

**GREAT LAKES FISHERY COMMISSION
GREAT LAKES FISH HEALTH COMMITTEE**

**POSITION STATEMENT REGARDING THE USE OF *Cyprinid Herpesvirus-3*(*CyHV-3*) AS A BIOLOGICAL
CONTROL AGENT FOR COMMON CARP**

The Great Lakes Fishery Commission - Fish Health Committee (GLFC-GLFHC) recognizes that various governmental entities throughout the world have considered the use of cyprinid herpesvirus-3 (CyHV-3), commonly called koi herpesvirus (KHV), as a control agent for nuisance cyprinid populations including for Common Carp (*Cyprinus carpio*). CyHV-3 is listed by, and reportable to, the World Organization for Animal Health (OIE). According to the OIE, common carp, koi carp, and several carp hybrids are susceptible to the virus (OIE, 2009). Both Silver (*Hypophthalmichthys molitrix*) and Grass Carp (*Ctenopharyngodon Idella*) can serve as asymptomatic carriers, but do not develop clinical disease (Bergmann et al. 2009). No information is available about the susceptibility of Black Carp (*Mylopharyngodon piceus*) or Bighead Carp (*Hypophthalmichthys nobilis*) to CyHV-3. The limited number of hosts susceptible to CyHV-3 is consistent with other herpes viruses, which co-evolve with a specific host. When considering the effectiveness of KHV as a control agent in the wild, additional information relevant to the GLFHC's deliberations include:

- CyHV-3 has caused numerous common carp mortality events in the United States, including in the Mississippi River drainage, making it likely that the Asian carps (Black, Silver, Bighead and Grass Carps) present in the basin have been exposed to the virus. No mortality events of Asian carps have been traced to CyHV-3.
- There is no information about the susceptibility of native cyprinids to the virus. Native cyprinids are important prey fish in lakes and streams, and serve as important sources of baitfish throughout the Great Lakes. In Michigan, between 25,000 to 38,000 gallons of minnows are harvested annually with about 85 to 90 percent coming from the Great Lakes or their tributaries (Kinnunen, 2016). In addition to their value as bait fish, some native cyprinids are listed as endangered species by state, provincial, and federal agencies such as the Topeka Shiner native to Minnesota that is listed as endangered by the U.S. Fish and Wildlife Service (2018).
- Russian sturgeon (*Acipenser gueldenstaedtii*) and Atlantic sturgeon (*Acipenser oxyrinchus*) are suspected carriers of CyHV-3, indicating a potential risk to North American sturgeon populations (Kempter et al. 2009). Some of which are endangered or are being considered for listing, or have ongoing rehabilitation efforts including Lake Sturgeon (*Acipenser fulvescens*).
- Boutier et al. (2015) suggests that Siluriformes may also be carriers of CyHV-3.
- Possible use of CyHV-3 for biocontrol purposes could have unintended negative impacts on the ornamental aquaculture industry in the U. S., as koi farms and businesses, as well as koi raised by hobbyists in outdoor ponds, may be inadvertently exposed to the virus through common water supplies that are being treated with CyHV-3.
- Although biocontrol efforts employing CyHV-3 almost certainly will kill large numbers of Common Carp, it is unlikely that this control agent will completely eliminate entire populations. Survivors will develop immunity, making them less susceptible to re-exposure to the virus.

- If resistance is a genetically driven trait, resistance to the pathogen will be passed on to offspring, reducing the efficacy of CyHV-3 for biocontrol.
- If resistance is due to exposure, the cyclic latency/reactivation nature of herpesviruses may also lead to increased resistance over the long-term.
- Direct transmission of CyHV-3 occurs in the water or by direct contact with infected fish. Indirect transmission can occur due to the persistence of the virus in the environment. Because multiple virus reservoirs are present in most watersheds, virus eradication would be very difficult or impossible and once conducted, would be an irreversible management action.
- The GLFHC also notes that the social acceptance of using CyHV-3, or other pathogens, for biocontrol is not well understood, and should not be contemplated without extensive public engagement before a final decision is made.

Given the above listed concerns and unaddressed data and knowledge gaps, the GLFHC's consensus recommendation is that using CyHV-3 for biocontrol in the wild is not an appropriate control strategy at this time.

The GLFHC also recognizes that filling knowledge gaps about the biology of CyHV-3 and the susceptibility of other species to CyHV-3 could be useful for fishery managers. The GLFHC appreciates that further investigation of CyHV-3 that includes experiments in isolation facilities and of retrospective analyses of past outbreaks could provide additional information useful for fishery managers. The GLFHC does not recommend conducting research on CyHV-3 in the wild.

REFERENCES

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