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A Preliminary Checklist of the Fishes of the Youghiogheny River

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ABSTRACT—Six species: *Amia calva, Carassius auratus, Ericymba buccata, Notropis rubellus, Ictalurus catus* and *Fundulus diaphanus* were added to the known ichthyofauna of the Youghiogheny River. A total of 82 species are now known from the drainage. Of these, 59 are considered native, 20 introduced and 3 undetermined. New records and several range extensions are discussed. Ohiopyle Falls and several dams on the main stem may act as barriers to dispersal of fishes up the main channel.

Introduction

The Youghiogheny River drains 4585 km² (EPA, 1971a) in Pennsylvania, Maryland and a small portion of West Virginia (Figure 1). It is the largest tributary to the Monongahela River, joining the main stem at McKeesport, Pennsylvania. Acid mine pollution has limited fishes in the drainage since 1890 (EPA, 1971b), but water quality has improved considerably since 1950 (Reppert, 1964), and the river now supports productive fish communities.

The first comprehensive list of Youghiogheny River fishes was provided by Fowler (1919). Raney (1938) reported on the distribution of the fishes of the Ohio River drainage of western Pennsylvania, but relied entirely on museum specimens for his Youghiogheny material. Mansueti (1962) reviewed the literature on Youghiogheny fishes and discussed the results of six collections in the Maryland portion of the drainage. Jenkins *el al.* (1972) reviewed the literature on Monongahela River fishes and added a list of fishes known from the Monogahela but not the Youghiogheny River. This latter list was incomplete (R. E. Jenkins, in litt.). As a result, some fishes were listed for the Youghiogheny which were expected but never actually collected there: *Lepisosteus osseus,*

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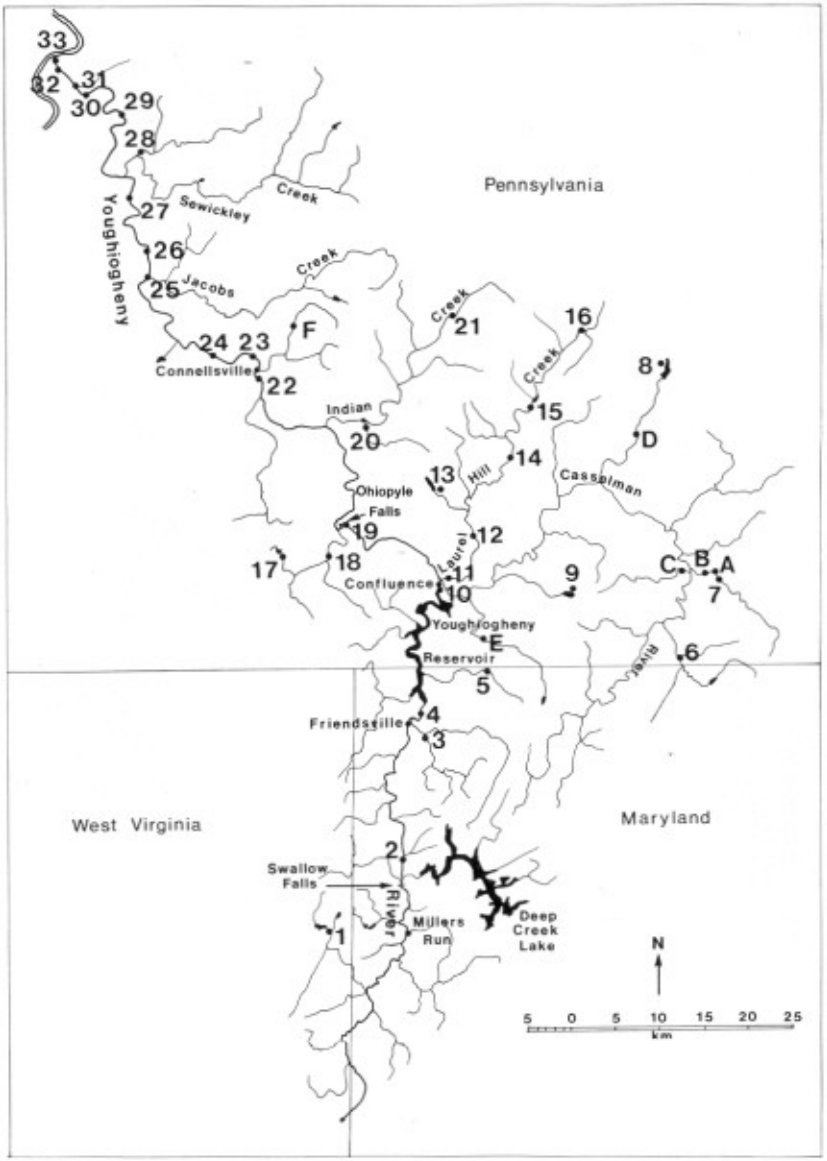

Figure 1. Map of the Youghiogheny River, showing sampling locations.

Onchorhynchus nerka, Hybopsis storeriana, Notropis ariommus, Notropis blennius, Notropis hudsonius, Pimephales vigilax, Ictalurus furcatus, Ictalurus melas, Noturus miurus, Lepomis mega-

lotis, Lepomis microlophus, Micropterus punctatus, Etheostoma camurum, Etheostoma variatum, Etheostoma zonale, Percina phoxocephala, and *Aplodinotus grunniens. Percina phoxocephala*, as recorded by Jenkins *et al.* (1972) for the Monongahela, actually refers to *P. oxyrhycha* (Thompson, 1977). Neither has been collected in the Youghiogheny. Lee *et al.* (1976) gave a checklist of the fishes of Maryland including the Maryland portion of the Youghiogheny. Other publications containing Youghiogheny material are Cope (1864), Uhler and Lugger (1876), Fowler (1907; 1909; 1912a; 1912b; 1940), Goldsborough and Clark (1908), Truitt, Bean and Fowler (1929), Schwartz (1961) and Davis (1973). Recent collections were made by Dr. E. L. Cooper and are catalogued in the Pennsylvania State University Fish Museum.

A major question remaining to be answered concerns the composition of the original fish fauna of the upper Youghiogheny River system, particularly in Maryland and West Virginia. No comprehensive fish collections were made in this area prior to pollution by acid mine wastes during the late 1800s. Subsequently, construction of dams at Connellsville and Confluence, PA, near the Maryland border, has prevented upstream movement of fishes that might otherwise have repopulated this part of the system following reduction of pollution and improvement in water quality. Compounding this probelm is the presence of Ohiopyle Falls. Although these falls are not high (4 m), it is conceivable that they may have acted as a barrier to the movement of certain species into upper parts of the drainage.

The purpose of this paper is to provide a preliminary checklist of the fishes of the Youghiogheny River and to report the additions of six species to the known fauna. Range extensions of several other species are also discussed.

Materials and Methods

One hundred and ten localities have been sampled to date. Of these, 33 localities contained material representing significant range extensions or which are noteworthy for other reasons; these localities are listed (Table 1, Figure 1). Data for the remaining collection localities are available from the University of Maryland, Appalachian Environmental Laboratory. Fishes were collected by seine, 220 volt DC electroshocker, Cofelt backpack electroshocker and by gill net and trap net in the lower reaches of the river near McKeesport. A representative qualitative sample of fishes (Hocutt *et al.*, 1974) was collected at each station. All fishes were preserved in 10% formalin and stored in 40% isopropanol. Identifications of fishes were made using Blair *et al.* (1968), Clay (1975), and Scott and Crossman (1973). Scientific nomenclature follows Bailey *et al.* (1970). Abbreviations used are as follows: AEL = Appalachian Environmental Laboratory Museum; CU = Cornell University Museum; OSUM = Ohio State University Museum; UMMZ = University of Michigan Museum; USNM = U. S. National Museum;

Table 1. Station descriptions for stations discussed in the text.

STATION	DESCRIPTION
1	Snowy Creek at spillpool on Terra Alta Lake, Preston Co., W. Va.; 7 July 1977.
2	Youghiogheny River at power plant at Hoyes Run, Garrett Co., Md.; 25 August 1977.
3	South Branch Bear Creek at confluence with North Branch, Garrett Co., Md.; 26 July 1977.
4	Youghiogheny River approximately 1 mile below Friendsville, Garrett Co., Md.; 25 July 1977.
5	Mill Run at bridge on Pigs Ear Rd., Garrett Co., Md.; 27 July 1977.
6	Piney Creek at bridge on Co. Rt. 55002, Somerset Co., Pa.; 20 June 1977.
7	Flaugherty Creek, 1 mile east of Glade City, Somerset Co., Pa.; 21 May 1977.
8	Somerset Lake at northern most boat access, Somerset Co., Pa.; 6 July 1977.
9	High Point Lake at north boat access, Somerset Co., Pa.; 6 July 1977.
10	Youghiogheny River at Confluence, Somerset Co., Pa.; 27 June 1977.
11	Laurel Hill Creek at first bridge on Rt. 281 north of Confluence, Somerset Co., Pa.; 27 June 1977.
12	Laurel Hill Creek at Lower Humbert Bridge, Somerset Co., Pa.; 20 June 1977.
13	Cranberry Glade Lake at dam breast, Somerset Co., Pa.; 18 August 1977.
14	Laurel Hill Creek at Rt. 653 bridge, Somerset Co., Pa.; 22 June 1977.
15	Laurel Hill Creek at bridge just below confluence of Jones Mill Run, Somerset Co., Pa.; 22 June 1977.
16	Laurel Hill Creek at first bridge below confluence of Clear Run, Somerset Co., Pa.; 26 June 1977.
17	Big Meadow Run at spillpool on Deer Lake, Fayette Co., Pa.; 22 June 1977.
18	Big Meadow Run at bridge on Co. Rt. T415, Fayette Co., Pa.; 12 August 1977.

Table 1. (cont'd.)

STATION	DESCRIPTION
19	Youghiogheny River at bridge on Rt. 381 in Ohiopyle, Fayette Co., Pa.; 27 June 1977.
20	Mill Run at confluence with Mill Run Reservoir, Fayette Co., Pa.; 18 August 1977.
21	Indian Creek in Jones Mills, Westmoreland Co., Pa.; 10 July 1977.
22	Youghiogheny River at bridge on Rt. 26044 in Connellsville, Fayette Co., Pa.; 29 June 1977.
23	Youghiogheny River in Broad Ford, Fayette Co., Pa.; 3 August 1977.
24	Youghiogheny River in Dawson, Fayette Co.; Pa.; 29 June 1977.
25	Youghiogheny River at mouth of Jacobs Creek, Fayette Co., Pa.; 23 July 1977.
26	Youghiogheny River at bridge on Rt. 981, Westmoreland Co., Pa.; 29 June 1977.
27	Youghiogheny River at bridge on Rt. 71 in West Newton, Westmoreland Co., Pa.; 28 June 1977.
28	Little Sewickley Creek at confluence with Sewickley Creek, Westmoreland, Co., Pa.; 22 July 1977.
29	Youghiogheny River at end of Henderson Rd., Allegheny Co., Pa.; 28 June 1977.
30	Youghiogheny River at bridge on Rt. 48, Allegheny Co. Pa.; 13 July 1977.
31	Youghiogheny River at mouth of unnamed tributary in McKeesport, Allegheny Co., Pa.; 13 July 1977.
32	Youghiogheny River, 200 m above bridge on Lysle Blvd. in McKeesport, Allegheny Co., Pa.; 13 July 1977.
33	Youghiogheny River at confluence with Monongahela River, Allegheny Co., Pa.; 12 July 1977.

ELC = collections by Edwin L. Cooper, Pennsylvania State University. All specimens which we collected are deposited at the University of Maryland, Appalachian Environmental Laboratory Fish Museum, Frostburg, Md.

Results and Discussion

A total of 82 species are presently known from the Youghiogheny system, of which 20 are introduced and the status of three is undetermined. Of this total, six represent new records for the drainage: *Amia calva* Linnaeus, *Carassius auratus* (Linnaeus), *Ericymba buccata* Cope, *Notropis rubellus* (Agassiz), *Ictalurus catus* (Linnaeus) and *Fundulus diaphanus* (Lesueur). In addition to the six new distributional records for the drainage, one species, *Clinostomus elongatus* (Kirtland), is added to the known fauna of the state of Maryland. The known ranges of *Pimephales promelas* Rafinesque, *Notropis micropogon* × *Rhinichthys cataractae*, *Catostomus catostomus* (Forester) and *Etheostoma blennioides* Rafinesque are expaned.

The above species are discussed below.

Amia calva Linnaeus, Bowfin

The bowfin is distributed along the Atlantic Coast from the Susquehanna River southward to Florida, westward to central Texas and Oklahoma, up the Mississippi basin to Minnesota and eastward to Quebec and Vermont (Blair *et al.*, 1968; Clay, 1975; Eddy, 1969, Scott and Crossman, 1973). It has been introduced in Connecticut (Blair *et al.*, 1968; Scott and Crossman, 1973). Jenkins *et al.* (1972) reported it as introduced in the Kanawha River above Kanawha Falls and as native to the Tennessee River and many Atlantic slope drainages. It is also native to the Susquehanna and Potomac rivers (Denoncourt and Cooper, 1975). No records are available for the Monongahela drainage.

One specimen (65.7 mm SL), collected at station 8 (Figure 1) in Somerset Lake, represents the first record for the Youghiogheny River drainage. Bowfin were introduced in Somerset Lake in 1961 and 1962 and have established a reproducing population (pers. comm., Clark Shiffer, Penna. Fish Commission).

Carassius auratus (Linnaeus), Goldfish

The goldfish is native to eastern Asia and has been widely introduced in Europe, England, and North America (Blair *et al.*, 1968; Clay, 1975; Scott and Crossman, 1973). It has been introduced in the Delaware, Susquehanna and Potomac drainage (Stauffer, Hocutt and Lee, in press). Mansueti (1962) observed it in the Youghiogheny Reservoir, but did not publish his findings. Preston (1974) reported it from the Monongahela River. The following collections represent the first records from the Youghiogheny River drainage: Station 30 (2, 180-181 mm SL); Station 31 (1, 169 mm SL); Station 32 (4, 165-186 mm SL); Station 33 (5, 162-170 mm SL).

Ericymba buccata Cope, Silverjaw minnow

The silverjaw minnow is distributed from southeastern Missouri to southeastern Michigan, eastward through Ohio to western

Pennsylvania, southward to Mississippi and the Florida panhandle, and on the Atlantic slope in the Rappahannock, Susquehanna and in the Potomac River above Great Falls (Wallace, 1973). It displays an unusual distribution pattern in the center of its range, being absent from the Cumberland River system below Cumberland Falls and from the eastern Tennessee River system (possibly originally native to one small area in the upper part of that system). Wallace (1973) discussed its distribution and dispersal, suggesting that it may have entered the Potomac from the Youghiogheny by stream capture via the Savage River. He attributed its apparent absence in the Youghiogheny to severe pollution due to acid mine drainage. Its present widespread occurrence in the Youghiogheny suggests that it must have survived the period of severe pollution in a number of clean tributaries, and subsequently recolonized the drainage from those refugia. Colonization from the Monongahela or from a single refuge seems unlikely due to numerous barriers such as Ohiopyle Falls, Big Meadow Run Falls, the dam at Mill Run Reservoir, a small dam on the main stem at Connellsville, PA, and severe pollution in the main stem Sewickley Creek, which prevents dispersal to its tributaries.

We collected over 300 specimens ranging from young of the year to adults at 13 stations throughout the drainage: Station 14 (2, 46.9-54.8 mm SL); Station 15 (179, 25.7-61 mm SL); Station 16 (2, 31.9-50.8 mm SL); Station 17 (20, 25.0-59.4 mm SL); Station 20 (5, 32.2-33.6 mm SL); Station 23 (2, 33.7-36.6 mm SL); Station 24 (8, 45.2-52.5 mm SL); Station 25 (13, 24.4-54.8 mm SL); Station 26 (3, 36.1-55.2 mm SL); Station 28 (17, 39.4-51.4 mm SL); Station 29 (5, 38.8-49.7 mm SL); Station 31 (73, 17.5-32.2 mm SL); Station 33 (44, 16.5-26.2 mm SL). One specimen was collected by Dr. Edwin L. Cooper of Penn State University in Mounts Creek (station F) on 17 July 1968. These collections represent the first known records for the Youghiogheny River drainage. Because of its wide distribution and the fact that it is native to the Monongahela, we consider *Ericymba buccata* to be native to the Youghiogheny drainage. The lack of prior records may be due to insufficient collecting.

Notropis rubellus (Agassiz), Rosyface shiner

The rosyface shiner is distributed from Oklahoma northward to North Dakota, from the Tennessee River to the Great Lakes, eastward to New York State and southward to Virginia (Blair *et al.*, 1968; Clay, 1975; Eddy, 1969; Scott and Crossman, 1973). Jenkins *et al.* (1972) reported it as native to the Monongahela River but not the Youghiogheny. It is also native to the adjacent Potomac and Susquehanna drainages (Stauffer *et al.*, in press). The following collections represent the first known records for the Youghiogheny River drainage: Station 11 (47, 35.4-47.5 mm SL); Station 12 (9, 39.3-53.1 mm SL); Station 14 (1, 56.7 mm SL); Station 24 (1, 42.0 mm SL); Station 25 (4, 44.4-50.7 mm SL).

Ictalurus catus (Linnaeus), White catfish

The white catfish is distributed on the Atlantic Coast from New York to Florida and has been introduced on the Pacific Coast and in Nevada (Blair *et al.*, 1968). It is native to the Potomac and Susquehanna drainage (Jenkins *et al.*, 1972; Stauffer *et al.*, in press) and has been introduced into commercial ponds in the Ohio Valley (Clay, 1975). Preston (1974) was the first to report it from the Monongahela River, but it has not been reported from the Youghiogheny drainage. The following collections are the first known records from this drainage: Station 30 (5, 135-172 mm SL); Station 31 (3, 163-252 mm SL); Station 33 (1, 174 mm SL).

The white catfish represents an introduced population in the Youghiogheny River.

Fundulus diaphanus (Lesueur), Banded killifish

The banded killifish is distributed in lakes, estuaries and sluggish rivers from South Carolina to the Maritime Provinces and west through New York, Pennsylvania and the Great Lakes Region to the Yellowstone River in Montana (Blair *et al.*, 1968; Eddy, 1969; Scott and Crossman, 1973). Jenkins *et al.* (1972) did not report it from any of the southern Appalachian drainages of the Ohio basin. Preston (1974) has subsequently reported it from the Monongahela River near Pittsburgh. The following collections represent the first known records from the Youghiogheny River drainage: Station 8 (10, 18.9-56.3 mm SL); Station 9 (63, 12.2-56.5 mm SL); Station 13 (3, 26.4-50.5 mm SL); Station 15 (1, 50.1 mm SL); Station D (1, collected by E. L. Cooper, 23 July 1968, length unknown). These specimens appear to be intergrades between the two known subspecies *F. d. diaphanus* and *F. d. menona*, suggesting that they may have been introduced from the Lake Ontario drainage where such intergrades are found (Hubbs and Lagler, 1958).

According to Clark Shiffer (pers. comm., Pa. Fish Commission), the banded killifish may have been introduced by the Pa. Fish Commission as forage for game species, but this is not possible to verify. The banded killifish is also a commonly used bait fish.

Clinostomus elongatus (Kirtland), Redside dace

The redside dace is distributed in the Mississippi drainage from New York to Kentucky and west to Wisconsin, Iowa and Minnesota (Blair *et al.*, 1968; Clay, 1975; Eddy, 1969; Scott and Crossman, 1973). Jenkins *et al.* (1972) list the Monongahela (including the Youghiogheny) as the only southern Appalachian drainage in which it occurs. Denoncourt and Cooper (1975) record it from the Susquehanna. It has not previously been recorded from the state of Maryland (Lee *et al.*, 1976).

A single specimen (50.3 mm SL) at station 3 represented the first known record from the State of Maryland. Although this species is native to the drainage, this specimen may represent a bait bucket

introduction for the following reasons. First, the same collection yielded one specimen of *Pimephales promelas* Rafinesque, a new record for the Maryland portion of the drainage. Second, a subsequent collection at the same site yielded neither *C. elongatus* or *P. promelas*. Third, Bear Creek is a popular fishing stream stocked with trout.

Redside dace were also collected at one other location within the drainage: Station 16 (4, 44.4-48.5 mm SL).

Pimephales promelas Rafinesque, Fathead minnow

The fathead minnow is widely distributed from northeastern Mexico and New Mexico through the Great Plains to Canada's prairie provinces and eastward through the Great Lakes drainages and southward through the Ohio and Mississippi valleys to the Tennessee River (Blair *et al.*, 1968; Clay, 1975; Eddy, 1969; Scott and Crossman, 1973). It has been introduced in California (Blair *et al.*, 1968) and in many other places around the country. Jenkins *et al.* (1972) list it as introduced in the Monongahela, Youghiogheny and Potomac rivers. It has also been introduced in the Susquehanna (Stauffer *et al.*, in press). Lee *et al.* (1976) record it from the Potomac River in Maryland but not from the Youghiogheny River. A single specimen (57.7 mm SL) at station 3 represents the first known record from the Maryland portion of the Youghiogheny drainage. This was the same collection in which we took *C. elongatus*. The presence of both species at this location may be the result of bait bucket introductions.

The fathead minnow was also collected at four other locations in the drainage: Station 10 (1, 44.9 mm SL); Station 24 (1, 40.7 mm SL); Station 27 (1, 36.9 mm SL); Station 31 (1, 45.9 mm SL).

Catostomus catostomus (Forester), Longnose sucker

The longnose sucker is widely distributed in Asia and across North America from Alaska south to Washington and Colorado in the west and from central Quebec and western Labrador south to Maryland in the East, including much of the Great Lakes drainages (Blair *et al.*, 1968; Scott and Crossman, 1973). It has been recorded from the Monongahela drainage only four times: Youghiogheny River near McKeesport, Pennsylvania (Jordon, 1878 [cited in Mansueti, 1957]); Harrington Creek and in the right fork of the middle fork of the (Tygart) Valley River at Queens, West Virginia—1900 collection—(Goldsborough and Clark, 1908); Whitehorn Lake, an impoundment on Herrington Creek, Garrett County, Maryland—1956 collection—(Mansueti, 1957). Mansueti's collection was made after the lake had been drained to control rooted aquatic vegetation. Elser (1957) discussed the same 1956 collection as Mansueti and reported additional longnose suckers collected from the same location in 1957, again after the lake was drained. In September, 1977, the lake was again drained but a collection there yielded no longnose suckers.

Some confusion exists regarding Goldsborough and Clark's (1908) record for Harrington Creek. First, we know of no Harrington Creek in the state of West Virginia. Second, Goldsborough and Clark also listed the following locations for other fishes: Harrington Creek, near mouth of Youghiogheny River; Harrington Creek; Harrington's Creek, near mouth of Little Youghiogheny; and Youghiogheny River, above mouth of Little Youghiogheny. It is obvious from this that Goldsborough and Clark made collections in the Youghiogheny River System in the state of Maryland. It seems likely that Goldsborough and Clark's Harrington Creek location refers to Herrington Creek, in Maryland.

We collected longnose suckers at one locality in Maryland and two in Pennsylvania: Station 5 (2, 108.8-146.6 mm SL); Station 6 (2, 90.0-156.0 mm SL); Station 7 (1, 129.0 mm SL).

Additional records of longnose suckers have been provided by Dr. E. L. Cooper of Penn State University, who made the following collections of longnose suckers in Pennsylvania: Station A (10, 19 October 1972); Station B (3, 18 July 1968); Station B (9, 25 May 1969); Station C (1, 18 June 1976); Station E (10, 22 June 1965).

Etheostoma blennioides, Greenside darter

The greenside darter is distributed in the Potomac, Great Lakes and Mississippi drainages from Oklahoma and Kansas east to northern Alabama, Georgia and North Carolina north to eastern New York (Miller, 1968; Schwartz, 1965). Denoncourt, Potter, and Stauffer (1977) also recorded it from the Susquehanna drainage. It is widely distributed in the Monongahela system, but has only recently been reported from the Youghiogheny. Davis (1973) reported one specimen from the Youghiogheny River in the vicinity of Station 4. Lee *et al.* (1976) have also reported it from the Maryland portion of the Youghiogheny.

We took it at 16 widely distributed stations in the drainage. These stations include Laurel Hill Creek (stations 11, 12, 14, 15, and 16); Big Meadow Run (stations 17 and 18); Indian Creek (station 21); and the Youghiogheny River proper (stations 4, 19, 22, 23, 24, 25, 26 and 27).

Dispersal of the greenside darter into the Potomac drainage is generally considered to have occurred via stream capture from the Monongahela River (Schwartz, 1965; Miller, 1968; Stauffer *et al.*, in press). Schwartz (1965) discussed the distribution and dispersal of this form in the Potomac River. He discarded the capture area between the Potomac and the Youghiogheny via the Savage River (Abbe, 1902; Ross, 1952) as a route of entry of *E. blennioides* to the Atlantic slope. He believed that the only route by which the species reached the Atlantic Coast was through Gandy Creek, Cheat River system, which was captured by the North Fork of the Potomac River. His evidence for this point of view was the apparent absence of the greenside darter from Youghiogheny River and the adjacent Savage River of the Potomac drainage.

In light of its present wide distribution in the drainage, we consider the greenside darter to be a native form. We also do not rule out the Savage River capture as a route for dispersal of *E. blennioides* from the Monongahela system to the Potomac (Hocutt, in press).

Nocomis micropogon × *Rhinichthys cataractae*

This form was originally described as *Rhinichthys bowersi* by Goldsborough and Clark (1908). Raney (1940) reidentified it as a hybird *Nocomis micropogon* (River chub) × *Rhinichthys cataractae* (longnose dace). It has been collected several times in the Monongahela drainage and twice in the Lake Erie drainage. In the Lake Erie drainage, it was collected in the West Branch of Cazenovia Creek (CU 18281) and in the East Branch Chagrin River (Ross and Cavender, 1977; OSUM 15160). Monongahela locations include Dry Fork (USUM 61576), Shavers Fork (UMMZ 109083, CU 24975 and AEL 60, 63, 65, 81, 83, 521), Minear Run (CU 5679, USMM 199981) and Youghiogheny locations include Snowy Creek (CU 32304), Big Meadow Run (ELC 150) and Flaugherty Creek (ELC 1467). Our collections resulted in two additional locations for the Youghiogheny drainage: Station 2 (1, 121.1 mm SL); Station 23 (1, 82.1 mm SL). In addition, we took three (46.0-59.3 mm SL) specimens at station 1 in Snowy Creek. Big Meadow Run and Flaugherty Creek were sampled but yielded no specimens of this form.

Summary

Eighty-two species of fishes are now known from the Youghiogheny River drainage. Our collections yielded 56 species resulting in six new distributional records for the drainage and one new record for the state of Maryland. Current distributional patterns in the Youghiogheny River suggest that Ohiopyle Falls and dams at Connellsville and Confluence may be barriers to the dispersal of fishes up the main channel. Thirteen species: *D. cepedianum*, *C. auratus*, *N. atherinoides*, *N. stramineus*, *N. volucellus*, *N. spilopterus*, *C. cyprinus*, *M. duquesnei*, *M. erythrurum*, *I. catus*, *I. punctatus*, *E. caeruleum* and *P. caprodes* were collected below the barriers but not above. Thus, it appears that typical big river fauna such as these were either never present above the falls or were extirpated above the falls and cannot now recolonize due to the barriers.

Literature Cited

Abbe, C., Jr. 1902. The physiography of Garrett County. *In* Garrett County, Maryland, Md. Geol. Surv. 340 p.

Bailey, R. B., J. F. Fitch, E. S. Herald, E. A. Lachner, C. C. Lindsay, C. R. Robins and W. B. Scott. 1970. A List of the Common and Scientific Names of Fishes from the United States and Canada.

3rd ed. American Fisheries Society, Special Publication No. 6, 149 pp.

Blair, W. F., A. P. Blair, P. Brodkorb, F. R. Cagle and G. A. Moore. 1968. Vertebrates of the United States. McGraw-Hill, New York. 616 pp.

Clay, W. M. 1975. The Fishes of Kentucky. Kentucky Department of Fish and Wildlife Resources, Frankfort, Kentucky. 416 pp.

Cope, E. D. 1864. Partial Catalogue of the Cold-blooded Vertebrata of Michigan, Part I. Proc. Acad. Nat. Sci. Phila. 16:276-285.

Davis, R. M. 1973. The effects of Acid Mine Drainage on the Water Quality and Benthic Macroinvertebrates and Fish Populations in Streams in Maryland. Univ. of Md. Nat. Resources Institute, Ref. No. 72-53.

Denoncourt, R. F. and E. L. Cooper. 1975. A review of the literature and checklist of fishes of the Susquehanna River drainage above Conowingo Dam. Proc. Penna. Acad. Sci. 49:121-125.

Denoncourt, R. F., W. A. Potter and J. R. Stauffer, Jr. 1977. Records of the Greenside darter, *Etheostoma blennioides*, from the Susquehanna River drainage in Pennsylvania. Ohio J. Sci. 77(1):38-42.

Eddy, S. 1969. How to Know the Freshwater Fishes. Wm. C. Brown, Dubuque, Iowa 153 pp.

Elser, H. J. 1957. The Lake Koshare draining project, 1957. Md. Dept. of Res. and Ed. Ref. No. 57-55. Solomons, Md. 3 pp.

EPA. 1971a. A Report on Pollution of the Ohio River and its tributaries in the Pittsburgh, Pennsylvania, Area. U.S. EPA, Region III. 93 pp.

EPA. 1971b. Summary Report: Monongahela River Mine Drainage Remedial Project. EPA. *In* Proceedings in the matter of pollution of the Interstate Waters of the Monongahela River and its Tributaries—Pa., W. Va. and Md. Second Session, Pittsburgh, Pa., Aug. 24, 1971.

Fowler, H. W. 1907. Records of Pennsylvania Fishes. Amer. Nat. 41:5-21.

Fowler, H. W. 1909. A synopsis of the cyprinidae of Penna. Proc. Acad. Nat. Sci. Phila. 1908. 60:517-553.

Fowler, H. W. 1912a. Notes on clupeoid fishes. Proc. Acad. Nat. Sci. Phila. 1911. 63:204-221.

Fowler, H. W. 1912b. Records of Fishes for the Middle Atantic States and Virginia. Proc. Acad. Nat. Sci. Phila. 34-59.

Fowler, H. W. 1919. A list of the fishes of Pennsylvania. Proc. Biol. Soc. Washington, 32:49-74.

Fowler, H. W. 1940. A list of the fishes recorded from Pennsylvania. Commonwealth of Penna., Board of Fish Commissioners, Bull. No. 7. 25 pp.

Goldsborough, E. L. and H. W. Clark. 1908. Fishes of West Virginia. Bull. Bureau of Fisheries, Washington 27(1907):29-39.

Hocutt, C. H. (in press). Drainage evolution and fish dispersal in the central Appalachians, Parts I (summary) and II (microfiche). Bull. Geol. Soc. Am. Contr. No. 849-AEL.

Hocutt, C. H., R. L. Kaesler, M. T. Masnick and J. Cairns, Jr. 1974. Biological Assessment of Water Quality in a Large River System: An Evaluation of a Method of Fishes. Arch. Hydrobiol. 74(4):448-462.

Hubbs, C. L. and K. F. Lagler. 1958. Fishes of the Great Lakes Region. University of Michigan Press, Ann Arbor, 135 pp.

Jenkins, R. E., E. A. Lachner and F. J. Schwartz. 1972. Fishes of the central Appalachian drainages: their distribution and dispersal. pp. 43-117. *In* P. C. Holt (ed.), The distributional history of the biota of the southern Appalachians. Part III: Vertebrates. Research Division Monograph 4, Virginia Polytechnic Institute and State University, Blacksburg, Virginia.

Jordan, D. S. 1978. A synopsis of the family *Catostomidae*. Bull. U.S. Nat. Mus. 12:97-230.

Lee, D. S., A. Norden, C. R. Gilbert and F. Franz. 1976. A list of the freshwater fishes of Maryland and Delaware. Chesapeake Science, 17(3):205-211.

Mansueti, R. 1957. Rare longnose or sturgeon sucker found in Maryland. Maryland Tidewater News 13(7):2.

Mansueti, R. 1962. Electrofishing results in the Youghiogheny River System (Ohio Drainage) in Maryland, July 17-19, 1962, with a provisual checklist of the Youghiogheny fishes recorded in Maryland, West Virginia, and Pennsylvania. Chesapeake Biological Laboratory. Ref. No. 62-46. 11 pp. (mimeo).

Miller, R. V. 1968. A systematic study of the Greenside darter, *Etheostoma blennioides* Rafinesque (Pisces, Percidae). Copeia (2):369-377.

Preston, H. R. 1974. Fish population studies of the Monongahela River. EPA 903/9-75-016. U.S. Environmental Protection Agency, Region III, S & A Division, Wheeling, West Virginia.

Raney, E. C. 1938. The distribution of the fishes of the Ohio drainage basin of western Pennsylvania. Doctoral Dissertation, Cornell University, Ithaca, New York.

Raney, E. C. 1940. *Rhinichthys bowersi* from West Virginia, a hybrid *Rhinichthys cataractae* × Nocomis *micropogon*. Copeia 1940(4):270-271.

Reppert, R. T. 1964. Aquatic life and the acid reaction. Pages 27-49, *In* Fifth Annual Symposium on Industrial Waste Control. Frostburg State College and Maryland Water Pollution Control Commission, Annapolis, Maryland.

Ross, R. D. 1952. The subspecies and races of the cyprinid fish *Campostoma anomalum* (Rafinesque) in eastern United States. Ph.D. Dissertation, Cornell Univ., Ithaca, N. Y.: 223 pp.

Ross, M. R. and T. M. Cavender. 1977. First report of the natural cyprinid hybrid, *Notropis cornutus* × *Rhinichthys cataractae*, from Ohio. Copeia (4):777-780.

Schwartz, F. J. 1961. Fishes of the Cranesville Swamp, West Virginia, and Maryland. Arboretum Newsletter, West Virginia Univ. 11(4):4.

Schwartz, F. J. 1965. The distribution and probable post glacial dispersal of the percid fish, *Etheostoma b. blennioides*, in the Potomac River. Copeia (3):285-290.

Scott, W. B. and E. J. Crossman. 1973. Freshwater fishes of Canada. Fisheries Research Board of Canada. Ottawa. 966 pp.

Stauffer, J. R., Jr., C. H. Hocutt, and D. S. Lee. (in press). The Zoogeography of the Freshwater Fishes of the Potomac River Basin. *In:* W. T. Mason, (ed.), Biological Resources of Potomac River Basin Streams Symposium. Interstate Comm. Potomac River Basin.

Thompson, B. A. 1977. An analysis of three subgenera *(Hypohomus, Odontopholis* and *Swainia)* of the genus *Percina* (Tribe Etheostomatini, Family Percidae). Ph.D. Dissertation, Tulane University: 399 pp.

Truitt, R. V., B. A. Bean and H. W. Fowler. 1929. The fishes of Maryland. Maryland Conservation Bulletin 3:1-120.

Uhler, P. R. and O. Lugger. 1876. List of the Fishes of Maryland. Rep. Comm. Fisheries, Maryland, 1876. pp. 67-178.

Wallace, D. C. 1973. The distribution and dispersal of the Silverjaw minnow, *Ericymba buccata* Cope. Am. Midl. Nat. 89(1):1155.

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Table 2. Checklist of the fishes of the Youghiogheny River. N = native, I = introduced, ? = status unknown, UI = unsuccessful introduction.

Species	Status	Collected in 1977
Lampetra aepyptera	N	
Amia calva	I	X
Anguilla rostrata	N	
Alosa pseudoharengus	UI	
A. sapidissima	UI	
Dorosoma cepedianum	N	X
Hiodon alosoides	N	
Salmo gairdneri	I	X
S. trutta	I	X
S. salar	UI	
Salvelinus fontinalis	N	X
S. namaycush	UI	
Osmerus mordax	I	
Esox a. americanus	I	X
E. lucius	I	X
E. masquinongy ohiensis	N	
E. niger	I	X
Campostoma anomalum	N	X
Carassius auratus	I	X
Clinostomus elongatus	N	X
Cyprinus carpio	I	X
Ericymba buccata	N	X
Hybopsis dissimilis	N	X
Nocomis micropogon	N	X
Notemigonus crysoleucas	N	X
Notropis atherinoides	N	X
N. c. chrysocephalus	N	X
N. photogenus	N	X
N. rubellus	N	X
N. spilopterus	N	X
N. stramineus	N	X
N. volucellus	N	X
Pimephales notatus	N	X
P. promelas	I	X
Rhinichthys atratulus	N	X
R. cataractae	N	X
Semotilus atromaculatus	N	X
S. margarita	N	
S. corporalis	?	
Tinca tinca	UI	
Carpiodes cyprinus	N	X
C. velifer	N	
Catostomus catostomus	N	X
C. commersoni	N	X
Hypentelium nigricans	N	X
Minytrema melanops	N	
Moxostoma anisurum	N	
M. carinatum	N	
M. duquesnei	N	X
M. erythrurum	N	X
M. macrolepidotum breviceps	N	
Ictalurus catus	I	X
I. natalis	N	X
I. nebulosus	N	X
I. punctatus	N	X
Noturus flavus	N	X
N. insignis	?	
Pylodictus olivaris	N	
Fundulus diaphanus	I	X
Labidesthes sicculus	N	
Morone chrysops	UI	
M. saxatilis	UI	
Ambloplites rupestris	N	X
Lepomis cyanellus	N	X
Lepomis gibbosus	I	X
L. macrochirus	N	X
Micropterus dolomieui	N	X
M. salmoides	N	X
Pomoxis annularis	N	X
P. nigromaculatus	N	X
Ammocrypta pellucida	N	
Etheostoma b. blennioides	N	X
E. caeruleum	N	X
E. flabellare	N	X
E. nigrum	N	X
Perca flavescens	?	X
P. macrocephala	N	
P. maculata	N	
Stizostedion canadense	N	
S. vitreum	N	X
Cottus bairdi	N	X