

## - NOTE -

### Common Carp Diet Includes Zebra Mussels and Lake Trout Eggs

#### ABSTRACT

Forty-seven common carp (*Cyprinus carpio*) were collected from harbors in southwestern Lake Michigan in 1993 and 1994, and their stomach contents were examined. Thirty-two of the carp contained zebra mussels; the proportion of carp feeding on mussels appeared to be related to the density of mussels at the site where they were collected. One of the only two carp collected during the lake trout spawning season on lake trout spawning habitat contained over 100 lake trout eggs. The fouling of cobble substrate by zebra mussels probably prevented the eggs from settling into interstitial spaces, thereby making the eggs vulnerable to carp predation.

Carp (*Cyprinus carpio*) was one of the first exotic species to invade in the Great Lakes. They possess heavy pharyngeal grinding teeth, and molluscs are a common component of their diet (Becker 1983). Therefore they are likely to be predators of exotic mussels such as the zebra and quagga mussels (*Dreissena polymorpha* and *D. bugensis*; French 1993).

I obtained two carp on Dec. 1, 1993 that were caught by fishermen along the outer breakwall at the Port of Indiana in southern Lake Michigan. During 1994, 45 carp were collected with an electroshocking boat inside Waukegan and North Point harbors, IL, and outside the west wall of the Port of Indiana. All carp were dissected within six hours of sampling and their stomachs were removed and preserved in formalin for later analysis.

Both carp collected in 1993 and thirty (67%) of the carp collected in 1994 contained zebra mussels. All four carp collected in 1993 and 1994 at the Port of Indiana had stomachs filled throughout their length with zebra mussels. Most (77%) of the carp collected in summer at Waukegan and North Point contained zebra mussels. None of the carp collected in October contained mussels, and few contained any material at all, which suggests that these carp were not feeding heavily. One of the carp collected at the Port of Indiana in 1993 contained 42 whole lake trout eggs and 70 egg chorions. Twenty-four (57%) of the whole eggs were translucent, indicating that they had been consumed while still viable.

The micro-habitat created by zebra mussels is richly inhabited by crustaceans and molluscs, which may be the primary goal of the foraging carp. Predation on zebra mussels by the carp I sampled was greatest at the site with highest zebra mussel densities (Port of Indiana), which suggests that zebra mussels may not be selectively grazed but are eaten in proportion to their availability. The number of other organisms in the stomachs tended to correlate with the number of zebra mussels. Zebra mussels may provide an important source of winter food for carp, as the mussels are readily accessible and extremely

abundant in many nearshore areas of the Great Lakes. The predation of zebra mussels by common carp adds support to the idea that stocking black carp (*Mylopharyngodon piceus*) as a zebra mussel control agent is redundant in addition to being potentially hazardous to native molluscs.

The presence of lake trout eggs in a carp stomach is surprising. Lake trout eggs should normally be protected from grazing predators because the eggs settle into interstitial spaces. The extensive colonization of the Port of Indiana breakwall by zebra mussels may have clogged most of the interstices, such that the eggs remained on top of the cobble among the mussels.

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### **LITERATURE CITED**

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