

NATURAL HISTORY SURVEY REPORTS

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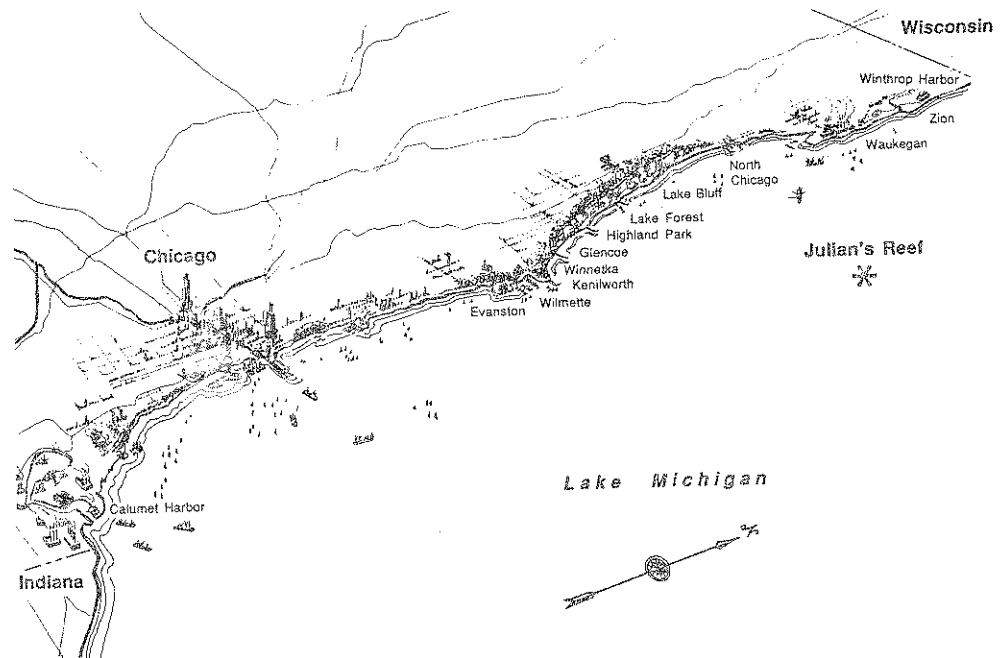
Lake Trout Spawning Studies on Julian's Reef, Lake Michigan

In Illinois, efforts to reestablish self-sustaining lake trout populations in Lake Michigan have focussed on Julian's Reef with well over one million lake trout stocked there. The fish have survived and grown well enough to support a lake trout sport fishery in Illinois. To date, however, no direct evidence exists to prove that the stocked fish successfully reproduce on Julian's Reef, or anywhere else in Illinois waters; although each fall over Julian's Reef the Illinois Department of Conservation is able to collect mature adult lake trout bearing viable eggs and sperm.

Until the mid-1940's native lake trout were sufficiently abundant in Lake Michigan to support commercial fishermen operating out of Waukegan and Chicago. In

the early days they were caught on set lines carrying 100 to 500 hooks each. One old fisherman interviewed in the 1970's remembered taking 300 to 700 pounds of lake trout per lift. Later, gill netting became the preferred method of capture and annual commercial harvests from Illinois' waters grew to exceed 1,000,000 pounds in the early 1940's. During the years when native lake trout were abundant in Lake Michigan, Julian's Reef was probably one site used for spawning.

Sea Lampreys were first reported in Lake Michigan in 1936. The sea lamprey's primary victim was the lake trout, and by 1950 the lake trout catch had dropped to zero. Lake Michigan was not unique; lake trout were extinct in all of the Great Lakes except Lake Superior where remnant native populations persisted.



Illinois shoreline on Lake Michigan showing location of Julian's Reef.

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The Past and the Promise

Stephen P. Havera
Katie E. Roat

Illinois Natural History Survey
Special Publication 10

Illinois River backwater lake near Havana in 1894 and the main points of interest thereafter. Forbes is known to many as the "Father of Ecology" and was the first Chief of the Natural History Survey.

The establishment of this biological station, first named the University of Illinois Biological Experiment Station and later referred to as the Illinois Biological Station, allowed Forbes and his staff to pursue the "continuous investigation of the aquatic life of the Illinois River and its dependent waters." This station, originally consisting of a chartered cabin boat stationed on Quiver Lake and three rented rooms in Havana, and the research conducted by the station's staff over 95 years have permitted the Illinois River to be referred to as the "most studied" river in the world.

During the span of years beginning with Forbes' first studying the Illinois River in 1876, continuing through the establishment of the biological station in 1894, the construction of a permanent building in 1939, and the expansion and remodeling of that building in 1988, Survey scientists have documented man's effects on an essentially pristine river. The special publication on the Forbes Biological Station is an entertaining

journey of words and pictures through almost 100 years of science conducted at a unique establishment.

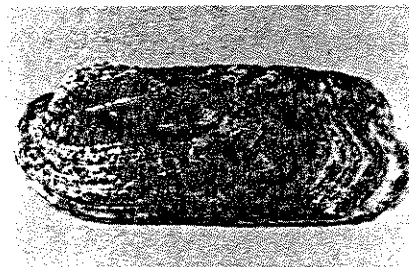
By Stephen P. Havera, Wildlife Research Section

Mussels of the Wabash River Drainage

The Wabash River, the longest free-flowing river in the eastern United States, and its floodplain contain abundant fish and wildlife. It is one of the few large rivers in the country that remain unimpounded and unchannelized throughout most of its length. From the time that Thomas Say, one of America's first naturalists, arrived in New Harmony, Indiana, in the early 1800's to the present, biologists have been interested in the diverse and abundant freshwater mussel fauna of the Wabash River. Approximately 75 species of mussels have been reported from the Wabash River; unfortunately, data collected in the past two years indicate that the number of species now present is only about 37, a 51% decrease in the number of species present historically.

Mussels are filter feeders that must continuously pass water through their gills to survive and, thus they are excellent indicators of water quality. These animals are normally long-lived and sedentary, and they are extremely susceptible to the cumulative effects of siltation and other forms of pollution.

In order to provide protection for this important part of our natural heritage, periodic stream surveys are needed to document changes in mussel populations. By looking at the number of individuals of each species found today



The rabbitsfoot (*Quadrula cylindrica*), one of the endangered mussel species found in the Wabash River Drainage (photo by Kevin S. Cummings).

The Illinois

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and comparing them to data from past studies, we can estimate changes that have occurred over the years. Recent surveys have indicated that many mussels that were widespread and common in the Midwest have been drastically reduced in number, or are thought to be extinct.

In 1987, a three-year study of the mussels of the Wabash River and two of its major tributaries, the White and Tippecanoe rivers, was initiated. The objectives of the study are to document the distribution and abundance of mussels present with a particular emphasis on endangered species. The project is a cooperative effort between the Illinois Natural History Survey, the Indiana Department of Natural Resources Division of Nongame and Endangered Species, and the U.S. Fish and Wildlife Service. Surveys have been completed on the Wabash and Tippecanoe rivers, and work began on the White River in the summer of 1989.

Fifty-three sites on the Wabash River and 16 sites on the Tippecanoe River were systematically sampled from spring 1987 to late summer 1988. Shells of 62 species were collected in the Wabash River, but only 37 species were found alive. The Wabash River collections were dominated by three species which accounted for over 64% of the 3,784 live mussels found.

The Tippecanoe River is a medium-sized tributary of the Wabash River in northern Indiana. It is one of the finest streams remaining in the upper Midwest with respect to mussels and contains many rare species. Forty species were found in the Tippecanoe River and, of those, 34 were found alive. The three most abundant species accounted for 33% of the 1,499 live mussels found.

Shells of 20 rare, threatened, or endangered species were found, but only six were found alive. These six include the federally endangered fat pocketbook (*Potamilus capax*); the federal candidate species fanshell (*Cyprogenia stegaria*), clubshell (*Pleurobema clava*), purple lilliput (*Toxolasma lividus*), the state-listed sheepsnose (*Plethobasus cyphus*), and rabbitsfoot (*Quadrula cylindrica*).

This survey and others like it around the eastern United States indicate that we have lost or are in danger of losing many of our native mussels. The decline in mussel populations is probably due to a combination of factors but siltation seems to be the primary cause. Stronger soil conservation measures are needed in lands bordering our streams to prevent surface run-off and to help curtail erosion. Increased controls on the commercial harvest of these animals may also be warranted if we are serious about protecting this valuable resource.

By Kevin S. Cummings, Section of Faunistic Surveys and Insect Identification

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