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## An Annotated List of the Fishes in the Streams Tributary to the Missouri River in Iowa

By HARRY M. HARRISON AND EVERETT B. SPEAKER

### INTRODUCTION

This paper is a report on the fishes collected in 17 streams draining the western and southern slopes of Iowa into the Missouri River. These streams include the Big and Little Sioux, Rock, Floyd, Ocheyedan, Otter, Soldier, Boyer, Maple, Willow, Plumb, Walnut, Nishnabotnas, Nodaway, Grand, 102 and Chariton Rivers. A total of 18 families represented by 74 species of fish are reported.

### TOPOGRAPHY

The topography of the area embraces at least three separate and distinct features. All of these exhibit discernable influences upon the stream flowing through them and in turn a different fish fauna is found associated with each. The magnitude of these faunal differences is quite proportional to the extremes displayed by the given topographic feature.

In the area glaciated by the Wisconsin glacial drift the surface of the land is nearly flat or gently undulating and natural drainage is for the most part quite poor. Erosion is at a minimum, the streams are sluggish and follow tortious paths. Fish life thrives from the standpoint of both numbers and specieization.

The second topographic feature falls within the area covered by the Missouri loesses. In this region the greater part of the surface presents a rolling topography that changes from nearly flat in the up-stream portions to gently rolling in the middle reaches and very rough as the streams approach the great valley of the Missouri. Eroding soil from the hills functions as a detriment to the economy of the streams. During freshets it smothers many kinds of aquatic life, including fish, by collecting on the gills and causing suffocation. Without exception, fish life, both from the size of populations and number of species become less and less as the streams run deeper into the loessial areas.

The third topographic feature of the region includes the alluvial plains of the Missouri and the lower reaches of its tributaries. A peculiarity of these plains is that they slope down from the

Missouri River to the base of the bordering bluffs. This partially accounts for the presence of numerous ponds and small lakes in the flood plain. Erosion from the immediate landscape is practically non-existent. Even though there is no immediate erosion, the streams are clogged with silt exuded from the areas upstream, and because of this the streams in the alluvial areas are by and large unfit for anything more than intermittant fish occupation. During brief periods of the year, however, quite good populations develop in these areas. The fishes probably run for a few miles into the tributary streams from the Missouri River and this accounts for their presence in the alluvial areas at certain stages of the river.

#### HISTORY AND PRESENT STATUS OF FISHES OF THE AREA

Fish remains have been found in the disposal pits of prehistoric Indian camps and records concerning the fishes of western Iowa date back at least to the explorations of Lewis and Clark. Others who pioneered in the Missouri Valley, including itinerate packet steamboat pilots, confine their remarks to casual notes on the abundance, availability and exceptional size of fishes observed.

To our knowledge the earliest scientific work in this area was compiled by Seth E. Meek between 1884 and 1887 (Meek, 1892). Further collections of fishes from western Iowa were reported by Meek in 1894. Larabee (1928), reporting principally on fishes of the Okoboji Lakes region, made several collections in the Little Sioux River in Dickinson County. Churchill and Over (1933), in their report on the fishes of South Dakota, specifically list several species from the Big Sioux River which borders Iowa. In 1932 Salyer and Speaker (MS) collected a few species from the Little Sioux River for Dr. Carl L. Hubbs who was engaged in making a survey of Iowa fisheries for the Iowa 25 Year Conservation Plan (1933). Some 40 collections were made in the streams of western Iowa by Speaker between 1932 and 1943. Some of these fishes were examined by Dr. Reeve M. Bailey and a few individuals are preserved in the Iowa State College Collections at Ames. Bailey, between 1936 and 1946, made widely scattered collections from tributaries and the Missouri River proper. These collections and field notes are housed at Iowa State College. Between 1949 and 1952, Harrison made over 80 collections in the 17 streams discussed in this paper.

The points of collections made by Harrison are shown in Figure I.

The present list included 74 species representing 18 families and is compiled from all above mentioned collections. Representative specimens of the fishes are stored at the University of Michigan Museums, Ann Arbor, Michigan; the Iowa State College, Ames, Iowa; and the State Conservation Commission, Madrid and Spirit Lake.

Only a few of the collections reported by Meek are comparable in location to the more recent collections of the authors and their co-workers. In these comparable surveys, Meek took 37 species of fish of which only one, the rock bass, has not been taken by contemporary workers. Collections made since 1932 in the same or nearby watersheds as those made by Meek have recorded a total of 74 species of fish. Had Meek worked a wider area in the Missouri watershed, he would have certainly expanded his list considerably. It is significant to note that the species lists and relative abundance have not changed appreciably. Most species reported abundant by Meek are still abundant, and those reported as rare are yet rare. There is some feeling that fish populations in western Iowa have not changed to any great degree as a result of civilization and intensive agricultural practices in the past six or seven decades.

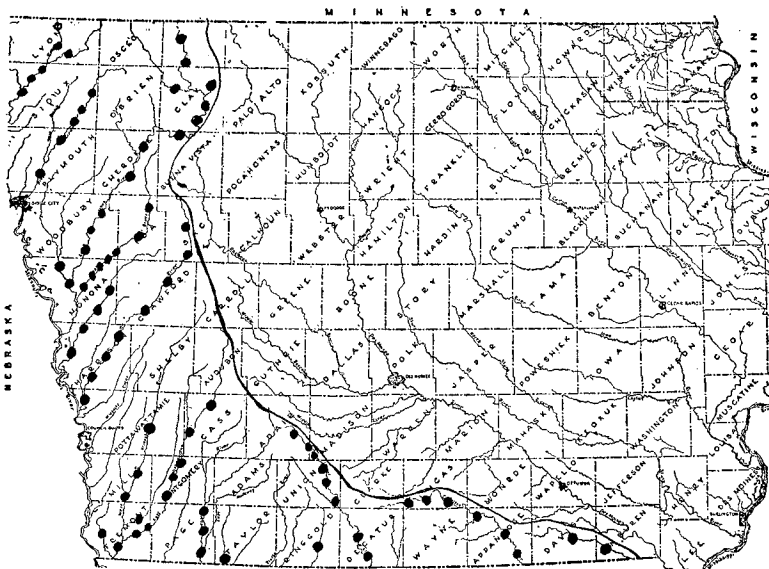


Figure 1. Geographical Location of Fish Collections Made Between 1949 and 1951.

## Paddlefish Family

*(Polyodontidae)*

*Polyodon spathula* (Walbaum), Paddlefish.—Rare. Specimens have been collected from the Missouri River and lakes in the flood plain, and although none have been taken from tributary streams, they must certainly move into the lower reaches of these streams upon occasion.

## Sturgeon Family

*(Acipenseridae)*

*Scaphirhynchus platyrhynchus* (Rafinesque), Shovelnose sturgeon.—Rare. This species is taken in the Missouri and is known to run into the larger tributaries from time to time. An individual from an overflow pond of the Missouri River in Mills County is contained in the Iowa State College collections.

## Gar Family

*(Lepisosteidae)*

*Lepisosteus platostomus* Rafinesque, Shortnose gar.—Rare. Generally speaking, this species is more abundant than the longnose gar. In the tributaries of the Missouri the shortnose gar is found most frequently in the area of the alluvial plains. It diminishes upstream.

*Lepisosteus osseus oxyurus* Rafinesque, Longnose gar.—Rare. Several specimens of the longnose gar were seined from below a lowhead dam in the Grand River near Davis City. The other occurrences of the species were confined to single individuals taken in the Nishnabotna, Nodaway and Soldier Rivers.

## Herring Family

*(Clupeidae)*

*Dorosoma cepedianum* (LeSueur), Gizzard shad.—Common. Widely distributed, but in quite small numbers throughout the whole Missouri watershed except in the flood plain lakes where it is abundant. In the streams, it reaches its greatest development in the downstream areas.

## Mooneye Family

*(Hiodontidae)*

*Hiodon alosides* (Rafinesque) Goldeye.—Rare. This species was quite abundant in the Grand River in our surveys in 1942 and 1948. In several collections since then, in the Grand River, the species has not reoccurred. Single individuals have been taken in the middle reaches of the Nishnabotna, Nodaway and Rock Rivers. Meek reported a few individuals from the Floyd River in 1890.

## Pike Family

*(Esocidae)*

*Esox lucius* Linnaeus, Northern Pike.—Rare. The northern pike occurs infrequently in the upper reaches of the Little Sioux and probably gains access to this stream from the Dickinson County lakes where it is relatively abundant. In 1894 Meek reported it as common in the Floyd River.

## Sucker Family

*(Catostomidae)*

*Cycleptus elongatus* LeSueur, Blue sucker.—Rare. The authors have observed but one specimen taken from the Big Sioux River although specimens are taken on occasion by commercial fishermen operating on the Missouri River. It was reported as abundant by Meek from the Floyd River in 1890.

*Ictiobus cyprinellus* (Valenciennes), Bigmouth buffalo.—Common. Only a few specimens of this species have been obtained in our surveys. It is generally distributed over the entire Missouri watershed, and reaches its greatest development both from the standpoint of numbers and size above dams.

*Ictiobus niger* (Rafinesque), Black buffalo. — Rare. A single specimen from the Little Sioux River is preserved at Iowa State College.

*Ictiobus bubalus* (Rafinesque), Smallmouth buffalo.—Rare. A specimen from Mills county is preserved in the Iowa State College collection of fish. Meek (1894) reported this species as abundant in the Floyd River near Sioux City.

*Carpiodes forbesi* Hubbs, Plains sucker.—Rare. A single individual from the Rock River has been examined by the authors. A second specimen from the Big Sioux is preserved in the Iowa State College collections.

*Carpiodes cyprinus* (LeSueur), Quillback.—Common. Found primarily in the glaciated and upper loessial areas. Absent downstream.

*Carpiodes carpio carpio* (Rafinesque).—Common. Over sand bottoms this species is quite abundant in the glaciated and upper loessial areas. It is absent in the deep loesses and in the alluvial areas.

*Carpiodes velifer* (Rafinesque), Highfin sucker.—Rare. This species is largely confined to the glaciated regions and is most frequently found in the swifter waters over gravel bottoms or in deposits of boulders.

*Moxostoma erythrurum* (Rafinesque), Golden Redhorse.—Rare. Only two specimens of this species were taken, these from the Rock River below Rock Rapids. Also reported as rare in the Floyd River by Meek (1894).

*Moxostoma aureolum* (LeSueur) Northern Redhorse.—Rare. This is a species quite largely restricted to the area covered by the Wisconsin Glacier. One specimen, however, was secured in the upper reaches of the Nishnabotna and one in Grand.

*Hypentelium nigricans* (LeSueur), Northern hog sucker.—Rare. One specimen taken in the Rock River. The species should and probably does occur in all of the glaciated area.

*Catostomus commersoni commersoni* (Lacepede), Common White Sucker.—Abundant. Occurs common to abundant in all waters. Rare, however, in the deep loessial regions of western Iowa.

#### Minnow Family

##### (Cyprinidae)

*Cyprinus carpio* Linnaeus, Carp.—Abundant. The carp is generally distributed throughout the Missouri watershed in Iowa. It is one of the most abundant species in the watershed. Like so many of the other fish of wide distribution in this area, this species is rare only in the deep loessial areas of western Iowa.

*Notemigonus crysoleucas auratus* (Rafinesque), Western Golden shiner.—Common. Widely distributed but always in small numbers throughout the Missouri watershed.

*Semotilus atromaculatus atromaculatus* (Mitchell), Northern creek chub.—Common. This species is common to all waters except in the deep loessial areas. It reaches its greatest development from both numbers and size in waters where only a few other species are present.

*Hybopsis biguttata* (Kirkland), Hornyhead chub.—Rare. The hornyhead chub is entirely restricted to the area covered by the Wisconsin glacier. Locally it is quite abundant in the upper reaches of the Little Sioux and Ocheydan Rivers.

*Hybopsis gracilis communis* (Girard), Plains flathead chub.—Common. This chub is not found in glaciated areas but is abundant in streams flowing through the loesses. It is less abundant in the alluvial plains.

*Hybopsis storeriana* Kirkland, Silver chub.—Rare. The silver chub was taken only in the streams of southern and southwestern Iowa. It was taken only as single individuals.

*Hybopsis gelida* (Girard), Sturgeon chub.—Rare. This species was reported as abundant by Meek in 1892 in the Missouri River. It has not been recorded from the inland streams of the state, but an individual from the Missouri River in Mills county is preserved in the Iowa State College collections at Ames.

*Hybopsis aestivalis* (Girard), Speckled chub.—Rare. The speckled chub was found only in the Grand, Nishnabotna and Nodaway Rivers. Except for the Nishnabotna where several specimens were seined, all other occurrences were as single individuals. The bodies of all specimens were conspicuously and irregularly marked with black flecks.

*Rhinichthys atratulus meleagries* (Agassiz), Western blacknose dace.—Rare. This species is confined entirely to the reaches of streams flowing through the glaciated area where it is fairly common. In this region it frequents swift waters generously supplied with rubble and boulders.

*Phenacobius mirabilis* (Girard), Plains suckermouth minnow.—Common. The suckermouth minnow is generally distributed in small numbers over the whole region being treated in this paper. It is absent, however, in the deep loesses and alluvial plains of western Iowa streams.

*Notropis atherinoides atherinoides* Rafinesque, Common emerald shiner.—Rare. Only two occurrences were recorded for this species, and these were as single individuals in the Nishnabotna and Nodaway Rivers.

*Notropis cornutus frontalis* (Agassiz), Northern common shiner.—Common. This species is absent only in the deep loesses and in the alluvial plains of the Missouri. Otherwise it is well distributed over the entire area.

*Notropis hudsonius* (Clinton), Spottail shiner.—Rare. Very few specimens of this fish were secured in our surveys. In all cases, these were from the Little Sioux River in Dickinson and Clay counties and possibly owe their presence in the stream as a result of running out of the Dickinson county lakes where they are relatively abundant.

*Notropis blennius* (Girard), River shiner.—Rare. A single specimen of this species from Mills county is preserved in the Iowa State College collections.

*Notropis dorsalis dorsalis* (Agassiz), Central bigmouth shiner.—Common. This species is found in all waters except the deep loesses and the alluvial plains. It shows a distinct preference for clearer waters and is most abundant in the glaciated area.



*Notropis lutrensis lutrensis* Baird and Girard, Plains red shiner.—Common. The plains red shiner is confined largely to the shallow and moderately deep loesses. In these areas where bedrock is exposed the species is very abundant.

*Notropis deliciousus missuriensis* (Cope), Plains sand shiner.—Common. The sand shiner reaches its greatest development in the glaciated section of the region. It is, however, quite tolerant of silt and ranges in substantial numbers far down into the loesses. It was not taken in the deep loesses or the alluvial plains of the Missouri River.

*Notropis topeka* Gilbert, Topeka shiner.—Rare. Only one specimen of the Topeka shiner was secured in our surveys. This was taken in the Rock River near the town of Rock Rapids.

*Hybognathus hankinsoni* Hubbs, Brassy minnow.—Common. The brassy minnow is quite largely confined to the glaciated area and for a short distance into the loess.

*Hybognathus nuchalis nuchalis* Agassiz, Silvery minnow.—Common. Generally speaking, this species was found only in southern and southwestern Iowa. Presumably it is quite tolerant of silt but not to the extent for survival in the deep loessial or alluvial areas of the Missouri River.

*Hybognathus placita* (Girard), Plains minnow.—Rare. The plains minnow is principally a species of the Missouri River. A few individuals, however, were taken in some of the southwestern Iowa streams. Specimens are preserved at the State College at Ames.

*Pimephales notatus* (Rafinesque), Bluntnose minnow.—Rare. This species is found only in the glaciated area, where it occurs in quite small numbers.

*Pimephales promelas promelas* Rafinesque, Fathead minnow.—Abundant. The fathead minnow is the most abundant and widely spread species of the Missouri watershed in Iowa. Along with the plains flathead chub, it thrives in both the deep loesses and alluvial plains of the Missouri River.

*Camptostoma anomalum pullum* (Agassiz), Central stoneroller.—Rare. The stoneroller is restricted entirely to the glaciated area, where it usually occurs in or near swift waters over rubble and boulders.

#### Catfish Family

##### (*Ameiuridae*)

*Ictalurus Iacustris Iacustris* (Walbaum), Channel Catfish.—Common. The channel catfish is widely distributed in substantial

numbers over the whole area and along with the bullhead it is the most important fish in the drainage to anglers. In our surveys of 1952 young of the year and yearlings were everywhere abundant in southern and southwestern Iowa streams. Aitken (1937) reported one of several albino catfish taken from the Missouri River.

*Ictalurus furcatus* (LeSueur), Blue catfish.—Rare. The species is apparently quite largely confined to the Missouri River in southwestern Iowa. It has not been identified by contemporary workers from the inland streams but may occasionally enter the lower reaches of some of the tributary streams. Specimens from Fremont and Mills counties are preserved in the Iowa State College collections.

*Ameiurus melas melas* (Rafinesque), Northern black bullhead.—Abundant. The black bullhead ranks second only to the fathead minnow from the standpoint of abundance in the Missouri watershed. It persists in large numbers throughout the area except in the deep loesses where it becomes absent to infrequent.

*Ameiurus natalis* (LeSueur), Yellow bullhead.—Rare. This species was taken only twice in our recent surveys and then only as single individuals; one each from the Nishnabotna and Nodaway Rivers. It probably ranges throughout the entire region but undoubtedly in relatively small numbers.

*Pliodictis olivaris* (Rafinesque), Flathead catfish.—Rare. Not taken from the tributaries of the Missouri River in these surveys, but has been reported by anglers. The species is known from the Missouri itself where it is quite important in the commercial catch.

*Noturus flavus* Rafinesque, Stone cat.—Rare. This species is found in small numbers over the region. It is quite restricted, however, to outcroppings of limestone.

*Shilbeodes insignis* (Richardson), Stender madtom.—Rare. Reported by Meek (1892-1894) from the Big Sioux and Floyd Rivers; Salyer and Speaker (5 specimens) from the Little Sioux and a single specimen from the Boyer River by Bailey.

#### Eel Family

##### (*Anquillidae*)

*Anguilla rostrata* (Le Sueur), American eel.—Rare. This species has not been reported by scientific workers from the Missouri watershed in Iowa. Commercial fishermen report it from the Missouri River, and because of its peculiar migratory habits it

is believed to inhabit streams of the western and southern parts of Iowa as well.

Topminnow Family

(*Cyprinodontidae*)

*Fundulus diaphanus menona* Jordan and Copeland, Western banded killifish.—Rare. Found only in the Little Sioux in Dickinson county. This species is quite common in the Dickinson county lakes and probably occurs in very limited numbers in Little Sioux as an overflow species from these lakes.

*Fundulus sciadicus* Cope, Plains topminnow.—Rare. Taken only once in recent surveys from the Little Sioux River.

Cod Family

(*Gadidae*)

*Lota lota maculosa* (LeSueur), Eastern burbot.—Rare. The burbot is taken infrequently by anglers in the Little Sioux and Missouri Rivers. A specimen is preserved at the Iowa Conservation Commission Biology Building at Okoboji, Iowa.

Trout-Perch Family

(*Percopsidae*)

*Percopsis omiscomaycus* (Walbaum), Trout-perch.—Rare. The trout-perch occurs in small numbers over the entire Missouri watershed in Iowa. In a few local areas it becomes quite common at times.

Bass Family

(*Serranidae*)

*Morone chrysops* (Rafinesque), White bass.—Rare. Meek reported the white bass from the Big Sioux. The species was occasionally taken in the Little Sioux in Dickinson and Clay counties, and it probably gains access to this stream from the Dickinson county lakes.

Sunfish Family

(*Centrarchidae*)

*Micropterus dolomieu dolomieu* Lacepede, Northern small-mouth bass.—Rare. The smallmouth bass is quite largely restricted to the glaciated area. Adults and young of the year were seined from the Rock River near Rock Rapids in 1950. It is quite possible the initial stock may have come from hatchery sources since they were known to have been introduced here within the past five years.

*Micropterus salmoides salmoides* (Lacepede), Northern largemouth bass.—Rare. Only a single individual of this species has been taken in our surveys. This was from the upper reaches of the Grand River, and is possible to have occurred there as a result of having been stocked from a nearby farm pond. Meek (1894) reported it from the Floyd River.

*Lepomis cyanellus* Rafinesque, Green sunfish.—Common. The green sunfish occurs over the entire region covered in this investigation. It is usually found in small overflow pools adjacent to the streams.

*Lepomis gibbosus* (Linnaeus), Pumpkin seed.—Rare. A single individual of this species from the Big Sioux River is preserved at Iowa State College.

*Lepomis macrochirus macrochirus* Rafinesque, Bluegill.—Rare. One bluegill was taken in our surveys. This individual was from the Rock River at Rock Rapids.

*Lepomis humilis* (Girard), Orange-spotted sunfish.—Common. The orange-spotted sunfish is widely distributed in the Missouri watershed. Like the green sunfish it can be found in almost any backwater or overflow pond along any of the western Iowa streams.

*Ambloplites rupestris rupestris* (Rafinesque), Northern rock bass.—Rare. The only occurrence of the rock bass are those listed by Meek (1892-1894) consisting of a single specimen from the Big Sioux and from the Floyd Rivers.

*Pomoxis annularis* Rafinesque, White crappie.—Rare. The white crappie is distributed intermittently over the whole Missouri drainage. Its absence from the record for any stream is the result of inexact surveys.

*Pomoxis nigromaculatus* (LeSueur), Black crappie.—Rare. The black crappie seems to prefer clearer water than the white crappie. In the present work, the black crappie occurred only two times, but may be more generally distributed in Missouri River streams than the records indicate.

#### Perch Family

##### (*Percidae*)

*Stizostedion canadense* (Smith), Sauger.—Rare. The sauger was reported by Meek, (1892-1894) from the Big Sioux and Floyd Rivers. Of recent date Dr. Reeve M. Bailey took an individual from an oxbow adjacent to the Missouri.

*Stizostedion vitreum vitreum* (Mitchell), Walleye.—Rare. This species has been reported from the Rock River by anglers, and it is frequently taken by fishermen from the Little Sioux. Several of these specimens have been examined by Mr. E. T. Rose and Mr. T. Moen, biologists for the Iowa Conservation Commission.

*Perca flavescens* (Mitchell), Yellow perch.—Rare. This species was taken once in the Rock River near Rock Rapids, and in several collections from the Little Sioux.

*Hadropterus maculatus* (Girard), Black-sided darter.—Rare. The black-sided darter occurred only in glaciated regions.

*Etheostoma nigrum nigrum* Rafinesque, Johnny darter.—Common. The Johnny darter is the most common of all darters in the Missouri watershed. It reaches its greatest development in the glaciated areas and dissipates quite rapidly as the stream flows into and through the loessial areas. It was not taken in the deep loesses or in the alluvial plains.

*Etheostoma exile* (Girard), Iowa darter.—Rare. This species was only taken in the upper reaches of the northwest Iowa streams. It is apparently intolerant of silt.

#### Drum Family

##### (*Sciaenidae*)

*Aplodinotus grunniens* Rafinesque, Freshwater drum.—Rare. The sheepshead or drum was reported by Meek from the Big Sioux. Of recent date it is reported from the Little Sioux. Specimens from the Little Sioux have been examined by Iowa Conservation Commission biologists.

#### Stickleback Family

##### (*Gasterosteidae*)

*Eucalia inconstans* (Kirkland), Brook Stickleback.—Rare. In all of our survey work of the past seven years the stickleback, when it occurs, is limited to very small areas and these areas are rather widely separated. In the Missouri watershed the stickleback appeared in fair numbers in three collections all from different streams. The streams in which they were found were the Ocheydan, Rock and Little Sioux Rivers.

#### Hybrid

*Etheostoma nigrum nigrum* (Rafinesque) X *Etheostoma nigrum eulepis* (Hubbs and Green).—Rare. This intergrade was a single specimen collected from the Little Sioux River by Carl Hubbs.

It is a hybrid between the Johnny darter and the Scaly Johnny darter.

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