

## THE SAFFRON SHINER (*NOTROPIS RUBRICROCEUS*) AS A NEST ASSOCIATE OF THE CREEK CHUB (*SEMOTILUS ATROMACULATUS*)

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**ABSTRACT**—The saffron shiner (*Notropis rubricroceus*) has been most commonly described as a nest associate of chubs in the genus *Nocomis*. A spawning group of saffron shiners was observed over a creek chub (*Semotilus atromaculatus*) nest in the North Prong of Walden Creek in Sevier County, Tennessee. It is likely that saffron shiners form nest associations with *Nocomis* spp. more frequently than with creek chubs because of greater overlap in their nesting seasons.

The saffron shiner (*Notropis rubricroceus*) is common in cool, rocky creeks in the upper Tennessee, Santee, and Savannah river drainages in Tennessee, Virginia, and North Carolina, and it has been introduced into the New River drainage in the latter two states (Etnier and Starnes, 1993; Jenkins and Burkhead, 1994). *Notropis rubricroceus* was reported by Outten (1958) to form spawning groups over the nests of river chubs (*Nocomis micropogon*) in North Carolina. Based on that account, Johnston (1991), in her review of nest associations involving cryprinids, listed *Nocomis* as the only host taxon for the saffron shiner. However, Woolcott and Maurakis (1988) had earlier reported *Notropis rubricroceus* over a nest of the Dixie chub (*Semotilus thoreauianus*). More recently, Jenkins and Burkhead (1994) observed spawning groups on five occasions over the nests of *Nocomis micropogon* or *N. leptocephalus* (bluehead chub) and on one occasion over pits being dug by central stonerollers (*Campostoma anomalum*) and striped shiners (*Luxilus chrysocephalus*). Jenkins and Burkhead (1994) also collected on two occasions individuals of both sexes in reproductive condition over gravel bottoms in runs where chub nests were absent, and they suggested the possibility that spawning may occur in the absence of nesting hosts.

The purpose of this note is to report the occurrence of a spawning group of saffron shiners over the nest of a creek chub (*Semotilus atromaculatus*).

### MATERIALS AND METHODS

Our observations were made on 19 May 2000 while backpack electrofishing (pulsed DC) for striped shiners (*Luxilus chrysocephalus*). We sampled approximately 60 m along the North Prong of Walden Creek (Little River drainage), along Walden Creek Road in Sevier County, Tennessee (35°44'49.3"N, 83°42'39.6"W). At this point the stream was approximately 3 m wide, mostly less than 0.2 m deep, and of high gradient with sequences of pools, runs, and riffles. The bottom was primarily sand and cobble with some gravel, boulders, and bedrock. The banks and catchment were primarily forested. Water temperature was 20°C at 19:00 EDT.

### RESULTS

We observed several creek chubs while electrofishing, including a large male over one of three pit-ridge nests. We also observed a school of saffron shiners, including brightly colored males, over one of the creek chub nests. Other fish species collected included central stonerollers (*Campostoma anomalum*), striped shiners (*Luxilus chrysocephalus*), a warpaint shiner (*L. coccogenis*), blacknose dace (*Rhinichthys atratulus*), a northern hogsucker (*Hypentelium nigricans*), banded sculpins (*Cottus caroliniae*), snubnose darters (*Etheostoma simoterum*), and a speckled darter (*E. stigmaeum jessiae*).

### DISCUSSION

Our observation of a spawning group of saffron shiners is consistent with previous accounts with respect to date (19 May) and water temperature (20°C). Outten (1958) observed spawning in North Carolina during the period 12 May–21 July at water temperatures of 16.1–30°C, whereas Jenkins and Burkhead (1994) observed spawning groups in Virginia during the period 20 May–30 June at 15–21.1°C.

Based on our observations and those of Woolcott and Maurakis (1988), the saffron shiner can be added to the list of cypripinids known to enter into nest associations with both *Nocomis* and *Semotilus* (Johnston, 1991). A review of spawning phenology (Jenkins and Burkhead, 1994) indicates greater overlap between the reported spawning seasons for saffron shiners and the relevant *Nocomis* species (*N. leptocephalus* and *N. micropogon*) than between saffron shiners and creek chubs, and it seems likely that nest associations between saffron shiners and *Nocomis* are more frequent. The ability of saffron shiners to spread beyond their native range (Jenkins and Burkhead, 1994) may be enhanced by flexibility with respect to spawning requirements.

### ACKNOWLEDGMENTS

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