

# Unraveling the science behind the bighead carp found in Lake Calumet

A new report has been released which attempts to determine the life history of the bighead carp captured in Lake Calumet, just 6 miles from Lake Michigan, in late June of 2010.

Small bones in the inner ear of fish, called otoliths, can be analyzed by scientists to determine the age of fish. By examining the otolith chemical composition, scientists also attempt to determine what environment the fish lived in.

Commissioned by the Illinois Department of Natural Resources with research performed by the Southern Illinois University, the report prompted a range of public statements and interpretations. Some have claimed that the report definitively establishes that the captured bighead carp was “planted” in Lake Calumet. **These interpretations are not supported by the science presented in the report.** In fact, the report is inconclusive in when and how the bighead carp arrived above the electric barrier.



Courtesy: Illinois Department of Natural Resources

Let's look at some myths and facts:

MYTH	FACT
<p>“Scientists from Southern Illinois University report the Asian carp found in Lake Calumet was most likely the result of a cultural release.”<sup>1</sup></p>	<p>The SIU report says nothing about how the fish may have moved or been transported above the electric barrier. It simply states that the bighead carp collected from Lake Calumet was approximately 6 years old and may have originated in the Illinois River and then moved or was transported to Lake Calumet/Lake Michigan. The report clearly outlines the major assumptions and uncertainties and says, “no conclusive statements regarding the environmental history of these two fish are currently possible.”</p>
<p>“Tests of chemical markers in the bighead carp suggest it was not a recent arrival in the waterway and probably did not get there by evading an electric barrier meant to prevent the species from infesting the Great Lakes.”<sup>2</sup></p>	<p>According to the SIU report, of the three testing procedures used (stable oxygen composition, carbon isotopic composition, and strontium-calcium molar ratios), only the carbon results--the least certain method used--point to the bighead carp having lived in Lake Michigan for all or the majority of its life. The report itself acknowledges the limitations of carbon testing. Dr. Steve Campana, one of two peer reviewers of the report, also advises that the carbon results should not be over emphasized, as carbon “is known to be under significant metabolic influence, and thus changes with the size and individual history of the fish.”</p> <p>Furthermore, the SIU report makes two assumptions that the expert reviewers say cannot be reliably used to draw conclusions about the bighead carp’s origination from the analysis of the fish. Specifically the assumptions are that 1) the otolith and its environmental signatures are consistent over time, and 2) that relationships between chemicals in the environment and the otolith for Asian carp are equivalent to those of other fish species sampled (as comparisons to previous tests on other fish species in these waters.)</p>

*continued »*

## Unraveling myths about the bighead carp found in Lake Calumet

MYTH	FACT
<p>“While this report does not have all the answers, it does suggest to us that the fish caught in Lake Calumet last month may have been put there by humans, perhaps as a ritual cultural release or through bait bucket transfer.”<sup>3</sup></p>	<p>Stuart Ludsin, the second peer reviewer, says in his review of this report: “I could fully discount your interpretation (or any other that you provided), owing to the two untested assumptions that you fully signify. In my opinion you would have no choice but to back off, if someone pressed you hard about the stability of these chemical signatures through time or the assumption of using one species to represent the other.”</p> <p>Simply stated, any inferences that the bighead carp arrival in Lake Calumet was likely due to a bait bucket transfer or “cultural release” or even that it “was not a recent arrival” is not actually justified by the limited data and analysis in the SIU report.</p>
<p>“Existing barriers are clearly working.”<sup>4</sup></p>	<p>The report states only that the carp was collected “beyond the electrical barriers intended to prevent Asian carp from entering the Great Lakes.” The Chemical Industry of Illinois, in an astounding leap of logic, made this statement in a press release headlined “Human Introduction Confirmed in Asian Carp Discovery.”</p> <p>While the electric barrier certainly has a welcome and substantial effect in deterring the Asian carp, in-water studies of effectiveness at the barrier site have yet to be completed, and numerous reports state that the electric barrier will not be 100 percent effective.<sup>5</sup> Emerging eDNA evidence points to Asian carp in many locations throughout Chicago’s canals beyond the electric barrier.<sup>6</sup></p>

### WHAT CAN WE CONCLUDE?

There are many paths besides “being planted” that this particular Asian carp could have taken to reach Lake Calumet: e.g. by swimming through the canals before or after the barrier was fully operational, bypassing the barrier during floods, or being carried above the barrier in barge ballast water or in eddy currents behind a barge. We may never know definitively. Given this uncertainty, what is important is that the Illinois Department of Natural Resources moved quickly to gather as much information as they possibly could from this fish and share scientific data and preliminary analysis with the public, as public scrutiny will ultimately lead to the most accurate interpretation of all data associated with the unified effort to stop Asian carp from invading the Great Lakes.

The detection of live fish in the Lake Michigan watershed underscores the urgency in which we must separate the Mississippi and Great Lakes basins and stop any Asian carp, regardless of mode of transportation, from getting above the barrier to protect the Great Lakes from an irreversible invasion.

### RESOURCES:

Find the Southern Illinois University report on the Lake Calumet Bighead carp, and the reviews by experts here: <http://asiancarp.org/wordpress/wp-content/uploads/2010/08/Lake-Calumet-Fish-report-July-2010.pdf>

For a report on the limitations of otolith sampling see Dr. Campana’s 2008 report “Otolith chemistry to describe movements and life-history parameters of fishes: hypotheses, assumptions, limitations and inferences”: <http://www.marinebiodiversity.ca/otolith/english/Abstracts/Elsdon%20et%20al%202008%20OMBAR.pdf>

### CONTACTS

Joel Brammeier  
Alliance for the Great Lakes  
(312) 939-0838 x224  
Jbrammeier@greatlakes.org

Jennifer Nalbone  
Great Lakes United  
(716) 213-0408  
jen@glu.org

Chad Lord  
Healing Our Waters  
Coalition  
(202) 454-3385  
clord@npca.org

Andy Buchbaum  
National Wildlife  
Federation  
(734) 887-7100  
buchbaum@nwf.org

Thom Cmar  
Natural Resources  
Defense Council  
(312) 651-7906  
tcmr@nrdc.org

Glynnis Collins  
Prairie Rivers Network  
(217) 377-3797  
gcollins@prairierivers.org



### REFERENCES

- <sup>1</sup> Unlock Our Jobs press release, “Human Introduction Confirmed in Asian Carp Discovery.” August 5, 2010. <http://www.unlockourjobs.org/2010/08/05/press-release-human-introduction-confirmed-in-asian-carp-discovery/>
  - <sup>2</sup> Associated Press, “Scientist: Carp May Have Been Planted Near Lake” August 5, 2010. <http://abcnews.go.com/print?id=11333152>
  - <sup>3</sup> Illinois Department of Natural Resources press release, August 5, 2010. <http://asiancarp.org/Wordpress/news/testing-complete-on-big-head-asian-carp-found-in-lake-calumet-2/>
  - <sup>4</sup> Unlock Our Jobs press release, “Human Introduction Confirmed in Asian Carp Discovery.” August 5, 2010. <http://www.unlockourjobs.org/2010/08/05/press-release-human-introduction-confirmed-in-asian-carp-discovery/>
  - <sup>5</sup> Brammeier, J., et al., “Preliminary Feasibility of Ecological Separation of The Mississippi River and the Great Lakes to Prevent the Transfer of Aquatic Invasive Species” 74, 79-82 (2008). <http://www.greatlakes.org/Document.Doc?id=473>
- See also: Malchoff, M., et al., “Feasibility of Champlain Canal Aquatic Nuisance Species Barrier Options.” (2006). <http://www.uvm.edu/~seagrant/communications/assets/ansbarrierrprt06.pdf>
- See also: FishPro “Feasibility Study to Limit the Invasion of Asian Carp into the Upper Mississippi River Basin” Report to Minnesota Department of Natural Resources (2004). [http://files.dnr.state.mn.us/natural\\_resources/invasives/aquaticanimals/asiancarp/umrstudy.pdf](http://files.dnr.state.mn.us/natural_resources/invasives/aquaticanimals/asiancarp/umrstudy.pdf)
- <sup>6</sup> U.S. Army Corps of Engineers, Chicago District, Monitoring and eDNA Archives. <http://www.lrc.usace.army.mil/AsianCarp/ArchivesPg.html>