

# The Distribution of Fishes in Putnam County, Indiana, and Vicinity<sup>1</sup>

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This report summarizes a study of the distribution of fishes in an area of approximately 1000 square miles which includes all of Putnam County and parts of Clay, Parke, Montgomery, Boone, Hendricks and Morgan Counties. Collections of fish from four main streams, their tributaries and headwaters were made during 1962, 1963 and 1964. Included in the study was that part of Raccoon Creek north of the town of Mansfield (drainage basin area = 260 square miles), Mill Creek (D. B. A. = 290 sq. mi.) and Big Walnut Creek (D. B. A. = 360 sq. mi.) above their junction with each other, and Deer Creek (D. B. A. = 90 sq. mi.).

These streams are relatively unpolluted and receive major contributions of treated domestic wastes only from Greencastle and the State Penal Farm at Putnamville. A single instance of fish mortality due to oxygen depletion as the result of pollution was noted in June, 1964 on Deer Creek below the latter site. Most of the Mill Creek system has been altered by dredging and straightening, but only the extreme headwaters of the Big Walnut and Raccoon systems in Boone and Hendricks Counties have been similarly affected.

The streams flow from northeast to southwest through a geologically varied terrain. The northern and eastern portions, comprising about half of the entire study area, consist of Borden formations of fine sandstone and siltstone. Mansfield sandstone underlies the extreme western part. Between these lies a wedge of limestone covering most of the southern part and tapering toward the northwest. Total alkalinity and pH determinations were made at 22 scattered locations on November 1 and 8, 1963, near the end of a prolonged drought. Total alkalinity ranged from 210 ppm. to 315 ppm. and pH ranged from 7.9 to 9.1.

Fifty-six sites within the study area were visited a total of one hundred and eleven times. Fish were obtained primarily by means of  $\frac{1}{4}$  inch mesh seines and a portable, battery-powered, A. C. electric shocking apparatus. The more common species were identified in the field. Others were preserved and identified in the laboratory using the keys of Gerking (1955) and Trautman (1957). A thorough description of each station is not possible because of space limitations, but a few of the more important characteristics appear in coded form after each of the stations listed in the Description of collection sites. The code letters correspond to the characteristics listed below.

A. pools large; 100 or more feet in length, depth to 4 feet

B. pools large, but shallow

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- C. pools small, depths to 3 feet
- D. pools small and shallow
- E. pools non-existent; a regular, shallow flow
- F. pool bottom mostly sand and/or gravel
- G. pool bottom mostly rubble and/or bedrock
- H. pool bottom mostly mud, silt or clay
- I. riffle bottom mostly sand and/or gravel
- J. riffle bottom mostly rubble and/or bedrock
- K. average gradient less than 5 feet per mile
- L. average gradient 5 to 10 feet per mile
- M. average gradient 10 to 15 feet per mile
- N. average gradient 15 to 20 feet per mile
- O. average gradient 20 to 30 feet per mile
- P. average gradient 30 to 40 feet per mile

The collection sites are listed below according to the stream system. Those on the mainstreams are listed consecutively beginning with the station farthest downstream and proceeding toward the headwaters. Tributaries are then listed in a similar order.

#### Description of collection sites

##### Big Raccoon Creek system

1. Big Raccoon creek, sec. 8, T. 14 N., R. 6 W. A, F, J, L.
2. Big Raccoon Creek, sec. 33, T. 16 N., R. 5 W. B, G, J, L.
3. Big Raccoon Creek, sec. 5, T. 16 N., R. 4 W. A, F, I, L.
4. Big Raccoon Creek, sec. 17, T. 17 N., R. 3 W. B, G, I, L.
5. Rocky Fork Creek, sec. 11, T. 14 N., R. 6 W. D, F, I, O.
6. Little Rocky Fork Creek, sec. 22, T. 14 N., R. 6 W. D, F, I, P.
7. Byrd Branch, sec. 30, T. 16 N., R. 5 W. D, G, J, O.
8. Ramp Creek, main stem, sec. 27, T. 16 N., R. 5 W. E, I, M.
9. Ramp Creek, main stem, sec. 30, T. 16 N., R. 4 W. A, F, I, L.
10. Ramp Creek, south branch, sec. 33, T. 16 N., R. 4 W. D, G, J, P.
11. Ramp Creek, north branch, sec. 20, T. 16 N., R. 4 W. C, F, I, M.
12. Cornstalk Creek, secs. 14, 27 & 34, T. 17 N., R. 4 W. A, F, I, L.
13. Haw Creek, sec. 30, T. 17 N., R. 3 W. C, F, J, M.

##### Big Walnut Creek system

14. Big Walnut Creek, sec. 29, T. 13 N., R. 5 W. A, F, I, K.
15. Big Walnut Creek, sec. 11, T. 13 N., R. 5 W. A, F, I, K.
16. Big Walnut Creek, sec. 27, T. 14 N., R. 5 W. A, F, I, K.
17. Big Walnut Creek, sec. 19, T. 14 N., R. 4 W. B, F, I, K.
18. Big Walnut Creek, sec. 10, T. 14 N., R. 4 W. B, F, I, K.
19. Big Walnut Creek, sec. 18, T. 16 N., R. 2 W. B, G, J, L.
20. Johnson Branch, sec. 19, T. 13 N., R. 5 W. E, I, M.
21. Maiden Run, sec. 16, T. 13 N., R. 5 W. C, F, J, O.
22. Snake Creek, sec. 33, T. 14 N., R. 5 W. D, F, J, O.
23. Little Walnut Creek, sec. 23, T. 14 N., R. 5 W. A, F, I, L.
24. Little Walnut Creek, sec. 10, T. 14 N., R. 5 W. B, F, J, L.
25. Little Walnut Creek, sec. 34, T. 15 N., R. 5 W. D, F, I, M.
26. Long Branch, sec. 22, T. 14 N., R. 5 W. C, F, I, O.
27. Clear Creek, sec. 22, T. 15 N., R. 3 W. B, F, I, M.

28. Miller Creek, sec. 34, T. 15 N., R. 3 W. B, F, J, N.
29. Bledsoe Branch, sec. 24, T. 15 N., R. 4 W. E, J, P.
30. Plum Creek, sec. 20, T. 15 N., R. 3 W. D, F, I, M.
31. Ramp Run, sec. 21, T. 16 N., R. 2 W. D, F, I, M.
32. Big Walnut Creek, East Fork, sec. 9, T. 16 N., R. 2 W. B, F, I, M.
33. Big Walnut Creek, West Fork, sec. 5, T. 16 N., R. 2 W. B, F, J, M.

## Deer Creek system

34. Deer Creek, sec. 26, T. 13 N., R. 5 W. A, F, I, K.
35. Deer Creek, sec. 23, T. 13 N., R. 5 W. A, F, I, K.
36. Deer Creek, sec. 24, T. 13 N., R. 5 W. B, F, I, K.
37. Deer Creek, sec. 16, T. 13 N., R. 4 W. A, F, G, L.
38. Deer Creek, sec. 10, T. 13 N., R. 4 W. B, F, J, M.
39. Deer Creek, sec. 2, T. 13 N., R. 4 W. B, F, I, M.
40. Leatherwood Creek, sec. 25, T. 13 N., R. 5 W. D, G, J, O.
41. Deweese Branch, sec. 5, T. 13 N., R. 4 W. D, F, I, M.
42. Upper Limestone Creek, sec. 12, T. 13 N., R. 4 W. C, F, J, P.
43. Little Deer Creek, sec. 32, T. 14 N., R. 3 W. D, F, I, O.

## Mill Creek System

44. Mill Creek, sec. 13, T. 12 N., R. 5 W. A, H, K.
45. Cataract Lake, sec. 19, T. 12 N., R. 4 W.
46. Mill Creek, sec. 35, T. 12 N., R. 4 W. Between upper and lower Cataract Falls, A, F, J.
47. Mill Creek, sec. 2, T. 12 N., R. 3 W. B, F, I, K.
48. Mill Creek, sec. 36, T. 13 N., R. 3 W. B, F, I, K.
49. Mill Creek, sec. 30, T. 13 N., R. 2 W. B, F, I, K.
50. Mill Creek, sec. 35, T. 15 N., R. 2 W. D, F, I, L.
51. Ferguson Branch, sec. 2, T. 12 N., R. 4 W. C, F, J, P.
52. Vermillion Branch, sec. 35, T. 13 N., R. 3 W. D, H, I, M.
53. Lake Ditch, sec. 21, T. 13 N., R. 2 W. E, H, K.
54. Mud Creek, sec. 2, T. 13 N., R. 2 W. D, F, I, K.
55. Sallust Creek, sec. 29, T. 14 N., R. 2 W., E, I, L.
56. Crittenden Creek, sec. 3, T. 14 N., R. 2 W. D, F, I, N.

## List of Species

- Lampetra lamottei* (LeSueur); American brook lamprey. 17, 22, 23, 26.
- Lepisosteus osseus* (Linnaeus): longnose gar. 23, 34, 36.
- Amia calva* Linnaeus; bowfin. 17.
- Dorosoma cepedianum* (LeSueur); gizzard shad. 2, 34, 35, 36.
- Ictiobus cyprinellus* (Valenciennes); bigmouth buffalofish. 45.
- Carpiodes cyprinus* LeSueur; quillback carpsucker. 2, 13, 15, 25, 34, 35, 36.
- Moxostoma anisurum* (Rafinesque); silver redhorse. 34.
- Mosotoma erythrurum* (Rafinesque) golden redhorse. 1, 4, 5, 12, 13, 15, 16, 18, 19, 22, 26, 32, 33, 34, 35, 36, 38, 39, 40, 44, 47, 49.
- Moxostoma breviceps* (Cope); Ohio shorthead redhorse. 34, 35.

*Hypentelium nigricans* (LeSueur); hog sucker. 1, 2, 3, 5, 6, 8, 10, 11, 12, 17, 18, 20, 21, 22, 23, 25, 26, 27, 29, 32, 33, 34, 35, 36, 38, 39, 40, 49, 50, 52, 53, 56.

*Catostomus commersoni commersoni* (Lacepede); common white sucker. 2, 4, 6, 8, 9, 11, 12, 13, 15, 19, 21, 22, 25, 26, 32, 34, 35, 36, 38, 39, 40, 41, 49, 50, 51, 52, 53, 56.

*Minytrema melanops* (Rafinesque); spotted sucker. 15, 22, 32, 34, 35, 36.

*Erimyzon oblongus claviformis* (Girard); western creek chubsucker. 52, 54.

*Cyprinus carpio* Linnaeus; carp. 2, 15, 47.

*Notemigonus crysoleucas* (Mitchill); western golden shiner. 52.

*Hybopsis amblops* (Rafinesque); bigeye chub. 9, 12, 18, 19, 23, 25.

*Hybopsis biguttata* (Kirtland); hornyhead chub. 8, 12.

*Hybopsis micropogon* (Cope); river chub. 1, 2, 3.

*Rhinichthys artatulus melaegris* Agassiz; western blacknose dace. 5, 6, 21, 25, 26, 29, 30, 40, 50, 53, 54, 55, 56.

*Semotilus atromaculatus atromaculatus* (Mitchill); northern creek chub. All stations *except* 2, 4, 6, 9, 19, 23, 26, 32, 37, 39, 42, 44, 45, 46, 48, 50.

*Phenacobius mirabilis* (Girard); suckermouth minnow. 2, 3, 13, 15, 25, 34, 35, 36, 39, 49, 52, 54.

*Chrosomus erythrogaster* Rafinesque; southern redbelly dace. 5, 6, 22, 30, 40, 42.

*Notropis atherinoides atherinoides* Rafinesque; river emerald shiner. 34.

*Notropis rubellus* (Agassiz); rosyface shiner. 2, 3, 15, 18, 19, 33.

*Notropis umbratilis* (Girard); redfin shiner. 4, 11, 13, 17, 18, 19, 20, 21, 22, 28, 32, 33, 34, 35, 36, 42, 46, 49, 50, 51, 52, 55.

*Notropis cornutus chrysocephalus* (Rafinesque); central common shiner. 1, 2, 3, 4, 5, 6, 8, 9, 10, 12, 13, 14, 15, 18, 19, 22, 23, 24, 26, 28, 29, 31, 33, 34, 35, 36, 38, 40, 41, 42, 43, 49, 50, 52.

*Notropis boops* Gilbert; bigeye shiner. 4, 12, 24, 26, 36, 37.

*Notropis whipplei* (Girard); steelcolor shiner. 50.

*Notropis spilopterus* (Cope); spotfin shiner. 1, 2, 3, 5, 8, 10, 14, 15, 17, 18, 19, 20, 24, 26, 32, 33, 34, 35, 36, 38, 45, 46, 47, 48, 49, 50, 52, 53, 54.

*Notropis deliciosus deliciosus* (Girard); southern sand shiner. 3, 8, 11, 15, 17, 18, 19, 25, 33, 34, 35, 46, 48, 49, 50, 54.

*Ericymba buccata* Cope; silverjaw minnow. 1, 5, 6, 7, 8, 9, 10, 11, 12, 13, 15, 17, 18, 20, 21, 22, 23, 24, 25, 26, 28, 29, 33, 34, 35, 36, 38, 39, 40, 41, 43, 46, 47, 49, 50, 52, 54, 55, 56.

*Pimephales notatus* (Rafinesque) bluntnose minnow. All stations *except* 7, 16, 30, 32, 37, 44, 45, 47, 53.

*Campostoma anomalum* (Rafinesque); stoneroller. 1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 17, 18, 20, 21, 22, 23, 24, 25, 26, 28, 29, 30, 31, 34, 35, 36, 38, 39, 40, 41, 43, 46, 49, 51, 52, 54, 56.

- Ictalurus punctatus* (Rafinesque); channel catfish. 15, 35, 36.  
*Ictalurus natalis* (LeSueur); yellow bullhead. 12, 31, 35, 41, 43, 54.  
*Ictalurus melas* (Rafinesque); black bullhead. 8, 12.  
*Noturus flavus* (Rafinesque); stonecat. 15.  
*Noturus miurus* (Jordan); brindled madtom. 2, 15, 17, 26, 35, 39.  
*Fundulus notatus* (Rafinesque); blackstripe topminnow. 4, 12, 19, 34, 35, 36, 41, 47, 49, 52, 53, 54.  
*Labidesthes sicculus sicculus* (Cope); northern brook silverside. 14, 34, 35, 36, 51.  
*Pomoxis annularis* (Rafinesque); white crappie. 2, 14, 34, 35, 36, 37, 43, 44.  
*Pomoxis nigromaculatus* (LeSueur); black crappie. 44.  
*Ambloplites rupestris rupestris* (Rafinesque); northern rock bass. 2, 4, 12, 15, 19, 22, 23, 32, 34, 35, 36, 38, 42.  
*Micropterus dolomieu dolomieu* Lacépède; northern smallmouth bass. 1, 2, 5, 12, 13, 18, 19, 23, 25, 26, 27, 30, 32, 34, 35, 36, 38, 42.  
*Micropterus punctulatus punctulatus* (Rafinesque) northern spotted bass. 1, 15, 34, 35, 37, 46.  
*Micropterus salmoides salmoides* (Lacepede); northern largemouth bass. 2, 8, 12, 22, 34.  
*Lepomis cyanellus* Rafinesque; green sunfish. 6, 7, 13, 19, 21, 24, 28, 31, 34, 35, 36, 40, 41, 42, 52, 53, 54.  
*Lepomis macrochirus macrochirus* (Rafinesque); northern bluegill. 1, 8, 13, 26, 34, 35, 36, 41, 42, 43, 45, 48, 49, 50.  
*Lepomis humilis* (Girard); orangespot sunfish. 35, 36.  
*Lepomis megalotis megalotis* (Rafinesque); central longear sunfish. 1, 2, 4, 8, 12, 16, 18, 19, 20, 21, 23, 24, 26, 34, 35, 36, 38, 39, 41, 43, 44, 45, 47, 49, 52, 53, 54.  
*Percina maculata* (Girard); blackside darter. 15, 18, 19, 34, 35, 36.  
*Percina caprodes caprodes* (Rafinesque); Ohio logperch. 9, 12, 13, 34, 35, 36, 38, 39.  
*Ammocrypta pellucida* (Baird); northern sand darter. 14, 15, 18.  
*Etheostoma nigrum nigrum* (Rafinesque); central Johnny darter. 3, 6, 7, 10, 11, 12, 13, 18, 20, 21, 22, 25, 27, 28, 30, 34, 35, 36, 38, 39, 40, 41, 43, 47, 49, 50, 52, 54, 56.  
*Etheostoma blenniodes* (Rafinesque); greenside darter. 3, 5, 12, 15, 17, 18, 23, 25, 33, 34, 35, 36, 38, 46, 54.  
*Etheostoma caeruleum* (Storer); rainbow darter. 1, 5, 6, 8, 11, 12, 13, 15, 18, 19, 21, 22, 23, 25, 27, 30, 33, 34, 35, 36, 38, 39, 42, 43, 51.  
*Etheostoma spectabile spectabile* (Agassiz); northern orange-throat darter. 6, 13, 15, 20, 28, 29, 40, 43, 51, 53, 54, 55, 56.  
*Etheostoma flabellare* (Rafinesque); fantail darter. 7, 11, 12, 19, 21, 22, 23, 25, 26, 33, 34, 35, 36, 39, 43.  
*Aplodinotus grunniens* (Rafinesque); freshwater drum. 34, 44.  
*Cottus bairdi bairdi* (Girard); northern mottled sculpin. 5, 6, 9, 21, 22, 27, 28, 40, 43.



### Discussion

A total of 60 species of fish belonging to 13 families were identified. Forty of the forty-eight species recorded for the study area by Gerking (1945) were found, and twenty additional species were captured.

Two specimens of Catostomids have been identified tentatively as *Moxostoma breviceps*, a species which has not been reported from Indiana since Jordan collected it in 1888 (Jordan, 1890). These two individuals seem to be identical in certain key characteristics to specimens collected in Big Walnut Creek in 1941 by Gerking, who identified them as *Moxostoma aureolum*. The ranges of *Moxostoma breviceps* and *M. aureolum* are distinct and separate except in Indiana where intergradation might possibly occur (Trautman, 1957, page 256). More specimens and work are needed before the exact taxonomic status of these individuals can be determined.

A total of 18 species had a widespread distribution throughout the study area. Ten of these usually had high population densities (*Moxostoma erythrurum*, *Hypentelium nigricans*, *Semotilus atromaculatus atromaculatus*, *Notropis cornutus chrysocephalus*, *Notropis spilopterus*, *Ericymba bucatia*, *Pimephales notatus*, *Campostoma anomalum*, *Lepomis megalotis megalotis* and *Etheostoma nigrum nigrum*). The other eight species were taken regularly, but the populations were much smaller (*Catostomus commersonii*, *Phenacobius mirabilis*, *Notropis deliciosus deliciosus*, *Notropis umbratilis*, *Fundulus notatus*, *Lepomis cyanellus*, *Lepomis macrochirus macrochirus*, and *Etheostoma spectabile spectabile*).

Three other species were widely distributed and fairly abundant, except for their absence above Cataract Falls (*Ambloplites rupestris rupestris*, *Etheostoma caeruleum* and *Etheostoma flabellare*). Thirteen additional species which were not captured above the Falls were taken at six or more stations elsewhere. It may not now be possible to determine if these species were blocked by the Falls because of extensive man-made changes in the habitat. Nevertheless, more intensive collecting might more firmly establish their presence or absence.

Most of the 20 species taken in this study that were not found by Gerking (1945) were probably present 20 years ago, but were not captured because of the localized nature of the populations or the scarcity of individuals. Two species, however, are presently so abundant in some of the streams that they almost surely have entered the area fairly recently. Good numbers of gizzard shad, *Dorosoma cepedianum*, now inhabit the lower part of Deer Creek and that part of Raccoon Creek above Mansfield Reservoir. The impoundment of Raccoon Creek has no doubt contributed greatly toward their success here. The river chub, *Hybopsis micropogon*, has become firmly established in Raccoon Creek and is now abundantly present both above and below Mansfield Reservoir.

### Summary

The distribution of fishes in an area of approximately 1000 square miles including all of Putnam County and parts of Clay, Parke, Montgomery, Boone, Hendricks and Morgan Counties was studied during

1962, 1963 and 1964. Collections were made at 56 sites on the main-streams and tributaries of Raccoon Creek north of the town of Mansfield, Deer Creek, and Big Walnut and Mill Creeks above their junction with each other. A total of 60 species of fish belonging to 13 families were identified. Two specimens of Catostomids have been identified tentatively as *Moxostoma breviceps*. *Ambloplites rupestris rupestris*, *Etheostoma caeruleum* and *Etheostoma flabellare* were not found above Cataract Falls, but were widely distributed and fairly abundant elsewhere. Thirteen other species which were not collected above the Falls were taken at six or more sites elsewhere. Within the past 20 years, the gizzard shad (*Dorosoma cepedianum*) and the river chub (*Hybopsis micropogon*) have entered the area and have become firmly established in some stream systems.

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