

Public Abstract

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Graduation Term:FS 2008

Department:Fisheries & Wildlife

Degree:MS

Title:EFFECTS OF TEMPERATURE, PHOTOPERIOD, AND SUBSTRATE ON THE MATURATION AND REPRODUCTIVE BEHAVIOR OF THE TOPEKA SHINER (NOTROPIS TOPEKA)

The Topeka shiner (*Notropis topeka*) is a federally-listed endangered cyprinid species native to small headwater prairie streams in the mid-west of the United States. It generally spawns over and around sunfish (*Lepomis* sp.) nests. The objectives of the present studies were to assess the effects that temperature, photoperiod, and substrate size have on the Topeka shiner's maturation and reproductive behavior.

A laboratory experiment demonstrated that maintenance under a longer photoperiod yielded greater male GSIs and female final weights and GSIs than the shorter photoperiod. The effects of temperature on weight and GSI varied, but the results generally indicated that 31 °C exceeded the optimum. Ovarian histology indicated that spawning had likely occurred in all treatments by the end of the experiment. The frequency of occurrence of reproductive behaviors did not differ between the temperature/photoperiod treatments, but was greater in the morning and decreased through the day. The details of these findings can be applied to propagation efforts and to studies of the species in its natural environment.

Substrate utilization by Topeka shiners in the absence of sunfish was tested to determine the shiner's fundamental preference. Fine substrates were chosen over Small Gravel, Large Gravel, Small Cobble, and the Bare Floor of the experimental tank. This preference may influence which sunfish nests are utilized, given that nest substrate characteristics differ both between sunfish species and within species across spawning site locations.