

FISHES OF THE VERMILLION RIVER, SOUTH DAKOTA

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The last known published list of the fishes of South Dakota is that of Churchill and Over (1), although a more recent mimeographed list of the species known from the state has been prepared by Professor Marvin Allum of South Dakota State College. The present report is based on 59 collections made in the Vermillion River during the years 1955-1958.

The Vermillion River is a small tributary of the Missouri River draining approximately 2,278 square miles in southeastern South Dakota (Fig. 1). The drainage basin, which is 150 miles long and 30 miles wide, lies between the James River basin to the west and the Sioux River basin to the east and north. A greater portion of the river is intermittent, but in years with average rainfall (24 inches) the channel from Parker to the Missouri River carries water. In 1951, 1955, and 1958 there was flowing water in only the lower 18 miles of the river. During the fall of 1955 and again in the fall of 1958 even the pools normally found in portions of the stream bed dried up.

Ninety-seven percent of the basin is in farmland and until the advent of the "soil bank" program was under intensive cultivation. The lower 20 miles of the channel was straightened in the first part of the century and in more recent years dredging has been undertaken in various parts of the upper river. Natural fluctuations in water levels due to variations in annual precipitation have been accentuated by drainage and agricultural practises. The average discharge recorded at a gauge located 15 miles north of Vermillion is 153 cfs (1945-53), with a maximum of 3,280 cfs (1952) and a minimum of 0 cfs (1951, 1955, 1958). Beaver dams, which are not uncommon in parts of the basin, may help to stabilize the flow and may also serve as refugia for certain species of fish during extended periods of drought.

Several species of fish that are presently rare or restricted in their distribution in the basin may possibly be relicts of the pre-drainage fish fauna. Early photographs of the river indicate that 50 years ago it was ecologically quite different from the present silty slow-moving stream. Gravel and rubble riffles were predomi-

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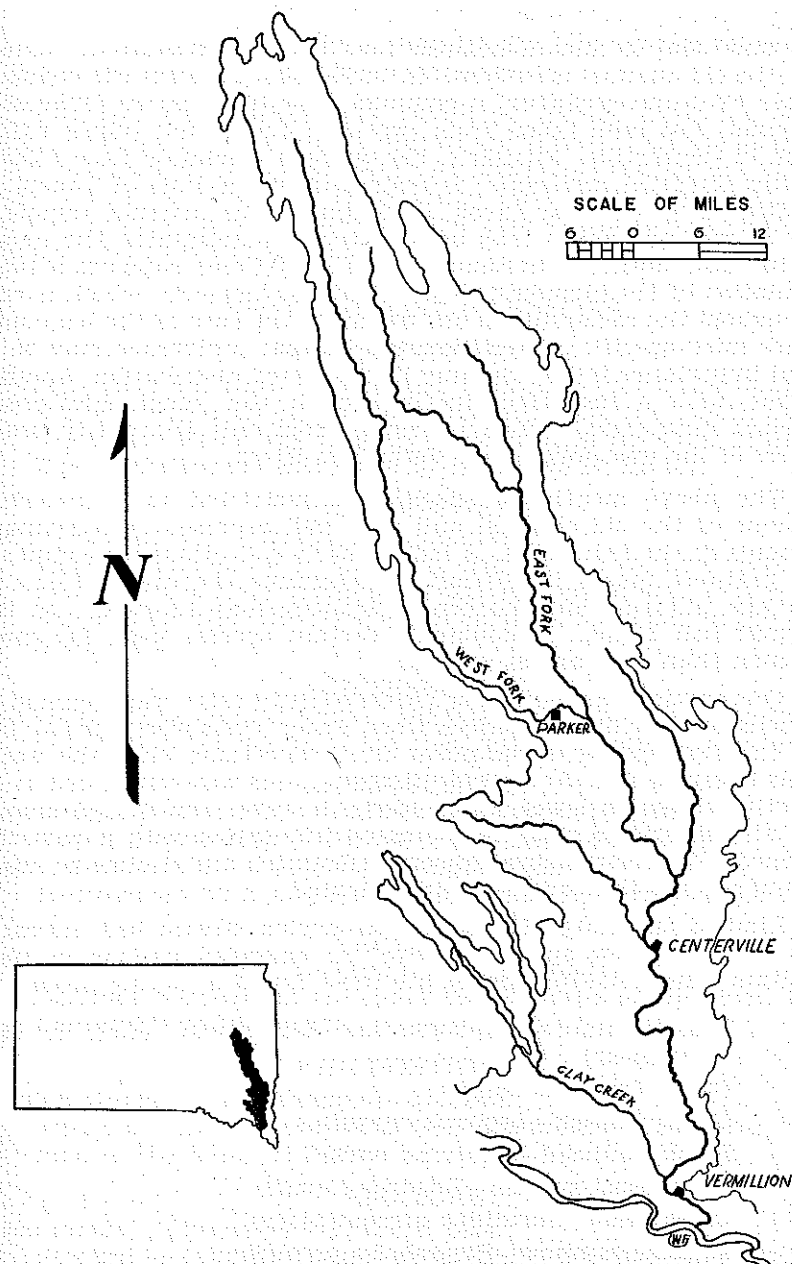


Figure 1. The drainage basin of the Vermillion River.

nate and today in certain localities near Parker and south of Centerville the old channel is evident. In these relict habitats the common shiner (*Notropis cornutus*) is common. The Iowa darter (*Etheostoma exile*) has been taken from two such gravel and rubble riffles south of Centerville. Similarly, the western blacknose dace (*Rhinichthys atratulus meleagris*) is restricted to one mile of stream at the headwaters of Clay Creek, although in this instance temperature as well as habitat may be a factor in determining the dace's limited distribution. The same mile of Clay Creek supports a large population of the bigmouth shiner (*Notropis dorsalis*) which is rare throughout the remainder of the basin. In the case of the bigmouth shiner inter-specific competition and habitat preference may be of equal importance in determining its restricted distribution. Another species with a restricted distribution is the brook stickleback (*Eucalia inconstans*) which is known from only the weedy headwaters of the west fork of the Vermillion River.

The above mentioned species are restricted to undisturbed portions of the old channel and may well represent pre-drainage elements of the fish fauna. A lack of early collections for comparative purposes makes it difficult to determine the exact effects of drainage, siltation and modern agriculture may have had on the original fish fauna. Undoubtedly certain species were far more common than they are at present.

One species, the red shiner (*Notropis lutrensis*), was common in collections made during periods when water levels were normal, but was the first species to disappear from collections when the water levels began to fall. At first its disappearance was considered to be directly related to lower water levels, however the disappearance was also associated with an increased infestation with a parasitic copepod. The relationship between infestation and decline in numbers of the red shiner is being investigated.

Limited sampling of pools in the drying stream bed indicates that relatively few species survive for extended periods in such habitats. The following species are those found in drying pools.

- Brassy minnow—*Hybognathus hankinsoni* (first to disappear)
- Carp—*Cyprinus carpio*
- Green sunfish—*Lepomis cyanellus*
- Black bullhead—*Ictalurus melas*
- Orangespot sunfish—*Lepomis humilis*
- Creek chub—*Semotilus atromaculatus*
- Fathead minnow—*Pimephales promelas*
- Sand shiner—*Notropis deliciosus* (last to disappear)

In the lower ten miles of the channel the last species to survive is the shortnose gar, *Lepisosteus platostomus*.

Harrison and Speaker (2) record 51 species from the Sioux River drainage in Iowa and 74 species are known from the Missouri River drainage of the same state. At present 48 species are known from Vermillion River, of these three have been introduced, the carp (*Cyprinus carpio*), the northern pike (*Esox lucius*), and the walleye (*Stizostedion vitreum*).

ANNOTATED LIST OF SPECIES

PETROMYZONTIDAE

Ichthyomyzon unicuspis Hubbs and Trautman—the silver lamprey.
A single specimen of the silver lamprey from the mouth of the Vermillion River was recently discovered in the Over Museum. The identification was made by Dr. Reeve M. Bailey.

POLYODONTIDAE

Polyodon spathula (Walbaum)—paddlefish.
Taken occasionally in the early part of the century from the mouth of the river, common in the Missouri River. It is represented from the river by a single mounted specimen in the Over Museum.

ACIPENSERIDAE

Scaphirhynchus platyrhynchus (Rafinesque)—shovelnose sturgeon.
Common in the mouth of the river during the spring months.

LEPISOSTEIDAE

Lepisosteus platostomus (Rafinesque)—shortnose gar.
Taken occasionally in the lower ten miles of the river.
Lepisosteus osseus (Linnaeus)—longnose gar.
Represented by a single specimen from the mouth of the river.

CLUPEIDAE

Dorsoma cepedianum (LeSueur)—gizzard shad.
Common throughout the lower twenty miles of the river, from Centerville to the mouth.

HIODONTIDAE

Hiodon alosoides (Rafinesque)—goldeye.
Taken on only two occasions from the mouth of the river, common in the Missouri River.

ESOCIDAE

Esox lucius (Linnaeus)—northern pike.
Stocked in Lake Marindahl, an artificial lake at the headwaters of Clay Creek.

CATASTOMIDAE

- Cycleptus elongatus* (LeSueur)—blue sucker.
Known only from the mouth of the river, in the Missouri River.
- Ictiobus bubalus* (Rafinesque)—smallmouth buffalo.
Common in the sluggish waters of the lower three miles of the channel.
- Carpiodes carpio carpio* (Rafinesque)—river carpsucker.
Common throughout the basin wherever there is permanent water.
- Moxostoma aureolum aureolum* (LeSueur)—northern redhorse.
Common in the main river channel from Parker south to the mouth.
- Catostomus commersoni* (Lacepede)—white sucker.
Common throughout the basin.

CYPRINIDAE

- Cyprinus carpio* (Linnaeus)—carp.
Introduced, common throughout the basin.
- Semotilus atromaculatus* (Mitchill)—creek chub.
One of the more abundant cyprinids, common in all collections.
- Hybopsis gracilis* (Richardson)—flathead chub.
Rare in all but collections made at the mouth of the river, where it is common in the fall months.
- Rhinichthys atratulus meleagris* (Agassiz)—western blacknose dace.
Known only from gravel and rubble riffles of Clay Creek, below Lake Marindahl.
- Notropis atherinoides* (Rafinesque)—emerald shiner.
Abundant at the river mouth, but occasional in the lower six miles.
- Notropis illecebrosus* (Girard)—silverstripe shiner.
Occasional in the mouth of the river.
- Notropis cornutus frontalis* (Agassiz)—northern common shiner.
Occasional in rubble riffles between Parker and Centerville, rare elsewhere in the basin.
- Notropis blennioides* (Girard)—river shiner.
Rare, known only from the mouth of the river, and represented by only one or two individuals in any one collection.
- Notropis dorsalis* (Agassiz)—bigmouth shiner.
Rare to occasional, locally abundant in the headwaters of Clay Creek.
- Notropis lutrensis* (Baird and Girard)—red shiner.
Common from Parker south to the mouth.

- Notropis*—sand shiner.
The most abundant species in the Vermillion River.
- Notropis topeka* (Gilbert)—Topeka shiner.
Common in the upper reaches, as many as twenty individuals in certain collections.
- Hybognathus hankinsoni* (Hubbs)—brassy minnow.
Common in the upper portions of the river, rare at the mouth.
- Hybognathus nuchalis nuchalis* (Agassiz)—silvery minnow.
Prior to the drought of 1958 this species was common in the lower twenty miles of the drainage, but in 1958 it was taken only in the river mouth.
- Pimephales promelas* (Rafinesque)—fathead minnow.
Common throughout the drainage.
- Campostoma anomalum* (Rafinesque)—stoneroller.
Occasional in gravel riffles.

ICTALURIDAE

- Ictalurus melas* (Rafinesque)—black bullhead.
Common throughout the drainage.
- Ictalurus punctatus* (Rafinesque)—channel catfish.
Common in the larger pools from Parker to the mouth.
- Noturus flavus* (Rafinesque)—stonecat.
Rare, taken on only three occasions from the lower six miles of the river.
- Pylodictus olivarius* (Rafinesque)—flathead catfish.
Known only from the mouth of the river.

ANGUILLIDAE

- Anguilla rostrata* (LeSueur)—American eel.
A single mounted specimen from the river below Vermillion is in the Over Museum.

GADIDAE

- Lota lota* (Linnaeus)—burbot.
A single specimen from the mouth of the river is in the Over Museum.

CENTRARCHIDAE

- Micropterus salmoides salmoides* (Lacepede)—northern largemouth bass.
Common in the river from Centerville to the mouth.
- Lepomis cyanellus* (Rafinesque)—green sunfish.
Common throughout the drainage.
- Lepomis macrochirus* (Rafinesque)—bluegill.
Occasional throughout the basin.
- Lepomis humilis* (Girard)—orangespotted sunfish.
Common throughout the drainage.

Pomoxis annularis (Rafinesque)—white crappie.

Common in the mouth, but rare to occasional throughout the remainder of the basin.

Pomoxis nigromaculatus (LeSueur)—black crappie.

Common throughout the basin.

PERCIDAE

Stizostedion vitreum vitreum (Mitchill)—walleye.

Stocked in Lake Marindahl at the headwaters of Clay Creek.

Stizostedion canadense (Smith)—sauger.

Common from Centerville to the mouth.

Perca flavescens (Mitchill)—yellow perch.

Occasional throughout the basin.

Etheostoma nigrum nigrum (Rafinesque)—central Johnny darter.

Common throughout the basin.

Etheostoma exile (Girard)—Iowa darter.

Rare, known from two gravel riffles south of Centerville.

SCIAENIDAE

Aplodinotus grunniens (Rafinesque)—freshwater drum.

Common in the lower reaches and mouth of the river.

GASTEROSTEIDAE

Eucalia inconstans (Kirtland)—brook stickleback.

Known only from the weedy headwaters of the West Fork, where it is quite common.

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LITERATURE CITED

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