner



Credit: Ivor Stuart/The Conversation

With widespread La Niña flooding in the Murray-Darling Basin, common carp (*Cyprinus carpio*) populations are having a boom year. [Videos](#) of writhing masses of both adult and young fish illustrate that all is not well in our rivers. Carp now account for up to [90%](#) of live fish mass in some rivers.

Concerned communities are wondering whether it is, at last, time for Australia to [unleash the carp herpes virus](#) to control populations—but the conversation among scientists, conservationists, communities and government bodies is only just beginning.

Globally, the carp virus has been detected in [more than 30 countries](#) but never in Australia. There are [valid concerns](#) to any future Australian release, including cleaning up dead carp, and potential significant reductions of water quality and native fish.

As river scientists and native fish lovers, let's weigh the benefits of releasing the virus against the risks, set within a context of a greater vision of river recovery.

A house of horrors for rivers

Carp are a pest in Australia. They cause dramatic ecological damage both here and in many countries. Carp were [first introduced](#) in the 1800s but it was only with "the Boolarra strain" that populations exploded in the basin in the early 1970s.

Assisted by flooding in the 1970s, carp have since invaded [92%](#) of all [rivers](#) and wetlands in their present geographic range. There have been estimates of up to [357 million fish](#) during [flood conditions](#). This year, this estimate may even be exceeded.

Carp are super-abundant right now because floods give them access to floodplain habitats. There, each large female can spawn millions of eggs and young have high survival rates. While numbers will decline as the floods subside, the number of juveniles presently entering back into rivers will be stupendous and may last years.

The impacts of carp are like a house of horrors for our rivers. They

cause massive degradation of aquatic plants, riverbanks and riverbeds when they feed. They alter the habitat critical for small native fish, such as southern pygmy perch. And they can make the bed of many rivers look like the surface of golf balls—denuded and dimpled, devoid of any habitat.

Most strikingly, this feeding behavior contributes to turbid rivers, reducing sunlight penetration and productivity for native plants, fish and broader aquatic communities.

Carp truly are formidable "ecosystem engineers", which means they directly modify their environment, much like rabbits. Their design leads to aquatic destruction of waterways.

We know when their "impact threshold" exceeds [88 kilograms per hectare](#) of adult carp, we see declines in aquatic plant health, water quality, native fish numbers and other aquatic values. At present, we expect carp to far exceed this impact threshold. For river managers, the challenge is to keep numbers below that level.



Adult carp usually search for food at the bottom of rivers, stirring up sediment and creating dimples on the riverbed. Credit: Ivor Stuart, John Koehn, Katie Doyle and Lee Baumgartner

The carp herpes virus

The carp virus ([Cyprinid herpesvirus 3](#)) represents one of the only landscape-scale carp control options, although there are some exciting genetic modification technologies also emerging.

Mathematical modeling suggests the carp virus could cause a 40-60% knockdown for at least [ten years](#), which may help tip the balance in favor of native fish. Certainly, there have been some well documented [virus outbreaks](#) in the United States resulting in large-scale carp deaths.

The risks and benefits of a potential Australian release of a carp virus

are transparently addressed under the federal government's [National Carp Control Plan](#), released last year. This plan provides some sorely needed leadership in the carp management space.

Risks the plan identifies include:

- major logistic challenges in cleaning up dead carp
- potentially serious short-term deterioration in water quality
- potential native fish deaths due to poor water quality.

On the other hand, the benefits of releasing the virus include:

- recovery of aquatic biodiversity populations—fish, plants and invertebrates
- major long-term improvements to [water quality](#)
- improved social amenity of inland waterways.

As carp continue to destroy Australia's riverine heritage, it's time to lay our cards on the table and have a serious conversation about the carp virus. Managing expectations is a key and the confidence of stakeholders and the community is vital for its success.

Like rabbits and other vertebrate pests, carp are emblematic of our inability to deal with entrenched pest animals. There are no silver bullets.



Carp alter the habitat critical for small native fish. Credit: Ivor Stuart, John Koehn, Katie Doyle and Lee Baumgartner

How else can we manage carp?

Rolling out the carp [virus](#) is only one potential pathway away from carp. If we truly want to reduce carp numbers and impacts in the long-term then we need to examine all the roles humans play supporting them.

For example, the series of weir pools in the lower Murray create perfect conditions for carp because they give fish access to floodplains year round.

Strategically lowering and removing weir pools to re-create flowing water habitats would be one solution to help Murray cod and other flowing water specialists, such as silver perch, river snails and Murray

crays. This is one of many integrated actions that could help tip the balance against carp.

Also, floodplain structures (which create artificial "floods") generate static, warm-bathtub conditions that carp, being from Central Asia, prefer, contributing to huge numbers especially in dry years. Few medium or large native fish benefit from these conditions.

Another pathway is to seek guidance from increasingly sophisticated environmental modeling, which can identify optimal population trajectories for native fish over carp.

Now the floods have returned, we need to move away from local decisions at the site-scale and instead manage ecosystems across the entire Murray-Darling Basin.

The present flooding also reminds us of the huge potential increases in the numbers of golden perch, frogs, yabbies and water birds. Animals that eat carp (Murray cod, golden perch, pelicans, cormorants) should all be as fat as can be.

Looking beyond carp

Just like the huge numbers of dead [native fish](#) from the Darling River fish kills in 2018-2019, the huge numbers of carp is a big wake-up call on the [poor state](#) of rivers in the Murray-Darling Basin and how we're managing them.

Perhaps what has been missing from the whole conversation is a vision for what our rivers should look like in ten or 20 years time. We don't want to leave a legacy of degraded rivers for future Australians.

River health is an issue all Australian's, country and city, need to engage

with. If we don't identify a common purpose, then we will likely continue to remain in lock-step with the great armies of carp and rivers of [fish](#) kills for generations to come. We need to do better than this. The future of our rivers depends on it.

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