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**A SURVEY OF THE MUSSELS OF THE MINNESOTA RIVER, 1989**

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## ABSTRACT

A survey of the Mussels of the Minnesota River of southern Minnesota was made during the summer of 1989. Fifty-nine sites were studied and 1268 live specimens representing 20 species were examined for size, condition, and abundance. The distribution of both live and dead species was determined from the site analysis. Both quadrats and timed searches were employed to gather the data.

Forty native species have been reported to have occurred in the river since the late 1800's, but one of them, *Anodonta grandis corpulenta*, was not distinguished from *Anodonta grandis grandis* for the purposes of this study. Of the 39 taxa recognized, only 20 were found to be living in the Minnesota River now, 17 others apparently have been extirpated, and two species are extralimital. *Corbicula fluminea*, the introduced Asiatic Clam, was found in the lowermost part of the river in 1978, but has not been found live there since.

Many of the extant species are considered to be in some degree of trouble. No signs of reproduction or recruitment were found at many sites, and at others they ranged from poor to good. Both reproduction and recruitment success differed among the species.

Density was found to be low at most sites and no mussels were found at a few others. Both density and diversity (as number of species) were highest just below dams as the result of fish congregating there and the reasonably stable habitat provided by the dam.

Among the variety of limiting factors affecting the mussels of the Minnesota River, drought, unstable substrates, excessive siltation, and perhaps chemical pollution emerge as the most important ones.

In its present condition, the Minnesota River mussel fauna cannot tolerate commercial harvesting.

EXPLANATION OF TABLE 1a  
Historical Record of Mussels in the Minnesota River

This table presents a summary of all the available records of species that have been found in the Minnesota River as well as a record of voucher specimens housed at the Bell Museum of Natural History, University of Minnesota. Voucher specimens at the Museum were re-examined to determine their status at the time of collection. Based on criteria presented in the materials and methods section, each specimen was categorized as follows:

L = found live  
RD = found recently dead  
D = found dead

Species not represented by specimens in the Bell Museum's collection are designated by an "X". They may be either literature citations or represented by collections housed elsewhere.

- I The first record found is a drawing in the "Narrative of the Long Expedition" by William Keating. The drawing was based on a specimen collected by Thomas Say in 1823 and is labeled *Anodonta gibbosus*. It appears to be a specimen of what we might now call *Anodonta grandis grandis*. Say no doubt collected more material on the Minnesota but it was impossible to check for this report as his writings are missing from the university library. Moreover, his Minnesota River collections were not found.
- II In 1835, George W. Featherstonhaugh led an expedition known as "A canoe voyage up the Minnay Sotor". In the written account of the voyage, Featherstonhaugh first notes mussels in the Minnesota River between the Blue Earth River and Swan Lakes. He said, "A great profusion of unios were lying in the sandy bottom, buried to their umbones; the species called *fasciatus*" (presumably *Actinonaias ligamentina carinata*). Later in the journey, after departure from Lac Qui Parle, he discusses a five hour march to a stream called *Wahboptah* ". . .which may be translated *Ground Nut River* after the species *Psoralea esculenta*, a bulbous root which grows here" (he was referring to the Pomme de Terre River). He ". . .strolled up the stream and collected some very fine unios. . .". Featherstonhaugh's final reference to collecting mussels is upon reaching Big Stone Lake. "Here on the beach, I found great quantities of unios and anadontas [most likely *grandis grandis*]; and whilst I was engaged in opening some of them, a beautiful large black marten came towards me, but ran off as soon as I stirred". The disposition of his specimens is as yet unknown.
- III Uly S. Grant was a geologist with the Minnesota Geological and Natural History Survey and, among his other duties, was in charge of collecting and curating mollusks. His report of 1886 not only lists mussels in the old Natural

- History Survey collection, but also mentions abundance. Most of his specimens are in the collection of the Bell Museum of Natural History.
- IV According to an old, inactive Bell Museum catalog, C. W. Hall collected several species in the late 1800's at Granite Falls. These specimens were lost sometime between 1900 and 1933 as their records were not transferred to the catalog begun in 1933.
- V Collector unknown. 1900. The Bell Museum has one specimen of *L. fragilis* collected from the mouth of the Chippewa River
- VI Henry Nachtrieb, former head of the Department of Zoology, University of Minnesota, was hired to survey the mussels of the Minnesota River. A recently discovered unpublished report by Nachtrieb indicates that he collected during the summer of 1908. The Bell Museum has many specimens collected from the Minnesota River during that time for which the collector is not listed, and it is most likely that they were collected by him. Because he collected with a crowfoot and boiled the specimens he sent to the Bureau of Fisheries, it is concluded that the mussels listed in his report represent live ones.
- VII Collector unknown. 1930. A single specimen of *A. grandis grandis*. Location given only as "Minnesota River".
- VIII Theodore A. Olson, formerly professor in the School of Public Health, University of Minnesota. He collected many specimens in the mid 1930's.  
1-- A live specimen (Bell MNH XXXX) collected near New Ulm in 1934, but no collector is recorded in Bell Museum records. C. Dawley (1944) recorded a specimen collected near New Ulm in 1934 by T. A. Olson. They are probably the same.  
2-- C. Dawley (1944) recorded that *P. cyphyus* was collected in 1934 16 miles above New Ulm, but she did not indicate the collector. It is likely that her record is one of Olson's.  
3-- C. Dawley (1944) recorded that *T. truncata* was collected in 1934 16 miles above New Ulm, but she did not indicate the collector. It is likely that her record is one of Olson's.
- IX Charlotte Dawley's works (1944, 1947) contain records of mussels known from the Minnesota River prior to 1944. She based her distribution records on the literature and specimens that are now at the Bell Museum. There is no record to show that she ever collected the Minnesota River.
- X Collector unknown. 1963.
- XI Marion E. Havlik. 1977. All specimens were collected dead in dredge spoil at the head of the 9-foot channel at river-mile 14.7 near Savage.

- XII Cummings & Jones. 1978
- XIII Bob Belligh. 1985.
- XIV Wallmow and McCormack. 1985.
- X V John Schladweiler. 1985.
- XVII ~~John Moriarity. 1988.~~ → XVI John Schladweiler. 1988
- XVIII John Enblom. 1988.
- XIX : Gerda Nordquist. 1988.
- X X Marion E. Havlik. 1989
- XXI This study.



