North Carolina Division of Marine Fisheries

Report to Atlantic States Marine Fisheries Commission South Atlantic Board: Spanish Mackerel Addendum I Pilot Program

April 25, 2016

Introduction

In August 2013, the South Atlantic State-Federal Fisheries Management Board (Board) approved a two-year pilot program through Addendum I to the Interstate Fishery Management Plan for Spanish Mackerel to allow states to reduce the commercial minimum size limit of Spanish mackerel from 12 inches to 11.5 inches (fork length) in the pound net fishery during the months of July through September. The intent was to reduce dead discards of these undersized fish that do not survive the bunting and bailing of the net during the summer months. The use of cull panels to allow for escape of undersized Spanish mackerel at this time of year has met with only limited success.

This exemption was originally applied only for the 2013 and 2014 fishing years to allow the Board to review the impacts of the pilot program and determine if it should be allowed to continue. In 2015, the Board extended the exemption. North Carolina was the only state to apply this exemption in its pound net fisheries. The results of sampling efforts and the impacts on harvest are detailed in the tables and figures below.

Results

A description of the North Carolina Spanish mackerel fishery and associated harvest characteristics from 2000-2012, including the pound net fishery, is contained in Addendum I and incorporated herein by reference. The following information is based on data collected through the North Carolina Trip Ticket Program and fishery-dependent biological sampling.

Tables 1a and 1b contain Spanish mackerel landings and proportion of harvest by pound nets vs. all other gear types, respectively, for the years 2012-2015. Although the pilot program only applied to fishing years 2013-2014 and was subsequently extended, harvest characteristics from 2012 are included for comparison. Total Spanish mackerel commercial landings, as well as that from pound nets, decreased substantially in 2013 relative to 2012 and increased only slightly in 2014, then decreased to 558,993 pounds in 2015 (Table 1a). However, the overall proportion of commercial landings of Spanish mackerel from pound nets stayed relatively constant until 2015, when it increased to seven percent, nearly double that of the previous three years (Table 1b). Table 2 provides an additional breakdown of landings by major gear type; harvest from gill nets clearly dominates landings.

The proportions of Spanish mackerel pound net landings by size bin were calculated using commercial trip ticket data and fishery-dependent sampling. The number of individuals, weight, and length frequencies (fork length) of Spanish mackerel in a pound net sample were expanded to represent the species quantities in the total state pound net catch (trip sample data were expanded to represent the total catch). Expansion was accomplished by matching at the market grade level biological fish house sample data (mean weight or length data) to the corresponding commercial trip ticket market grade harvest. For example, the total length frequency of a species within a catch was derived by expanding the length frequency of the individuals measured in the subsample of a market grade (culled samples) to the total market category weight of that species in the sampled trip. These sample distributions were then summed and the summed distribution applied to the total landings of that market grade.

All of the monthly market grade distributions were summed to produce a single monthly length distribution (i.e., weighted by number of individuals in each distribution); similarly, annual distributions were summed to produce a single weighted annual distribution. In instances where only partial data sets were obtained, such as no fish house length data for a reported trip ticket market grade of extra-large, the number of fish values was applied to the proportions of fish greater than or equal to 12 inches fork length. In cases where species collection weight was obtained, but not species collection number, substitute estimates based on means calculated from available data (e.g., average year market weight) in the same or adjacent sampling cells were used to fill in missing values.

Table 4 and Figure 1 show the proportions of July through September Spanish mackerel pound net harvest (in numbers of fish) accounted for by different size bins for the years 2012-2015. There was a distinct increase of the proportions of fish below 11.5 inches during these months, from one percent in 2012 to 16 percent in 2013, then dropping to 11 percent in 2014, and increasing back to 15 percent in 2015. Similarly, the proportion of fish harvested between 11.5 and 11.99 inches increased from eight percent in 2012 to 16 percent in 2013, decreased slightly to 12 percent in 2014, and dropped to seven percent by 2015. In 2015, the proportion of fish less than 11.5 inches increased to 15 percent of Spanish mackerel pound net harvest during July through September, while the proportion of fish between 11.5 and 11.99 inches dropped to seven percent.

Table 5 and Figure 2 illustrate the annual proportions of Spanish mackerel pound net harvest (in numbers of fish) by size bin. On an annual basis, the proportion of fish less than 11.50 inches increased from less than one percent in 2012 to 11 percent in 2013, dropped in 2014 to two percent, and reached 10 percent in 2015. The proportion of fish between 11.5 and 11.99 inches increased from three percent in 2012 to 11 percent in 2013, and fell to four percent in 2014, then reached five percent of annual Spanish mackerel pound net harvest in 2015.

Discussion

The harvest of Spanish mackerel by pound nets in North Carolina represents a small fraction of the total commercial landings. Despite the decrease in pound net landings of Spanish mackerel in 2013, the proportion of fish harvested within the exempted size limit and below is somewhat high (on an annual basis, Table 5) in comparison to 2014. There are several possible reasons for this: a decrease in the total number of pound net trips in 2013 compared to 2012; the relatively short timeframe during which this fishery occurs; and the small geographic area (the eastern edge of Pamlico Sound on the backside of the Outer Banks). All of these factors combined to produce limited fishery-dependent sampling opportunities in 2013 for the pound net fishery. Fewer available trips and a shortened season can result in missed sampling of certain market grades, which impacts the ability to accurately characterize the fishery. For these reasons, 2014 and 2015 may be a better comparison with regard to the effectiveness and impact of the size limit exemption on harvest.

While the proportional increases in harvest by size bin in 2013 are high in comparison to 2012 and 2014, the magnitude of that harvest is relatively small in comparison to the total harvest

(across all fisheries) of Spanish mackerel, especially since the proportion of size bins landed in 2015 were more similar to 2013 than any other year. Applying the proportions of July through September harvest below 11.5 inches and between 11.5 and 11.99 inches from Table 4 to the pound net landings during these months in Table 3, approximately 3,900 pounds of Spanish mackerel under the regular 12-inch size limit were harvested in 2013 (roughly 2,000 pounds below 11.5 inches and 2,000 pounds between 11.5 and 11.99 inches). Similarly for 2014, approximately 500 pounds of Spanish mackerel below 11.5 inches and 600 pounds between 11.5 and 11.99 inches were harvested by pound nets. For 2015, given the overall increase in pound net harvest, approximately 3,500 pounds below 11.5 inches and 1,600 pounds between 11.5 and 11.99 inches were harvested by pound nets.

Finally, a couple discrepancies should be noted between the 2015 report and this report. First, an unnecessary conversion (from kilograms to pounds) occurred with landings from 2012 in the 2015 report; this has been corrected. Second, corrections to the coding of fishery-dependent pound net samples occurred in the NCDMF biological database, which impacted the proportions of harvest shown in Tables 4 and 5, and Figures 1 and 2.

Table 1a. North Carolina Spanish mackerel landings (pounds) by pound nets vs. other gears (2012-2015).

Gear Type	2012	2013	2014	2015	Grand Total
Pound net	38,612	18,764	25,600	40,032	123,008
Other gears	874,382	598,051	645,592	518,961	2,636,986
TOTAL	912,994	616,815	671,192	558,993	2,759,994

Table 1b. North Carolina Spanish mackerel proportion of landings from pound nets vs. other gears (2012-2015).

Gear Type	2012	2013	2014	2015	Grand Total
Pound net	4%	3%	4%	7%	4%
Other gears	96%	97%	96%	93%	96%
TOTAL	100%	100%	100%	100%	100%

Table 2. North Carolina Spanish mackerel landings (pounds) by major gear type (2012-2015).

Gear Type	2012	2013	2014	2015
Beach Seine	15	44	23	22
Estuarine Gill Net	372,801	250,524	221,972	229,439
Long Haul	197	682	1,069	
Ocean Gill Net	501,369	346,801	422,528	289,500
Pound Net	38,612	18,764	25,600	40,032
TOTAL	912,994	616,815	671,192	558,993

Table 3. North Carolina pound net landings (pounds) by month (2012-2015).

Month	2012	2013	2014	2015
May	3,173	-	389	93
June	24,191	6,222	20,262	16,127
July	5,761	4,408	2,425	9,519
August	2,719	3,585	2,297	11,365
September	2,622	4,357	218	2881
October	146	111	9	43
November	-	81	-	4
TOTAL	38,612	18,764	25,600	40,032

Table 4. Proportion of July - September Spanish mackerel pound net landings (number of fish) by size class (2012-2015).

Size (July-Sept)	2012	2013	2014	2015
<11.5 in	<1%	16%	11%	15%
11.5-11.99 in	8%	16%	12%	7%
≥12 in	91%	68%	77%	78%

Table 5. Proportion of annual Spanish mackerel pound net landings (number of fish) by size class (2012-2014).

Size (Jan-Dec)	2012	2013	2014	2015
<11.5 in	<1%	11%	2%	10%
11.5-11.99 in	3%	11%	4%	5%
≥12 in	97%	78%	95%	85%

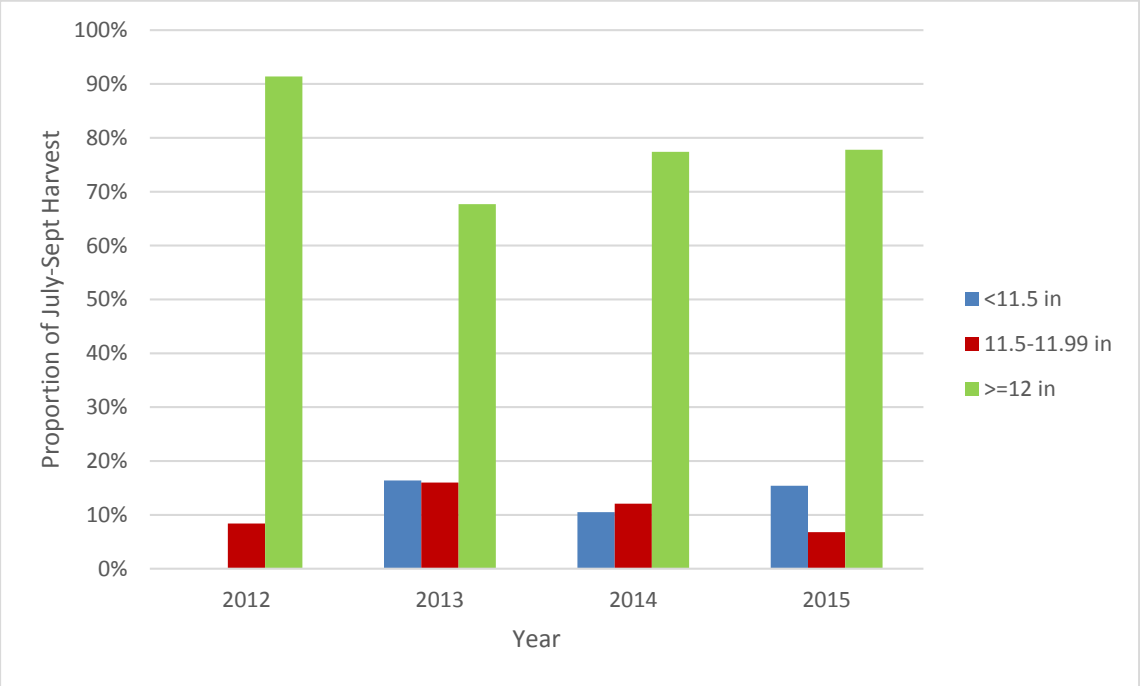

Figure 1. Proportion of July through September Spanish mackerel pound net harvest accounted for by different size bins (2012-2015).

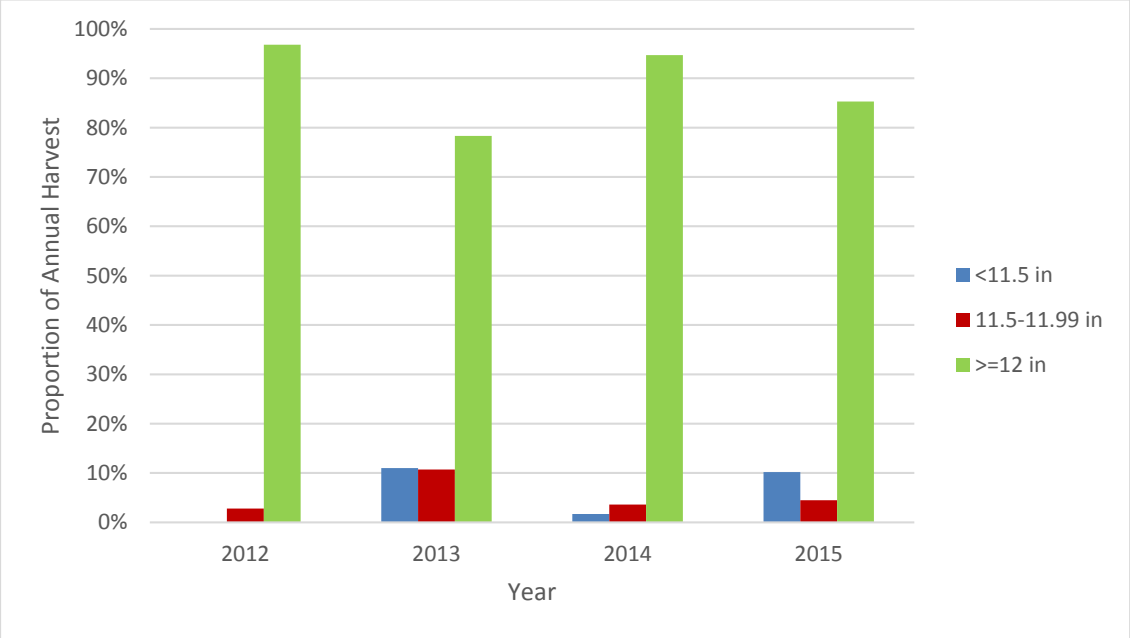

Figure 2. Proportion of annual Spanish mackerel pound net harvest accounted for by different size bins (2012-2015).