ANNUAL PATTERNS OF LENGTH-FREQUENCY DISTRIBUTIONS OF THE YAZOO SHINER *NOTROPIS RAFINESQUEI* IN THREE STREAMS IN NORTHERN MISSISSIPPI

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ABSTRACT

We studied demographics of the Yazoo shiner *Notropis rafinesquei*, a species endemic to the upper Yazoo River system, in three northern Mississippi streams. We sampled each population approximately monthly from March 1993 to October 1994. Preliminary analysis of length-frequency distributions suggests several life history features. Spawning, as evidenced by appearance of young-of-year in samples, occurred twice each year (late spring-summer and fall) in all streams. Recruits from spring spawning reached 10-20 mm standard length by July-August, and by October, are large enough to potentially participate in fall spawning. Length-frequency distributions were similar at all sites in both years. However, animals appeared to live 2-3 years in Buckhorn and Cypress creeks, but only 1.5-2 years in Hotopha Creek. Maximum adult size was lower in Hotopha Creek. Our results show that the Yazoo shiner shares life history traits with related species, particularly the orangefin shiner (*Notropis ammophilus*). Further analysis of life history strategies of the Yazoo shiner and comparisons among close relatives will allow discriminations of ancestral characteristics from species-specific adaptations.

INTRODUCTION

The Yazoo shiner (*Notropis rafinesquei*) was described in 1991 (Suttkus 1991), and is endemic to the upper Yazoo River system of northern Mississippi. It belongs to a species group which includes *N. ammophilus*, *N. longirostris*, and *N. sabinae* (Raley and Wood 2001). Similar to the other species in this group, the Yazoo shiner is a benthic, schooling species found in small and medium sized streams. We examined length-frequency histograms to gain insight into the life-history patterns of *N. rafinesquei*.

METHODS AND MATERIALS

- We sampled *N. rafinesquei* populations in three streams in northern Mississippi from March 1993 to October 1994.
- We collected fish approximately once a month using timed electrofishing and preserved all specimens in 5% buffered formalin.
- We measured standard lengths to the nearest 0.1mm using dial calipers.
- We classified all specimens into 1-mm length classes and constructed length frequency histograms for each stream and sample date.

Figure . Monthly length frequency histograms for *Notropis rafinesquei* in three northern Mississippi streams. Arrows indicate appearance of a probable second cohort in the fall.

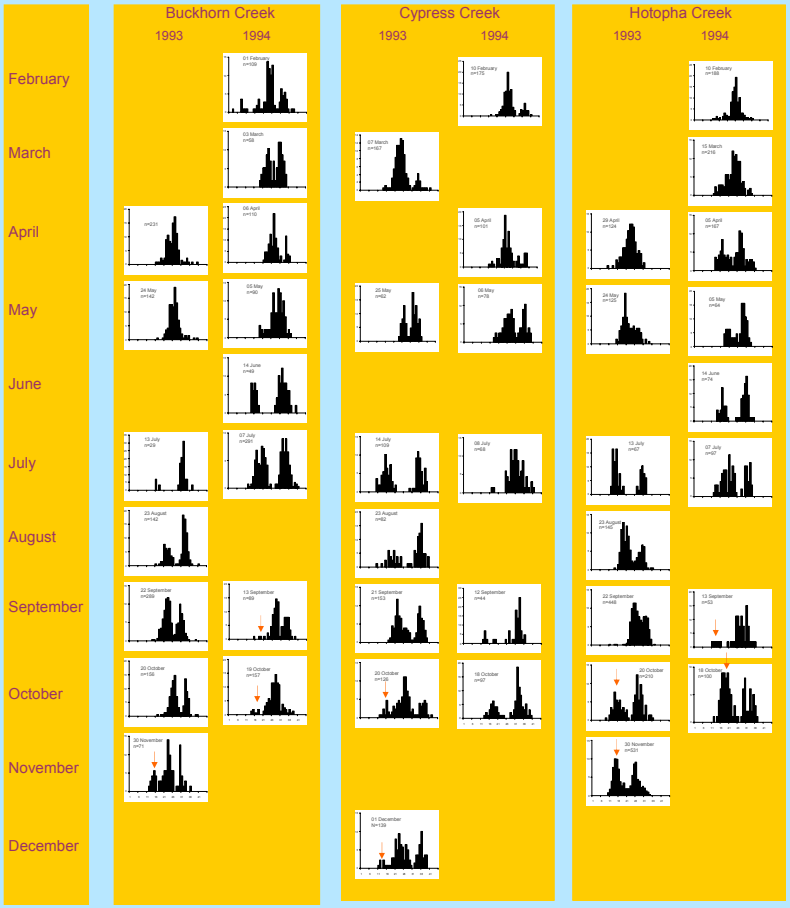
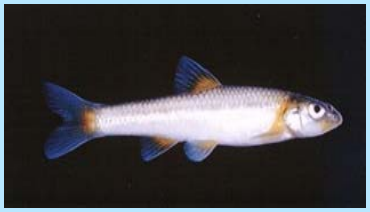


Table 1. Mean standard lengths of largest individuals and maximum lengths for three populations of *Notropis rafinesquei* in northern Mississippi.

Stream	Mean SL ± SE (mm) > 95th percentile	Maximum SL (mm)
Buckhorn Creek	36.0 ± 0.2	41
Cypress Creek	39.0 ± 0.1	41
Hotopha Creek	34.0 ± 0.1	37



RESULTS AND CONCLUSIONS

- Examination of length frequency histograms for 6023 individuals (Buckhorn=2013, Cypress = 1401, Hotopha=2609) revealed several interesting life-history aspects for *Notropis rafinesquei.*
- Young of year appeared in the spring and in the fall, suggesting spawning occurs twice per year.
- Both spring and fall cohorts appeared at about the same times in all streams in both years.
- Following of peaks in length frequency histograms suggests animals live 2-3 years in Cypress and Buckhorn creeks, but only 1.5-2 years in Hotopha Creek.
- Maximum size was lower in Hotopha Creek than in Buckhorn and Cypress creeks, but mean size of largest individuals differed among all three streams and was highest in Cypress Creek.
- Life history characteristics of the Yazoo shiner are similar to other close relatives, Particularly, the orangefin shiner (*N. ammophilus*).

FURTHER STUDIES

To more precisely determine these life history characteristic, we are currently examining:

- Size at maturity
- Timing of gonadal development and reproductive periodicity
- Ova size and number
- Strength of recruitment events and patterns of absolute abundance over time

LITERATURE CITED

Raley, M.E. and R.M. Wood. 2001. Molecular systematics of members of the *Notropis dorsalis* species group (Actinoperygii; Cyprididae). Copeia. 3: 638-645.
Suttkus, R.D. 1991. *Notropis rafinesquei*, a new cyprinid fish from the Yazoo river system in Mississippi. Bull. Alabama Mus. Nat. Hist. 10: 1-9.

ACKNOWLEDGMENTS

We would like to thank Gordon McWhirter, Clifford Harwell, Susie Adams, Doug Shields, Cathy Jenkins, Frances McEwen, Mahala Shillingsford, and Amber McConnell for their various contributions to this study.
This study was supported by the USDA Forest Service, Southern Research Station, Center for Bottomland Hardwoods Research.