Add II Revised State Plans

- States required to implement Addendum II measures by May 1, 2024
- Board approved state implementation plans on March 26, 2024 with three exceptions:
  - PA's timeline for implementing new recreational spring slot
  - MD and PRFC's timeline for paying potential 2024 commercial quota overage
- PA, MD, PRFC submitted revised implementation plans for Board consideration

A Brief Summary of Terminal Tackle Research Conducted by the *Massachusetts Division of Marine Fisheries*

Phase I: Efficacy of Circle Hooks in the Striped Bass Recreational Fishery
-Comparison of release mortality from J-hooks vs. circle hooks

Phase II: Comparison of release injury/mortality from various terminal tackle
-using citizen science to increase sample size for a mortality model

Phase III: Survey of Terminal Tackle Use
-in planning stages (2 year horizon)

Acknowledgements

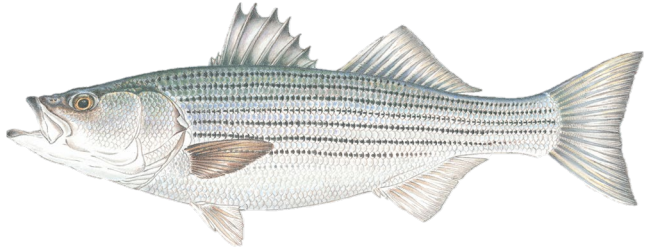
- Dr. Micah Dean
- Bill Hoffman
- Ben Gahagan
- And many others

Phase I: Efficacy of Circle Hooks in the Striped Bass Recreational Fishery

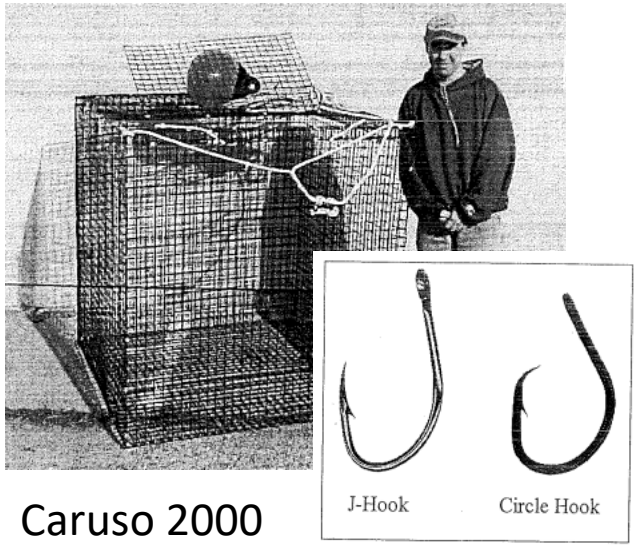
-Comparison of release mortality from J-hooks vs. circle hooks

Conservation benefit of circle hooks?

- Prior studies on **striped bass** (*unpublished*)
  - Caruso 2000; Lukacovic 2000
  - Chummed with menhaden chunks
  - Survival monitored in cages for 48-72 hours
  - Circle hooks resulted in significantly lower mortality



- Prior studies on **other species**
  - Reviewed by Cooke and Suski (2004)
  - Circle hooks *generally* reduce mortality, but not in all cases and results can vary based on several factors

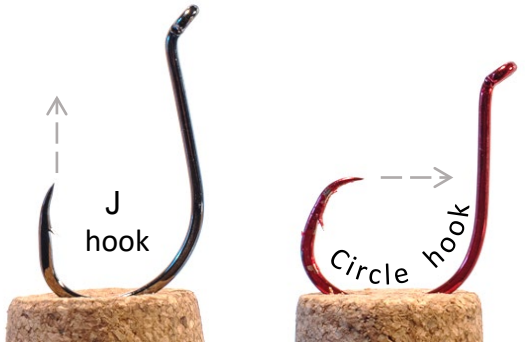


Caruso 2000

Conservation benefit of circle hooks?

Study Objectives

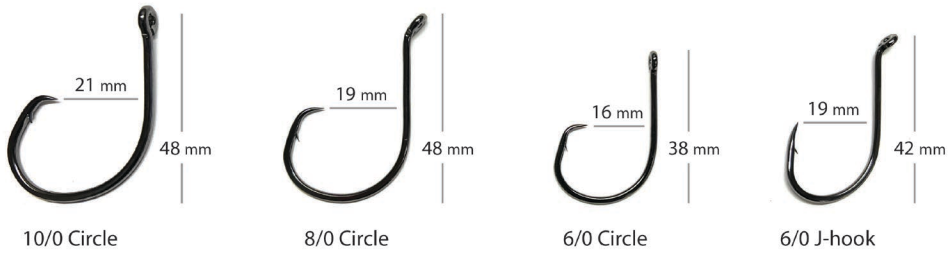
1. How much do circle hooks reduce release mortality?



2. What factors influence post-release survival?

Methods – Angling

- Typical recreational bait fishing techniques (mostly live mackerel)
- Fished from boat, close to shore (surf zone)
- Typical J-hook vs 3 popular circle hooks

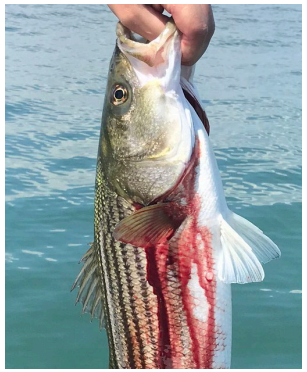


Methods – Data

- Fish – length, hook location, release condition
- Fishing – hook, bait , fight time, handling time
- Environment – date, time, location, temp

Release Condition Score

1 = no injury

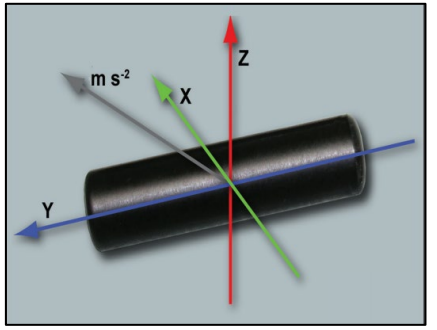


4 = mortality

Methods – Telemetry

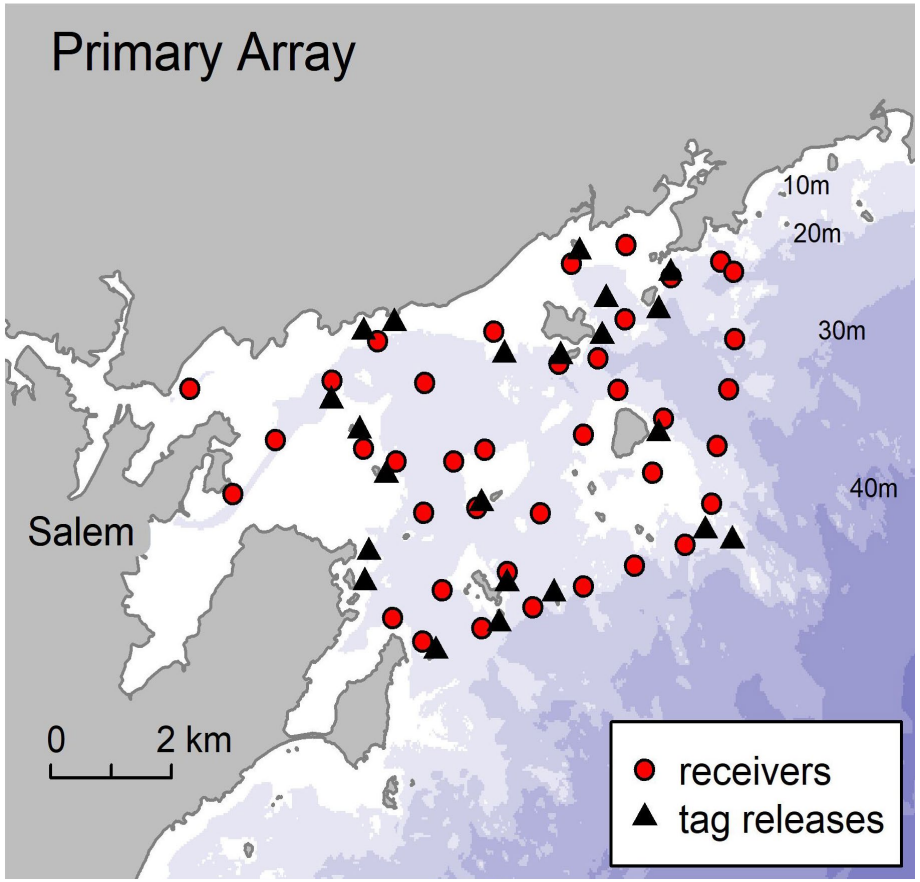
- Accelerometer tags – externally attached via harness & wire
- Receivers – deployed before 1st tag release, hauled 30+ days after last fish release

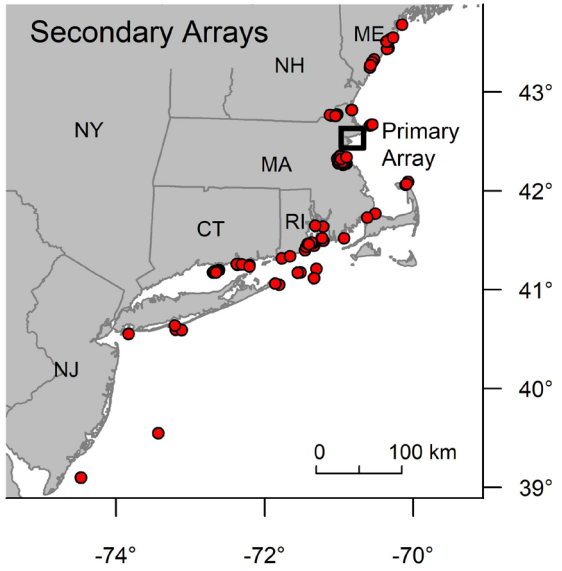
V13A tags
180-day battery
350 m range



39 receivers in primary array
45 km^2 area

Study Area

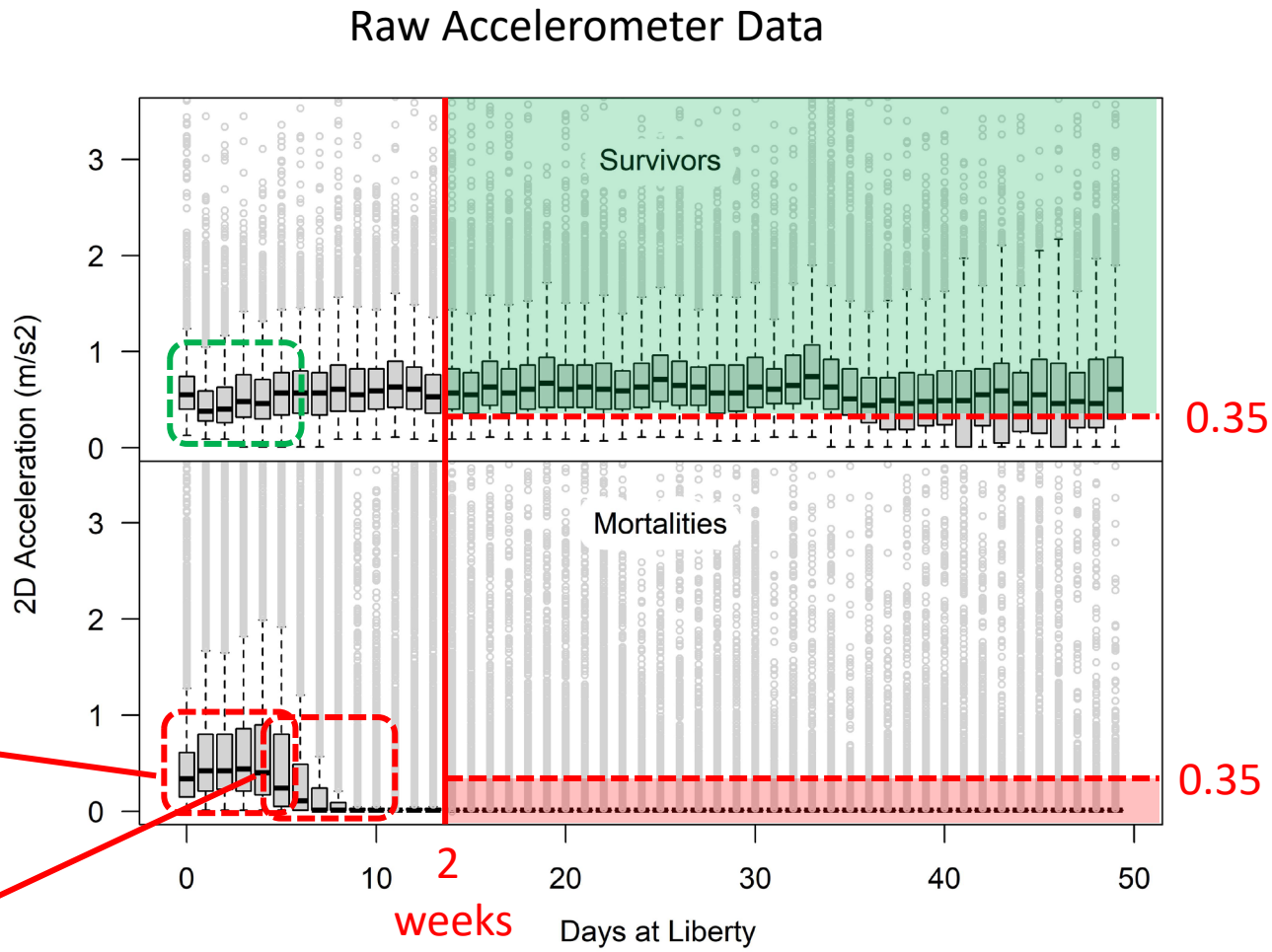




- Primary array – Salem Sound, MA
  - Summer foraging area
  - Lots of exposed rocky shoreline
- Secondary arrays – ME to NJ
  - Survival confirmation

Mortality Determination

- Inability to determine time of death from accelerometer
- Mortality via reference period
  - Dead = < 0.35 $\frac{m}{s^2}$ after 2 wks



Survival Modeling

Candidate Variables

Variable	Description
LENGTH	Total length of fish (cm)
TFIGHT	Duration of fight, from hook set to removal from water (sec)
TUNHOOK	Duration of handling time, from end of TFIGHT to hook removal (sec)
HLOCATION	Hooking location (mouth; body; esophagus; stomach; gill)
TAGGED	Was the fish tagged? (TRUE/FALSE)
CONDITION	Fish release condition, accounting for injury and vitality (1-4)
CONDFAC	CONDITION, treated as a factor
HTYPE	Hook treatment (8/0 J; 6/0 circle; 8/0 circle; 10/0 circle)
HGROUP	Hook group (J; circle)
HGAP	Hook gap width (mm)
HHEIGHT	Hook height (mm)
BAIT	Type of bait used (live or dead)
ATMP	Average daytime air temperature on day fish was released (degrees C)
WTMP	Average daytime water temperature on day fish was released (degrees C)
AWDIFF	Difference between ATMP and WTMP

Fish

Fishing

Environment

Survival Modeling

Telemetry data, n = 349

Candidate Variables

Variable	Description
LENGTH	Total length of fish (cm)
TFIGHT	Duration of fight, from hook set to removal from water (sec)
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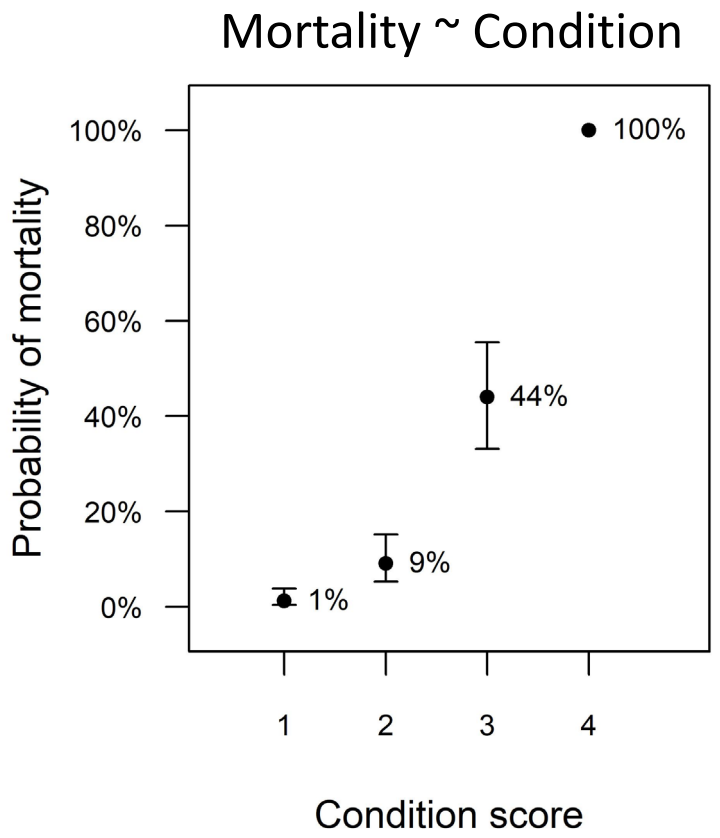
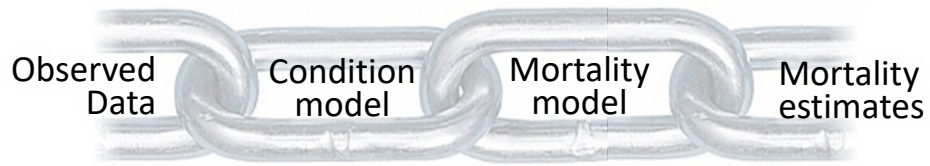
AWDIFF	Difference between ATMP and WTMP

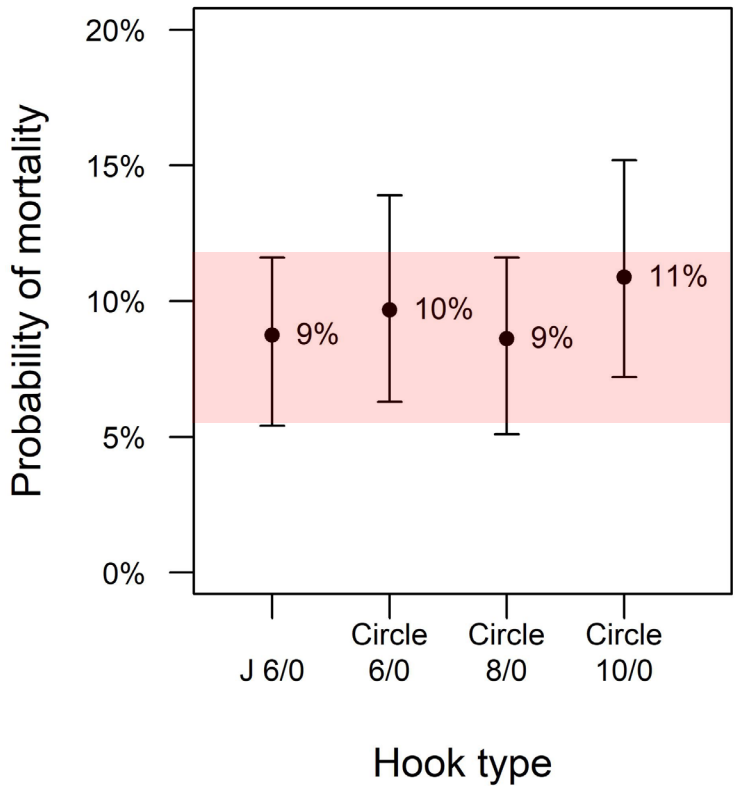
Logistic regression

Step	Model	BIC	ΔBIC
1	MORTALITY ~ 1	225.92	
2	**MORTALITY ~ CONDITION**	**162.72**	**-63.20**
3	MORTALITY ~ CONDITION + HGROUP	163.22	0.50

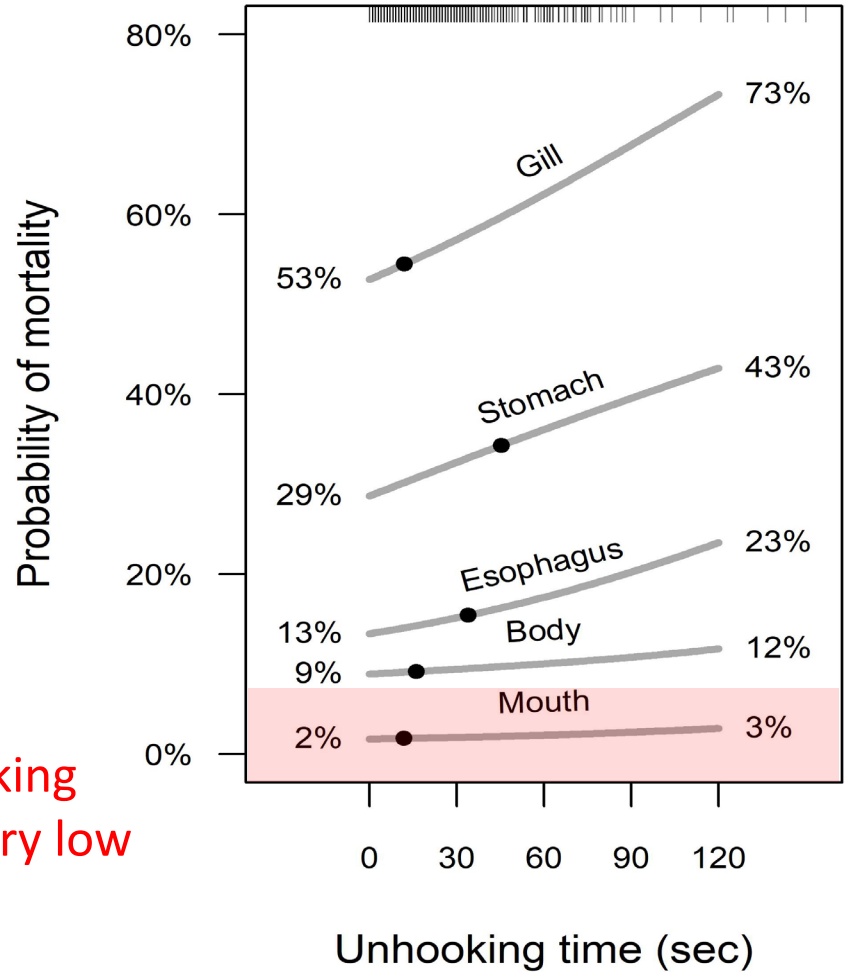


Mortality estimates by conditional reasoning





Popular circle hook models did not reduce mortality



Mouth-hooking results in very low mortality

Why no circle hook effect?

Our goal was to represent the fishery

- Popular hook models/sizes
- Popular bait fishing techniques

MA is largest source of striped bass releases

- 85% of bait is live
- 90% is mackerel or menhaden

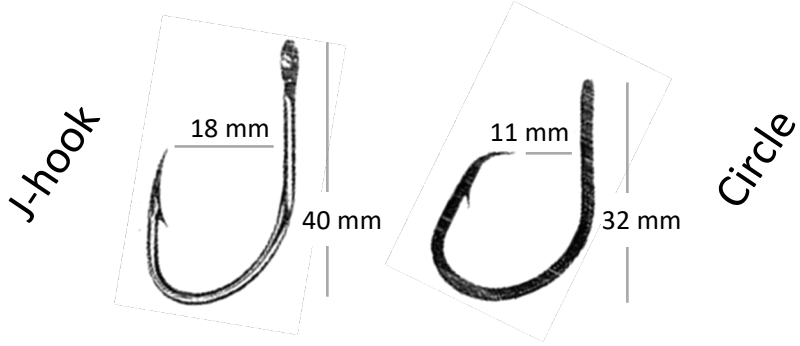
Why no circle hook effect?

- Popular circle hook models may not be optimal for minimizing gut hooking?
- Hook style may not matter as much for live bait?

Present Study

9% 9%

Caruso 2000



9% 2%

Phase II: Comparison of release injury/mortality from various terminal tackle

-using citizen science to increase sample size for a mortality model

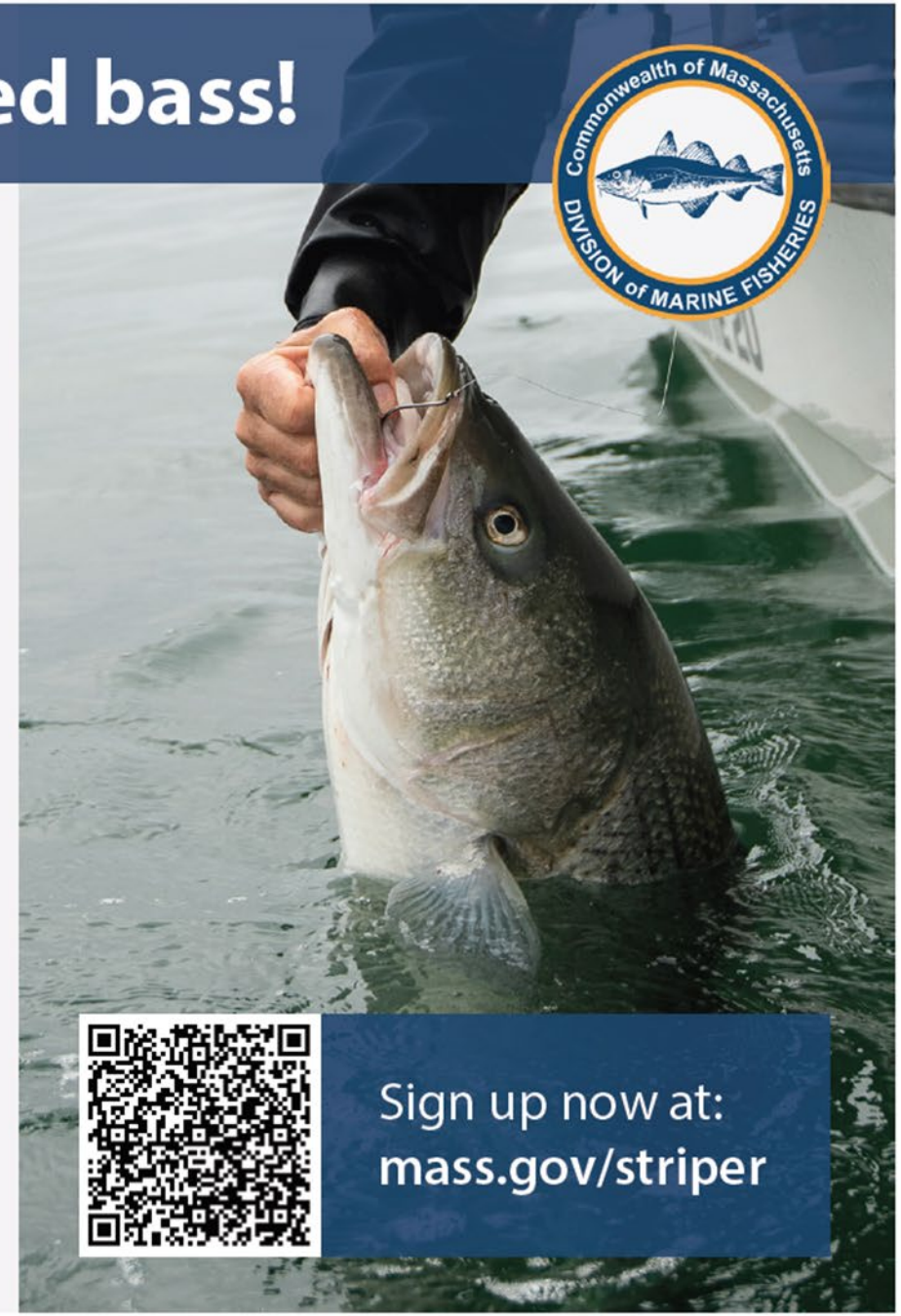
Help us conserve striped bass!

Become a citizen scientist *and help biologists understand why striped bass die after they are released.*

We are seeking volunteer anglers to record data while fishing for striped bass.

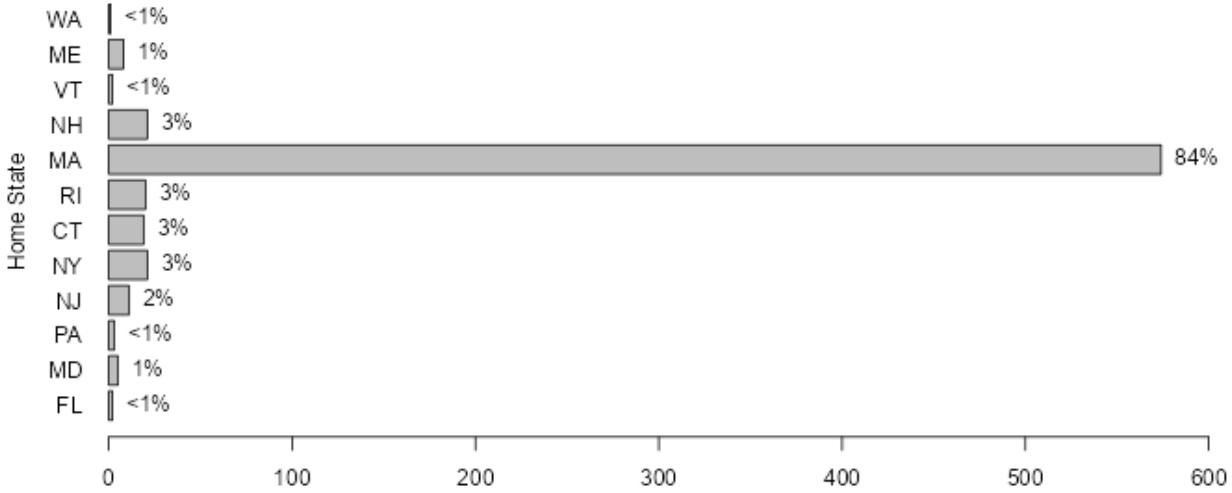
- We'll provide a kit and instructions to help you record the data we need.
- Submit your first report and get a pair of fishing pliers as a thank-you gift.
- Continued participation will keep you entered into weekly raffle prize drawings.

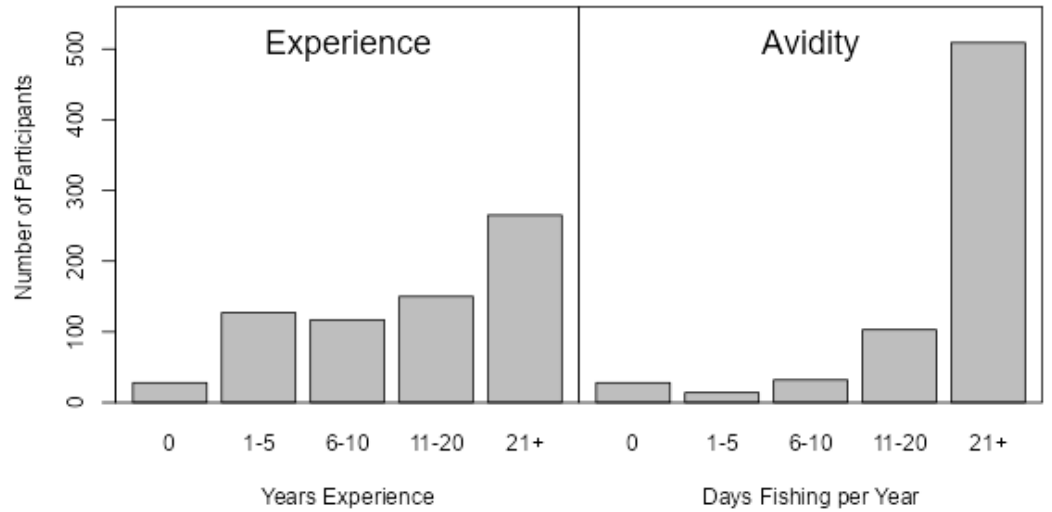
Participate for a chance to win a Shimano rod and reel combo and other prizes!



2023 Citizen Science – Anglers

- 689 signed up – Mostly from MA



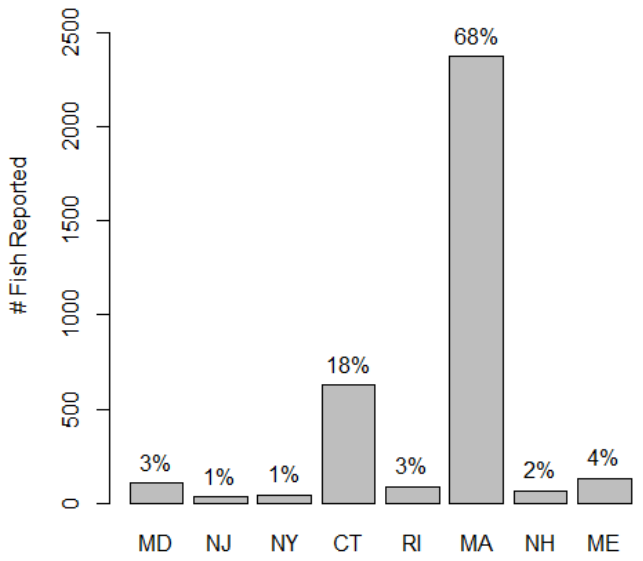


- 162 reporting (24 %)

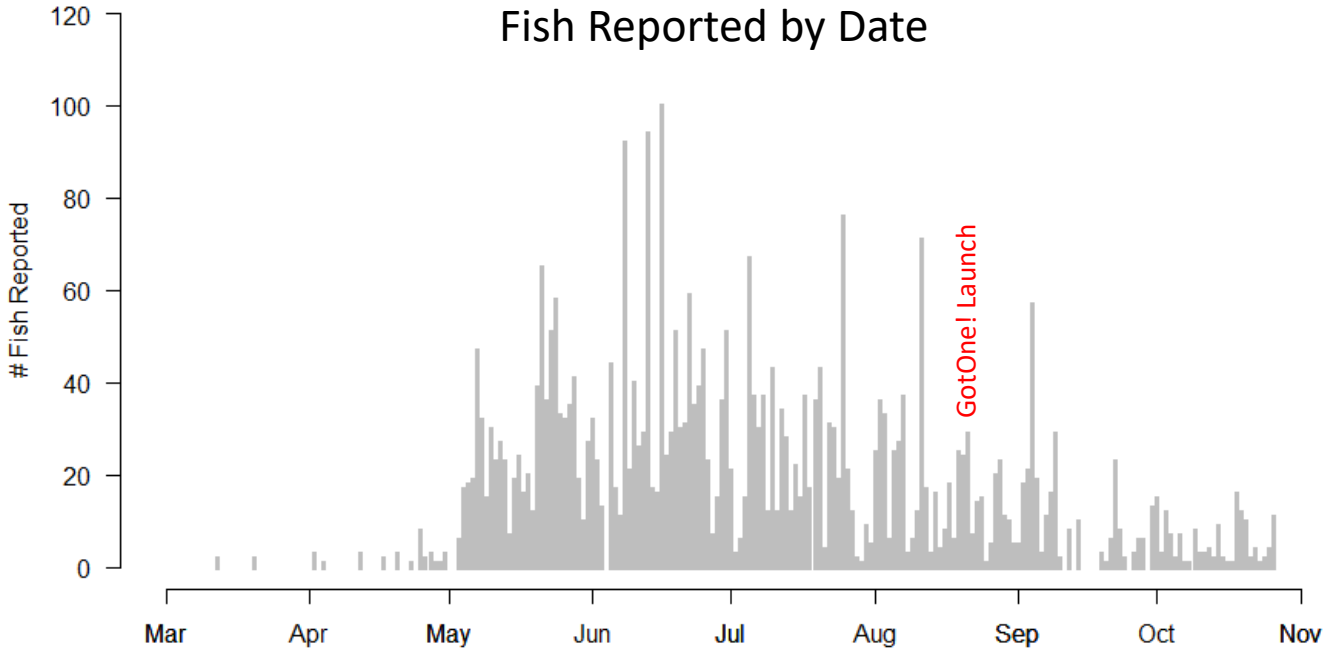
2023 Citizen Science – Reports

- 882 trips (~5.4 per angler)
- 3,580 fish (~22 per angler; ~4 per trip)
  - 3% MADMF; 4% Charters; 93% Individual anglers

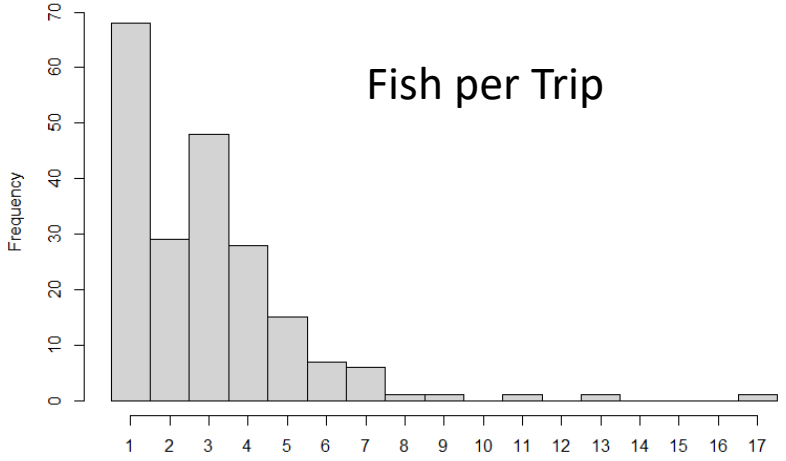
Fish Reported by Home State



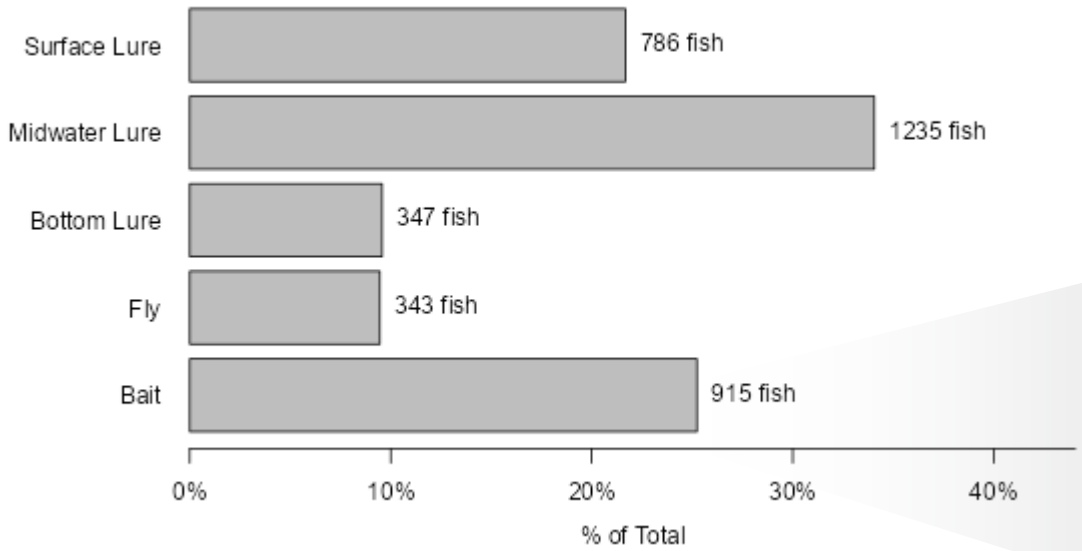
Fish Reported by Date



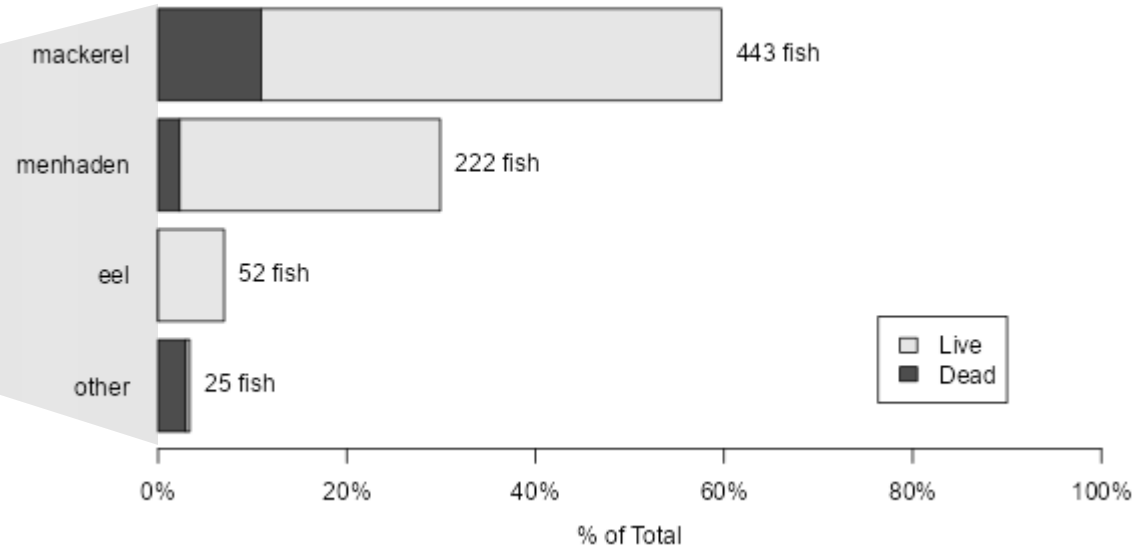
Fish per Trip



Bait / Lure choices

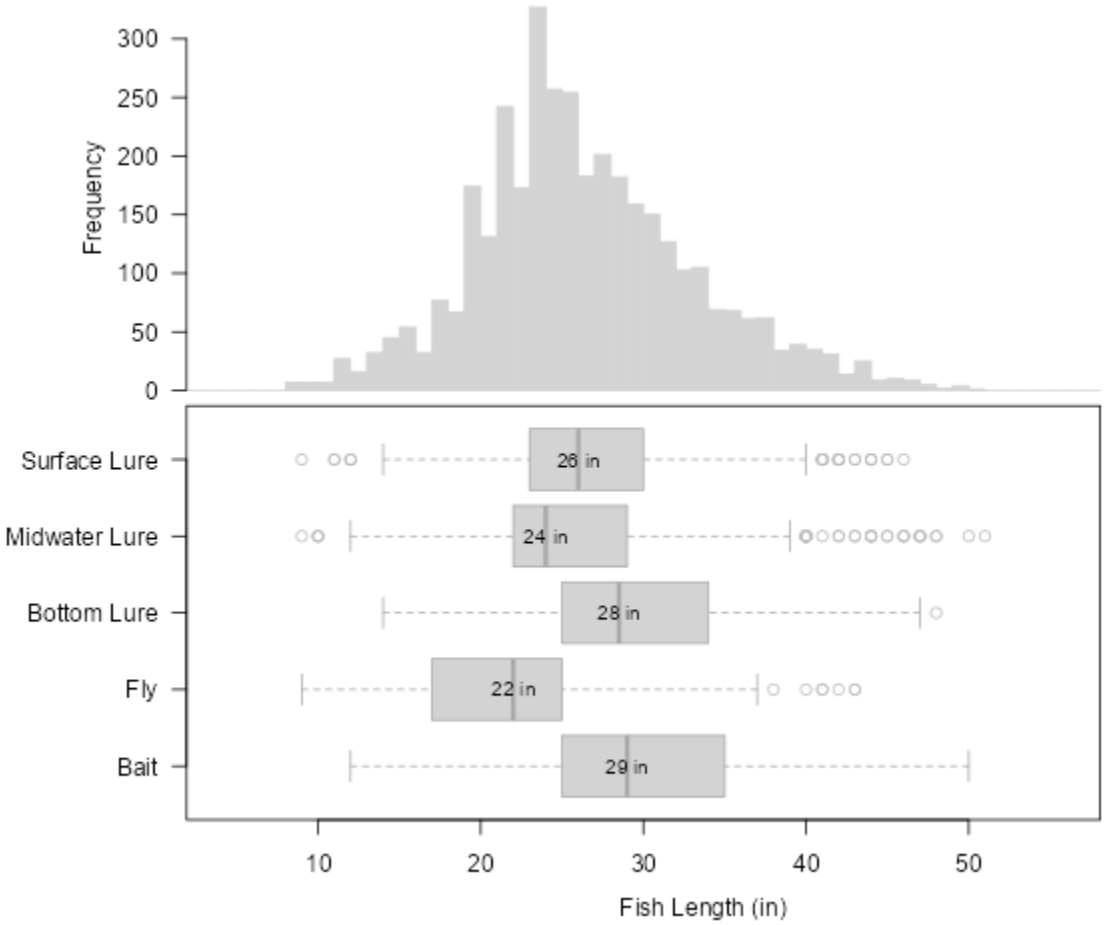


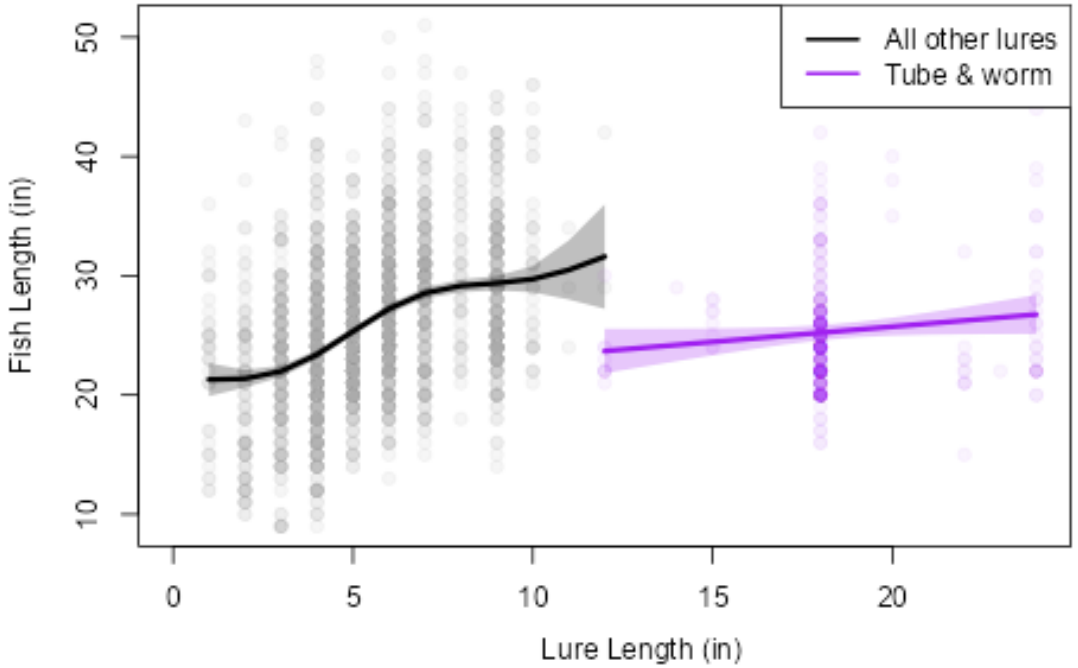
25% Bait, 75% Lures



85% Live Bait
90% Mackerel + Menhaden

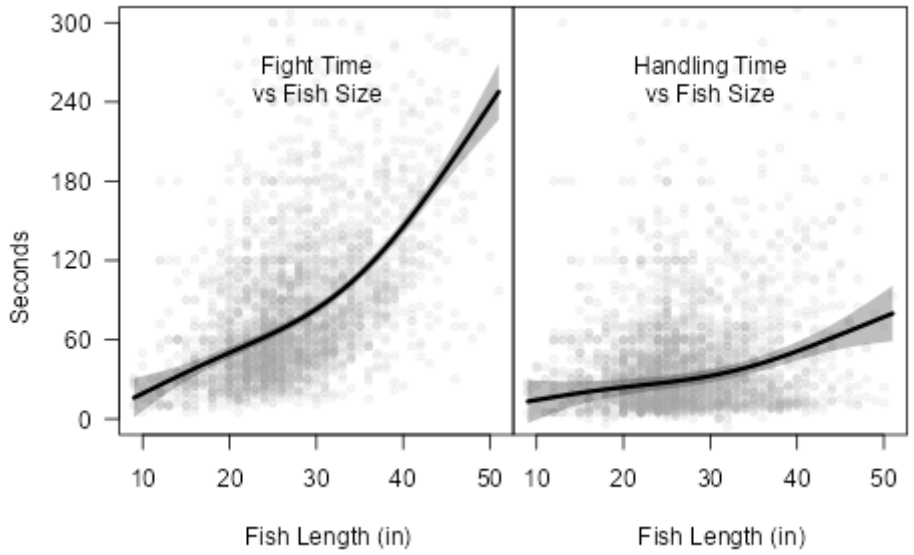
Fish Size





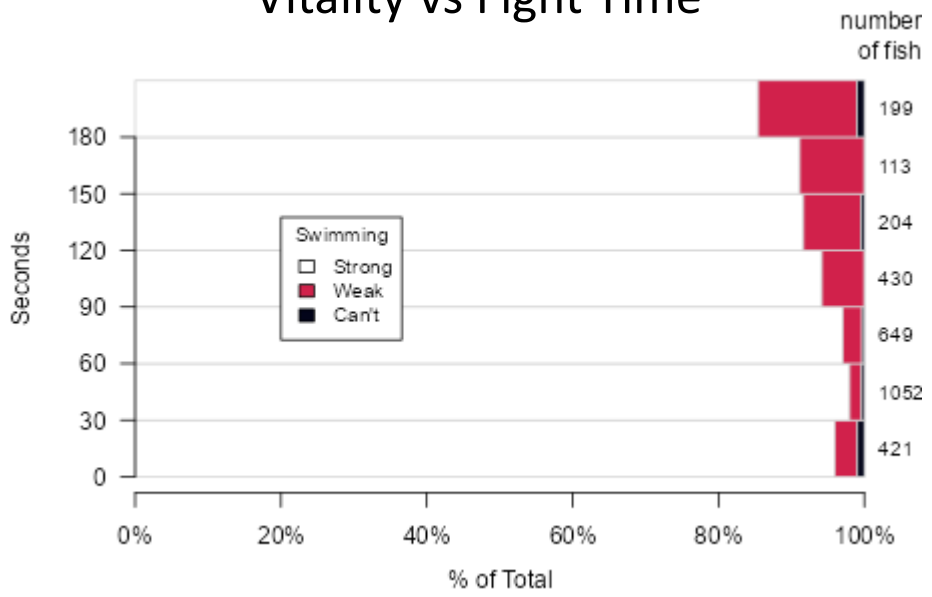
Larger lures catch larger fish

Fight & Handling Time

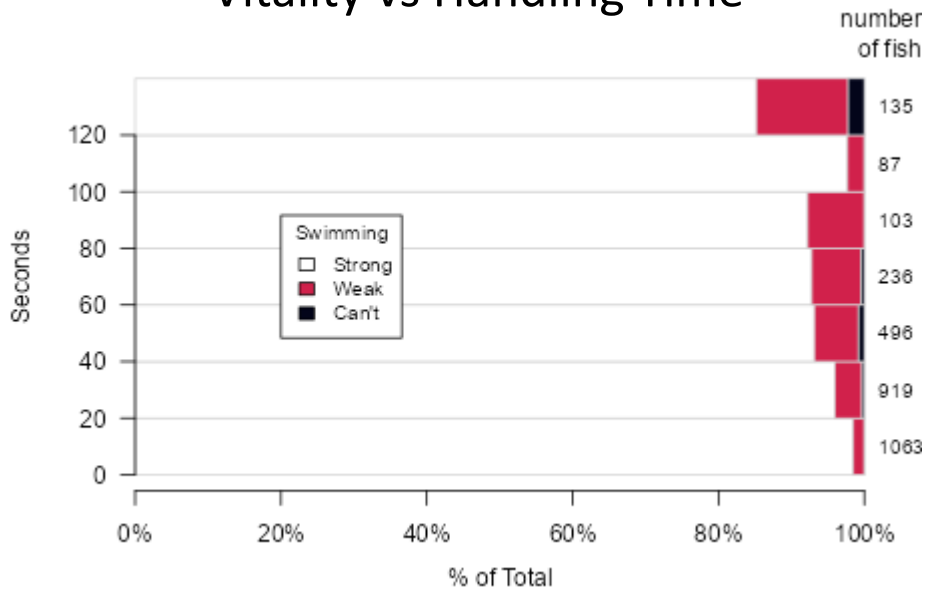


Larger fish take longer to fight & handle
Longer fight & handling times → worse condition

Vitality vs Fight Time

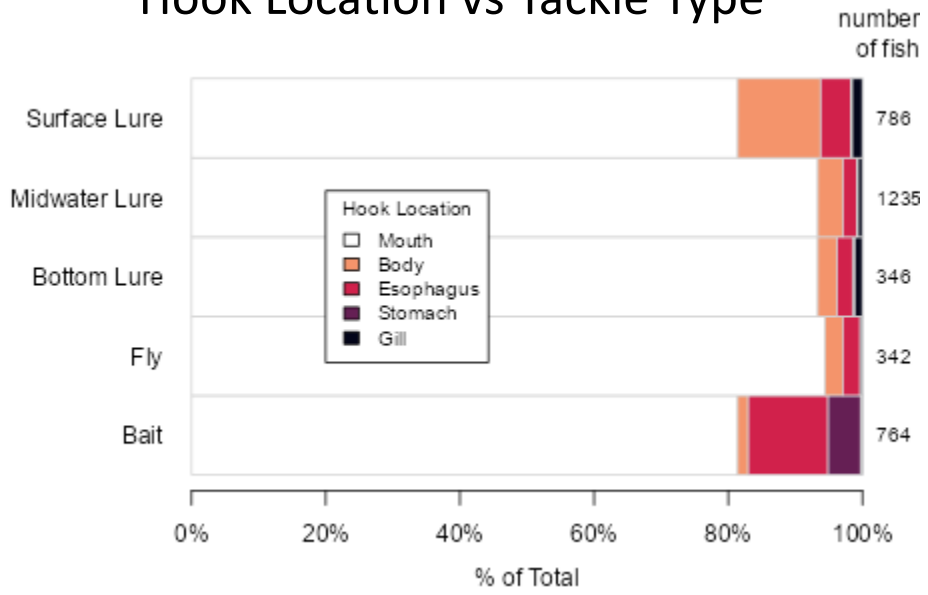


Vitality vs Handling Time



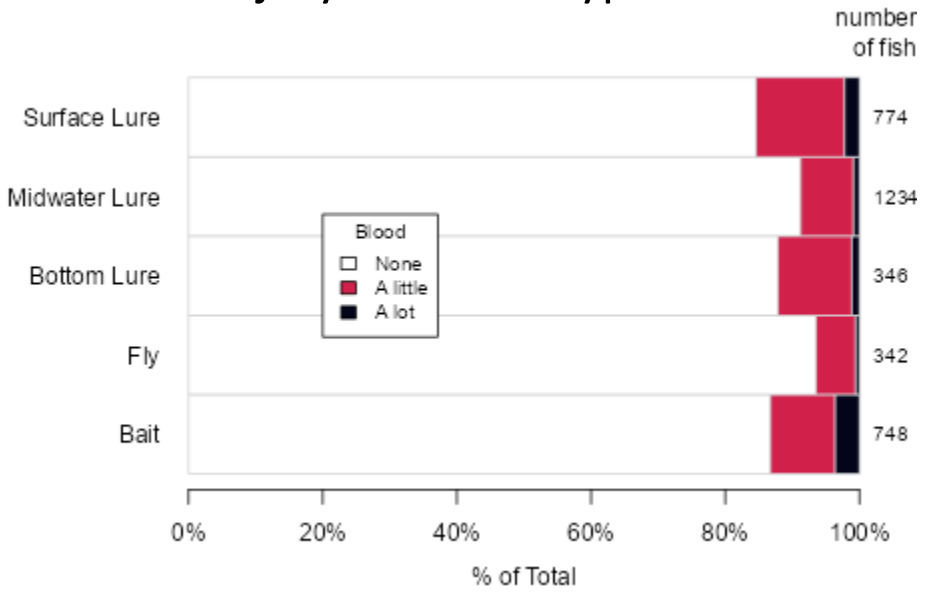
Tackle Type

Hook Location vs Tackle Type

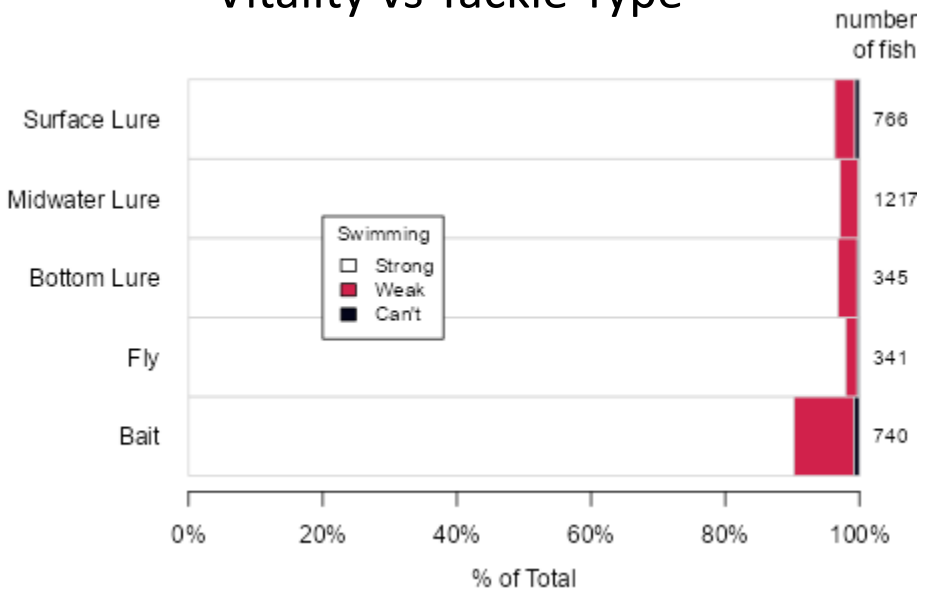


Bait results in more gut hooking
Surface lures result in more foul hooking

Injury vs Tackle Type

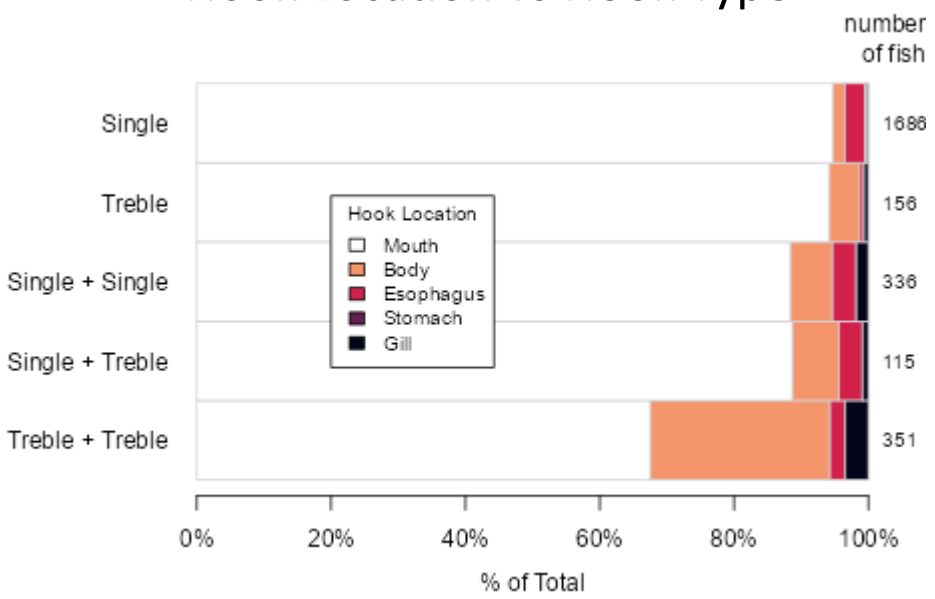


Vitality vs Tackle Type

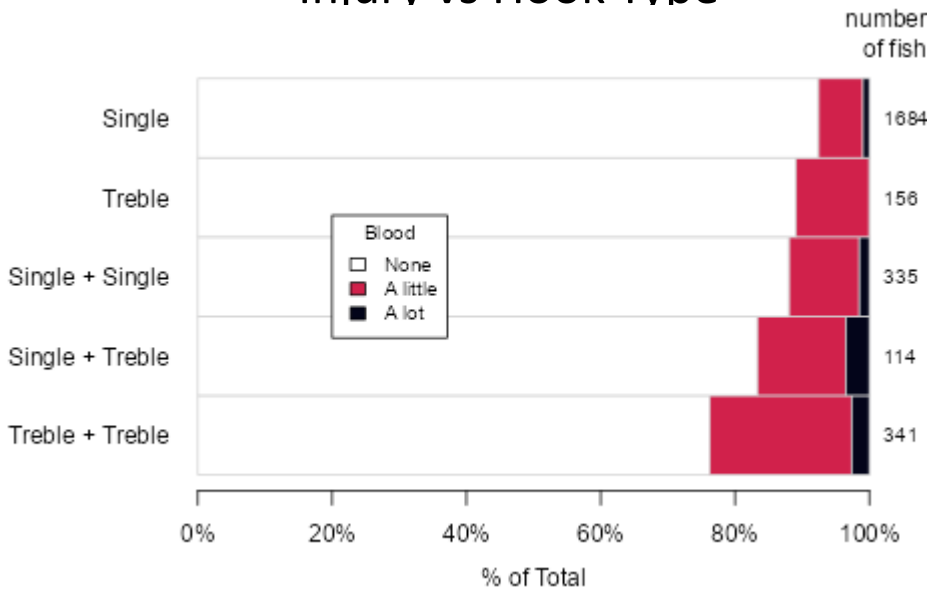


Hook Type – Lures Only

Hook Location vs Hook Type



Injury vs Hook Type

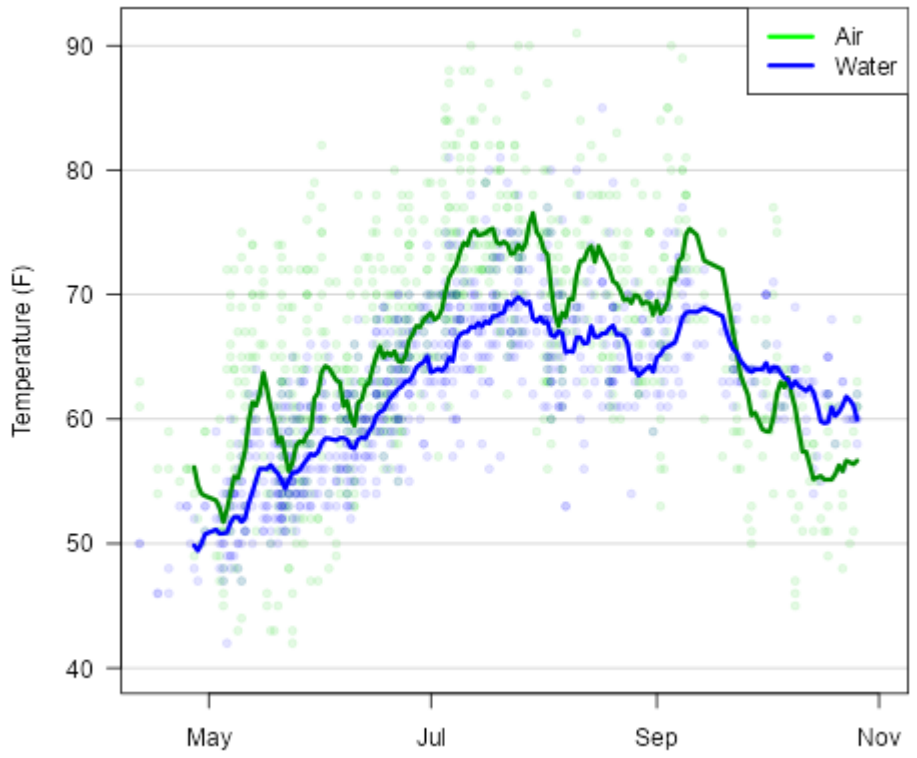


Treble hooks cause more injury

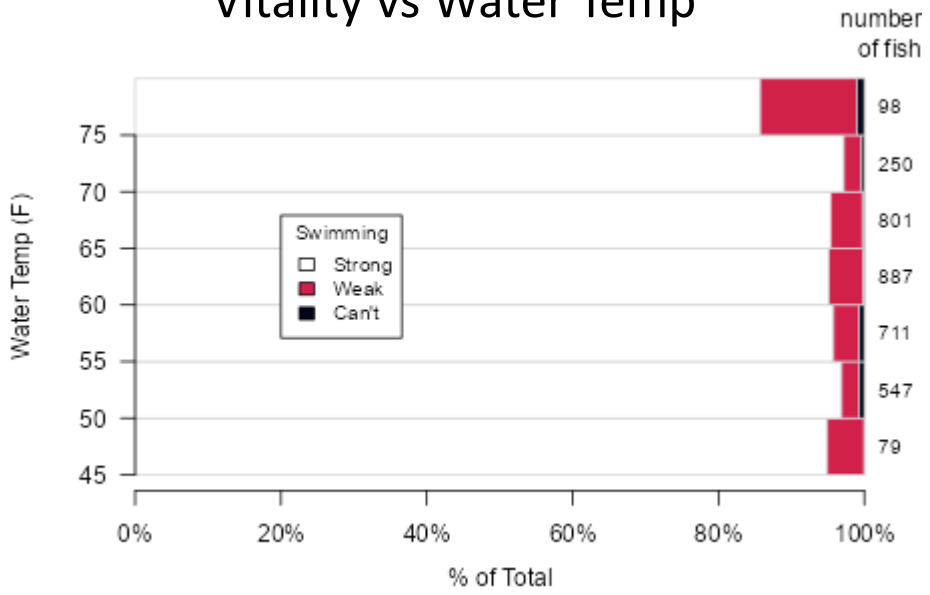
Multiple hooks cause more injury

Water Temperature

Air & Water Temp of released fish



Vitality vs Water Temp

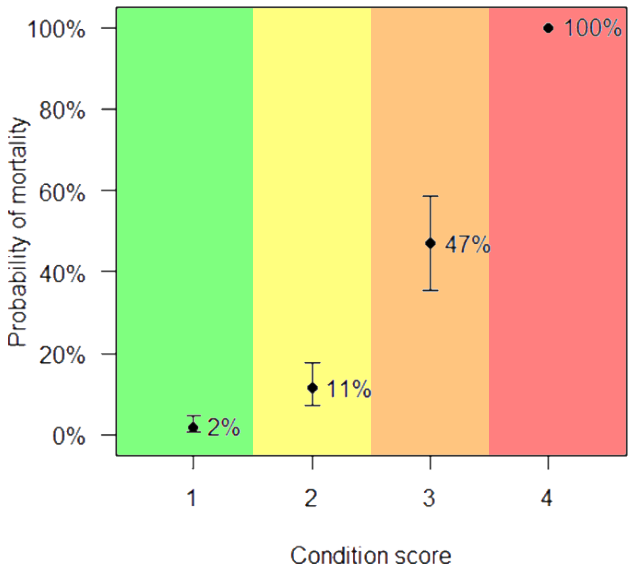


Worse condition in water temps > 75 F

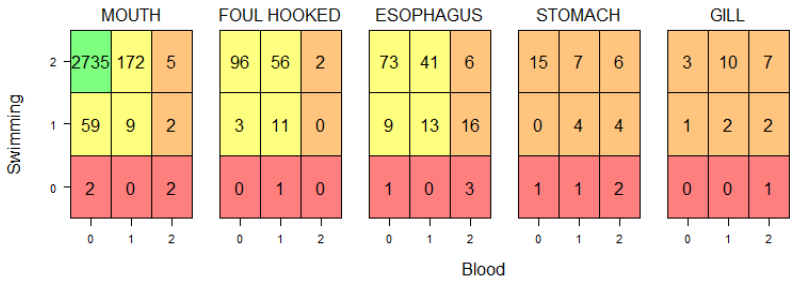
Citizen Science → Condition Scores → Mortality Rates

Mortality by Condition Score

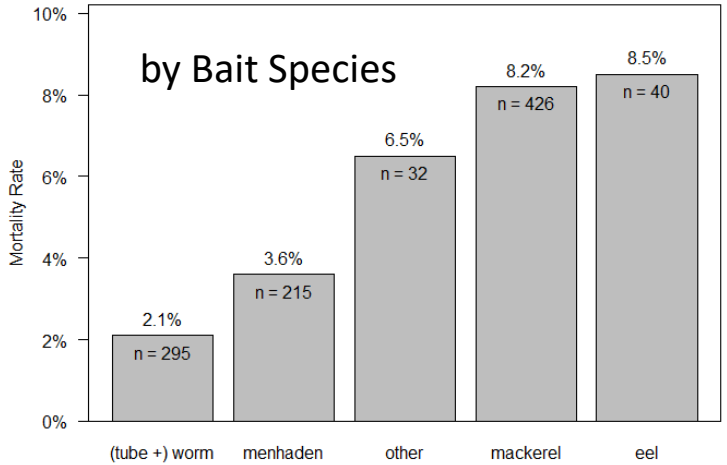
From telemetry

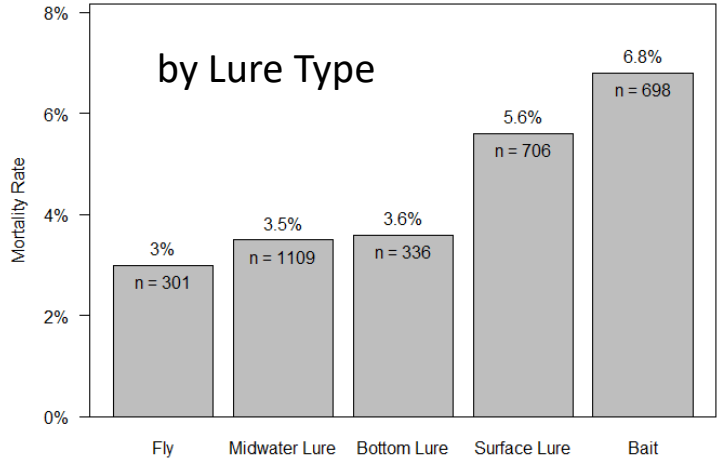


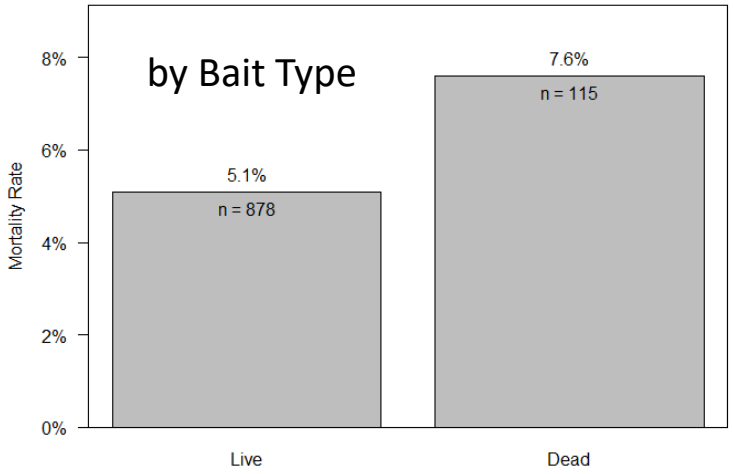
Condition Scores from Citizen Science

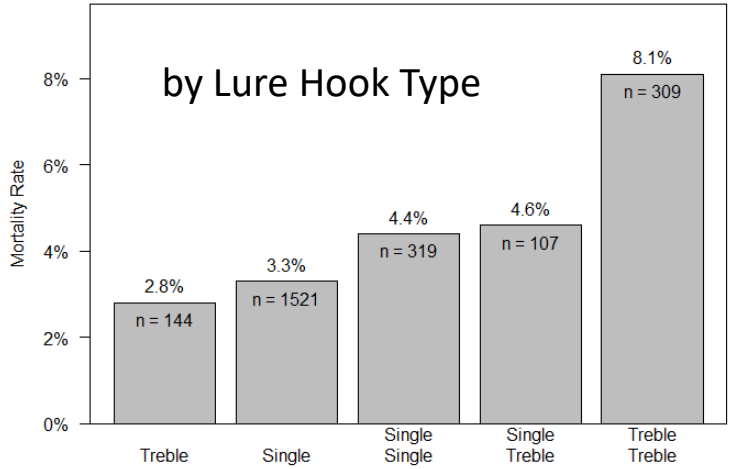


Predicted Mortality Rates by Bait/Tackle Type









Conclusions for 2023 Citizen Science

- Efficient and effective method of collecting discard data
  - n = 3,500+ for the cost of sampling kits and raffle prizes (~$25,000)
- Partnerships expand outreach
- Discard Mortality of Lures < Bait
  - Tackle choices, handing time, fight time, water temperature also important

Data Collection will continue into 2024 with recruitment of participants from other States

Phase III: Survey of Terminal Tackle Use
-in planning stages (2 year horizon)

Striped Bass Tackle Survey

- <u>stratified-random email survey</u>
  - Randomly select X,000 email addresses from license frame
  - Hope that some will fill it out (assuming < 10%?)
  - Identify meaningful strata – zip code? Age?
  - Weight results by licenses per stratum

Draft Survey Questions:

1. **Did you fish** for striped bass last year (YES or NO)

If YES…
2. How many striped bass did you **harvest** last year?
3. How many striped bass did you **release** last year?

If answer to 3 is > 0
4. What % of striped bass did you catch using live or dead **bait**? (0-100)
If > 0
   - 4.1. Did you predominantly use **live or dead** bait? (LIVE or DEAD)
   - 4.2. When bait fishing, what % of striped bass were caught using **mackerel**? (0-100)
   - 4.3. When bait fishing, what % of striped bass were caught using **menhaden** (aka pogies, bunker)? (0-100)
   - 4.4. When bait fishing, what % of striped bass were caught using **eels**? (0-100)
   - 4.5. When bait fishing, what % of striped bass were caught using a **different bait** species? (0-100)

If answer to 3 is > 0
5.What percent of striped bass did you catch using **artificial lures**? (0-100)
If > 0
   - 5.1. When using artificial lures, what % of striped bass were caught on **surface** lures? (0-100)
   - 5.2. When using artificial lures, what % of striped bass were caught on **midwater or bottom** lures? (0-100)
   - 5.3. When using artificial lures, what % of striped bass were caught on **flies**? (0-100)

Recreational Release Mortality Board Discussions

Atlantic Striped Bass Management Board
May 1, 2024

Outline

Board action for consideration today: Approve task for Board Work Group on recreational release mortality

- Summary of recent Board consideration of recreational release mortality
- Potential tasking questions for WG

Rec Release Mortality

- ~90% of striped bass caught recreationally are released alive
- 9% release mortality rate
- Each year from 2017-2021, number of fish removed via recreational release mortality was higher than number harvested

Rec Release Mortality

- Recreational release mortality could be addressed through:
  - Measures to increase the chance of survival after a striped bass is released (gear restrictions)
  - Effort controls (seasonal closures) to reduce the number of trips interacting with striped bass and thus the overall number of striped bass released alive

Gear Restrictions

- Addendum VI (2019) required non-offset circle hooks when fishing with bait
  - Later clarified definition of bait and exemption for artificial lure with bait attached

- Amendment 7 (2022) prohibited the use of gaffs, and requires striped bass caught on unapproved method of take to be released

Gear Restrictions

- Draft Amendment 7 PDT put forward three additional potential options that were removed from consideration prior to public comment:
  - Prohibit treble hooks
  - Require barbless hooks
  - Prohibit trolling with wire

- Board members noted complexities of specific gear requirements and variation along coast, and questioned measurable benefit of gear measures
- Outreach and education to promote best practices

Gear Restrictions

- Benefit of gear restrictions (how many fish could be saved) is difficult to quantify
  - Unknown how many anglers already use certain gear types
  - Non-compliance rates
  - Enforcement challenges proving intent or target species

Outreach and Education

- Addendum VI and Amendment 7 encouraged states to continue developing outreach and education campaigns on the benefits of circle hooks and best handling/release practices

- Board decided to encourage outreach efforts, not require it
  - Difficult to define what required program would look like
  - States already conducting outreach and education

Seasonal Closures

- Seasonal closures could be:
  - No-harvest (catch-and-release fishing is allowed)
  - No-targeting (no take, attempt to take, or target)

- Considerations
  - Trips targeting other species with incidental striped bass releases would still occur
  - May shift effort to other species, or shift effort to other times of year when striped bass fishery is open

Seasonal Closures

- Addendum VI did not consider seasonal closures
- MD and PRFC implemented no-targeting closures through conservation equivalency
  - Summer no-targeting closures when release mortality rates are relatively high in Chesapeake Bay
- These no-targeting closures still in place as part of Add II

Seasonal Closures

- Draft Amendment 7 considered seasonal closures, primarily no-targeting closures
- Enforceability concerns about no-targeting closures, but assumed higher reduction in releases as compared to no-harvest closures
- Estimating reduction in removals for no-targeting closure depends on assumptions about angler behavior, which is highly uncertain

Seasonal Closures

- Draft Amendment 7 PDT put forward options for coastwide, regional, and state closures
- Board removed coastwide and regional closures prior to public comment
  - Support for state flexibility on closure dates
  - Concern about prescribed Wave 4 coastwide closure option
  - Concern about how to define regions and avoid different closures in shared waterbodies

Seasonal Closures

- Draft Amendment 7 for public comment included options for:
  - No-targeting state-specific, two-week closures to occur when striped bass fishery is active
  - No-harvest spawning area closures
  - No-targeting spawning ground closures
- Board ultimately decided not to include closures in Amendment 7
  - Enforceability concerns for no-targeting
  - Further discussion on no-targeting
  - Existing spawning closures adequate

Seasonal Closures

- Draft Addendum II PDT put forward options combining size limit changes and no-harvest closures
- Board initially added option that could designate closures as no-targeting
- Board subsequently voted to remove all seasonal closure options from Draft Addendum II

Outline

Board action for consideration today: Approve task for Board Work Group on recreational release mortality

- Summary of recent Board consideration of recreational release mortality
- **Potential tasking questions for WG**

Potential WG Tasking Questions

Chair noted potential WG tasking questions for discussion:

- Review existing non-targeting closures, including any information on impacts to striped bass catch and effort as well as their enforceability.
- Review the MA DMF discard mortality study and other relevant reports to evaluate the efficacy of potential gear modifications.
- Identify assessment sensitivity runs which may inform Board discussion around release mortality (e.g., how low would you have to reduce the release mortality rate in order to see a viable reduction in removals with the same level of effort?).

Questions?