The Australian government plans to target invasive European carp with a herpes virus, leaving hundreds of thousands of tonnes of carp rotting in the river systems that supply our drinking water and irrigate the fruit and vegetables we eat.

The aim of "Carpageddon" is to return Australian aquatic ecosystems to their pre-carp state by eliminating or reducing the serious pest species.

Carp currently make up 83% of the fish biomass in the Murray-Darling Basin in New South Wales. They alter river and lake habitats in a way that reduces habitability for native species, including five threatened species. They also have a major impact on inland fisheries, with an estimated annual economic cost of A$22 million .

This all makes a substantial argument for releasing a carp killing herpes virus. However, dealing with the aftermath could cost A$30 million for NSW alone.

Cleanup costs could be reduced by introducing viruses to discrete populations. However, if the virus escapes into the Murray-Darling Catchment, we will lose control of the virus spread and carp death will be rapid and widespread.

Without a dedicated cleanup effort, the sudden influx of millions of dead fish could permanently pollute our waterways. A potential solution is to recruit nature's cleaners to do our work for us – scavengers like turtles and crayfish. They could save us from carcass-choked rivers and wetlands, but only if we can protect them from endangerment and extinction.

Turtles and crayfish are our unlikely saviours

Carp carcasses are normally eaten by scavengers, a process that's vital to the food web (the system of what eats what in a given environment). In fact, the majority of dead fish are consumed

by scavengers

.

As such, simply removing the carp carcasses may reduce the overall amount of nutrients in the ecosystem. This would destabilise the food web, especially for scavengers such as turtles and crayfish who rely on them.

Instead, these scavenging species can provide crucial biocontrol . They would eat any decomposing flesh in our water systems, particularly in areas we can't easily access with nets, boats and trucks. They would maintain the quality of our waterways in three ways:

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Slow the spread of bacteria that break down dead fish , keeping water safe to drink and limiting deoxygenation that could devastate native fish species;

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Digest carp directly into basic nutrients (fertiliser) that is more readily absorbed by plants and primary producers;

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Semi-permanently store carp nutrients in their slow to decompose shells and exoskeletons , preventing or limiting toxic algal blooms caused by excess nutrients in water.

Our unlikely saviours are also dying

Threats to crayfish include agricultural and urban expansion, recreational fishing, pollution from surface runoff and insecticides, and introduced species such as trout and cane toads.

Consequently, native crayfish are declining, with nearly 80% of Spiny Crayfish recognised as threatened . However, yabbies have e

xpanded their range
.

Turtles on the other hand, are in sharp decline throughout the Murray Catchment and elsewhere in Australia
. A recent gathering of turtle experts in Canberra discussed
major threats to turtles, and ways to protect them
.

The meeting addressed major causes behind the 2% annual mortality rate of adult turtles that is leading the species to rapid extinction . Cars and foxes kill a significant number of adult turtles every year, and foxes destroy more than 95% of turtle nests in the Murray-Darling Basin
.

Changes to the hydrology of the Murray Catchment may also impact turtles. Some species require permanent wetlands
, while
others prefer to move
between temporarily flooded wetlands and more permanent waters.

Following modern water management, some temporary wetlands are permanently flooded or gone and some permanent wetlands are dry .

All of these threats together may cause turtles to become functionally extinct in the near future, meaning they cannot play their significant role in the ecosystem anymore.

How can we help conserve the turtle population?

Such a sudden decimation of carp has potentially catastrophic consequences. But it may also be an excellent opportunity to recognise the importance of turtles and prioritise their conservation.

In a recent study , headstarting was named as the only management tool that could protect freshwater turtles from the multiple threats throughout their life cycle and eliminate all risks of extinction.

Headstarting involves rearing eggs or newborn animals in captivity, then releasing them into the wild. It has been controversial for decades, but releasing thousands of little turtles throughout the Murray River just might rescue us from the post-apocalyptic effects of Carpageddon.

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