

A Taxonomic Study of Recently Introduced Populations of the Banded Darter, *Etheostoma zonale* (Cope), in the Susquehanna River.

Etheostoma zonale (Cope), the banded darter, has an extensive distribution in the Mississippi drainage from Louisiana and Mississippi in the south to Minnesota and New York in the north. It is readily collected in the Allegheny tributaries of western Pennsylvania.

The banded darter was first reported in Little Pine Creek, Lycoming County, Susquehanna River drainage (Atlantic slope) in Kneib (1972) who suggested a bait bucket introduction. Denoncourt et al. (1975) reported

who supplied banded darters from Pine Creek.

A sample of 20 adult specimens was obtained from the mouth of Stony Creek, Dauphin County, Pennsylvania, (lower Susquehanna drainage, 42 to 56 mm standard length), from Pine Creek, Lycoming County, Pennsylvania (upper Susquehanna drainage, 42 to 60 mm), and from French Creek, Crawford County, Pennsylvania (Allegheny drainage, 38 to 55 mm). They were examined for cheek, breast and belly squamation as described in

TABLE 1. Meristic data from samples of three populations of the banded darter, *Etheostoma zonale* from Stony Creek (lower Susquehanna River), from Pine Creek (upper Susquehanna River) and from French Creek (Allegheny River).

Lateral line scales	42	43	44	45	46	47	48	49	50	51	\bar{x}	ANOVA ($p = .05$)
Stony Creek	1	1	7	5	2	1	3	—	—	—	45.1	NS
Pine Creek	—	1	2	4	5	4	3	—	—	1	46.2	
French Creek	—	2	3	6	3	—	4	2	—	—	45.8	
Scales above lateral line				4	5	6					\bar{x}	ANOVA ($p = .05$)
Stony Creek				3	17	—					4.8	NS
Pine Creek				3	16	1					4.9	
French Creek				2	17	1					5.0	
Scales below lateral line				6	7	8					\bar{x}	ANOVA ($p = .05$)
Stony Creek				5	14	1					6.8	NS
Pine Creek				1	18	1					7.0	
French Creek				7	11	2					6.8	
Least caudal peduncle scales				16	17	18	19				\bar{x}	ANOVA ($p = .05$)
Stony Creek				1	10	5	4				17.6	NS
Pine Creek				1	12	2	5				17.6	
French Creek				2	7	7	4				17.6	
Anal soft rays				6	7	8					\bar{x}	ANOVA ($p = .05$)
Stony Creek				5	8	7					7.1	NS
Pine Creek				3	15	2					7.0	
French Creek				4	13	3					7.0	
Dorsal hard rays				9	10	11	12				\bar{x}	ANOVA ($p = .05$)
Stony Creek				—	5	14	1				10.8	S
Pine Creek				—	3	14	3				11.0	
French Creek				2	9	8	1				10.4	
Dorsal soft rays				10	11	12	14				\bar{x}	ANOVA ($p = .05$)
Stony Creek				1	12	7	—				11.3	NS
Pine Creek				1	6	12	1				11.7	
French Creek				1	14	3	2				11.4	
Total dorsal rays				20	21	22	23	24	25		\bar{x}	ANOVA ($p = .05$)
Stony Creek				—	4	10	6	—	—		22.1	S
Pine Creek				—	2	6	9	3	—		22.6	
French Creek				3	5	9	2	—	1		21.7	

populations of the banded darter in the lower Susquehanna in Conowingo Pond, Lancaster County, which represent a downstream extension of over 400 kilometers in three years.

The purpose of this paper is to report a taxonomic comparison of samples from populations in the lower and upper Susquehanna with a sample from the Allegheny drainage (Ohio River system) and with descriptions of the banded darter given in Tsai and Raney (1974). We thank Edwin L. Cooper of Pennsylvania State University

Tsai and Raney (1974). The following counts were made as in Hubbs and Lagler (1958) or in Raney and Suttikus (1964): lateral line scales, scales above the lateral line, scales below the lateral line, least caudal peduncle scales, dorsal spines, dorsal rays and anal rays. A one-way analysis of variance ($p = .05$) was used to test the meristics.

Although individual variations in meristic characteristics is evident, distributions and means are remarkably similar among the three populations (Table 1). The

analysis of variance tests indicated that differences in the number of dorsal spines and differences in total dorsal spines plus rays are significant at the $p = .05$ level. However, the description and means of all samples fit well within the Ohio River race of the banded darter as described in Tsai and Raney (1974).

Squamation also indicated that the Susquehanna River populations are probably derived from the Ohio River. Breasts in the Susquehanna River samples are partially scaled posteriorly or naked. The cheek squamation is variable, but usually some partially exposed and some embedded scales are found on all specimens. A fully scaled cheek is not present, and the belly on all specimens is naked.

The characteristics of the Susquehanna River populations of the banded darter fit the description and diagnosis of the Ohio River race of this species given by Tsai and Raney (1974). We conclude the Susquehanna River populations of the banded darter are appropriately assigned to that taxon. This lends credence to the suggestion by Kneib (1972) that the species was probably a bait bucket introduction and would indicate that the source was a nearby tributary of the Allegheny River (Ohio River drainage).

LITERATURE CITED

DENONCOURT, R. F., C. H. HOCUTT AND J. R. STAUFFER, JR. 1975. Extensions of the known ranges of

Ericymba buccata Cope and *Etheostoma zonale* (Cope) in the Susquehanna River drainage. *Proc. Pa. Acad. Sci.* 49(1):45-46.

HUBBS, C. L., AND K. F. LAGLER. 1958. Fishes of the Great Lakes Region. Cranbrook Inst. Sci. Bull. No 26. 213 pp.

KNEIB, R. T. 1972. The effects of man's activity on the distribution of five stream fishes in Little Pine Creek, Pennsylvania. *Proc. Pa. Acad. Sci.* 46:49-51.

RANEY, E. C., AND R. D. SUTTKUS. 1964. *Etheostoma moorei*, a new darter of subgenus *Nothonotus* from the White River System, Arkansas. *Copeia* 1964(1):130-139.

TSAI, C., AND E. C. RANEY. 1974. Systematics of the banded darter, *Etheostoma zonale* (Pisces: Percidae). *Copeia* 1974(1):1-24.

ROBERT F. DENONCOURT

*Department of Biological Sciences
York College of Pennsylvania
York, Pennsylvania 17404*

JAY R. STAUFFER, JR.

*Appalachian Environmental Laboratory
University of Maryland
Frostburg State College Campus
Frostburg, Maryland 21532*

A Record of the White Bass, *Morone chrysops*, from the Susquehanna River

Recently a specimen of the white bass, *Morone chrysops* (Rafinesque), was brought to our attention. It was frozen in July 1969 by Dave Daniels for future reference. The specimen was a hook-and-line capture (by Charles Chapman of New Cumberland, Pennsylvania) from the Susquehanna River in Cumberland County, Pennsylvania. We have been extensively involved in fisheries and fish surveys in the Susquehanna River drainage (Denoncourt and Cooper 1975; Denoncourt, Hocutt and Stauffer 1975a, 1975b; Potter and Associates 1975). This specimen represented the only one presently known from the Susquehanna River drainage.

The specimen is a male, 263 mm in fork length with a head length of 69 mm and a second anal spine length of 22 mm. The dorsal fins are separate and there are 12 anal soft rays. The body is 84 mm deep and has six conspicuous and two partial longitudinal stripes. It weighs 311.5 g and is 2+ years of age. It is deposited in the fish collection at the Academy of Natural Sciences at Philadelphia (ANSP 131824).

The range of the white bass was generally given as fresh waters from the St. Lawrence River through the Great Lakes and Ohio-Mississippi drainages (Scott and Crossman 1973). It was listed by Fowler (1924) from Tuscarora Creek in East Waterford, Juniata County (Susquehanna drainage). No specimen or record of the white bass was found at the Academy of Natural Sciences at Philadelphia where Fowler worked, and it

was not subsequently mentioned by Fowler (1940) where locations in the Delaware, Genesee and Ohio drainages were listed. Thus, the former listing (Fowler 1924) was considered a probable misidentification or erroneous locality, corrected by 1940. This particular specimen may have been a bait-bucket introduction. Fishermen and live-bait suppliers indiscriminately transport species for stocking and for bait. One reviewer of this paper stated that sportsmen deliberately put white bass into Virginia reservoirs from which the species had been banned. *M. chrysops* has recently (1970, 1971) been introduced into the Susquehanna River drainage by the Pennsylvania Fish Commission (Denoncourt, Robbins and Hesser 1975). However, establishment of this species in the drainage is unknown.

The assistance of William Saul of the Academy of Natural Sciences at Philadelphia is gratefully acknowledged.

LITERATURE CITED

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. Pa. Acad. Sci.* 49(2):121-125.

———, C. H. HOCUTT, AND J. R. STAUFFER, JR. 1975a. Additions to Pennsylvania ichthyofauna of the Susquehanna River drainage. *Proc. Acad. Nat. Sci. Phila.* 127(9):67-69.