UJFM-2023-0050: Evaluation of shoreline rotenone application to control Largemouth Bass recruitment in small impoundments

Thank you for the opportunity to review this manuscript. All told, this is a great paper with some great results and tons of management implication. The paper is also well written, making the review pleasant to conduct. I do have some concerns that I'll highlight below, but I think this study will make a nice contribution to North American Journal of Fisheries Management.

One glaring question is why the decision was made to separate "small" and "large" impoundments? Given that this was a subjective cut-off, why not combine to increase statistical power? This question was really hammered home in the methods that noted all instances of poor mixed-model performance associated with few values for large impoundments. If there was an objective reason to separate at 33 ha, that should be listed in the paper. A case could be made that all impoundments < 40 ha are functionally considered "small" (Neal and Willis 2012). This criterion could allow a single size group and only omit Lee County Lake from analyses (or keep it with an amended definition of small). Alternatively, the five impoundments > 11 ha could be omitted from this manuscript if the focus was observing the effects of the treatment on impoundments ≤ 10 ha (Line 87). One of these approaches would clean up a lot of seemingly repetitive findings and verbiage for describing both small and large impoundment models and responses. This is particularly notable in the methods when sample size was too small to allow a random effect (lines 198, 201-202,213-214, 217). If an impoundment size effect question existed, perhaps modeling any/all of the response variables against surface area would address that. A two-dimensional Kolmogorov-Smirnov test could also be considered to see if there was a critical impoundment size cutoff where shoreline rotenone failed to elicit the expected response.

The sampling schedule, as presented, was confusing to me. I found myself reading and re-reading trying to figure out when and how these populations were sampled. Perhaps rereading through these sections with a critical eye toward improving clarity is warranted.

Abstract

Line 15: Consider replacing "would need to" with "should"

Introduction

Lines 44-45: Consider moving all citations to the end of the sentence for ease of reading.

Lines 46 and 47: What does productive mean in these instances? What makes a sport fish productive? What makes small impoundment habitat productive?

Lines 76-77: It's intuitive that standard hook-and-line sampling is inefficient at catching age-0 Largemouth Bass but not so much for electrofishing. A citation here would be helpful.

Line 91: I'm not familiar with the study locations, but I'm curious if surface area is a good proxy for littoral area? In other words, are these small systems all effectively littoral area? There might be value in examining response as a function of littoral area rather than surface area if the two aren't related.

Methods

Lines 104-1407: This sentence is clumsy. Perhaps break it up to more clearly say when and how the ponds were sampled and when rotenone was applied. Also, there's mention of electrofishing but not

seining? Maybe the best option would be to provide more general information…"sampled with a suite of fish sampling gears". Regardless of the approach, this could use some increased clarity.

Lines 113-116: This information would be better suited for the introduction.

Line 122: What does the measurement "210,920 L/m2" refer to? If it's an application rate, it seems very high. By my math, that's about 225,000,000 gallons/acre. Fun aside, I'm not sure why this measurement would be associated with a spray wand.

Lines 127-128: Typical rotenone applications are measured by ppm or ppb. Although 0.5 L per 90 m of shoreline is also a concentration, it's hard to gauge how much rotenone was actually applied. I'm curious if this represents 2 ppm in the littoral area? 10 ppm? Is there a way to report how much was applied in a way that relates to other studies?

Line 154: embedded instead of imbedded?

Lines 191-218: See earlier comments about sample size and small/large impoundments. This verbiage is necessary as the paper stands, but it really bogs things down for the reader.

Results

I really struggled to get through the results because there are so many models to interpret. Like my comment above, this is needed for the current structure, but I'd sure consider getting rid of the small/large to cut the methods and results sections in half.

Discussion

Line 311: Here's another example of the different sizes of small impoundments creating unnecessary confusion.

Line 312: Consider replacing "bream" with Bluegill or something similar.

Lines 367-372: Kudos to the authors for this. I raised my eyebrow at the survival index upon first read but it grew on me in subsequent reads. This is a nice job of recognizing the limitations.

Management implications

Line 409: I'm not sure the efficacy of shoreline rotenone on reduced bass recruitment as a function of surface area was assessed in this study? To my eye, there was a somewhat arbitrary grouping of small and large small impoundments that were analyzed separately. Examination of bass response to similar treatments using surface area as a continuous predictor would allow this comparison.

Tables

Table 1: Consider rewriting this caption to omit the (c.f., "control"). Maybe "c.f.," is commonly used but I've never seen it. Also considering organizing these differently. As it stands, it seems like years sampled is the most important variable. I'd consider either ordering by size or years treated.

Figures

Consider combining figures 2 and 3 and figures 4 and 5.

Figures 7, 8, and 9 left me with more questions than answers. Are these figures necessary? I can't figure out what all of the lines mean if they are just showing temporal trends. Shouldn't there only be treated and untreated (two lines) in each panel? The Figure 7 caption introduces more confusion than I suspect was expected. Maybe a table would be better?

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