

Southern Illinois University Summary of Data Obtained from the Silver Carp Caught in the Calumet River 6/22/2017

Based on examination of gonads, this fish was a mature male

Fish was age-4 based on examination of sectioned post-cleithra bones and vertebrae (consensus age estimate from examination of one post-cleithrum at SIU and examination of the other post-cleithrum and vertebrae by Duane Chapman's lab at the U.S. Geological Survey – Columbia Environmental Research Center)

Ploidy analysis of eyes at U.S. Fish and Wildlife Service La Crosse Fish Health Center confirmed that the fish was diploid. Analysis of tissue samples from the fish at the U.S. Fish and Wildlife Service Whitney Genetics Lab confirmed that it was a Silver Carp based on two mitochondrial markers.

One lapillar otolith was analyzed for stable oxygen and carbon isotope ratios ($\delta^{18}\text{O}$ and $\delta^{13}\text{C}$) using subsamples taken from the otolith core, edge, and mid-way between the core and edge. The second lapillus was analyzed for strontium:calcium and barium:calcium along a laser ablation transect from the core of the otolith to its edge.

Otolith core chemistry data were not consistent with this fish being of aquaculture origin. Otolith core chemistry was consistent with values expected for fish in the Illinois River or Middle/Lower Mississippi River, suggesting that it may have originated in one of these rivers.

Otolith chemistry data within the last quarter of the laser ablation transect (toward the otolith edge) are consistent with and suggest movement upstream into the Des Plaines River (precise location with respect to location of the electric barrier can't be determined).

Only the stable isotope subsample from the otolith edge reflects the expected value for the fish's collection location (Calumet River near O'Brien Lock and Dam, on the Lake Michigan/Lake Calumet side of the wastewater treatment plant effluent on the Calumet River). This suggests that the fish was at or near its collection location long enough to acquire that location's isotopic 'signature' (i.e., more than just a few days). Precise characterization of temporal resolution isn't possible due to difficulty in observing growth marks in lapilli otoliths from Silver Carp, but based on otolith-fish size relationships, locations of subsamples taken from the otolith, and estimated fish age, the fish was likely in the section of the Calumet River near its collection location for a period of weeks to months. Otolith chemistry data are consistent with arrival of the fish in the collection area at age-3 or 4, but not at an earlier age/smaller size.

Although otolith chemistry data are consistent with this fish having been in the Illinois and Des Plaines Rivers, it is not possible to determine whether the fish arrived at its collection location in the Calumet River on its own (breaching the electrical barriers) or if it was illegally transported to the Calumet River.