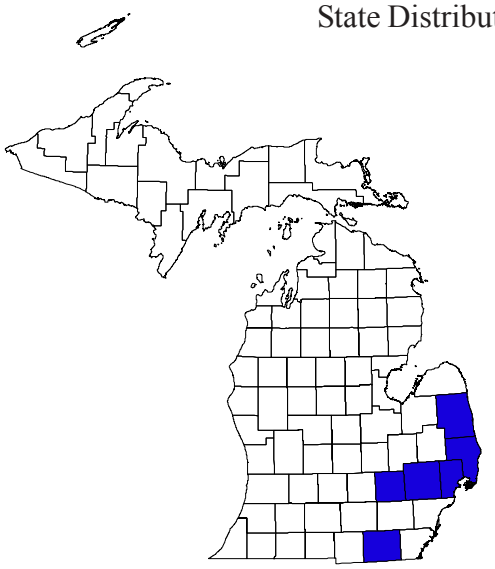
Ammocrypta pellucida Putnam — Eastern Sand Darter

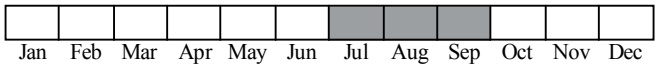
Courtsey of Rob Criswell

Courtsey of Ohio Division of Natural Areas and Preserves

State Distribution



Best Survey Period



Status: State threatened

Global and state rank: G3/S1S2

Family: Percidae (perch and darters)

Total range: Eastern sand darters are found in the St. Lawrence River drainage, the Lake Champlain drainage in Vermont, south to West Virginia and Kentucky, west through south western Ontario and southeast Michigan (Scott and Crossman 1973, Page and Burr 1991).

State distribution: Historically, the eastern sand darter was restricted to the southeastern portion of Michigan and was found in the Huron River drainage, the Detriot, St. Joseph, Raisin, and Rouge rivers, and Lake St. Clair and St. Clair County (Evers 1994). However within the last 20 years, the eastern sand darter has only been found in the Lake St. Clair drainage, specifically Lake St. Clair, the Bell, Pine, and Black rivers, and in the Huron River Drainage.

Recognition: The eastern sand darter is a long, slender, pale darter averaging 64 mm in length (Scott and Crossman 1973). Large areas on their bodies are scaleless (Smith 1985) but 2-4 rows of scales are found along the midline (Trautman 1981). Their caudal peduncle is completely scaled (Smith 1985). The lateral line is complete and has 65-78 scales (Trautman 1985, Smith 1985, Scott and Crossman 1973). This darter has 10-19 spots along their sides and 12-16 small spots along their dorsal midline (Trautman 1985, Scott and Crossman 1973). There is no spine on their opercule. They have one weak anal spine, and 8-10 soft anal rays (Trautman 1985, Scott and Crossman 1973). The first dorsal fin has 8-11 weak spines and the second fin has 8-12 soft rays (Smith 1985, Trautman 1981, Scott and Crossman 1973).

Best survey time/phenology: Like many fish, the best sampling time is likely in late summer during low flows in streams and rivers. Sampling in lakes may be more flexible.

Habitat: The eastern sand darter is found in streams and rivers with sandy substrates and lakes with sandy shoals (Scott and Crossman 1973). They are often found in slow moving waters where fine sand is deposited, often immediately downstream of a bend (Danials 1993).

Biology: The eastern sand darter spawns from April through June when water temperatures are around 20-23°C (Johnston 1989) and spawning occurs throughout the day (Johnston 1989). Eggs are deposited singly and buried in the sand substrate (Johnston 1989). Eastern

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sand darters mature at age 1 and probably only live for 2+ years.

Eastern sand darters feed mainly on chironomid (midge) larvae (Holm and Mandrak 1996, Smith 1979, Smith 1985, Scott and Crossman 1973). They also eat oligochaetes (worms) and cladocerans (zooplankton), but to a lesser extent (Holm and Mandrak 1996).

The eastern sand darter spends much of its time buried in the sand (as shown in the small picture on page 1). Authors originally speculated that this behavior allowed them to capture prey more effectively (Trautman 1981, Smith 1985). However, Daniels (1989) specifically examined this behavior and concluded that the eastern sand darter buries itself in sand to more effectively conserve energy and maintain its position on the river (or lake) bottom in these unstable/shifting habitats.

Eastern sand darter populations have been shown to fluctuate widely from year to year. Facey (1998) found 32 fish per 100 m^2 in his first study year, in year 2 the numbers collected dropped to 8.5, they dropped again to 1.5 in year 3, increased slightly to 3.2 in year 4, and rebounded to 22.2 in year 5. This fluctuation may be due to reproductive success, instability of habitat conditions, and/or yearly changes in sand bar locations (Facey 1998). Because this species habitat is so unstable and easily changes from year to year, sampling efforts must recognize that specific habitats and locations may vary in quantity and quality from year to year. Sampling efforts must take a much wider approach to adequately determine the presence of this species within a river or lake system.

Movements: Most small bodied fish are suggested to have limited movements, generally less than 500m (Goforth and Foltz 1998, Mundalh and Ingersoll 1989, Smithson and Johnson 1999). However, the eastern sand darter is reliant on unstable, shifting sand bar habitats which can dramatically change in location, quantity, and quality from year to year dependent upon river flows. Hence it is likely that the eastern sand darter is capable of large scale movements to take advantage of these shifting habitats. Since no movement studies have been conducted on this species, it is difficult to suggest their movement capabilities.

Conservation and management: The eastern sand darter requires clean sand substrates, hence siltation has been a major factor in their decline. Siltation decreases the quality of habitat for both egg development and adults by decreasing oxygen levels within the sand itself. Silted habitats may cause adult darters to not fully burrow or decrease their time burrowed causing them to waste energy reserves (Holm and Mandrak 1996). As mentioned earlier, this species relies on shifting sand bars which naturally change from year to year. Because this habitat is so variable and reliant upon natural sediment transfers within systems, modifications to riparian areas, channel or flow alterations, nutrient enrichment, or other habitat modifications (Simon 1993) can completely change the amount, quality, and locations of these shifting sand bars to the detriment to the eastern sand darter.

Research needs: Facey (1998) suggests four areas of research important to the conservation of eastern sand darters: 1) investigation of microhabitat choice, 2) reasons behind the year-to-year variability in abundance at many sites, 3) information on reproduction and recruitment, and 4) population genetics. Research on movements / dispersal of this species is critical. Movement information may provide insight into the year to year variability seen at many sites and may also provide insight into the potential for recovery of the species, especially into habitats that have been restored.

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Abstract citation:

Derosier, A.L. 2004. Special Animal Abstract for *Ammocrypta pellucida* (eastern sand darter). Michigan Natural Features Inventory. Lansing, MI. 3 pp.

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Funding provided by the National Oceanic and Atmospheric Administration (NOAA) Coastal Services Center via the Great Lakes Commission.

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