

CHECKLIST OF THE FISHES AND MACROINVERTEBRATES OF CONOCOCHEAQUE CREEK, PENNSYLVANIA AND MARYLAND¹

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INTRODUCTION

The fauna of the Potomac River drainage has been documented by Truitt, Bean and Fowler (1929); Fowler (1945); Mansueti (1957); Jenkins, Lachner and Schwartz (1972); Loos, Woolcott and Foster (1972); and Lee *et al.* (1976). Stauffer, Hocutt and Lee (in press) presented a general overview of the zoogeography of the freshwater fishes of the Potomac basin. The fauna of the Potomac River has been derived principally by stream captures with the Monogahela (Hocutt, Denoncourt and Stauffer, 1978), James (Stauffer *et al.*, in press) and Susquehanna rivers, as well as migration along the Atlantic Coastal Plain and Chesapeake Bay (Stauffer *et al.*, in press).

Conococheague Creek, a subdrainage of Potomac River, drains 1,458 km² in the Great Valley (Ridge and Valley Province) of Pennsylvania and Maryland. It meanders 129 km through the valley to discharge into the Potomac 1.6 km northwest of Williamsport, Md., at an elevation of 103 m (Figure 1). The East and West branches are the main headwater tributaries.

The East Branch rises near South Mountain, Adams County, Pa., at an elevation of 597 m and flows westward through state forest lands, Caledonia State Park and across the limestone portion of the valley. Chambersburg, population 17,343 (1976 census), is the only large town on the East Branch. Sections of the creek are channelized throughout the Chambersburg area. Below Chambersburg, the width averages 20 to 25 m, and due to nutrient enrichment from surrounding farmlands, aquatic vegetation is more prevalent.

The West Branch originates on Kittatiny and Tuscorora mountains at an elevation of 689 m, flows southwest through a narrow valley between nearly parallel ridges and drains mostly shale soils. Mercersburg, Pa., population 1,820 (1976 census) is the only incorporated town on the West Branch. The West Branch joins the East Branch near Bino, approximately 3.2 km north of the Pennsylvania-Maryland state line. Below the confluence, Conococheague Creek averages 30 to 40 m in width and 1.5 m in depth. The main stream is characterized by extensive areas of *Elodea*, *Lemna* and *Potamogeton*.

Published records of Conococheague fishes and macroben-

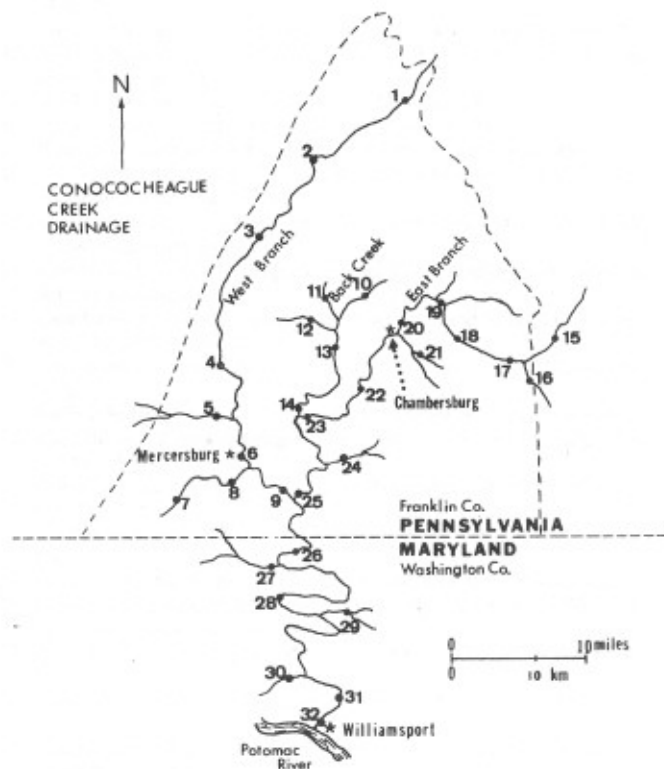


FIGURE 1. Map of Conococheague Creek showing station localities.

thos are rare even though the Potomac River has been continuously studied. Early surveys of Pennsylvania and Maryland fishes usually excluded stream localities or did not include the upper Potomac Basin. Fowler (1919) included several Conococheague collections in a list of Pennsylvania fishes. The U. S. Army Corps of Engineers conducted a qualitative survey of the fauna in the Conococheague sub-basin in conjunction with their Potomac River Basin Report (Anonymous, 1963). The Pennsylvania Fish Commission conducted a series of unpublished surveys of the upper portions of the creek to determine suitability for stocking.

LaBuy (1968) and Davis and Enamait (1976) published lists of the macroinvertebrates identified to genus. Other generic level studies included unpublished data by the Pennsylvania Department of Environmental Resources (1974, 1975, 1976)

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and the Maryland Water Resources Administration (1976). The Pennsylvania Fish Commission (C. Schiffer, pers. comm.) and the Army Corps of Engineers (Anonymous, 1963) conducted surveys on the watershed and identified taxa to order. The Environmental Protection Agency (Region III office) has an on-going survey of the Conococheague basin, but a final report will not be finished for 2 to 3 years (G.A. Koltonuk, pers. comm.). A thorough water quality study for the entire drainage including Conococheague Creek was accomplished by the Interstate Commission for the Potomac River Basin (Mason *et al.*, 1974). This inventory of fishes and macroinvertebrates of Conococheague Creek was conducted in 1976 as part of an ongoing survey of the Potomac River fauna by the Appalachian Environmental Laboratory (AEL), University of Maryland.

METHODS

Thirty-two stations (Table 1) were established on Conococheague Creek and its major tributaries. Stations were selected for accessibility, but spaced as evenly as possible throughout the river's length (Figure 1). Fishes were collected with a 1.5 m x 3 m x .32 cm seine (all stations), a 1.2 m x 7.6 m x .32 cm bag seine (stations 1, 2, 25, 26, 31) and an AC/DC 110-220 v. electrofishing unit (stations 8, 12, 16, 18). All habitats at each locality were sampled to obtain a representative sample (Hocutt *et al.*, 1974). Large specimens were identified in the field and released. The remainder of the collection was preserved in 10 percent formalin, identified to species and permanently stored in 40 percent isopropyl alcohol at the Fish Museum, Appalachian Environmental Laboratory, University of Maryland, Frostburg, Md. A representative series of each species was deposited in the U.S. National Museum. With the exception of *Cottus girardi*, all scientific and common names follow Bailey *et al.* (1970).

Macroinvertebrates were collected from all available habitats concurrently with fish collections via a 3-minute D-frame kick sample described by Benfield and Cairns (1974). The entire sample was preserved in 60 percent isopropyl alcohol. Specimens were identified in the laboratory to the generic level with the aid of Edmundson (1959), Edmunds *et al.* (1976), Hilsenhoff (1975), Pennak (1953), Usinger (1956) and Wiggins (1977).

RESULTS AND DISCUSSION

Fish

A total of 11,654 fishes, represented by 46 species and 10 families, was collected in this survey (Table 2). Of the 46 species collected, Stauffer *et al.* (in press) considered 36 native to the upper Potomac Basin. *Salmo trutta*, *Carassius auratus*, and *Cyprinus carpio* were introduced from the Old World. *Ambloplites rupestris*, *Lepomis cyanellus*, *Lepomis megalotis* and *Micropterus dolomieu* were transplanted from other North American drainage basins. *Lepomis macrochirus* and *Micropterus salmoides* may have been native to the Potomac system but wide spread stocking makes it impossible to document their original distributions (Stauffer *et al.*, in press). Species stocked by the Pennsylvania Fish Commission in Conococheague Creek include *Salmo gairdneri*, *Salmo trutta*, *Salvelinus fontinalis*, *Ictalurus natalis*, and *Esox niger* (C. Shiffer,

TABLE 1

List of sampling locations for fish and macroinvertebrates in Conococheague Creek, Potomac River Basin, 1976.

1. West Branch Conococheague Creek at Co. Rd. 591 bridge, off Co. Rt. 28060, 1.6 air km NE of Amberson, Pa.
2. West Branch Conococheague Creek at Co. Rd. 264-A bridge, 2.4 air km N of Willow Hill, Pa.
3. West Branch Conococheague Creek below Fannetsburg Dam, Fannetsburg, Pa.
4. West Branch Conococheague Creek at Co. Rt. 28090 bridge, Ft. Loudon, Pa.
5. Buch Run at Co. Rt. 28038 bridge, Dickey, Pa.
6. West Branch Conococheague Creek at Co. Rt. 28037 bridge, 1.6 km E of Mercersburg, Pa.
7. Licking Creek at Co. road bridge off Co. Rt. 28046, 8.0 km SW of Mercersburg, Pa.
8. Licking Creek at St. Rt. 416 bridge, 2.4 km E of Shimpstown, Pa.
9. West Branch Conococheague Creek at Co. road bridge 2.4 km NW of Bino, Pa.
10. Rocky Spring Branch off Co. Rt. 28006, 3.2 km NW of Jackson Hall, Pa.
11. Dennis Creek at Co. Rt. 28006 bridge, 4.0 km E of Edenville, Pa.
12. Wilson Run at Co. road bridge S of Co. Rt. 28006, 4.8 air km NE of St. Thomas, Pa.
13. Back Creek at St. Rt. 30 bridge, St. Thomas, Pa.
14. Back Creek at St. Rt. 995 bridge, Williamson, Pa.
15. Birch Run, just below Chambersburg Water Reservoir, Pa.
16. Rocky Mountain Creek at Co. Rt. 28086 bridge, 4.8 km S of St. Rt. 30 at Caledonia St. Park, Pa.
17. Confluence of Conococheague Creek and Rocky Mountain Creek, Caledonia State Park, Pa.
18. East Branch Conococheague Creek at Cook Bridge on Woodstock Rd., Woodstock, Pa.
19. East Branch Conococheague Creek at Scotland School for Veteran's Children, Scotland, Pa.
20. East Branch Conococheague Creek at Wilson College, Chambersburg, Pa.
21. Falling Spring Creek at Co. Rt. 28003 bridge, Stoufferstown, Pa.
22. East Branch Conococheague Creek at Co. Rt. 28033 bridge, 1.6 km SE of Turkeyfoot, Pa.
23. Conococheague Creek at Co. Rt. 28004 bridge, just SE of Williamson, Pa.
24. Muddy Run at Co. Rt. 28004 bridge, 1.6 km NW of Greencastle, Pa.
25. Conococheague Creek at Co. Rt. 28034, 0.8 km E of Bino, Pa.
26. Conococheague Creek at St. Rt. 416 bridge, just S of the Pennsylvania-Maryland state line, Md.
27. Rockdale Run at Gossard Mill Rd. bridge, 1.6 km SE of Fairview, Md.
28. Conococheague Creek at Cress Pond Rd., 6.4 km NE of Wilson, Md.
29. Confluence of Rush Run and Troupe's Run at Elks Picnic Ground, along Rt. 63, Md.
30. Meadow Brook Creek at Jct. Kemps Mill Rd. and Pinesburg/Kempshall Rd., Md.
31. Conococheague Creek at Kemps Mill, just N of Williamsport, Md.
32. Conococheague Creek at St. Rt. 68 bridge, Williamsport, Md.

pers. comm.). Species not collected in this survey but known from the Conococheague include *Hybognathus nuchalis*, *Ictalurus nebulosus* (P. Buhner, pers. comm.; specimens verified), and *Moxostoma erythrurum* (R. Davis, pers. comm.), thus, increasing the total known fish fauna to 49 species.

Of particular interest is the distribution of a form which was described as *Cottus girardi* by Robins (1961) and subsequently synonymized with *Cottus bairdi* by Savage (1962). Opinions differ as to its status (Stauffer *et al.*, in press). However, the consensus regard *C. girardi* as most closely related to *Cottus caroliniae* and should be removed from the synonymy of *C. bairdi* (C. R. Robins, pers. comm.; C. R. Gilbert, in litt., 1977; R. E. Jenkins, in litt., 1976). Although a

TABLE 3

Checklist of macroinvertebrate taxa from Conococheague Creek (AEL = Appalachian Environmental Laboratory (1976 collections), Pa. DER = Pennsylvania Department of Environmental Resources (unpublished data, 1974, 1975, 1976), FWQA = Federal Water Quality Administration (LaBuy, 1968), Md. WRA = Maryland Water Resources Administration (unpublished data, 1974), Md. FA = Maryland Fisheries Administration (Davis and Fnamait, 1976))

TAXA	COLLECTOR				
	AEL	PA. DER	FWQA	MD. WRA	MD. FA
Platyhelminthes					
Planariidae	X	X	—	—	—
<i>Dugesia</i>	X	X	X	X	—
Nematoda	X	X	—	—	—
Annelida					
Oligochaeta	X	X	—	—	—
Lumbricidae	X	—	—	—	—
Tubificidae	X	—	—	X	—
Hirudinea	X	—	—	—	—
<i>Helobdella</i>	—	—	X	—	—
Mollusca					
Gastropoda					
Manicolidae sp.	—	—	—	—	X
<i>Ferrissia</i>	X	X	—	—	—
<i>Gyraulus</i>	X	X	—	—	—
<i>Helisoma</i>	X	—	—	—	—
<i>Lymnaea</i>	X	X	—	—	—
<i>Physa</i>	X	X	X	—	—
Planorbidae sp.	—	—	—	—	X
<i>Pleurocera</i>	X	—	—	—	—
<i>Viviparus</i>	—	X	—	—	—
Pelecypoda					
<i>Musculium</i>	—	X	—	—	—
<i>Psidium</i>	X	—	—	—	—
Sphaeriidae sp.	—	—	—	—	X
<i>Sphaerium</i>	X	X	—	—	—
Athropoda					
Crustacea					
<i>Asellus</i>	X	X	—	—	X
<i>Cambarus</i>	X	—	—	—	—
<i>Gammarus</i>	X	X	X	—	X
<i>Lirceus</i>	—	X	—	—	—
<i>Orconectes</i>	X	—	—	—	—
Arachnoidea					
Hydracarina	X	X	—	—	—
Insecta					
Coleoptera					
<i>Ancyronyx</i>	X	—	—	—	—
<i>Berosus</i>	X	X	—	—	—
<i>Dineutus</i>	X	X	—	—	—
<i>Dubiraphia</i>	X	—	—	—	—
<i>Ectopria</i>	X	—	—	—	—
Elmidae sp.	—	—	—	—	X
<i>Haliplus</i>	—	X	—	—	—
<i>Macronychus</i>	X	—	—	—	—
<i>Optioservus</i>	X	—	—	—	—
<i>Psephenus</i>	X	X	—	X	X
<i>Stenelmis</i>	X	X	—	X	—
<i>Tropisternis</i>	X	—	—	—	—
Diptera					
<i>Antocha</i>	X	X	—	X	—
<i>Atherix</i>	X	X	—	—	—
<i>Brillia</i>	—	X	—	—	—
<i>Cardiocladius</i>	—	X	—	—	—
Ceratopogonidae sp.	X	—	—	—	—
Chironomidae sp.	X	—	—	—	X
<i>Chironomus</i>	—	X	—	—	—
<i>Coelotanypus</i>	—	—	—	X	—
<i>Conchapelopia</i>	—	X	—	—	—
<i>Corynoneura</i>	—	X	—	—	—
<i>Cricotopus</i>	—	X	—	X	—
Cyclidae sp.	X	—	—	—	—
<i>Diamsa</i>	—	—	—	X	—
Empididae sp.	X	X	—	X	—
<i>Eukiefferiella</i>	—	X	—	—	—
<i>Hexatoma</i>	X	—	—	—	—
<i>Kiefferulus</i>	—	X	—	—	—
<i>Limnophyes</i>	—	X	—	—	—
<i>Metricnemus</i>	—	X	—	—	—
<i>Micropsectra</i>	—	X	—	—	—
<i>Microtendipes</i>	—	X	—	—	—
<i>Monodiamesa</i>	—	X	—	—	—
<i>Nilotanypus</i>	—	X	—	—	—
<i>Orthocladius</i>	—	—	—	X	—

TABLE 3 (Continued)

TAXA	COLLECTOR				
	AEL	PA. DER	FWQA	MD. WRA	MD. FA.
<i>Parachironomus</i>	—	X	—	—	—
<i>Pentaneurini</i> sp.	—	X	—	X	—
<i>Polypodium</i>	—	X	—	X	—
<i>Psectrocladius</i>	—	X	—	—	—
<i>Rheotanytarsus</i>	—	X	—	—	—
<i>Simulium</i>	X	X	—	X	—
<i>Stenochironomus</i>	—	X	—	—	—
<i>Tabanus</i>	X	—	—	—	—
<i>Thienemanniella</i>	—	X	—	—	—
<i>Tipula</i>	X	—	—	—	—
<i>Tribelos</i>	—	X	—	—	—
<i>Trichocladus</i>	—	X	—	—	—
Ephemeroptera					
<i>Ameletus</i>	—	X	—	—	—
<i>Baetis</i>	X	X	X	—	—
<i>Caenis</i>	X	X	—	—	X
<i>Centroptilum</i>	X	—	—	—	—
<i>Ephemerella</i>	X	X	—	X	X
<i>Ephoron</i>	—	X	—	—	—
<i>Heptagenia</i>	X	—	—	—	X
<i>Hexagenia</i>	X	—	—	—	X
<i>Isorychia</i>	X	X	—	X	X
<i>Paraleptophlebia</i>	X	X	—	—	—
<i>Potamanthus</i>	—	X	—	X	X
<i>Pseudocleon</i>	—	X	—	—	X
<i>Stenacron</i>	X	—	—	—	—
<i>Stenonema</i>	X	X	—	X	X
<i>Tricorythodes</i>	X	X	—	—	X
Hemiptera					
<i>Gerris</i>	X	—	—	—	—
<i>Metrobates</i>	X	—	—	—	—
<i>Notonecta</i>	X	—	—	—	—
<i>Ranatra</i>	X	—	—	—	—
<i>Rhagovelia</i>	X	—	—	—	—
<i>Sigara</i>	X	—	—	—	—
<i>Trepobates</i>	X	—	—	—	—
Lepidoptera					
<i>Elophila</i>	—	X	—	—	—
Megaloptera					
<i>Chauliodes</i>	—	X	—	—	—
<i>Corydalus</i>	X	X	—	—	—
<i>Nigronia</i>	X	—	—	—	—
<i>Sialis</i>	X	—	—	—	—
Odonata					
<i>Argia</i>	X	X	X	—	X
<i>Boyeria</i>	X	—	—	—	—
<i>Calopteryx</i>	X	—	—	—	—
<i>Cordulegaster</i>	X	—	—	—	—
<i>Erythemis</i>	—	—	X	—	—
<i>Gomphus</i>	X	—	—	—	—
<i>Ishnura</i>	—	—	X	—	—
<i>Lanthus</i>	X	—	—	—	—
<i>Macromia</i>	X	—	—	—	—
<i>Ophiogomphus</i>	X	—	—	—	—
Plecoptera					
<i>Acroneuria</i>	X	X	—	—	—
<i>Allocapnia</i>	—	X	—	—	—
<i>Brachyptera</i>	—	X	—	—	—
<i>Isogenus</i>	—	X	—	—	—
<i>Ispoerla</i>	X	X	—	—	—
<i>Leuctra</i>	—	X	—	—	—
<i>Nemoura</i>	X	X	—	—	—
<i>Peltoperla</i>	X	—	—	—	—
<i>Perlesta</i>	X	X	—	—	X
<i>Phasgonophora</i>	—	—	—	X	—
<i>Pteronarcys</i>	X	—	—	—	—
<i>Taeniopteryx</i>	—	X	—	—	—
Trichoptera					
<i>Agryalea</i>	—	X	—	—	—
<i>Brachycentrus</i>	X	—	—	—	—
<i>Cheumatopsyche</i>	X	X	—	—	X
<i>Chimarra</i>	X	X	—	—	—
<i>Glossosoma</i>	X	X	—	—	—
<i>Goera</i>	X	—	—	—	—
<i>Heliopsyche</i>	X	—	—	—	—
<i>Hydropsyche</i>	X	X	X	—	X
<i>Hydroptila</i>	X	X	—	—	—

TABLE 3 (Continued)

TAXA	COLLECTOR				
	AEL	PA. DER	FWQA	MD. WRA	MD. FA.
<i>Lepidostoma</i>	—	X	—	—	—
<i>Leucotrichia</i>	X	X	—	—	—
<i>Limnophitus</i>	—	X	—	—	—
<i>Macronomum</i>	—	—	—	X	—
<i>Neophylax</i>	X	—	—	—	—
<i>Oecetis</i>	—	X	—	—	—
<i>Orthotrichia</i>	—	X	—	—	—
<i>Polycentropus</i>	X	X	—	X	—
<i>Psychomyia</i>	X	X	—	—	—
<i>Psychopyche</i>	—	X	—	—	—
<i>Rhyacophila</i>	X	X	—	—	—

complete discussion of the taxonomic status is outside the scope of this paper, *C. girardi* is regarded as a valid species for the purposes of this paper. The type locality of *C. girardi* is the East Branch Conococheague Creek approximately 0.8 km north of Station 1.

C. girardi was collected at many stations in the upper Conococheague and in most tributaries to the lower section. It was frequently collected at the same station where *C. bairdi* was present. *C. girardi* was usually found at the deeper, slower-moving downstream end of the riffle, while *C. bairdi* was found mostly at the upstream, swifter, shallower portion.

Fishes native to the Potomac which might be expected from Conococheague include: *Clinostomus funduloides*, *Notropis amoenus*, *Notropis procne*, *Moxostoma erythrurum*, *Ictalurus catus*, and *Percina peltata*. Each occurs in the main-channel or tributary streams of the Potomac basin in either the Ridge and Valley Province or the Blue Ridge Province. *Moxostoma rhothoecum*, *Nocomis leptcephalus*, and *Etheostoma caeruleum* appear to be limited to the southern tributaries of the Potomac drainage, but could feasibly be found in Conococheague Creek. Introduced Potomac species which may be expected include *Pomoxis nigromaculatus* and *Pimephales promelas*.

No fish species found in Conococheague Creek is included on the federal threatened and endangered list. Because *Cottus girardi* is known only from the Potomac and James rivers (R. E. Jenkins, pers. comm.), its status should be carefully monitored.

Macrobenthos

In general, there is a diverse macroinvertebrate assemblage in Conococheague Creek. Throughout the system, there are many taxa which are usually associated with "clean water", e.g., Plecoptera, Ephemeroptera and Trichoptera (Goodnight, 1973; Mackenthun, 1969). Our macroinvertebrate collections yielded 88 taxa distributed among 77 genera (Table 3). Data from the Federal Water Quality Administration, Pennsylvania Department of Environmental Resources, Maryland Water Resources Administration and Maryland Fisheries Administration are also summarized in Table 2. Based on the above studies, a total of 143 taxa represented by 131 genera of macroinvertebrates is known from Conococheague Creek (Table 3).

The extensive growths of aquatic vegetation in the western tributaries and main-branch Conococheague were probably due to inadequate treatment of urban sewage and agricultural runoff (Mason *et al.*, 1974).

SUMMARY

A total of 49 fish species is known from Conococheague Creek, with 39 considered as native. At least 8 additional fishes which are native to the Potomac may feasibly occur. None of the fish species present in the creek are regarded as rare or endangered, although *C. girardi* should be carefully monitored. A total of 146 macroinvertebrate taxa represented by 131 genera is known to occur in Conococheague Creek and its tributaries. Water quality throughout the basin is generally regarded as fair-good to good (Mason *et al.*, 1974).

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