

22.—A LIST OF THE SPECIES OF FISHES KNOWN FROM THE VICINITY OF NEOSHO, MISSOURI.

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This paper is based upon a small collection of fishes which was made October 27 to 30, 1891, in the vicinity of Neosho, Mo., by Prof. Evermann, assisted by Dr. J. T. Scovell, of Terre Haute, Ind. Collections were made in Indian Creek, a few miles south of Neosho, and in the Spring Branch, which supplies water for the United States fish-hatchery at Neosho.

In 1889, Prof. Seth E. Meek, while engaged in investigations for the U. S. Fish Commission, in Missouri, made some collections near Neosho, in Shoal Creek, and in Hickory Creek, one of its small tributary streams. Subsequently he obtained a few specimens from the Spring Branch at the fish-hatchery. In this paper we have included all the species of these various collections.

Indian Creek is a stream of fair size, having its rise in the southeastern part of Newton County; flowing southwest some 30 miles, it joins Elk River a few miles below Pineville, the county seat of McDonald County, which is the southwest-corner county of the State. Elk River flows into Neosho River a short distance west of the Missouri line. Indian Creek is a moderately clear stream, with rock, gravel, or mud bottom, usually shallow and with some current, but with occasional deep holes with muddy bottom and scarcely any current.

The following list represents only approximately the fishes of the region, but may be regarded as fairly complete as to the species inhabiting the smaller streams.

In the larger streams, such as Spring River on the north, Neosho River on the west, and White River to the southeast, many additional species are known to occur, not only of *Cyprinidæ* but of the larger river fishes, such as the channel cat (*Ictalurus punctatus*), *Ameiurus*, *Ictiobus*, and the like.

This list contains 34 species, representing 8 families, as follows: *Siluridæ*, 1; *Catostomidæ*, 3; *Cyprinidæ*, 14; *Peciliidæ*, 1; *Atherinidæ*, 1; *Centrarchidæ*, 4; *Percidæ*, 9; and *Cottidæ*, 1. Or 17 genera, distributed as follows: *Noturus*, 1; *Catostomus*, 2; *Moxostoma*, 1; *Campostoma*, 1; *Chrosomus*, 1; *Hybognathus*, 1; *Pimephales*, 1; *Notropis*, 6; *Hybopsis*, 2; *Semotilus*, 1; *Tinca*, 1; *Zygonectes*, 1; *Labidesthes*, 1; *Lepomis*, 3; *Micropterus*, 1; *Etheostoma*, 9; *Cottus*, 1.

1. *Noturus exilis* Nelson. *Stone Cat*. Two specimens, 1½ and 3 inches long, from Indian Creek. One 3 inches long, taken by Prof. Meek from the Spring Branch, and others reported by him from the same place.
2. *Catostomus teres* (Mitchill). *Common Sucker*. Two specimens, 4½ and 8½ inches long, from Indian Creek; one 10½ inches long from the Spring Branch, and by Dr. Meek reported common in Shoal Creek.
3. *Catostomus nigricans* Le Sueur. *Hog Sucker*; "*Hog Molly*." One specimen, 3¼ inches long, from Indian Creek. Reported scarce in Shoal Creek by Dr. Meek.
4. *Moxostoma duquesnei* (Le Sueur). *Common Redhorse*; *White Sucker*. Two specimens, 4½ and 5½ inches long, from Indian Creek; reported common, by Dr. Meek, in Shoal Creek.
5. *Campostoma anomalum* (Rafinesque). *Stone Roller*. Three specimens from Indian Creek and two from the Spring Branch, the longest of which was 3½ inches, the shortest 2½, and the average length about 3 inches. Dr. Meek reported this species common in Shoal Creek.
6. *Chrosomus erythrogaster* Rafinesque. *Red-bellied Minnow*. Three specimens from the Spring Branch, and five taken by Dr. Meek from the same place. The longest of 8 specimens is 2½ inches, the shortest 2⅓, and the average 2½ inches long. Reported abundant by Prof. Meek in Shoal Creek.
7. *Hybognathus nubila* (Forbes). Six examples from Indian Creek, where it is common. The smallest is 2¼ inches long, the largest 2⅔ inches, and the average is 2⅔ inches. Reported by Dr. Meek as abundant in Shoal Creek.
8. *Pimephales notatus* (Rafinesque). One specimen, 2½ inches long, from Indian Creek. Abundant in Shoal Creek.
9. *Notropis shumardi* (Girard). Head, 4; depth, 4½; eye, 2⅓; snout, 3¼; D. 8; A. 8; scales, 6-36-3, 12 to 14 scales before the dorsal. Dorsal fin rather high, its anterior rays nearly as long as head, the last ray 2½ in first ray; origin of dorsal somewhat behind base of ventrals, nearer tip of snout than base of caudal; pectorals long, not quite reaching base of ventrals, 1½ in head; anal small, its longest ray 1½ in head; caudal deeply forked. Head rather heavy; snout shorter than eye, rather blunt; mouth rather large, oblique, jaws subequal; maxillary reaching orbit, 3 in head. Teeth, 1, 4-4, 1, hooked, and with slight grinding surface. Two specimens, each 2½ inches long, from Indian Creek, which we refer to this species. The mouth is somewhat larger and the snout more blunt than in typical *shumardi*.
10. *Notropis illecebrosus* (Girard). One small specimen of this species from the Spring Branch at Neosho.
11. *Notropis galacturus* (Cope). *Milky-tail Minnow*. Obtained in Shoal Creek, where it is said not to be common.
12. *Notropis megalops* (Rafinesque). *Common Shiner*. Not obtained by us, but found by Dr. Meek to be very common in Shoal Creek.
13. *Notropis zonatus* (Agassiz).
Alburnus zonatus Agassiz, in Putnam, Bull. Mus. Comp. Zool., 1, 9, 1863. Type locality: Osage River, Missouri.
 Teeth 1, 4-4, 1, hooked and with slight grinding surface. Head, 4; depth, 4¼; eye, 3; snout, 3½. D. 8; A. 9; scales, 7 or 8-42-3 or 4, 14 before dorsal. Height of dorsal 1½ in head, its origin over base of ventrals equally distant between tip of snout and base of caudal. Head less pointed than in *N. rubrifrons*; mouth smaller, maxillary scarcely reaching eye. Color essentially as in *N. rubrifrons*, the black dorsal line rather more distinct; lateral line less decurved and the pores less plainly marked. We have examined 31 specimens of this species, 20 from Indian Creek and 11 from Spring Branch. The average length of these 31 specimens is nearly 3 inches; the shortest is 2 inches, the longest 3½ inches. It was found by Prof. Meek to be abundant in Shoal Creek.
14. *Notropis rubrifrons* (Cope). Three specimens from Indian Creek; common in Shoal Creek. Head, 4; depth, 4¼; eye, 3½; snout, 3½. D. 8; A. 9; scales, 6-37-3. Dorsal moderate, its longest ray 1½ in head, origin considerably behind base of ventrals, much nearer base of caudal than tip of snout. Mouth large, oblique, maxillary reaching past front of eye; snout pointed; jaws subequal, or lower one slightly projecting. Lateral line decurved. A small, straw-colored minnow with a narrow black line along middle of back and a broad silvery lateral band edged with plumbeous above.

15. *Hybopsis amblops* (Rafinesque). One specimen, $2\frac{1}{2}$ inches long, taken from Indian Creek, and a few recorded by Dr. Meek from Shoal Creek.
16. *Hybopsis kentuckiensis* (Rafinesque). *River Chub; Jerker*. Eight specimens from Indian Creek, 3 specimens taken by Dr. Meek from the Spring Branch, and reported common in Shoal Creek. Of 11 specimens, the longest is $4\frac{1}{2}$, the shortest $1\frac{1}{2}$, and the average length a little over 2 inches.
17. *Semotilus atromaculatus* (Mitchill). *Creek Chub*. Not found by us, but obtained by Dr. Meek in Shoal Creek.
18. *Tinca tinca* (Linnaeus). *Tench*. This European cyprinoid, which is one of the species reared at the Neosho fish-hatchery, has escaped into Spring Branch, where young individuals were quite common.
19. *Zygonectes macdonaldi* Meek.
Zygonectes macdonaldi Meek, Bull. U. S. Fish Comm., ix, 1889, 122, pl. 42, fig. 1. Type locality: Jones Creek, near Dixon, Mo., and Osage Fork of the Gasconade, near Marshfield, Mo.
 This species, described by Prof. Meek from the localities mentioned above, was also obtained by him at Neosho. It was found by us to be a very common fish in the Spring Branch. In 17 examples examined the length varied from $1\frac{1}{2}$ inches to $2\frac{3}{4}$ inches, the average length being about 2 inches.
20. *Labidesthes sicculus* Cope. *Brook Silverside; Skipjack*. Three specimens from Indian Creek, measuring $2\frac{3}{8}$, $2\frac{3}{8}$, and $2\frac{1}{4}$ inches in total length, respectively. A single specimen obtained in Shoal Creek by Dr. Meek.
21. *Lepomis cyanellus* Rafinesque. *Green Sunfish*. Three specimens from the Spring Branch and one from Indian Creek, measuring $3\frac{1}{8}$, $1\frac{3}{8}$, $1\frac{1}{4}$, and $1\frac{1}{2}$ inches respectively.
22. *Lepomis megalotis* (Rafinesque). *Long-eared Sunfish*. One specimen from Indian Creek, $3\frac{1}{2}$ inches long. Reported very abundant, by Dr. Meek, in Shoal Creek.
23. *Lepomis pallidus* (Mitchill). *Blue-gill; Blue Bream*. One specimen, $3\frac{1}{2}$ inches long, from Spring Branch.
24. *Micropterus dolomieu* Lacépède. *Small-mouthed Black Bass*. Not taken by us, but obtained by Prof. Meek in Shoal Creek.
25. *Etheostoma nigrum* Rafinesque. Seven specimens from Indian Creek, the longest being $2\frac{3}{4}$, the shortest $1\frac{1}{2}$, and the average about 2 inches long. Dorsal VIII, 12 in 4 of the 7 examples, instead of IX, 12.
26. *Etheostoma blennioides* Rafinesque. Two specimens, $3\frac{1}{2}$ and 2 inches in length, from Indian Creek.
27. *Etheostoma copelandi* (Jordan). Three specimens obtained in Shoal Creek.
28. *Etheostoma caprodes* Rafinesque. *Log Perch*. One specimen, $5\frac{1}{2}$ inches in length, from Indian Creek.
29. *Etheostoma zonale* (Cope). Three specimens from Indian Creek. Scales 6-52-9, 6-58-9, and 6-55-7. The 3 specimens are $2\frac{1}{2}$, $2\frac{1}{2}$, and $2\frac{1}{2}$ inches long, respectively.
30. *Etheostoma flabellare* Rafinesque. Two specimens obtained by Prof. Meek in Shoal Creek.
31. *Etheostoma whipplei* (Girard). There is one small darter, 2 inches long, from Indian Creek, which seems to be this species, though it does not wholly agree with specimens collected in the Sallisaw River, at Mackey, Ind. T., by Prof. Meek, and identified by him and us as *E. whipplei*. The following is a description of our specimen: Head, * $3(3\frac{1}{2})$; depth, 5; eye, $4(3\frac{1}{2})$; snout, $4\frac{1}{2}(3\frac{3}{8})$. D. XI, 13; A. II, 9; scales, 11-63-11, the lateral line developed on about 34 scales, not arched above base of pectoral. Cheeks with fine imbedded scales; opercles almost naked; breast and nape with very fine scales; middle line of belly with ordinary scales. Head moderate; mouth large, terminal, but little oblique, the maxillary reaching vertical of pupil; premaxillaries not protractile; gill membranes scarcely connected. Body deep, compressed, back somewhat elevated; caudal peduncle compressed and deep, the least depth $2\frac{3}{8}$ in head with opercular flap. Everywhere densely covered with minute coffee-colored specks.

* In obtaining the number inside the parenthesis the opercular flap was not included in the length of the head.

32. *Etheostoma pagei* Meek.

Etheostoma pagei Meek, American Naturalist, November, 1894, 957.

This interesting darter was described by Dr. Meek from 2 specimens obtained by him in the Spring Branch on the U. S. Fish Commission grounds at Neosho, and was named for Mr. W. F. Page, superintendent of the Government fish-hatchery at that place. The original description is as follows: Head, $3\frac{1}{2}$ in length of body; depth, 4 to $4\frac{1}{4}$; eye, $3\frac{1}{2}$ in head; snout, $3\frac{1}{2}$; dorsal fin with 9 or 10 spines and 12 or 13 soft rays; anal spines, 2; soft rays, 7; scales, 8-56 to 61-13. Body robust; snout abruptly decurved, but not blunt; mouth rather large, terminal, maxillary reaching vertical from pupil; premaxillaries not protractile; lips thick; gill membranes not connected; cheeks, opercles, and breast naked; nape scaled; lateral line imperfect, developed on only about 12 scales. Color of male: Belly bright red, extending on side to upper rays of pectoral fins; above the red is a yellowish band on the sides about as wide as diameter of eye; upper part of body olivaceous, with darker markings, each scale being provided with a black spot, these making faint lateral streaks along the rows of scales; about 9 dark blotches on the side, resembling faint bars. Caudal and soft dorsal fins barred; pectorals faintly barred; anal and ventrals plain; a dark numeral scale. The female has the under parts whitish, the sides olivaceous, much mottled with darker; otherwise as in the male. Length, 2 inches. Only the types known.

- 33. *Etheostoma cœruleum spectabile* (Agassiz).** *Rainbow Darter.* This is the most abundant darter in Spring Branch and in Shoal Creek. It is also common in Indian Creek. Of 24 examples examined by us all are of the small brook form described as *spectabile*. The males were all extremely brilliant in life. The average length of the 24 specimens is $2\frac{1}{2}$ inches.
- 34. *Cottus bairdi* Girard.** *Blob; Miller's Thumb.* Four specimens from Indian Creek, 2 to $3\frac{1}{2}$ inches long. Common in Shoal Creek.