Evaluation of Low-frequency Electrofishing Pulse Rates for Sampling Blue Catfish (*Ictalurus furcatus*)

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Blue Catfish

• Largest N. American catfish

• Found in large rivers and reservoirs
  • Introduced throughout America

• Highly sought after by commercial and sport anglers
Sampling

• Gill nets
  • Low catch rates
  • Biased against fish <250mm

• Hook and line
  • Effective for catching fish >635mm
  • Low catch rates

Photo courtesy of Peter Leonard
Sampling

• Low-frequency electrofishing
  • Electrofishing with <30 pps
  • Most effective form of sampling
  • Odd surfacing response

• Improvements in electrofishing technology

• Need to standardize sampling
Objective

• Evaluate low-frequency electrofishing pulse rates for sampling Blue Catfish
  • 7, 10, 12, and 15 pps
Study Area

Winthrop Rockefeller Lake (Pool 9)
Sampling Methods

- Four pulse rates were selected to be evaluated
  - 7, 10, 12, and 15 pulses/sec (pps)
  - Test difference in catch rate and length frequency

- 20 wing dikes were randomly selected in Pool 9
  - All wing dikes sampled once with each pulse rate
  - Four day rest period between sample runs

- Sampling was conducted in July 2017

Photo courtesy of Zach Moran
Sampling Methods

• Electrofishing was conducted with a Midwest Infinity Box
  • 200V, 35% duty cycle, and ~30A

• Sample runs lasted 5 min

• Move in the direction of the highest concentration of fish

• Total length was recorded to nearest mm
Statistical Analysis

• Catch Rate
  • Calculated as fish/minute and transform using $\log_{10}(n+1)$
  • One-way repeated measures ANOVA with Bonferroni's post hoc test

• Length Frequency
  • Kolmogorov-Smirnov test

• All values considered significant at $\alpha<0.05$
Results

• Temperature 28.7-31.7 °C

• Conductivity 537-712 µS

• Total of 691 fish collected
Total Catch

- Seven pps: 94
- Ten pps: 199
- Twelve pps: 247
- Fifteen pps: 151
Catch Rate

$F_{3, 54} = 4.06, \ P = 0.01$
Length Frequency

D = 0.164, P = 0.013
Conclusion

• 12 pps is most efficient pulse rate for collecting Blue Catfish
  • Use 12 pps when possible
  • Use a combination of 7 and 15 pps, if 12 pps is not possible
Future Needs

• Evaluate pulse rates at different conductivities

• Evaluate pulse rates in other lotic environments

• Evaluate pulse rates in a lentic systems

• Evaluate different duty cycles

• Standardize pulse rates for other catfish species
Questions