

A SURVEY OF FISHES IN AN ILLINOIS STREAM

By LOREN P. WOODS
CURATOR OF FISHES

RUNNING DOWN the west side and around the foot of Lake Michigan lies a continental divide, the Valparaiso Moraine, left there by the retreat of the last (Wisconsin) glacier. This is a true divide, for water falling on the east face of it flows through the Great Lakes and out the St. Lawrence, while that falling on the west and south eventually reaches the Mississippi River and Gulf of Mexico. Actually this divide is scarcely noticeable when driving across it for it is of low relief and the streams

beneath the surface. This turbidity, characteristic of most of our streams, results from run-off of fields, eroding banks, and livestock wading in the channel. These factors introduce a large amount of exceedingly fine silts and clays, of which the soils of the surrounding country have a high percentage, into the streams.

STREAM WATERS CLEAR

In late winter while the surface water is still held frozen on the land the only water entering the stream proper is ground water seepage from springs. At this time



MUSEUM FISH COLLECTORS AT WORK IN HICKORY CREEK, ILLINOIS

flowing from its summit are usually sluggish. In fact, many of the streams have one or more of their source tributaries rising from the overflow of a marsh held between the low glacial-drift hills that make up the divide. Such a stream is Hickory Creek, rising in southwest Cook County, Illinois, flowing southwest, and emptying into the Des Plaines River at Joliet. Hickory Creek and its principal tributary, Marley Creek, resemble most of the smaller streams of northeastern Illinois in characteristics of low gradient, shallow valley, and banks alternately following along cultivated fields, pastures, woodlands, or through towns. Hickory Creek's fauna and flora are largely duplicated in the majority of other small streams making up our local drainage pattern.

Hickory Creek is approximately 21 miles long from its farthest east tributary to its mouth, and it drains an area of about 100 square miles. During most of the year the water is quite turbid so that only by sampling with seine, dredge, or dip net is it possible to learn anything about what lies

the water is free from silt and it is possible to see the stream bed along its entire length. The invertebrates that have survived the winter, the fishes, and their nesting areas all are visible. On February 3 one year, although the water was clear, in the shallow headwater portions of Marley Creek a great deal of anchor ice was present and no fishes were seen. Anchor ice is formed where the current is too swift for the formation of surface ice. The turbulent water is cooled by the air below the freezing point but it does not freeze because of its motion. Near the bottom or wherever the current is sufficiently retarded the supercooled water freezes and the ice attaches to stones, frequently to such an extent that the whole bottom may be covered by ice.

Supercooling on clear cold nights when the air temperature is below zero degrees Fahrenheit will often cause the formation of innumerable free crystals of slush ice (sometimes called frazil). The ice crystals may be sufficiently abundant to make the water milky. Slush ice and anchor ice scouring the

bed and polishing the rocks or covering up the bed may greatly reduce the numbers of all kinds of animals in the creek. Some kinds of fishes survive living in the mouths of springs and some in riffles too swift for the attachment of anchor ice, but most kinds migrate downstream where they find deep holes.

The thawing of the ice held on land and along the edges of the stream along with spring rains often swells the volume to flood stage. It is well known that during such periods of rising waters many kinds of fishes migrate upstream.

The white sucker and creek chub move upstream and spawn on gravel beds that may be covered with 12 to 24 inches of water only during flood periods, that is, within the intermittent portion of the stream. The young creek chubs remain in this part of the stream and sometimes perish if the water falls too rapidly. Other species that migrate upstream as far as they can are the stone roller, the little green sunfish, and golden shiner. The last two species even enter tiles draining fields and may work their way up to a break so they come out in a flooded field or perhaps in a suburban garden.

Lampreys and carp also migrate upstream to spawn, the lamprey very early in spring (April) and the carp a little later (May and June). The non-parasitic brook lampreys spawn on gravel riffles where the water is not more than two feet deep. With their sucker mouths they carry stones until they have constructed a shallow depression about 12 to 24 inches in diameter. The pair then attach themselves to a large stone at the upstream edge of the nest to spawn. The freshly laid eggs stick so firmly to the stones of the nest that any attempt at dislodging destroys them, but after a day or two the eggs are washed off and lie loose among the pebbles. Carp seek a shallow weedy area for their spawning—a marsh or even a flooded pasture. Usually one female is attended by several males and with much splashing the eggs are scattered widely. These eggs are adhesive and cling to plant surfaces. Many eggs are lost, but carp are very prolific—one female will produce 300,000 to 700,000 eggs in a season but not more than 400 to 500 are deposited at one time.

Altogether 38 species of fishes have been collected from Hickory Creek. Since this is a small stream, nearly all the thousands of individuals taken have also been small (less than 10 inches). They are principally of kinds that are most often found inhabiting creeks although some kinds also live in larger streams or lakes where they grow to larger sizes. In Hickory Creek there are 4 kinds of suckers, 14 species of minnows, 4 species of catfishes, 5 different sunfishes, 8 kinds of the dwarf perches (called darters) and the mud-minnow, the sculpin, and the black-striped top minnow. It is unusual to find such a diversified lot of fishes living in a stream of this size. The present inhabi-

tants of the creek are almost completely isolated from other streams by pollution at the stream mouth. Studies on Hickory and Marley Creeks have been carried on intermittently by many people during the past 50 years and a survey made within the last five years revealed the same kinds as those in Museum collections gathered 50 years ago. The fact that until recently the watershed and stream have remained relatively unchanged is no doubt responsible for this stability.

During the recent survey no little pickerel were collected, although these are still abundant in adjacent streams and were reported from Hickory Creek by the early collectors. Very likely this one species has disappeared from this stream and it is the only one of which there is a record of extinction. Two exotic species, carp and goldfish, have appeared in the stream either by invasion or introduction since the early survey was made around 1905.

Looking at the stream from the marshes at the head to the sludge-laden mouth, similar habitats of pools, gravelly riffles, broad meandering mud-bottom stretches, and weed patches occur again and again. Many of the species have very definite habitat preferences and no species is found distributed throughout the stream in a random or uniform manner. The rock bass can always be found in the deep holes under bridges while the catfishes and suckers live in the deep, mud-bottom holes of meanders or where a tributary joins the main stream. The sunfishes and several kinds of minnows prefer deep

The two most important conditions that determine how animals are distributed in streams are current and kind of bottom. These two conditions influence the vegetation, light, and carbon dioxide and oxygen content. On the other hand the conditions of current and kind of bottom are determined by the physiography, the length of the stream, and elevation of the source above the mouth.

The habitat preferences change as the fish grows. The very young fry of most species seek protection in shallows where the grass or rushes grow dense and the battle against the current is least. As they grow and change their feeding habits they move to other parts of the stream.

Since fishes are sufficiently motile they are able to seek out the place along the stream that suits them best. Once established, the individuals tend to remain throughout the season. Although they may be temporarily dislodged by a summer flood, the majority return to the same spot and never wander very far from it.

During the summer the stream population is fairly sedentary. The principal movements and migrations occur in late fall and early winter when most kinds of fishes cease to feed and seek the protection of deep holes where they crowd together. In the spring, even before the ice has completely melted from all parts of the stream, some kinds—for example, the suckers and sculpins—begin their migrations to suitable spawning areas. The other kinds—sunfishes, minnows, and catfishes—disperse later. Several

kinds of sunfishes remain on the spawning beds all summer, holding a territory against others of the same species, guarding eggs or caring for successive broods.

As the population of the city and suburbs grows, few streams in our area remain unchanged. Siltation and domestic and industrial pollution reduce the streams to conditions far from suitable for most kinds of fishes. Subdivisions and country homes along the valley usually

destroy the very natural beauty that made the site desirable. The Hickory Creek fauna survived the establishment of farms and pastures, but within the past five years many sections have changed because of growth of villages in the watershed and building along the valley. Dredging and straightening have begun. I predict that a survey 50 years hence will be so unproductive that no biologist is likely to be interested in making it.

STAFF NOTES

Papers on technical subjects were presented before various sections of the meetings of the American Association for the Advancement of Science in Washington on December 28 by four members of the Museum staff: **Dr. Robert H. Denison**, Curator of Fossil Fishes; **Dr. Rainer Zangerl**, Curator of Fossil Reptiles; **Philip Hershkovitz**, Curator of Mammals, and, *in absentia*, **D. Dwight Davis**, Curator of Vertebrate Anatomy. . . **Emmet R. Blake**, Curator of Birds, has returned to the Museum after nearly half a year in Peru where he conducted the Conover Ornithological Expedition. His account of collecting in little-known areas will appear in the next BULLETIN. . . **Rupert L. Wenzel**, Curator of Insects, attended the annual meetings of the Entomological Society of America last month in Salt Lake City. He also spent several days in study of collections at the California Academy of Sciences, San Francisco. . . **Loren P. Woods**, Curator of Fishes, recently lectured on "The Sea Lamprey in Lake Michigan" before the Izaak Walton League. . . **Henry S. Dybas**, Associate Curator of Insects, recently spoke before the Conservation Council in Chicago on "The Periodical Cycada." . . **Allen Liss**, Custodian of Collections-Anthropology, attended the recent annual meeting of the Illinois Archaeological Survey in Urbana.

Staff Changes Announced

At his own request, **Dr. Fritz Haas**, Curator of Lower Invertebrates, has relinquished the active control of his division, to assume a research and consultative status under the title of Curator Emeritus of Lower Invertebrates. **Dr. Alan Solem**, Assistant Curator of the division, has been promoted to Curator of Lower Invertebrates.

Melvin A. Traylor, Jr., has been promoted from Assistant Curator to Associate Curator of Birds.

Miss Patricia McAfee has been promoted from Assistant to Associate in Public Relations.

The changes are effective from January 1, 1959.

Children's Journeys Continue To Birds' Winter Resort

The Museum Journey for children entitled "Chicago—Winter Resort for Birds," will continue this month and on to the end of February. Boys and girls may take this Journey any day during regular visiting hours. They may obtain instructions and questionnaires at either the north or south entrance of the Museum. Those who successfully complete four different Journeys receive awards as Museum Travelers.



GREEN SUNFISH AND REDFIN SHINER ON NET

stretches with gravel or hard bottom and the darters and sculpin live on the riffles or parts of the stream where the current is most rapid. In one stretch there is a forested section and the stream here has more than usual gradient, cutting into dense clay. Here, in submerged holes in the banks, lives the translucent madtom catfish. The lower portion of the stream where broad weed patches grow in summer is the habitat of smallmouth bass 8 to 10 inches long.



Woods, Loren P. 1959. "A Survey of Fishes in an Illinois Stream." *Bulletin* 30(1), 6-7.

View This Item Online: <https://www.biodiversitylibrary.org/item/25677>

Permalink: <https://www.biodiversitylibrary.org/partpdf/371312>

Holding Institution

University Library, University of Illinois Urbana Champaign

Sponsored by

University of Illinois Urbana-Champaign

Copyright & Reuse

Copyright Status: In copyright. Digitized with the permission of the Chicago Field Museum.
For information contact dcc@library.uiuc.edu.

Rights Holder: Field Museum of Natural History

This document was created from content at the **Biodiversity Heritage Library**, the world's largest open access digital library for biodiversity literature and archives. Visit BHL at <https://www.biodiversitylibrary.org>.