

FISHES OF WEST VIRGINIA

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BUREAU OF FISHERIES DOCUMENT NO. 631

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CONDITIONS IN THE STREAMS.

The particular regions visited in West Virginia were selected because of their former reputation for abundance of fishes, which abundance was now said to be decreasing. It was hoped that the cause of this decrease, if there was a decrease, might be found, and examination was made of all the streams of any importance in those parts of the state visited.

It was concluded that the aquatic life in general, and fishes in particular, had been and are now in many streams being greatly injured and in others practically destroyed by the unwise and destructive operations of the lumberman and the miner. There is no doubt that the trout have greatly diminished in numbers in certain localities and that the decrease is continuing. There is, further, no reason why this decrease can not be checked by the enactment and enforcement of protective laws and the Monongahela and upper Potomac basins become an attractive region to the angler. The water of the mountain streams is sufficiently cool for the continued residence of the trout, native and still abundant in certain localities, and efforts to protect and propagate the fish would undoubtedly produce most satisfactory and obvious results.

NORTHEASTERN WEST VIRGINIA.

The investigations were begun in 1899 at Beverly, with a route thence in a sort of irregular circle about the mountainous region, including the headwaters of the Monongahela, Potomac, and Greenbrier or their tributaries. Thus, with a comparatively small amount of journeying, it was possible to examine streams diverging into widely different regions.

^a Based on investigations conducted for the Bureau of Fisheries, under direction of William Perry Hay, head of the department of biology in the Washington High Schools, Washington, D. C.

Fish were found to be fairly abundant everywhere, and in the districts not affected by the lumbering or mining operations they were quite plentiful. Trout are native to all the streams and in places afford good angling. Black bass have been introduced, very probably unwisely. The bass and trout are not congenial companions, and sooner or later one or the other is driven out—usually the trout. The first plants of black bass were made in 1854 by Mr. William Shriver, of Wheeling, the fish being brought from the Ohio River in the tank of a locomotive and deposited in the canal basin at Cumberland. From the canal basin they escaped into the Potomac River, where they have greatly increased. More have since been planted at various times and places, until now the Potomac and its tributaries are well stocked.

SOUTHERN WEST VIRGINIA.

In 1900 the work was taken up in the southern part of the state. Beginning July 5, nearly two months were occupied in the examination of streams and in making extensive collections of the aquatic animals and plants. The route followed made it possible to reach and to study at several different points the tributaries of the New, Great Kanawha, Greenbrier, Big Sandy, and Guyandotte rivers, of the Ohio basin. All of these have water slightly warmer than the streams tributary to the Monongahela. The beds of most of them are rocky, but in many places there are long intervals of mud, sand, or gravel. Until within very recent years the fish life was extremely abundant, but it is now becoming more difficult each season to secure a good catch. No trout were taken in this region, though they were seen in some of the smaller streams and are said to have been abundant in the larger streams some years ago.

The agencies which have cooperated to injure and to destroy the fish are the same as those in the northern part of the state, with the additional bad effects of more active work in coal mining near the heads of the streams. Thus the fish of the Bluestone River have been greatly reduced in numbers throughout nearly the entire length of the stream by the mining operations at Pocahontas, Va. In Wyoming and McDowell counties logging and coal mining have together wrought great destruction, and streams which were formerly known far and wide as fine fishing streams are now muddy, filthy currents in which few if any fish are to be found. The railroads, in opening up new regions, have employed and brought into the country irresponsible persons who have had no hesitancy in using dynamite in order to secure a few fish, thus at the same time killing great numbers of others. Such conditions, all incidental to the industrial development of the country, could nevertheless, and should, be controlled by the state.

FISHES COLLECTED.^a

The number of species of fishes found in the northern part of the state was 45; in the southern part but 28 were taken. Why there should be this difference is not clear, but it is probably due to the injurious effect of the lumbering and mining operations, which are more energetically pursued in this than in the northern

^a A report on the plants collected during this investigation has been published in the Proceedings of the Biological Society of Washington, Vol. XIII, Oct. 31, 1900, p. 171-182, under the title "Some plants of West Virginia," by E. L. Morris, botanist of the party.

region. Fish are certainly less abundant here than in the northern part of the state. As already noted, no trout were secured from this region, though they were seen in some of the streams; the black bass seems to be fairly well established, but is nowhere in abundance. Eels were seen, but not taken; they were also seen in the northern part of the state in both the Potomac and Ohio basins. It is interesting to note with what persistency the eel pushes its way up from the deep-sea water—for eels spawn only in the sea—to the very headwaters of these streams, many hundreds of miles from the Gulf of Mexico or Chesapeake Bay, where they must have been hatched.

All the fish taken in the southern part of the state were from streams belonging to the Ohio basin. In the northern part they were taken from both the Ohio and Potomac basins. In the Potomac basin 14 species were found, while 46 were found in the Ohio. Two species, *Exoglossum maxillingua* and *Lepomis auritus*, were found in the Potomac, but not in the Ohio basin. The German carp has been introduced and seems to be well established in most of the streams visited in both parts of the state.

ANNOTATED LIST OF SPECIES COLLECTED IN THE OHIO BASIN.

Family LEPISOSTEIDÆ.

1. *Lepisosteus osseus* (Linnæus). *Long-nosed Gar*.
One specimen, 13.5 inches long, from Ten-mile Creek, at Lumberport.

Family SILURIDÆ.

2. *Ictalurus punctatus* (Nelson). *White Cat; Channel Cat*.
Ten-mile Creek, at Lumberport; Deckers Creek, above Morgantown; Greenbrier River, 8 miles above Hinton; Bluestone River, just above its mouth; Guyandotte River, at Baileysville.
3. *Schilbeodes exilis* (Nelson).
One specimen, 3.5 inches long, from Guyandotte River.

Family CATOSTOMIDÆ.

4. *Catostomus catostomus* (Forster). *Red Sucker*.
Harrington Creek; Right Fork of Middle Fork of Valley River, at Queens. The discovery of this species in this region is very interesting, extending the recorded range farther south and into a region where the fish was supposed not to exist.
5. *Catostomus commersonii* (Lacépède). *White Sucker*.
Cheat River, at Raines; Deckers Creek, above Morgantown; Dry Fork, at Harman; West Fork of Glady; Left-hand Fork of Middle Fork of Valley River, at Cassiday; Sand Run, 2 miles above Buckhannon; Right Fork of Middle Fork of Valley River, at Queens; Trubies Run, 7 miles above Buckhannon; Valley River, at Mingo; Bluestone River, at Abbs Valley, and at mouth of Delashmut Creek; Brush Creek, near Princeton; Delashmut Creek, at Kegley; East River, at Ingleside; Horsepen Creek, near Horsepen, Va.; Clear Fork, at Rocky Gap, Va.; War Creek, near Peeryville; Gandy Creek, at Osceola; Glady Fork, at Seneca Route Crossing.
6. *Catostomus nigricans* Le Sueur. *Hog Sucker*.
Cheat River at Cheatbridge, Ises Ferry, and Raines; Childers Run, 3 miles north of Buckhannon; Doughertys Run, near Albright; Deckers Creek, above Morgantown; Dry Fork, at Harman; Elk Creek, at Quiet Dell; West Fork of Glady; Glady Fork, at Seneca Route Crossing; Kings Run, between Beverly and Elkins; Left-hand Fork of Middle Fork of Valley River, at Cassiday; Muddy Creek, near Albright; Red Creek, at Junction with the Dry Fork of the Cheat River; Right-hand Fork at Queens; Shavers Fork of Cheat; Stonecoal Creek, between Buckhannon and Weston; Ten-mile Creek, at Lumberport;

Valley River, at Huttonsville; Barrenshe Creek, near Peeryville; Bluestone River, at Abbs Valley, and just above its mouth; Dry Fork of Tug, at Barrenshe; East River, at Ingleside; Horse Creek, southern West Virginia; Indian Creek, tributary of New River, at Greenville; Rich Creek, at Spanishburg; Clear Fork, at Rocky Gap, Va.

7. *Moxostoma anisurum* (Rafinesque). *White-nosed Sucker*.

Three specimens, 2 to 2.75 inches long, from Stonecoal Creek, between Buckhannon and Weston; 3 specimens 4.5 to 5 inches long from Ten-mile Creek, at Lumberport.

8. *Moxostoma aureolum* (Le Sueur). *Redhorse*.

Two specimens, 9 and 12 inches, Deckers Creek, above Morgantown; 4 specimens, 4 to 6 inches, Elk Creek, near Quiet Dell; 10 specimens, 2.5 to 6 inches, Hackers Creek, near Jane Lew; 4 specimens, 9 inches, Stonecoal Creek, between Buckhannon and Weston; 6 specimens, 2.5 to 5 inches, Ten-mile Creek, at Lumberport; 8 specimens, 2.25 to 6.75 inches, West Fork of Monongahela, at Weston; 7 specimens, 3 to 5 inches, Dry Fork of the Tug, at Barrenshe; 7 specimens, 4 to 6 inches, Dry Fork of Tug, at Seager; Guyandotte River, at Baileysville.

9. *Moxostoma macrolepidotum* (Le Sueur).

One specimen, 4.75 inches long, from Deckers Creek, above Morgantown.

Family CYPRINIDÆ.

10. *Campostoma anomalum* (Rafinesque). *Stone-roller*.

Elk Creek, near Quiet Dell; Greenbrier, at Durbin; Stonecoal Creek, between Buckhannon and Weston; West Fork of the Greenbrier; West Fork of the Monongahela, at Weston; Barrenshe Creek, near Peeryville; Bluestone River, just above mouth, and at mouth of Delashmut Creek; Dry Fork of Tug, at Barrenshe and at Iaeger; East River, near Ingleside; Madams Creek, across New River from Hinton; Clear Fork, at Rocky Gap, Va.

11. *Pimephales notatus* (Rafinesque). *Blunt-nosed Minnow*.

Cheat River, at Ises Ferry; Childers Run, 3 miles northeast of Buckhannon; Hackers Creek, near Jane Lew; Sand Run, 2 miles above Buckhannon; Stonecoal Creek, between Buckhannon and Weston; Ten-mile Creek, at Lumberport; Trubies Run, 7 miles above Buckhannon; West Fork of Monongahela, at Weston; Barrenshe Creek, near Peeryville; Bluestone River, just above mouth, and at mouth of Delashmut Creek, and at Abbs Valley; Delashmut Creek, at Kegley; East River, near Ingleside; Greenbrier River, 8 miles above Hinton; Horse Creek; Horsepen Creek, near Horsepen, Va.; Indian Creek, tributary of New River, near Greenville; Rich Creek, near Spanishburg; Clear Fork, at Rocky Gap; War Creek, near Peeryville; Elk Creek, near Quiet Dell.

12. *Semotilus atromaculatus* (Mitchill). *Horned-dace; Creek-chub*.

Childers Run, 3 miles northeast of Buckhannon; Kings Run, between Beverly and Elkins; Left-hand Fork of Middle Fork of Valley River, at Cassidays; Riches Run, between Beverly and Elkins; Sand Run, 2 miles above Buckhannon; Trubies Run, 7 miles above Buckhannon; Valley River, at Mingo; Big Stony Creek; Delashmut Creek; Greenbrier River, 8 miles above Hinton; Horsepen Creek; Clear Creek, Rocky Gap, Va.; Madams Creek, across New River from Hinton; War Creek near Peeryville.

13. *Semotilus bullaris* (Rafinesque). *Fallfish*.

One specimen, 2.5 inches long, from the mouth of Seneca Creek, near Harman, was the only specimen of this species secured.

14. *Leuciscus margarita* (Cope).

East Fork of the Glady River; Gandy Creek, at Osceola; Glady Fork, at Seneca Route Crossing; Kings Run, between Beverly and Elkins; Sand Run, 2 miles above Buckhannon; West Fork of the Glady; Cheat River, at Raines.

15. *Notropis whipplii* (Girard). *Silver-fin.*

Deckers Creek, above Morgantown; Elk Creek, near Quiet Dell; Sand Run, 2 miles above Buckhannon; Stonecoal Creek, between Buckhannon and Weston; Ten-mile Creek, at Lumberport; West Fork of the Monongahela, at Weston; Big Stony Creek; Bluestone River, just above mouth, and at mouth of Delashmut Creek; Indian Creek, near Greenville; Rich Creek, near Spanishburg; War Creek, near Peeryville; Greenbrier River, 8 miles above Hinton.

16. *Notropis galacturus* (Cope).

Cheat River, at Ises Ferry; Barrenshe Creek; War Creek, near Peeryville.

17. *Notropis cornutus* (Mitchill). *Shiner.*

Deckers Creek, above Morgantown; Elk Creek, near Quiet Dell; Stonecoal Creek, between Buckhannon and Weston; West Fork of Monongahela at Weston; Barrenshe Creek, near Peeryville; Dry Fork of the Tug, at Barrenshe; Horsepen Creek, near Horsepen, Va.; War Creek, near Peeryville.

18. *Notropis macdonaldi* Jordan & Jenkins.

Right-hand Fork, at Queens, 3 specimens.

19. *Notropis atherinoides* (Rafinesque).

Twenty-one specimens, 2 to 4 inches long, East River, near Ingleside.

20. *Notropis arge* (Cope).

Dry Fork, at Harman; Horsepen Creek, near Horsepen, Va.; Indian Creek, near Greenville; Clear Fork, at Rocky Gap, Va.; War Creek, near Peeryville; Dry Fork of Tug, at Barrenshe.

21. *Notropis rubrifrons* (Cope).

Cheat River at Cheatbridge, Raines and Ises Ferry; Deckers Creek, above Morgantown; Elk Creek, near Quiet Dell; West Fork of Glady; Glady Fork, at Seneca Route Crossing; Left-hand Fork of Middle Fork of Valley River, at Cassiday; Doughertys Run, near Albright; Muddy Creek, near Albright; Red Creek, at junction with Dry Fork of Cheat River; Sand Run, 2 miles above Buckhannon; Right-hand Fork, at Queens; Shavers Fork of Cheat; Valley River, at Mingo; Bluestone River, just above mouth; Horse Creek; Indian Creek, tributary of New River, near Greenville; Clear Fork, Rocky Gap, Va.

22. *Ericymba buccata* Cope.

Three specimens 2.25 to 5 inches long from Stonecoal Creek between Buckhannon and Weston and one specimen 2.25 inches long from Ten-mile Creek, at Lumberport.

23. *Phenacobius teretulus* Cope.

Three specimens, 2 to 3.5 inches long, from Bluestone River, at Abbs Valley.

24. *Rhinichthys cataractæ* (Cuvier & Valenciennes). *Long-nosed Dace.*

Cheat River, at Cheatbridge; Cheat River, at Raines; Doughertys Run, near Albright; East Fork of Glady River; West Fork of the Glady; Laurel Fork of Cheat River, near Seneca Route Crossing; Muddy Creek, near Albright; Red Creek, at the junction of the Dry Fork with the Cheat River; Right-hand Fork, at Queens; Shavers Fork of Cheat; Valley River, at Mingo; Gandy Creek, at Osceola.

25. *Rhinichthys atronasmus* (Mitchill). *Black-nosed Dace.*

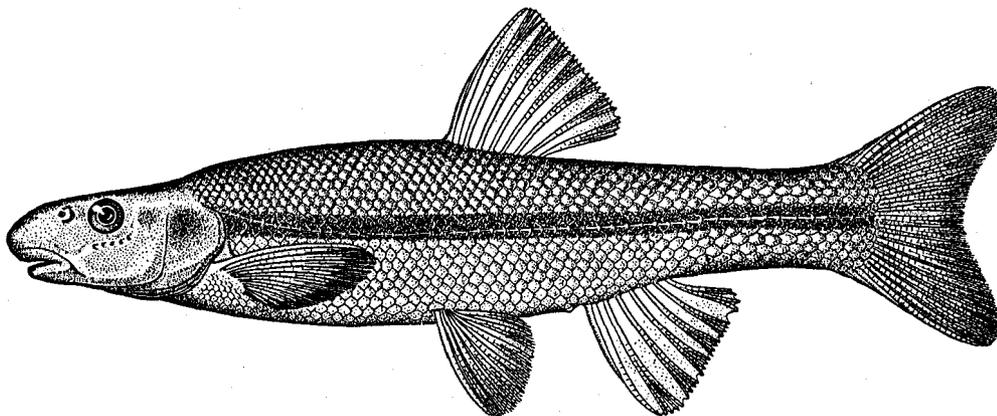
Harringtons Creek, near mouth of Youghiogheny River; Kings Run, between Beverly and Elkins; Riches Run, between Beverly and Elkins; Trubies Run, 7 miles above Buckhannon; Valley River, at Mingo; Madams Creek, across New River from Hinton; Bluestone River, at mouth of Delashmut Creek; Brush Creek, near Princeton; Delashmut Creek, at Kegley; East River, at Ingleside; War Creek, near Peeryville; West Fork of the Glady; Right-hand Fork, at Queens.

26. *Rhinichthys atronasmus croceus* (Storer).

War Creek, near Peeryville, and Madams Creek, across New River from Hinton. Brush Creek, near Princeton.

27. *Rhinichthys bowersi* Goldsborough & Clark, new species.

Head 3.87 in length; depth 4.65; eye 5 in head; snout 2.6; maxillary 3; interorbital 3; preorbital 4.4; dorsal 8; anal 7; scales 10-48-7, 25 before dorsal.



Rhinichthys bowersi, new species.

Body moderately elongate, little compressed; caudal peduncle long and stout, slightly compressed, its least depth 2.1 in head; head blunt, somewhat flattened above; snout projecting, the profile above and behind eye slightly concave; mouth horizontal, inferior, its cleft not quite reaching orbit; the fleshy snout projecting beyond mouth; premaxillary not protractile, joined to the snout by a rather broad and distinct frenum; lower lip rather thin; tongue fleshy, joined to mouth; a well-developed barbel at tip of maxillary; eye somewhat anterior, high; gill-membranes broadly joined to isthmus. Teeth usually 4-4, sometimes 1, 4-4, 1; bluntly hooked and with slight grinding surface. Origin of dorsal midway between tip of snout and base of caudal, slightly posterior to origin of ventral, its longest ray 1.4 in head, base 2 in head and covering about 8 or 9 rows of scales, its margin nearly straight; caudal emarginate, lobes equal and rounded; anal similar to dorsal, its origin about 3 scales posterior to last ray of dorsal, its longest ray 1.6 in head, its base 2.5; ventrals short and rounded, 1.6 in head, reaching vent; pectoral short and broadly rounded, longest ray 1.35 in head, tip not reaching base of ventral by a distance 1.5 times greater than eye.

Scales nearly uniform on entire body, not crowded before dorsal, about as long as deep; head entirely naked; alimentary canal short, not as long as body; peritoneum dusky, with dark specks.

Color in spirits uniform olivaceous, belly somewhat lighter, fins all plain.

This species appears to be intermediate in some respects between *Rhinichthys* and *Hybopsis*. In form of mouth it resembles *Rhinichthys cataractæ*, but in general form and appearance of body it resembles *Hybopsis kentuckiensis*. The scales are too large for any known species of *Rhinichthys*, and the teeth are not those of typical *Rhinichthys*, being 1, 4-4, 1 or 4-4.

Type, no. 61576, U. S. Nat. Mus., a specimen 4.1 inches long, from the Dry Fork at Harman, W. Va., August 30; also cotype no. 5314, U. S. Bureau Fisheries, a specimen 3.8 inches long, and cotype no. 20015; Stanford University Mus., a specimen 3 inches long, both from Cheat River at Cheatbridge, July 25, 1899.

28. *Hybopsis amblops* (Rafinesque). *Silver Chub*.

West Fork of Monongahela, at Weston, and Deckers Creek, above Morgantown.

29. *Hybopsis kentuckiensis* (Rafinesque). *Horny-head. River Chub*.

Cheat River, at Cheatbridge; Cheat River, at Raines; Deckers Creek, above Morgantown; Dry Fork, at Harman; Gladly Fork, at Seneca Route Crossing; Greenbrier, at Durbin; Harringtons Creek; Laurel Fork of Cheat, near Seneca Route Crossing; Left-hand Fork of Middle Fork of Valley River, at Cassidy, Little Youghiogheny, 2 miles below Oakland, Md.; Muddy Creek, near Albright; Red Creek, at junction with Dry Fork of Cheat River; Right-hand Fork, at Queens; Sand Run, 2 miles above Buckhannon; Valley River, at Mingo; West Fork of the Gladly; Bluestone River, at Abbs Valley; Dry Fork of Tug, at Barrenshe; Guyandotte River, at Baileysville; Clear Fork, at Rocky Gap, Va.

Family SALMONIDÆ.

30. *Salvelinus fontinalis* (Mitchill). *Brook Trout.*

North Fork of Blackwater, at Cortland; Gladly Fork, at Seneca Route Crossing; Cheat River, at Cheatbridge; Elk River, at Cogars Mill; Gandy Creek, at Osceola; Harringtons Creek, near mouth of Little Youghiogeny; North Fork of Blackwater, at Cortland; Blister Run, below Cheatbridge.

Family ESOCIIDÆ.

31. *Esox ohioensis* Kirtland.

One specimen, 8 inches long, from Deckers Creek, above Morgantown.

Family ATHERINIDÆ.

32. *Labidesthes sicculus* (Cope). *Brook Silverside; Skipjack.*

Seven specimens, each 2 inches long, from Deckers Creek, above Morgantown; one specimen 3.25 inches long from Elk Creek, at Quiet Dell; 8 specimens 1 to 1.5 inches long from West Fork of Monongahela at Weston.

Family CENTRARCHIDÆ.

33. *Ambloplites rupestris* (Rafinesque). *Rock Bass.*

Beaver Creek, a tributary of Valley River, near Beverly; Chenowith Creek, between Elkins and Beverly; Cutrights Run, 5½ miles above Buckhannon; Hackers Creek, near Jane Lew; Stonecoal Creek, between Buckhannon and Weston; Ten-mile Creek, at Lumberport; Trubies Run, Tygarts Valley, near Beverly; Valley River at Huttonsville; West Fork of Monongahela, at Weston; Sand Run, 2 miles above Buckhannon; Big Stony Creek, near Bargers Spring; Greenbrier River, 8 miles above Hinton; Clear Fork at Rocky Gap, Va.

34. *Apomotis cyanellus* (Rafinesque). *Blue-spotted Sunfish.*

Sixteen specimens, 1 to 3 inches long, from Greenbrier River, 8 miles above Hinton; one specimen 2.75 inches long from Bluestone River, at mouth of Delashmut Creek.

35. *Lepomis megalotis* (Rafinesque). *Long-eared Sunfish.*

Sand Run, 2 miles above Buckhannon; Cutrights Run, 5½ miles above Buckhannon; Childers Run, 3 miles northeast of Buckhannon; Hackers Creek, near Jane Lew; Elk Creek, near Quiet Dell; Dry Fork of Tug Creek, at Barrenshe; Guyandotte River, at Baileysville.

36. *Micropterus dolomieu* Lacépède. *Small-mouth Black Bass.*

Chenowith Creek, between Beverly and Elkins; Valley River, at Huttonsville; Valley River, at Mingo; Peach Run, across New River from Hinton; Trubies Run, 7 miles above Buckhannon; Stonecoal Creek, between Buckhannon and Weston; Elk Creek, near Quiet Dell; Tygarts Valley River, near Beverly; Little Youghiogeny River, near Oakland; Ten-mile Creek, at Lumberport; Hackers Creek, near Jane Lew; Dry Fork, at Harman; Youghiogeny River, above mouth of Little Youghiogeny; Cheat River, at Raines; Cheat River, at Albright; Deckers Creek, above Morgantown; Left-hand Fork of Middle Fork of Valley River, at Cassiday; Muddy Creek, tributary of Cheat, near Albright; Sand Run, 2 miles above Buckhannon; West Fork of Monongahela, at Weston; Bluestone River, just above mouth; Dry Fork of the Tug, at Barrenshe and at Iaeger; Greenbrier River, 8 miles above Hinton; Guyandotte River, at Baileysville; Indian Creek, near Greenville; Rocky Gap, Va.

37. *Micropterus salmoides* (Lacépède). *Large-mouth Black Bass.*

Dry Fork of Tug, at Iaeger; Greenbrier River, 8 miles above Hinton.

The large-mouth black bass from Greenbrier River differ from current descriptions in having smaller scales on the cheek, the number of rows frequently being as high as 14 or 15. In this respect they approach *dolomieu*, but in other respects, such as color, size of scales on side, etc., they agree with typical *salmoides*. Some young have the conspicuous black submarginal caudal black bar, a character not found in all, and which, while common to both species, is usually more constant in *dolomieu*.

Family PERCIDÆ.

38. Percina caprodes (Rafinesque). *Log Perch.*

Elk Creek, near Quiet Dell; Stonecoal Creek, between Buckhannon and Weston; Ten-mile Creek, at Lumberport; West Fork of Monongahela, at Weston; Dry Fork of the Tug, at Barrenshe and at Leager; Guyandotte River, at Baileysville.

39. Hadropterus macrocephalus (Cope).

Cheat River, at Raines; Shavers Fork of Cheat; Elk Creek, at Quiet Dell.

40. Hadropterus aspro (Cope & Jordan). *Black-sided Darter.*

Elk Creek, at Quiet Dell; Hackers Creek, near Jane Lew; Sand Run, 2 miles above Buckhannon; Stonecoal Creek, between Buckhannon and Weston; Ten-mile Creek, at Lumberport; West Fork of the Monongahela, at Weston; Trubies Run, 7 miles above Buckhannon.

41. Ulocentra stigmæa (Jordan). *Speck.*

Cheat River, at Ises Ferry.

42. Diplesion blennioides (Rafinesque). *Green-sided Darter.*

Doughertys Run, near Albright; Dry Fork, at Harman; Elk Creek, near Quiet Dell; Muddy Creek, near Albright; Shavers Fork of Cheat River; West Fork of the Monongahela; East River, near Ingle-side; Greenbrier River, 8 miles above Hinton; Horsepen Creek, near Horsepen, Va.; Indian Creek, tributary of New River, near Greenville; Clear Fork, at Rocky Gap, Va.

43. Boleosoma nigrum (Rafinesque). *Johnny Darter.*

Elk Creek, near Quiet Dell; Hackers Creek, near Jane Lew; Sand Run, 2 miles above Buckhannon; Stonecoal Creek between Buckhannon and Weston; Ten-mile Creek, at Lumberport; Trubies Run, 7 miles above Buckhannon; West Fork of Monongahela, at Weston; Dry Fork of Tug, at Iaeger; Horsepen Creek, near Horsepen, Va.

44. Etheostoma zonale (Cope).

Obtained only in Elk Creek, near Quiet Dell, the location from which the greater number of darters taken were secured.

45. Etheostoma flabellare Rafinesque. *Fan-tailed Darter.*

Elk Creek, at Quiet Dell; Greenbrier River, near Durbin; Kings Run, between Beverly and Elkins; Left-hand Fork of Middle Fork of Valley River, at Cassiday; Riches Run, between Beverly and Elkins; Valley River, at Huttonsville and at Mingo; West Fork of Greenbrier; Big Stony Creek, near Bangers Spring; Brush Creek, near Princeton; Indian Creek, a tributary of New River, near Greenville; Madams Creek, across New River from Hinton; Rich Creek, at Spanishburg.

Family COTTIDÆ.

46. Cottus ictalops (Rafinesque). *Blob; Muffle-jaw.*

Cheat River, at Cheatbridge and at Raines; Doughertys Run, near Albright; East Fork of the Glady; West Fork of Glady; Greenbrier River, at Durbin; Harringtons Creek, near mouth of Little Youghiogheny River; Kings Run, between Beverly and Elkins; Laurel Fork of Cheat River, near Seneca Route Crossing; Left-hand Fork of Middle Fork of Valley River, at Cassiday; Muddy Creek, near Albright; Trubies Run, 7 miles above Buckhannon; Valley River, at Mingo; Right-hand Fork, at Queens; Gandy River, at Osceola; Elk River, at Cogars Mill; East River, at Ingle-side.

ANNOTATED LIST OF THE SPECIES COLLECTED IN THE POTOMAC BASIN.

Family CATOSTOMIDÆ.

1. Catostomus commersonii (Lacépède). *White Sucker.*

Big Run, 1 mile above Circleville; Middle Fork of Potomac, near Crabbottom, Va.; Nydegger Run, at Gorman, Md.; Potomac River, 1 mile below Bayard, Md.; North Fork of Potomac, at mouth of Seneca.

2. Catostomus nigricans Le Sueur. *Hog Sucker.*

Big Run, 1 mile above Circleville; North Fork of the Potomac, 5 miles above Circleville; North Fork of the Potomac, at mouth of Seneca Creek.

Family CYPRINIDÆ.

3. *Campostoma anomalum* (Rafinesque). *Stone-roller*.
North Fork of Potomac, 5 miles south of Circleville, and at the mouth of Seneca Creek.
4. *Leuciscus margarita* (Cope).
North Fork of Potomac, 5 miles above Circleville.
5. *Notropis cornutus* (Mitchill). *Shiner*.
Big Run, 1 mile above Circleville; mouth of Seneca Creek; Middle Fork of the Potomac, near Crabbottom; North Fork of Potomac.
6. *Notropis rubrifrons* (Cope).
North Branch of Potomac, at mouth of Seneca Creek.
7. *Rhinichthys cataractæ* (Cuvier & Valenciennes). *Long-nosed Dace*.
North Fork of Potomac, 5 miles south of Circleville.
8. *Rhinichthys atronasus* (Mitchill). *Black-nosed Dace*.
Big Run, 1 mile above Circleville; Potomac River, 1 mile below Bayard, Md.; Franks Run, near Crabbottom, Va.; Nydegger Run, Gorman, Md.; Little Fork of the Potomac, near Crabbottom; North Fork of the Potomac, near Rockville; Potomac River, at mouth of Seneca Creek.
9. *Exoglossum maxillingua* (Le Sueur). *Cut-lips*.
East Branch of Potomac, at mouth of Seneca River; Seneca River; North Branch of Potomac, 5 miles south of Circleville.

Family SALMONIDÆ.

10. *Salvelinus fontinalis* (Mitchill). *Brook trout*.
North Fork of Potomac, 5 miles south of Circleville; North Fork of Potomac, opposite mouth of Seneca.

Family CENTRARCHIDÆ.

11. *Lepomis auritus* (Linnæus). *Red-breast Bream*.
Only 1 specimen was obtained. This was collected at the mouth of the Seneca August 29, 1899.
12. *Micropterus dolomieu* Lacépède. *Small-mouth Black Bass*.
North Fork of Potomac, 5 miles south of Circleville; North Fork of the Potomac, at the mouth of Seneca Creek.

Family PERCIDÆ.

13. *Etheostoma flabellare* Rafinesque. *Fan-tailed Darter*.
Middle Fork of Potomac, near Crabbottom, Va.; North Fork of Potomac, 5 miles south of Circleville; Potomac River, 1 mile below Bayard, Md.; mouth of Seneca Creek; Nydegger Run, at Gorman, Md.
There is considerable variation in the color of this species. Some from Nydegger Run have the distinct side bars, but somewhat broken into above by wavy vermiculations. Others from Greenbrier River, at Durbin, have the bars distinct but not broken into vermiculations above, some black spots along the rows of scales above but not very distinct; still another from Indian Creek has the bars not so distinct, but general color darker, the black spots on each scale distinct, forming somewhat distinct longitudinal dotted lines along the side of entire body.

Family COTTIDÆ.

14. *Cottus ictalops* (Rafinesque). *Blob; Muffle-jaw*.
Middle Fork of Potomac, near Crabbottom, Va.; Nydegger Run, near Gorman, Md.