



# *TEMPORARY MANAGEMENT MEASURES TO REDUCE STRIPED BASS MORTALITY IN THE TAR-PAMLICO AND NEUSE RIVERS*

*DEPARTMENT OF ENVIRONMENTAL QUALITY*

Marine Fisheries

N.C. Marine Fisheries Commission | Charlton Godwin | Nov. 14-16, 2018



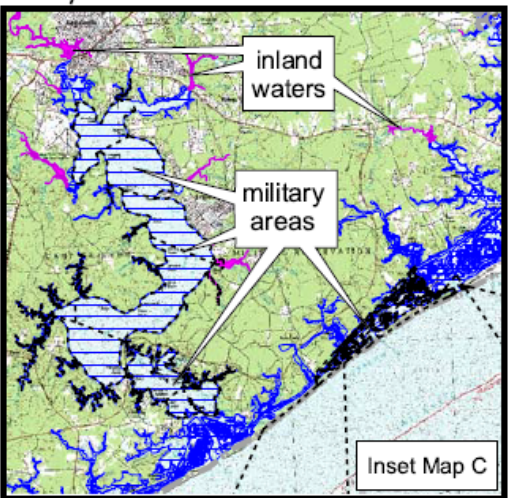
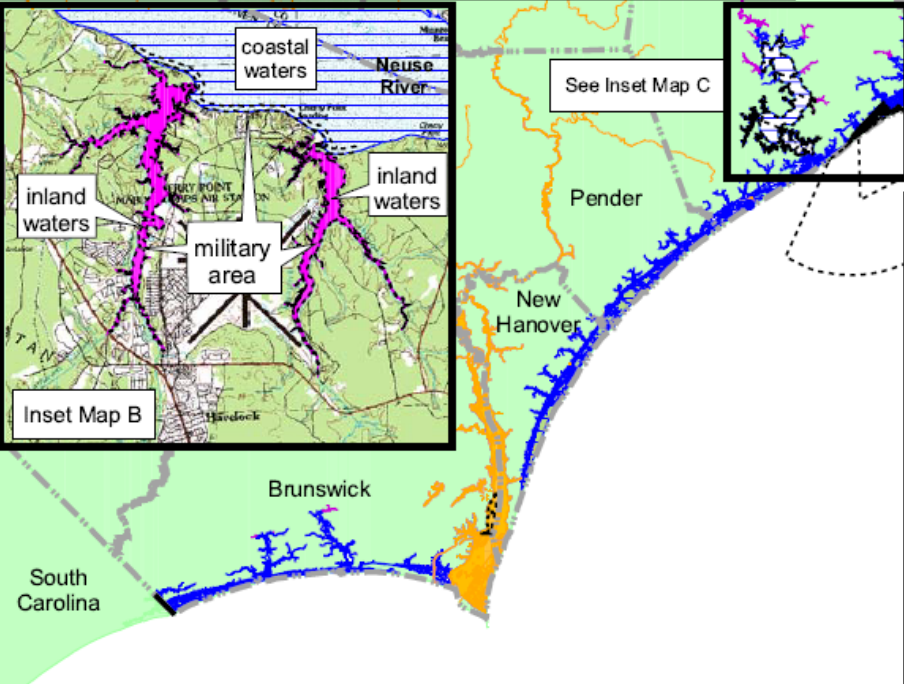
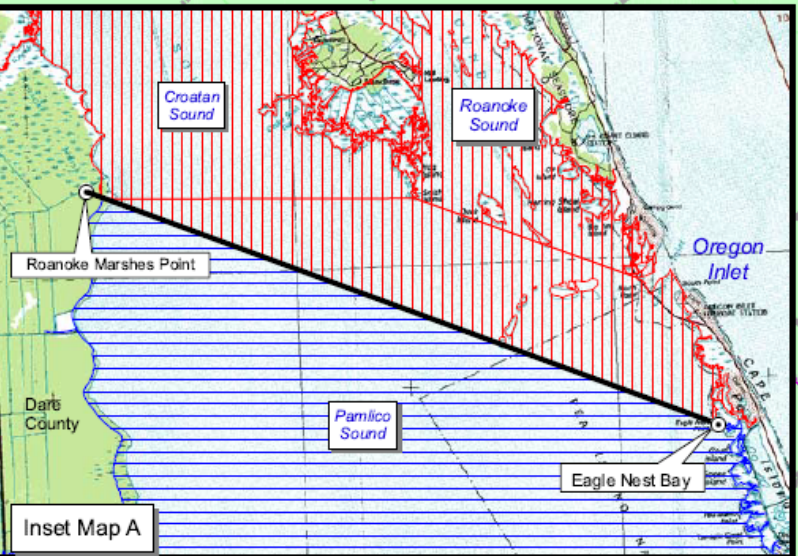
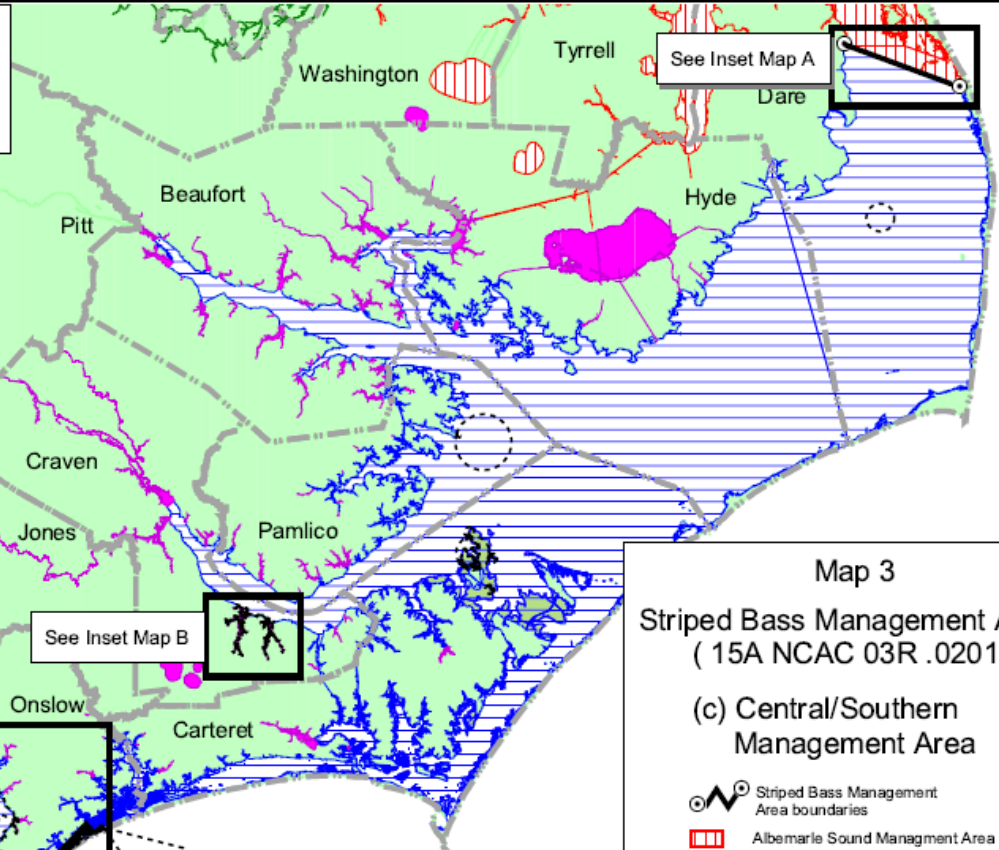
Division recommendation to develop temporary management measures to supplement the NC Estuarine Striped Bass Fishery Management Plan with a no possession limit in the Central Southern Management Area to protect important year classes while the next plan amendment is being developed.



1. Map of the area.
2. Evaluate the sources, magnitude, and importance of striped bass mortality by sector in the Tar-Pamlico and Neuse Rivers.
3. Characterize the hook and line fisheries in these systems.
4. Characterize the gill net fisheries in these systems.
5. Review the recreational and commercial restrictions and outreach measures intended to reduce mortality in these systems.
6. Review the most recent genetics information about the percent hatchery contribution to the stocks in these systems.
7. Review the reductions that would result from a 26-inch minimum size limit in these systems.
8. Review DMF management recommendation.



This map was produced by the Geographic Information Systems (GIS) Program. Informational data used to create this map were collected from federal, state, county, and private organizations. This map is a general guide to assist the public and is for illustrative purposes only. While every effort is made to keep this map accurate and up-to-date, it is not intended to replace any official source. Under no circumstances shall the State of North Carolina be liable for any actions taken or omissions made from reliance nor shall the State be liable for any other consequences from any such reliance.



**Map 3**  
**Striped Bass Management Areas**  
 ( 15A NCAC 03R .0201 )  
**(c) Central/Southern Management Area**

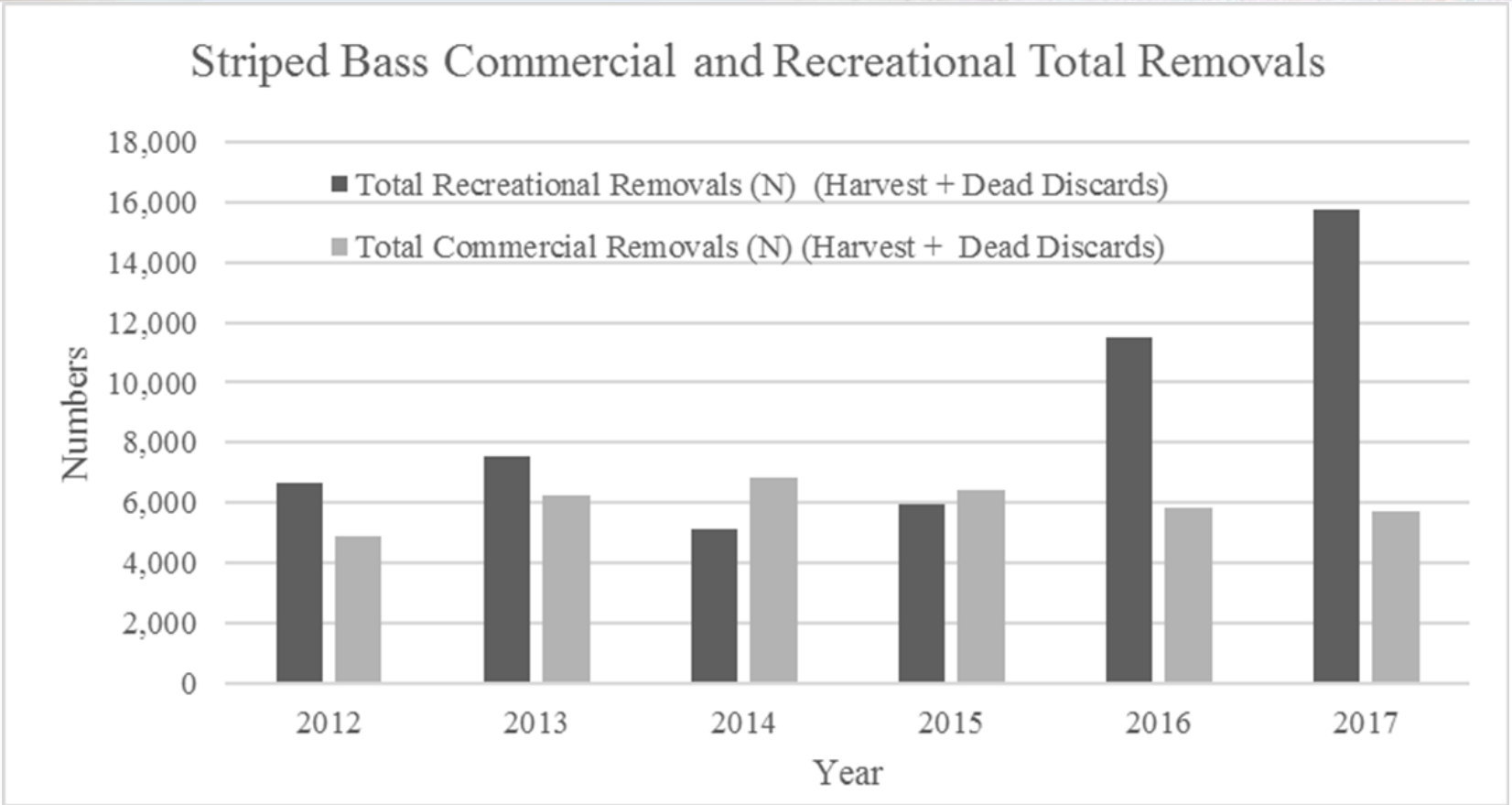
- Striped Bass Management Area boundaries
- Albemarle Sound Management Area
- Roanoke River Management Area
- Central/Southern Management Area - Coastal Waters
- Central/Southern Management Area - Inland and Joint Waters - not including the Cape Fear River and Tributaries
- Central/Southern Management Area - Cape Fear River and Tributaries
- Military Danger Zones and Restricted Areas (MDZRA)

Datum: NAD83  
 Projection: NC State Plane  
 Map Date: September 2017

6 0 6 12 Miles

locator map

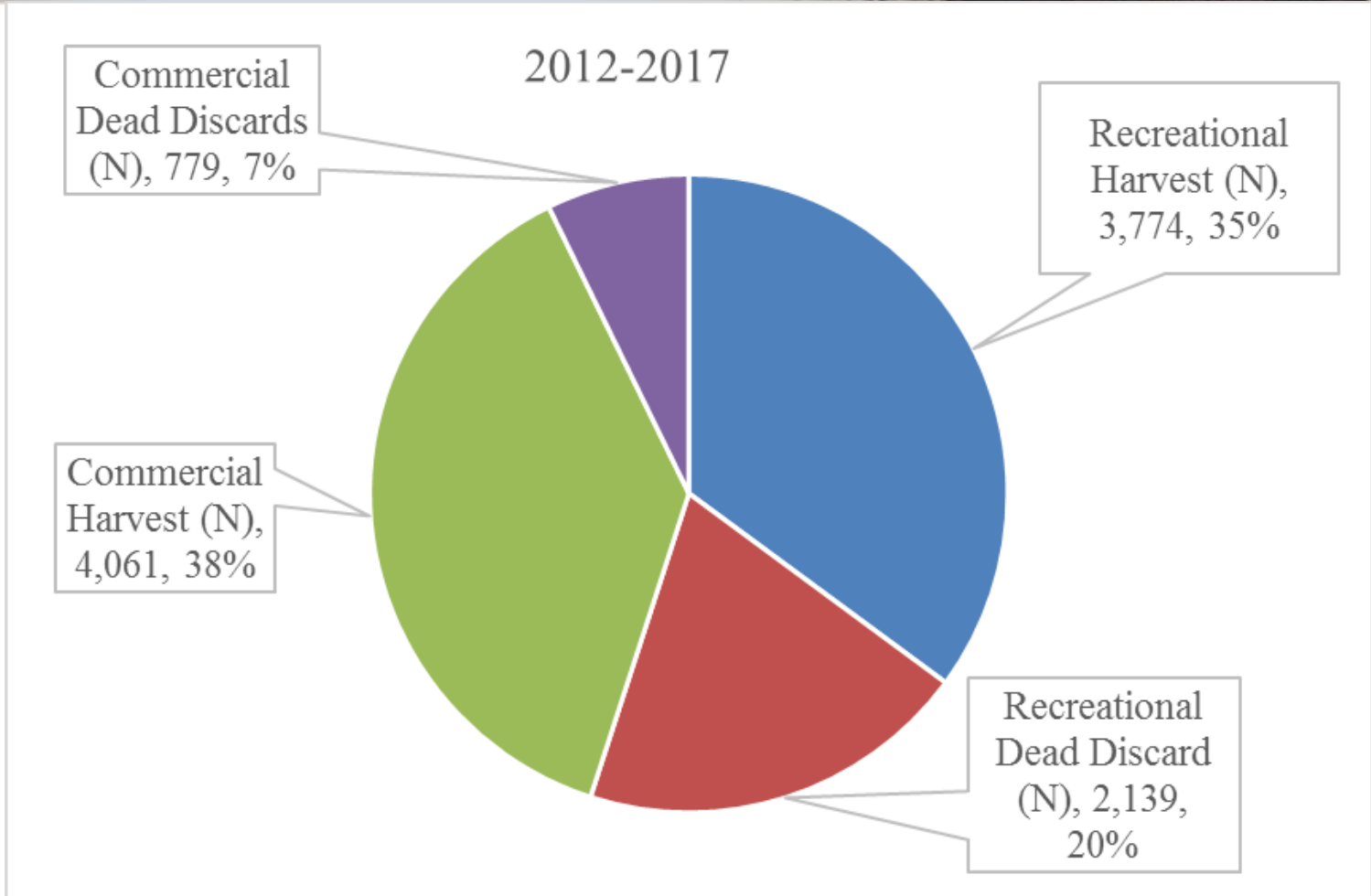
# Sources, Magnitude, and Importance of Mortality by Sector



Tar-Pamlico and Neuse Rivers Combined.



# Sources, Magnitude, and Importance of Mortality by Sector



Average number of striped bass harvest and discards from the recreational and commercial sectors, Tar-Pamlico and Neuse Rivers combined, 2012-2017.

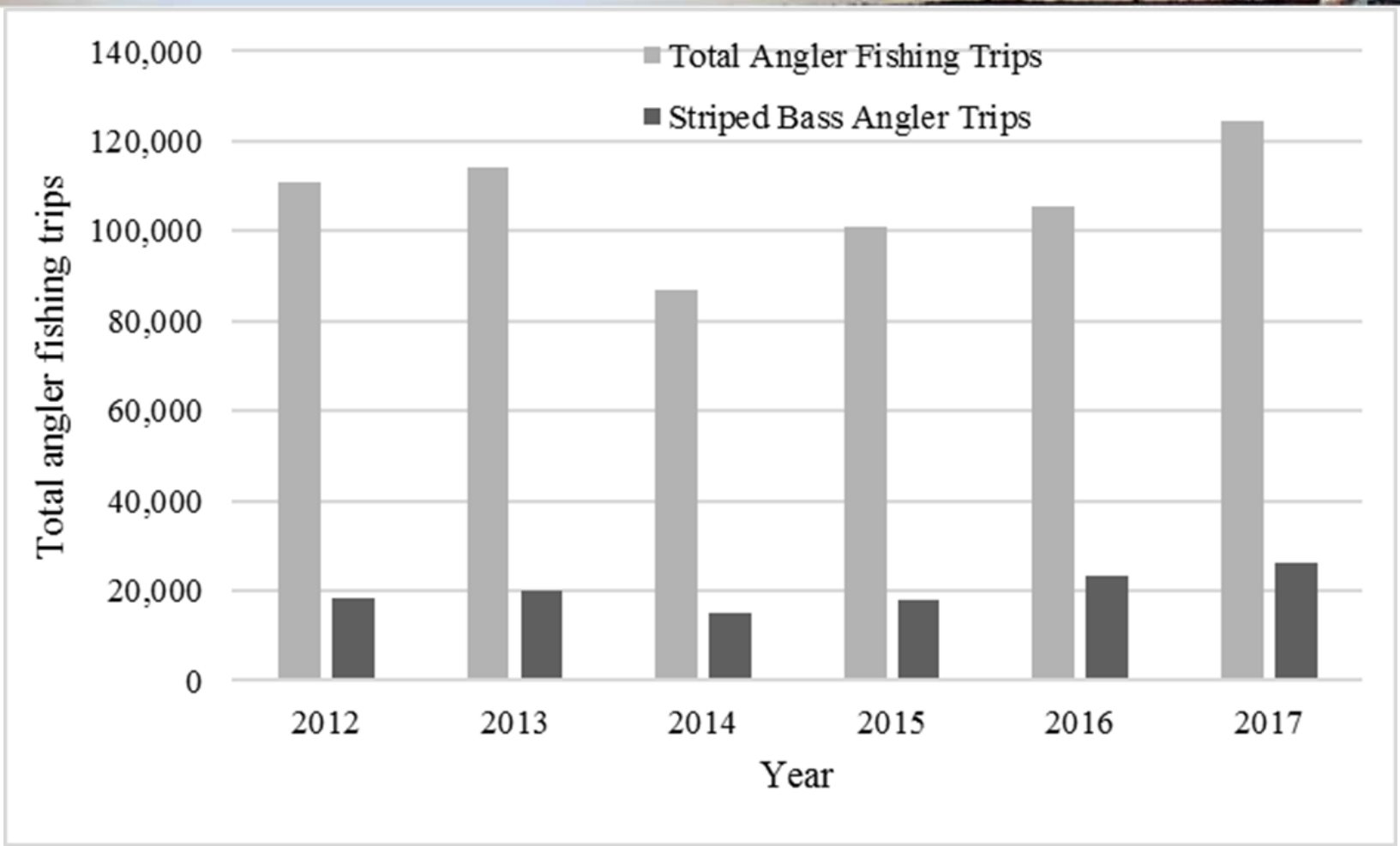


## *Sources, Magnitude, and Importance of Mortality by Sector*

- Rachels and Ricks (2018) used a linear regression approach to evaluate environmental, harvest and effort factors that potentially influenced annual striped bass mortality in the Neuse River.
- Predictor variables included: 1) summer dissolved oxygen, 2) summer water temperature, 3) gill net effort, and 4) commercial harvest.
- Results of the analysis indicated the best model included gill net effort and commercial harvest as the best predictor variables to explain mortality.
- However, the model only evaluates the variables provided.
- To determine the impact of all factors that potentially influenced striped bass mortality, DMF staff re-ran the analysis to include recreational harvest and effort data.
- Results indicated commercial effort, commercial harvest, recreational effort, and recreational discards were all equally important (not statistically different from each other) in explaining mortality.



# Characterize the Hook and Line Fisheries

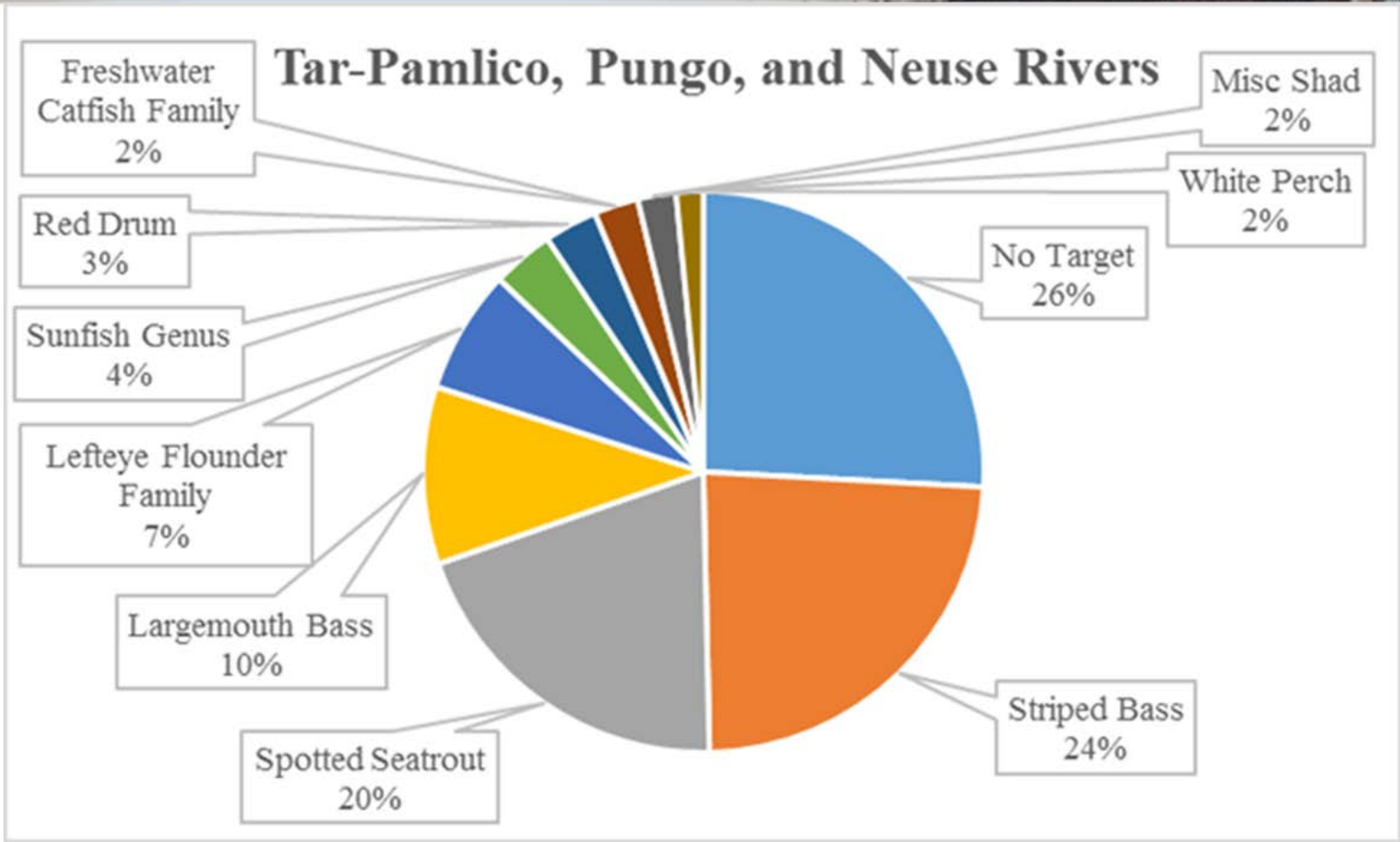


Angler trips for the Tar-Pamlico and Neuse rivers combined.





# Characterize the Hook and Line Fisheries



Top ten Targeted Species reported by anglers interviewed in the CSMA creel survey, Tar-Pamlico and Neuse Rivers combined, 2012-2017.





# Characterize the Hook and Line Fisheries

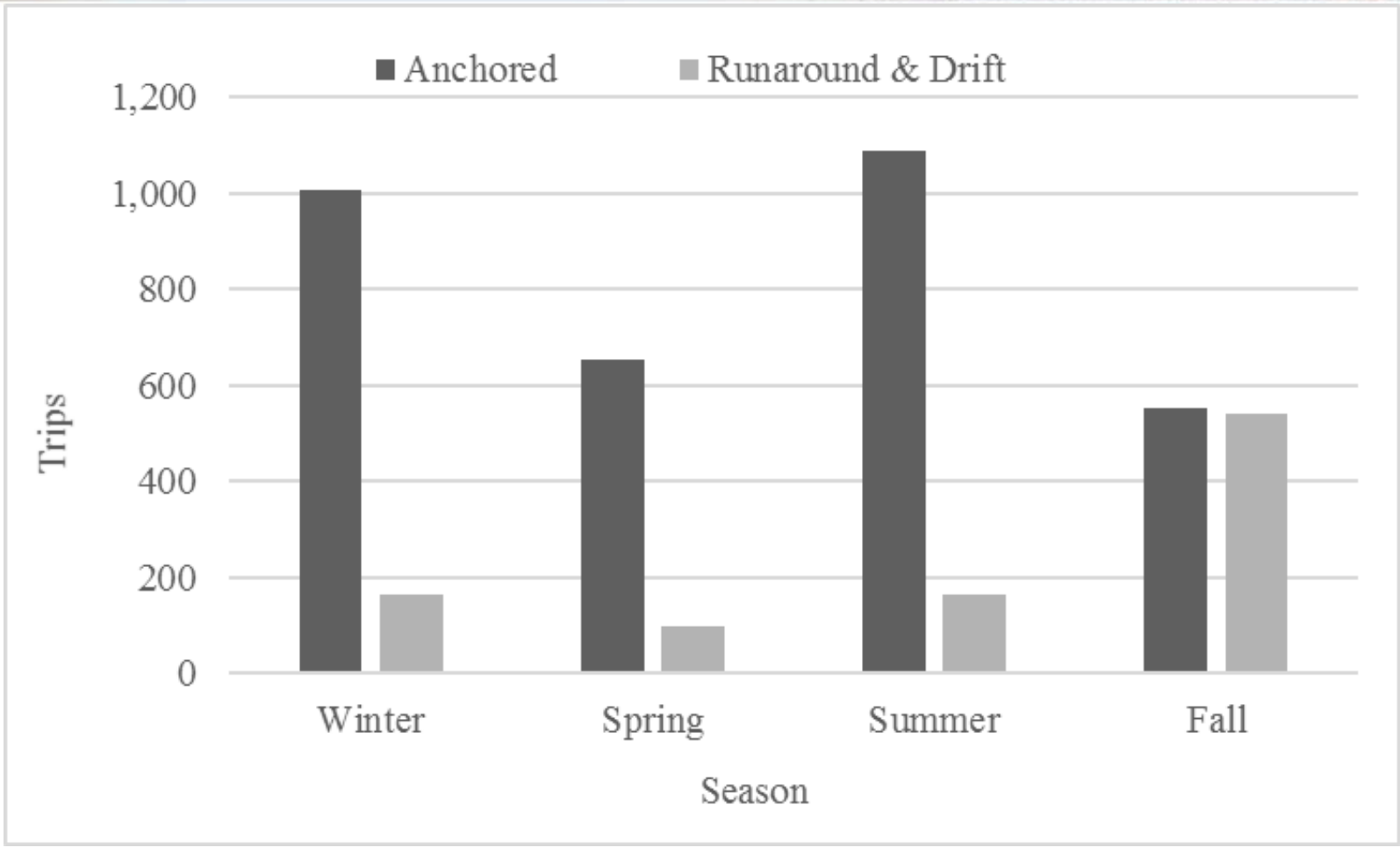
2016			Economic Impacts		
River System	Estimated Angler Hours <sup>1</sup>	Estimated Expenditures (thousands of dollars) <sup>2</sup>	Jobs <sup>3,4</sup>	Income Impacts (thousands of dollars) <sup>4</sup>	Output Impacts (thousands of dollars) <sup>4</sup>
Neuse River	210,111	\$1,176	17	\$639	\$1,954
Tar/Pamlico Rivers	245,998	\$1,938	27	\$1,033	\$3,204
Cape Fear River	43,226	\$346	5	\$190	\$578
Total	499,335	\$3,460	49	\$1,862	\$5,736

Economic impacts of recreational fishing in the coastal rivers of the Central Southern Management Area, 2016.





# Characterize the Commercial Gill Net Fisheries

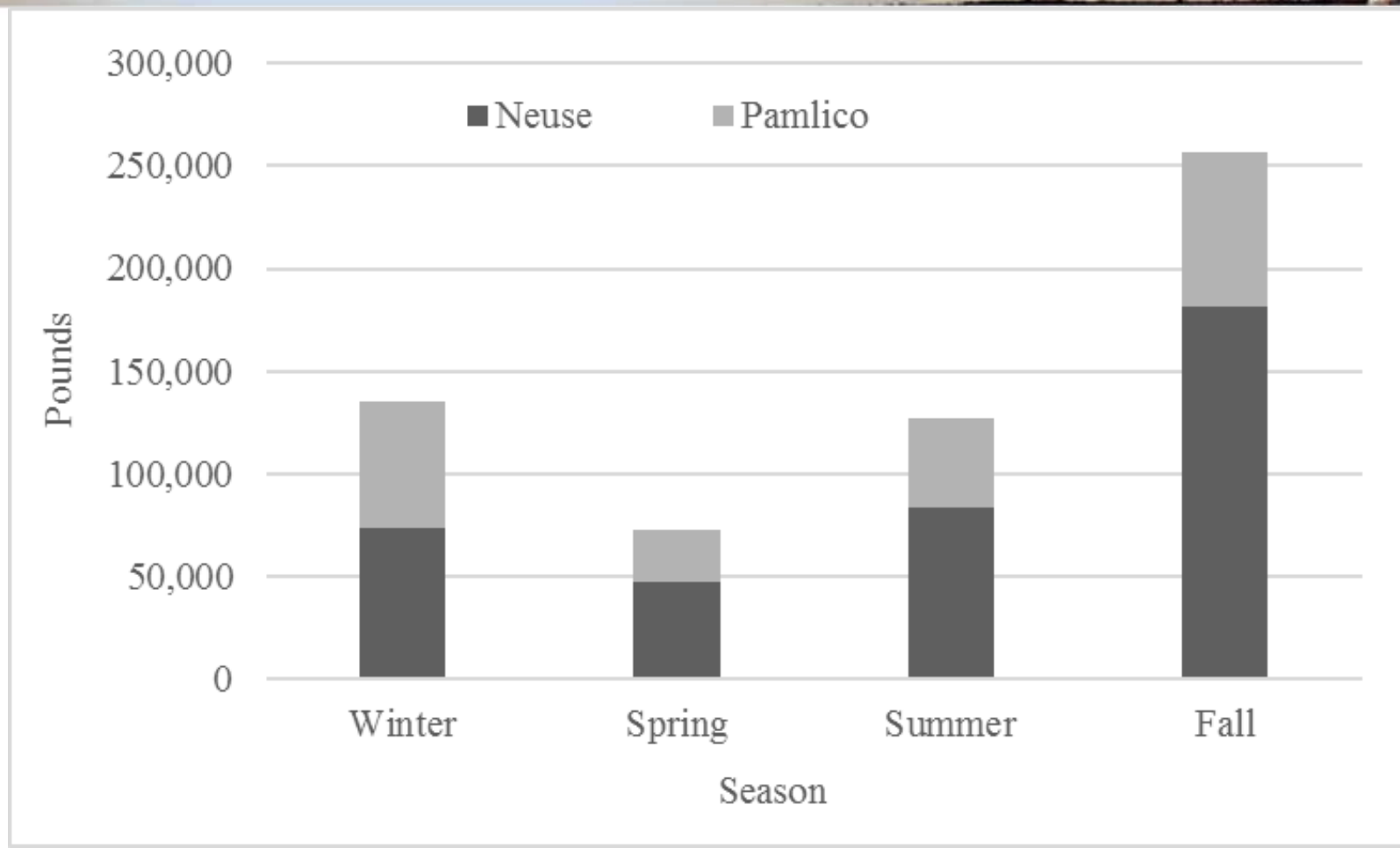


Average number of gill net trips per year, by season and gill net type, in the Pamlico and Neuse rivers combined, 2012-2017.





# Characterize the Commercial Gill Net Fisheries

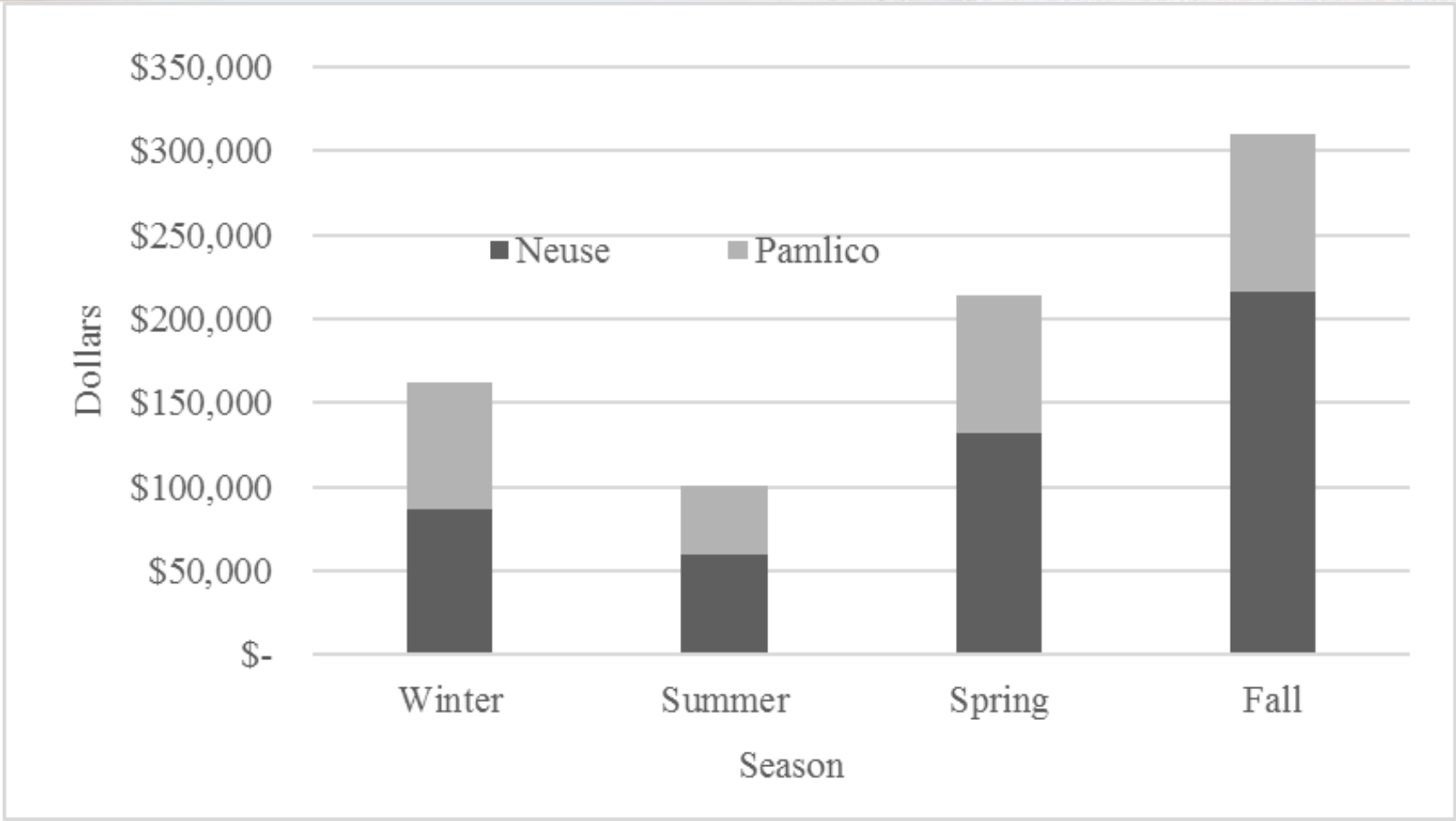


Average pounds harvested per year by all gill nets in the Pamlico and Neuse rivers combined, 2012-2017.





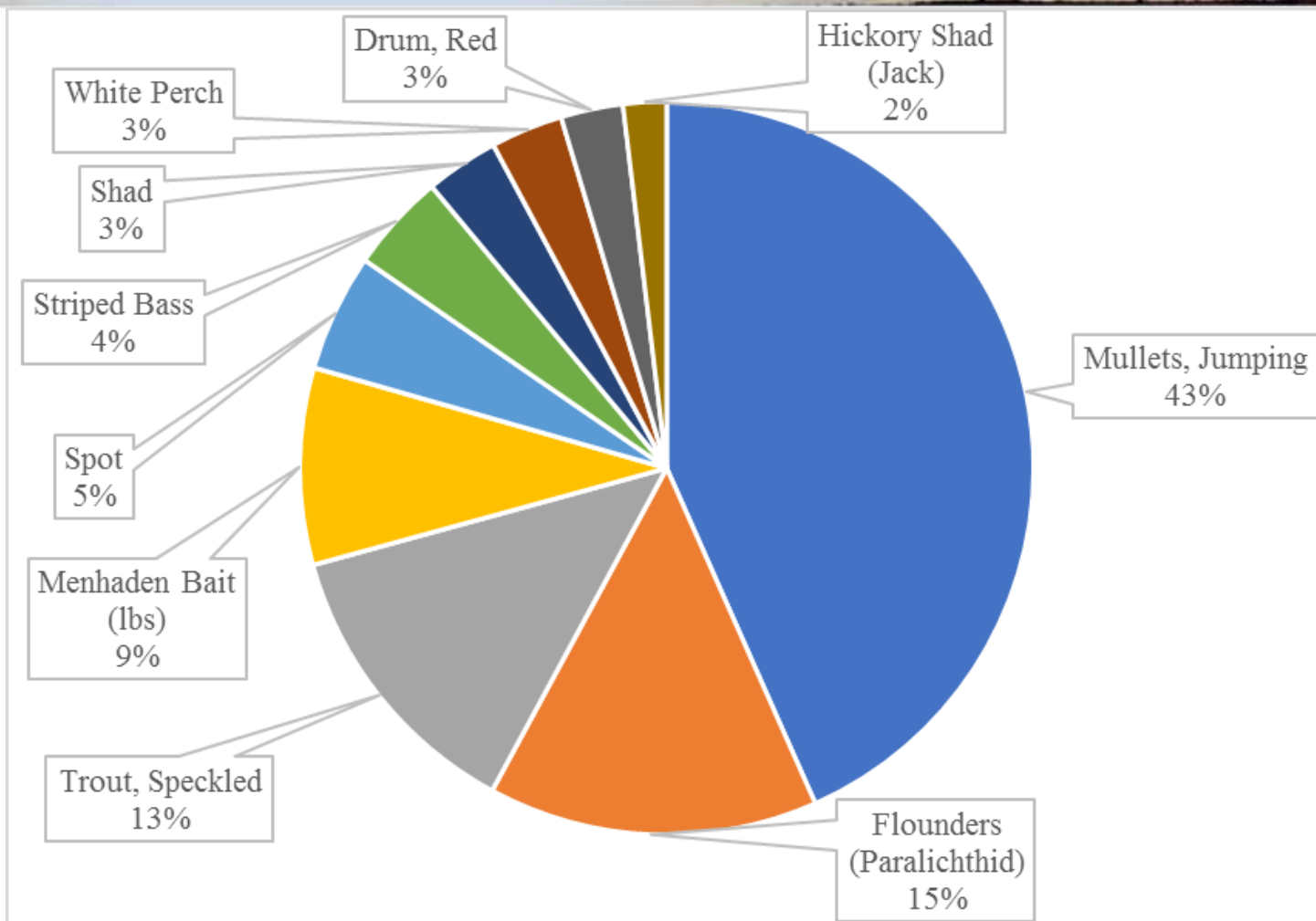
# Characterize the Commercial Gill Net Fisheries



Average dockside value of landings from all gill nets in the Pamlico and Neuse rivers combined, 2012-2017.



# Characterize the Commercial Gill Net Fisheries



Top ten species harvested from all gill nets in the Pamlico and Neuse rivers combined, 2012-2017.



## *Review Recreational Measures in Place to Reduce Mortality*

- Unified harvest season Oct. 1 – April 30
- Closed harvest season May 1 – Sept. 30
- 2 fish daily creel
- 18 inch minimum size limit (except now 26-inch in inland waters)
- Protective slot (no harvest) 22 – 27 inches TL (joint only; except 26-inch in inland waters)
- Harvest moratorium for Cape Fear River and its tributaries
- These totaled to an expected 34% reduction in mortality
- Hooks, Sinkers, and Lines and Ethical Angling brochures aim to increase angler education about ethical angling techniques to reduce release mortality.



## *Review Commercial Measures in Place to Reduce Mortality*

- 25,000 lb Total Allowable Landings (TAL), spring season only
- 10 fish maximum trip limit
- Require the use of a 3 foot tie down in large mesh ( $\geq 5$  inch stretch mesh) gill nets in internal coastal fishing waters upstream of the 76°28.0000' W longitude line.
- Maintain a minimum distance from shore of 50 yards for large mesh nets in the middle portion of the rivers
- The gill net restrictions are effective after the commercial 25,000 lb TAL is met (spring ~April) through December 31 of each year.
- In the Cape Fear River and its tributaries, a striped bass moratorium (no harvest) was also initiated in 2008.
- These totaled to an expected 85% reduction in discard mortality in the Tar-Pamlico and Neuse rivers.







# Genetics: Review of Parentage Based Tagging



Parentage Based Tagging

- Genetic “tags” study started in 2010 by the WRC on the spawning grounds in the Tar-Pamlico and Neuse rivers.
- All offspring **SINCE 2010** can be identified back to the individual parents.

- DMF started obtaining samples in 2016 from recreational and commercial fisheries and lower part of the CSMA rivers to include more area coverage

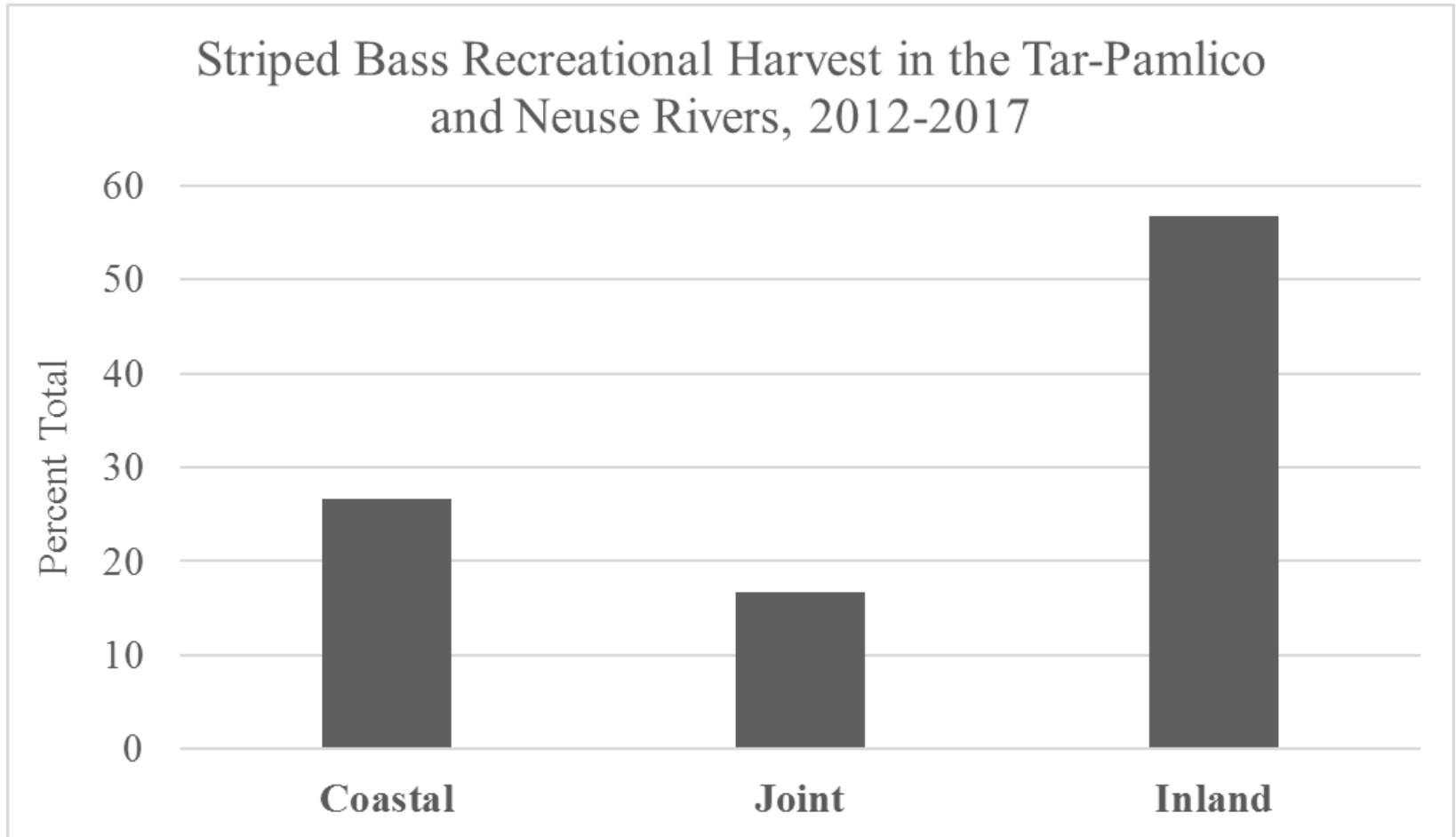




# Genetics: Review of Parentage Based Tagging

Year	System	N Samples	Hatchery	"Wild"	% "Wild"
2016	DMF Tar-Pam	190	164	26	14%
	WRC Tar-Pam	195	171	24	12%
	DMF Neuse	150	142	8	5%
	WRC Neuse	61	44	17	37%
2017	DMF Tar-Pam	148	103	52	34%
	WRC Tar-Pam	137	96	41	30%
	DMF Neuse	118	66	52	44%
	WRC Neuse	233	198	35	15%

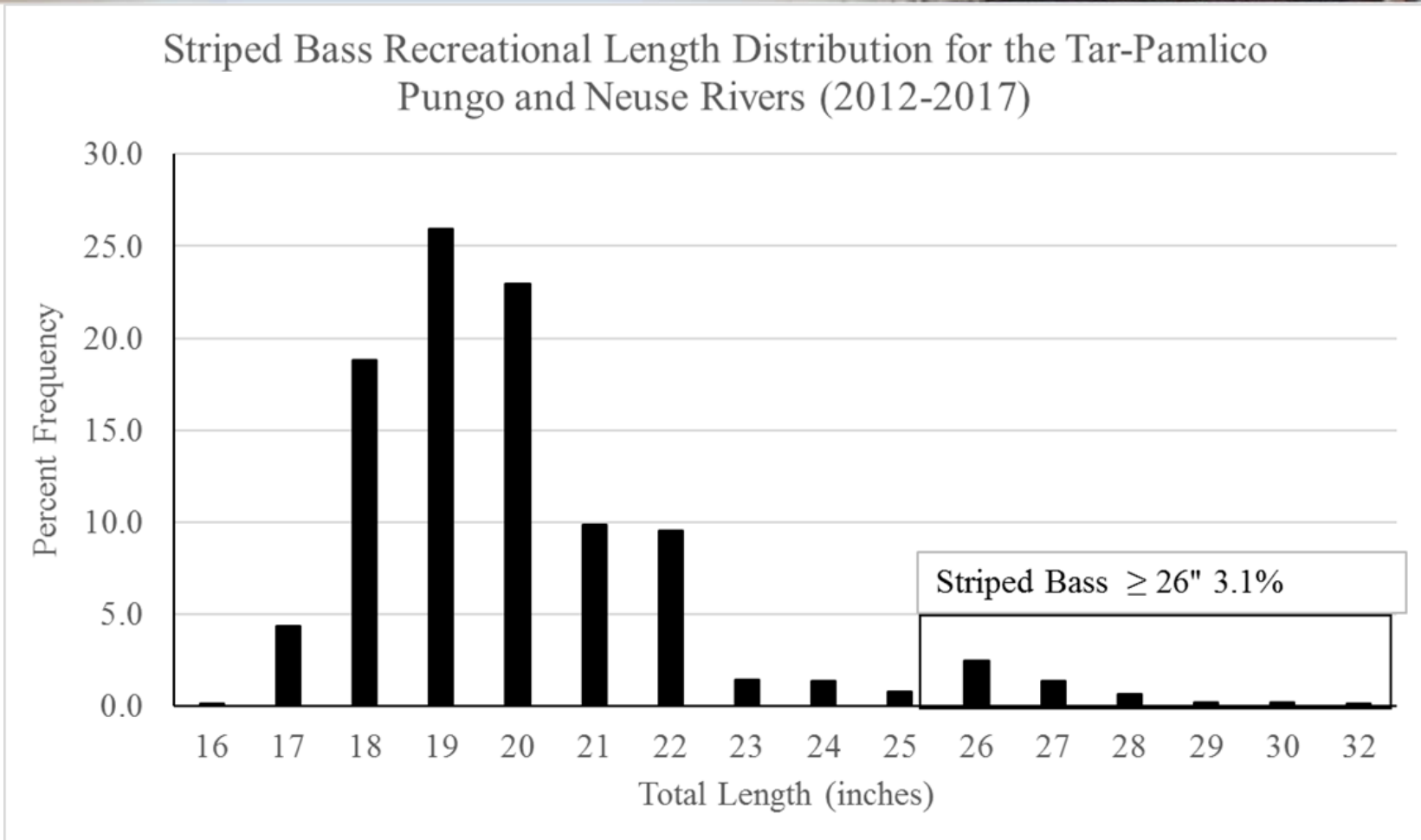
# Recreational 26-inch Reduction Analysis



43% of recreational striped bass harvest comes from Coastal and Joint waters, 57% from Inland waters.



# Recreational 26-inch Reduction Analysis



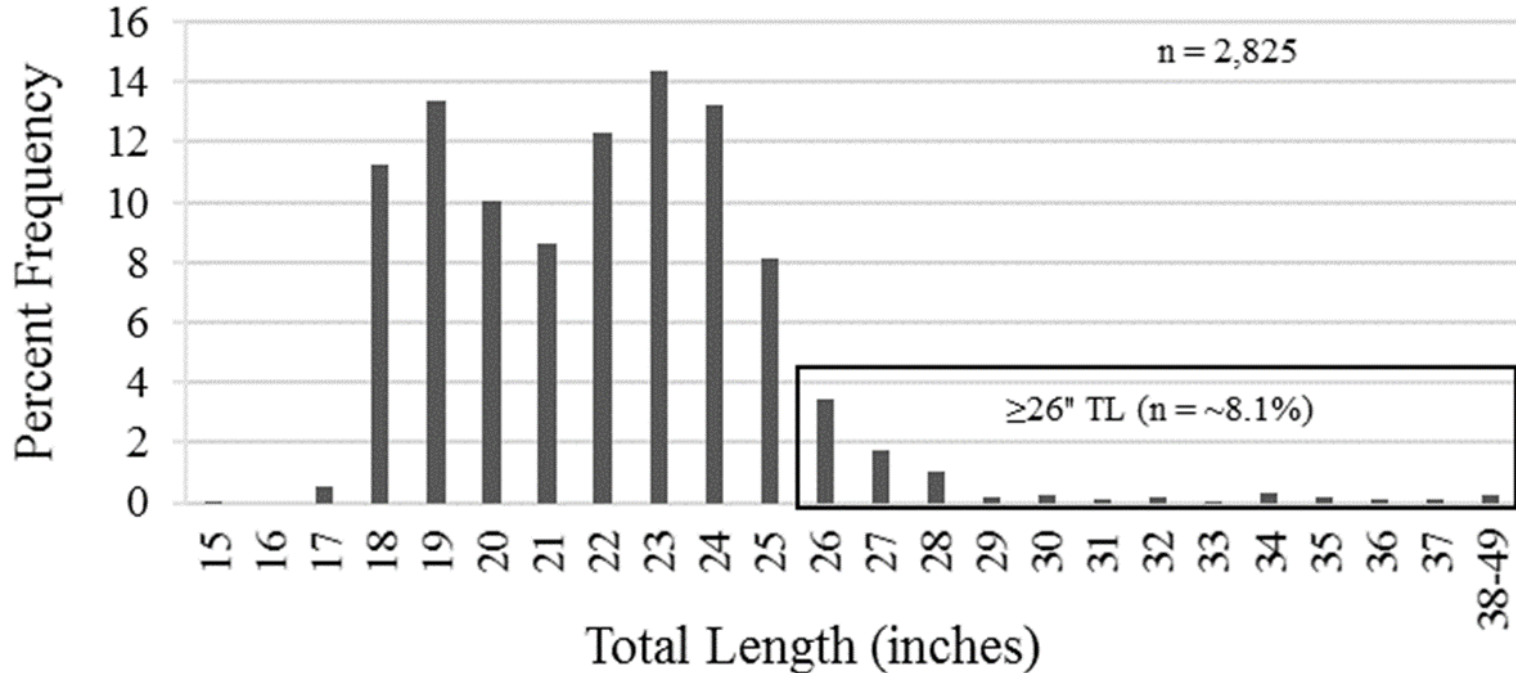
26-inch minimum size reduces recreational harvest in all jurisdictions by 96.9%.



# Commercial 26-inch Reduction Analysis



Striped Bass Commercial Length Distribution for the Tar-Pamlico and Neuse Rivers (2012-2017)



26-inch minimum size reduces commercial harvest by 91.9%.



# Management Recommendations

- DMF recommends that a complete no possession limit would provide the greatest protection for two important year classes.
- Focused, easily implemented, short-term while we finish the FMP.
- DMF recommends to hold one public meeting in the Washington area.
- MFC consider adoption at the Feb 2019 business meeting.
- Draft Goal Statement of Amendment 2 to the NC Estuarine Striped Bass FMP: To achieve self-sustaining populations that yield sustainable harvest based on science based decision making processes. If biological and/or environmental factors prevent a self-sustaining population then alternative management strategies will be implemented that provide protection and access to the resource.





# *Questions?*

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