

# Metabolic Physiology of the Zebra Mussel and Abundance Changes in Native Mussels (Unionidae) Research Project

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## Project Ended FY 1999

Although information is available from Europe about the biological and ecological characteristics of the Zebra mussel, little is known about its physiological characteristics or variation in its biochemical content. Such data serve as indicators of the relative "health" of the population. Thus, comparisons of such data from different areas and during different times of the year may lead to a better understanding of the ecological requirements of the organism and, over time, may provide an understanding of fluctuations in the populations. Research from this project will determine the seasonal oxygen consumption and nitrogen (ammonia) excretion, and soft-tissue lipid content and C:N ratios of Zebra mussels collected from Lake St. Clair.

## 1999 Plans

We plan to finish counting Zebra mussels collected in 1996 at five sites in Lake St. Clair. These sites were the only sites (of 30) where unionids were collected in 1994. No unionids were collected at these sites in 1996. A short paper will be written that documents changes in the abundance and size-frequency of the Zebra mussel population at these five sites between 1994 and 1996.

## 1999 Accomplishments

The data analysis was completed and a manuscript published. To determine trends in abundances, a survey of unionids (Unionidae: Bivalvia) and Zebra mussels (*Dreissena polymorpha* [Pallas, 1771]; Dreissenidae) was conducted at five sites in the northwestern portion of Lake St. Clair in 1997. Previous, more extensive spatial surveys between 1986 and 1994 showed that unionids had basically been eliminated from the lake as a result of Zebra mussel infestation, but at least some unionids were still present in the northwestern portion in 1994. The 1994 survey also showed that Zebra mussel densities were still increasing in this portion of the lake. In the present survey, no live unionids were collected despite a sampling effort specifically modified from prior surveys to locate live individuals. Based on these results, it can be stated with great certainty that unionids have been completely lost from the open waters of Lake St. Clair. Zebra mussel populations appear to have reached a steady state in the northwest as evidenced by a decrease in mean density from 2,247 m<sup>-2</sup> in 1994 to 1,237 m<sup>-2</sup> in 1997, and a decrease in the mean size of individuals in the population. Although common in previous surveys, we did not collect any individuals with a shell length > 20 mm.

## Products

Nalepa, T. F., Hartson, D. J., Fanslow, D. L., and Lang, G. A. 2001. Recent population changes in Unionidae and *Dreissena polymorpha* (Zebra mussel) in Lake St. Clair. *Amer. Malacol. Bull.* 16(1/2):141-145.