Estimation of Sportfish Populations in an Unmanaged Farm Pond in Arkansas.

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Background

- Population estimation has been a valuable tool for fishery managers regarding the management of sportfish populations (Pope et al. 2010).
- This tool can be used to establish baselines for sportfish species so that proper management objectives can be applied to a fishery (Pope et al. 2010).
- Population estimation techniques to estimate the sportfish populations of an unmanaged farm pond (Bullfrog Pond; 2.5 hectares) surrounded by agriculture fields and deciduous forest and at the edge of the Arkansas Tech University (ATU) campus.

Objectives of Study

- *Objective 1:* To estimate Largemouth Bass population size in Bullfrog Pond.
- *Objective 2:* To determine if any environmental variables impacted catch rates.

Figure 1: Map of the Bullfrog Pond on the Arkansas Tech Campus.

Methods

- Hook-and-line sampling was used to collect data on sportfish species in the ATU farm pond (Bullfrog Pond; Fig. 1; Bonar et al. 2009). Various lures were used to increase chances of catching a fish. Hook-and-line sampling took place weekly (October-November).
- At least two anglers participated in hook-and-line sampling during each sampling event.
- Every individual fish caught (>100 mm in length) was tagged with a numbered T-bar anchor tag.
- Tagged fish were allowed a 10-min. recovery period after tagging, then placed back into the pond.
- Catch-per-unit-effort (CPUE; fish/hr) was estimated for each sampling event. Water temperature (˚C) and current weather conditions were estimated during each sampling event as well.
- Largemouth Bass (*Micropterus* nigricans) population numbers were estimated with the modified Lincoln-Peterson Index (Chapman 1951;Southwood and Henderson 2000).

Results

- A total of 32 Largemouth Bass fish were captured during sampling. Of the 32 caught fish, only 1 was a recap.
- CPUE varied during this project, with the median (range) CPUE across all sampling events being 0.44 (0.12-1.33; Fig. 2).
- The population estimate (confidence intervals) for Largemouth Bass was 41.8 (17.8-66.8).

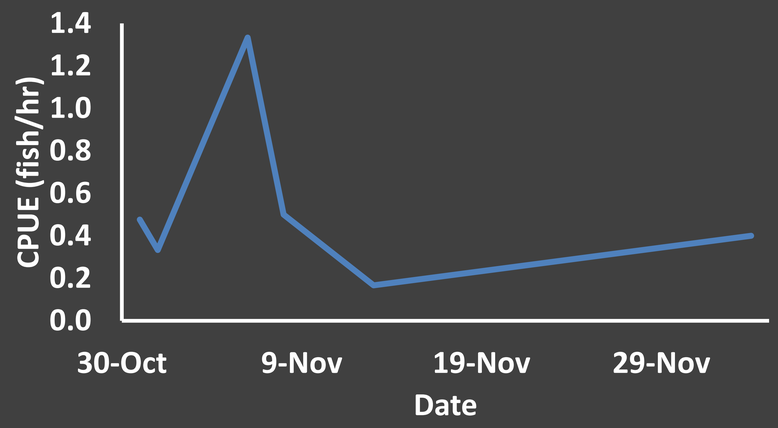

Figure 2: Temporal variation in CPUE (fish/hr) during sampling events.

Discussion

- The low population estimate might have been due to varying CPUE and lack of recaptures. Fishing from a boat or kayak may have yielded a higher CPUE.
- Increased CPUE and recaptures would likely increase the population estimation of sportfish species in this farm pond.
- One factor unaccounted for is harvest by local anglers in this private pond, this may have removed tagged fish
- This data will provide knowledge to inform management decisions regarding the fishery in this farm pond.

Literature Cited

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