

RESEARCH NOTE

EXTENSIONS OF THE KNOWN RANGES OF *PERCINA SHUMARDI* GIRARD AND THREE SPECIES OF *ETHEOSTOMA* (SUBGENUS *NOTHONOTUS*) IN PENNSYLVANIA¹

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ABSTRACT

We used Missouri benthic trawls to sample benthic fish assemblages of the Ohio River within Pennsylvania during the summer and autumn of 2007. As part of our survey, we established range extensions for four species of darters (Percidae: Etheostomatini). These included the River Darter, *Percina shumardi* Girard, which is a new species record for Pennsylvania, although it is common in lower reaches of the Ohio River. We also extended the ranges of Bluebreast Darter, *Etheostoma camurum* (Cope), Spotted Darter, *Etheostoma maculatum* Kirtland, and Tippecanoe Darter, *Etheostoma tippecanoe* Jordan and Evermann, into the Ohio River. These latter three species are classified as threatened within Pennsylvania. The expansion of the known ranges of these fishes may be due to water quality improvement in the Ohio River, or may be the result of more efficient sampling techniques. Further sampling is warranted to elucidate their full ranges within Pennsylvania.

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INTRODUCTION

Over the past several years while conducting mussel surveys, we have noted the abundance of many species of darters (Percidae: Etheostomatini) in the deep pools and runs of large rivers. These habitats are difficult to sample for small fishes; thus they have been underrepresented in ichthyological surveys. The development of the Missouri

benthic trawl (Herzog et al. 2005) for sampling small benthic fishes has greatly improved the effectiveness of our sampling large riverine habitats; hence, our knowledge of the distribution and abundance of these species has increased. As a result of utilizing these sampling techniques, we extended the known ranges of the River Darter, *Percina shumardi* Girard, and three species of *Etheostoma* (subgenus *Nothonotus*) in Pennsylvania.

METHODS AND MATERIALS

We sampled the Ohio River in Pennsylvania at regular 1.0 km intervals from its formation at the confluence of the Allegheny and Monongahela rivers in Pittsburgh to the Ohio and West Virginia border (Fig. 1) in August 2007. We sampled the tailwaters of the Montgomery Dam (New Cumberland Pool) and the Dashields Dam (Montgomery Pool) in October 2007. Sampling was conducted using a Missouri benthic trawl according to the sampling protocols established by Herzog et al. (2005). Trawls were conducted in the central channel as well as near-shore, at depths ranging between 1.5–6.7 m. All fishes were identified in the field, with voucher specimens retained for laboratory verification.

RESULTS AND DISCUSSION

We captured a total of 35 River Darters, *Percina shumardi* (Fig. 2), from the Ohio River. We collected four individuals in the New Cumberland Pool of the Ohio River; and two individuals each at two sites located approximately 7 km and 11 km upstream from the Ohio/West Virginia border, respectively (PSU 4477, Fig. 1). Further targeted sampling revealed that their range within Pennsylvania extends at least 34 km upstream on the Ohio River to the Dashields Dam (PSU 4459, 4460, 4476).

The River Darter is distributed throughout the Mississippi River drainage, and is locally abundant in the Ohio River

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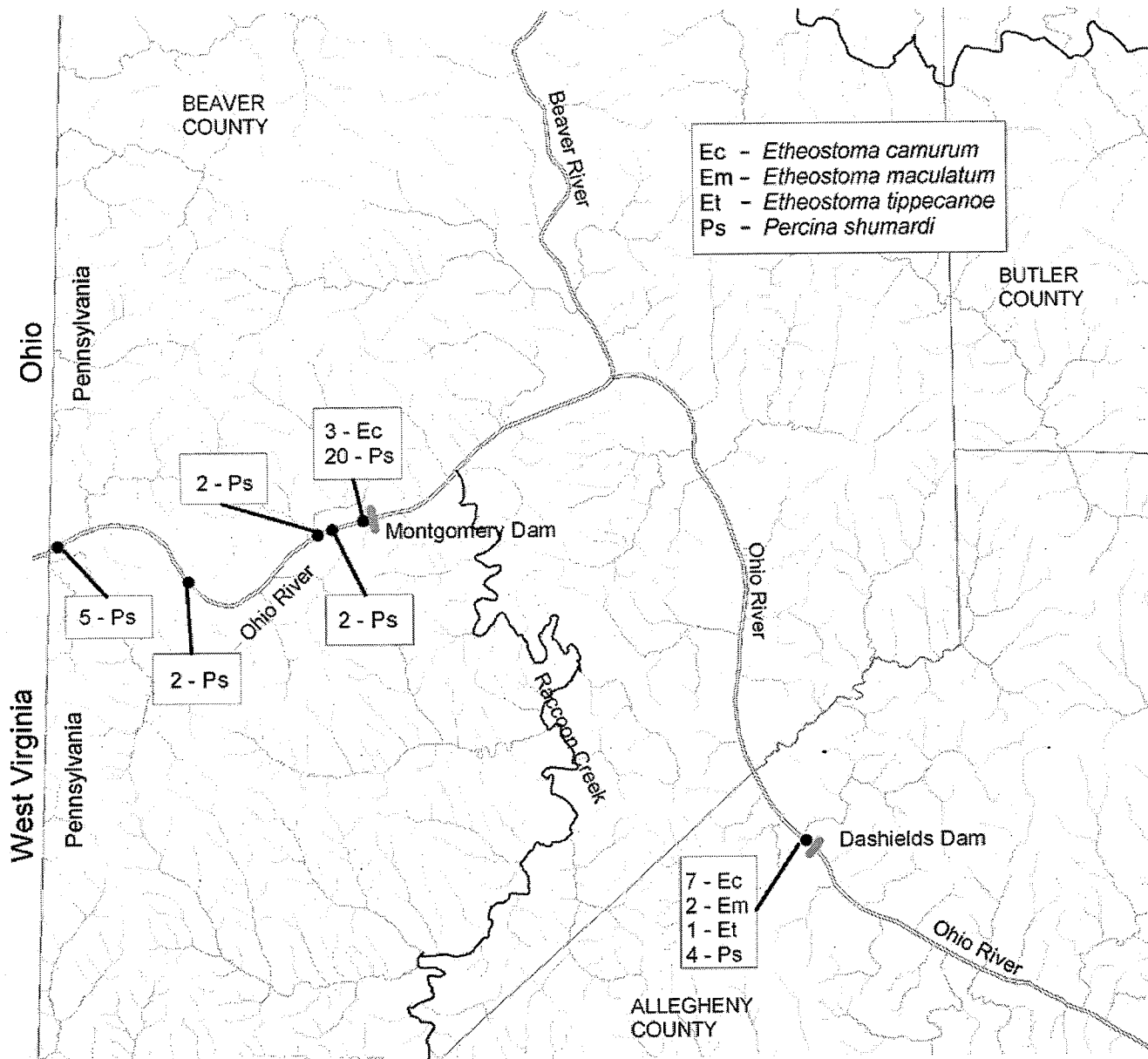


Figure 1. Map showing capture data for rare darter species caught during benthic trawl sampling of the Ohio River.

into West Virginia and Ohio, as well as being the most common darter collected from the Mississippi River (Kuehne and Barbour 1983, Page 1983). While River Darters have never been collected from Pennsylvania prior to this study, Cooper (1983) suggested that they may be a future migrant into Pennsylvania as water quality improved. Although River Darters have been thought to be invertebrate-generalist feeders (Trautman 1981, Page 1983), it has been determined that they may also specialize in feeding on snails, similar to other species of *Percina*, subgenus *Imostoma* (Haag and Warren Jr. 2006).

River Darter habitat consists primarily of large rivers with gravel/cobble/boulder substrates and with moderate to fast currents (Scott and Crossman 1973, Trautman 1981, Cooper 1983, Page 1983), with younger individuals inhabiting shallower

water. Specimens have been collected, however, from areas which are too turbid for many other darter species (Scott and Crossman 1973, Trautman 1981, Kuehne and Barbour 1983), and also from streams (Haag and Warren Jr. 2006); thus, these range extensions for *P. shumardi* within Pennsylvania may underestimate their true distribution within the state.

We collected three Bluebreast Darters, *Etheostoma camurum* (Cope), from Montgomery Dam tailwaters (New Cumberland Pool, PSU 4459). Seven Bluebreast Darters, five Spotted Darters, *Etheostoma maculatum* Kirtland, and one Tippecanoe Darter, *Etheostoma tippecanoe* Jordan and Evermann, were collected from the Dashields Dam tailwaters (Montgomery Pool, PSU 4476). These dams are located approximately 13 km and 34 km from the Ohio/West Virginia border, respectively (Figure 1).



Figure 2. River Darter (*Percina shumardi*), New Cumberland Pool, Ohio River, Beaver County, PA . 7 October 2007 . Photo: R.W. Criswell.

These three species are presently classified as threatened within Pennsylvania by the Pennsylvania Fish and Boat Commission (2007). The Tippecanoe Darter has heretofore been reported only from the Allegheny River system. The Bluebreast Darter and Spotted Darter were collected from the Allegheny and Mahoning rivers, but have been extirpated from the latter (Bean 1892, Cooper 1983). The closest records downstream of the state line for the Bluebreast Darter and Tippecanoe Darter are from the lower Muskingum River, but they probably occurred in the unimpounded Ohio River as well (Trautman 1981). The nearest downstream records of the Spotted Darter include the middle sections of the Elk River in West Virginia (Stauffer Jr. et al. 1995) and Muskingum and Scioto rivers in Ohio (Trautman 1981), but there are none from the mainstem Ohio River. Water quality in the Ohio River has been improving over the last 50 years, with marked improvement since the Clean Water Act was implemented in 1972, and is closely correlated with marked improvements in fish diversity and assemblages from 1957–2001 (Thomas et al. 2005). Our recent records, facilitated by the use of benthic trawls as a novel sampling gear, therefore most likely represent an expansion of the Allegheny River populations of all three species as a result of improved water quality.

Additional sampling is warranted to elucidate the full range of these species throughout the Ohio River drainage in Pennsylvania, including both the Allegheny and Monongahela rivers. It is likely that further sampling using benthic trawls will yield more new species records for Pennsylvania and document additional range extensions.

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LITERATURE CITED

- Bean, T. H. 1892. The fishes of Pennsylvania. Rep. State Comm. Fish. Pa., 1889–1891. 149 pp.
- Cooper, E. L. 1983. Fishes of Pennsylvania and the northeastern United States. The Pennsylvania University Press, University Park, PA. 243 pp.
- Haag, W. R. & M. L. Warren Jr. 2006. Seasonal feeding specialization on snails by River Darters (*Percina shumardi*) with a review of snail feeding by other darter species. *Copeia*: 604–612.
- Herzog, D. P., V. A. Barko, J. S. Scheibe, R. A. Hrabik & D. E. Ostendorf. 2005. Efficacy of a benthic trawl for sampling small-bodied fishes in large river systems. *North American Journal of Fisheries Management* 25: 594–603.
- Kuehne, R. A. & R. W. Barbour. 1983. The American darters. The University Press of Kentucky, Lexington, KY. 177 pp.
- Page, L. M. 1983. Handbook of darters. TFH Publications, Neptune City, NJ. 271 pp.
- Pennsylvania Fish and Boat Commission. 2007. Threatened Species Title 58 Pennsylvania Code, Section 75. 2.
- Scott, W. B. & E. J. Crossman. 1973. Freshwater fishes of Canada. Galt House Publications Ltd., Oakville ON, Canada. 966 pp.
- Stauffer Jr, J. R., J. M. Boltz & L. R. White. 1995. The fishes of West Virginia. Academy of Natural Sciences of Philadelphia, Philadelphia, PA. 389 pp.
- Thomas, J. A., E. B. Emery & F. H. McCormick. 2005. Detection of temporal trends in Ohio River fish assemblages based on lockchamber surveys (1957–2001). pp. 431–449. In: J. N. Rinne, R. M. Hughes & R. Calamusso (eds.) American Fisheries Society Symposium 45: Historical changes in large river fish assemblages of the Americas, American Fisheries Society, Bethesda, MD.
- Trautman, M. B. 1981. The fishes of Ohio. Ohio State University Press, Columbus. 782 pp.