

BRIEF NOTE

Recent Collections and Food Items of River Darters, *Percina shumardi* (Percidae), in the Markland Dam Pool of the Ohio River¹

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ABSTRACT. A 1986 electrofishing survey in the Ohio River found 13 river darters (*Percina shumardi*) distributed over 31.8 km of shoreline in Hamilton County, Ohio during late September. Catch per unit effort (CPUE) increased markedly during dusk and night sampling and showed a movement of river darters to shallower shoreline waters after sunset. Results indicate that *P. shumardi* was more abundant during 1986 than previously reported and that dusk and night sampling during late September is a productive time for estimating the relative abundance of this species. Food items examined revealed almost exclusively a diet of midge larvae.

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INTRODUCTION

The river darter, *Percina shumardi* (Girard), is listed as endangered in Ohio (ODNR 1982) and of special concern in West Virginia, Kentucky, Kansas and North Dakota (Johnson 1987). On 24 September 1986, 13 adult river darters were collected by Ohio Environmental Protection Agency (OEPA) personnel from five locations along 31.8 km of Ohio River shoreline in Hamilton County, Ohio (Fig. 1). These collections indicated a greater abundance and broader distribution in the Markland Dam pool than had previously been reported (Burr and Warren 1986, Trautman 1981, Pearson and Kromholz 1984). Since collections of this number of river darters in Ohio are unusual and little is known about this species in the Ohio River, we here report information about this nongame species and describe sampling techniques which may help others assess similar populations.

The river darter is distributed from the Gulf Coast northward up the Mississippi River valley to Manitoba, and easterly to the upper Tennessee and Ohio River systems and western Lake Erie (Gilbert 1980). In moderate to large free-flowing streams, river darters inhabit chutes, raceways, and the deep end of riffles with moderate to fast currents and gravel or rocky substrates (Pflieger 1975, Trautman 1981, Burr and Warren 1986). In lakes, *P. shumardi* occurs along wave-swept shores with sand, gravel, rubble, and bedrock substrates (Becker 1983). In the Mississippi River, this species is frequently associated with flowing waters over gravel and sand bars (Burr and Warren 1986). It appears to be more tolerant to silt than most darters and is common in the upper Mississippi River and larger streams and ditches of the Missouri lowlands (Pflieger 1975, Page 1983).

Due to its small size and inhabitation of deep-water habitats, *P. shumardi* is generally difficult to capture. Collections typically include a single specimen or a few young-of-the-year or yearling fish (Trautman 1981, Becker 1983). Shallow water collections have reportedly included only young fish (Thomas 1970, Becker 1983) and occurred only during turbid conditions (Trautman

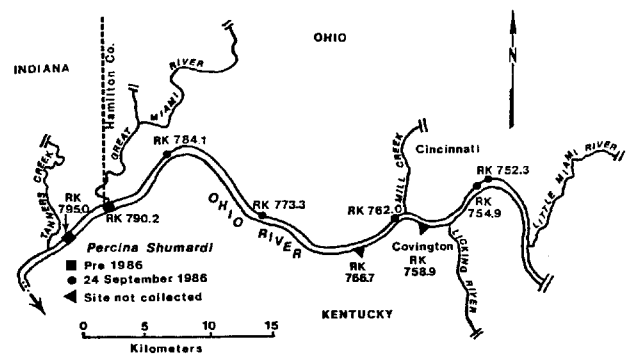


FIGURE 1. Ohio River study area showing seven sampling locations (by river kilometer, RK) and 1986 distribution of river darters (*P. shumardi*) in the Markland Dam pool.

1981). Becker (1983) noted that *P. shumardi* was probably more common in Wisconsin than records indicated due to the lack of adequate sampling equipment. In Canada, this species does not appear to be common anywhere (Scott and Crossman 1973). Burr and Warren (1986) described its distribution in Kentucky rivers as sporadic and uncommon. Trautman (1981) reported that the river darter was not collected within inland Ohio between 1955 and 1980, but suspected that it might still be present. Since 1980, *P. shumardi* has been collected from three inland Ohio locations: the Scioto River near river kilometer (RK) 74.0 (OSUM 49886) (Richards et al. 1985) and RK 90.1 on 17 September 1985 (M. Smith pers. comm.), and the Muskingum River at RK 21.7 on 7 October and 4 November 1987 (D. Rice, G. Phinney, and T. Cavender pers. comm.). Collections at the last two locations were also made during the autumn. Specimens were captured in deep, fast chutes by investigators using boat-mounted electrofishing gear during the day (one individual from RK 90.1) and seines during the night (four individuals in two nights from RK 21.7).

Ohio River records for the river darter are sporadic and few in number but show a broad distribution (Burr and Warren 1986, Trautman 1981). Within the Markland Dam pool, which extends from RK 855.3 to 702.0, this species has been previously reported from only two locations: RK 790.2 between 1920 and 1950, and RK 795.0 between 1977 and 1981 (Fig. 1, Trautman 1981, ESE Inc. 1987, Burr and Warren 1986,

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Pearson and Krumholz 1984). Collections from RK 795.0 were made near the Tanners Creek Power Plant and included four individuals by trawling (WAPORA 1979, 1980) and one by seining (Geo-Marine 1982). Trawling was listed as the method of capture for one (OSUM 42724) of the seven individuals collected during 1977 (WAPORA 1978). In addition to the five new locations established by OEPA personnel between RK 752.3 and 784.1, a single adult specimen (OSUM 68038) was collected near RK 736.6 on 2 February 1987 (D. Stansbery pers. comm.). This record is rather unique and further supports the river darter's inhabitancy of deep water habitats. It was captured in a Unionidae shell collected by a scuba diver at a depth of approximately 12.2 m.

Recent collections verified from other Ohio River dam pools include eight specimens (OSUM 70872) taken from power plant water intakes at RK 900.4 between December, 1985 and December, 1986 (G. Seegert pers. comm.); a single young-of-the-year fish by seining along the Ohio shoreline at RK 584.2 on 24 June 1981 (T. Cavender pers. comm.); a single specimen (WVWR 367) by rotenone in a West Virginia backwater at RK 378.0 (Cincotta et al. 1986); and a specimen at RK 418.4 (Geo-Marine Inc. 1983, W. Pearson and D. Cincotta pers. comm.).

MATERIALS AND METHODS

Seven shoreline sites (1.0-1.3 km in length) were sampled by standardized boat electrofishing methods (OEPA 1987) on 27 July, 2 September, and 24 September 1986. Sampling was conducted during daylight hours except at RK 784.1 on 24 September. Sampling at RK 784.1 on this date started in the last few minutes of dusk and continued into the night (approximately 1955-2045 h). A flashlight was taped to the dipnet handle to provide light. Due to inadequate lighting, the percent of stunned fish netted during the night sample was estimated to be less than that of the day samples.

River stages at Cincinnati were similar on all sample dates and ranged from 7.9 m on 2 September to 8.2 m on 24 September. Daily flows (m^3/s) below the Markland Dam were 1897 on 27 July, 283 on 2 September, and 538 on 24 September. Mean monthly flows (July-September, 1986) downstream from Markland Dam were substantially less than historical means (ESE Inc. 1987). Turbidity was highest on 2 September, and lowest on 24 September, when visibility extended approximately 70 cm below the surface.

RESULTS AND DISCUSSION

River darters were not collected at any location on the first two dates but appeared in five of seven shoreline collections on 24 September (Fig. 1). Total lengths of the 13 darters ranged from 64-72 mm (standard lengths 55-63 mm), suggesting that adult fish were taken (Pflieger 1975, Thomas 1970). Single specimens (OSUM 71739, 71744, 71748, 71753) were collected from the four Hamilton County, Ohio stations sampled during daylight. In these collections, percent composition, relative number per km and catch per unit effort (CPUE) of river darters were consistently low with values of 0.2 to 0.4%, 0.8 to 1.0 per km, and 1.1 to 1.8 per hour. Results from the single night sample (RK 784.1) were markedly different, however. Nine river darters (OSUM 71740) were collected; percent composition, relative number per km, and CPUE increased to 6.2%, 9.0 per km, and 19.3 per hour. These results suggested that adult river darters remain mostly in the deeper main channel of the Markland Dam pool throughout the summer and move into the shallower,

rocky shoreline during the autumn, with the greatest movement after sunset.

All specimens appeared in good health and enlarged guts suggested recent feeding. Examination of food items from the stomachs and intestines of four darters (all different locations) revealed a mean number of 98 organisms (range = 48-144). Taxa consumed were similar and composed of almost exclusively (94-97%) midge (Chironomidae) larvae. Two pollution-tolerant species, *Cricotopus (C.) bicinctus* and *Polypedilum (P.) illinoense*, numerically dominated the ingested midges. Organisms ingested in addition to midge larvae consisted of 12 midge pupae, a single caddisfly larvae (*Cyrmellus fraternus*), a mayfly nymph (*Stenacron* sp.), a scud (Gammaridae), and three small bivalves (Pelecypoda). Food studies of other river darter populations have indicated that the diet of this species consists primarily of midge and caddisfly (Hydropsychidae) larvae (Thomas 1970) or, in another case, gastropods (Thompson 1974).

The shoreline habitat from which these darters were collected is most similar to the wave-swept shores in lakes reported by Becker (1983). Estimated mean water depths (OEPA 1987) ranged from 80 cm at RK 762.0 to 150 cm at RK 752.3. Substrates were predominantly composed of gravel and boulder size rocks. Fish species collected along the shoreline in association with *P. shumardi* included sauger (*Stizostedion canadense*), freshwater drum (*Aplodinotus grunniens*), channel catfish (*Ictalurus punctatus*), emerald shiner (*Notropis atherinoides*), gizzard shad (*Dorosoma cepedianum*), logperch (*P. caprodes*), and rainbow darter (*Etheostoma caeruleum*).

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Note added in proof:

Additionally, on 12 September 1988, 28 river darters were collected by OEPA personnel electrofishing along the Kentucky Shoreline at RK 571.9.

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