

Population Assessment of Alosine in the Upper Chesapeake Bay

Maryland DNR



2023 SRAFRC Annual Meeting
5 December 2023

Outline



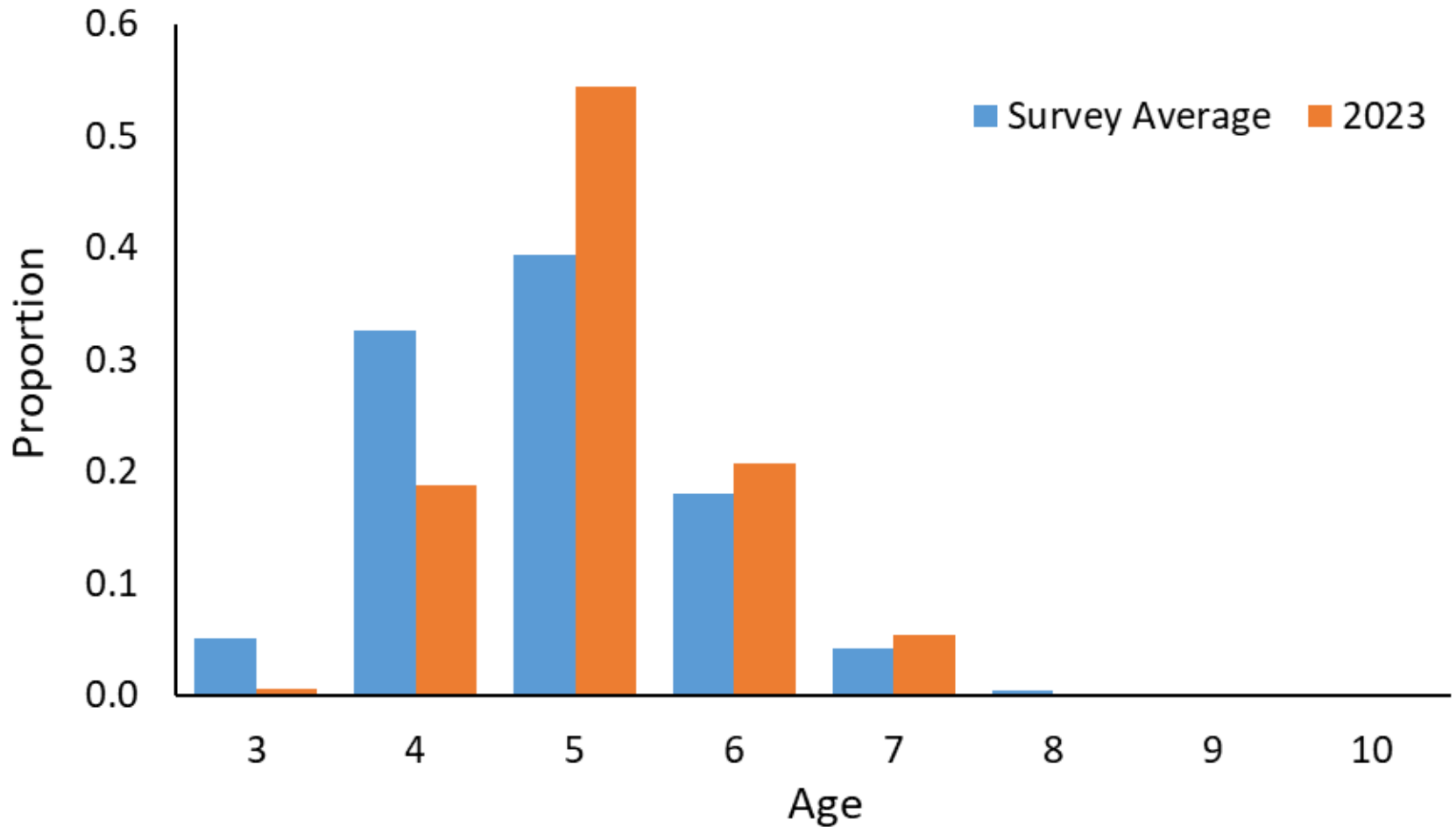
- Hook & Line Tagging Survey
 - Conowingo Tailrace
 - 1984* – 2023
 - Adult American shad
- Creel and Logbook Surveys
 - Fisherman's Park / Susquehanna River
 - 2000 – 2023
 - Adult American and hickory shad
- Striped Bass Spawning Stock Survey (Gillnet)
 - Upper Chesapeake Bay
 - 1991 – 2023
 - Adult American and hickory shad
- Estuarine Juvenile Finfish Survey (Seine)
 - Upper Chesapeake Bay
 - 1959 – 2023
 - Juvenile American shad and river herring

Hook & Line

- 1984 – 2023
- Measure, sex, remove scales, and tag all healthy/non-spent fish
 - 334 caught
 - 276 successfully aged
 - 276 tagged
- Fish Lift Recaps
 - 2 fish tagged in 2022
 - 24 fish tagged in 2023

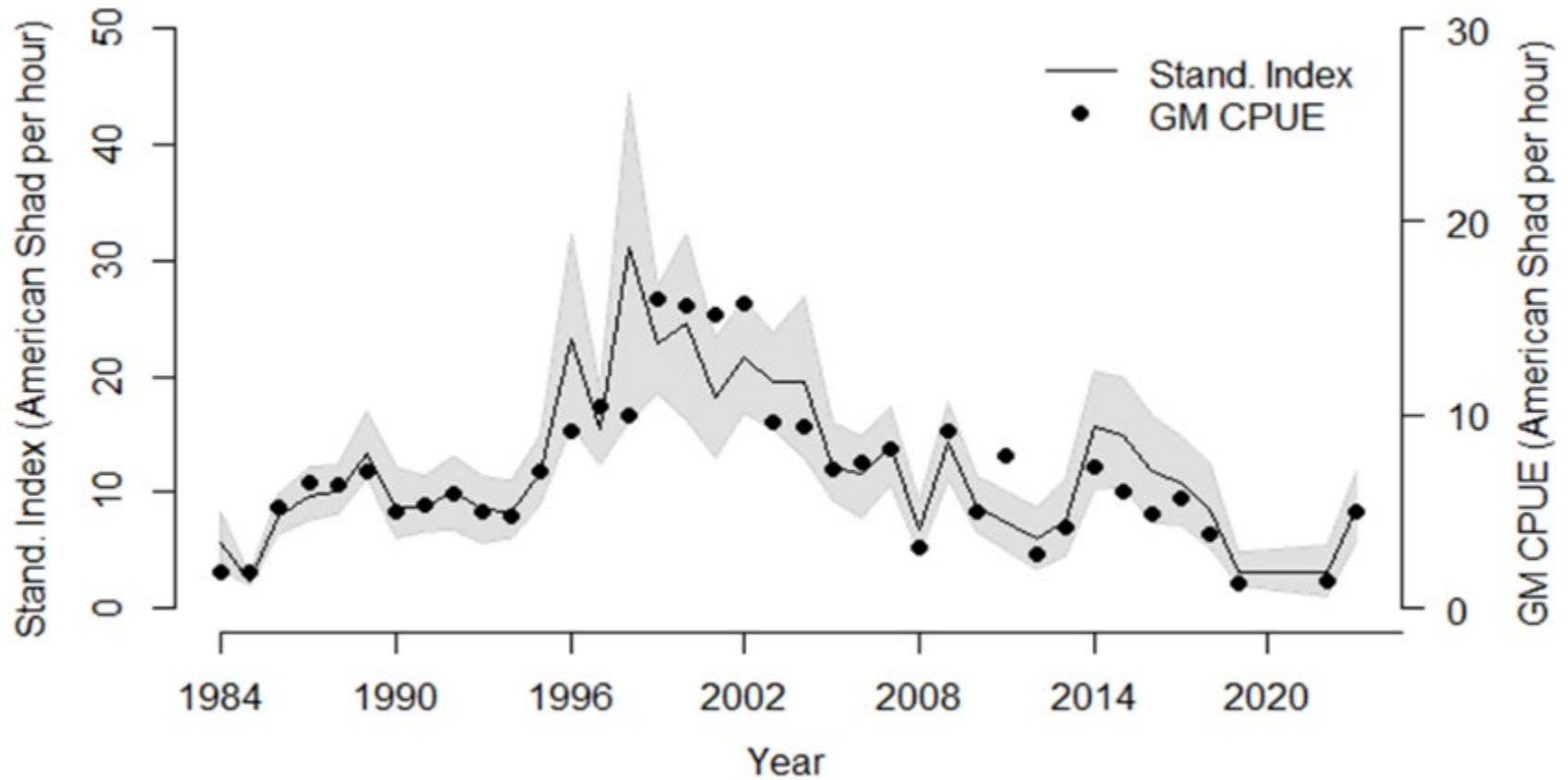


Age Distribution



*Ages not yet final for 2023

H&L Index



Tag Recap Estimates



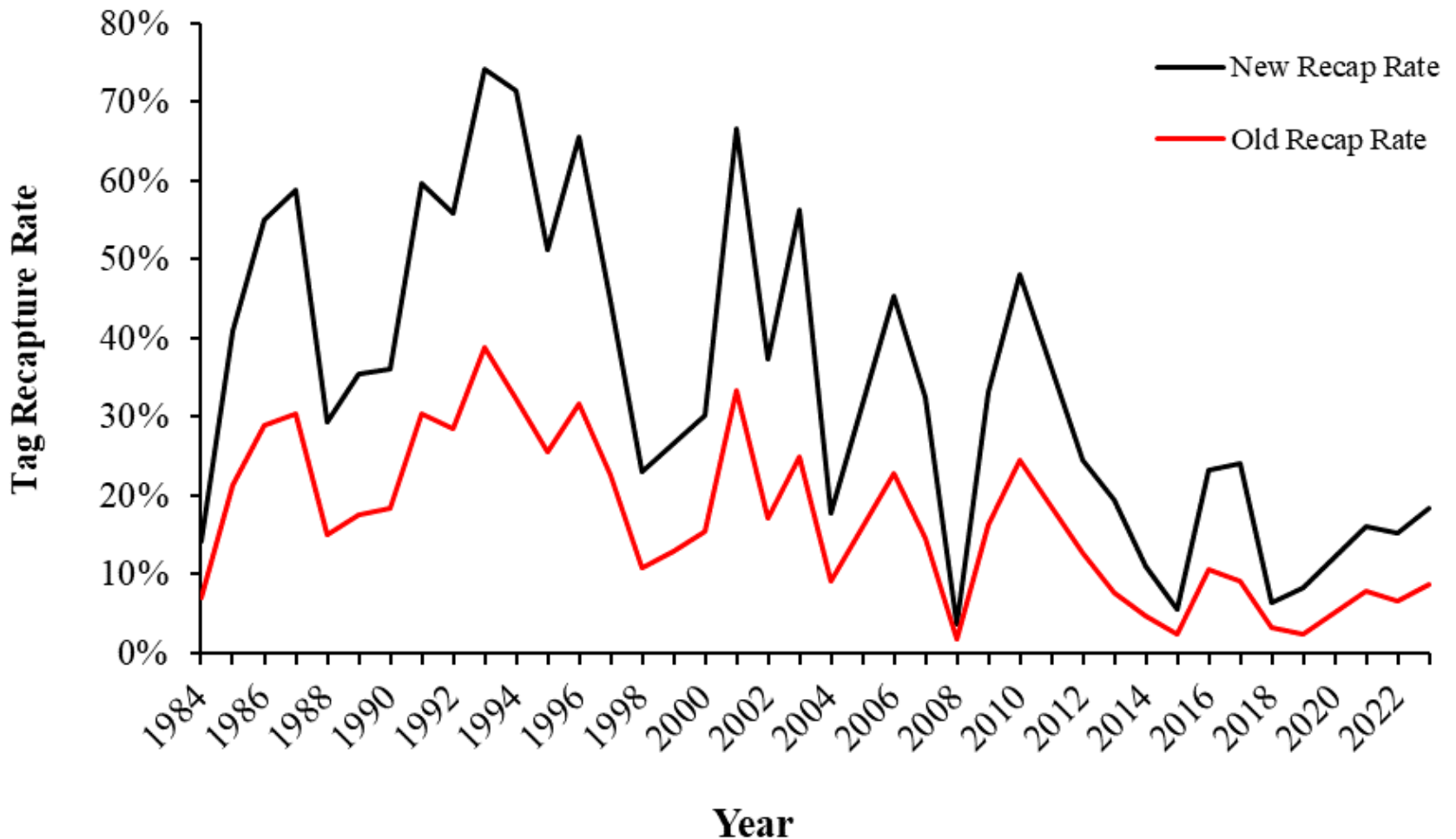
- Overhauled the way recapture rates were calculated
- Incorporated tag “fallback” rate based on the 2010 and 2012 telemetry studies
 - 45.3%
 - Excluded fish tagged at Shures Landing in 2012
- Created weighted values for tagged fish based on days between tagging and the end of lift operations
 - Used data from telemetry studies and 2021 – 2023
 - 0.36 / 7days
 - 0.57 / 14 days
 - 0.89 / 21 days
 - 0.96 / 28 days

Results

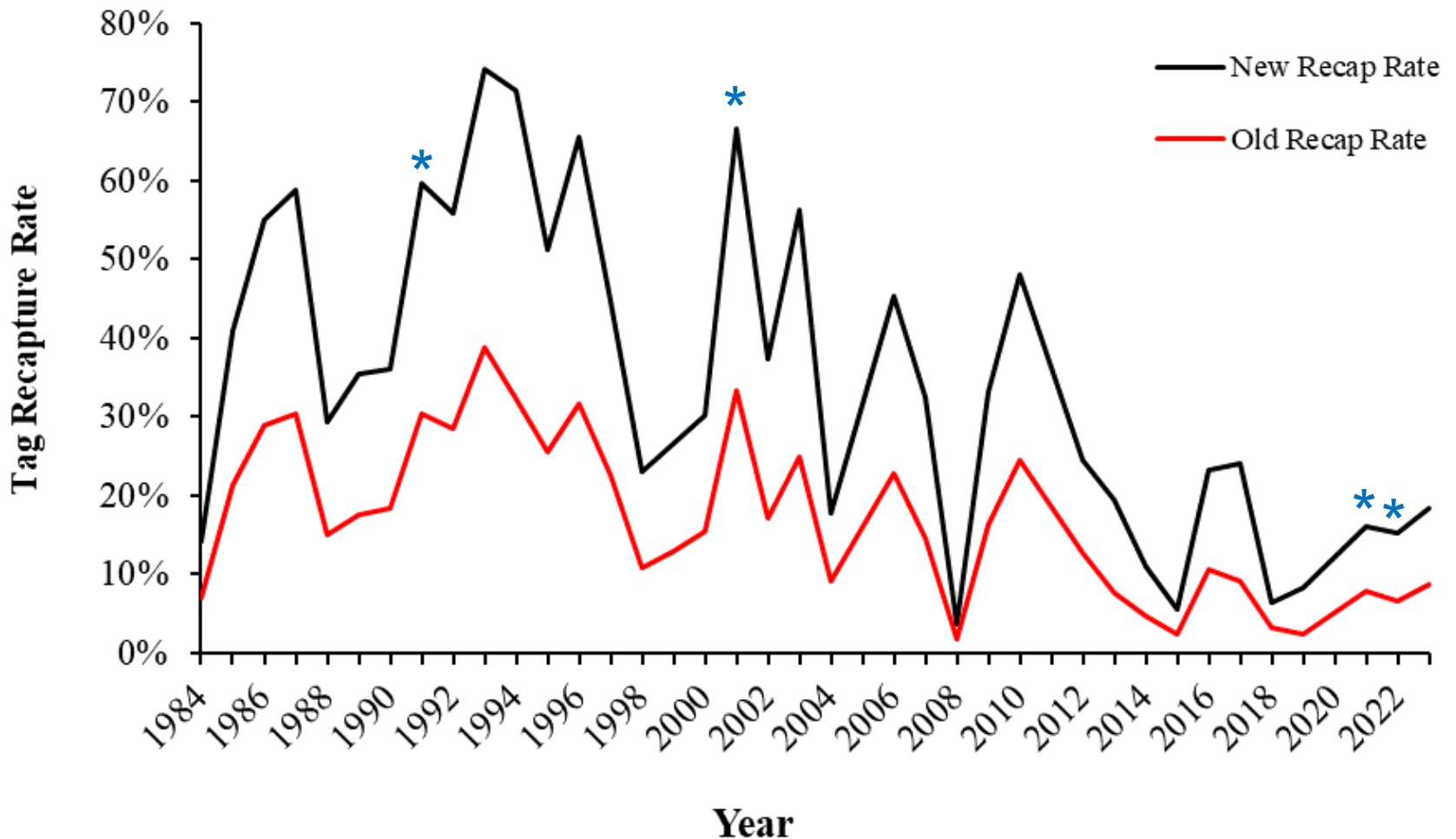


- Tag recapture rates increased by 101%
 - 1990s
 - 25% → 51%
 - 2000s
 - 17% → 36%
 - 2010s
 - 9% → 15%
- Compared to *2010* and *2012 telemetry studies*
 - 2010 (48% vs 45%)
 - 2012 (24% vs 26%)
- Was
 - 2010 (25% vs 45%)
 - 2012 (13% vs 26%)
- Tailrace population estimates declined by 52%
 - 2000 peak
 - 1,008,992 → 536,760
 - 2023
 - 99,687 → 52,911

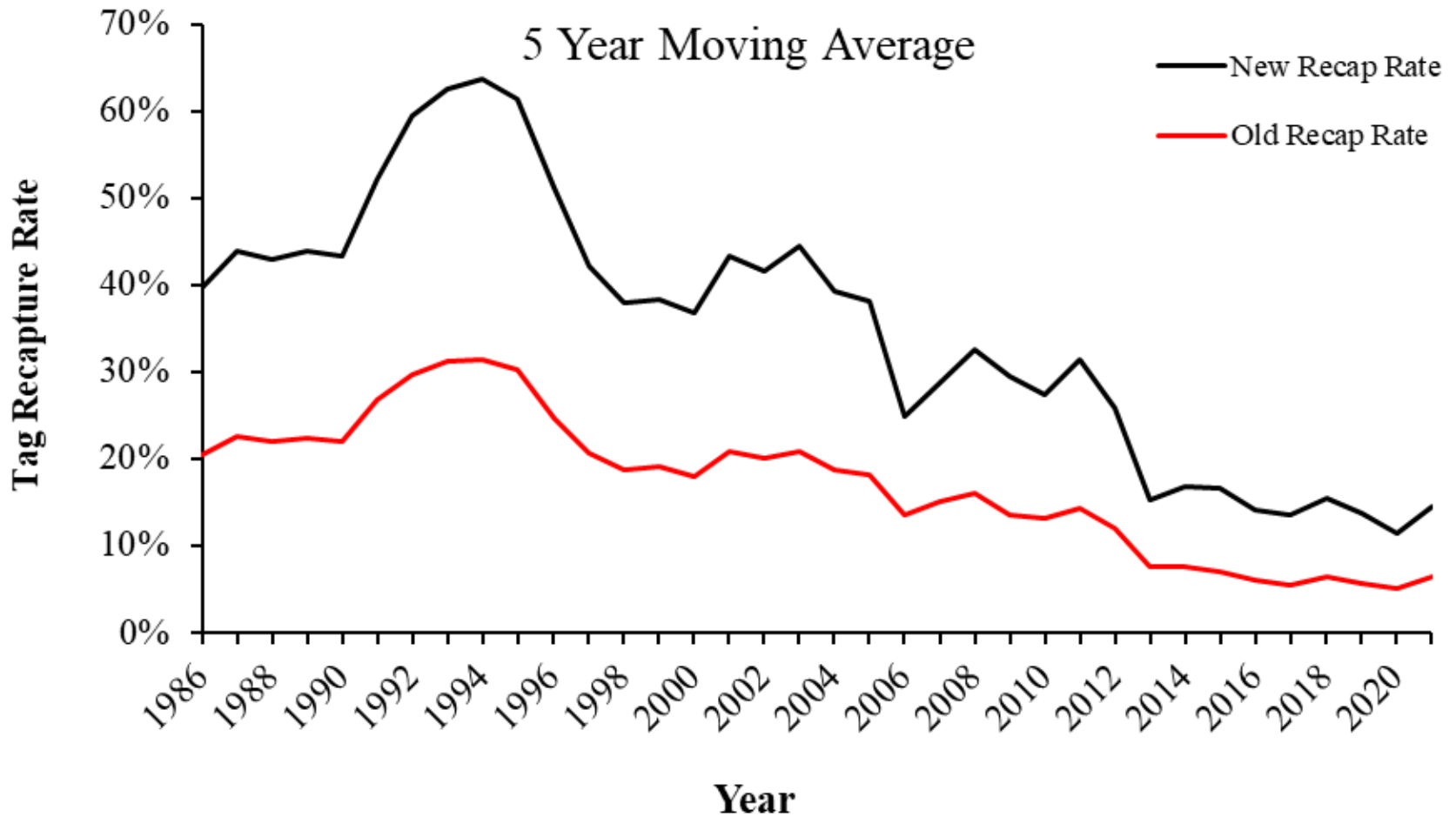
Fish Lift Tag Recap Rate



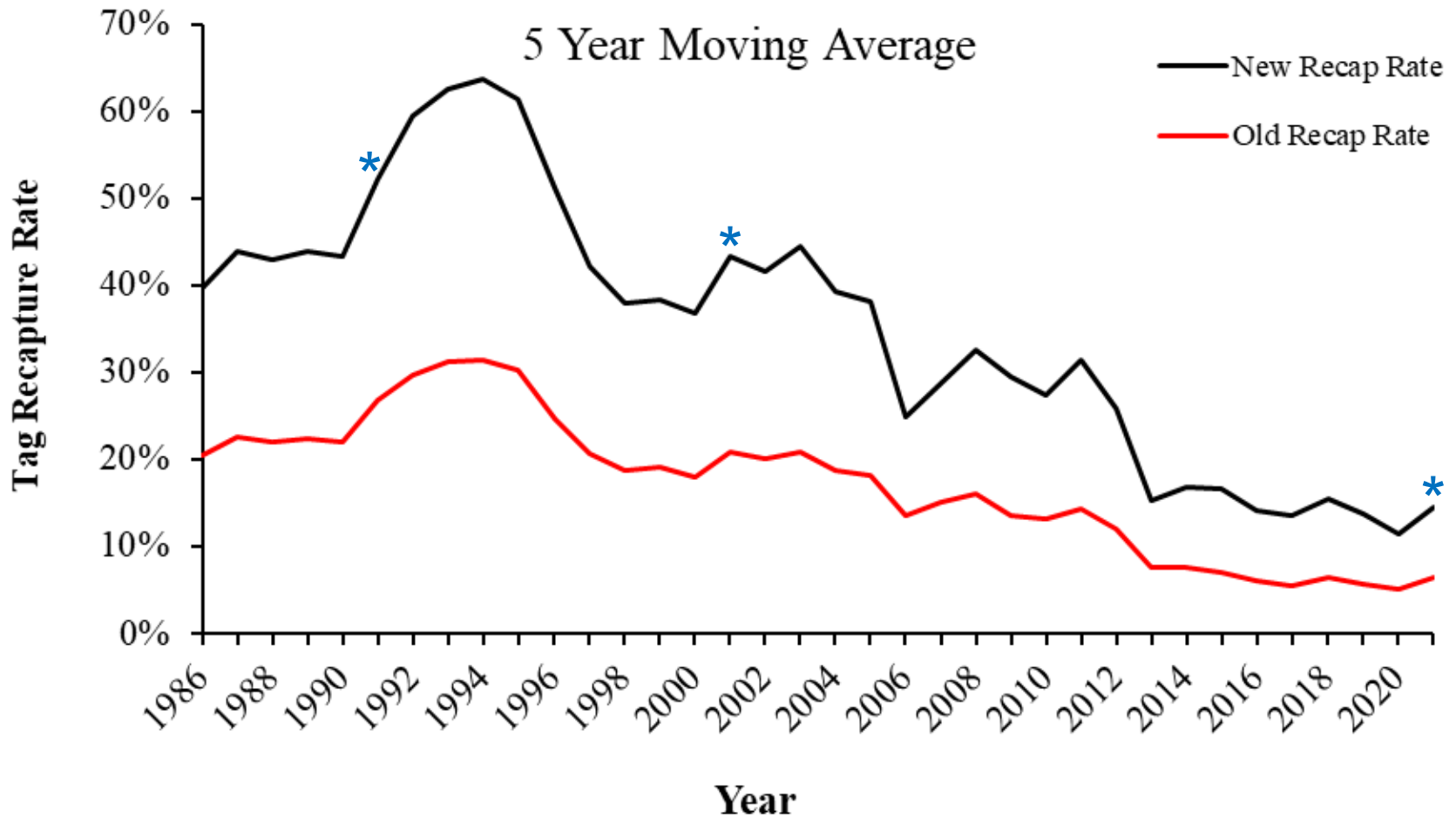
Fish Lift Tag Recap Rate



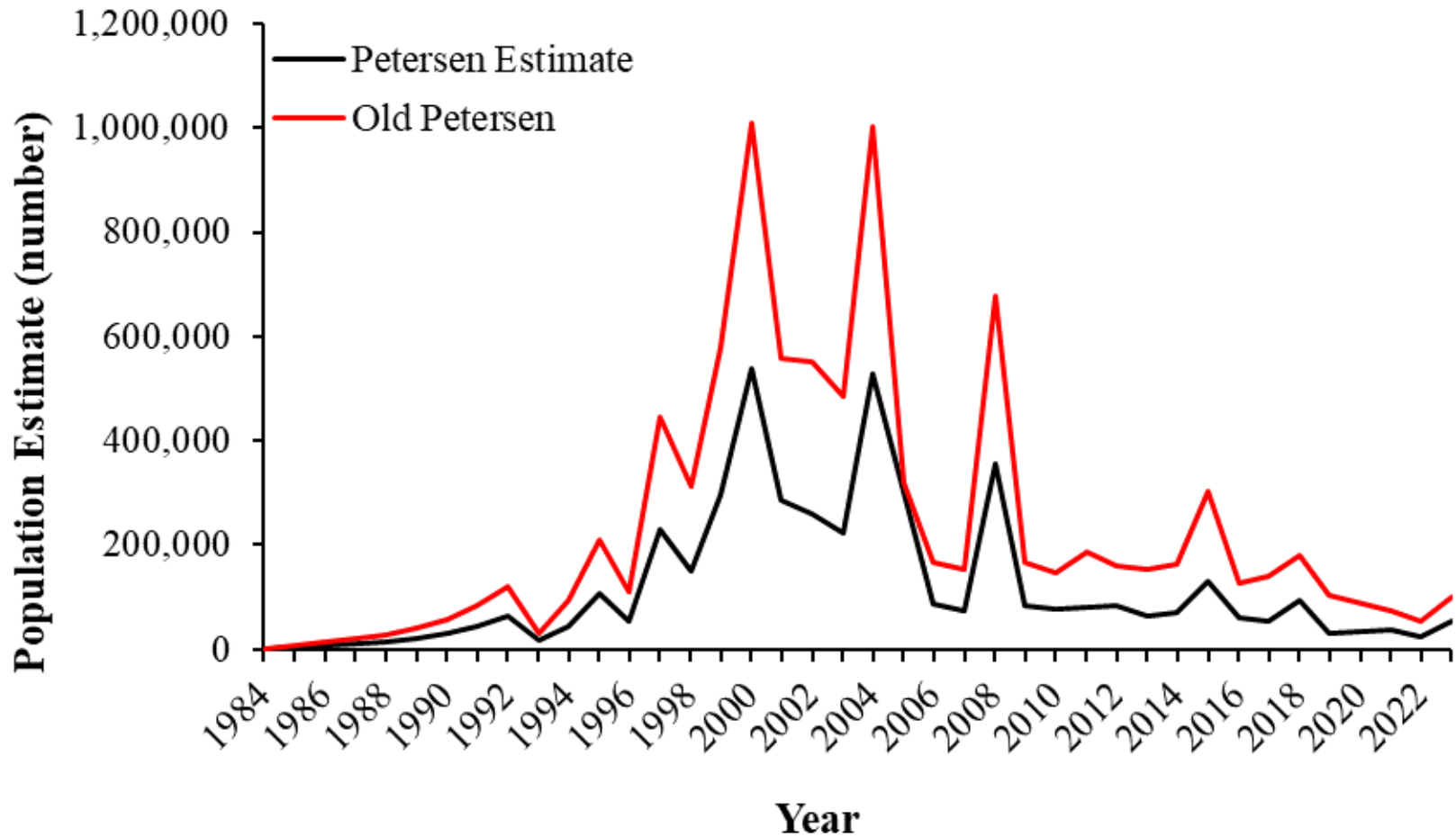
Fish Lift Tag Recap Rate



Fish Lift Tag Recap Rate



Population Size

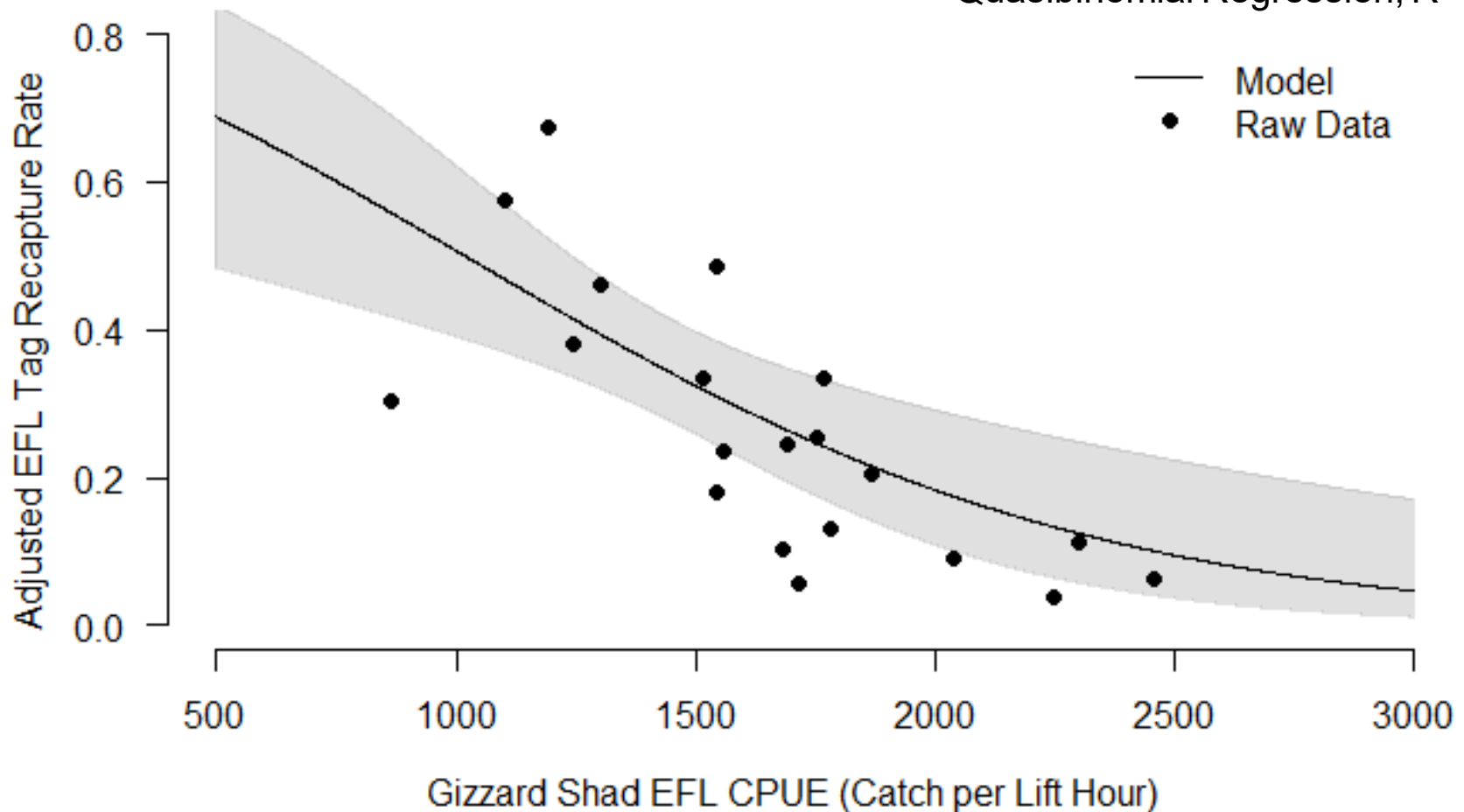


Tag Recaps Vs Gizzard Shad Abundance



2000-2023

Quasibinomial Regression; $R^2 = 0.42$

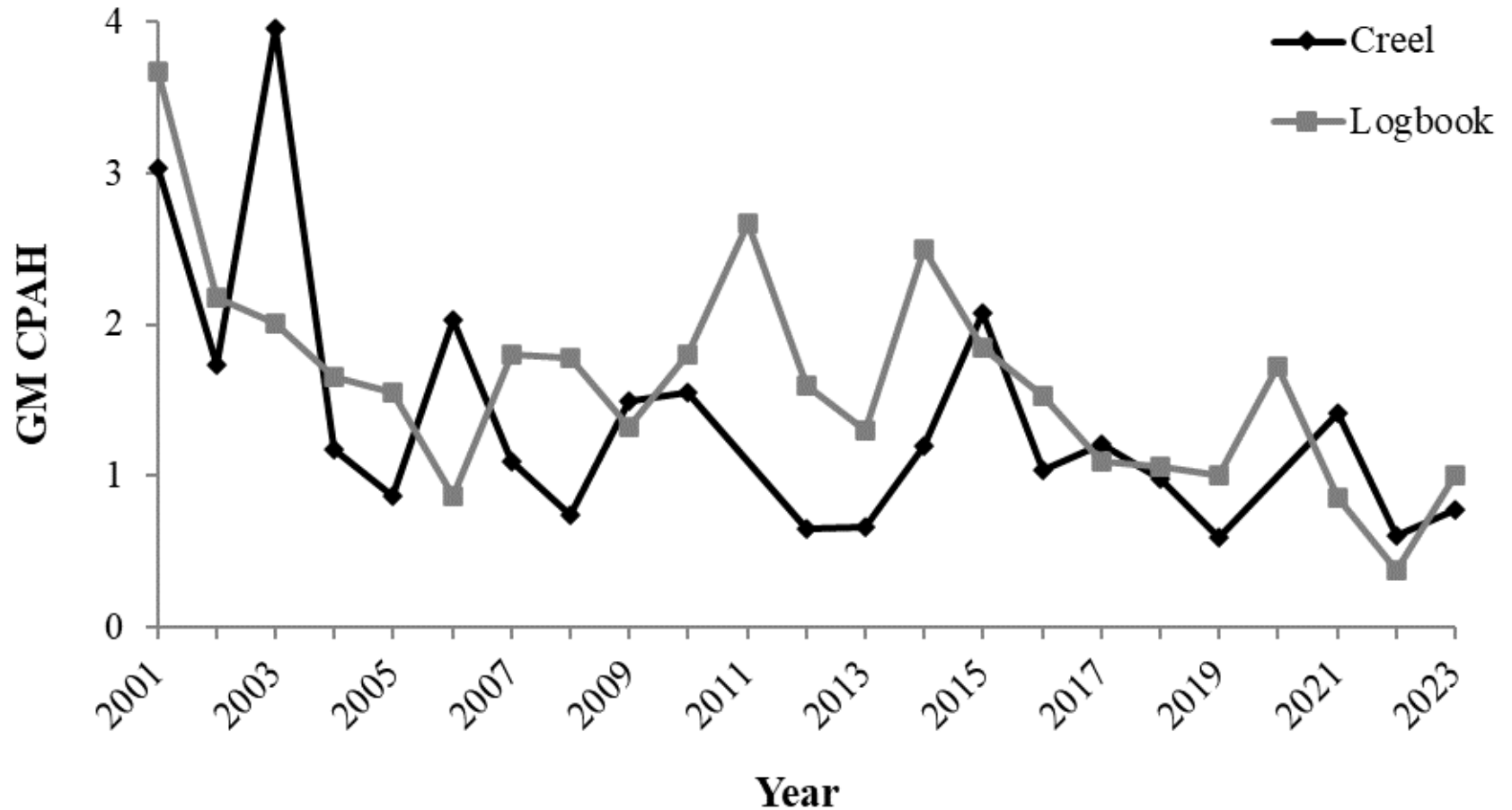


Assumptions and Caveats

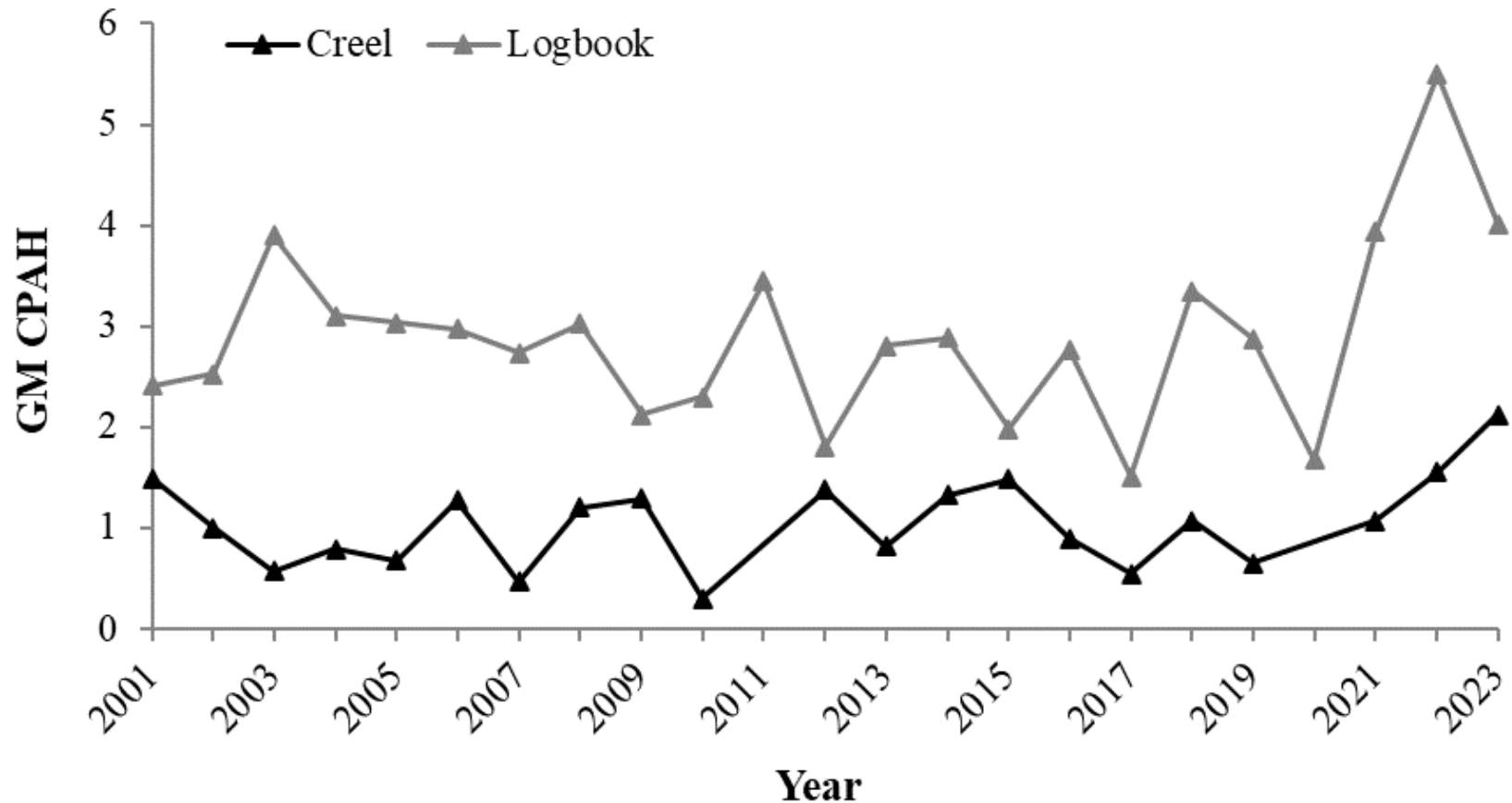


- Fallback rate, the time to enter the fish lifts, and post-release mortality are static across years
 - Mortality from predation has likely increased
- Fallback rates from the telemetry studies may differ compared to MD DNR tagged fish
- Changes are accounting based, rather than model based
 - New variability not quantified
- The values are only a rough estimate of fish passage efficiency
 - Still useful for examining trends

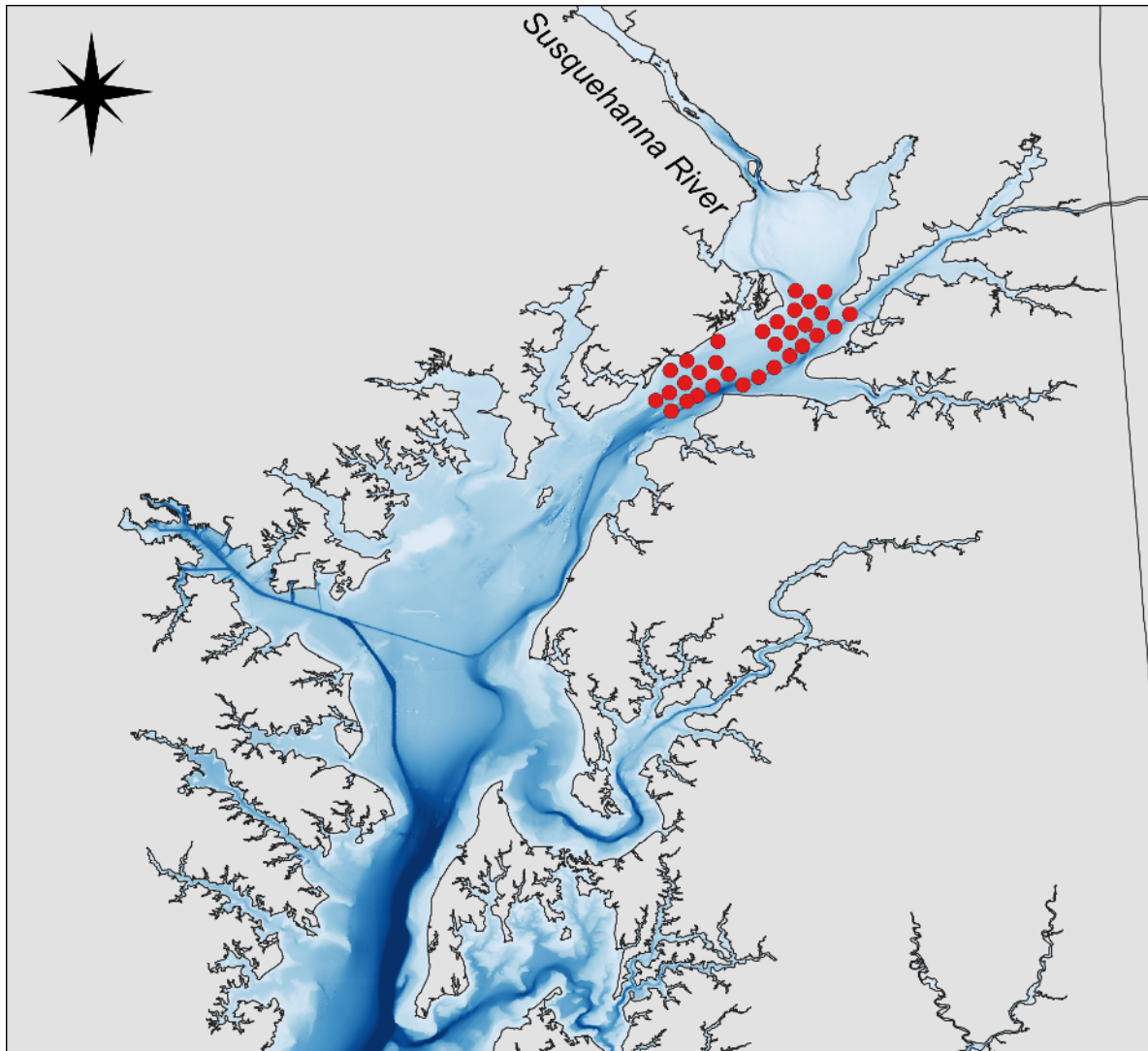
Creel and Logbook American Shad



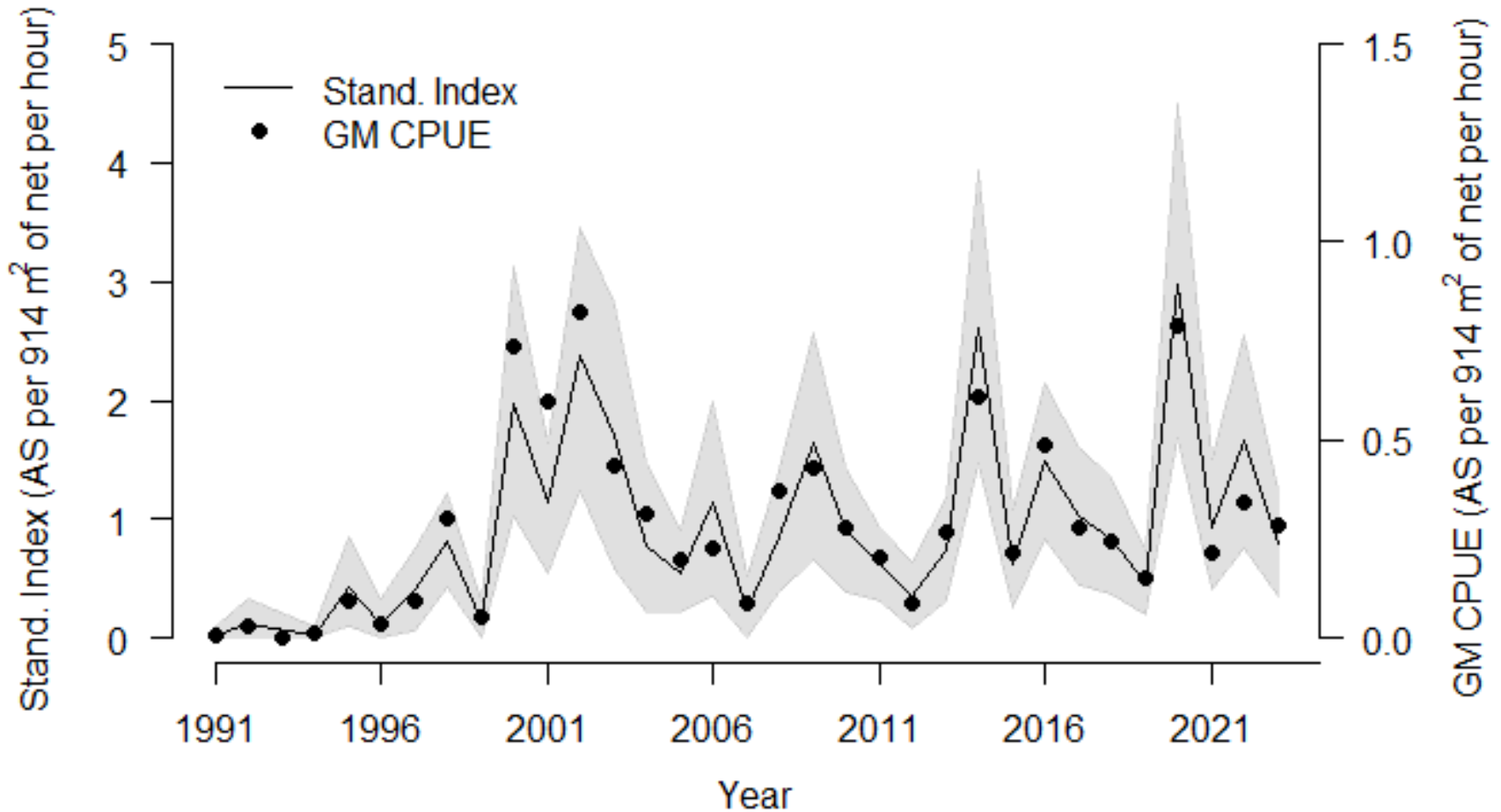
Creel and Logbook Hickory Shad



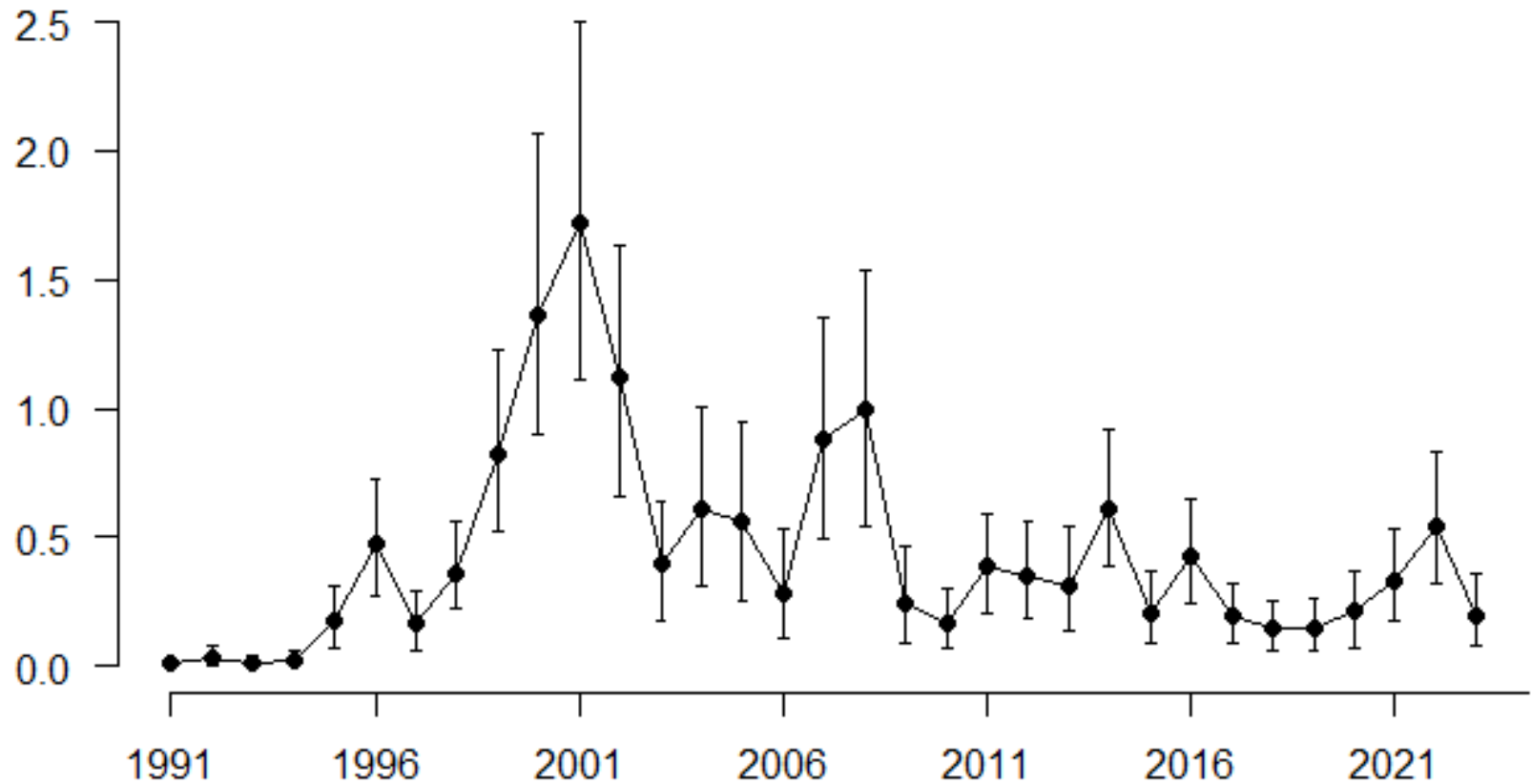
SBSSS (Upper Bay)



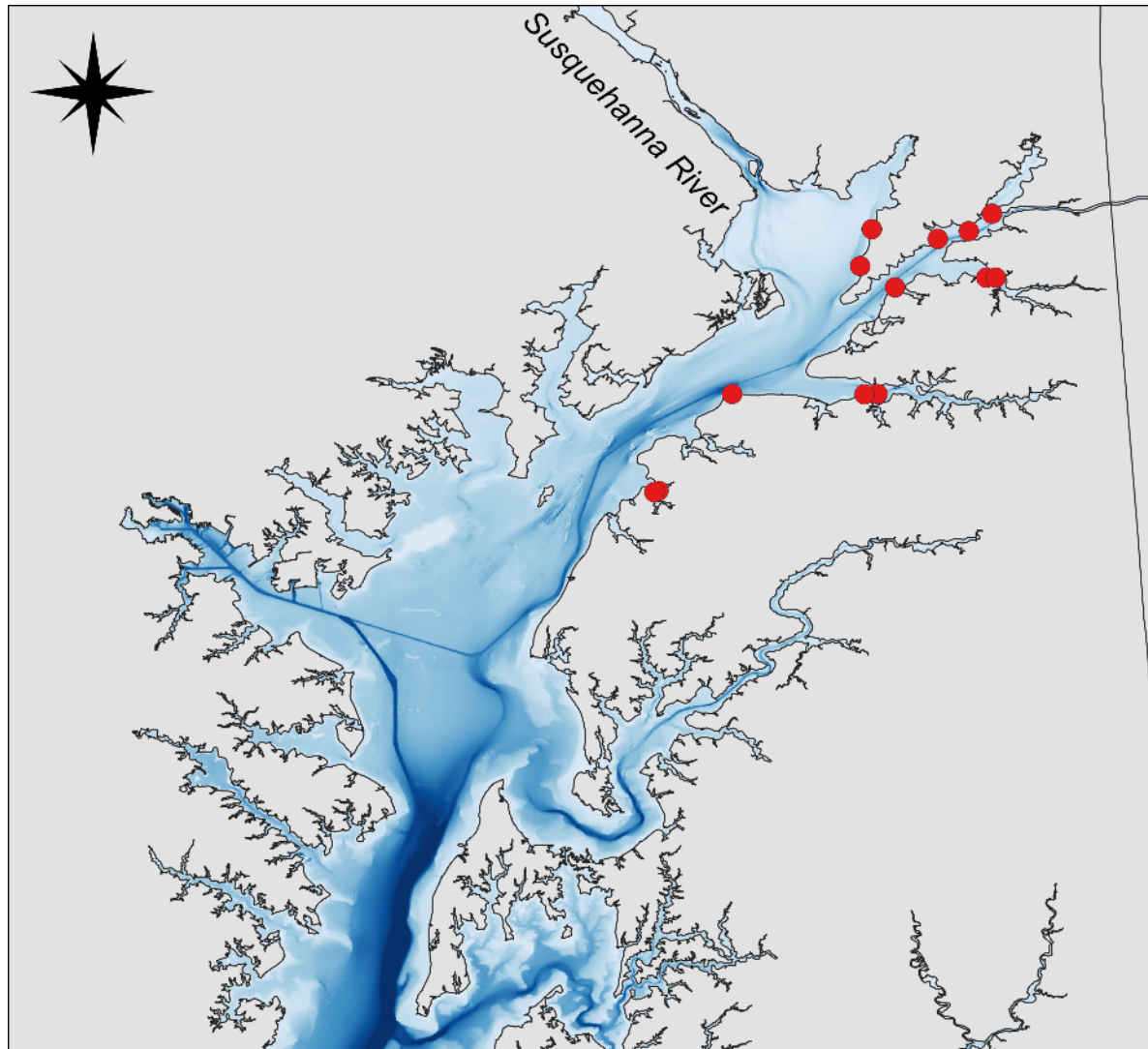
SBSSS (Upper Bay) American Shad



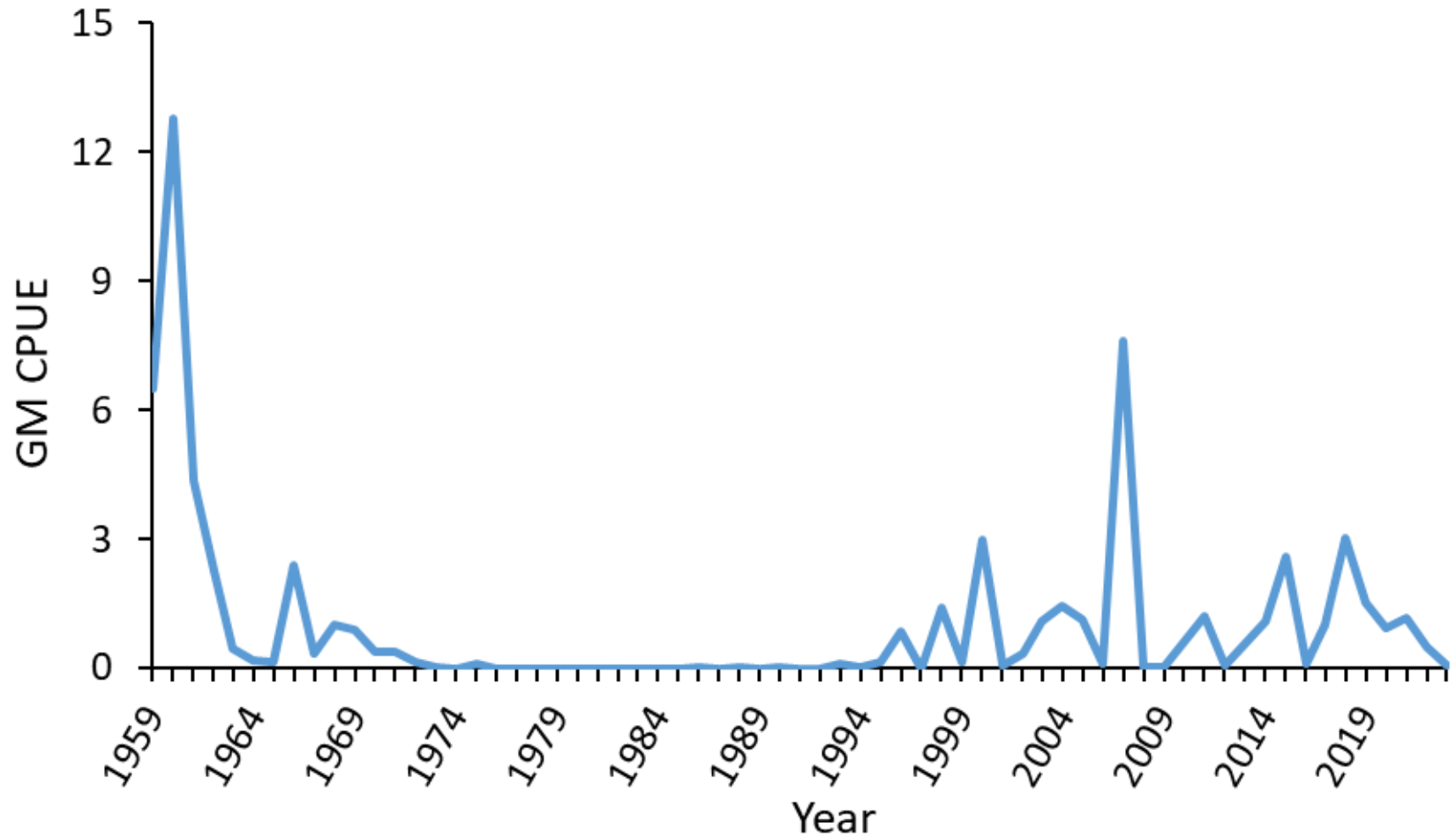
SBSSS (Upper Bay) Hickory Shad



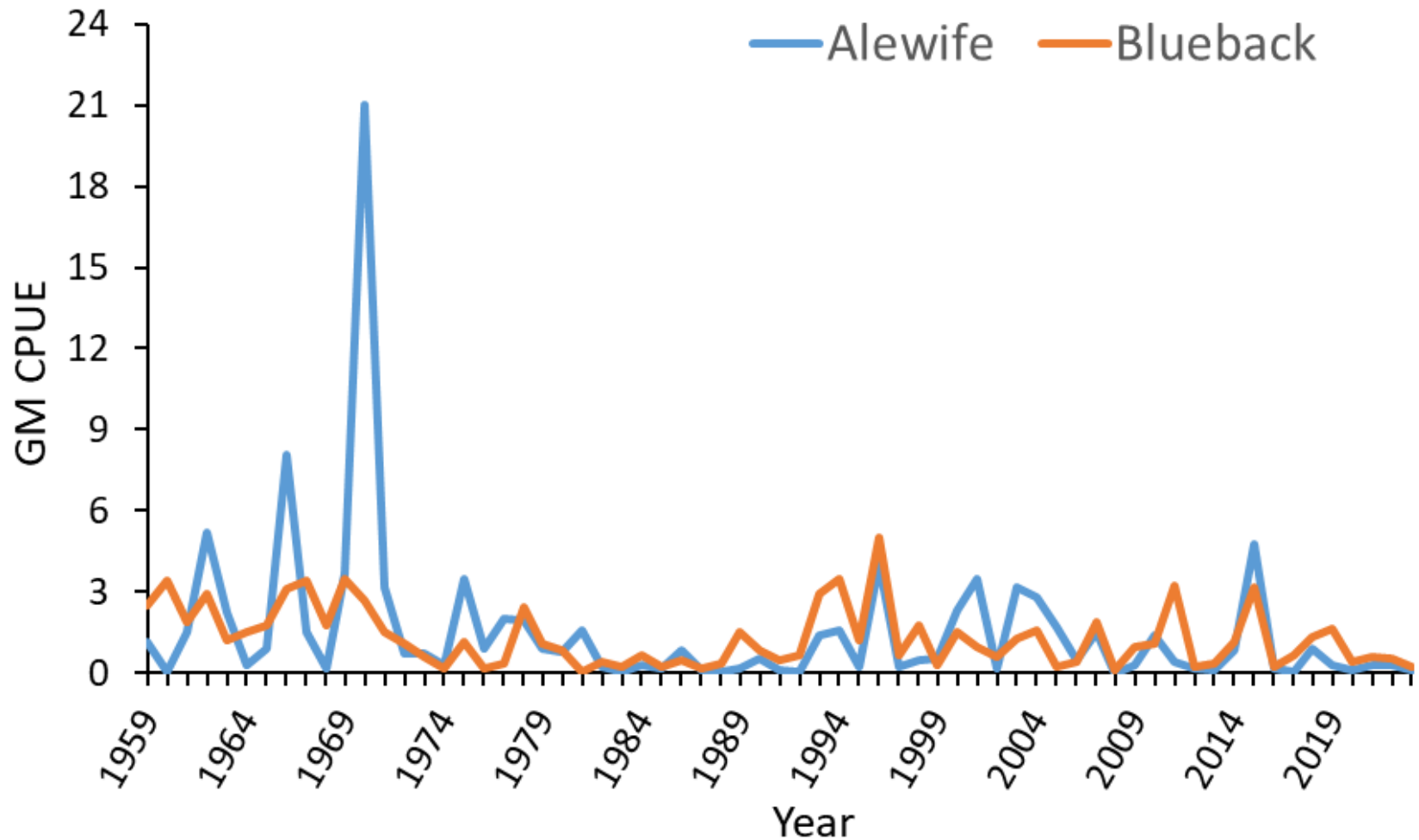
Juvenile Seine Survey



Juvenile American Shad



Juvenile River Herring



Questions?

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