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Abstract Submission

Symposium: Bayesian Inference: Applications and Interpretation [ID # [9234](https://afs.confex.com/afs/2020/webprogrampreliminary/Session9234.html)]

**Title:**

Using Hierarchical Modeling to Predict Common Carp and Bigmouth Buffalo Electrofishing CPUE from Abundance and Environmental Covariate Data

**Authors:**

Martin Simonson1, Michael Weber1, Audrey McCombs2

**Affiliations:**

1: Department of Natural Resource Ecology and Management, Iowa State University

2: Department of Statistics, Iowa State University

**Abstract:**

Many assessments of fish populations rely on catch per unit effort (CPUE, i.e., number of fish per hour of electrofishing), but using fluctuations in CPUE to infer relative changes in fish populations can be problematic. The relationship between catch rate and fish abundance can be highly variable because catchability may not be constant over time and under a wide range of environmental sampling conditions. Common Carp and Bigmouth Buffalo are often subject to population management, the timing and amount of effort necessary to reach accurate CPUE indices of population abundance are often unknown, and it is not possible to separate changes in detection probability from changes in population size with CPUE alone. Therefore, we compared biomass density estimates from independent capture-mark-recapture techniques to variable CPUE within a closed population across a range of environmental variables (e.g., lake surface area, shoreline complexity, water temperature) using a Bayesian hierarchical framework. Posterior distributions showed that \_\_\_\_\_\_\_\_\_\_\_\_ had an effect on Common Carp CPUE whereas \_\_\_\_\_\_ did not; while \_\_\_\_\_\_\_\_ affected Bigmouth Buffalo CPUE but \_\_\_\_\_\_ did not. Applying the same sampling protocol to both species could result in false inferences regarding changes to the populations from year to year.