Martin D Rocliffe

Senator Barry O'Sullivan
Senator Glenn Sterle
Senator Janet Rice
Senator Richard Colebeck
Senator Rex Patrick
Senator Slade Brockman

4th July 2018

Re: Senate Rural and Regional Affairs and Transport Legislation Committee public regarding the potential release of the Herpes Virus in Carp

Dear Senators,

Can I firstly thank the committee for allowing my colleagues and I to appear before the committee at the Public Hearing on Monday June 25th. During our witness session there were some questions asked that required accurate details we could not provide on the spot. We would like to take this opportunity to summarise the extra information requested by the senators present.

Summary of observed mortalities during trials of carp and natives: McColl and Crane (2013) Cyprinid herpesvirus 3, CyHV-3: Its potential as a biological control agent for carp in Australia.

Method	Carp	Silver Perch	Murray Cod	Golden Perch	Galaxias	Rainbow trout
Bath	72% (*)	35%	24%	42%	82%	43%
Injected	60% (*)	55%	35%	37%	*Not trialled*	100%
Aborted			100%			

Native mortalities were explained as the result of poor animal husbandry during the trials. If this explanation is valid the assumed efficacy of the virus in all trials should be lowered, significantly reducing expected carp mortality rate (*). The effect of this explanation being accepted are extremely low efficacy of the virus vs carp (almost zero in adults once adjusted). The alternative is an unacceptably high and unexplained mortality rate for the native species tested.

Scientific method, observations and unsatisfactory explanations for observed mortality

- A Cycle Threshold (CT) lower than 37 was the core criteria to determine “infection”.
- The author concluded that native mortality was not due to the virus by this measure.
- Alternative causes for the higher mortality rates in natives were proposed but not tested.
- Viral DNA, Gill necrosis and other symptoms common to Carp Herpes Virus were observed in a number of the natives that succumbed to the trials.
- We are not aware of the time and budget constraints placed upon the study group that may have prevented further testing.

Confirmation of stability of Botulinum toxin and concentration (in fresh water) required for lethal effect on animals and humans.

- Botulinum neurotoxin (BoNT) Type B is considered the most toxic biotoxin known to man
- Botulinum toxin is relatively stable and can persist for days in water without a high degree of Chlorination, Heat treatment or reverse Osmosis. Infected maggots within drinking water would pose a major risk.

- Any detectable level in drinking water is considered dangerous. In swimming water, it is absorbed through the membranes (e.g. eyes or lungs through accidental aspiration).
- Inhaled doses of 0.7ng per kg (i.e. 0.001 mg per person) are potentially fatal to adults.
- 2-5 maggots have been proven to be toxic to a waterfowl. The thousands of maggots resulting from a single dead fish or waterfowl would be potentially deadly to cattle.

Confirmation of whether current Immunisation of cattle includes Botulism.

- Some vaccines such as Singvac 3 Year, where applied correctly in advance, can protect animals being vaccinated for the first time. A second dose is necessary after 36 months.
- Wild species of Birds, Reptiles, Amphibians and Mammals will of course NOT be immunised, and would succumb to the toxin if affected Carp carcasses and maggots were ingested.

Confirmation of the presence of Carp and the Carp Herpes Virus in the USA, and approximate dates when both were introduced.

- Common Carp first appeared in the USA in the 1800's. Asian Carp appeared in the 1970's.
- The Carp Herpes Virus did not appear anywhere until after the late 1980's, possibly after a mutation from a similar Herpes virus in the Carp Aquaculture industry (Asia or Israel).
- The USA like all afflicted countries, is NOT considering the use of CyHV-3 as a biocontrol.
- Recent studies of wild outbreaks show that long term reductions in carp post virus are not likely as demonstrated in 6 out of 7 major outbreaks where sufficient records exist.

Recommendation for extending the NCCP timeframe and the consideration of non-viral control measures.

- We would support environmentally sustainable methods of Carp control such as "Daughterless Carp", Gene Drive, Commercial Fishing, Electro-fishing, trapping, screening, drainage and river flow restoration. Many of which have been used successfully in Australia.
- None of these measures have been trialled as part of a large scale, integrated program.
- Given the enormous cost of a suitable post Virus Clean-up campaign, all of these Carp control measures are comparatively cost effective. More "economical" small scale clean-up should be unacceptable due to lack of efficacy and the significant environmental consequences.
- The initial scoping for a plan to deliver safe effective carp control, should not be built around a single method of control, the NCCP should be re-scoped with a purpose of delivering long term improvements that address the causes of carp infestation rather than the symptom.
- We believe the Senate would benefit from insisting that Dr Jonathan Marshall be invited to your upcoming NCCP visit to Mildura. It is important that balanced information be provided at this meeting. Alternatively, a video of the proceedings would allow independent scientists to give feedback to the committee on the information presented.

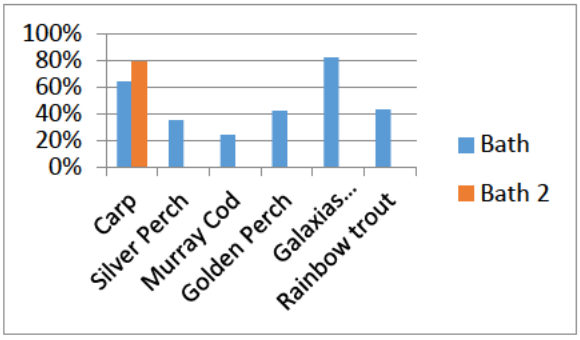
I trust that this information helps to demonstrate the concerns that exist within the scientific community and general public. More detailed documentation will be made available by my colleagues shortly, but please do not hesitate in contacting me should you require any additional information in the meantime or to arrange further hearings on the many topics we did not get to discuss in the time available.

Yours sincerely

Martin D Rocliffe M.I. Biol

Graphical representation of observed mortalities during trials of carp and natives: McColl and Crane (2013) Cyprinid herpesvirus 3, CyHV-3: its potential as a biological control agent for carp in Australia.

Bath (Natural) Trial Mortality Rates (%)



Injected Trial Mortality Rates (%)