



KOI SOCIETY
OF
AUSTRALIA

NSW Natural Resources Commission
Level 6, 52 Martin Place
Sydney NSW 2000.

Gerard McDonald
President - Koi Society of Australia

20th May 2016

Dear Sirs,

On behalf of the Koi Society of Australia (KSA) I would like comment on the planned release of Carp Herpes Virus (CyHV-3) and the Research / Press releases recently emanating from CSIRO & NSW DPI.

Initially however, I would like to state that the KSA acknowledges the problems created by the population of European Carp in Australian waterways and supports ideas to control this pest provided the methods used are environmentally sound and ethical. It is also worth stating at this stage that the initial interest of the KSA with this proposed project was based upon concerns over the possible exposure of pet Koi to this deadly virus. However, our overriding concern now is for the Environment, Public safety and economic impact.

The evidence supporting the release CyHV-3 as a means of controlling the Carp problem is far from convincing and the KSA does not support this project. The main reasons for our objection are summarised below and will be explained in more detail later in this letter:

1. Environmental impact of millions of dead Carp polluting our Rivers and Dams.
2. Economic implications of the Clean-up campaign and impact on long term plans to utilise Carp as a resource.
3. Quality of Research into CyHV-3 to date.
4. Safety questions raised by Australia being the first country in the world to knowingly release an OIE listed pathogen, and whether the general public are aware that live Herpes Virus will be present in Domestic water supplies.

Members of the KSA have had meetings and numerous exchanges via email and phone with NSW DPI & CSIRO representatives over the past years. The inescapable conclusion is that the research to date is not sound, and that Press releases that are being used are 'economical with the truth' in order to gain support from the public and government alike. Poor river water quality and the decline in our native fish populations is a complex problem and using CyHV-3 as a 'Magic Bullet' will not solve the problem. Potentially it makes matters worse.

Yours sincerely

Gerard McDonald

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KSA 2016

1. Environmental impact of millions of dead Carp polluting our Rivers and Dams.

Estimates put Feral Carp as being 80% of the Biomass in some waterways. That means that 80% of a River or Lake's biological material could be rapidly turning into putrid dead waste as Carp die off over several days/weeks after the release of CyHV-3.

Rather than look at less environmentally damaging schemes (e.g. Daughterless Carp, Capture/Commercial use of Carp etc.) CSIRO & NSW DPI risk filling our rivers and lakes with millions (or Billions) of dead or dying Carp every year if CyHV-3 is utilised.



The Newstreams clip above is from the DPI website February 2008. It helps to demonstrate the scale of devastation and associated costs involved when large numbers of Fish are killed (in this case by depleted Oxygen levels following wide scale rotting of vegetation after flooding).

http://www.dpi.nsw.gov.au/__data/assets/pdf_file/0020/210836/newstreams12-Feb2008.pdf

In countries such as South Africa naturally occurring CyHV-3 is still regularly killing millions of tonnes of fish. This renders rivers unusable for fishing and recreation. Locals are told not to eat the fish. At a meeting of the NSW NRC in Parramatta (May 12th 2016) the Committee Chairman himself admitted that he would not like his Children to swim in waterways where lots of carp bodies were floating nearby.

Once released, CyHV-3 cannot be managed. Major die-offs of carp actually risk killing native fish due to deoxygenation events, not to mention carrion bird losses from botulism. Blue-Green algal blooms and Black water events following flooding and aquatic vegetation die-off are not uncommon in Australia. The experience of local councils who often bare the cost of such clean-ups seriously puts into doubt the allocated budget of \$15million nationally.

The degradation of River and lake water quality is evident outside of Australia. Recently, hundreds of posts on the 'Friends of Lake Wingra' (Madison County USA) on Facebook spoke about nutrient pollution from agriculture, Stormwater and saltwater pollution. Not a single mention of carp was made, despite the carp population being significant in this area.

Terms like 'courageous' and 'innovative' have been used by Matt Barwick from NSW DPI to describe the release of CyHV-3. Photographic images of muddy river water are also used during presentations to reinforce the argument that Carp are to blame. Given that fact that Australia stands isolated from other countries in its intended use of CyHV-3 and that muddy water is caused by a multitude of factors and not just carp, perhaps terms like 'ill informed' and 'naive' would be more accurate.

The decline in Native fish numbers was established well before the arrival of European Carp, due to habitat degradation and overfishing. Carp in fact don't compete for native fish habitat and it was the removal of the woody habitat that is more to blame. At least two Australian studies prove this and that it is loss of bank vegetation and Agricultural run-off (not Carp) that make the water muddier. Native fish are less tolerant to pesticides and less tolerant to low oxygen levels. Native fish also require more reproductive signals to spawn such as rising water level and rising water temperatures (both of which dams and weirs disturb). Recent studies also show that Carp biomass will not keep growing, in fact it is shrinking.

These above facts are conveniently overlooked by groups such as CSIRO and NSW DPI, particularly when they are making a political case for additional funding. The so called 'Magic Bullet' of CyHV-3 that kills "Mud sucking carp" seems not only plausible but attractive. The likely environmental impact is covered in a cursory statement about an unsubstantiated 'Clean-up' campaign. The damage to our aquatic environment caused by wide scale CyHV-3 carp deaths will also have some impact on local tourism, recreational activities, farming and industries such as fisheries and seafood producers.

2. Economic implications of the Clean-up campaign and impact on long term plans to utilise Carp as a resource

The 'Clean-up' campaign to deal with large numbers of dead fish is of course a major consideration as CSIRO & NSW DPI have stated. Such a campaign would also need to be ongoing as CyHV-3 will be around for a very long time once released and this will cost could exceed \$100m annually.

NSW DPI & CSIRO have openly stated possible budgets for Clean-up ranging from \$30-50 million. Recently this figure has been downgraded to \$15 million, and the KSA believes this is purely to allow the initial stages of the project to pass Government approval without budgetary objection.

The question of how are the bodies of millions of dead carp are going to be collected across tens of thousands of kilometres of river banks has not been answered. All publicity photos used by NSW DPI & CSIRO show trucks filled with carp bodies or neat piles of Carp bodies on river banks. These images are from photo stocks and show Carp that have actually been captured live using Traps and Cages. NSW DPI and CSIRO however have stated that these methods are ineffective. How will dead carp be persuaded to congregate so they can be collected?

More recently they have also suggested using "Volunteers" or even allowing Birds and small mammals to consume the dead fish carcasses. Clearly this element of the proposed CyHV-3 release project has not been investigated thoroughly and wildly inaccurate assumptions may be being made. Can you imagine teams of volunteers trying to remove tonnes of dead carp from the most inaccessible areas of the Murray Darling Basin?

The suggestion of 'burying the carp carcasses in the paddock' is also preposterous and dangerous.

The presence of CyHV-3 will impact some businesses where Carp harvesting already occurs in Australia (e.g. Charlie Carp, K C Fisheries).

http://www.kcfisheries.com.au/index.php?option=com_content&view=article&id=47&Itemid=54).

The KSA would like to point out that alternatives to the release of CyHV-3 as a means of controlling Feral Carp exist and are being used elsewhere. In the USA, the problem of Asian Carp in waterways is even worse than our own issue here in Australia. A company in Illinois (Big River Fish Corp.) has secured a \$2m US Federal grant and is now catching Carp and selling them to China. Currently the Chinese market for Carp as a food source is 1.2 Million Tonnes per year. The need for the Chinese to import Carp from USA (and Australia) is driven by increasing demand and the higher quality of carp produced compared to carp from the polluted Chinese waterways. The Big River Fish Corp are now marketing their Carp as a 'High end product' in much the same way as the Beef industry markets Black Angus Beef etc.

http://www.prairiestateoutdoors.com/pso/article/illinois_company_selling_millions_of_pounds_of_asian_carp_to_china

The operation is simple, efficient and very cost effective. And the growing market for Carp as a food source in China shows no signs of abating, so the Big River Fish Corp will soon employ 61 staff. More importantly the environmental impact of such a scheme is almost zero (compared to CyHV-3 release).

KSA would encourage NSW NRC to follow this example and introduce funding to allow development of such schemes and provide long term employment as we convert a problem into a resource. The employment potential, especially to some of the Aboriginal communities around the Murray Darling Basin would be tremendous. Clearing such large numbers of Carp in NSW would not be an 'overnight success story' but its efficacy would be at least as good, if not better than KHV release. The general Public of Australia would also be far more accepting of this commercialisation scheme rather than releasing Viruses into their Waterways with no long term guarantees of success or safety.

However, it should be noted that if CyHV-3 is released, the possible export of Carp and other Fish as a food source to other countries will be severely impacted. Countries such as China, USA and Japan (where CyHV-3 is being actively avoided) will not take kindly to importing contaminated Carp and Barramundi fish fillets.

Whilst the Koi keeping Hobby in Australia is relatively small, it is nonetheless significant. Koi Hobbyists will be affected as their collections of Koi inevitably become infected and die off. It's worth reiterating that due to import restrictions, Koi cannot be brought into Australia from overseas. So if the current breeding stock is killed off, so too is the Koi industry and a hobby enjoyed by thousands of Australians.

The Carp that infest our Rivers and Dams are from the European carp deliberately introduced over 100 year ago. Koi only exist in the wild in very low numbers and are not the source of the main carp problem.

3. Quality of Research into CyHV-3 to date.

At this point in time, no clear indication has been given about how often CyHV-3 will need to be re-released. Even under laboratory conditions only 40-80% of Carp will be killed and immunity occurs rapidly within the surviving individuals. CSIRO & NSW DPI have stated that new strains of the virus will need to be developed to help overcome this innate immunity with Carp. This presumably means two things:

- There will be additional costs to the Australian Tax payer over and above the \$15million stated
- Some degree of mutation must occur within the DNA of the CyHV-3 virus, so as to produce new strains. This contradicts CSIRO statements about the virus NOT mutating.

The research into possible transfer and infection of CyHV-3 to non-carp species has to date shown no risk. Goldfish appear to be possible carriers, but are asymptomatic. However, we do not believe that the work done here is sufficient, and should be continued to rule out transmission of different strains of the virus.

Claims made by CSIRO and NSW DPI state that CyHV-3 will only infect Carp when the water temperature is above 22°C, and when the carp are stressed. Also, they claim that the virus cannot be transferred by vectors such as birds and amphibians and that once in a river or lake it remains localised. However, in Europe & Asia KHV (CyHV-3) has decimated Carp populations in lakes and rivers rendering them useless for years.



The image is a screenshot of a GOV.UK press release. The header includes the GOV.UK logo and a search icon. The main title is "Koi herpesvirus disease outbreak confirmed in Worcestershire". Below the title, it lists the source as "Centre for Environment, Fisheries and Aquaculture Science", the date as "3 September 2015", and the category as "Aquatic animal health news and consultations and Animal and plant health". The main text states: "Koi herpesvirus (KHV) disease has been confirmed in carp (Cyprinus carpio) at Washing Pool, Worcestershire." To the right of the text is a photograph of a pond with green reeds and a small white fish. Below the photo, the text reads: "An outbreak of KHV disease has been confirmed at Washing Pool, Witley Park Farm, Worcester Road, Great Witley, Worcestershire. The site is now subject to statutory controls to prevent or limit the spread of the disease. The Fish Health Inspectorate (FHI) at Cefas, acting on behalf of Defra has issued a confirmed designation prohibiting the movement of fish to, from and within the fishery complex. Fishery equipment disinfection and movement control measures are in place and anglers must ensure that they comply with all biosecurity measures within the designated area. The fishery reported the problem for further investigation and had voluntarily closed the affected water in advance of official controls."

The example above shows how KHV was introduced accidentally to a Carp Fisheries in Worcestershire, England. Angler's Keep nets with minute quantities of contaminated water on them were to blame.

<https://www.gov.uk/government/news/koi-herpesvirus-disease-outbreak-confirmed-in-worcestershire>

The water temp was around 16°C and the fish were not sick or stressed at the time. These facts cast serious doubt on research quoted by CSIRO & NSW DPI, namely:

- KHV doesn't spread easily from waterway to waterway;
- is only active in warmer temperatures;
- is not virulent for long without a fish host;
- requires fish to fish contact to be transmitted;

There are still too many unknowns within this CyHV-3 release project. When words like “should” or “we think” are being used by CSIRO and NSW DPI Scientists, particularly at this late stage of the process, the KSA becomes very concerned.

Calicivirus is often held up as a glowing example of how good Bio-vectors can be. But once again the facts tend to bring into question how well this particular virus has performed and how well it was managed. Firstly, Calicivirus became accidentally released well before official testing was completed. Secondly, once released it turned up way beyond the initial planned test areas (even as far as NZ!). Thirdly, Calicivirus has had to be reintroduced on more occasion to maintain its potency. And there is no Vaccine for pet Koi to protect them from CyHV-3 in the same way that a local vet can immunise a pet Rabbit from Calicivirus. Despite this fact, vaccines are often spoken about by NSW DPI in public consultations. I want to make it absolutely clear that there is **No Vaccine** for CyHV-3 that is applicable in this instance. Cost, efficacy and the sheer numbers of pet Koi owned by Hobbyists make it impossible to use.

This current PR campaign from CSIRO & NSW DPI is designed to introduce the concept of using Viruses to the public and "Scientific Community" well ahead of the Federal and State sanctioning of its use. However, good Marketing and clever PR are no substitute for sound scientific research and common sense.

NSW DPI and CSIRO repeatedly flag up the ‘Daughterless Carp project’ as an adjunct project to the CyHV-3 project.

However, KSA believes that the public and Politicians are being misled.

No research has been undertaken into Daughterless Carp by CSIRO in over 5 years and no funding is currently allocated to it. The KSA believe that this is a very worthwhile project, which potentially achieves everything CyHV-3 aimed to, but without the massive financial impact. Daughterless carp also fits nicely alongside Trapping and commercialisation projects that turn Carp into a resource.

On several occasions, NSW DPI (Matt Barwick) has stated that there has been "robust" research. However, to date, despite multiple requests to his office to see this research, information has not been forthcoming. If there is to be a complete, robust and exhaustive consultation process with affected stakeholders, this research should have been made available prior to the submission of this document to Government. As there has been no fulfilment in this request, there has not been an adequate consultation. Any recommendations or actions on carp management using the virus cannot be made, until there is a full disclosure of the research. KSA believe that correct process has not been followed.

4. Safety questions raised by Australia being the first country in the world to knowingly release an OIE listed pathogen, and whether the general public are aware that live Herpes Virus will be present in Domestic water supplies.

Figures released by CSIRO and NSW DPI show that CyHV-3 has a relatively low kill rate (even in aquaculture ponds and tanks) of only 50-80% only. There is rapid emergence of resistance and high fecundity of carp, so numbers will rapidly bounce back. This means that the quantity of viral concentrate that will need to be released will be high combined with frequent re-releases.

CyHV-3 will undoubtedly appear in Rivers and dams that feed directly into domestic water supplies. NSW DPI figures show that the level of Chlorine required to denature CyHV-3 is x40 times higher than levels currently used by Water treatment companies. So the Herpes virus will enter the homes of the public. Whilst there is no existing evidence for potential health risk to humans, perhaps it would be prudent to make this fact public knowledge. Given the choice of Water with or without 'added Virus' the general public would almost certainly prefer the latter.

DNA viruses like CyHV-3 do not mutate to the same frequency as RNA viruses. However, they do mutate. CyHV-3 (KHV) did not appear until the late 1990's. It is feasible to assume therefore that it possibly mutated from another viral strain. The uncertainty of viral mutations are reason enough to be cautious about deliberately releasing CyHV-3 into our water supplies.