



***SHRIMP FMP AMENDMENT 2
MANAGING EFFORT AND GEAR IN THE NORTH
CAROLINA SHRIMP FISHERY TO REDUCE
BYCATCH***

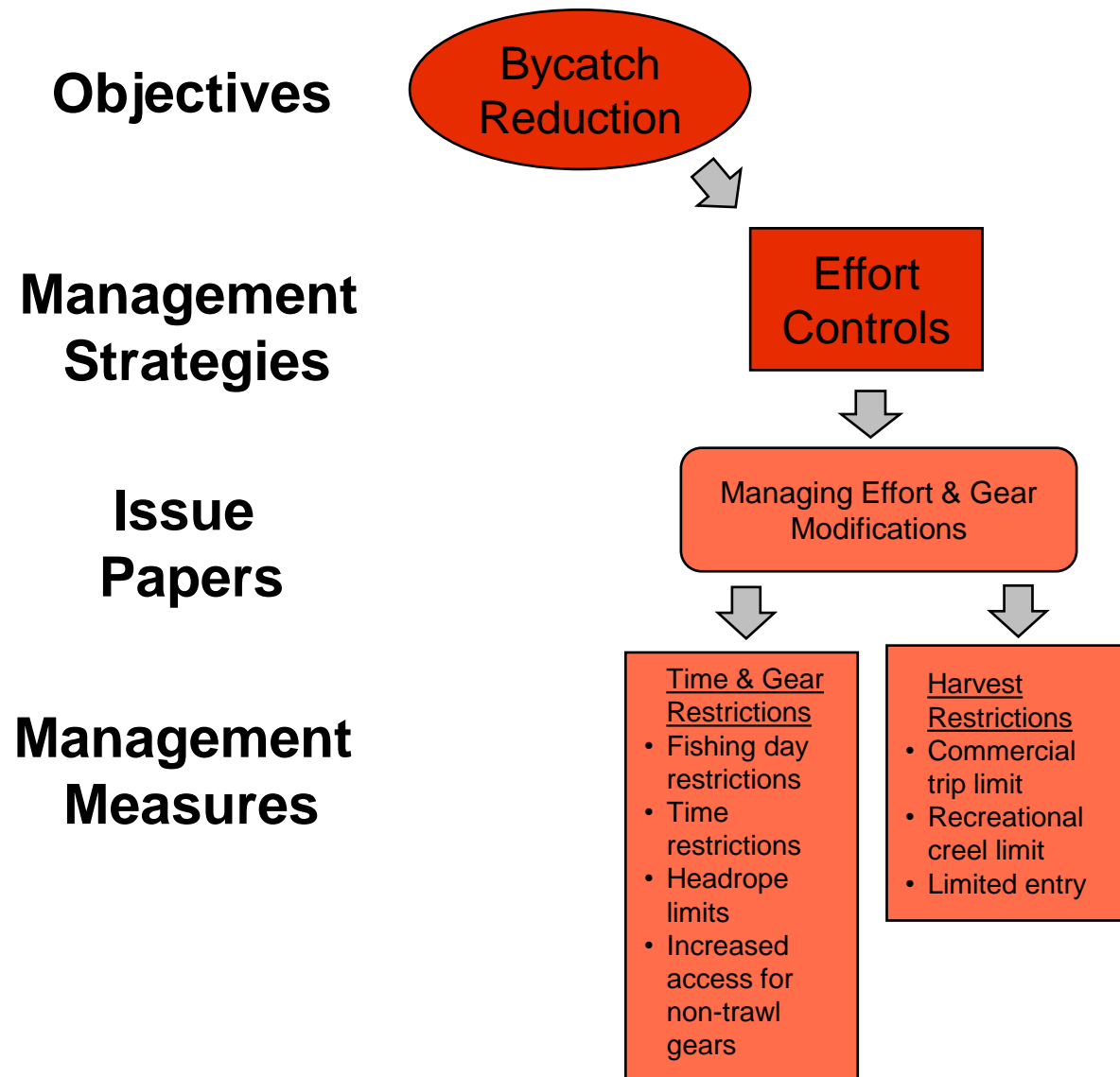
DEPARTMENT OF ENVIRONMENTAL QUALITY

Marine Fisheries

Shrimp Advisory Committee | Jason Rock | March 11, 2021



Types of Effort and Gear Management Measures



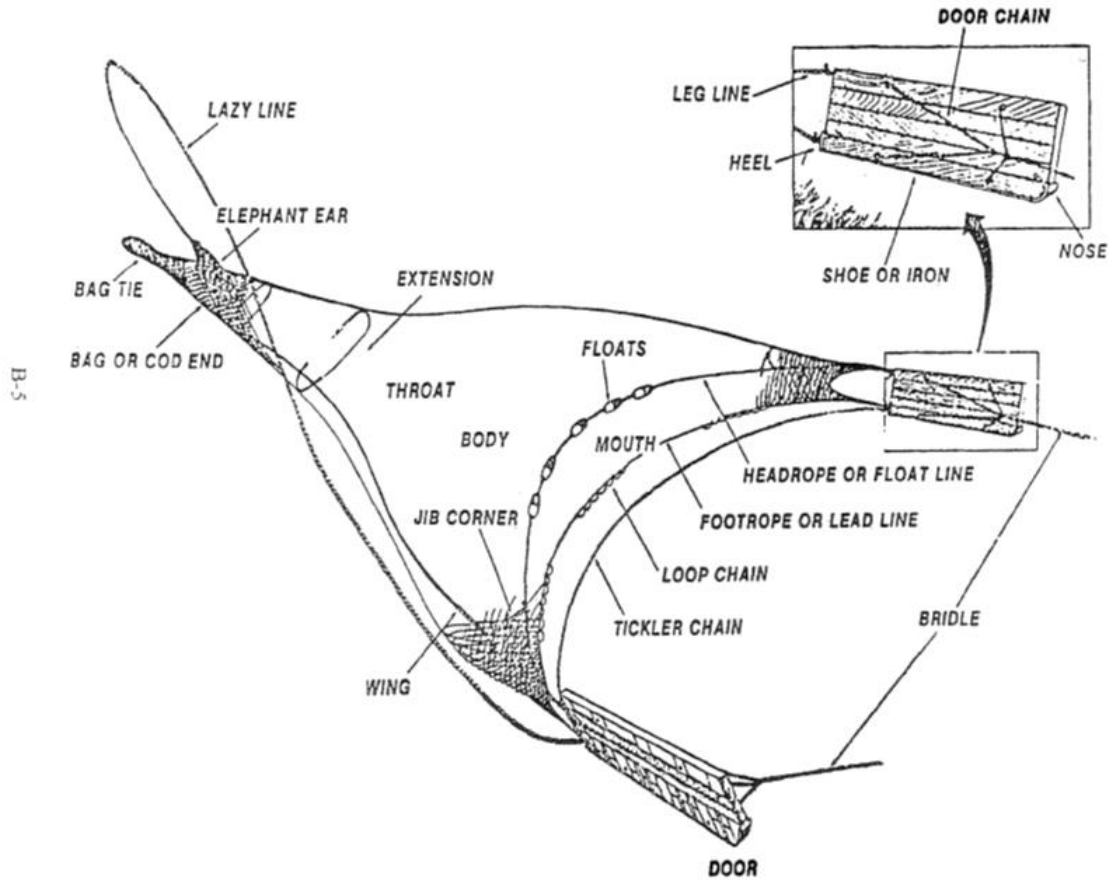
Data Sources

- NCDMF Trip Ticket Program
- CFRF Shrimp Trawl Gear Characterization Phone Survey
- NCDMF Shrimp Trawl Observer Surveys



Otter Trawl

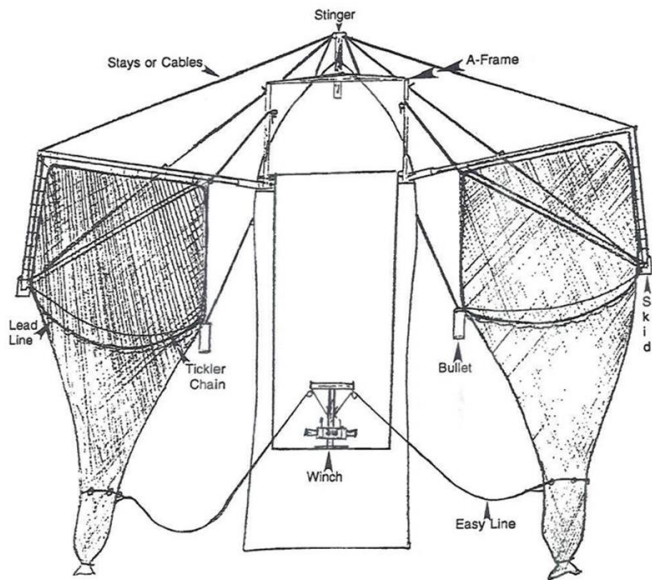
OTTER TRAWL COMPONENTS



Source: NOAA 2008



Skimmer Trawl

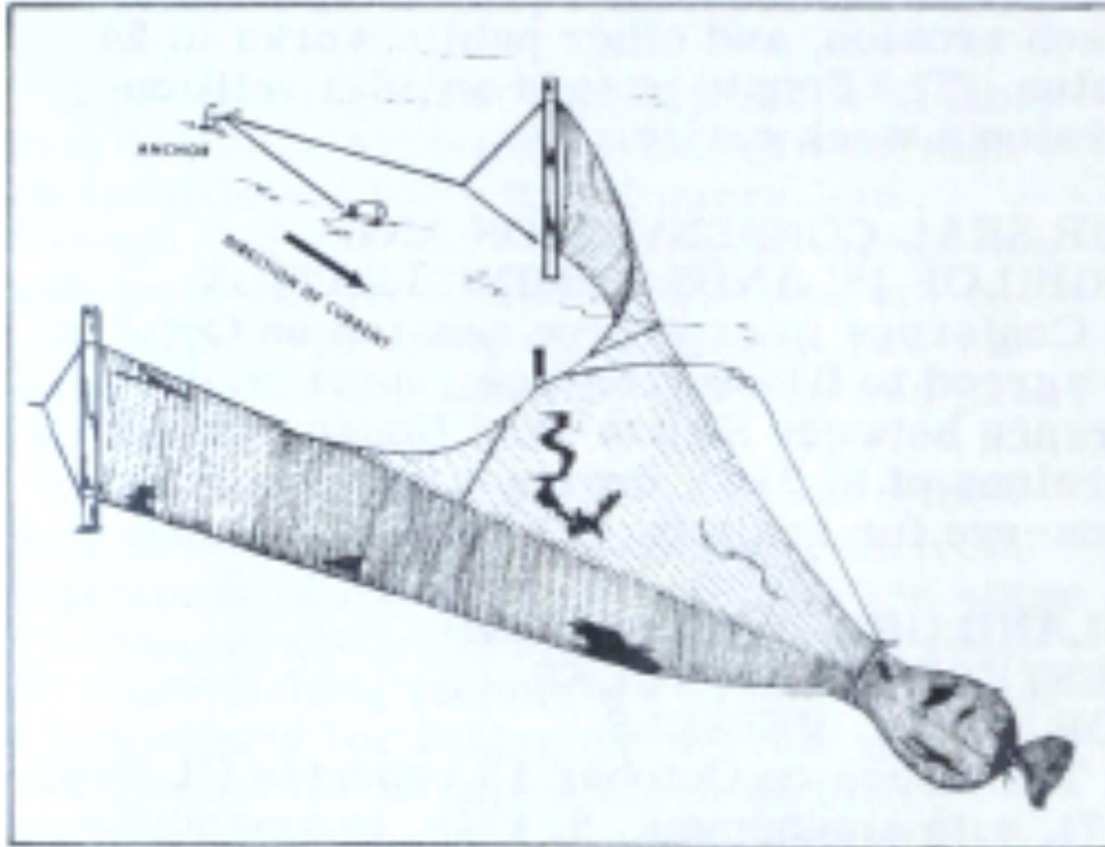


Source: Hein and Meier 1995



Photo Credit: Tina Moore

Channel Net



Source: Guthrie 1966

Shrimp Pound Net



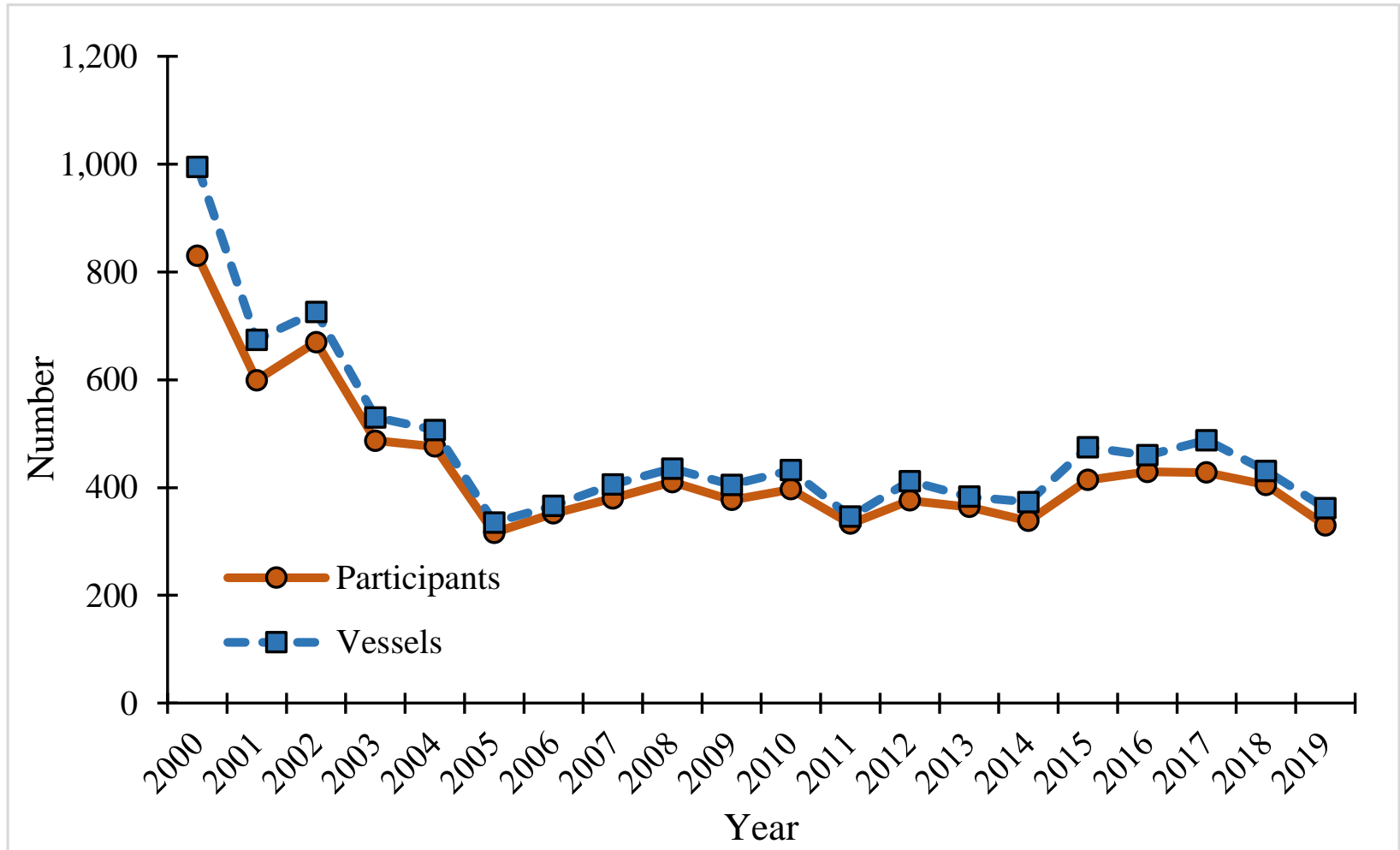
Source: Thorpe and Sessions 2007

NCDMF Trip Ticket Program

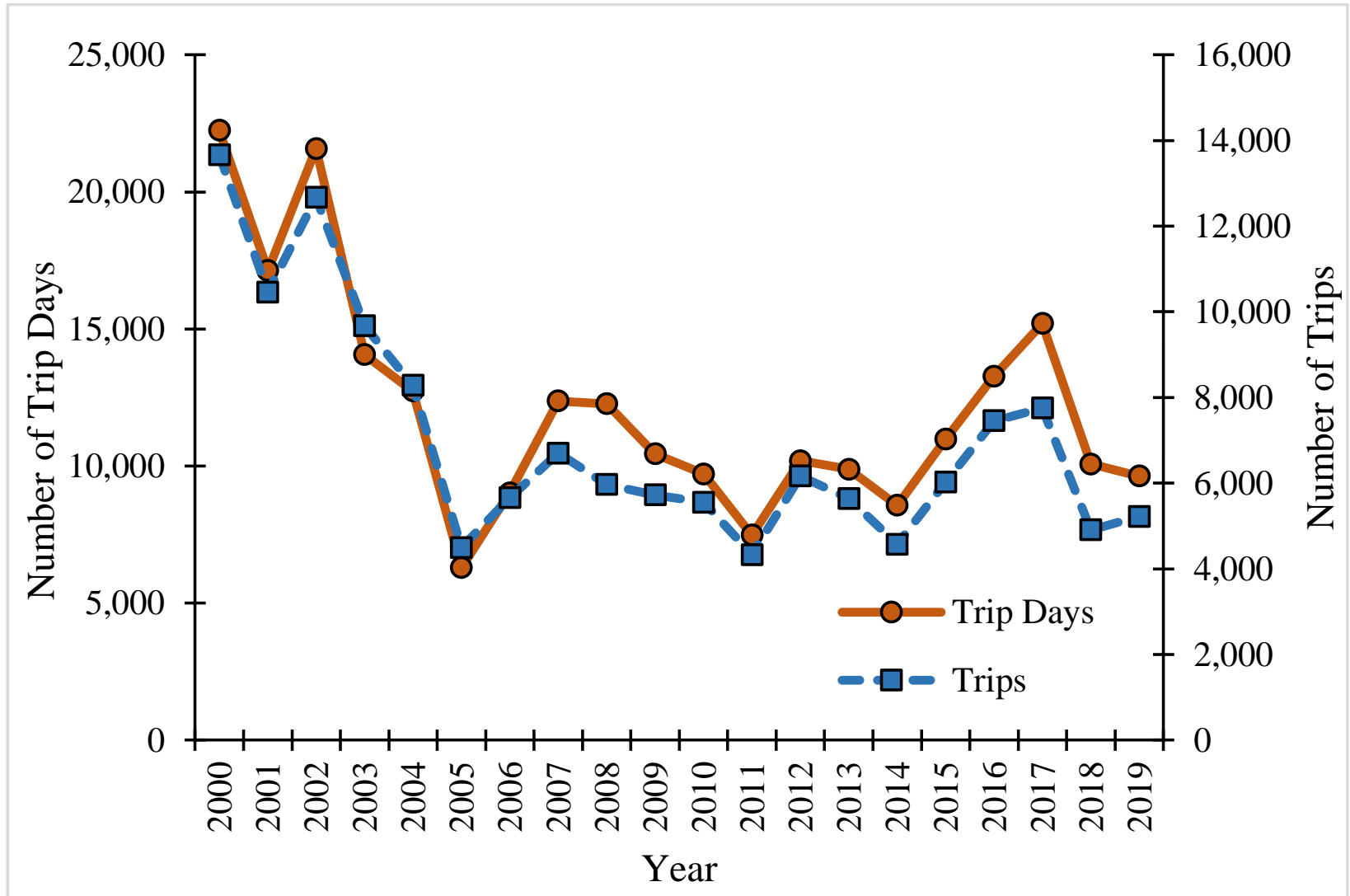
- Gear categories
 - Otter trawls
 - Skimmer trawls
 - Channel nets
 - Cast nets
 - Other gears
- Available effort data included:
 - Participants
 - Vessels
 - Number of trips
 - Trip duration



Trip Ticket Commercial Effort Otter Trawl Participants and Vessels

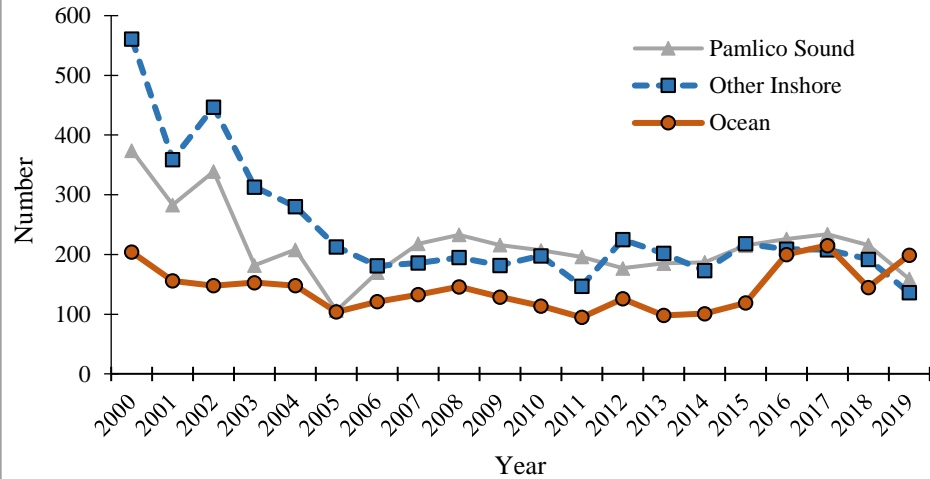


Trip Ticket Commercial Effort Otter Trawl Trips and Trip Days

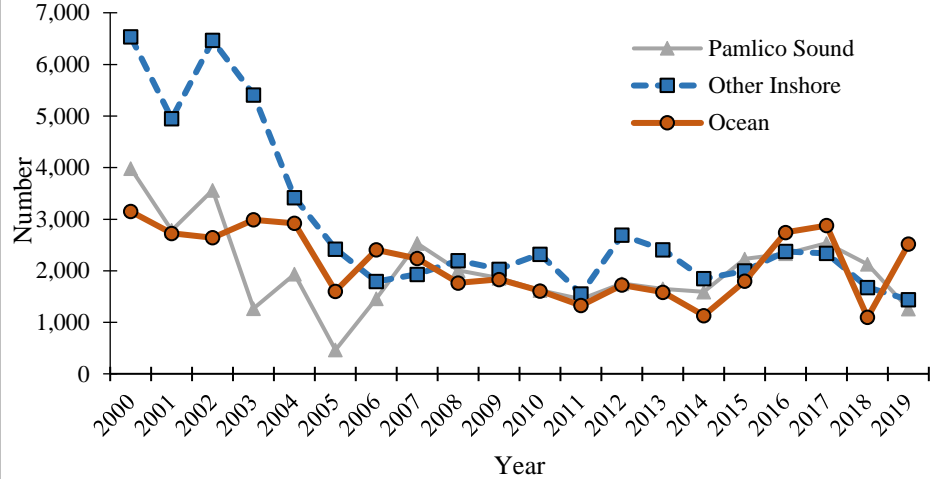


Trip Ticket Commercial Effort Otter Trawl Effort by Area

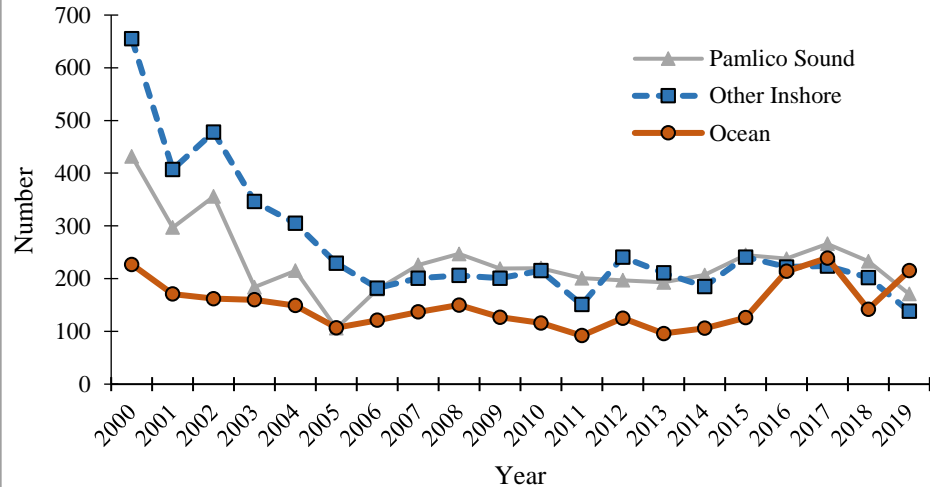
Otter Participants



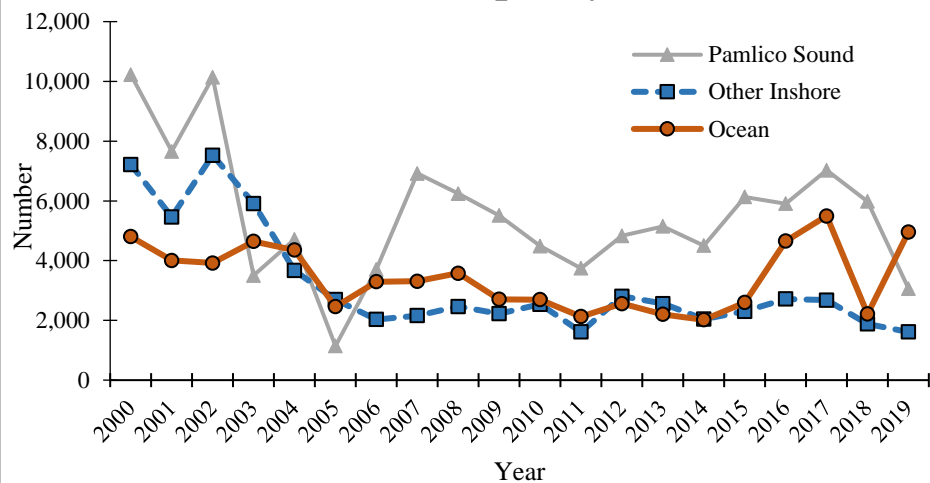
Otter Trips



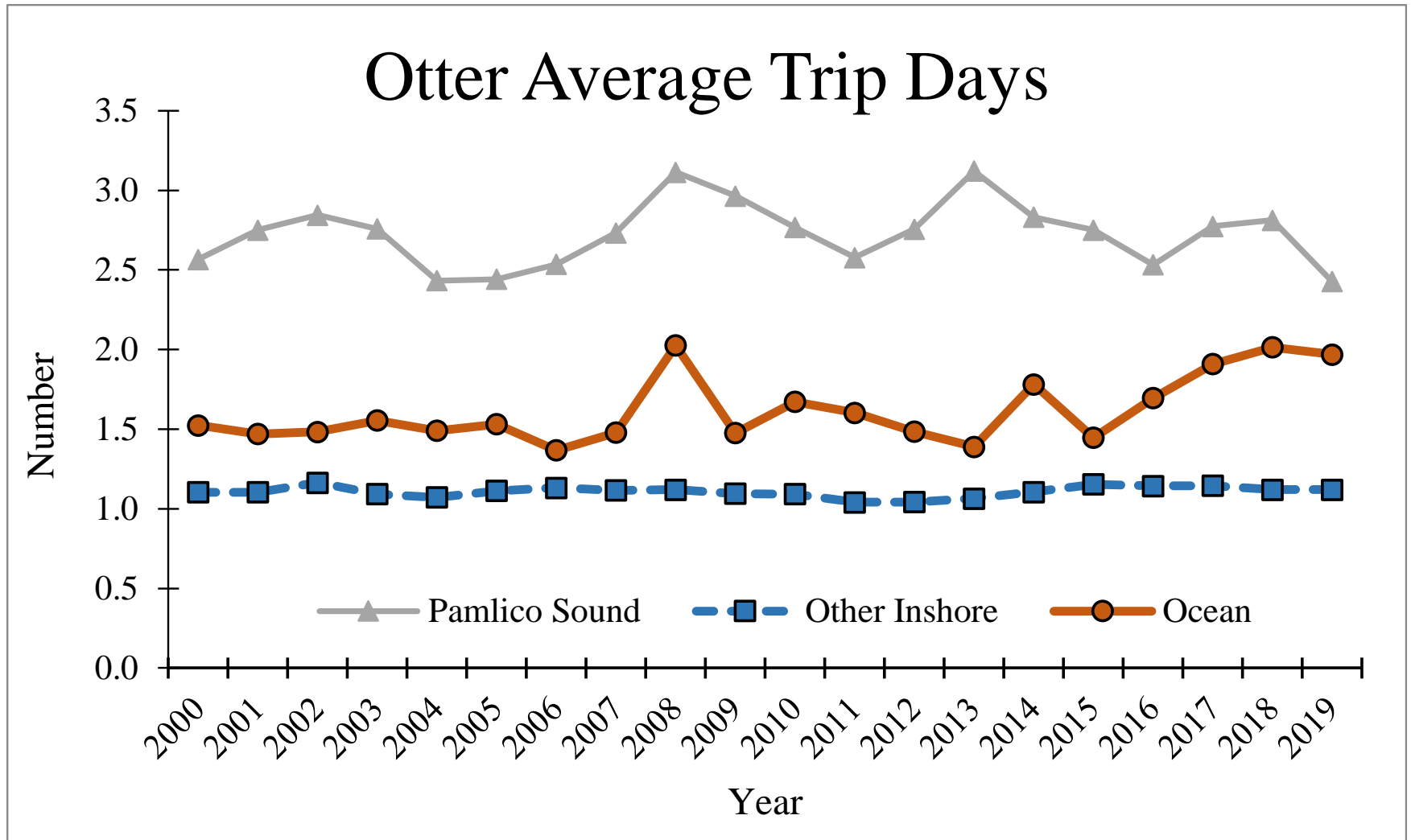
Otter Vessels



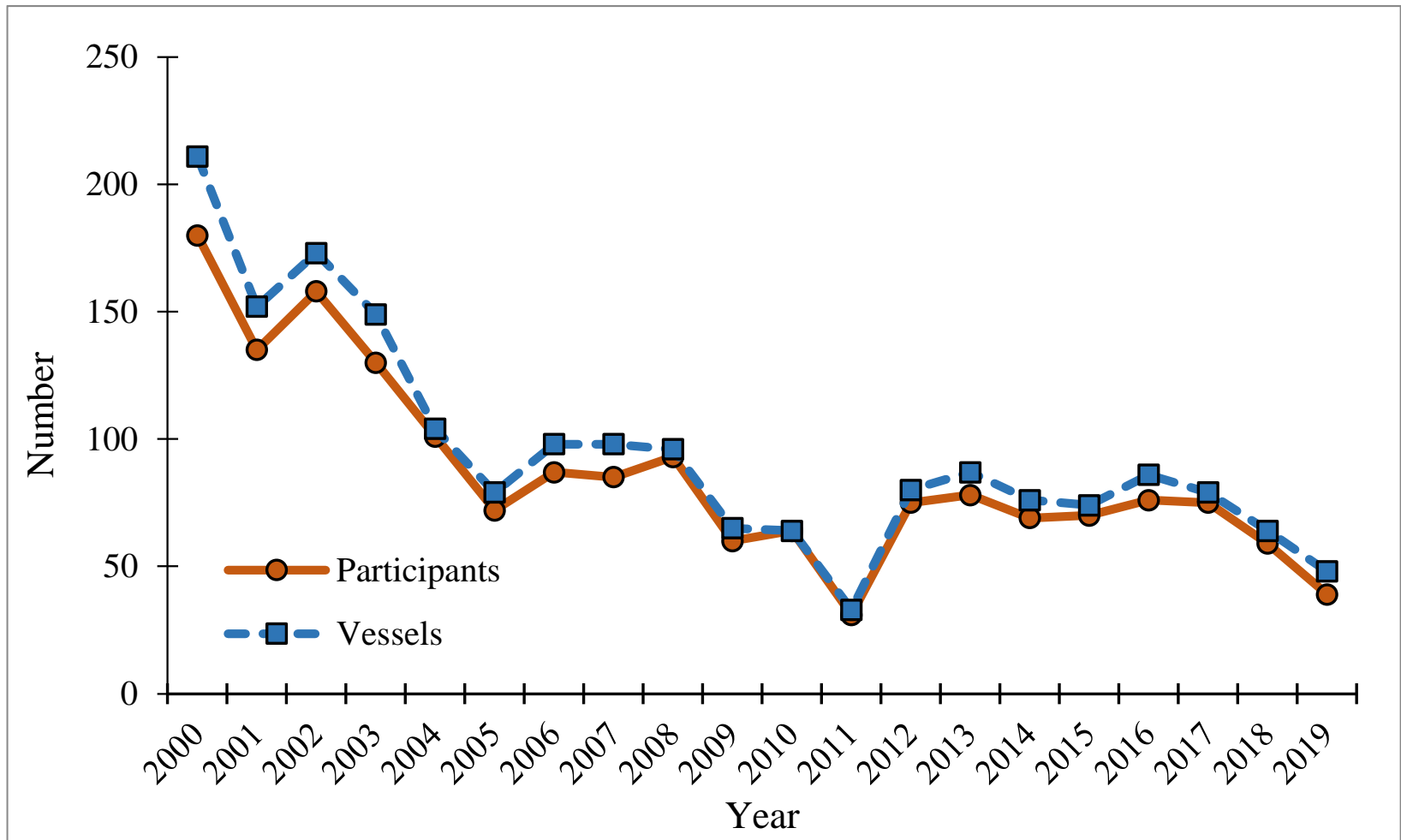
Otter Trip Days



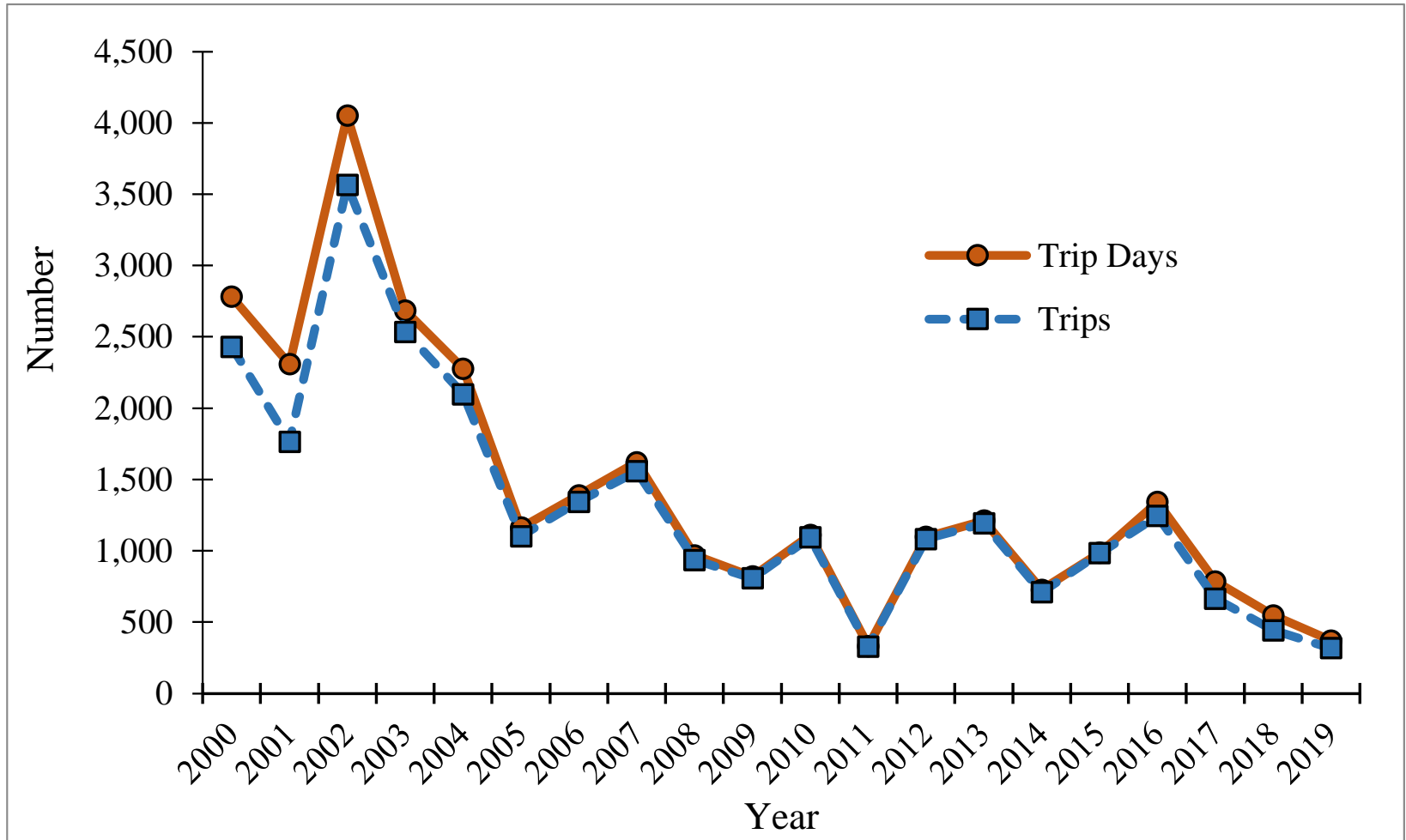
Trip Ticket Commercial Effort Otter Trawl Average Trip Days by Area



Trip Ticket Commercial Effort Skimmer Trawl Participants and Vessels

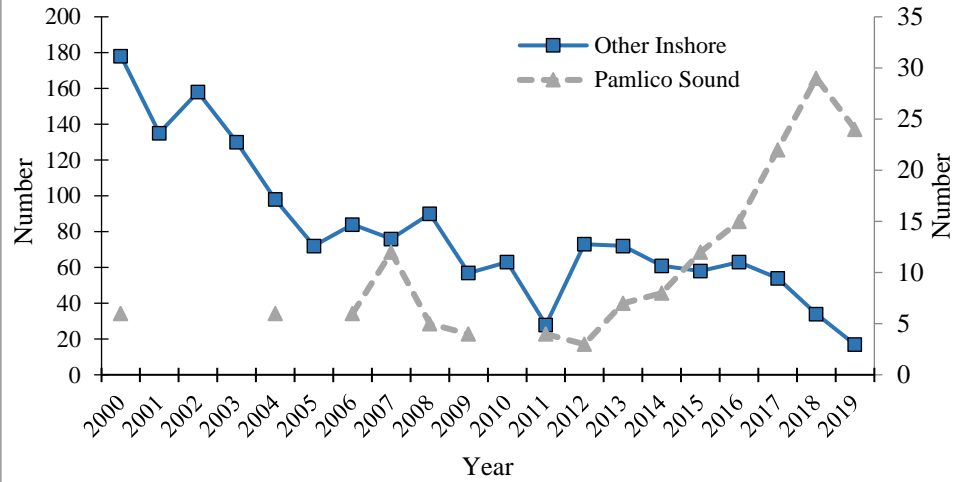


Trip Ticket Commercial Effort Skimmer Trawl Trips and Trip Days

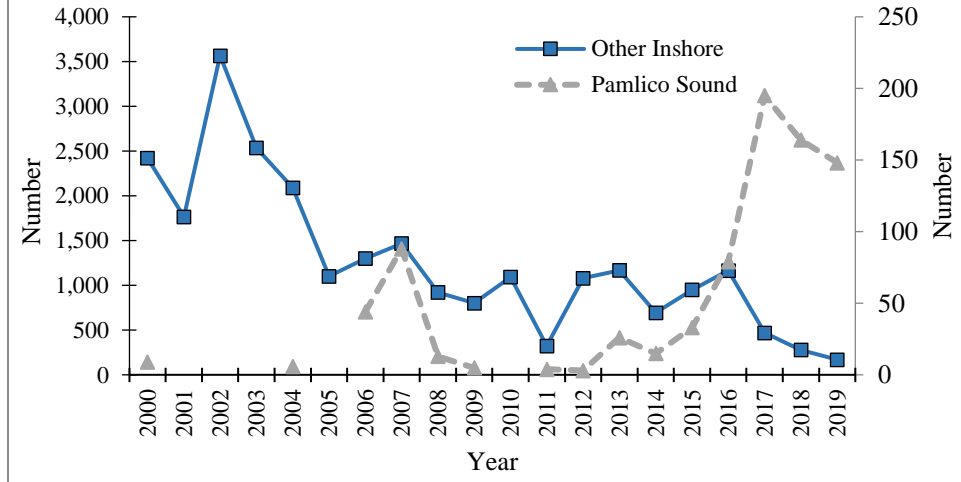


Trip Ticket Commercial Effort Skimmer Trawl Effort by Area

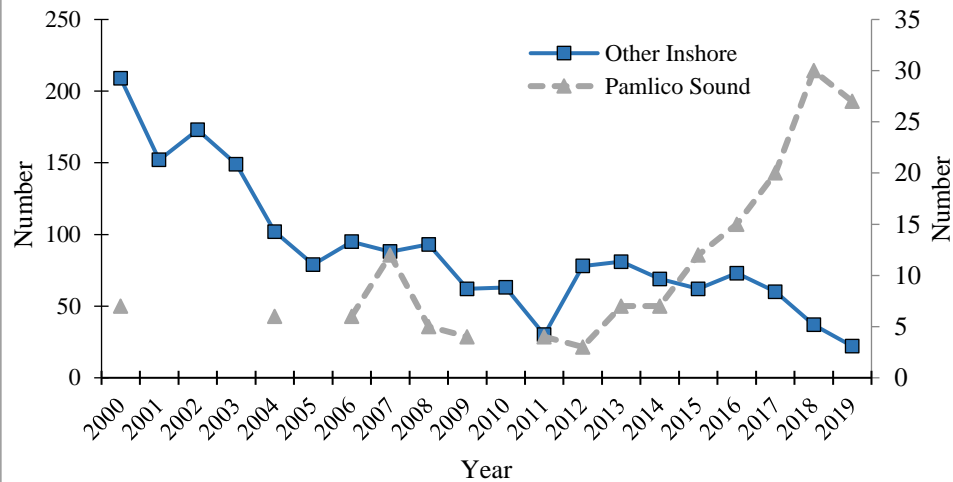
Skimmer Participants



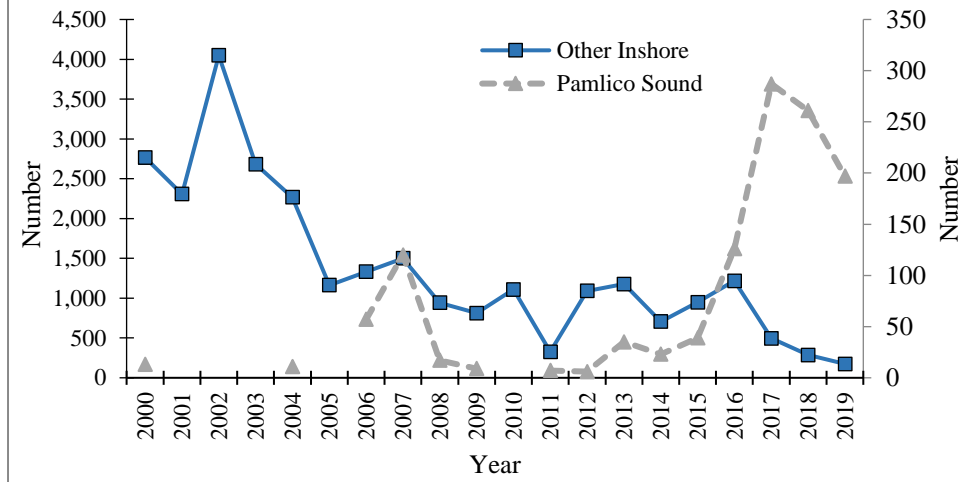
Skimmer Trips



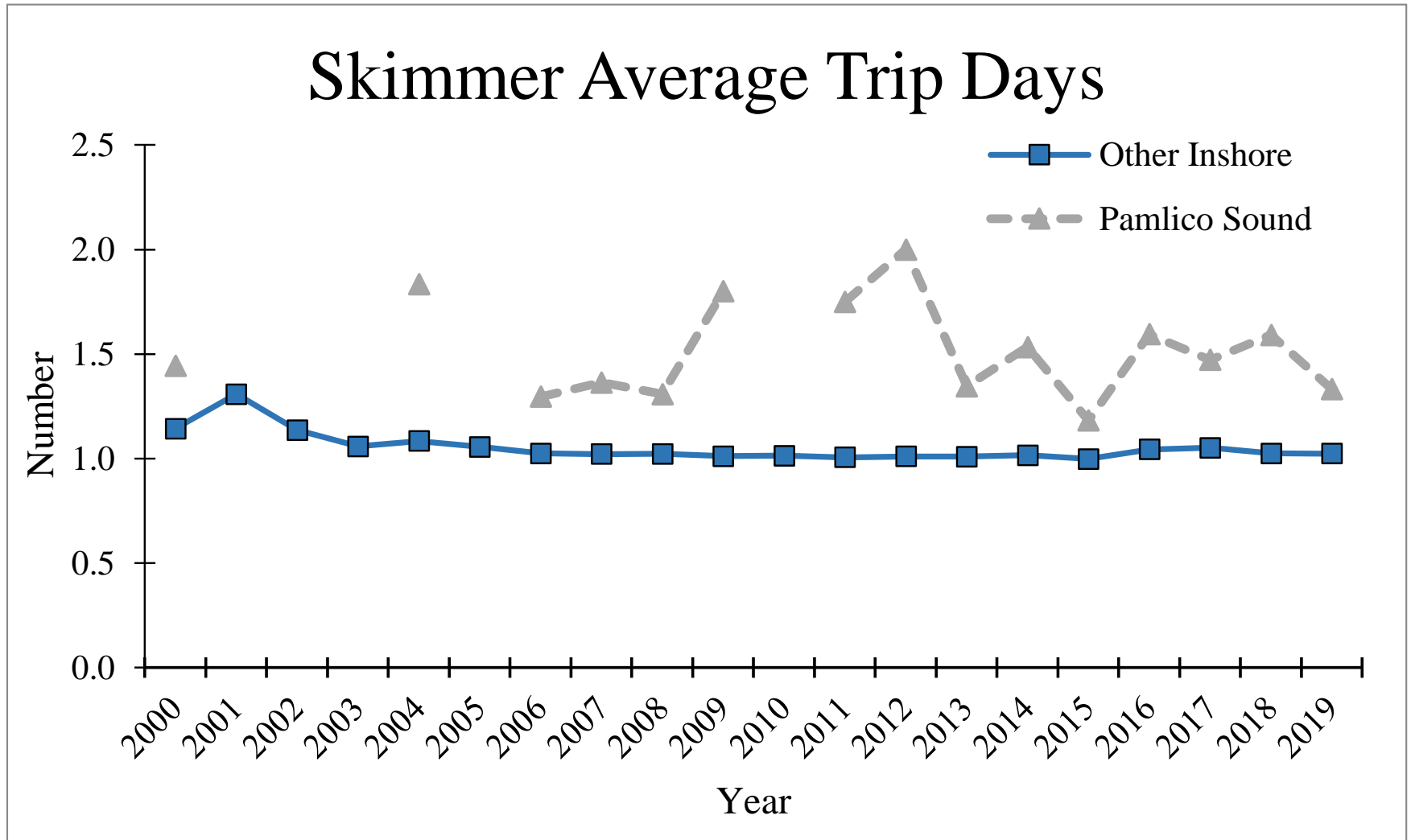
Skimmer Vessels



Skimmer Trip Days

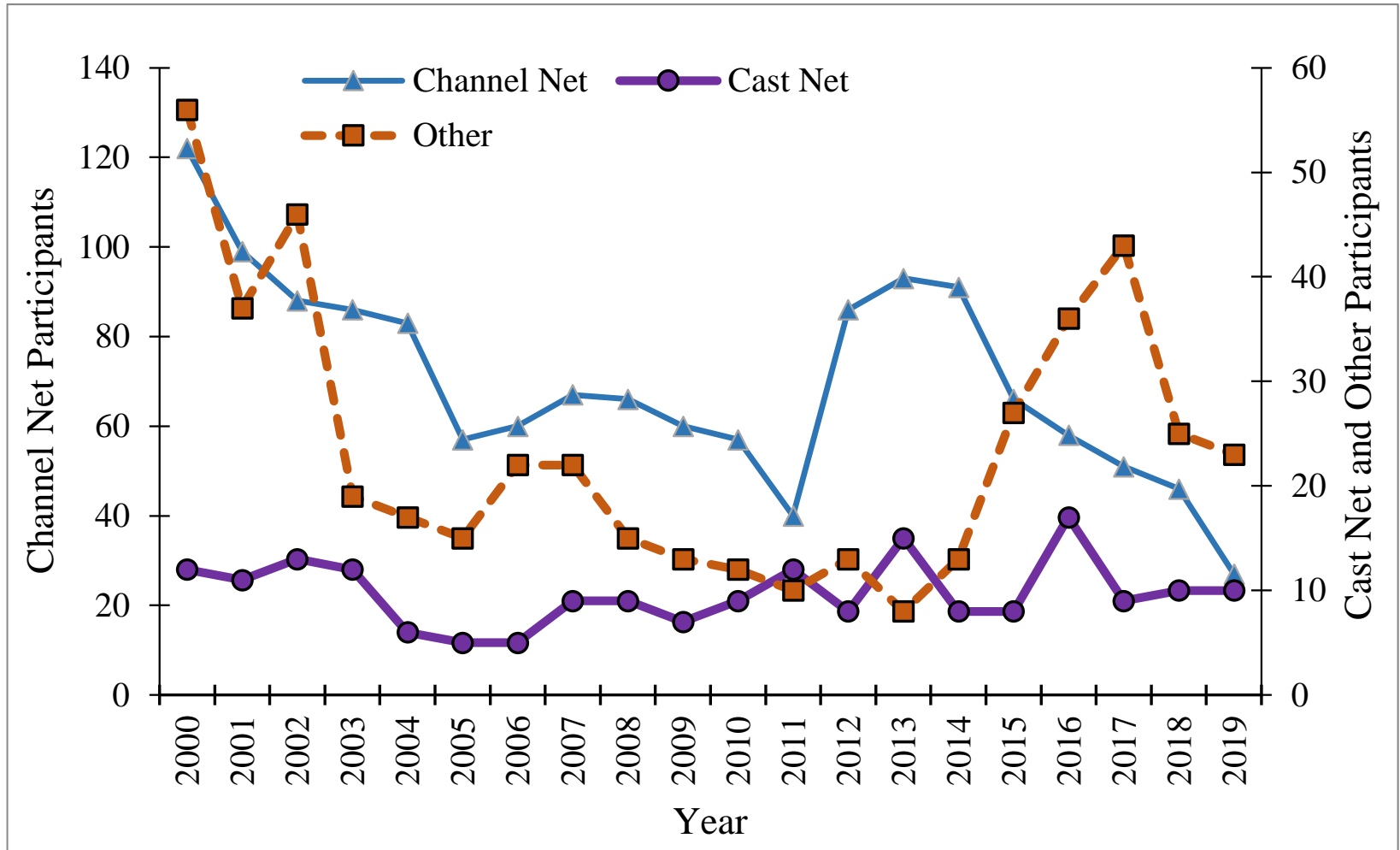


Trip Ticket Commercial Effort Skimmer Trawl Average Trip Days by Area



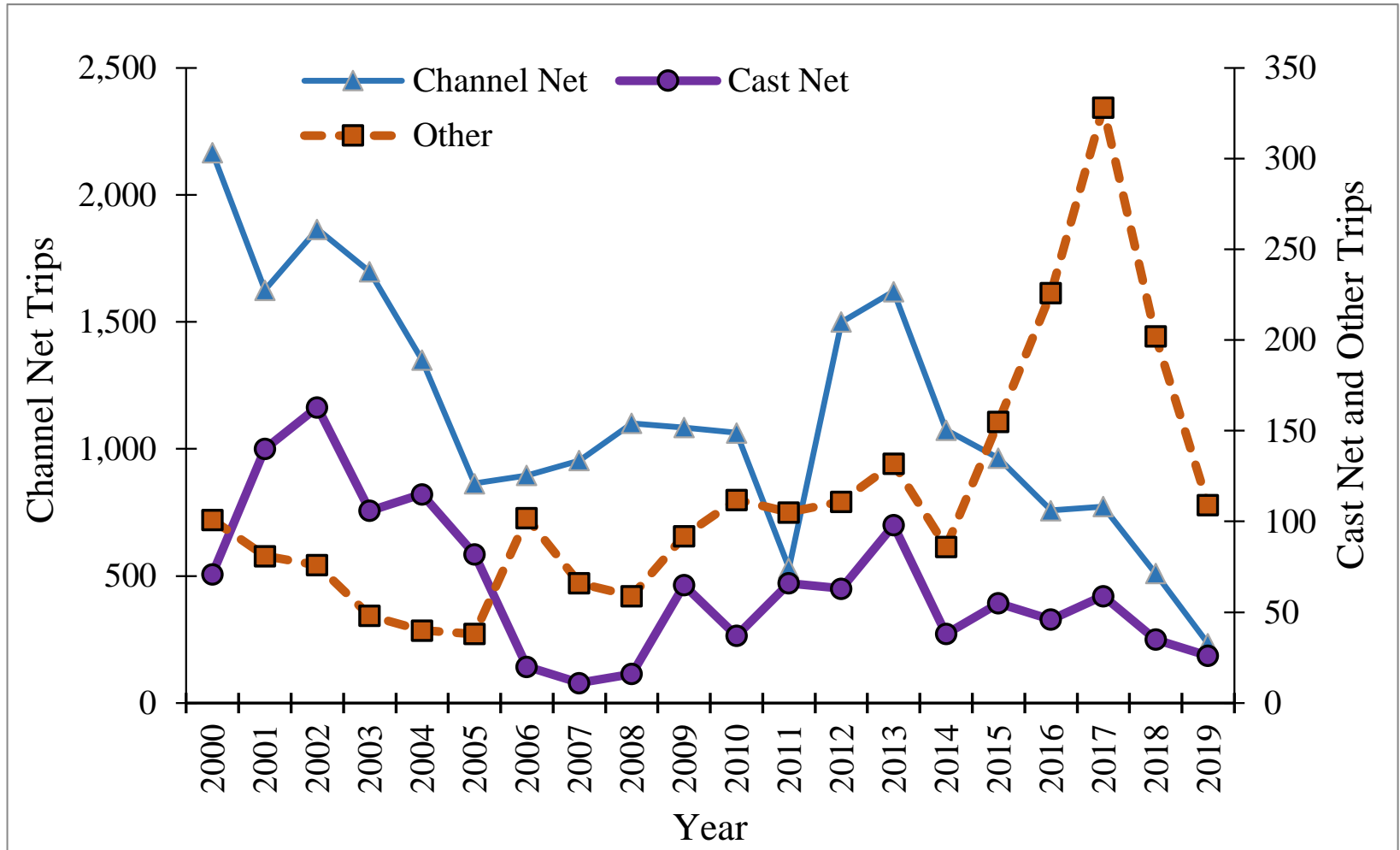
Trip Ticket Commercial Effort

Channel Nets, Cast Nets, and Other Gears



Trip Ticket Commercial Effort

Channel Nets, Cast Nets, and Other Gears

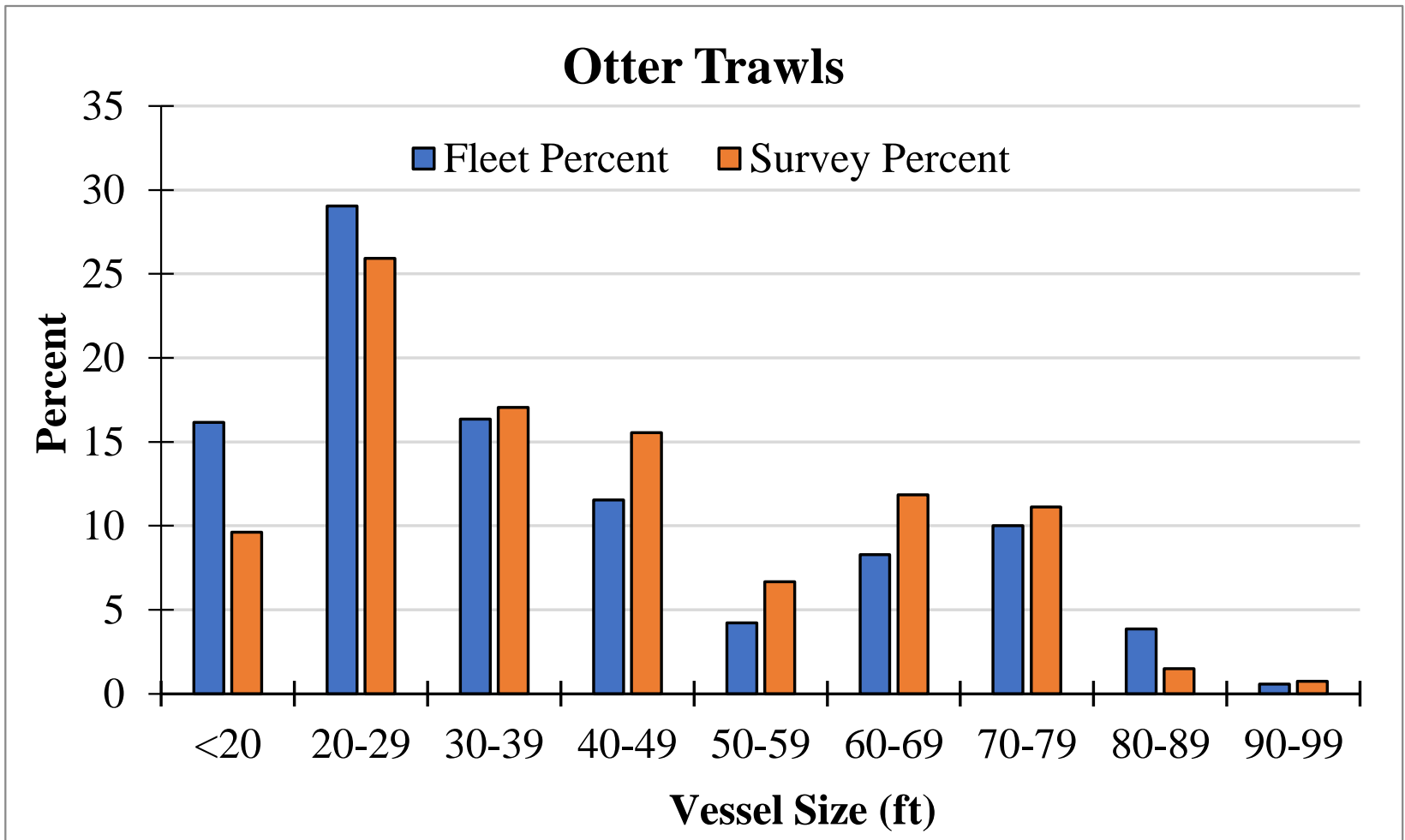


CFRF Shrimp Trawl Gear Characterization Phone Survey

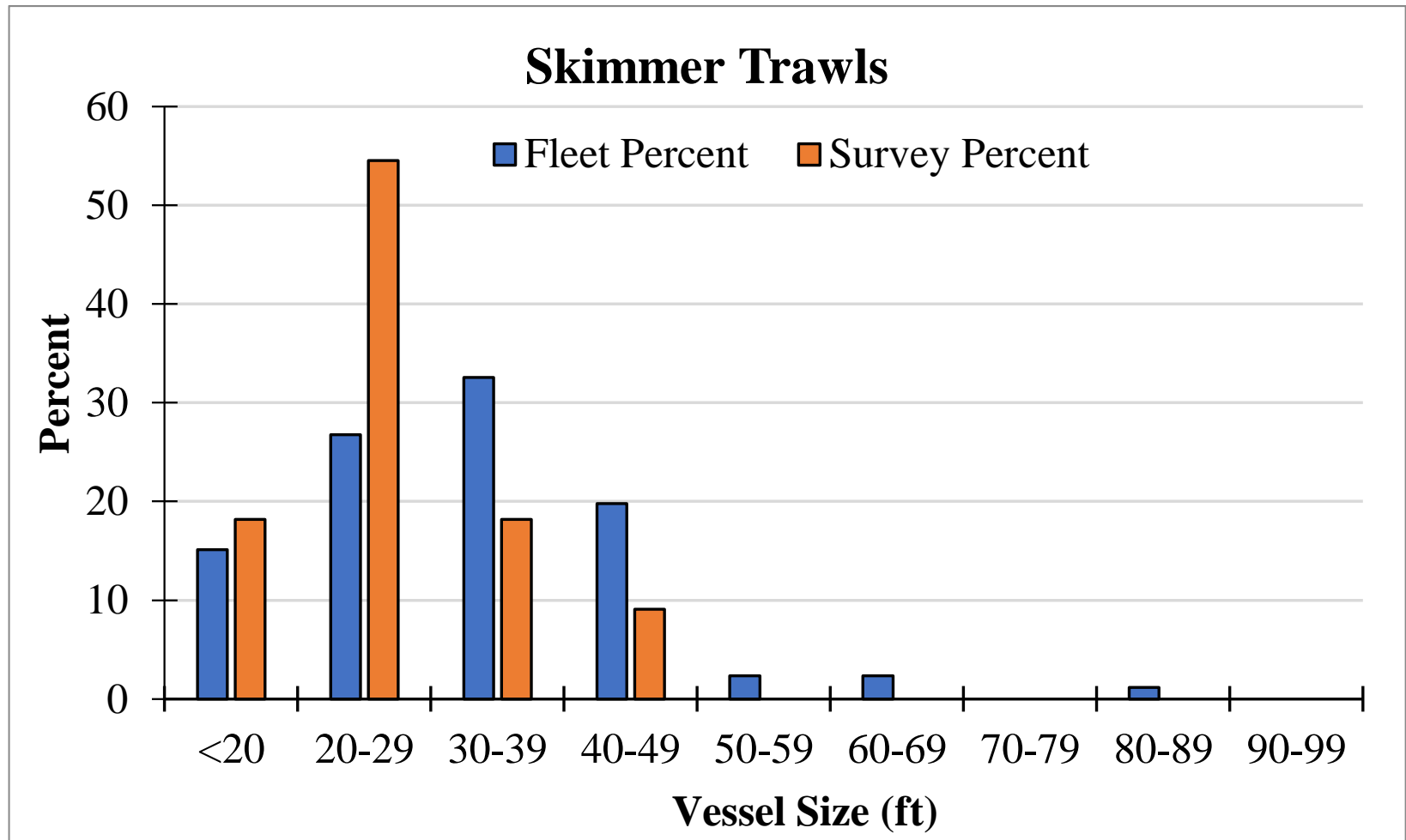
- Phone survey conducted in early 2020
- 521 trawlers with shrimp landings in 2018 or 2019
- Headrope data
 - Responses from 146 vessels
 - 135 otter trawl vessels
 - 11 skimmer trawl vessels
 - 212 unique gear configurations
 - 197 otter trawls
 - 15 skimmer trawls



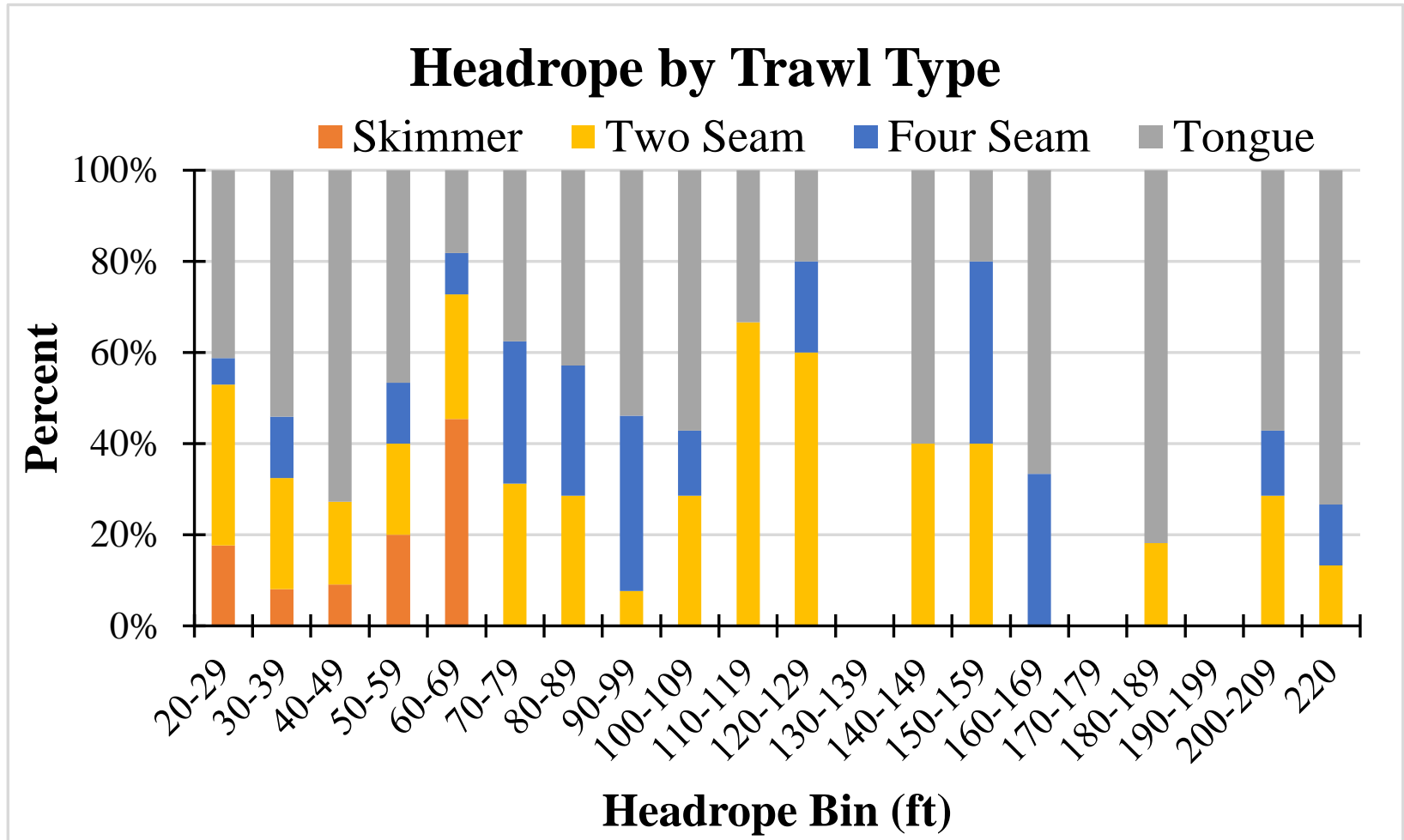
CFRF Shrimp Trawl Gear Characterization Phone Survey



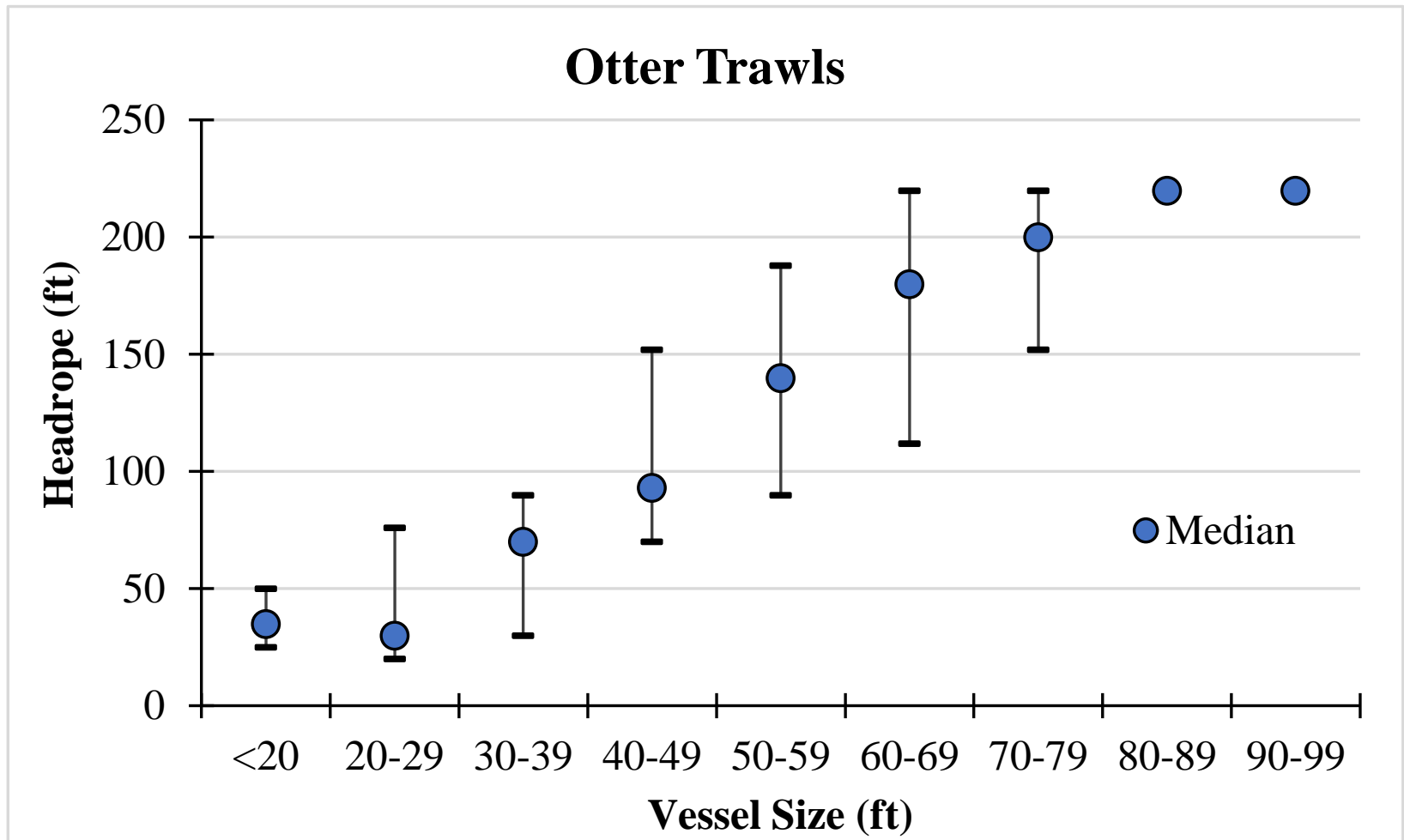
CFRF Shrimp Trawl Gear Characterization Phone Survey



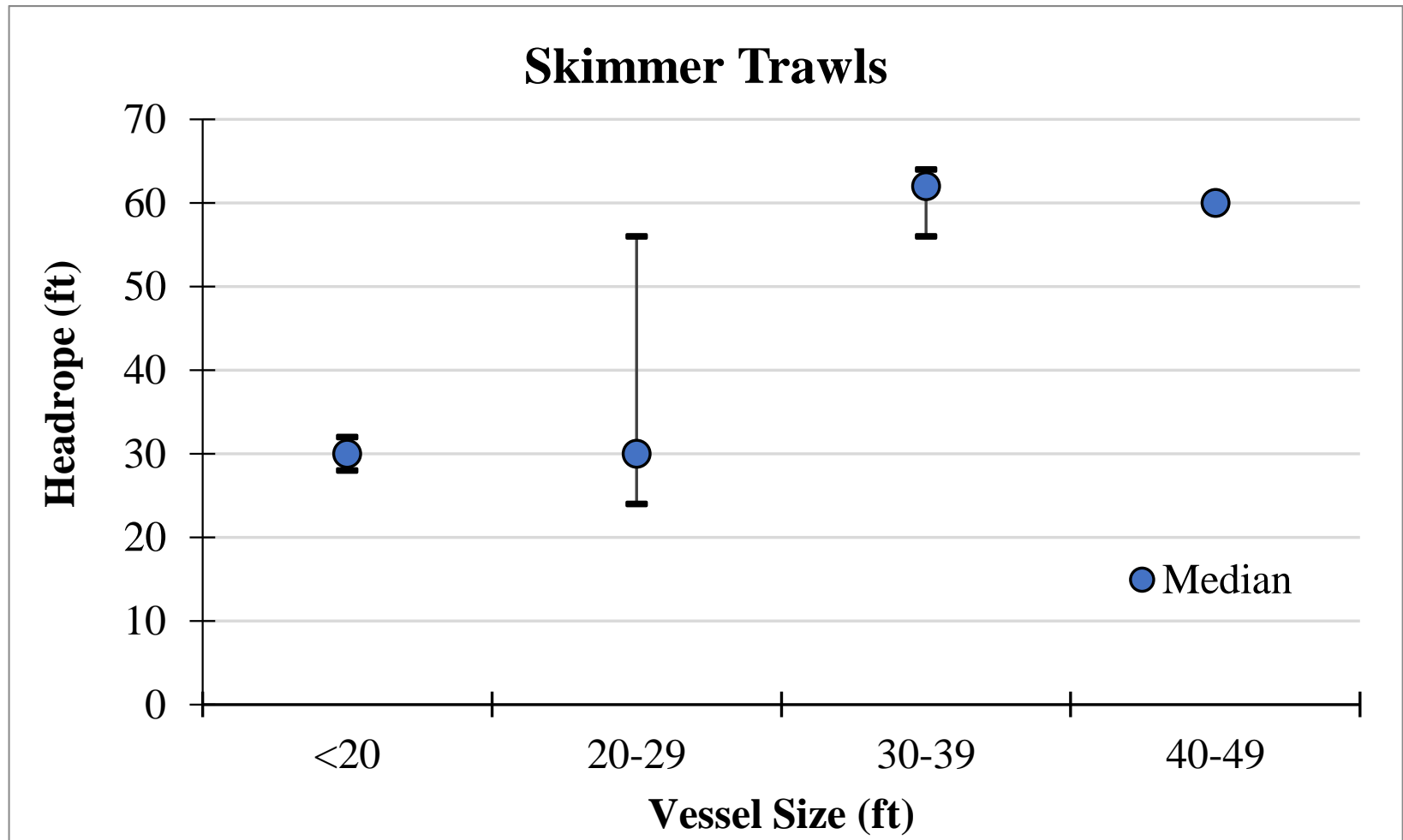
CFRF Shrimp Trawl Gear Characterization Phone Survey



CFRF Shrimp Trawl Gear Characterization Phone Survey



CFRF Shrimp Trawl Gear Characterization Phone Survey



NCDMF Shrimp Trawl Observer Surveys

- Data:
 - 2012-2017
 - Over 1,500 tows in the analysis
 - Limited by year, month, and area
- Two model types examined data:
 - CPUE
 - Presence/Absence (used for zero-inflated species)
 - Incorporated different area definitions



NCDMF Shrimp Trawl Observer Surveys

- Significant factors
 - Year (80% of sub-models)
 - Net type (66% of sub-models)
 - Season (52% of sub-models)
- Not significant factors
 - Total headrope per boat
 - Wing mesh
 - Tailbag mesh
- Weakfish bycatch highest in the fall in the Pamlico Sound CPUE sub-model
- Tongue nets had higher bycatch of spot and weakfish in the CPUE sub-models



NCDMF Shrimp Trawl Observer Surveys

Takeaways

- Results can be used to direct future research
- Data gaps highlight need for dedicated observer program



Carry Forwards From Amendment 1

- 1) Require shrimp trawls, with the exception of skimmer trawls, to use BRDs or gear configurations that reduce finfish bycatch by at least 40% over a standard shrimp trawl consisting of a Florida fisheye BRD, a federally approved TED, and a 1.5-inch mesh tailbag
- 2) Allow any federally certified BRD to be used in state waters where new BRD or gear configuration requirements have not been established
- 3) Require two state approved BRDs to be used in shrimp trawls in state waters where new BRD or gear configurations have not been established



Headrope Limit

- Regulations differ by area
 - 90 ft in Internal Waters outside Pamlico Sound
 - 220 ft in Pamlico Sound
 - No limit in state ocean waters
 - Implemented to reduce conflict and cap vessel capacity
- Not a significant factor from observer data analysis
- Industry may compensate with more boats, resulting in no change to total amount of headrope used in fishery
- If areas open to shrimp trawls are significantly reduced, reducing headrope lengths may be needed to reduce conflicts among fishermen



Limit Number of Fishing Days/Fishing Hours

Fishing Days

- Extending the weekend closure would likely reduce effort
- Current closure: 9:00 p.m. Friday through 5:00 p.m. Sunday for Internal Coastal Waters (excludes ocean waters)
- Best catches of shrimp are on the night of the opening after the “rest period”
- Not possible to quantify the bycatch reduction from adding additional day(s)
- May disproportionately impact RCGL holders and part-time fishermen

Fishing Hours

- Several existing daily fishing time restrictions for some areas
- The habits of North Carolina’s three shrimp species determine when they are targeted
- South Carolina, Georgia, Mississippi, Louisiana, and Texas close all or part of their shrimp fisheries to nighttime trawling

Maximum Tow Time

- Can be used by skimmer trawls and trammel nets in lieu of TEDs
- Limiting tow times likely to reduce bycatch from a single tow
- One study found a significant relationship between catch and tow duration
- May not reduce overall bycatch as additional tows could be made
- May reduce bycatch mortality
- Tow times in lieu of TEDs were allowed in a small area of the ocean from 1996 through 2005 under a now-expired Incidental Take Permit
 - Very difficult to enforce and required constant oversight by observers
 - Began when trawl doors entered water and ended when they exited
- Skimmer trawls difficult to time



Commercial Trip Limit

- May be effective in reducing overall shrimp trawl effort and presumably bycatch
- Trip limit would have to be:
 - high enough to be profitable
 - low enough to offload catch at least once during open period
- Establishing limits in high volume fisheries can be difficult
- Trip limit that works for 40 ft vessels may not work for 80 ft vessels
- Waste a potential issue if trip limit set too low



Recreational Creel Limit

- Different creel limits for areas open versus closed to shrimp harvest
 - Open: 48 quarts (heads on) or 30 quarts (heads off)
 - Closed: four quarts (heads on) or two and one-half quarts (heads off)
- No areas completely closed to shrimp harvest
- Increased access could be given to recreational fishermen in closed areas by allowing non-trawl net gears (i.e., seines, cast nets, and other non-trawl nets) to be used to harvest shrimp in areas closed to trawling
- Bycatch is minimal with these other gears
- Removing creel limit for closed areas would simplify regulations and allow additional harvest opportunities for recreational fishermen



Increased Access for Non-trawl Gears

- Restrictions on non-trawl gears primarily due to size management and fairness issues over access to the resource
 - Current management restricts harvest of shrimp with trawls, seines, and cast nets to specific areas and times
 - Areas open to harvest with seines and cast nets at the same time they open to trawls
 - Channel nets prohibited in some areas unless open to trawls, seines, and cast nets
- Shrimp pounds, shrimp pots, fyke nets, and other non-net gears are not limited to areas and times open to trawls, seines, and cast nets
- Removing connection between non-trawl gears and trawls will allow additional harvest opportunities, simplify regulations, and ease confusion over what areas are open to which gears

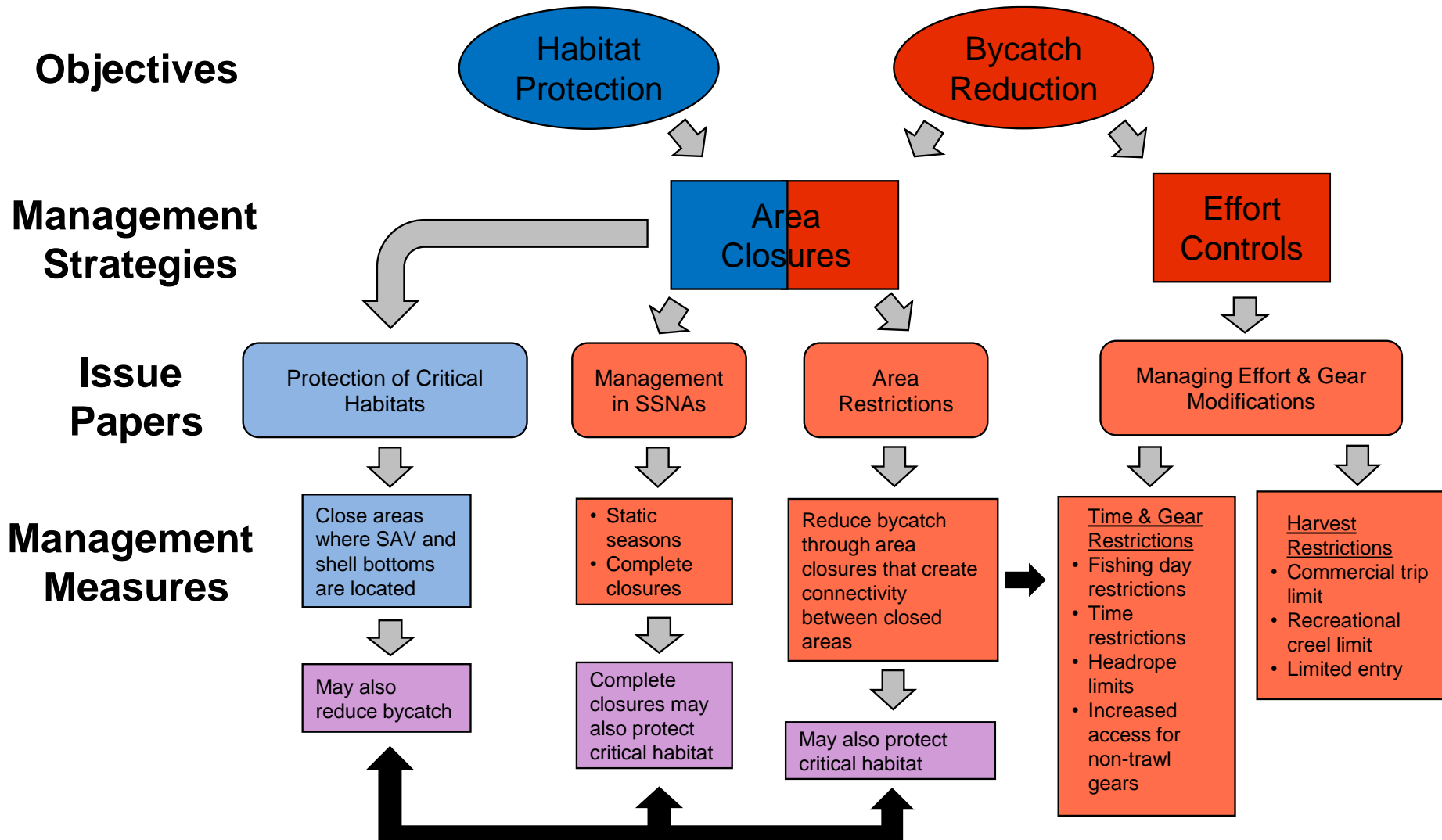


Limited Entry

- NCMFC can **only recommend the General Assembly** limit participation in a fishery if the commission determines it is the **only** way to achieve sustainable harvest
- Shrimp managed as an annual crop, so sustainability not an issue
- Several bycatch species classified as either overfished, overfishing is occurring, or both
- Would need to reduce number of vessels in the fishery
- If open areas are significantly reduced, may be worth exploring as effort will be concentrated in smaller areas



Other Considerations



Summary

- Can not adequately quantify the impact any of these measures may have on bycatch reduction or the shrimp fishery and its associated industries
- Reducing headrope lengths may warrant consideration if areas open to shrimp trawling are significantly reduced
- Reducing the number of days open to shrimp trawling would reduce effort but may disproportionately impact RCGL and part-time fishermen.
- Daily fishing times may reduce effort and likely impact vessels making multi-day trips
- Limiting tow times may reduce bycatch mortality but is difficult to enforce

Summary

- Commercial trip limits may reduce effort but difficult to determine
- Simplifying recreational creel limits will aid both the public and enforcement
- Removing dependency of other gears on trawls will simplify regulations and create additional harvest opportunities for non-trawl gears
- Limited entry would be difficult to enact with current statutory restrictions
- No clear link between shrimp trawl discards and status of finfish bycatch species
- Decision to be weighed is potential unquantified gain in some bycatch species versus losses to an economically important fishery

Discussion Points

Points to consider during your discussion:

- This paper examines ways to reduce bycatch by further restricting effort via gear modifications, allowable fishing times, and harvest limits.
- Management measures enacted from this paper will likely depend on measures enacted from the other three issue papers
- The amount of bycatch reduction and its impact on the status of bycatch species is non-quantifiable.
- Impacts to all stakeholders if additional measures are implemented.



Discussion Points

- Are there management measures under consideration that would not be effective in reducing effort in the shrimp trawl fishery?
- Are there alternative measures that should be considered to reduce effort in the shrimp trawl fishery?

Discussion Points

- If a maximum tow time is implemented, how long should it be? Should it vary regionally, seasonally, or by vessel size?
- If a commercial trip limit is established, what poundage would be reasonable? Should it vary regionally, seasonally, or by vessel size?



Discussion Points

- If the maximum headrope length is reduced, should it be reduced in the 90-ft areas, the 220-ft areas, or both?
- If the number of fishing days per week is reduced, how many days a week should be open to harvest with shrimp trawls? Should they be added to the current weekend closure or occur mid-week?
- If the fishing day is shortened, when should the daily closure occur, daytime, nighttime, or some other set time?



Discussion Points

- Should the lower recreational harvest limit associated with cast nets in closed areas be removed?
- Should more access to non-trawl gears in areas closed to shrimp trawling be considered?





Questions?