

OBSERVATIONS ON SPAWNING BY CAPTIVE SAND SHINERS (*NOTROPIS STRAMINEUS*) FROM MINNESOTA



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INTRODUCTION

Little information is available on the spawning behavior of the Sand Shiner (*Notropis stramineus*) (Becker, 1983). For example, it was not included in Johnston and Page's (1992) listing of 95 North American minnow species for which reproductive strategies had been reported. More recently, Platania and Altenbach (1998) stated that Sand Shiners were broadcast spawners that laid demersal, adhesive eggs. They observed a captive female being chased by a male, but did not observe the actual spawning event. The purpose of this note is to report additional observations of spawning by captive Sand Shiners.

METHODS

The observations reported herein did not result from a planned, controlled study. The Sand Shiners were originally captured in the Root River, Fillmore County, Minnesota in 2011. They were held in an aquarium by the original collectors until May 2012, when they were transferred to my possession. I put three Sand Shiners in a hexagonal glass aquarium (side panels: 59 cm tall × 29 cm wide; horizontal distance between panels: 50 cm) with a juvenile Common Shiner (*Luxilus cornutus*) from the Root River, five Southern Redbelly Dace (*Chrosomus erythrogaster*) from the Upper Iowa River in Mower County, Minnesota, two small bichirs (*Polypterus* sp.), two green *Corydoras* sp., and a Sailfin Pleco (*Pterygoplichthys gibbiceps*). The tank was provided with a gravel bottom, partly covered by a dolostone slab, a piece of driftwood, and sparse java moss (*Taxiphyllum barbieri*). Only a single strand of

Elodea extended farther than 24 cm above the gravel surface. The tank was equipped with an undergravel filter with two lift tubes, an internal power filter, and an overhead light that was left on 24 hours per day. The fish were fed commercial flake food and frozen bloodworms (*Chironomus* sp.) daily, but the Sand Shiners were not observed to feed on the latter. Water temperature varied with in the temperature of the room where the tank was kept and was 20°C on the date that spawning was observed.

RESULTS

On the evening of 14 November 2012, I noticed that the Sand Shiners seemed more silvery than usual,



Sand Shiners (*Notropis stramineus*), Kankakee River, IL. (Photos by Uland Thomas)

reflecting light like flashes from a mirror, and that they were very active, “chasing” back and forth in the upper half of the water column. I realized then that they might be displaying reproductive behavior. It appeared as if one fish was chasing another, but when the trailing fish suddenly reversed, the other did too. I could not discern breeding tubercles or distinguish between sexes. However, within approximately five minutes I witnessed three spawning events, two involving all three Sand Shiners and one involving two. In each case the fish suddenly turned up in a vertical direction in the central portion of the tank as the eggs were released. As the eggs fell through the water, they were rapidly consumed by the other minnows in the tank.

DISCUSSION

Compared to many species, the Sand Shiner has an extended spawning season. Becker (1983) reported that it spawns in Wisconsin from late May until mid-August. It seems possible that reproduction by a species with an extended spawning season would be less tied to specific temperatures, daylengths, or other environmental cues, and hence, more likely to occur in captivity at an atypical time of year.

The observations reported here lend support to those of Platania and Altenbach (1998). It seems safe to conclude that the Sand Shiner is indeed a broadcast spawner with demersal eggs. However, both cases involved captive specimens observed in small numbers (3–4). It would be desirable to observe how larger

spawning groups behave in unconfined situations with a choice of substrates.

Acknowledgments

I thank my students Clinton Nienhaus, Collin Nienhaus, and Tom Walker, who originally collected the Sand Shiners observed spawning during this study and cared for them during their first months in captivity.

Literature Cited

Becker, G.C. 1983. *Fishes of Wisconsin*. University of Wisconsin Press, Madison, Wisconsin.

Johnston, C.E. and L.M. Page. 1992. The evolution of complex reproductive strategies in North American minnows (Cyprinidae). Pp. 600–621 *in*: R.L. Mayden (editor). *Systematics, historical ecology, and North American freshwater fishes*. Stanford University Press, Stanford, California.

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Sand Shiner, Macon County, IL. (Photo by Lance Merry)

2014 Convention (Continued from page 1)

plus registration. Registration is \$75 for members, \$105 for non-members (including a 1-year membership), \$35 for students, and \$15 for non-collecting spouses coming to the banquet. Registration includes a cook-out on Friday.

So the Forest Service knows how much food to buy, **FINAL PAYMENTS MUST BE RECEIVED BY MAY 9TH**. Latecomers may be able to stay at the facility, but keep in mind that numbers are limited and they **DO NOT** take credit cards. To register and pay online, go to <http://www.nanfa.org/convention/2014.shtml> and scroll down to the registration and payment link (just above the Rosyside Dace). If you don't want to use Paypal, send a check, payable to NANFA, along with the information requested on the registration form (<http://>

www.nanfa.org/cgi-bin/2014convention.pl), to Tom Watson at the address below the NANFA logo on the back cover of this issue.

There are a number of campgrounds in the area, including one operated by the National Park Service at Linville Falls, only 6 miles away. There are two motels in Linville Falls and one in Pineola, both about five miles away. Nearby Linville Falls, Crossnore, and Newland have several good restaurants. The nearest airport is in Asheville, some 70 miles (90 minutes) away.

Though there will not be any formal presentations, bring videos, underwater photos, or powerpoint presentations for informal get-togethers in the evenings.

