



US Army Corps
of Engineers
Waterways Experiment
Station

Zebra Mussel Research

Technical Notes

Section 4 — Miscellaneous

Technical Note ZMR-4-07

May 1994

Reproductive Cycle of Zebra Mussels

- Background and purpose** Consideration of the zebra mussel reproductive cycle may be helpful when formulating and implementing control measures. For example, measures that target newly settled larvae should be intensified during periods of gamete release. The purpose of this technical note is to describe the timing of gamete synthesis and maturation for a population of zebra mussels from the Niagara River in Buffalo, New York.
- Additional information** This technical note was written by Mr. Dana R. Denson and Dr. Shiao Y. Wang, University of Southern Mississippi. Dr. Ed Theriot, U.S. Army Engineer Waterways Experiment Station, (601) 634-2678, is Manager of the Zebra Mussel Research Program.
- Approach** Monthly samples of 48 zebra mussels from the Black Rock Lock in Buffalo, NY, were dissected and the entire soft body fixed in Davidson's fixative. The samples were then embedded in paraffin, sectioned at a thickness of 5 μm , and stained with hematoxylin and eosin. Mounted sections of each mussel were examined using light microscopes to determine its sex and reproductive state. Since the beginning of the study in May 1992, nearly 700 mussels have been examined.
- Results** The reproductive cycle of these zebra mussels began in November, when the first evidence of sperm and egg development was seen. Gamete development continued through the winter and spring. Spawning began as early as May, when some of the mussels contained mature gametes. Most of the gametes were released in July and August, when all mussels above 9-mm shell length contained mature gametes. It is likely that individual mussels spawn several times during a season. Most of the spawning activity appeared to cease sometime in September, with all mussels having released gametes by October. In November, the cycle was reinitiated.
- Figure 1 illustrates the general reproductive pattern of zebra mussels as determined in this study.

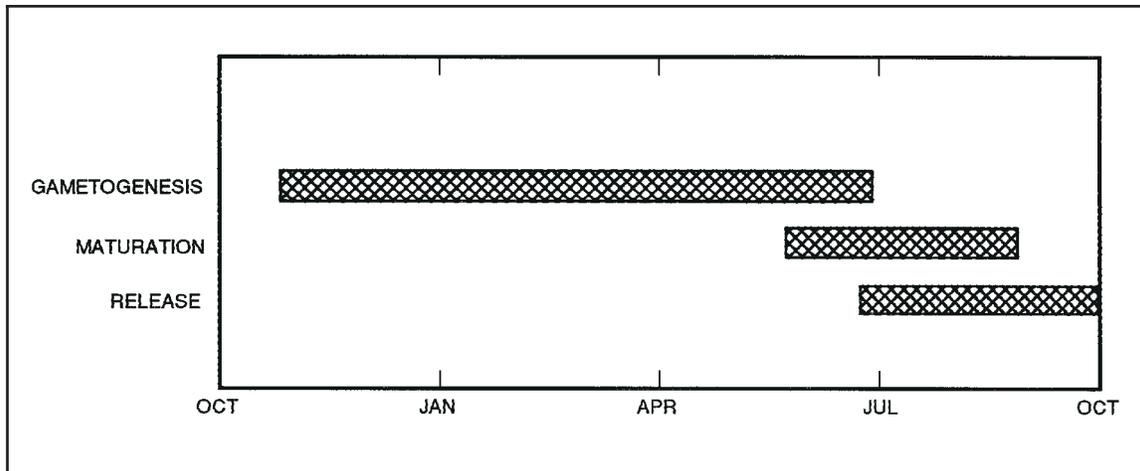


Figure 1. Timing of gamete synthesis, maturation, and release in zebra mussels

Possible control applications

Knowledge of the reproductive cycle of zebra mussels can allow for judicious timing of the application of appropriate control measures. Since spawning takes place mainly in July and August, it would be better to implement eradication measures prior to this time to prevent release of gametes. If the control strategy is directed toward the larvae, monitoring and control measures should be intensified during June through August, when mussel spawning activity is at its peak.