Occurrences of Catostomid Fishes (Suckers) in the North Canadian River and Lake Eufaula, Oklahoma

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A 17-year survey of the North Canadian (Beaver) River, Lake Eufaula, and the Canadian River below Lake Eufaula by the Oklahoma State Health Department between 1976 and 1992 produced seven species of catostomid fishes. During a review of historical fish collections, we found two additional sucker species, for a total of nine catostomids from the drainage. The new species were the lake chubsucker, *Erimyzon sucetta,* and the white sucker, *Catostomus commersoni.* Two species may have disappeared from the drainage: the spotted sucker, *Minytrema melanops,* and the golden redhorse, *Moxostoma erythrurum.* Eight of the nine species occurred primarily downstream from Oklahoma City. The white sucker was the only species limited to headwater sections of the river. The river carpsucker was the only sucker distributed throughout the system.

INTRODUCTION

In this paper, we describe the distribution and abundance of catostomid fishes in the North Canadian River Basin in Oklahoma. Very little is known of the long-term trends in the abundance of native stream fishes in Oklahoma. Because of human influences on Oklahoma streams, especially those of the North Canadian River basin, fish populations have been heavily affected by human-made disturbances. Using data from a long-term survey and reviews of historical fish collections, we attempted to identify changes in the abundance of catostomid fishes in the North Canadian drainage between 1921 and 1992. These changes are important in assessing the long-term influences of human activities on fishes in the North Canadian River basin.

TABLE 1. Locations of the 10 long-term DEQ (or OSDH) biotrend sampling stations.

Station	County	Legal Location	ER[a]
A. State Line to Lake Optima[b]			WHP
B. Lake Optima to Woodward			
1.	Beaver	S06T03NR21E	SWT
2.	Beaver	S07T04NR24E	SWT
3.	Harper	S23T25NR24W	SWT
C. Woodward to Lake Canton			
4.	Woodward	S25T23NR16W	CGP
5.	Dewey	S28T20NR16W	CGP
D. Lake Canton to Lake Overholser			
6.	Blaine	S27T16NR12W	CGP
7.	Canadian	S32T13NR07W	CGP
E. Lake Overholser to Harrah			
8.	Oklahoma	S22T12NR01E	CGP
F. Harrah to Lake Eufaula			
9.	Hughes	S12T09NR10E	COTP
G. Lake Eufaula to Arkansas River			
10.	Haskell	S12T09NR19E	ARKV

a ER = Ecoregion; WHP = Western High Plains; SWT = Southwestern Tablelands; CGP = Central Great Plains; COTP = Central OK/TX Plains; ARKV = Arkansas Valley.
b No collections owing to lack of water.

METHODS

The present Department of Environmental Quality (DEQ), formerly the Oklahoma State Department of Health (OSDH), survey included 386 collections from 55 sites in the river, tributaries and reservoirs. Ten long-term sampling sites were established on the mainstem between 1976 and 1980 (Table 1). Collections were made two or three times yearly through 1992. A 3.3-m by 1.3-m heavy-leaded seine with 3.0-mm mesh was always used to ensure standardized sampling. A 200-m reach of stream was sampled during each visit.

ANNOTATED CHECKLIST

In the following checklist, parentheses after the common name indicate (in this order): number of sites where the species was collected, number of collections containing the species, and number of specimens taken. These values are a summary of all collections made by DEQ (or OSDH) between 1976 and 1992. The dates in parentheses indicate unpublished collections from the University of Oklahoma Stovall Museum of Zoology (UOMZ), Oklahoma State University Collection of Vertebrates

TABLE 2. Occurrences of the river carpsucker (*Carpiodes carpio*) in samples from the 10 OSDH fish collecting sites on the North Canadian River from 1976 to 1992.

Year	Site number												
	1	2	3	4	5	6	7	8	9	10	TFC	TCY	MNSY
1976	--	--	--	--	--	--	1	1	--	--	2	2	1.0
1977	--	--	--	--	--	--	14	5	--	--	19	6	3.2
1978	--	--	--	0	--	3	0	105	14	--	122	10	12.2
1979	--	--	--	3	--	1	6	1	28	0	39	15	2.6
1980	--	--	--	18	--	1	1	83	84	34	221	18	12.2
1981	0	0	0	1	--	0	2	1	41	68	113	19	5.9
1982	0	1	0	0	--	0	0	7	24	0	32	17	1.8
1983	0	2	10	31	--	0	2	25	16	0	86	21	4.1
1984	0	0	0	85	--	1	8	29	830	0	953	21	45.4
1985	0	6	1	10	11	0	16	33	2	13	92	23	4.0
1986	0	0	0	2	1	2	0	22	25	0	52	20	2.6
1987	0	0	0	0	0	0	0	19	5	0	24	23	1.0
1988	12	0	0	1	2	0	0	140	20	0	175	21	8.3
1989	0	0	0	0	0	0	1	16	2	0	19	26	0.7
1990	0	0	80	27	0	0	4	22	0	2	135	23	5.9
1991	0	0	1	2	2	0	0	34	20	20	79	24	3.2
1992	0	0	0	0	0	0	2	2	3	2	9	25	0.4
TFC	12	9	92	180	16	8	57	545	1114	139	2172	314	6.9
TCW	1	3	6	12	4	5	16	31	26	6	110		
TC	22	22	22	39	16	30	49	51	34	29		314	
MFC	0.6	0.4	4.6	4.6	1.0	0.3	1.2	10.6	32.7	4.8			6.9

--- = No collections were made that year.
TFC = Total number of river carpsuckers collected.
TCW = Total number of collections with river carpsucker.
TC = Total number of collections made at that site.
MFC = Mean number of river carpsuckers per collection (MFC=TFC/TC).
TCY = Total number of collections made that year.
MNSY= Mean number of river carpsuckers collected each year (MNSY=TFC/TCY).

Zoology Museum (OSUS), University of Kansas Museum of Natural History (KU), University of Tulsa Museum of Zoology (UTZM; Note: all UTZM specimens are now at OSUS), and the U.S. National Museum of Natural History, Smithsonian Institute (USNM).

RESULTS: CATOSTOMIDAE. Suckers

1. *Carpiodes carpio* (Rafinesque). River carpsucker (30-145-2,669).

The initial collection of this species was from the mainstem near Woodward by Ortenburger in 1928 (OKNMH). Examination of past collections indicate that this species has never been abundant west of Woodward. Extensive sampling by Lindsay and Bates of the University of Oklahoma Biology Survey (UOBS) of the mainstem and tributaries in Texas and Beaver Counties in 1963, yielded a single specimen from the mainstem and seven specimens from Coon Creek, Beaver County (UOMZ).

We collected 180 specimens from the mainstem north of Woodward during 39 collecting visits for a mean of 5.0 specimens per site per collection. The largest numbers were taken west of Site 7 (Table 2).

Numbers of river carpsuckers varied widely between 1976 and 1987 in past collections from the central sections of the river (Table 2). We collected large numbers from this section (Sites 7-8) of the river: 602 specimens in 100 collections (Table 2).

Past collections indicated large numbers of river carpsucker in the lower reaches of the river as it flows through Okmulgee, Okfuskee, McIntosh, and Haskell Counties Extensive collecting by Houser and Lindsay (ODWC) in 1962 produced 1,137 specimens in 11 collections for a mean of 103 specimens/collection. One collection from Okmulgee County contained 1,010 specimens (UOMZ 35246). Nineteen collections from the tributaries contained 128 specimens for a mean of 6.7 specimens/collection. The mean for the river above Lake Eufaula (Sites 8 and 9) in our study was 19.8 specimens/collection, and 4.8 specimens/collection below the lake. The mean for past collections below Lake Eufaula was 12 specimens/collection. The distribution today is similar to what we observed in past

collections, with an increase in abundance downstream to Lake Eufaula.

In our collections, the river carpsucker was very abundant and widely distributed. It represented 0.7% of the fish captured and occurred in 38% of the collections. This species was taken from all mainstem river sites and was present in 36% of the collections from these sites. We observed an increase in the mean per collection from 0.6 at Site 1 to 37.0 at Site 9 (Table 2).

In 1969, 2,367 river carpsuckers were collected from the stilling basin below Canton Lake. This was 2.5% of the fish. These carpsuckers had a combined weight of 571.6 kg or a mean weight of 211.5 g and represented 10.0% of the fish biomass collected from the basin (*5*).

In 1966, ODWC collected 64 specimens during the annual rotenone sampling of Haag Cove in Lake Canton (*6*). In our survey, we collected 480 river carpsuckers in 25 collections from Lake Canton, representing 2.1% of all fish. This species occurred in samples from all seven lakes. The largest number (231 specimens) was collected from Lake Hefner, where it represented 28% of the fish taken from the lake. The state record river carpsucker was caught by a fisherman on 18 May 1990 from a Canadian County farm pond near the river (ODWC State Records); it weighed 3.5 kg and had a total body length of 70 cm.

In 1990, this species was taken in large numbers (80 specimens) at Site 3, N of May, Harper County. During low flow conditions in 1990, the river at the ODWC Beaver River Wildlife Management Area, 14.5 km W of Beaver, consisted of one long shallow pool. We collected 16 large specimens and counted 42 dead specimens on the banks where someone had discarded them.

In 1988, *C. carpio* was collected three times from tributaries. Thirty-five large river carpsuckers were collected from Hackberry Creek SE of Hardesty, Texas County.

2. *Catostomus commersoni* (Lacepede). White sucker (1-1-7)

We found no past collections of this species from the North Canadian (Beaver) River drainage in Oklahoma. Miller and Robison (*7*) indicated that this species was limited to the clear Ozark streams of NE Oklahoma. This species has been reported in the New Mexico sections of the river in north central New Mexico (*8*). On 24 September 1988, we collected seven specimens from Cirrumpa Creek, a tributary of the Beaver River, 3 km E and 10 km S of Wheeless, Cimarron County, (8 km E of the New Mexico State Line). This species represented 3% of the fish collected. The specimens ranged from 63 to 219 mm in total length. The largest specimen weighed 145.2 g. All seven specimens were cataloged into the OSDH fish museum collection as OSDH 3131 and were given to OSUS.

3. *Erimyzon oblongus* (Mitchell). Creek chubsucker (0-0-0).

We were able to find one earlier collection record for this species. Two specimens were collected in 1931 by Ortenburger of UOBS from the North Fork of Gaines Creek, 1.4 km S of Damon, Latimer County. Both specimens were deposited in the U. S. National Museum of Natural History (USNM 109445).

4. *Erimyzon sucetta* (Lacepede). Lake chubsucker (1-1-2).

On 2 August 1990 we seined two lake chubsucker from Longtown Creek, 12 km N of Quinton on HW 71, Haskell County. Longtown Creek, a tributary of the South Canadian River now flows into Lake Eufaula (*9*). This uncommon sucker was found in a clear, vegetated pool with rocky substrate. The two specimens were deposited at OSUS (cat. number: 26781).

5. *Ictiobus bubalus* (Rafinesque). Smallmouth buffalo (17-54-682).

The smallmouth buffalo represented <0.1% of the fish collected in this study, and occurred in 14.1% of the collections. *I. bubalus* exhibited a greater abundance in downstream areas as over 88% of the specimens came from sites 8 and 9 (Table 3). This sucker was uncommon in the mainstem west of Woodward (four specimens) and below Lake Eufaula (one collection of 10 specimens). The large numbers collected at Site 9 (Table 3) may indicate upstream migration from Lake Eufaula.

In the past, this species was rare in the river. A survey of past fish collections revealed no specimens of smallmouth buffalo from the mainstem. Extensive surveys by Lindsay and Bates in 1963 from Beaver and Texas Counties (UOMZ) and by Houser and Lindsay in 1962 from the easternmost reaches of the river failed to

TABLE 3. Occurrences of the smallmouth buffalo (*Ictiobus bubalus*) in samples from the 10 OSDH fish collecting sites on the North Canadian River from 1976 to 1992.

Year	Site number												
	1	2	3	4	5	6	7	8	9	10	TFC	TCY	MNSY
1976	--	--	--	--	--	--	0	1	--	--	1	2	0.5
1977	--	--	--	--	--	--	0	0	--	--	0	6	0.0
1978	--	--	--	0	--	0	0	1	0	--	1	10	0.1
1979	--	--	--	0	--	0	0	1	0	0	1	15	0.1
1980	--	--	--	0	--	0	0	0	0	0	0	18	0.0
1981	0	0	0	0	--	0	0	0	1	0	1	19	0.1
1982	1	0	0	3	--	0	0	2	108	0	114	17	7.2
1983	1	0	0	0	--	0	1	2	36	0	40	21	1.9
1984	0	0	0	1	--	0	28	0	132	0	161	21	7.7
1985	0	0	0	0	0	0	17	7	152	0	176	23	7.7
1986	0	0	0	1	0	0	0	49	0	0	50	20	2.5
1987	0	0	0	0	0	0	0	1	9	0	10	23	0.4
1988	0	0	0	0	0	0	0	15	25	0	40	21	1.9
1989	0	0	1	0	0	0	0	1	0	0	2	26	0.1
1990	0	0	0	9	0	1	0	2	3	6	21	23	0.9
1991	0	0	1	0	0	0	0	4	7	0	12	24	0.5
1992	0	0	0	0	0	0	0	0	1	4	5	25	0.2
TFC	2	0	2	14	0	1	46	86	474	10	635	314	2.0
TCW	2	0	2	4	0	1	3	13	13	2	40		
TC	22	22	22	39	16	30	49	51	34	29	314		
MFC	0.1	0.0	0.1	0.4	0.0	0.0	0.9	1.7	13.9	0.3	2.2		2.0

-- = No collections made that year.
TFC = Total number of smallmouth buffalo collected.
TCW = Total number of collections with smallmouth buffalo .
TC = Total number of collections made at that site.
MFC = Mean number of smallmouth buffalo per collection (MFC=TFC/TC).
TCY = Total number of collections made that year.
MNSY= Mean number of smallmouth buffalo collected each year (MNSY=TFC/TCY).

collect this species from the mainstem (UOMZ). However, during Houser's 1962 ODWC survey of the tributaries of the proposed Lake Eufaula this species was collected from 11 tributaries, usually in small numbers (1 to 13 specimens per collection). The mean was 5.5 specimens per collection.

We found records of two other previous collections of this species from the drainage. In 1969, 239 specimens were collected from the stilling basin below Canton Lake (*7*). This species represented 0.2% of the individuals and 6.1% of the fish biomass collected from the basin. In 1987, 21 collections from the mainstem in central Oklahoma near Little in Seminole County included two collections containing four specimens (*4*).

In our survey smallmouth buffalo occurred in samples from three of the 10 reservoirs sampled. The 45 specimens collected represented <0.1% of the fish taken from the reservoirs. Nine of the 12 reservoir collections of the species were from Lake Eufaula. Unpublished ODWC lake surveys between 1950 and 1987 listed good (57 to 283 specimens) numbers of smallmouth buffalo from Lake Eufaula. The state record smallmouth buffalo was caught by a fisherman on 6 August 1991 from Lake Canton (ODWC state records). This fish weighed 14.8 kg and had a total length of 94.0 cm.

In this study, *I. bubalus* was rare in the tributaries. We collected a single specimen from Wolf Creek below Ft. Supply Lake in 1990. The 1962 ODWC Survey reported that 11 collections from tributaries included from 1 to 13 specimens/collection (UOMZ).

Considerable temporal variation in the abundance of this species was found in our collections. From 1976 to 1981 the numbers ranged from zero to one per year. The numbers increased to 114 in 1982 (Table 3). Of the total numbers of smallmouth buffalo collected, 337 (53.4%) individuals were taken in 1984 and 1985. A substantial decrease in numbers occurred between 1984 and 1992 (Table 3).

6. *Ictiobus cyprinellus* (Valenciennes). Bigmouth buffalo (6-10-79).

The bigmouth buffalo was rare and limited to those sites downstream from El Reno (Site 7) in Canadian County. This sucker represented <0.1% of the fish

collected and was found in 3% of the collections. We found this species at four mainstem sites including Site 7 in 1976 from the mainstem near El Reno. In 1982, we collected 66 specimens from Site 9. This was the largest number of *I. cyprinellus* taken in a single collection from the drainage. Extensive sampling in the past failed to collect this species. One recent collection was found. In 1987, 14 specimens were collected from the mainstem near Little in Seminole County (*4*). The absence of this species in past collections may indicate an increase in abundance since 1976 when we first collected it in the river.

Three collections from two sites on Lake Eufaula included six specimens. Earlier collections by ODWC from Lake Eufaula include 24 in 1966, one in 1968, 15 in 1977 and 13 in 1984. The first recorded bigmouth buffalo from a reservoir in the drainage was reported from Lake Canton in 1944 by Cross and Buck (OSUS). A single specimen was collected in 1978 from Ft. Supply Reservoir by ODWC (OSUS 53). In 1980, six large specimens were collected from Lake Hefner by ODWC. The total biomass was 22.2 kg or a mean weight of 3.7 kg for each individual. We collected single specimens from both Canton and Overholser lakes in 1992.

7. *Ictiobus niger* (Rafinesque). Black buffalo (1-1-13).

Thirteen specimens were collected on 19 July 1991 from the mainstem near Wetumka. This was the only collection of this uncommon species during this survey. *I. niger* prefers a stronger current than other buffalo fishes and occurred in deeper and swift currents.

On 1 May 1953, Moore collected a single dead specimen from the river below Canton Lake (OSUS). The total length for this sucker was 45 cm. In 1960, a single specimen was collected from the river below Canton Lake by Cross (OSUS). In 1989, 12 individuals were collected by Oklahoma State University personnel from the mainstem of the river south of Okemah. Five individuals were taken from the river north of Bearden on HW 48 and nine from the Beaver River north of May, Beaver County (*10*).

There are several records of this buffalo from reservoirs within the drainage. Seven specimens were collected in 1950 by Cross and Buck from Lake Canton (OSUS). This species was found in Lake Canton ODWC collections made in 1971 and 1972. Two individuals were collected from Lake Eufaula in 1966 by ODWC.

8. *Minytrema melanops* (Rafinesque). Spotted sucker (0-0-0).

The spotted sucker was collected by Ortenburger in 1931 (UOMZ) from Buffalo and Gaines Creeks, in Latimer County. Six specimens were deposited into USNM. The 1962 survey by ODWC collected one to eight specimens of this species in 16 tributaries from Pittsburg, Latimer and McIntosh Counties. Sixteen collections included 48 specimens for a mean 3.0 specimens/collection. We failed to find this species during this survey, although it once was common in the lowland portions of the tributaries of Lake Eufaula.

9. *Moxostoma erythrurum* (Rafinesque). Golden redhorse (0-0-0)

The first record of golden redhorse from the drainage was made in 1931 from the North Fork of Gaines Creek in Latimer County by Ortenburger (UOMZ). During the 1962 survey by ODWC, 41 specimens were collected from three tributaries. A single collection from a tributary of Brushy Creek located in Pittsburg County included 28 individuals (OKNMH). This species appears to have been restricted to the smaller eastern tributaries of the river in Latimer and Pittsburg Counties.

M. erythrurum was not collected during this survey. We were unable to locate any past record of this species from the mainstem or reservoirs. There have been no known collections of this species since 1962.

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