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THREATENED FISHES SURVEY

By
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NEBRASKA GAME AND PARKS COMMISSION
Fishery Division

March - 1975

Project Name: Threatened Fishes Survey

Project Leader: Steve Schainost

Project Location: Statewide

INTRODUCTION:

The advance of civilization frequently results in activities which cause changes in the native wildlife species. The economy of the state of Nebraska has submitted its streams to the effects of intensive agricultural and irrigation developments, stream channelization, and dams. The responses of different fish species to these different activities vary but they always occur and are usually unnoticed unless of large magnitude.

Relatively little has been done with regard to noting the responses of Nebraska's stream fishes to the activities of man. Previous workers have frequently worked within a basin rather than statewide. Jordan and Meek (1885), Jordan and Everman (1896), and Everman and Cox (1896) primarily collected fishes in the Missouri River basin. Johnson (1942) collected fish from several basins within the state. Witt (1970) reported on fish collections from the Nemaha River basin while Gray (1971) collected fish in the headwaters of the South Loup River. As can be seen from the dates, most of this work is prior to 1970 and probably no longer valid due to major changes in land use practices.

A statewide stream survey was carried out during 1972 and 1973. This survey was primarily designed to obtain current data on the state's streams and the fish species they contained. At the completion of this survey, it was determined that 26 of the species reported by previous workers (Table 1) were not sampled in this survey. Of the 18 threatened species listed by R. R. Miller (1972) (Table 2), the following five were sampled during the 1972-73 stream survey: northern redbelly dace, finescale dace, pearl dace, bluntnose minnow,

TABLE 1. SPECIES REPORTED FROM PREVIOUS SURVEYS WHICH WERE NOT IDENTIFIED FROM SAMPLES TAKEN DURING THE 1972-1973 STREAM SURVEY.

Rosyface shiner	<u>Notropis rubellus</u>
*Spottail shiner	<u>Notropis hudsonius</u>
Silverband shiner	<u>Notropis shumardi</u>
Silverstripe shiner	<u>Notropis stilbius</u>
Steelcolor shiner	<u>Notropis whipplei</u>
Banded darter	<u>Etheostoma zonale</u>
Trout-perch	<u>Percopsis omiscomaycus</u>
Silver redhorse	<u>Moxostoma anisurum</u>
Black redhorse	<u>Moxostoma duquesnei</u>
Rio Grande killifish	<u>Fundulus zebrinus</u>
River redhorse	<u>Moxostoma carinatum</u>
**Hornyhead chub	<u>Nocomis biguttatus</u>
**Topeka shiner	<u>Notropis topeka</u>
**Golden redhorse	<u>Moxostoma erythrurum</u>
**Mooneye	<u>Hiodon tergisus</u>
**Pallid sturgeon	<u>Scaphirhynchus albus</u>
**Chestnut lamprey	<u>Ichthyomyzon castaneus</u>
**Silver lamprey	<u>Ichthyomyzon unicuspis</u>
**Lake sturgeon	<u>Acipenser fulvescens</u>
**Highfin carpsucker	<u>Carpionodes velifer</u>
**Black buffalo	<u>Ictobius niger</u>
**Blue catfish	<u>Ictalurus furcatus</u>
Lake chub	<u>Hybopsis plumbea</u>
Sicklefin chub	<u>Hybopsis meeki</u>
Blackside darter	<u>Percina maculata</u>
Mountain sucker	<u>Catostomus platyrhincus</u>

*Recently stocked in Lewis and Clark Lake as potential forage species.

**Species listed as threatened in R. R. Miller (1972).

TABLE 2. THREATENED FISHES OF NEBRASKA AS LISTED BY R. R. MILLER (1972)

Chestnut lamprey (endangered)	<u>Ichthyomyzon castaneus</u>
Silver lamprey (endangered)	<u>Ichthyomyzon unicuspis</u>
Lake sturgeon (endangered)	<u>Acipenser fulvescens</u>
Pallid sturgeon (endangered)	<u>Scaphirhynchus albus</u>
Mooneye (endangered)	<u>Hiodon tergisus</u>
**Sturgeon chub (endangered)	<u>Hybopsis gelida</u>
Hornyhead chub (rare)	<u>Nocomis biguttatus</u>
Blacknose shiner (rare)	<u>Notropis heterolepis</u>
Topeka shiner (endangered)	<u>Notropis topeka</u>
*Northern redbelly dace (rare & endangered)	<u>Phoxinus eos</u>
*Finescale dace (endangered)	<u>Phoxinus neogaeus</u>
*Bluntnose minnow (endangered)	<u>Pimephales notatus</u>
**Blacknose dace (endangered)	<u>Rhinichthys atratulus</u>
*Pearl dace (rare)	<u>Semotilus margarita</u>
Highfin carpsucker (endangered)	<u>Carpionodes velifer</u>
Black buffalo (indeterminate)	<u>Ictiobus niger</u>
Golden redhorse (rare)	<u>Moxostoma erythrurum</u>
Blue catfish (indeterminate)	<u>Ictalurus furcatus</u>

*Sampled during the period 1972-1974.

**Sampled by other fishery workers, 1974.

and blacknose shiner. It was also noted that the brook stickleback, Culaea inconstans, although not classed as endangered, was found in widely scattered streams of a type that are gradually disappearing within this state.

The objective of this study was to determine the current status with regard to distribution and abundance of those 18 fishes previously classified as threatened. (Table 2)

The species classifications used in this report are those developed by the Survival Service Commission of the International Union for Conservation of Nature and Natural Resources (IUCN) and described by R. R. Miller (1972) as follows:

Endangered: Actively threatend with extinction. Continued survival unlikely without the implementation of special protective measures.

Rare: Not under immediate threat of extinction but occurring in such small numbers and/or in such restricted or specialized habitat that it could quickly disappear. Requires careful watching.

Depleted: Although still occurring in numbers adequate for survival, the species has been heavily depleted and continues to decline at a rate substantially greater than can be sustained.

Indeterminate: Apparently threatened but insufficient data currently available on which to base a reliable assessment of status.

Peripheral: Those fish common elsewhere but rare in a state. These populations, often disjunct, merit inclusion because isolated gene pools may have practical and scientific value.

METHODS AND PROCEDURES:

Sampling was carried out in those streams which once held or are presently known to hold those fish species classed as threatened (Table 2). In addition, sampling was extended to streams in the immediate geographic vicinity of known populations and to streams of similar character and water quality wherever they were encountered. All sampling was done with electrical fishing gear, twenty-foot minnow seines, and/or fine-meshed dip nets.

The above sampling was accomplished, in the manner stated, during the summer of 1974.

RESULTS:

The planned sampling was completed by mid-summer of 1974. As a result of this sampling, information on distribution was expanded for five of the 18 species previously classified as threatened. Four more streams were found to hold populations of northern redbelly dace, Phoxinus eos, and two more streams were found to hold populations of brook stickleback, Culaea inconstans.

One previously misidentified species was correctly identified by Dr. Richard Stasiak (University of Nebraska at Omaha) as being the blacknose shiner, Notropis heterolepis. In addition, Dr. Stasiak has also stated (personal communication) that he has identified the blacknose dace, Rhinichthys atratulus, from several streams in the lower Niobrara River basin. Contacts with Monte Mayes, (Ph.D. candidate, University of Nebraska) have resulted in the location of a new site for the brook stickleback and the addition of the sturgeon chub, Hybopsis gelida, which he collected in the Platte River near Fremont.

With the exceptions of the sturgeon chub, bluntnose minnow, and blacknose dace, those species listed in Table 3 were found in similar types of habitat. Specifically, they were usually found to inhabit the headwaters of spring-fed streams. With a few exceptions, these streams were small (less than 10 feet wide), clear, non-flooding, and have a narrow range of temperature fluctuation.

Aquatic vegetation may vary from abundant to negligible, although streams without aquatic vegetation were usually very small and had much terrestrial vegetation on the banks. The specific collection sites for each species in Table 3 except blacknose dace and sturgeon chub, are listed in Appendix I.

No habitat types can be stated for the blacknose dace since this species has been reported by another worker. The sturgeon chub was also taken by another worker but it is known that it was taken from the Platte River which is a large, wide stream with a rolling sand bottom.

The bluntnose minnow, Pimephales notatus, was sampled in three separate streams in the Elkhorn River basin. This species did not show any definite habitat preference beyond the fact that it was found in larger streams (22 to 80 feet wide) having both sand and silt bottoms with clear and turbid water.

The blacknose shiner was sampled at three stations on Holt Creek in Keya Paha County. These stations were in the headwaters area where the water was cool and clear, although vegetation varied from dense to negligible.

The northern redbelly dace was sampled in eleven streams of three river basins. Of these, seven streams were in the central Niobrara River basin. Most of these streams were small (2 to 10 feet wide) and all had clear water with sand bottoms. Aquatic vegetation was not common.

The finescale dace, Phoxinus neogaeus, was found in three streams in the Loup River basin. These streams were very small (2 to 3 feet wide) and had clear water and sand bottoms. Aquatic vegetation was uncommon although there were dense stands of grasses on their banks.

The pearl dace, Semotilus margarita, was found in five streams in two river basins. All of the streams had sand bottoms and clear water with aquatic vegetation varying from negligible to heavy. Of the five streams, four were very small (2 to 3 feet wide).

The brook stickleback was found in ten streams of four river basins. The stream size was more varied (2 to 20 feet wide) and most had abundant aquatic

TABLE 3. THREATENED SPECIES WHICH WERE SAMPLED DURING 1972-1974 STREAM SURVEYS

Bluntnose minnow	<u>Pimephales notatus</u>
Northern redbelly dace	<u>Phoxinus eos</u>
Finescale dace	<u>Phoxinus neogaeus</u>
Pearl dace	<u>Semotilus margarita</u>
*Brook stickleback	<u>Culaea inconstans</u>
Blacknose dace	<u>Rhinichthys atratulus</u>
Sturgeon chub	<u>Hybopsis gelida</u>
Blacknose shiner	<u>Notropis heterolepis</u>

*Not on threatened species list of Miller, Table 2.

vegetation. They had clear water with sand and/or silt bottoms while being relatively unaffected by flooding.

Two species from Table 2 can be removed from the threatened species list on the following basis. The chestnut lamprey, Ichthyomyzon castaneus, has not been positively identified from waters of this state. The only record consists of fishery workers saying that they saw this lamprey attached to fish. The mooneye, Hiodon tergisus, record consists of one specimen taken at the mouth of the Platte River in 1939. Therefore, it should be considered to be non-existent within this state until additional specimens are identified.

The remaining species in Table 2 were not sampled during the stream surveys. Excepting the hornyhead chub and topeka shiner, the following species typically inhabit the mainstem Missouri and Platte Rivers: silver lamprey, lake sturgeon, pallid sturgeon, highfin carpsucker, black buffalo, golden redhorse, and the blue catfish. Due to their large size, these streams have not been sampled adequately, therefore, there is insufficient data for making determinations as to the status of these species.

The hornyhead chub, Nocomis biguttatus, and topeka shiner, Notropis topeka, are small stream fish which were not identified from collections taken during the stream survey. It is possible that they were misidentified, therefore, their status should be changed to indeterminate/extinct.

The blacknose shiner has been found in only one stream (Holt Creek) within this state and therefore, should be classed as endangered/peripheral.

The northern redbelly dace, brook stickleback, pearl dace, bluntnose minnow, and finescale dace are rare within this state although abundant elsewhere in the nation. Since our populations are peripheral relict populations, their classification should be rare/peripheral.

Table 1 includes several species of fish which have not been identified from samples taken within the state of Nebraska but were collected from waters on or near the State's boundaries. Specifically, they were the following:

rosyface shiner, spottail shiner, silverband shiner, silverstripe shiner, steelcolor shiner, banded darter, trout-perch, silver redhorse, black redhorse, Rio Grande killifish, and river redhorse. At the time of their collection, it was believed that they would be found within Nebraska's borders.

The rosyface shiner, Notropis rubellus, and silver redhorse, Moxostoma anisurum, were collected in the Missouri River at St. Joseph, Missouri, in 1871. This collection site, a few miles south of the Nebraska border, may represent a northern limit of their range since it presently occurs in several southeastern Kansas streams. Cross (1967) stated that this species seems to prefer upland streams with limestone beds and steep gradients, a type relatively uncommon in Nebraska.

Seth Meek (1892, 1894) collected fish from the mouths of the Big Sioux and Floyd Rivers. Several of the species he collected are restricted to the central Missouri River Basin and are not known to have occurred either upstream or downstream of this area. Bailey and Allum (1962) discuss this situation in detail and suggest that there may have been a headwaters connection between the Minnesota River, the Big Sioux River, and the Des Moines River. This could be the reason for Meek's collection of the spottail shiner, Notropis hudsonius, and the trout-perch, Percopsis omiscomaycus, at the mouth of the Big Sioux River but nowhere else. This could also explain the presence of the topeka shiner in central Iowa.

The steelcolor shiner, banded darter, black redhorse, and Rio Grande killifish may be misidentifications (Bailey and Allum, 1962). Specifically, the steelcolor shiner, Notropis whipplei, may have been confused with the red shiner, Notropis lutrensis, especially since this species was not reported by Meek although it is now common there. The banded darter, Etheostoma zonale, may be a misidentified Iowa darter, Etheostoma exile, or a head waters transfer from the Minnesota River. The black redhorse, Moxostoma duquesnei, is probably a misidentified shorthead redhorse, Moxostoma macrolepidotum. The Rio Grande

killifish, Fundulus zebrinus, was probably the banded killifish, Fundulus diaphanus, which previously occurred in the Iowa and Des Moines Rivers. It presently is found in several lakes in northeast Iowa. Two records of its occurrence in northeast Colorado may be a similar error especially since the normal range of the Rio Grande killifish is supposed to be the trans-pecos region of Texas.

The silverband shiner, Notropis shumardi, was found in Meek's collection by Johnson, (1942). It was subsequently found by Bailey and Allum in several South Dakota streams and could theroretically occur in Nebraska streams across the Missouri River.

The river redhorse, Moxostoma carinatum, and sicklefin chub, Hybopsis meeki, may still occur in the Missouri River. This river has not been sampled adequately enough to make a determination on the status of several species. The blackside darter, Percina maculata, was found by Meek and at two locations in the Elkhorn River Basin by Evermann and Cox. It is unknown as to whether or not it still occurs here.

The lake chub, Hybopsis plumbea, was collected in three streams in the central Niobrara River Basin by Evermann and Cox. Its status is unknown although it is probably extinct.

The mountain sucker, Catostomus platyrhyncus, was found in Hat Creek and the White River by Evermann and Cox. It has not been collected here since that date, however, it does occur across the border in South Dakota.

The silverstripe shiner, Notropis stilbius, was identified from Lewis and Clark Lake. The normal distribution of this species is the Gulf drainage of Mississippi, Alabama, and Georgia; therefore, I feel this is in error unless further samples verify the identification.

CONCLUSIONS:

(1) The brook stickleback, although not on the threatened species list, is found only in the same type of clear, spring-water habitats that contain the blacknose shiner, northern redbelly dace, finescale dace, and pearl dace.

(2) The blacknose shiner is the only species currently known to occur in only one stream within the state of Nebraska.

(3) Those fish species which typically inhabit the Missouri or Platte Rivers were not adequately sampled, as a result, relative abundance determinations could not be made.

RECOMMENDATIONS:

(1) The brook stickleback, northern redbelly dace, finescale dace, pearl dace, and blacknose shiner may be used as indicators of the water quality of the streams they inhabit.

(2) The brook stickleback should be placed on Nebraska's threatened species list as a rare species because of its restrictive habitat requirements.

(3) The chestnut lamprey and mooneye should be removed from the threatened species list.

(4) Utilizing the categories set up by the International Union for Conservation of Nature and Natural Resources (IUCN), the following statements can be made:

- a. The blacknose dace, bluntnose minnow, pearl dace, finescale dace, and northern redbelly dace should be classified as rare/peripheral.
- b. The blacknose shiner should be classified as endangered/peripheral.
- c. The hornyhead chub and topeka shiner should be classified as indeterminate/extinct.

(5) The results of stream surveys should be reported in such a manner that the information is available to other fishery workers.

APPENDIX I --- Sampling locations for the six threatened species taken during the 1972-1974 stream surveys.

Bluntnose minnow, Pimephales notatus

Elkhorn Basin

Cache Creek - Holt County - NE Sec. 13 T. 26N R. 9W
July 17, 1972 2 mi. S. 1.5 mi. E. Ewing

South Fork Elkhorn River - Holt County - SW Sec. 2 T. 26N R. 9W
July 19, 1972 1 mi. S. Ewing

Union Creek - Stanton County - SE Sec. 31 T. 22N R. 1E
July 26, 1972 1 mi. N. 5 mi. E. Madison

Blacknose shiner, Notropis heterolepis

Niobrara Basin

Holt Creek (three stations) - Keya Paha Co. - October 23, 1973
SW Sec. 35 T. 35N R. 21W 9 mi. N. 1 mi. W. Springview
NE Sec. 28 T. 28N R. 21W 5 mi. N. 2 mi. W. Springview
SW Sec. 34 T. 35N R. 21W 9 mi. N. 1½ mi. W. Springview

Northern redbelly dace, Phoxinus eos

North Platte Basin

Sand Creek - Keith County - NW Sec. 9 T. 14N R. 36W
September 6, 1972 5 mi. W. 4.5 mi. N. Paxton

Unnamed tributary to North Platte River - Keith County
September 7, 1972 SE Sec. 23 T. 14N R. 35W

Loup Basin

South Loup River - Logan County - SW Sec. 34 T. 18N R. 27W
April 25, 1974 1 mi. N. 1.5 E. Gandy

Unnamed tributary to S. Loup River - Custer Co. - NE Sec. 28 T. 17N R. 25W
April 17, 1974 0.25 mi. W. Arnold

Niobrara Basin

Lost Creek - Keya Paha County - NW Sec. 23 T. 35 N R. 23W
October 24, 1973 9 mi. N. 3 mi. E. Norden

East Holt Creek - Keya Paha County - SE Sec. 25 T. 34N R. 21W
May 14, 1974 4 mi. N. 0.5 mi. E. Springview

Minnechaduza Creek - Cherry County - SE Sec. 24 T. 35N R. 31W
May 16, 1974 3 mi. N. 3 mi. E. Kilgore

S. Branch Fairfield Creek - Cherry County - SW Sec. 15 T. 32N R. 25W
July 4, 1973 7 mi. N. Wood Lake

Holt Creek - Keya Paha County - NE Sec. 28 T. 34N R. 21W
October 23, 1973 5 mi. N. 2 mi. W. Springview

Snake River - Cherry County - West side of Highway 61
July 4, 1973 24 mi. S. Merriman

Bone Creek - Brown County - SE Sec. 22 T. 30N R. 22W
1973 0.25 mi. W. Ainsworth

Finescale dace, Phoxinus neogaeus

Loup Basin

Middle Loup River - Cherry County - SE Sec. 33 T. 26N R. 36W
July 11, 1972 10 mi. N. Whitman

S. Branch Middle Loup River - Hooker County - NE Sec. 3 T. 24N R. 34W
July 10, 1972 3 mi. N. 10 mi. W. Mullen

Unnamed tributary to S. Loup River - Custer Co. - NE Sec. 3 T. 15N R. 23W
July 12, 1972 0.5 mi. NW Callaway

Pearl dace, Semotilus margarita

Loup Basin

Middle Loup River - Cherry County - SE Sec. 33 T. 26N R. 36W
July 11, 1972 10 mi. N. Whitman

Niobrara Basin (Keya Paha County)

Holt Creek - 11 mi. N., 2 mi. E. Springview SE Sec. 19 T. 35N R. 20W
September 23, 1973

E. Holt Creek - 5 mi. N 0.5 mi. E. Springview NW Sec. 25 T. 34N R. 21W
September 23, 1973

Niobrara Basin (Keya Paha County, continued)

Cottonwood Creek - 6 mi. N. 8 mi. W. Springview NE Sec. 10 T. 34N R. 22W
September 24, 1973

Lost Creek - 9 mi. N. 3 mi. E. Norden NW Sec. 23 T. 36N R. 23W
September 24, 1973

Brook stickleback, Culaea inconstans

Middle Platte Basin

Unnamed tributary to Middle Platte River-Dawson Co.-SW Sec. 1T. 9N R. 23W
June 7, 1972 5 mi. S., 4 mi. E. Cozad

Lower Platte Basin

Clear Creek - Saunders County - SW Sec. 12 T. 14N R. 9E
May 11, 1972 3 mi. S. 1 mi. E. Yutan

Niobrara Basin

Antelope Creek - Sheridan County - NE Sec. 11 T. 32N R. 41W
June 11, 1973 2 mi. S. 6 mi. E. Gordon

South Side Niobrara River - Brown County

June 17, 1974 12 mi. N. 4.5 mi. E. Ainsworth
by Billings and Korke (through Dr. Lynch, U.N.)

Loup Basin

Messenger Creek - Valley County - NW Sec. 26 T. 19 N R. 13W
June 26, 1972 7 mi. E. 0.5 mi. S. Ord

Gracie Creek - Loup County - SE Sec. 30 T. 23N R. 17W
August 16, 1973 11 mi. N. 3 mi. E. Taylor

W. Fork Calamus River - Brown County - SE Sec. 12 T. 27N R. 24W
June 28, 1972 17 mi. S. Johnstown

Unnamed tributary to S. Loup River - Custer Co. - NE Sec. 3 T. 15N R. 23W
July 12, 1972 0.5 mi. NW Callaway

Unnamed tributary to S. Loup River - Custer Co. - NE Sec. 28 T. 17N R. 25W
May 17, 1974 0.25 mi. W. Arnold

Niobrara Basin

Bone Creek - Brown County - (verbal communication from J. L. Hutchinson)

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