

Age and Growth of the Highland Shiner (*Notropis micropteryx*) in Rockcastle County, Kentucky

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Figure 1. *Notropis micropteryx* 50 mm breeding male, collected 1 June 2022

Introduction

Notropis micropteryx (Figure 1), the Highland Shiner, is common in small to large streams of the Cumberland, Tennessee, and upper Green River drainages. It usually inhabits rocky riffles (Eisenhour and Eisenhour 2004). While their population size was assessed as stable by the IUCN in 2012, little is known about the age and growth of this minnow species. Despite being a small fish, attention must be given to the health of its population as it serves an ecological niche and impact on the surrounding ecosystem.

The goal of this study is to identify the age and growth of *N. micropteryx* to provide a more thorough understanding of their life history to aid in future conservation efforts to preserve the health of this species.

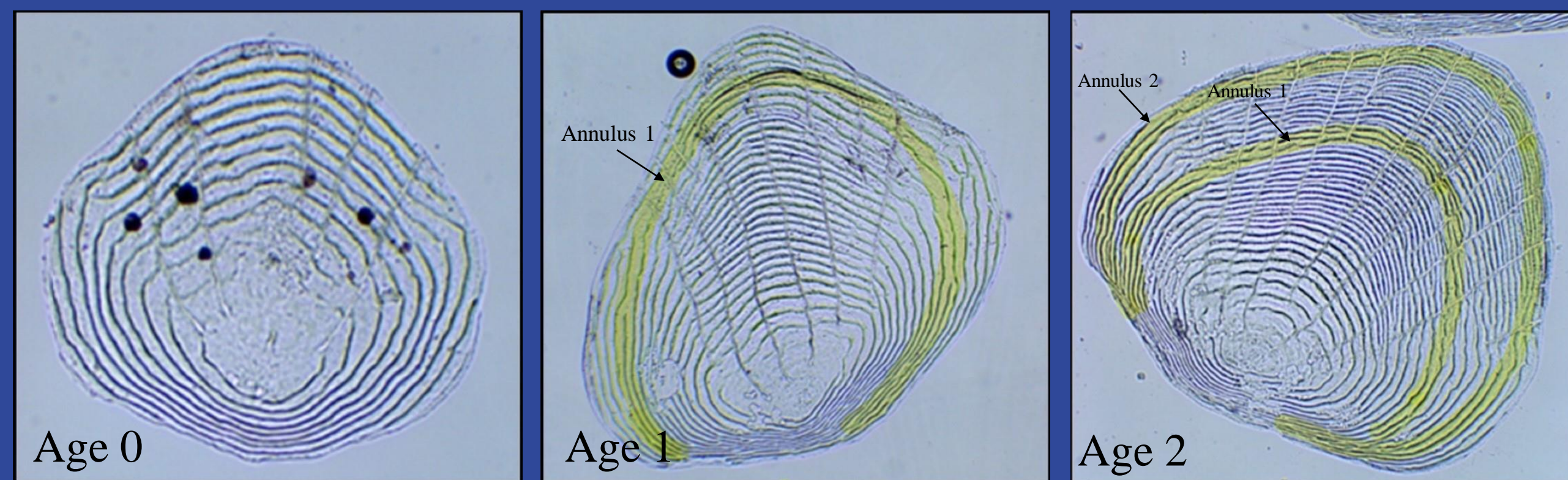


Figure 2. Scale annuli used for the aging of fishes, pictured are scales of *N. micropteryx* collected 13 July 2022 in the Rockcastle River.

Methods

- Study location – Two sites in Rockcastle River in Rockcastle County, KY (Figure 3).
- Using a seine, monthly samples occurred from the beginning of June to the middle of October, for a total of 5 monthly samples.
- The standard length of captured and released fish were measured for length frequency analysis.
- About 100 specimens in total were preserved for aging using scale annuli (Figure 2). An annulus is deposited in the winter/early spring, thus for this study: Age 0 fish have no annuli, and are 0-4 months old. Age 1 fish have one annulus, and are 12-16 months old. Age 2 fish have two annulus, and are 24-28 months old.
- Sex was determined through examination of gonads and the presence of tubercles on the body.

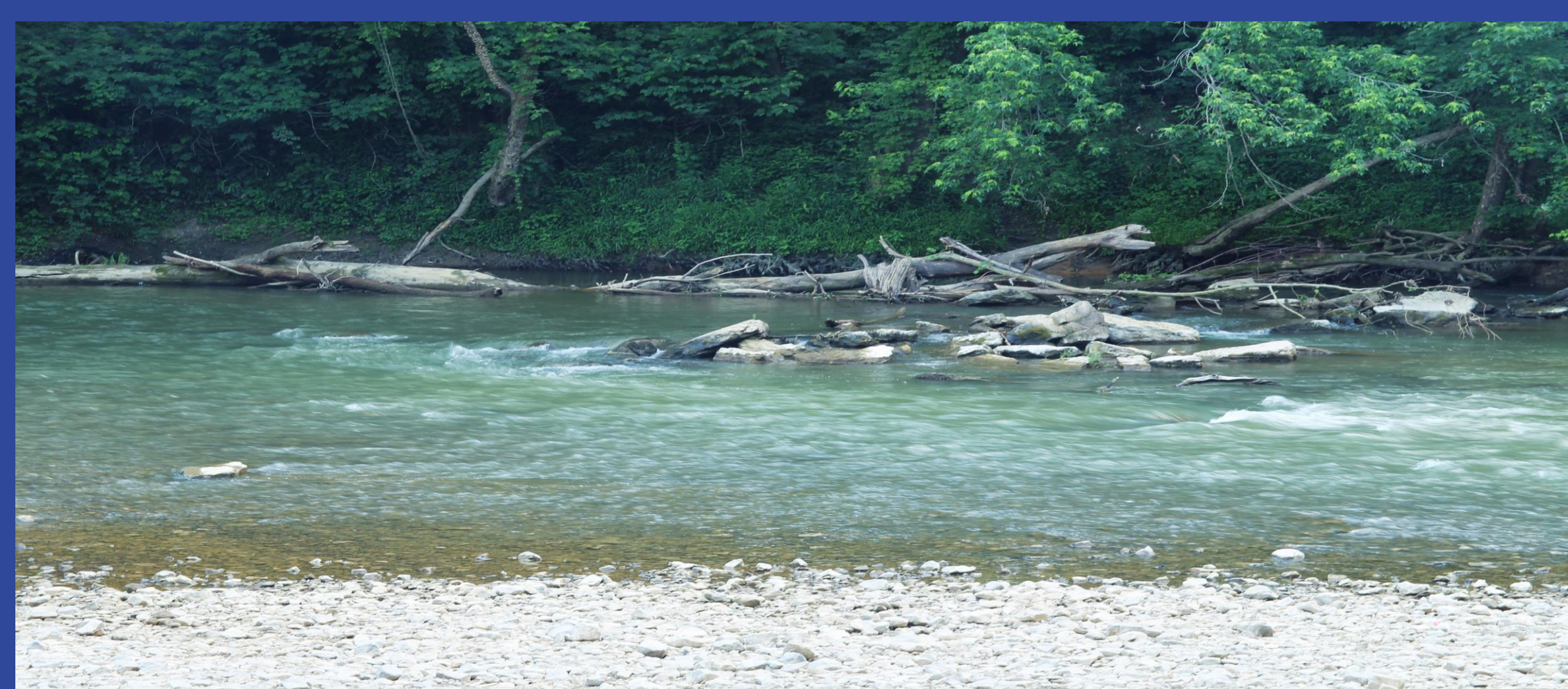


Figure 3. Primary collection site for *N. micropteryx* in the Rockcastle River

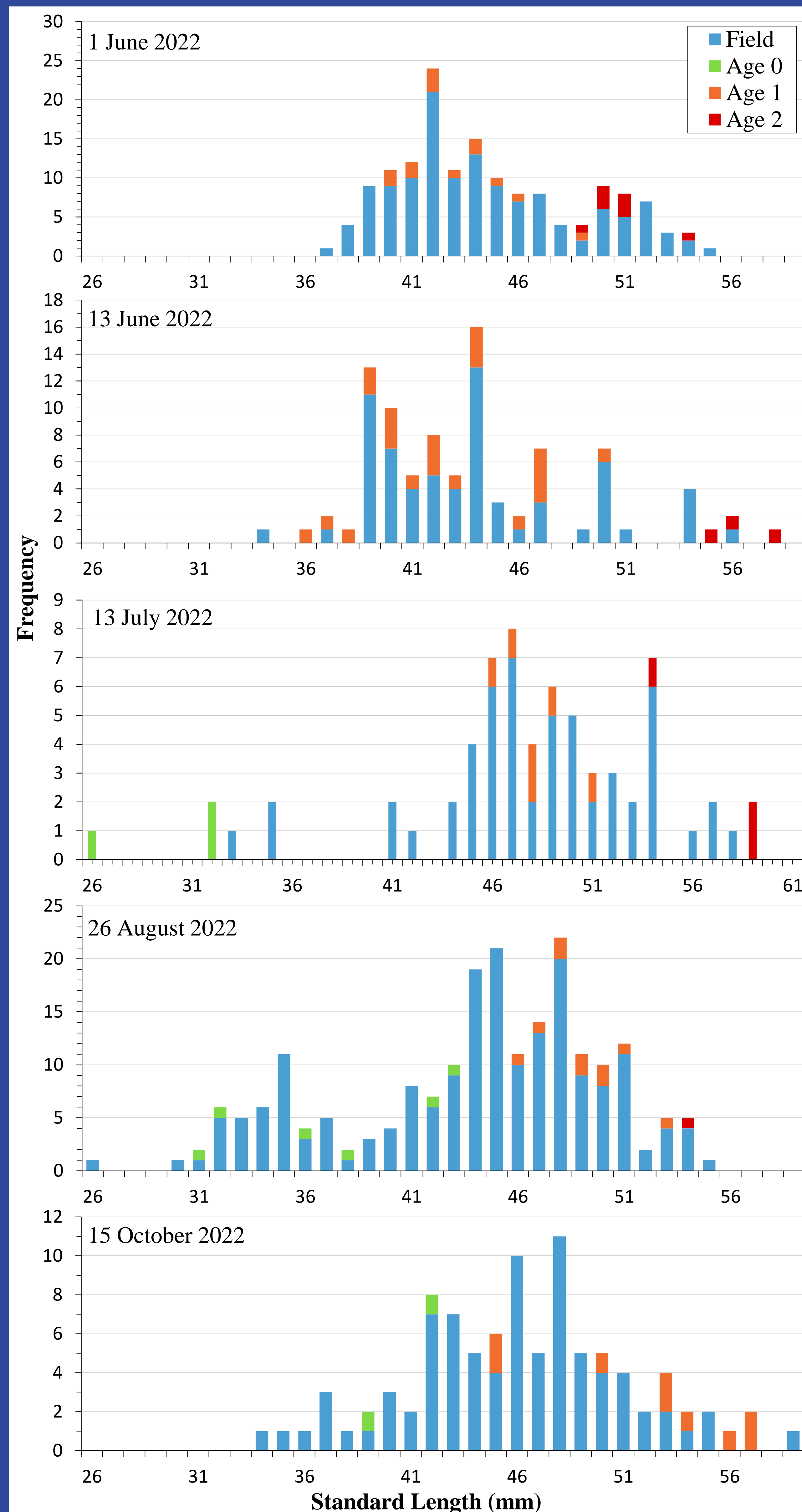


Figure 4. Length frequency data of *N. micropteryx* from June through October.

Future Research

This is a preliminary analysis of results as we work towards a more holistic life history study for *N. micropteryx*. We are beginning a gonad analysis to determine the reproductive cycle of this species, including its spawning period. Our gonad analysis will be followed by a stomach content analysis to determine diet.

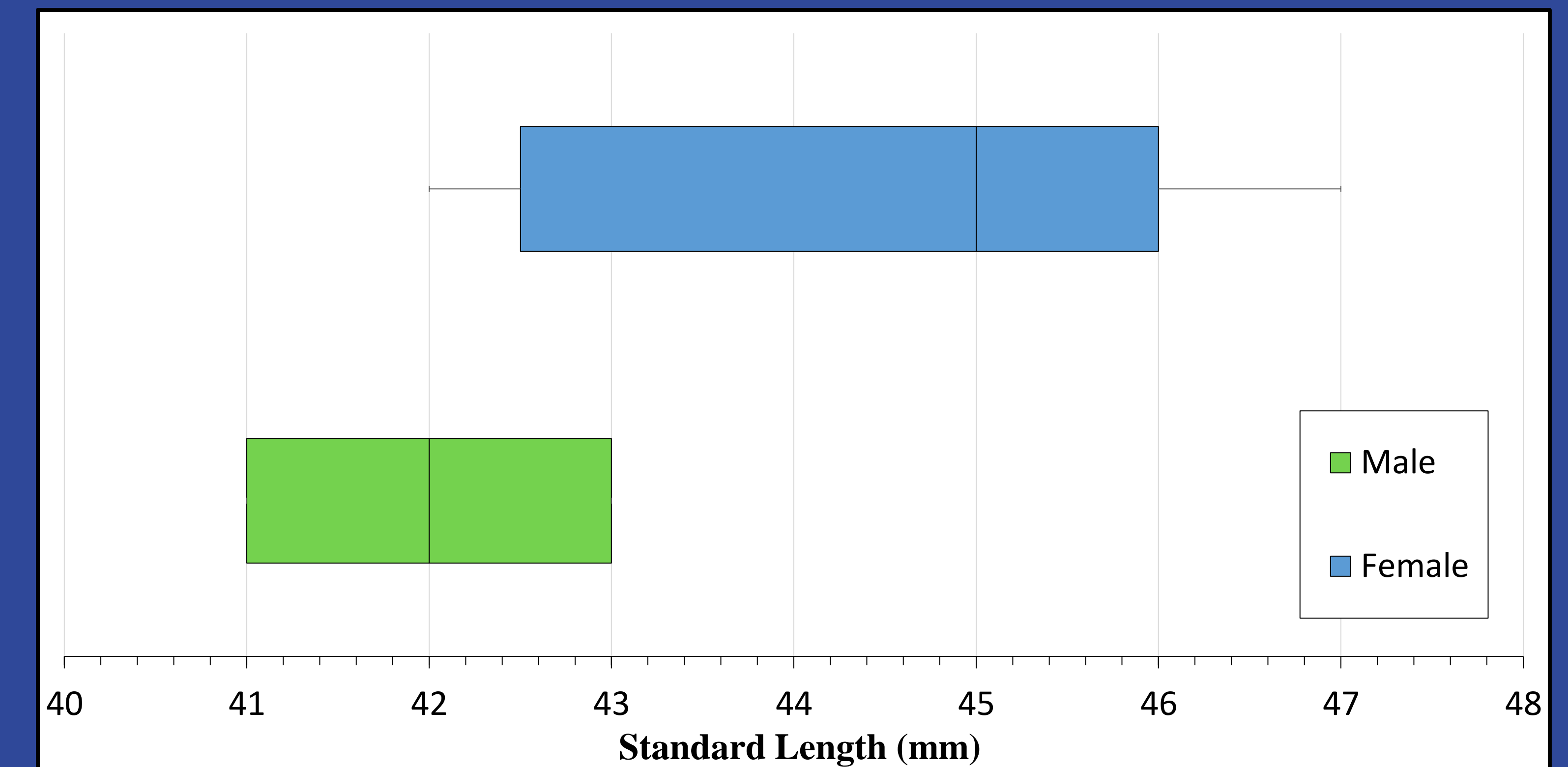


Figure 5. Average Lengths of aged 1 and 2 *N. Micropteryx* from June 2022. T test results concluded difference in length between sexes were insignificant.

Results

Length frequency analysis in conjunction with aging via scale annuli suggested that *N. micropteryx* typically live at least 24 months. Average standard lengths for fishes aged 12 and 24 months were 45 and 56 mm respectively. These data suggests *N. micropteryx* experience the most growth during their first year of life. The smallest individual was 26 mm, collected 13 July 2022 and assumed to be age 0. The largest individual was 61 mm, collected 15 October 2022. Age 1 (12 months) and age 2 (24 months) fishes were predominantly collected in the months of June and July. However, fishes collected in the months of August and October consisted mostly of age 1 and age 0 (3 – 5 months) individuals with few age 2 individuals. For the month of June 2022, age 1 males averaged 42 mm SL and age 1 females averaged 44.4 mm SL (Figure 5).

Species Comparison

- *N. micropteryx* shares a similar age and growth distribution with minnows in the genus *Notropis*, such as *Notropis rubellus*, but does not grow or live as long as non-*Notropis* minnow species such as *Camptostoma anomalum* (Central Stoneroller).
- An unpublished study from our lab, found that a similar minnow species, *N. ariommus*, typically lived to be age 2, with average SL's of 52 mm by age 1 (Black, Vice, et al. 2023). *N. micropteryx* also lives to be age 2 with an average SL of 45 mm by age 1.
- *C. anomalum* grows to be 4 years old and reaches an average SL of 75 mm by age 1 (Bisping, Fischer, et al. 2010).

Summary

- Typically live about 2 years
- The fishes reached an average standard length (SL) of 45 mm at 12 months and 56 mm at 24 months.
- Age 0 fish, as small as 25 mm SL, first appeared in July collections
- Sexual dimorphism data is currently inconclusive

Acknowledgements

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Work Cited

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