

Large River Catfish Populations in the Wabash and White Rivers

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 - Phil Kacmar
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 - Dr. Mark Pyron
 - Max Stafford
- EIU Center for Fisheries and Aquatic Sciences



Background

- Catfish species → recreational & commercial value
 - Most targeted riverine fish group (Clarks Kolaks et al. 2011)
 - Commercial fishery
 - 29% of harvest in Illinois annually (Maher 2019)
 - Wabash, White, Patoka, Ohio Rivers
 - Recreational fishery
 - Top 3 targeted group in Indiana (Molinaro 2022)
 - Recreational harvest
 - Trophy catch and release

Blue Catfish *Ictalurus furcatus*



Channel Catfish *Ictalurus punctatus*



Flathead Catfish *Pylodictis olivaris*



Regulation History

- Pre-2015
 - Commercial:
 - Illinois: 15” minimum length
 - Indiana: 10” minimum length
 - Recreational:
 - Illinois: no minimum length limit
 - Indiana: 10” minimum length
- Post-2015
 - Commercial & Recreational:
 - 13” minimum length limit
 - 1 trophy fish per day
 - Channel 28”, Blue and Flathead 35”



Background

- Historic population studies
 - Colombo 2007:
 - Differences in Channel Catfish demographics among management reaches
 - Mitchell 2016:
 - Species specific responses to current minimum length limits (MLL)
 - Sustainable for Channel Catfish
 - Recommended higher MLL for Flathead Catfish
 - Moody-Carpenter 2017:
 - Increase MLL for Flathead Catfish
 - Thompson 2024:
 - Current harvest regulations sustainable for Channel Catfish



Objective

- Determine population characteristics of catfish in Indiana's Rivers
 - How many are there?
 - Abundance
 - How big are they?
 - Size Structure
 - How heavy are they?
 - Body condition



Methods

- Boat electrofishing:
 - Standard community frequency (60 hz)
 - Low frequency (15hz)
 - 60 minutes of effort per site
- Hoop netting
 - INDNR surveys: 1.5" mesh, 10 nets per site
 - EIU & BSU surveys: 1", 1.5", 2" mesh, 9 nets per site
 - Baited with Zote soap
- Fish data
 - Total length, weight
 - Pectoral spine collected for aging
 - Tagged with external Floy tag



Data Analysis

- How many?
 - Catch per unit effort: # of fish per effort expended
 - Hoop nets: fish/net night
 - Electrofishing: fish/hour
- How big?
 - Proportional length histograms
 - Proportional Size Structure
- How heavy?
 - Relative weight (W_r)
 - Weight / Standard weight * 100
 - Standard weight → derived from other 'healthy' populations
 - W_r target value = 100



$W_r > 100$



$W_r < 100$

Study Area

Wabash River:
Lafayette → Ohio Confluence

White River:
West Fork (Spencer)
East Fork (Hindostan Falls)
→ Wabash Confluence

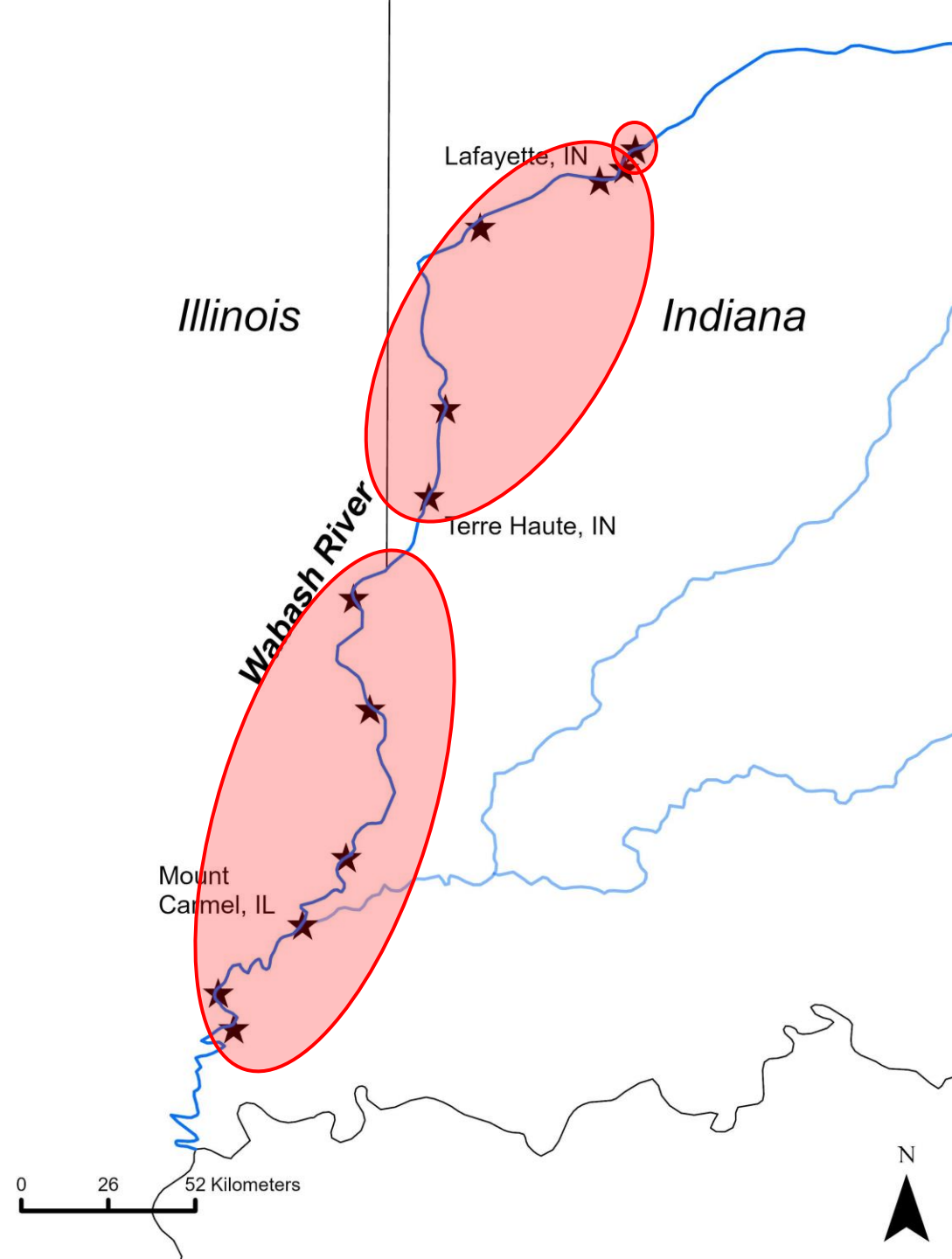


Wabash River Sites

12 sites:
No commercial : 1 site

Indiana commercial
reach: 5 sites

Indiana & Illinois
commercial reach: 6 sites



White River Sites

5 Sites:

No commercial: 2 sites

Indiana Commercial: 3 sites



Total Effort (2024)

- Boat electrofishing:
 - Standard frequency: 8.5 hours
 - Wabash: 5.5 hours
 - White: 3 hours
 - Low frequency: 9 hours
 - Wabash: 6 hours
 - White: 3 hours
- Hoop netting:
 - Total net nights: 362
 - Wabash: 266 nights
 - White: 96 nights



Total catch (2024)

Electrofishing:

River	Blue Catfish	Channel Catfish	Flathead Catfish	Total
Wabash	12	35	298	345
EF White	5	14	113	132
WF White	0	5	88	93
White			10	10
Total	17	54	509	580

Hoop Netting:

River	Blue Catfish	Channel Catfish	Flathead Catfish	Total
Wabash	1	374	50	425
EF White	3	86	12	101
WF White	7	103	6	116
Total	11	563	68	642

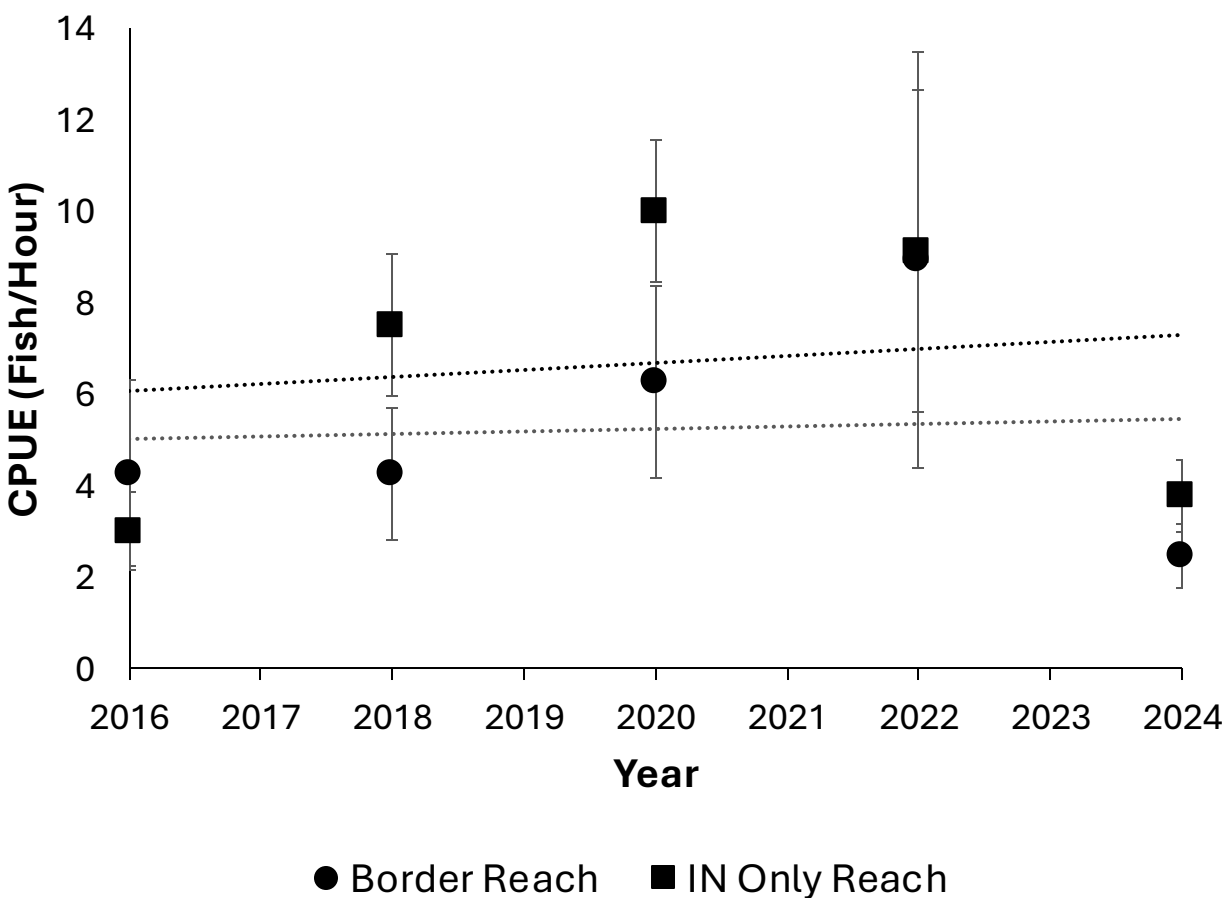
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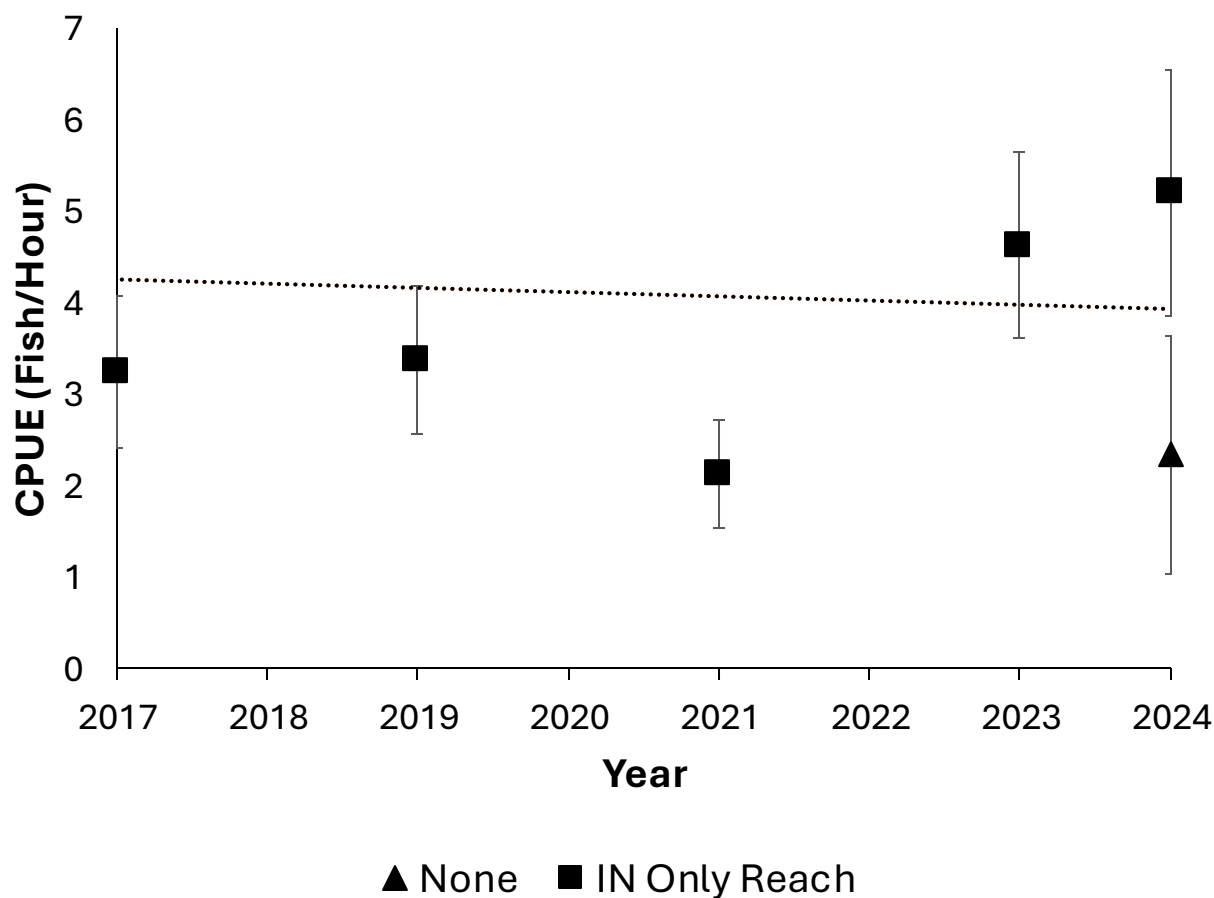


Electrofishing CPUE (Channel Catfish)

Channel Catfish Wabash

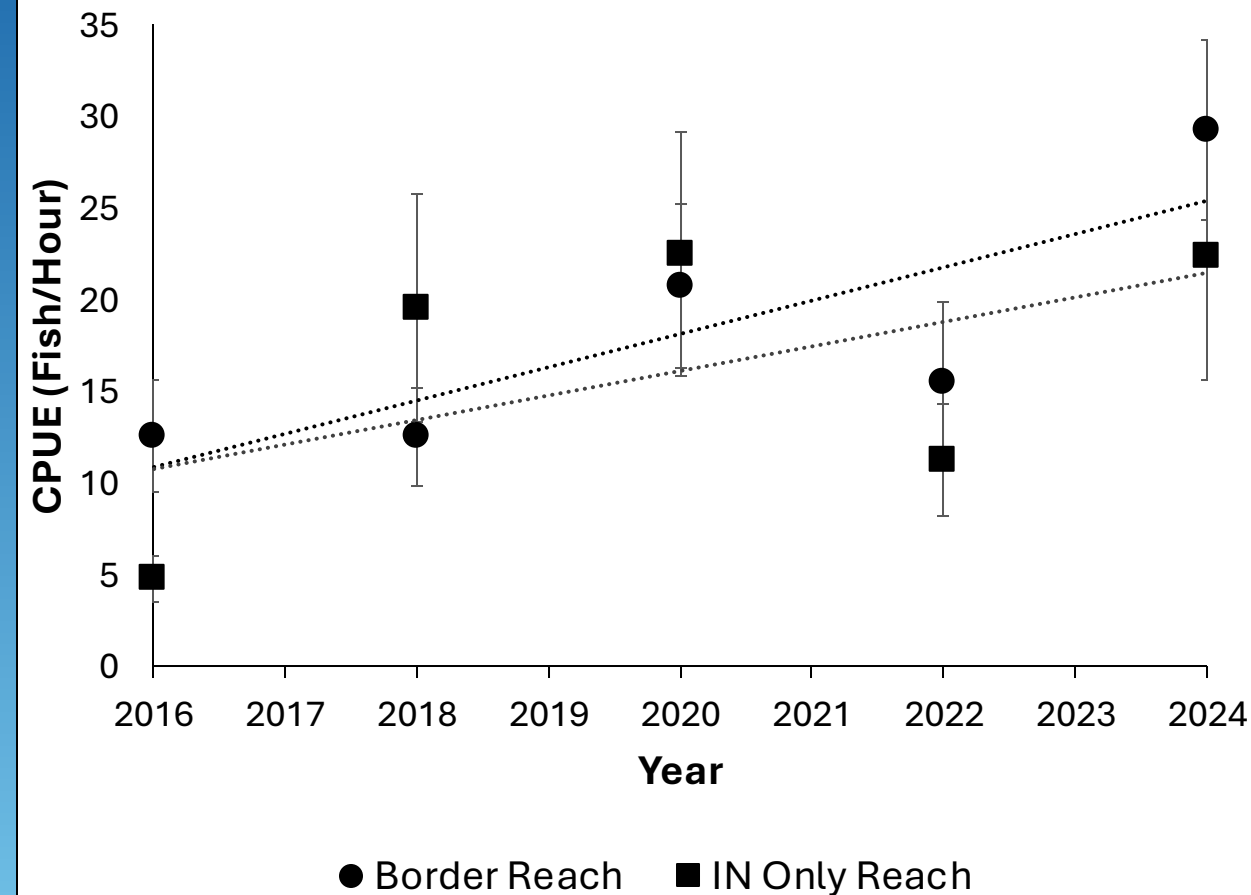


Channel Catfish White

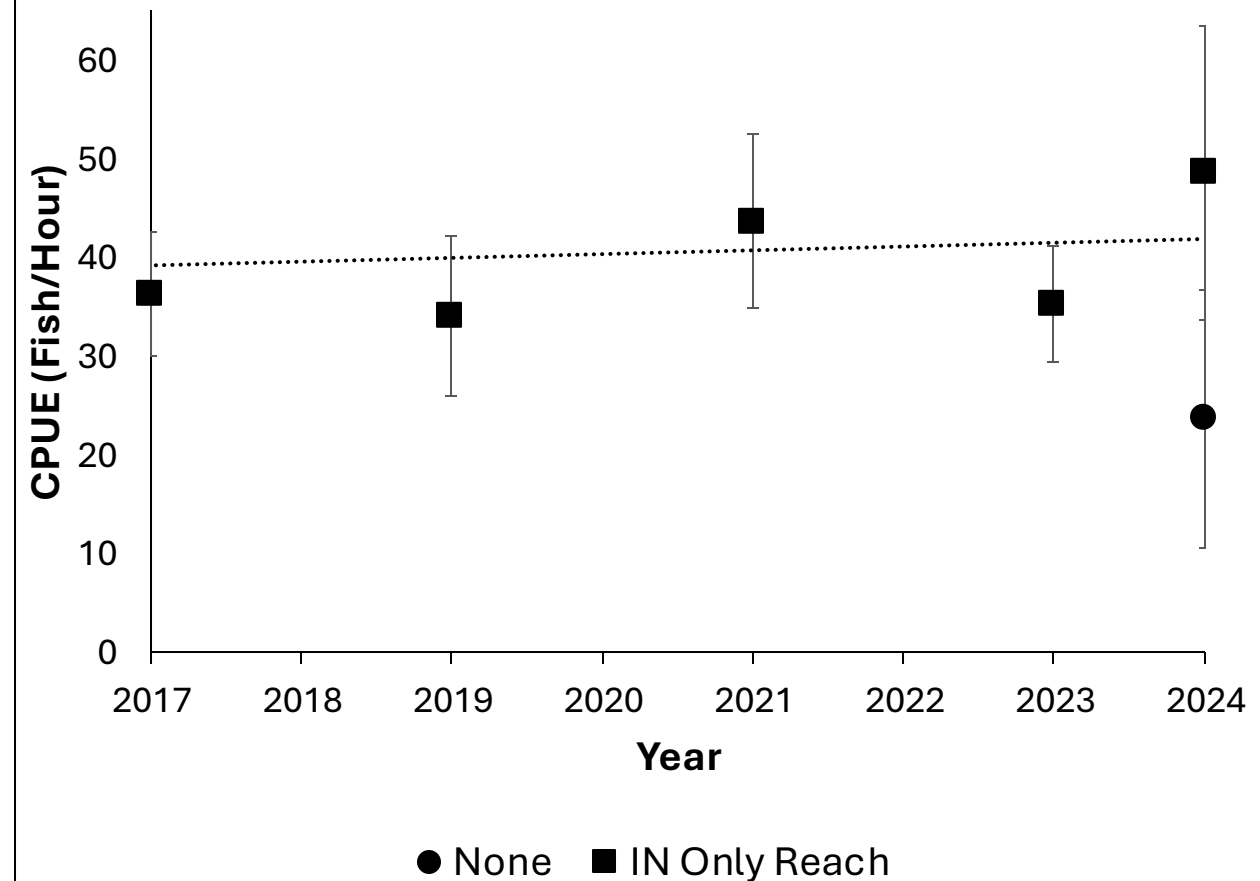


Electrofishing CPUE (Flathead Catfish)

Flathead Catfish Wabash

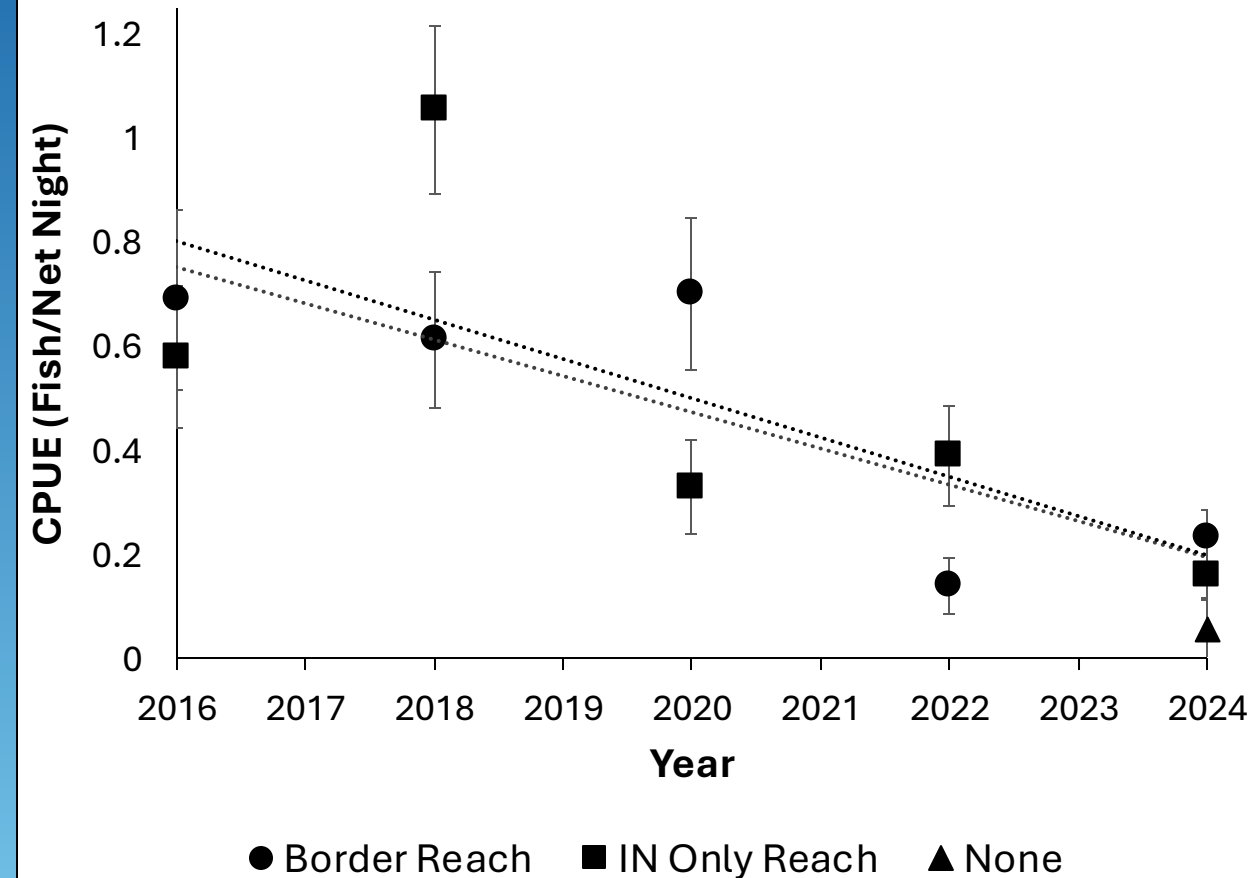


Flathead Catfish White

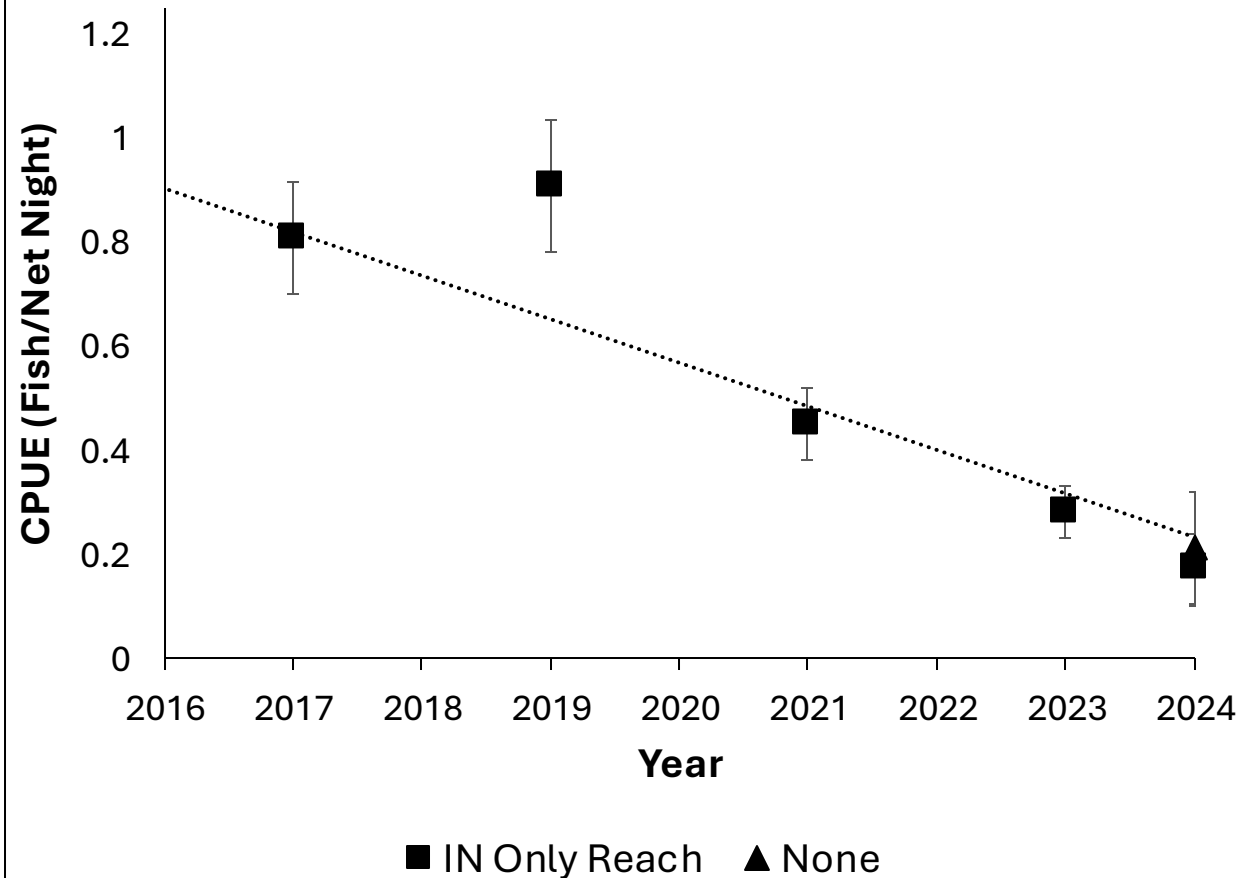


Hoop Net CPUE (Flathead Catfish)

Flathead Catfish Wabash



Flathead Catfish White



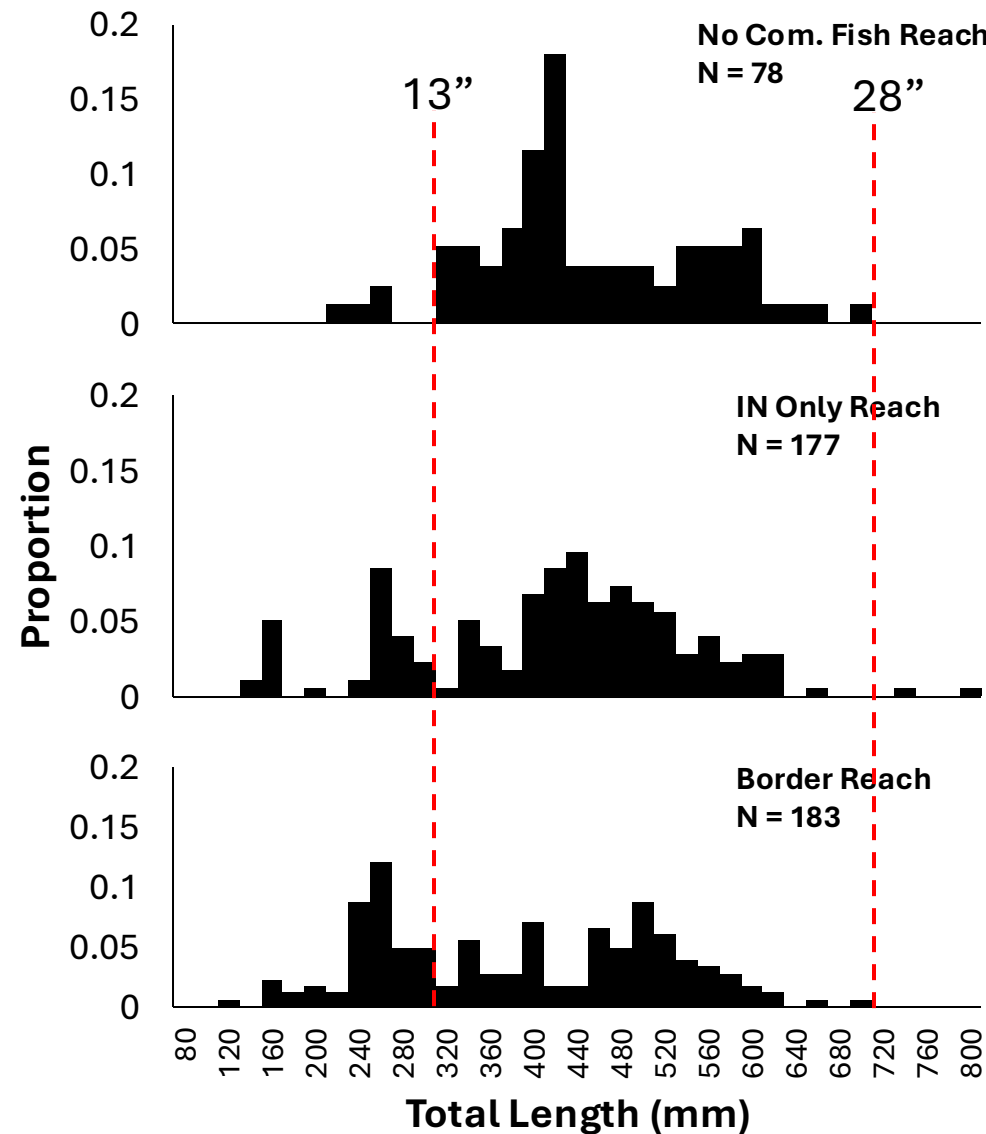
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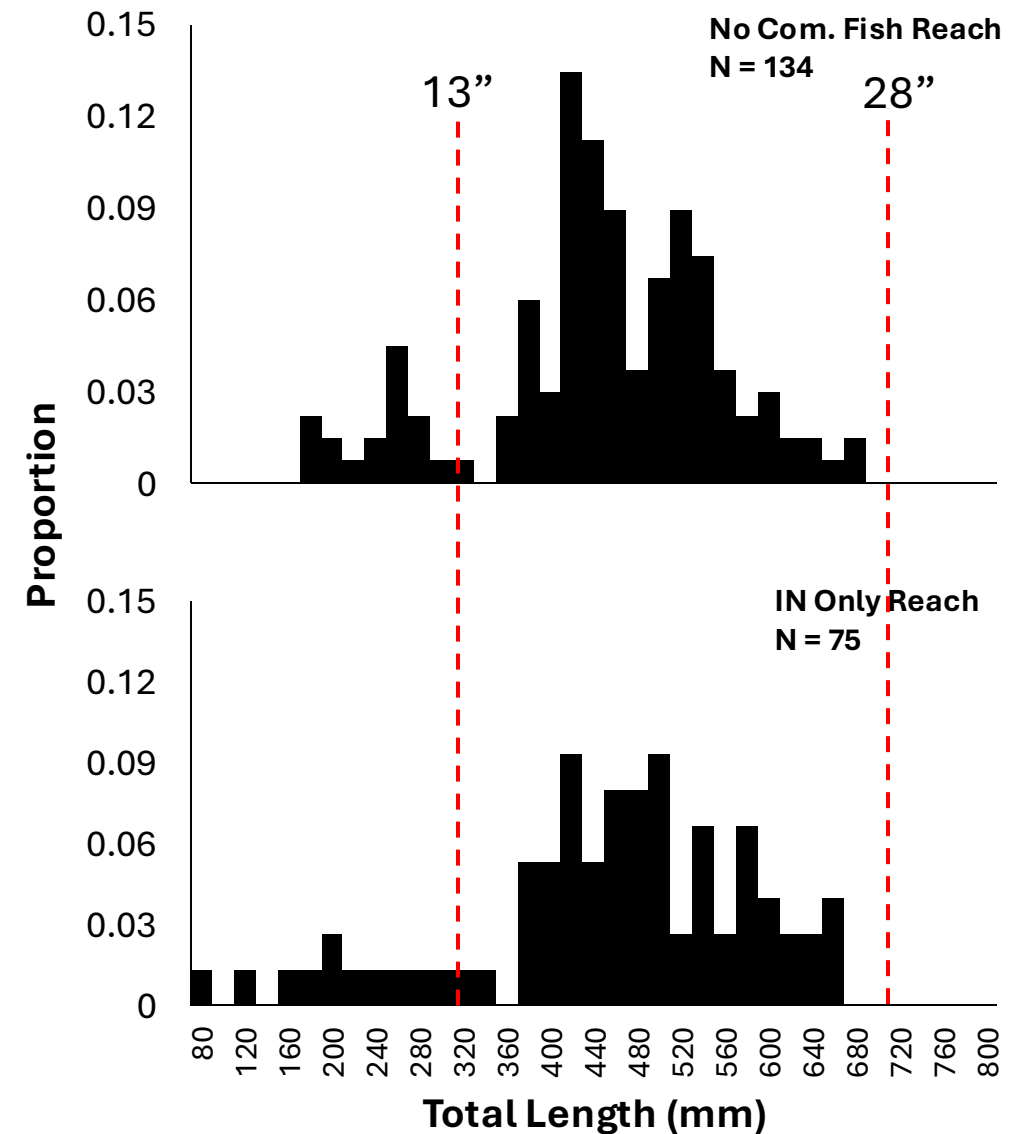


Size Structure (Channel Catfish)

Wabash River

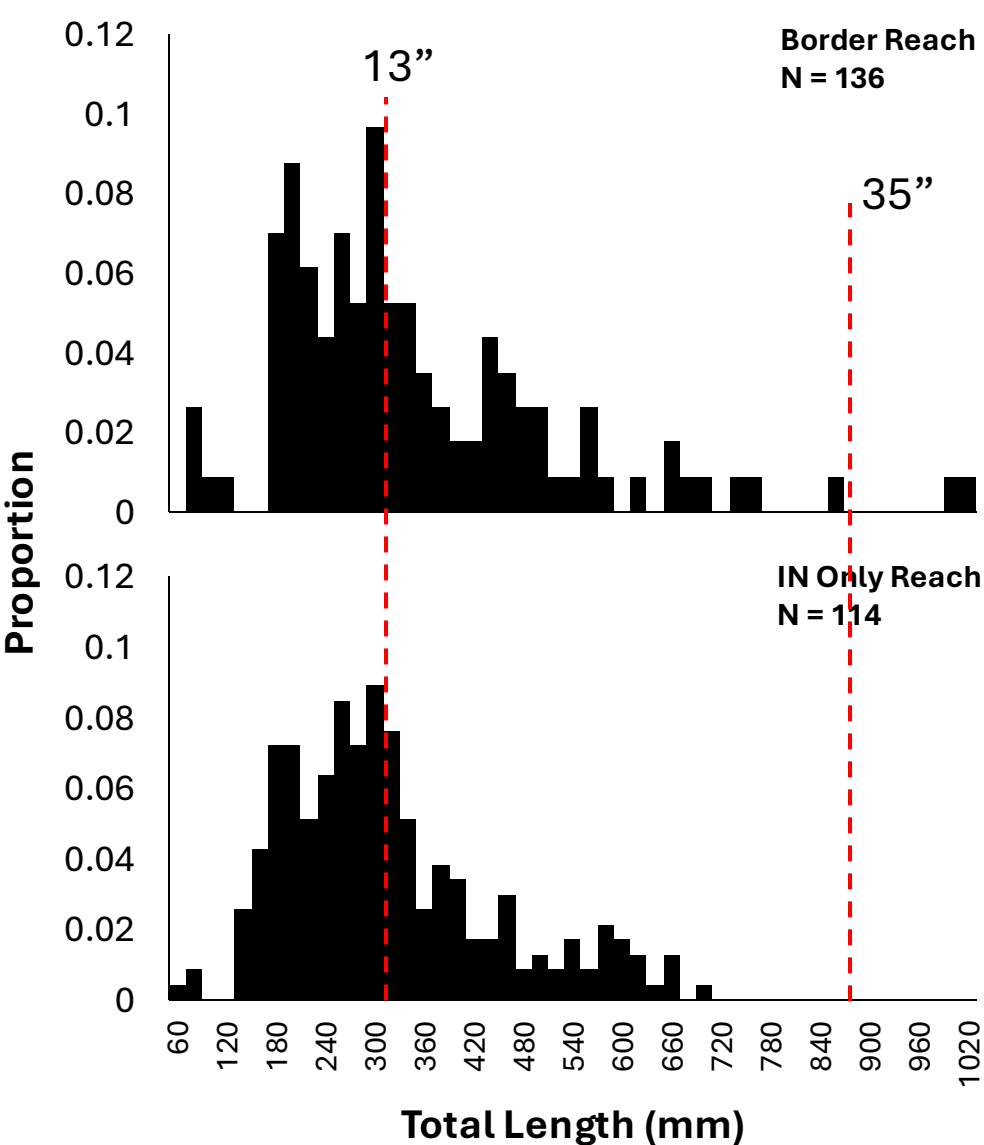


White River

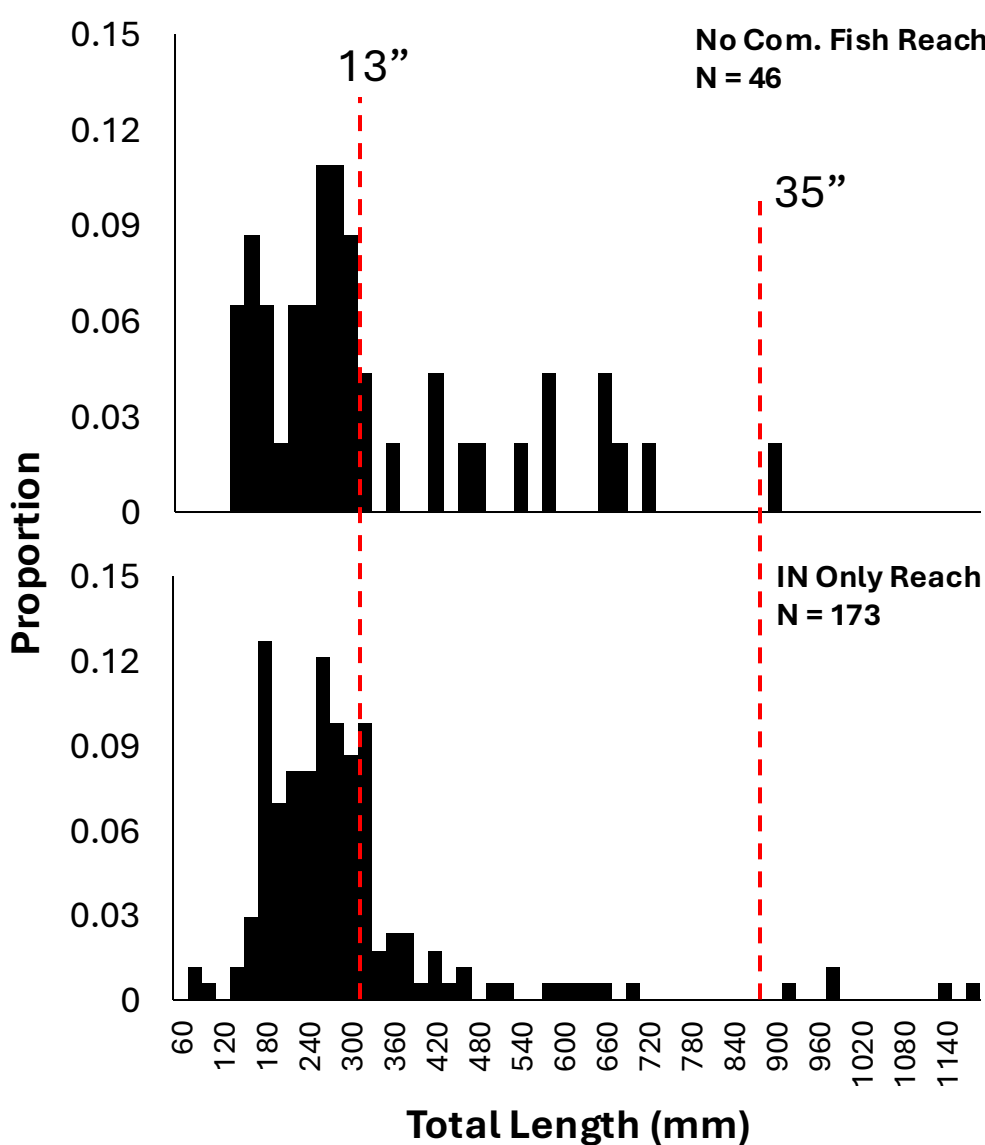


Size Structure (Flathead Catfish)

Wabash River



White River



Proportional Size Structure

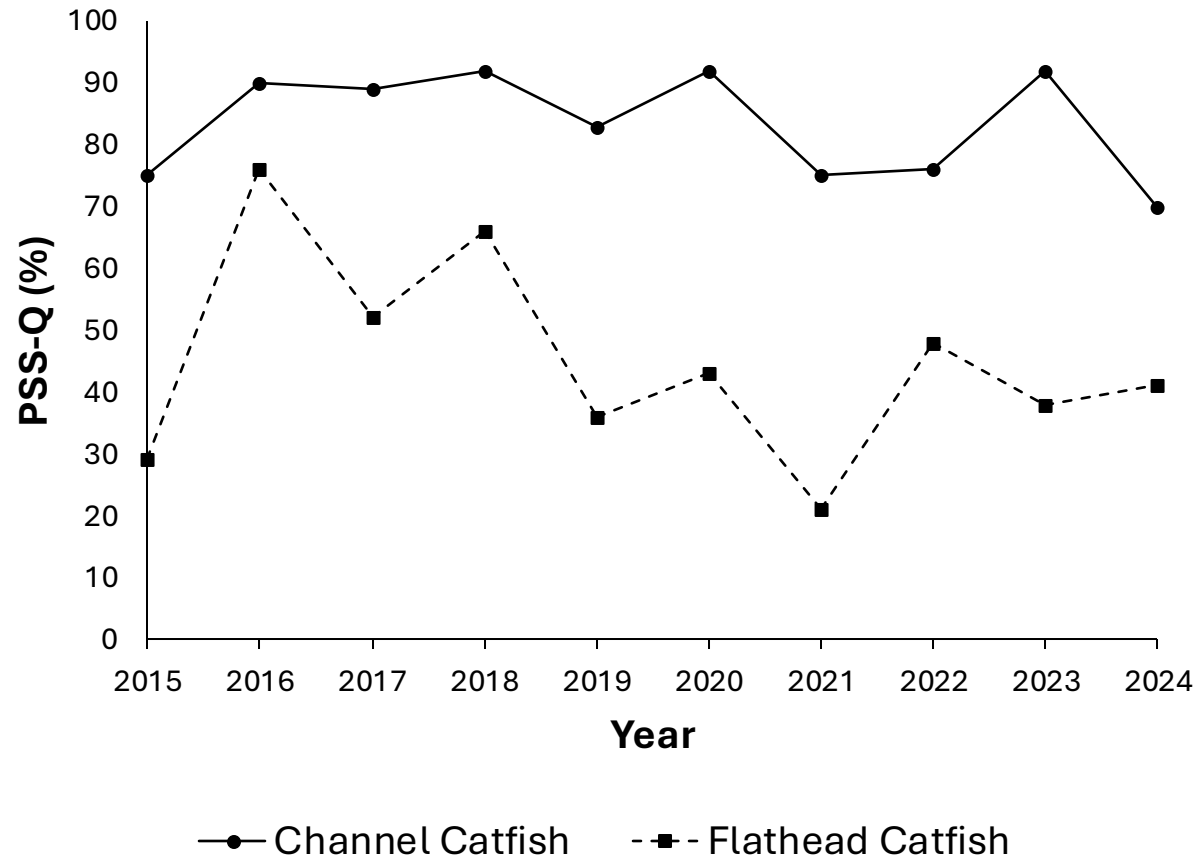
- Percentage of fish greater than given length

$$\frac{\# \text{ of fish } \geq \text{length } X}{\# \text{ of fish } \geq \text{stock length}} * 100$$

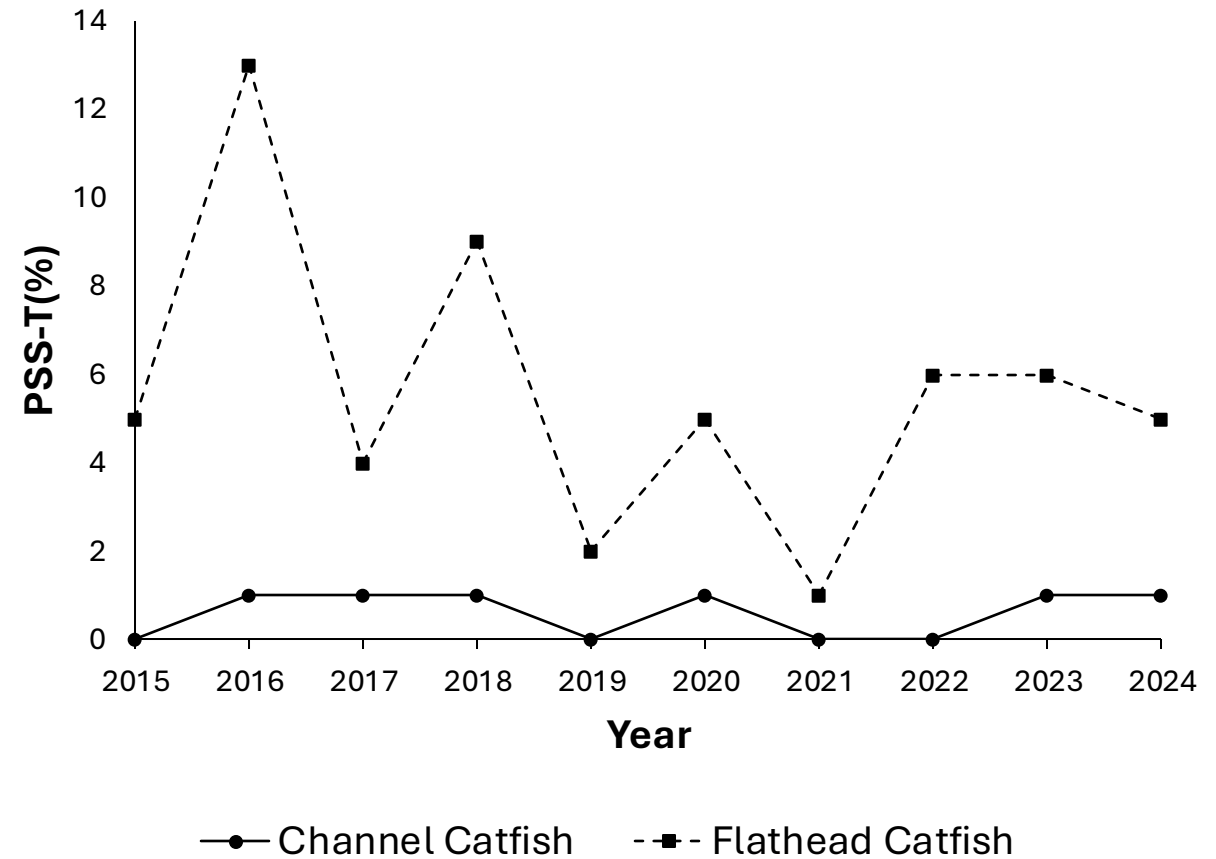
Length Category	Channel Catfish	Flathead Catfish
Stock	11"	13"
Quality	16"	20"
Trophy	28"	35"

Proportional Size Structure

Quality Size



Trophy Size



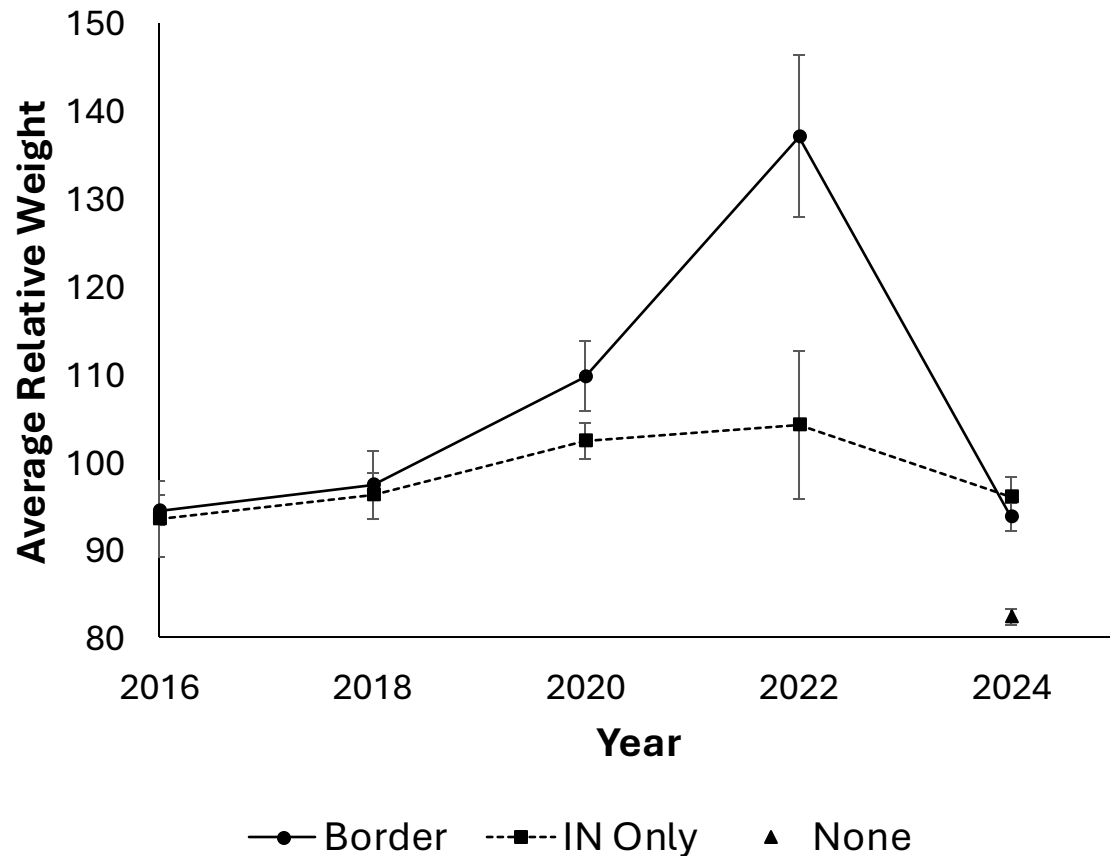
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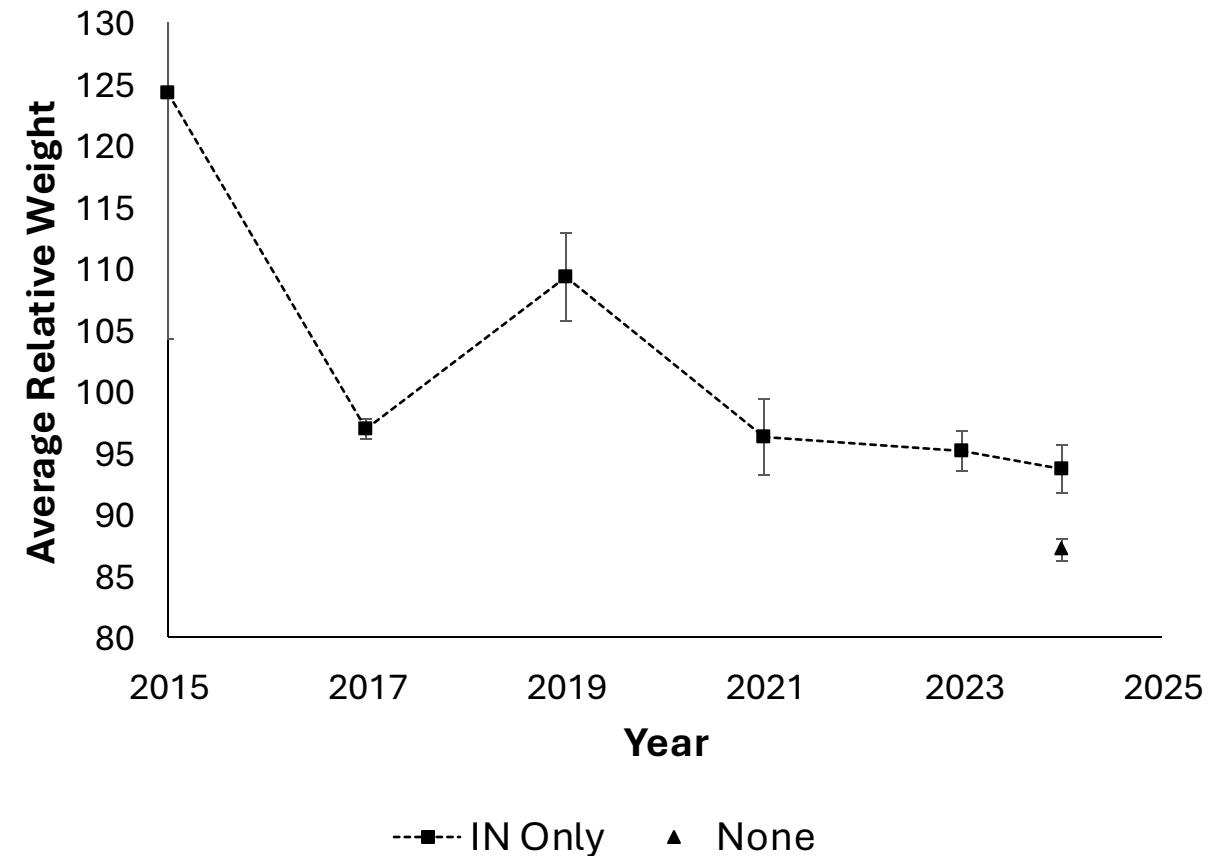


Channel Catfish Condition

Channel Catfish Condition Wabash

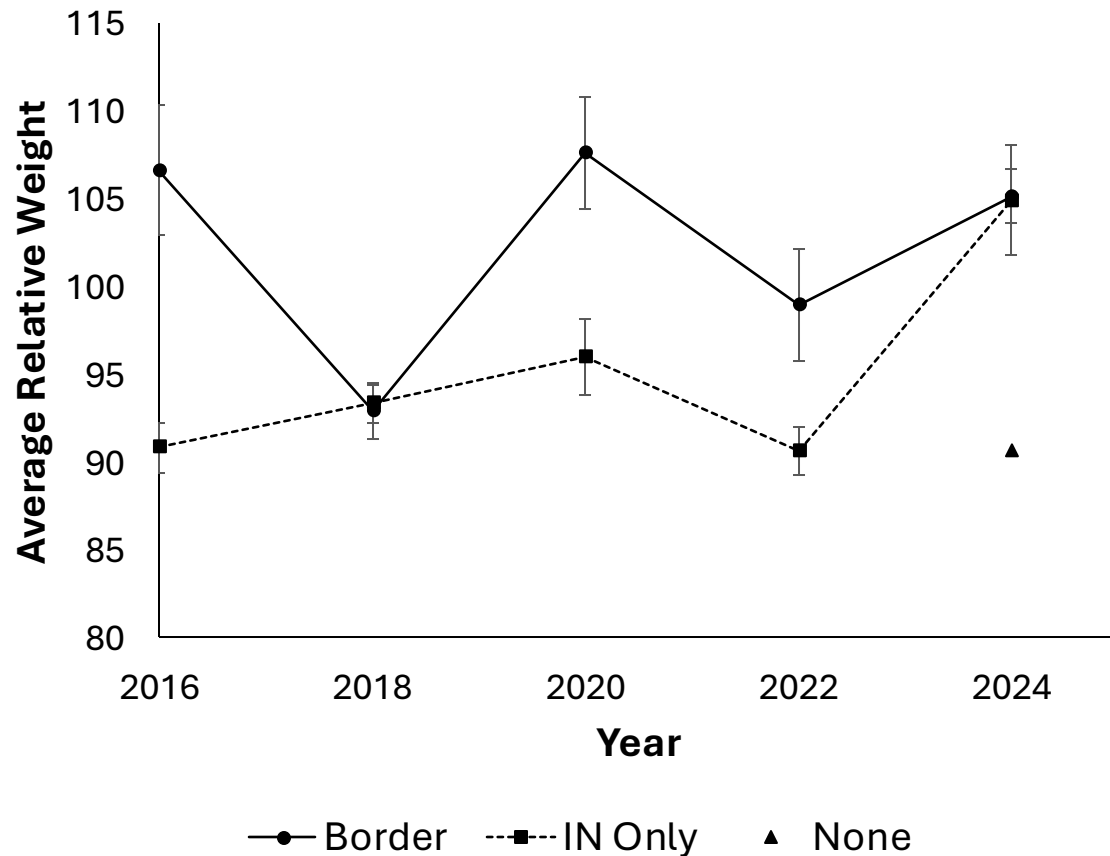


Channel Catfish Condition White

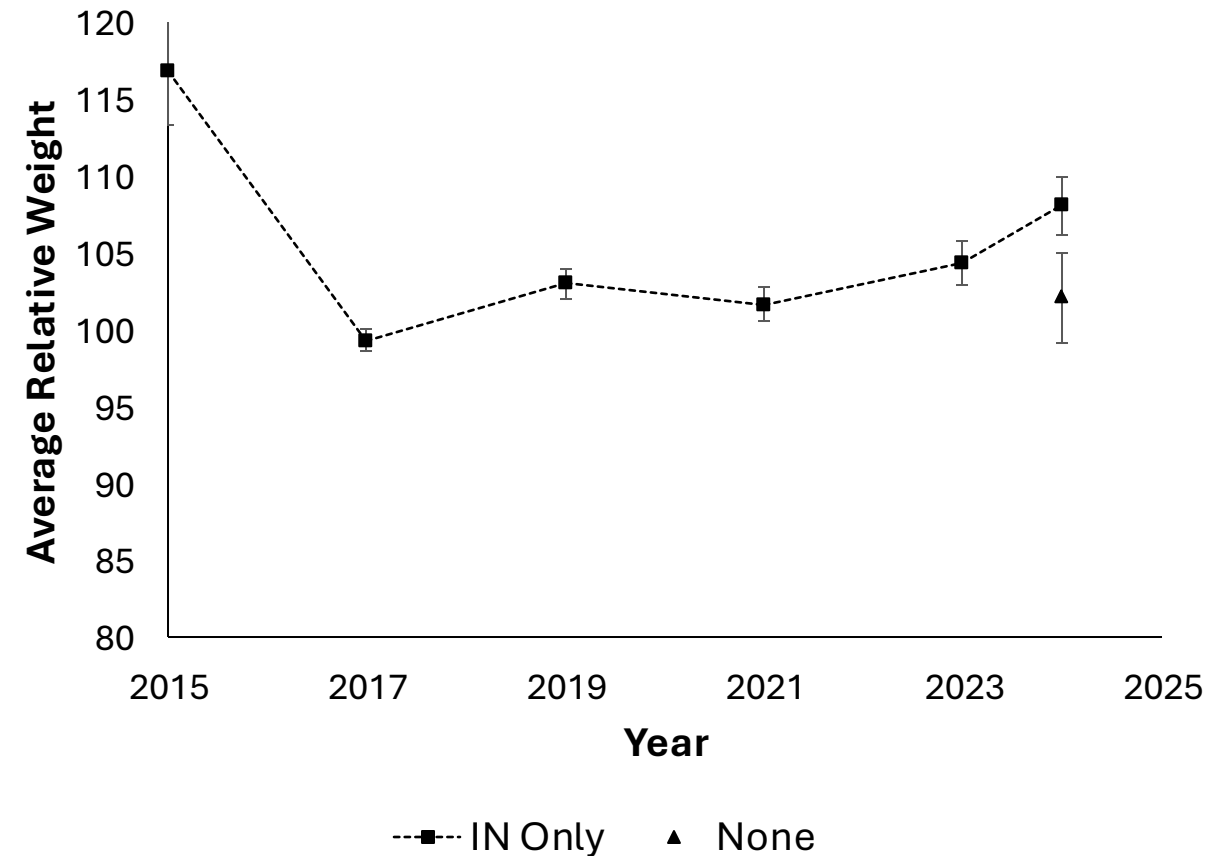


Flathead Catfish Condition

Flathead Catfish Condition Wabash



Flathead Catfish Condition White



Summary

- CPUE:
 - Channel Catfish stable
 - Flathead Catfish decline in hoop nets
- Size Structure:
 - Most Channel Catfish harvestable
 - Potential stockpiling of Flathead Catfish
 - Proportional Size Structure
 - Channel Catfish good
 - Trophy Flathead Catfish decline
- Condition:
 - Condition generally high for both species



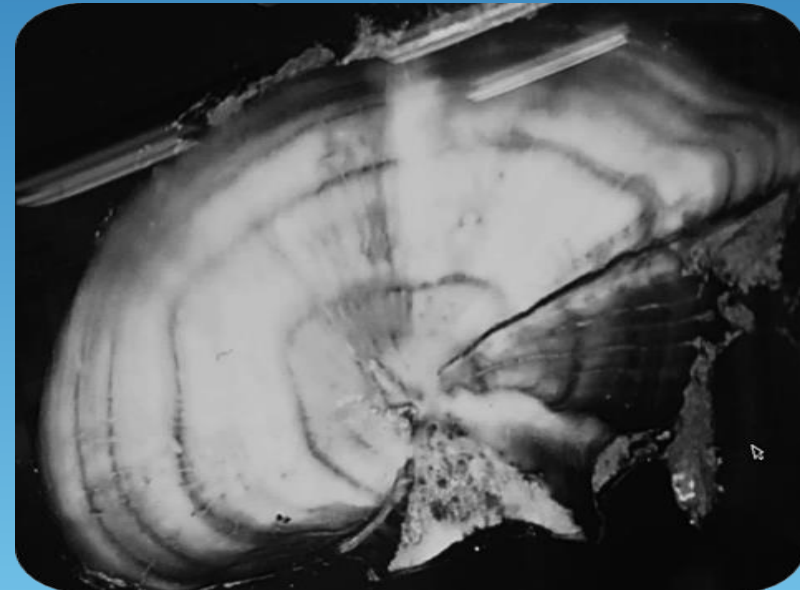
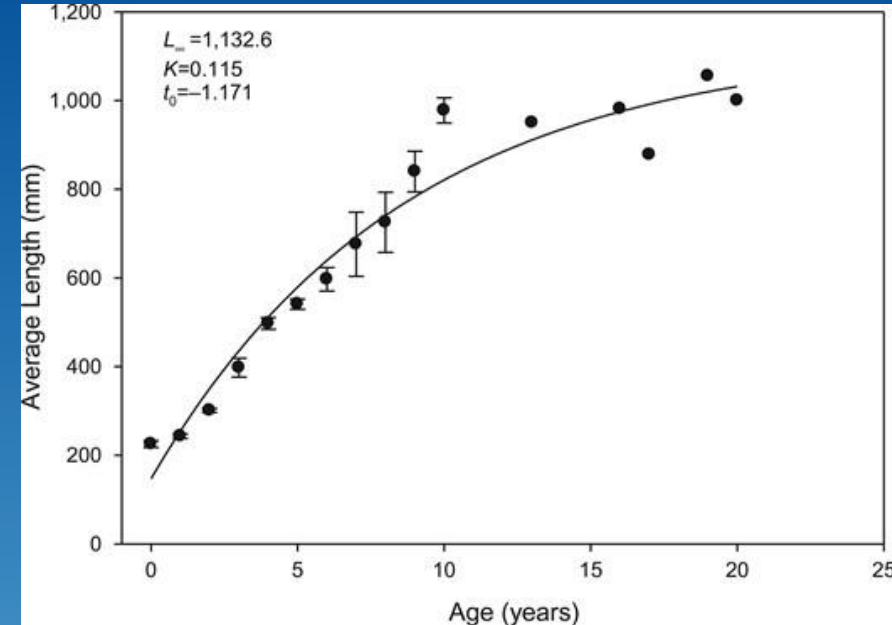
Conclusions

- Potential mechanisms
 - Competition
 - Higher density, lower condition
 - Harvest → may influence density and size structure
 - Flathead Catfish → increase minimum length limit
 - Invasive species → food web alteration
 - Many trophic guilds in Wabash in decline
- Need additional population data



Next steps

- Finish 2024 aging
 - Age, growth, mortality
- 2 additional sampling years
 - Multiple year comparison
- Collect more data in non-commercial zones



References

- Colombo, R. E., 2007. Demographics And The Ecological Role Of The Channel Catfish (*Ictalurus Punctatus*) In Commercially Exploited And Unexploited Reaches Of The Wabash River With Implications For The Flathead Catfish (*Pylodictis Olivaris*). PhD Dissertation, Southern Illinois University, Carbondale.
- Clark-Kolaks, S., D. Carnahan, and R. L. Ball. 2011. Wabash River Angler, Recreational and Commercial Fisher Activity Survey of 2005 to 2006. Indiana Department of Natural Resources, Fish Research Report, Indianapolis.
- Mitchell, Z. A. 2016. Sampling Efficiency, Population Characteristics, and Potential Impacts of Harvest Regulations on Three Riverine Species of Catfish. Masters Thesis, Eastern Illinois University.
- Moody-Carpenter, C. J., G. G. Sass, L. D. Frankland, E. K. Bollinger, and R. E. Colombo. 2017. Demographics and Interstate Management Implications for Flathead Catfish in the Lower Wabash River, Illinois and Indiana.
- Maher, R. 2019. 2019 Annual Commercial Catch Report Exclusive of Lake Michigan. Illinois Department of Natural Resources.
- Thompson, V. J. 2024. Population Demographics of Channel Catfish in the Lower Wabash River. Masters Thesis, Eastern Illinois University

Questions?

- EIU Center for Fisheries and Aquatic Sciences Website

<https://www.eiu.edu/fisheries/>

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