Mid-Atlantic Fishery Management Council
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MEMORANDUM

Date: 5/25/2018

To: Council

From: Julia Beaty

Subject: Chub Mackerel Amendment briefing materials

The following documents are enclosed behind tab 6 for consideration by the Council.

1. 2018 Chub Mackerel Fishery Information Document
2. Summary of April 27, 2018 Fishery Management Action Team (FMAT) meeting
3. Correspondence between the Council and NMFS Greater Atlantic Regional Fisheries Office on chub mackerel management unit options
4. May 8, 2018 staff memo on chub mackerel assessment and ABCs
5. 2018 Advisory Panel (AP) Chub Mackerel Fishery Performance Report
6. Summary of May 15, 2018 Mackerel, Squid, Butterfish AP and Committee meeting
7. Additional comments from AP members
8. Small scombrid ID guide

Chub Mackerel Fishery Information Document

May 2018

This document provides a brief overview of the biology, stock condition, management system, and recent fishery information for Atlantic chub mackerel (*Scomber colias*) in U.S. waters.

1. Biology and Life History

Atlantic chub mackerel are a schooling pelagic species that are found on the continental shelf to depths of about 250-300 meters throughout much of the western and eastern Atlantic Ocean. In the western Atlantic, their range spans from Nova Scotia (where they are rare) through Argentina, including the Gulf of Mexico (Collette and Nauen 1983, Collette 2002).

Chub mackerel can be found throughout U.S. Atlantic waters (Collette and Nauen 1983, Collette 2002). However, they are not commonly encountered in the Northeast Fisheries Science Center's (NEFSC's) bottom trawl survey. Most chub mackerel catches in this survey occur south of the Hudson Shelf Valley in warm water temperatures (i.e. generally higher than about 20°C or about 68°F; personal communication, John Manderson, Michele Traver, and Chris Tholke). State trawl surveys and recreational catch data suggest that chub mackerel can also be found in inshore waters.

The stock structure of chub mackerel in the western Atlantic Ocean has not been well studied. Studies from other regions suggest, based on differences in morphology, spawning seasons, and/or sizes at maturity, that sub-stocks may exist (Chen et al. 2009, Weber and McClatchie 2012, Cerna and Plaza 2014, Yasuda et al. 2014). However, chub mackerel have been found to be genetically uniform across wide areas (Scoles et al. 1998, Zardoya et al. 2004). For example, Scoles et al. (1998) found no significant genetic differentiation between chub mackerel from the eastern Mediterranean Sea, the Ivory Coast, and South Africa; however, they did find significant genetic differentiation between chub mackerel from the western and eastern Atlantic.

Migratory patterns in the western North Atlantic are also not well understood. In the northern hemisphere, chub mackerel migrate between northern areas in warmer months and southern areas in cooler months (Collette and Nauen 1983). Adults prefer temperatures of 15-20°C (about 60-70°F; Collette and Nauen 1983, Perotta et al. 2001). Some studies suggest that juveniles tend to be found closer inshore than adults (Castro 1993).

Atlantic chub mackerel grow rapidly during the first year of life (Krivospitchenko 1979, Lorenzo et al. 1995, Lorenzo and Pajuelo 1996, Hernández and Ortega 2000, Kiparissis et al. 2000, Perrota et al. 2005, Velasco et al. 2011, Daley 2018). For example, Lorenzo and Pajuleo (1996) found that chub mackerel attain 40% of their maximum length in the first year of life. Females and males do not exhibit differences in growth rates (Lorenzo and Pajuelo 1996, Vasconcelos et al. 2011, Velasco et al. 2011) or age at maturity (Lorenzo and Pajuelo 1996). Daley (2018) suggested that chub mackerel in the northwest Atlantic may grow faster and reach smaller

average lengths at age compared to other regions; however, these differences may be partly due to the influence of fishery selectivity on the samples collected.

Chub mackerel have been documented to reach at least age 13 (Carvalho et al. 2002); however, in most regions, ages 0-5 or younger are most commonly observed in commercial fishery and survey catches (e.g. Krivospitchenko 1979, Perotta 1992, Lorenzo and Pajuelo 1996, Martins et al. 2013, Daley 2018). Daley (2018) sampled chub mackerel from commercial fishery and survey catches off the northeast U.S. in 2016 and 2017. Estimated ages ranged from 0 to 7 years, with ages 2 – 4 being the most common.

Atlantic chub mackerel spawn in several batches (Collette and Nauen 1983). They typically spawn in water temperatures of 15-20°C (about 60-70°F). Berrien (1978) found evidence of chub mackerel spawning from North Carolina to Florida during January - July. Richardson et al. (2010) documented Atlantic chub mackerel larvae in the straits of Florida in nearshore waters during January – May. Daley (2018) suggested that spawning occurs in the winter in the Gulf of Mexico based on larval and juvenile concentrations, which were highest during January, February, March, and April. The closely related Pacific chub mackerel (*Scomber japonicus*) is believed to spawn several times throughout the year whenever oceanographic conditions are favorable and sufficient food is available (Crone and Hill 2015). The same may be true for Atlantic chub mackerel.

Daley (2018) performed a histological analysis of chub mackerel caught in commercial fisheries off the mid-Atlantic and found that chub mackerel reach maturity around age two.

2. Ecosystem Considerations

Chub mackerel have a unique ecosystem role as both a forage species and a predator of other forage species (Okey et al. 2014).

No studies of the diet composition of chub mackerel off the U.S. east coast have been found to date. Studies from other regions suggest that they are opportunistic predators with a seasonally-variable diet of small crustaceans (especially copepods), small fish, and squid (Habashi and Wojeiechowski 1973, Collette and Nauen 1983, Castro and Del Pino 1995, Server et al. 2006, Bachiller and Irigoien 2015). Adults tend to consume larger prey and more fish prey than juveniles (Castro 1993).

It can be difficult to visually distinguish partially-digested chub mackerel from other small scombrids such as Atlantic mackerel (*Scomber scomber*), bullet mackerel (*Auxis rochei*), and frigate mackerel (*Auxis thazard*; Paine et al. 2007; John Graves, personal communication; Steve Poland, personal communication; Michelle Staudinger, personal communication). For this reason, there are limited quantitative estimates of the contribution of chub mackerel to the diets of any predator species. Manooch et al. (1984) found that chub mackerel made up 0.2% (by frequency of occurrence) of the diets of dolphinfish sampled off North Carolina through Texas. They have also been documented as important prey for blue marlin at certain times of year off Portugal (Veiga et al. 2011) and Cabo San Lucas (Abitia-Cardenas et al. 1999).

Many diet studies quantify scombrids at the family or genus level, rather than the species level. The family Scombridae, which includes mackerels and tunas, contributes to the diets of many

predators, including common dolphins, pilot whales, yellowfin tuna, wahoo, and others (e.g. Manooch and Hogarth 1983, Manooch and Mason 1983, Smith et al. 2015, Duffy et al. 2017).

In 2018, the Council funded a study to assess the contribution of chub mackerel to the diets of white and blue marlins and bigeye and yellowfin tunas. These predators were identified as priority species by stakeholders. Sampling will occur in commercial and recreational fisheries from New Jersey through North Carolina during 2018 and 2019. This study will use a combination of traditional stomach content analysis, genetic barcoding techniques, and stable isotope analysis.

3. Status of the Stock

The stock status of Atlantic chub mackerel in the western Atlantic Ocean is unknown as there have been no quantitative assessments of this species in this region.

Large fluctuations in Atlantic chub mackerel abundances have been reported around the world, including in the mid-Atlantic and New England (Goode 1884, Hernández and Ortega 2000). These fluctuations may be partly the result of environmental influences such as temperature and upwelling strength on recruitment (Hernández and Ortega 2000). Given that chub mackerel are a fully pelagic species, ocean processes likely influence their availability in any given area, as well as their recruitment.

The stock assessment for the closely-related Pacific chub mackerel suggests that periods of high recruitment success occur "no more frequently than at least every few decades" (Crone and Hill 2015). Several studies suggest that environmental factors, especially sea surface temperature, influence recruitment and abundance of Pacific mackerel (e.g. Sinclair et al. 1985, Avalos-García et al. 2003, Yatsu et al. 2005, Chen et al. 2009, Martins et al. 2013, Yasuda et al. 2014, Crone and Hill 2015, Hilborn et al. 2017).

4. Fishery Characteristics

Commercial Fisheries

Commercial catch and landings data for the northeast (mid-Atlantic and New England) and the southeast (South Atlantic and Gulf of Mexico) were extracted from separate datasets and are summarized separately. Northeast landings and price data for 2017 are preliminary. Southeast landings and price data for 2017 were not available at the time of writing this document.

Mid-Atlantic and New England Commercial Fisheries

Commercial chub mackerel landings from the mid-Atlantic and New England show a notable increase starting in 2013 (Table 1, Figure 1). According to dealer data, during 1998-2012 commercial landings in the mid-Atlantic and New England averaged 62,293 pounds per year with an average ex-vessel price of $0.29 per pound (adjusted to 2016 dollars). Landings reached a peak of 5.25 million pounds in 2013. Average landings from 2013 through 2017 were about 1.84 million pounds, with an average ex-vessel price of $0.38 per pound (adjusted to 2016 dollars; Table 1).

This increase in landings is the result of a small number of vessels targeting chub mackerel in some years. According to participants in this fishery, there was little market demand for chub mackerel from this region until recently. This changed due to the efforts of certain commercial fish dealers and changes in other fisheries around the globe.

A small number of bottom trawl vessels which also participate in the *Illex* squid fishery have been responsible for the vast majority of chub mackerel landings since 2013. Some fishermen describe chub mackerel as a "bailout" species which they harvest when they are not able to harvest *Illex* squid. Chub mackerel tend to be harvested in the same areas and times of year when *Illex* squid are also harvested; however, fishermen say they typically will not harvest both species at the same time because the quality of the chub mackerel suffers when the two are stored together. Commercial chub mackerel landings from the mid-Atlantic and New England show an inverse correlation with *Illex* squid landings in recent years (Figure 2).

According to public comments, a small number of vessels on the east coast are large and fast enough to harvest this fast-swimming, low-value species in profitable quantities. Landings data seem to support this. Public comments suggest that most of the chub mackerel landed in this region are processed for use as human food and lesser amounts are used as bait in other fisheries.

During 1998-2017, as many as 29 federally-permitted vessels per year landed chub mackerel in the mid-Atlantic and New England.[1] As many as 9 federally-permitted dealers per year in 4 northeast states purchased these landings. However, a small subset of these vessels and dealers accounted for the majority of landings.

According to data from the Northeast Fisheries Observer Program (NEFOP), during 1997-2016, bottom otter trawls accounted for 93% of observed chub mackerel catch, midwater trawls accounted for 7% of observed catch, and all other gear types accounted for less than 1% of observed catch.

According to northeast dealer data, northeast vessel trip reports (VTRs), NEFOP, and data from vessels participating in the NEFSC's study fleet, nearly all chub mackerel landings (>95%) over the past 20 years occurred during June-October. The highest proportion of landings occurred in September (35-65%, depending on the dataset), followed by August (16-17%, depending on the dataset).

According to NEFOP data, during 1998-2017, about 90% of the observed chub mackerel catch was kept and about 10% was discarded. VTR data over the same time period show that 97% of the catch was kept and 3% was discarded.

According to VTR data, over 90% of the landings originated from statistical areas south of New York. Much of these landings came from statistical areas which overlap with the shelf break (Figure 5). About 80% of the landings reported through VTRs, the study fleet, and NEFOP resulted from catch at about 50-100 fathoms depth.

[1] The number of vessels without federal permits which landed chub mackerel is unknown.

South Atlantic and Gulf of Mexico Commercial Fisheries

Chub mackerel landings in the South Atlantic and Gulf of Mexico have not shown the same increasing trend as mid-Atlantic and New England landings (Figure 3). Nearly all dealer-reported chub mackerel landings from this region during 1997-2016 occurred in Florida. At least 90% of the landings in each year were reported by Florida Gulf coast dealers. Landings averaged 87,505 pounds per year with an average ex-vessel price of $0.34 per pound (adjusted to 2016 dollars; Table 2, Figure 2).

According to commercial landings data, about 89% of commercial chub mackerel landings in the Gulf of Mexico during 1997-2016 came from bottom trawls or unspecified trawls and about 8% came from purse seines. All other gear types combined accounted for less than 3% of landings from the Gulf of Mexico. Landings from the South Atlantic were much lower (generally accounting for 10% or less of total annual landings from the South Atlantic and Gulf of Mexico) and were harvested with a greater variety of gear types, including purse seines, hand lines, cast nets, gill nets, and other gears, none of which accounted for more than about one third of the total South Atlantic landings.

Southeast landings were not as seasonally concentrated as northeast landings. About 72% of southeast landings during 1997-2016 occurred during June-October. The highest proportion of southeast landings occurred during August (20%), followed by June (19%).

Southeast dealer data are not compiled in such a way that the number of vessels can be determined. As previously stated, nearly all commercial southeast landings during 1997-2016 occurred in Florida. As many as 7 Florida dealers per year (with an average of 5) reported chub mackerel landings per year.

Fewer details on the locations of commercial chub mackerel catches are available from the South Atlantic and Gulf of Mexico, compared to the mid-Atlantic and New England. Southeast logbook data include information on effort and areas fished; however, they contain very few records of chub mackerel representing only 11 trips since 2000. It is unlikely that informative conclusions could be drawn from these data due to the small number of records.

Commercial Fisheries Bycatch

During development of the Unmanaged Forage Omnibus Amendment (MAFMC 2017a), individuals familiar with the recent targeted commercial chub mackerel fishery said vessels have little incentive to land fewer than about 40,000 pounds of chub mackerel at a time. Forty thousand pounds of chub mackerel can fill a bait truck. Given the low value of chub mackerel (Table 1), and the limited market for chub mackerel in this region, fishermen may have a hard time selling fewer than 40,000 pounds at a time. Thus, for the purposes of examining bycatch in the mid-Atlantic and New England, targeted chub mackerel trips were defined as trips where at least 40,000 pounds of chub mackerel were landed. On such trips, the other species most commonly caught (by weight) were *Illex* squid, longfin squid, butterfish, and round herring, according to NEFOP data for 1998-2017.

Bycatch in South Atlantic and Gulf of Mexico fisheries has not yet been examined; however, based on the information presented above, chub mackerel do not appear to be targeted in these regions to the same extent as in the mid-Atlantic and New England in recent years.

Table 1: Northeast dealer-reported landings and average price per pound of chub mackerel and *Illex* squid, 1998-2017. Data from some years are combined to protect confidential information representing fewer than three vessels and/or dealers. Prices are adjusted to 2016 dollars using the gross domestic product deflator index. Landings and price data for 2017 are preliminary. 2017 average prices are unadjusted.

Northeast region (mid-Atlantic and New England)				
Year	**Chub mackerel landings (lb)**	**Average chub mackerel price per pound**	***Illex* squid landings (lb)**	**Average *Illex* squid price per pound**
1998	40,219	$0.13	51,958,751	$0.13
1999	6,443	$0.26	16,289,021	$0.17
2000	16,246	$0.24	19,866,592	$0.14
2001	4,384	$0.74	8,837,567	$0.16
2002	471	$0.33	6,061,729	$0.18
2003	488,316	$0.04	14,090,521	$0.22
2004	126	$0.41	57,534,687	$0.23
2005	0	--	26,526,087	$0.26
2006	0	--	30,740,382	$0.22
2007-2009	21,039	$0.26	95,549,924	$0.20
2010-2011	192,301	$0.16	76,326,551	$0.37
2012	164,846	$0.36	25,813,134	$0.39
2013	5,249,567	$0.19	8,359,998	$0.27
2014	1,230,311	$0.26	19,327,085	$0.30
2015	2,108,337	$0.23	5,339,292	$0.29
2016	610,783	$0.17	14,736,843	$0.49
2017	2,202	$1.20	22,164,447	$0.45
1998-2017 Average	506,780	$0.25	26,349,909	$0.22

Table 2: Southeast dealer-reported landings and average price per pound of chub mackerel, 1997-2016. Data from the Gulf of Mexico and South Atlantic, and for some years, are combined to protect confidential information representing fewer than three dealers. Prices are adjusted to 2016 dollars using the gross domestic product deflator index.

Southeast region (South Atlantic and Gulf of Mexico)		
Year	**Chub mackerel landings (lb)**	**Average chub mackerel price per pound**
1997	113,621	$0.69
1998	93,669	$0.20
1999	67,665	$0.37
2000	46,907	$0.20
2001	268,110	$0.66
2002	172,914	$0.35
2003	204,382	$0.36
2004	170,807	$0.36
2005	30,069	$0.37
2006	13,393	$0.17
2007	18,244	$0.24
2008	41,841	$0.36
2009	2,767	$0.26
2010	82,424	$0.14
2011	178,006	$0.19
2012-2013	193,976	$0.21
2014	117,686	$0.23
2015	98,503	$0.24
2016	57,499	$0.20
1997-2016 average	103,815	$0.31

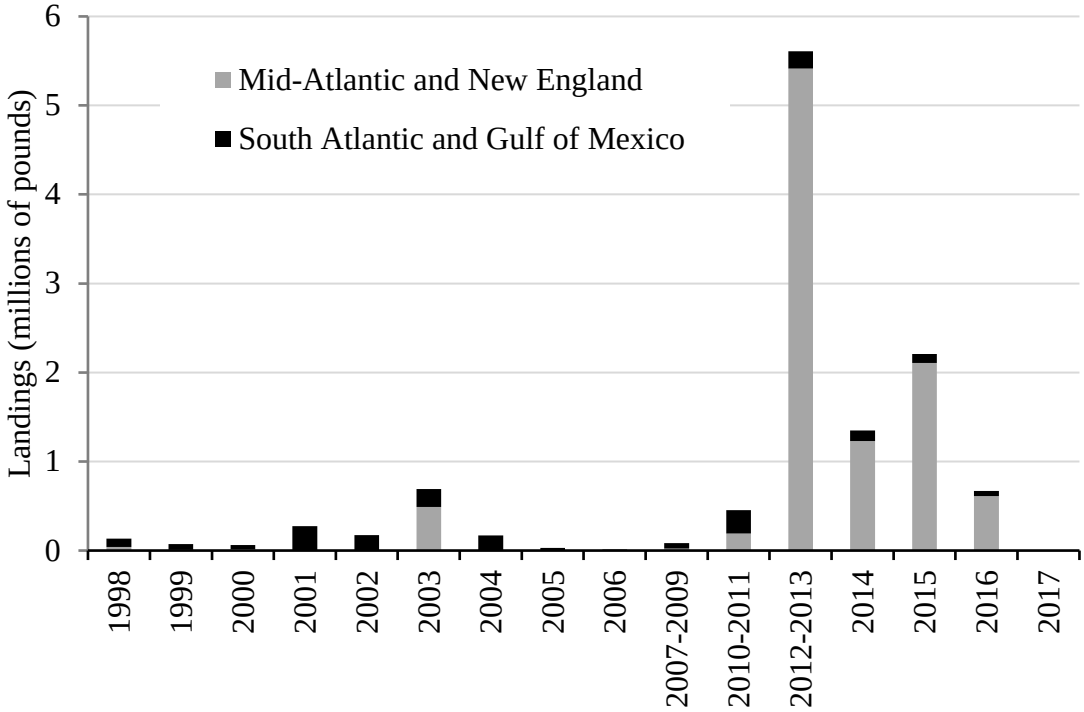

Figure 1: Dealer-reported chub mackerel landings, 1998-2017. Data are combined into two regions and some years are combined to protect confidential information representing fewer than three vessels and/or dealers. Mid-Atlantic and New England data for 2017 are preliminary. South Atlantic and Gulf of Mexico landings data for 2017 are not currently available.

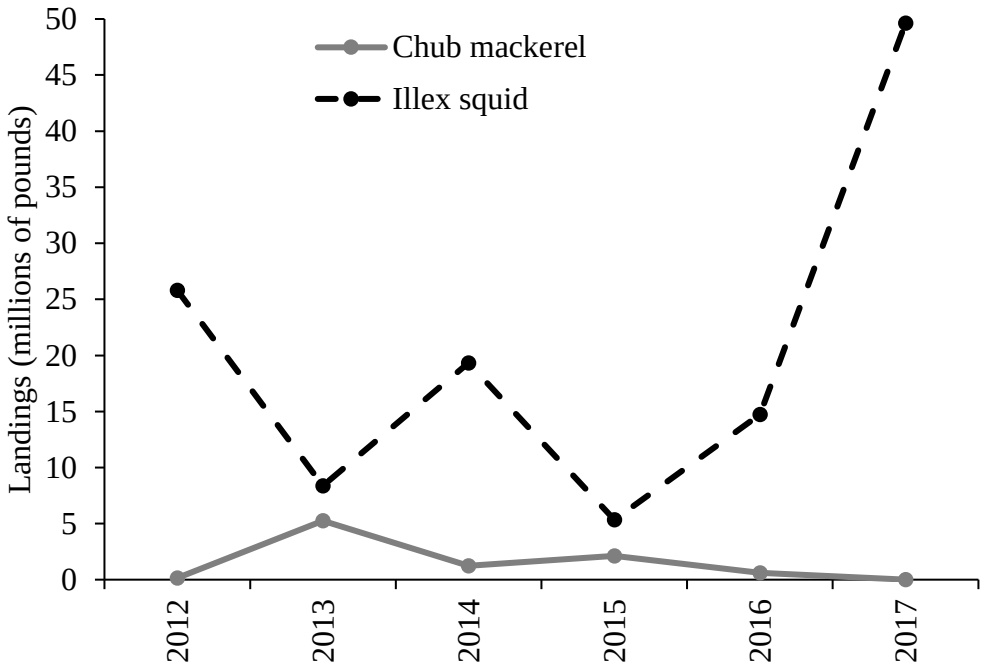

Figure 2: Landings of chub mackerel and *Illex* squid, 2012 - 2017, as shown in northeast commercial dealer data. 2017 landings are preliminary.

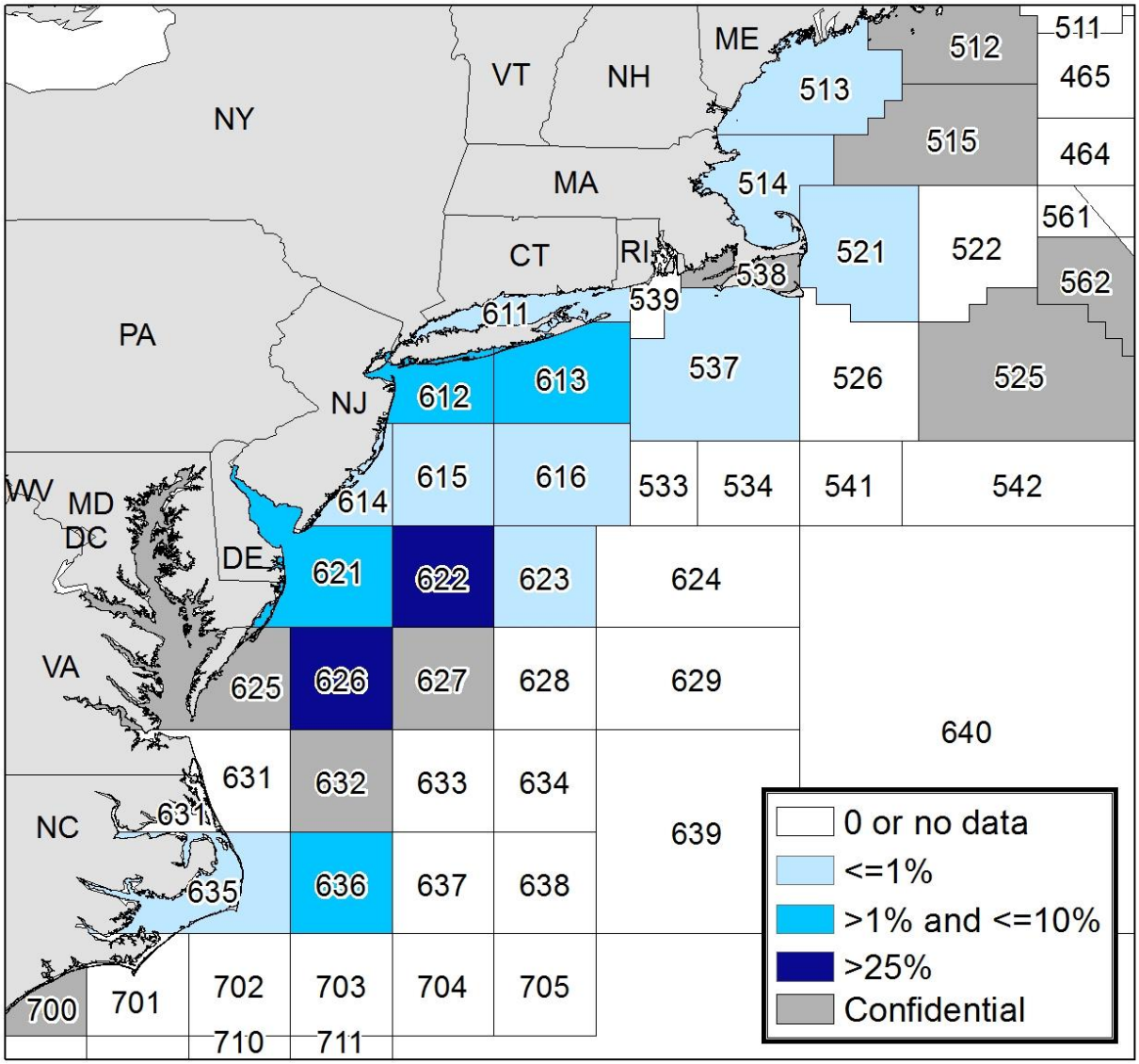

Figure 3: Percent of commercial chub mackerel landings (by weight) by statistical area, 1998-2017 as shown in northeast Vessel Trip Report data. Data associated with fewer than three vessels and/or dealers is confidential. Confidential landings collectively accounted for less than 10% of the total.

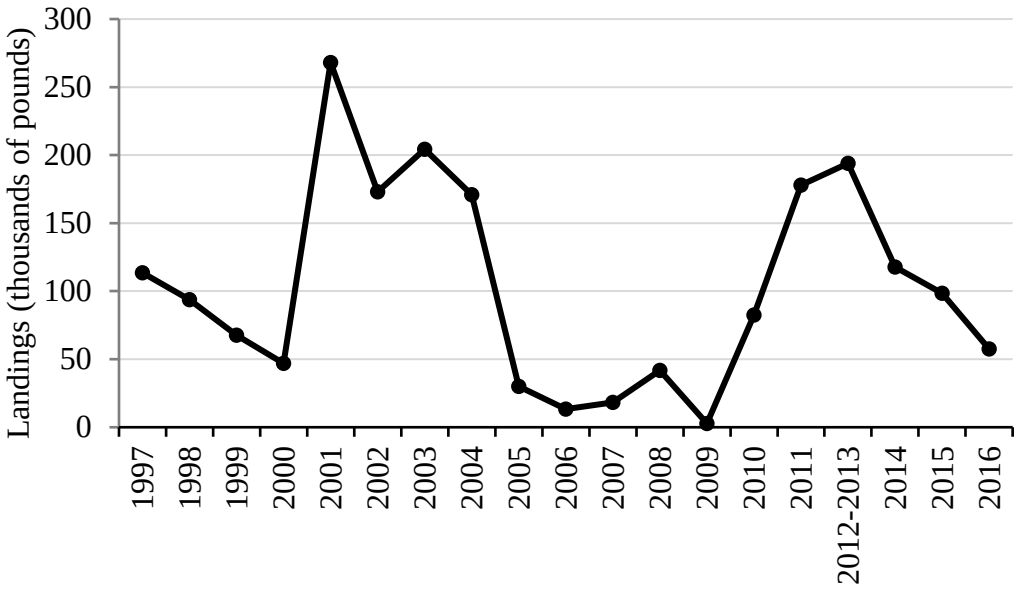

Figure 4: Dealer-reported chub mackerel landings from the Gulf of Mexico and South Atlantic, 1997-2016. Data for both regions and for some years are combined to protect confidential information representing fewer than three dealers.

Recreational Fisheries

Data on recreational chub mackerel catch, landings, and effort are available from the Marine Recreational Information Program (MRIP) and the southeast region headboat survey. Both data sets show sporadic catches. MRIP data for the entire Atlantic coast and the Gulf of Mexico show an average of 10,620 pounds of estimated recreational chub mackerel landings per year during 1998-2017. In about half of those years, no recreational landings were estimated (Table 3, Figure 5). According to self-reported angler data, about 25% of these landings were caught in state waters, with the remaining 75% in federal waters.

Chub mackerel may be rarely encountered on recreational trips. There may also be instances of misreporting chub mackerel as Atlantic mackerel, especially in datasets that rely on self-reported angler data, such as MRIP. Recreational chub mackerel data are should be considered uncertain and imprecise.

The Mid-Atlantic Fishery Management Council has heard anecdotal descriptions of recreational chub mackerel harvest, including reports of catch on for-hire vessels out of New York and New Jersey. There have also been reports of chub mackerel harvest for use as live bait on recreational trips out of Maryland and Virginia for species like white and blue marlin, sailfish, spearfish, yellowfin tuna, bigeye tuna, and wahoo. According to public comments, this live bait fishery occurs on the edges of certain offshore canyons, especially Norfolk Canyon, where chub mackerel and their predators are concentrated in the late summer and early fall (see MAFMC 2016 and MAFMC 2017b for more details).

Table 3: MRIP estimated recreational landings and discards of chub mackerel from New England, the Mid-Atlantic, and Gulf of Mexico combined, 1998-2017. No landings or discards from the South Atlantic was estimated during this time period.

Year	**Estimated landings** (pounds)	**Estimated landings** (numbers of fish)	**Estimated discards** (numbers of fish)	**Percent of catch discarded**
1998	363	742	0	0%
1999	0	0	0	0%
2000	2,773	1,797	0	0%
2001	0	83,339	28,722	26%
2002	43,676	246,302	18,354	7%
2003	0	0	914	100%
2004	96,344	85,986	786	1%
2005	2,499	2,180	0	0%
2006	6,745	5,883	0	0%
2007	0	5,541	0	0%
2008	0	0	0	0%
2009	0	0	0	0%
2010	0	5,269	771	13%
2011	17	55,016	0	0%
2012	0	481	4,659	91%
2013	0	0	0	0%
2014	48,215	84,157	10,382	11%
2015	0	0	0	0%
2016	1,660	21,810	367	2%
2017	10,103	31,587	2,610	8%
1998-2017 average	10,620	31,505	3,378	13%

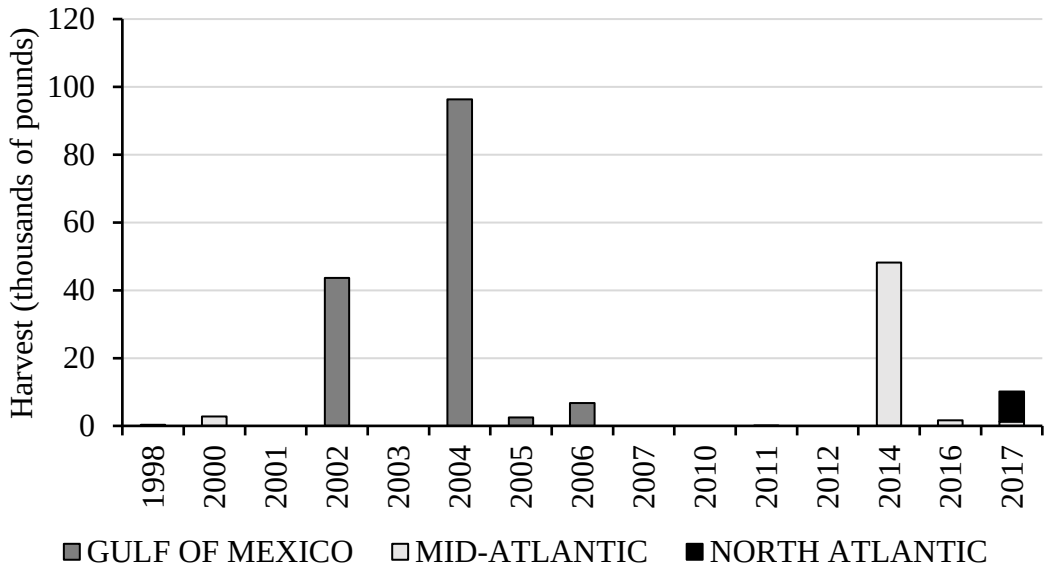

Figure 5: MRIP-estimated recreational landings of chub mackerel by region, 1998-2017. No harvest from the South Atlantic was estimated during this time period.

5. Management System

The Mid-Atlantic Fishery Management Council developed the first management measures for Atlantic chub mackerel in U.S. waters through the Unmanaged Forage Omnibus Amendment (MAMFC 2017a). These measures have been in effect since September 2017 and include the following:

- A 2.86 million pound annual landings limit for all chub mackerel landed by commercial fishermen in the mid-Atlantic and New England
- A 40,000 pound possession limit which applies only to commercial fishermen in the mid-Atlantic after the annual landings limit is reached
- A requirement for all commercial vessels which possess chub mackerel in mid-Atlantic federal waters to have a commercial fishing permit from the Greater Atlantic Regional Fisheries Office

The 2.86 million-pound annual landings limit is equivalent to average annual landings in the mid-Atlantic and New England from 2013 through 2015, according to commercial fish dealer reports.

Forty thousand pounds was chosen as the possession limit to be enforced after the annual landings limit is reached because, as described above, it is approximately the amount of chub mackerel needed to fill a bait truck. Given the low value of chub mackerel (Table 1), vessels may not target chub mackerel when restricted to a 40,000-pound possession limit; however, they would have an incentive to land chub mackerel caught incidentally. A 40,000 pound possession limit could, therefore, discourage discards.

All the chub mackerel management measures listed above will expire after December 31, 2020. The Council intended for these measures to be replaced by longer-term management measures which will be developed through an amendment to add chub mackerel as a stock in the Mackerel, Squid, and Butterfish Fishery Management Plan. If new management measures are not implemented or additional action is not taken by December 31, 2020, then Atlantic chub mackerel will be unmanaged in U.S. waters starting January 1, 2021.

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Mid-Atlantic Fishery Management Council
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Chub Mackerel Fishery Management Action Team (FMAT)
Meeting Summary

April 27, 2018

FMAT members in attendance: Greg Ardini (NMFS), Julia Beaty (MAFMC), Doug Christel (NMFS), Ben Galuardi (NMFS), Sarah Gurtman (NMFS), John Manderson (NMFS), Diane Stephan (NMFS), Alison Verkade (NMFS)

Others in attendance: Purcie Bennet-Nickerson (Pew Charitable Trusts), Taylor Daley (University of Southern Mississippi), Greg DiDomenico (Garden State Seafood Association), Joseph Gordon (Pew Charitable Trusts), Jeff Kaelin (Lund's Fisheries), Meghan Lapp (Seafreeze, ltd.), Robert Leaf (University of Southern Mississippi)

Amendment Goals and Objectives

The FMAT revised their previously recommended goals and objectives for the Chub Mackerel Amendment.[1] The FMAT recommended the following goals and objectives for chub mackerel. The goals are high-level values and priorities. The objectives are specific, actionable steps towards achieving those goals. The Council is in the process of revising the Fishery Management Plan goals and objectives for other Council-managed species. The goals and objectives below reflect the structure of the revisions under consideration for other species (e.g. summer flounder, surf clams, and ocean quahogs).

The goals and objectives are meant to guide development of management actions for chub mackerel. Any management alternatives considered should be consistent with the goals and objectives.

- **Goal 1:** Maintain a sustainable chub mackerel stock.
    - **Objective 1.1:** Prevent overfishing and achieve and maintain sustainable biomass levels that promote optimum yield in the fisheries and meet the needs of chub mackerel predators.
    - **Objective 1.2:** Consider, to the extent practical, the role of chub mackerel in the ecosystem, including its role as prey, as a predator, and as food for humans.
- **Goal 2:** Optimize economic and social benefits from utilization of chub mackerel, balancing the needs and priorities of different user groups.

[1] For more information, see the summary of the June 2017 FMAT meeting, available at: http://www.mafmc.org/actions/chub-mackerel-amendment.

    - **Objective 2.1:** Allow opportunities for commercial and recreational chub mackerel fishing, considering the opportunistic nature of the fisheries, changes in availability that may result from changes in climate and other factors, and the need for operational flexibility.
    - **Objective 2.2:** To the extent practical while meeting the other objectives, allow the *Illex* squid fishery to proceed without additional limiting restrictions when *Illex* are available.
    - **Objective 2.3:** Balance social and economic needs of various sectors of the chub mackerel fisheries (e.g. commercial, recreational, regional) and other fisheries, including recreational fisheries for highly migratory species.
- **Goal 3:** Support science, monitoring, and data collection to enhance effective management of chub mackerel fisheries.
    - **Objective 3.1:** Improve data collection to better understand the status of the chub mackerel stock, the role of chub mackerel in the ecosystem, and the biological, ecological, and socioeconomic impacts of management measures, including impacts to other fisheries.
    - **Objective 3.2:** Promote opportunities for industry collaboration on research.

One FMAT member cautioned that the objectives should be phrased in a manner that avoids conflicting with applicable law. He also mentioned that narrowly focused objectives could raise the risk that the final measures may not address every aspect of the amendment's objectives. Broader objectives allow greater flexibility in developing management measures and avoiding conflicts with the Fishery Management Plan (FMP) objectives.

The FMAT discussed the need for special management considerations given that the chub mackerel fishery is opportunistic and prosecuted by a small fleet at the seasonal northern edge of the range of the stock. Climate variability, which may include systematic change, is likely to influence the availability of this species. The FMAT acknowledged that the commercial chub mackerel fishery in the mid-Atlantic and southern New England is an alternative fishery that provides flexibility to commercial fishermen. This type of operational flexibility is an ecosystem consideration as it allows fishermen to target stocks when they are abundant and can help reduce fishing pressure on stocks that are less abundant. The FMAT recommended that such operational flexibility be encouraged, but also cautioned that the chub mackerel fishery should be carefully managed given that it occurs at the seasonal northern edge of the range of the stock. Objective 2.1 is meant to address these considerations.

The FMAT agreed that economic allocations, including within and among different regions, should not be the sole purpose of any management alternative. The goals and objectives above were crafted with this consideration in mind.

The FMAT discussed the possibility of combining objectives 2.2. and 2.3. Objective 2.2 could be considered a specific example of the concerns addressed in objective 2.3. However, the FMAT agreed that the needs of the *Illex* squid fishery are unique enough to warrant a standalone objective (i.e. objective 2.2). There is significant overlap between the *Illex* squid fishery and the chub mackerel fishery. The two species are caught by the same vessels in similar areas at the

same time of year. Fishermen, fish dealers, processors, and other businesses rely on *Illex* squid to a much greater extent than chub mackerel. The *Illex* squid fishery is more established and more valuable than the chub mackerel fishery, which, as stated above, is largely opportunistic. Participants in the *Illex* squid fishery have requested that their fishery operations be considered when developing chub mackerel management alternatives to minimize negative impacts to the *Illex* squid fishery.

Limited quantitative data are available on the contribution of chub mackerel to the diets of any predators in this region. The Council plans to fund a study to help fill this data gap. One member of the public asked how the goals and objectives above would change if this study determines that chub mackerel are not an important prey species for any predator. The FMAT agreed that this would not necessitate a change in the goals and objectives as written above. One FMAT member noted that social concerns related to certain recreational fisheries for apex predators would remain if the study found that chub mackerel are not an important prey species.

One member of the public suggested that the word "consider" in objective 1.2 be replaced with "protect" or "maintain". The FMAT did not support this recommendation because it would be difficult to measure success in meeting such an objective given currently available data.

Management Unit

National Standard 3 states: "to the extent practicable, an individual stock of fish shall be managed as a unit throughout its range". The FMAT discussed considerations related to the management unit for chub mackerel, including the National Standard 3 Guidelines and examples from other FMPs.

Chub mackerel are wide ranging. They are found throughout the U.S. east coast, the Gulf of Mexico, the Caribbean, and in South American waters. Only U.S. waters can be included in the management unit. Few data are available on chub mackerel in the Caribbean.

The FMAT reaffirmed their previous recommendation that the chub mackerel management unit include U.S. waters from Maine through Texas. The FMAT noted that the Council could develop separate management measures for different regions within the management unit.

The National Standard 3 Guidelines state that "a less-than-comprehensive management unit may be justified if, for example, …the unmanaged portion of the resource is immaterial to proper management". The FMAT cautioned against considering the portions of the chub mackerel stock in the South Atlantic and Gulf of Mexico to be "immaterial to proper management" from both biological and fishery perspectives. The FMAT recommended that the management unit not be decoupled from the biology of the stock. For example, the scientific literature and fisheries-independent survey data suggest that the Gulf of Mexico may include important chub mackerel spawning habitats.

Most commercial landings in recent years occurred at the seasonal northern edge of the range of the stock (i.e. the mid-Atlantic and southern New England). Excluding other areas which may be used more extensively by the stock could lead to management challenges if landings in those areas increase in the future. The FMAT emphasized that a management unit from Maine through Texas would allow the Council to react most efficiently to future changes in the fishery. Given the recently developed market for chub mackerel caught in the mid-Atlantic and the influence of the environment on availability, it is possible that landings in the South Atlantic or Gulf of Mexico could increase rapidly from one year to the next, as occurred in the mid-Atlantic and New England (Figure 1). Given the biology of the stock, major changes in fisheries in other regions could potentially negatively impact the mid-Atlantic and southern New England fishery. Including other regions in the management unit would allow the Council to react to any fishery changes which could negatively impact mid-Atlantic fisheries. This would not preclude the Mid-Atlantic Council from collaborating with other councils as necessary and appropriate.

A comprehensive management unit (e.g. Maine through Texas) is also beneficial for National Environmental Policy Act purposes. Considering a broad stock area from the beginning could help facilitate analysis of future management actions addressing different parts of that range.

The FMAT recommended that future stock assessments consider the full range of the stock.

One FMAT member noted that genetic differentiation is not the only relevant consideration when evaluating sub stock structure. Genetically-similar contingents with distinct migratory patterns, spawning seasons, and other life history characteristics can play important roles in stock dynamics and resiliency of schooling pelagic fish.

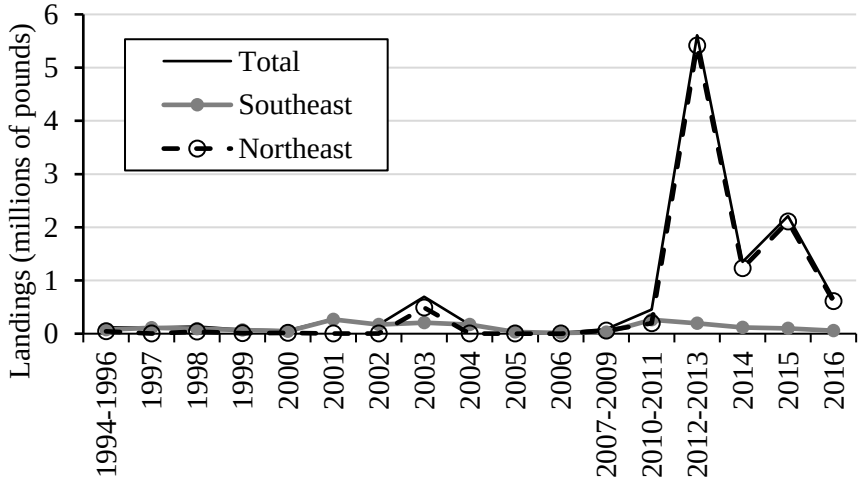

Figure 1: Dealer-reported chub mackerel landings, 1994-2016. Data for some years are combined to protect confidential information representing fewer than three vessels and/or dealers. Southeast data include landings from North Carolina through Texas. Northeast data include landings from Maine through Virginia.[2]

[2] Figure 1 does not include recreational harvest. The FMAT did not revisit their previous discussions of recreational data. Due to the similarities in appearance between Atlantic mackerel and chub mackerel, there is likely some degree

Forage Considerations

The FMAT discussed the possibility of accounting for chub mackerel's role in the ecosystem as a forage species through the setting of optimum yield (OY). The regulations for other Council-managed species allow the Council to set OY at a lower level than the acceptable biological catch (ABC) level recommended by the Scientific and Statistical Committee (SSC) based on social, economic, or ecological factors.

The FMAT noted that limited data are available to quantify the appropriate reduction from the ABC to OY (if any). It may be worth bringing in individuals with ecosystems expertise, including SSC members and other experts, when considering how to use OY to address ecosystem concerns.

One FMAT member recommended consideration of a simple metric for calculating OY which could be easily modified as new information becomes available. For example, the ABC could be reduced by a certain percent to ensure that some chub mackerel are set aside for ecosystem considerations. Another FMAT member expressed concern about the uncertainty of any numbers that would be considered, as well as the perception that the Council uses multiple conservative "buffers" when setting quotas.

The FMAT agreed that a forage ABC control rule[3] is not currently feasible for chub mackerel given existing data limitations and the lack of a quantitative stock assessment.

One FMAT member noted that forage considerations have been addressed for other species through the calculation of natural mortality and status determination criteria.

Management Measures to Address Potential Localized Depletion of Chub Mackerel Predators

As previously stated, limited quantitative data are available on the contribution of chub mackerel to the diets of any predators in the mid-Atlantic. The Council is funding a study to help fill this data gap. This study will take place over 2018-2019, with final results likely not available until 2020.

The Council developed the first management measures for chub mackerel fisheries in the mid-Atlantic through the Unmanaged Forage Omnibus Amendment. These measures will expire on January 1, 2021. The Council plans to take final action on the Chub Mackerel Amendment in late 2018 or early 2019 to ensure that new management measures can be implemented before the current measures expire.

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of undocumented or inaccurately reported catch in recreational fisheries. For more information, see the summary of the June 19, 2017 FMAT meeting, available at: http://www.mafmc.org/actions/chub-mackerel-amendment.

[3] For an example, see figure 4 in the Council's 2014 white paper on managing forage fishes in the mid-Atlantic region, available at: http://www.mafmc.org/eafm/

The results of the diet study will not be available in time to inform development of alternatives in the Chub Mackerel Amendment. For this reason, the FMAT recommended that this amendment not include management alternatives aimed at preventing localized depletion of chub mackerel predators. For example, some stakeholders have requested that the Council consider spatial/temporal closures of the commercial chub mackerel fishery to prevent localized depletion of recreationally-important species such as white and blue marlin and bigeye and yellowfin tunas. Two FMAT members said the potential for localized depletion is very difficult to assess given currently available information on predator diets and chub mackerel patterns of movement and habitat use. The FMAT concluded that this amendment does not need to consider all issues relevant to chub mackerel. Other subsequent actions could address other issues as more information becomes available to support additional analysis.

Other Recommendations

The FMAT did not revisit their previous recommendations on several topics, including research recommendations, essential fish habitat, and their previous recommendations for "considered but rejected" alternatives (including minimum fish size restrictions, gear restrictions, and limited access provisions). For more information on these recommendations, see the summary of the June 19, 2017 FMAT meeting, available at: http://www.mafmc.org/actions/chub-mackerel-amendment.

MID-ATLANTIC FISHERY MANAGEMENT COUNCIL

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Michael P. Luisi, Chairman | G. Warren Elliott, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

April 20, 2018

Mr. Michael Pentony
Regional Administrator
National Marine Fisheries Service Greater Atlantic Region
55 Great Republic Drive
Gloucester, MA 01930-2276

Dear Mike:

Based on a call on April 19 between myself, Julia Beaty of my staff, John Almeida of the Office of General Counsel, and Doug Christel of your staff, it is our understanding that it is the responsibility of the Council to define the management unit for chub mackerel when considering whether to add it as a stock in the Mackerel, Squid, and Butterfish Fishery Management Plan. Based on the biology of the species and recent fishery conditions, possible management unit options could include Maine to North Carolina, Maine to Florida, Maine to Texas, or even the entire Atlantic EEZ (including the Caribbean). Whichever option the Council chooses should be justified based on the objectives of the FMP and the National Standard 3 Guidelines. It is also our understanding that the Council need not apply management measures to entire management unit. For example, the Council could select a management unit from Maine through Texas and develop management measures that apply from Maine through Virginia, with no management measures applied to North Carolina through Texas, provided the Council sufficiently justifies this choice.

If any of this does not align with your understanding of how the management process should work, please contact me as soon as possible. Please call me or Julia Beaty of my staff if you have any questions.

Sincerely,

Christopher M. Moore, PhD.
Executive Director, MAFMC

Cc: Luisi, Elliott, Beaty

UNITED STATES DEPARTMENT OF COMMERCE
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Dr. Christopher M. Moore
Executive Director
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MAY 0 3 2018

Dear Chris:

Thank you for the April 20, 2018, letter documenting your discussions with staff to help define a management unit for chub mackerel. It is important to clarify the difference between a biological stock (geographic distribution of a species based on available scientific information) and a management unit (the fishery or portion of a fishery in which management objectives and associated measures adopted in the fishery management plan (FMP) apply). As you note, available information suggests that the species is distributed beyond the Mid-Atlantic Council's jurisdiction and that the area from Maine through the Gulf of Mexico, at least, may define its biological stock area.

The Council does not need to designate a management unit throughout this entire biological stock area, current National Standard 3 Guidelines suggest that an FMP should cover the biological stock area for planning purposes. The Council could consider specifying the required status determination criteria, overfishing limit, and acceptable biological catch (ABC) for the entire biological stock area, and adopt management measures within a smaller management unit. For example, the Council could adopt an approach that applies all catch within the biological stock area against an overall ABC, but only specify an annual catch limit (ACL) and associated accountability measures (AM) for catch within a management unit from Maine or New York through North Carolina. The Council takes a similar approach with Atlantic mackerel in that it deducts Canadian catch from the overall ABC applicable to the biological stock area that includes Canadian waters, while ACLs and AMs only apply to fishery operations in the Federal Exclusive Economic Zone. This seems consistent with what you described in your letter, with the clarification that the biological stock area can differ from the management unit. As the Council further develops this action, it may determine that a different approach than described above is more appropriate. We are happy to work with you in evaluating any options the Council chooses to pursue.

We appreciate your efforts to proactively engage our staff on these issues, and look forward to continuing to work with you and the Council on this action. If you have any further questions, please call me or Doug Christel.

Sincerely,

Michael Pentony
Regional Administrator

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MEMORANDUM

Date: May 8, 2018

To: Chris Moore

From: Julia Beaty

Subject: Chub mackerel assessment and ABCs

In 2017, the Council issued a request for proposals for a chub mackerel stock assessment. However, based on the recommendations of a review panel of Council and NEFSC staff and an SSC member, the Council ultimately decided not to fund an assessment.

The review panel agreed that given the extreme data limitations for chub mackerel, even a data limited modeling approach would likely produce highly uncertain results, which could prove risky for setting management measures.

Significant concerns regarding the ability to quantitatively assess the status of the chub mackerel stock include:

- **Low and sporadic catches in fisheries independent surveys**
  - Northeast Fisheries Science Center (NEFSC) bottom trawl survey
    - There are no records of chub mackerel caught in the spring NEFSC bottom trawl survey during 1963-2016.
    - Chub mackerel are periodically encountered in the fall NEFSC bottom trawl survey. Most of these catches occurred south of the Hudson Shelf Valley in warm water temperatures (i.e. generally higher than about 20°C/68°F; personal communication, John Manderson, Michele Traver, and Chris Tholke; Figure 1 and Figure 2).
  - State trawl surveys
    - Catches in state fisheries-independent surveys are rare.
  - Larval surveys
    - The Chub Mackerel Amendment Fishery Management Action Team agreed that a larval survey may be the most appropriate fishery-independent index of abundance, given that recruitment is likely a main driver of abundance.
    - Through 2016, the ECOMON survey collected 67 chub mackerel larvae from North Carolina through southern New England.
    - During 1983 - 2014, the Southeast Fisheries Science Center collected 1,748 chub mackerel larvae throughout the Gulf of Mexico (Figure 3).

- **The influence of factors other than abundance on fishery catch per unit effort** (CPUE)
    - Catch in the mid-Atlantic and southern New England appears to be influenced by factors such as the availability of substitute species (especially *Illex* squid), temperature, price, and market demand.
    - Due to the significant overlap with the *Illex* squid fishery, it can be difficult to determine which trips targeted chub mackerel, as opposed to *Illex* squid.
    - Directed fishing effort on chub mackerel was generally very low until about 2013 and has been variable since that time.
    - Chub mackerel landings in the southeast may be largely incidental.[i]
- **Limited data on growth and maturity in U.S. Atlantic waters**
    - The only known information on age, length, and maturity for chub mackerel in U.S. Atlantic waters is included in Daley (2018).[ii]
    - With additional funding, additional data on age, length, and maturity could be collected from existing sampling programs, such as the NEFSC and state trawl surveys, the southeast Trip Interview Program, and the observer program.
- **Uncertainty regarding stock structure in U.S. waters**
    - In the eastern Atlantic Ocean, chub mackerel are found from southern New England, through the Gulf of Mexico, in the Caribbean, and off South America.
    - No studies on stock structure in U.S. waters have been conducted.
    - Studies from other regions (e.g. Europe and Africa) suggest based on differences in morphology, spawning seasons, and/or sizes at maturity that sub-stocks may exist; however, the species is genetically uniform across wide areas (e.g. the eastern Mediterranean Sea, the Ivory Coast, and South Africa).[iii]

The Council is developing an amendment to add chub mackerel as a stock in the Mackerel, Squid, and Butterfish Fishery Management Plan. This necessitates adoption of an acceptable biological catch (ABC) level. Given the lack of a stock assessment and the data limitations described above, the ABC may need to be specified based on catch history.

Tables 1-3 include information on commercial and recreational landings and discards for three different regions. This information could be used to inform development of an ABC. Information on three different regions is provided because the Council has not yet selected a preferred management unit for chub mackerel.

For more information on chub mackerel fisheries, see the 2018 Chub Mackerel Fishery Information Document, available at: http://www.mafmc.org/actions/chub-mackerel-amendment.

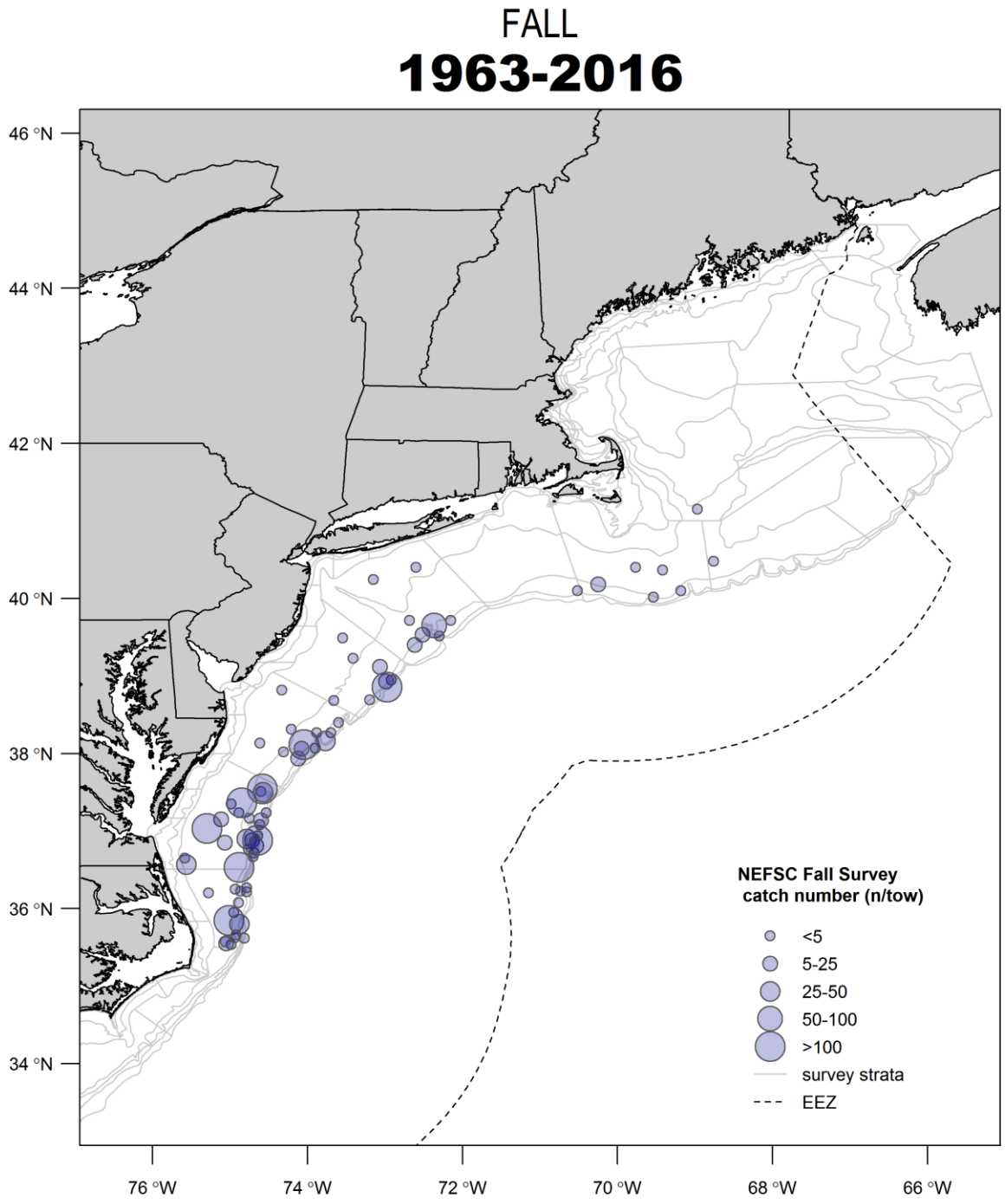

Figure 1: NEFSC fall survey chub mackerel catch in numbers per tow, 1963-2016 (source: Michele Traver and Chris Tholke, personal communication).

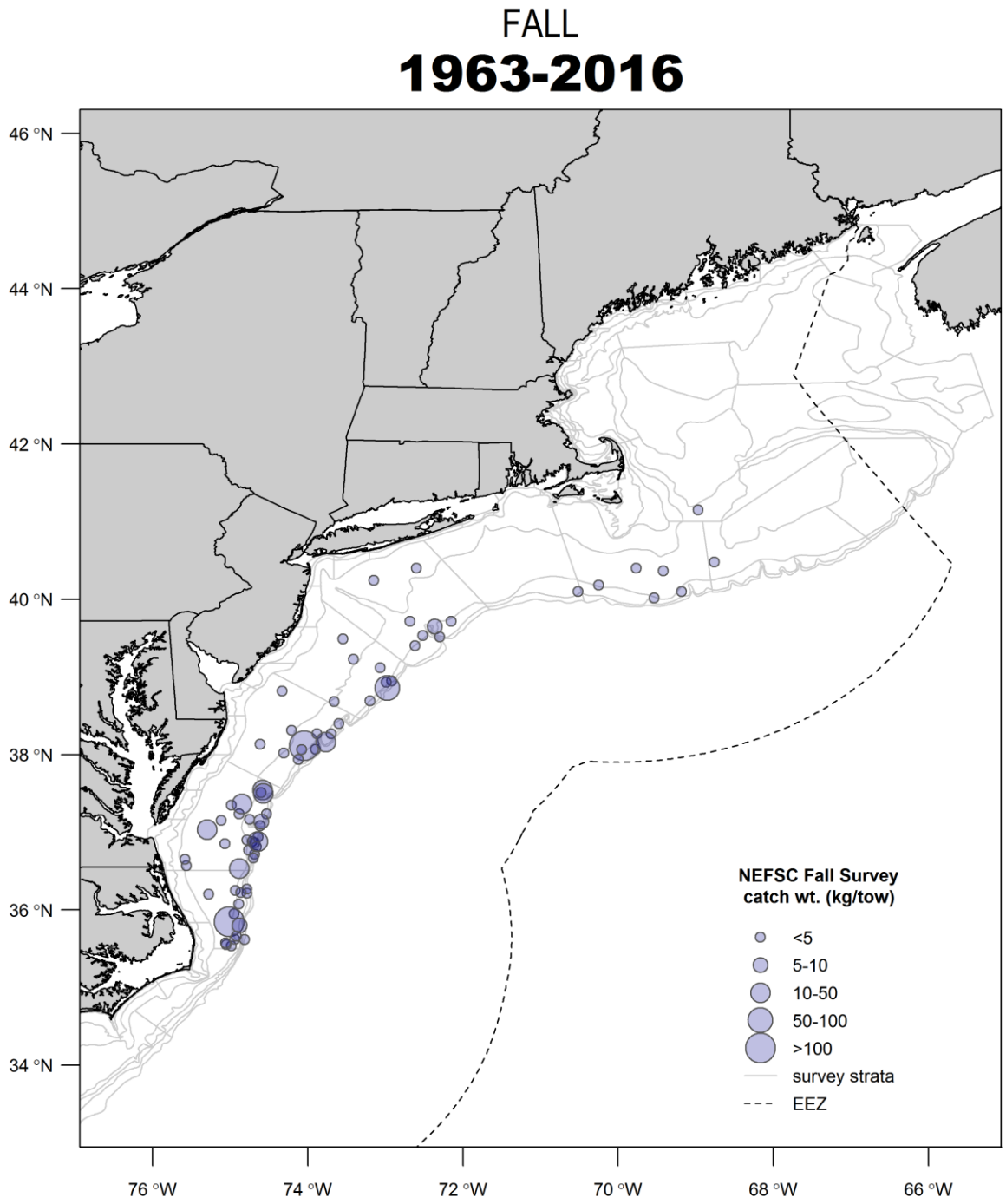

Figure 2: NEFSC fall survey chub mackerel catch in weight per tow (kg), 1963-2016 (source: Michele Traver and Chris Tholke, personal communication).

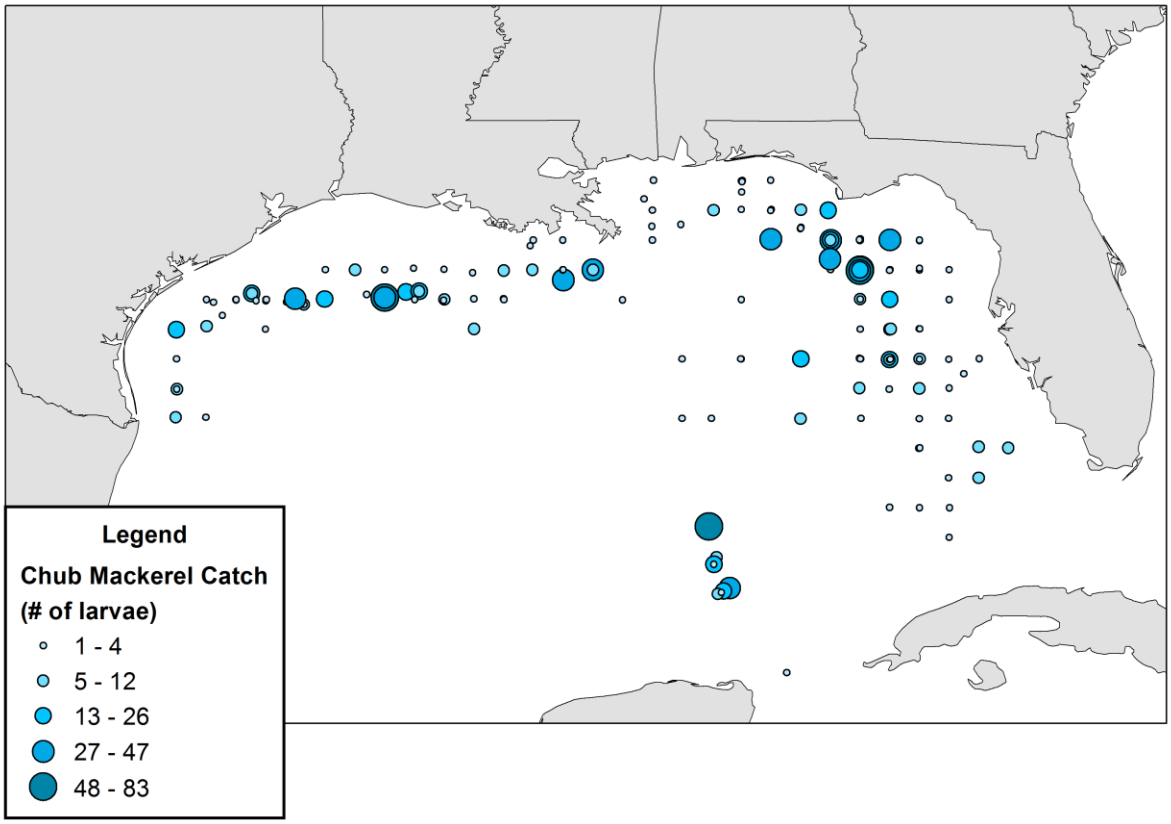

Figure 3: Southeast Fisheries Science Center larval survey catches of chub mackerel larvae, 1983-2014.

Table 1: Average commercial and recreational chub mackerel landings, in pounds, by region. Data from 2017 are not included because they were not available for all regions at the time of writing this document.

Time Period	ME-NC	ME-FL	ME-TX
2002-2016 (15 years)	674,399	676,936	776,518
2007-2016 (10 years)	962,708	966,462	1,041,802
2012-2016 (5 years)	1,882,744	1,883,241	1,976,277
2013-2015 (top 3 and basis for Unmanaged Forage Amendment Measures)	2,878,810	2,879,439	2,966,221

Table 2: Percent of commercial chub mackerel catch that was discarded, based on NEFOP and northeast vessel trip report (VTR) data.

Years	NEFOP Discard %	VTR Discard %
2002-2016 (15 years)	10%	3%
2007-2016 (10 years)	10%	3%
2012-2016 (5 years)	10%	3%
2013-2015	10%	3%

Table 3: Recreational discard rates by year and region, according to the Marine Recreational Information Program. Years with no reported discarded chub mackerel are not shown.

Year	Region	Estimated discard rate
2002	GULF OF MEXICO	7%
2003	GULF OF MEXICO	100%
2004	GULF OF MEXICO	1%
2010	GULF OF MEXICO	13%
2012	MID-ATLANTIC	100%
2014	MID-ATLANTIC	17%
2016	MID-ATLANTIC	16%
2017	NORTH ATLANTIC	8%
2017	MID-ATLANTIC	63%
2017	GULF OF MEXICO	1%

[i] For more information, see the 2018 Chub Mackerel Fishery Information Document, available at: http://www.mafmc.org/actions/chub-mackerel-amendment

[ii] Daley, T. 2018. Growth and reproduction of Atlantic chub mackerel (*Scomber colias*) in the Northwest Atlantic. Master's thesis. University of Southern Mississippi.

[iii] Cerna, F. and G. Plaza. 2014. Life history parameters of chub mackerel (*Scomber japonicus*) from two areas off Chile. *Bulletin of Marine Science*. 90(3):833-848.

Chen, X., G. Li, B. Feng, and S. Tian. 2009. Habitat suitability index of chub mackerel (*Scomber japonicus*) fromJuly to September in the East China Sea. *Journal of Oceanography*. 65: 93-102.

Scoles, D. R., B. B. Collette, and J. E. Graves. 1998. Global phylogeography of mackerels of the genus *Scomber*. *Fishery Bulletin.* 96: 823-842.

Weber, E. D. and S. McClatchie. 2012. Effect of environmental conditions on the distribution of Pacific mackerel (*Scomber japonicus*) larvae in the California Current System. *Fishery Bulletin*. 110:85-97.

Yasuda, T., R. Yukai, and S. Ohshimo. 2014. Fishing ground hotspots reveal long-term variation in chub mackerel *Scomber japonicus* habitat in the East China Sea. *Marine Ecology Progress Series*. 501: 239-250.

Zardoya, R., R. Castilho, C. Grande, L. Favre-Krey, S. Caetano, S. Marcato. 2004. Differential population structuring of two closely related fish species, the mackerel (*Scomber scombrus*) and the chub mackerel *Scomber japonicus*), in the Mediterranean Sea. *Molecular Ecology.* 13:1785-1798.

2018 Chub Mackerel
Advisory Panel Fishery Performance Report

The Mid-Atlantic Fishery Management Council's (Council's) Mackerel-Squid-Butterfish (MSB) Advisory Panel (AP) met on May 15, 2018 to review the 2018 Chub Mackerel Fishery Information Document and develop this Fishery Performance Report. This document summarizes the perspectives and ideas of advisors. These are not necessarily consensus or majority statements.

Advisory Panel members in attendance: Katie Almeida, Vito Calomo, Gregory DiDomenico, Joseph Gordon, Jeffrey Reichle

Others in attendance: Terry Alexander (MSB Committee member), Julia Beaty (Council staff), Purcie Bennett-Nickerson (Pew Charitable Trusts), Douglas Christel (GARFO), Peter Christopher (MSB Committee member), Taylor Daley (University of Southern Mississippi), Peter Hughes (MSB Committee chair), Jeff Kaelin (Lund's Fisheries), Meghan Lapp (SeaFreeze ltd.), Robert Leaf (University of Southern Mississippi), Laurie Nolan (MSB Committee member), Eric Reid (MSB Committee member), Sara Winslow (MSB Committee vice chair)

Factors Influencing Catch/Landings

One advisor said the recent increase in chub mackerel landings in the mid-Atlantic and southern New England was not influenced by market factors as there has always been a market for chub mackerel. He said the *Illex* squid fishery is the biggest determinant of chub mackerel fishing effort and landings. Vessels won't concentrate on chub mackerel if *Illex* squid are available and if the *Illex* price is higher than that for chub mackerel.

Multiple advisors agreed that chub mackerel are difficult and costly to harvest in profitable quantities. Chub mackerel are fast swimmers; therefore, vessels need high horse power to tow fast enough to catch them. In addition, chub mackerel prefer warm water temperatures (around 15-20°C/60-70°F); therefore, vessels must have refrigerated sea water or freezing capacity to store profitable quantities. For these reasons, few vessels in this region are capable of targeting chub mackerel.

One advisor said fluctuations in landings are not reflective of abundance and are instead the result of the capacity of the fleet, the small number of participating vessels, and the operations of the *Illex* squid fishery.

A few advisors said fishermen see some chub mackerel every year, but the abundance is variable. In addition, in some years, chub mackerel are "bunched", which makes them easier to catch. In other years, they are more spread out. Advisors did not know why chub mackerel bunch in some years but not others. One advisor said fewer *Illex* squid are present when chub mackerel are bunched. He said the two species are mixed together to some extent in the beginning and end of the season (usually May and October), but not when both species are most abundant (usually June - September). Although both species are sometimes caught together, fishermen will not store them together.

One advisor said in his many years of fishing from Maine through Rhode Island, he's seen a few chub mackerel, but never any notable abundances.

One advisor said the pattern of commercial landings in the South Atlantic and Gulf of Mexico could reflect multi-year cycles of abundance influenced by environmental factors.

Research Recommendations

One advisor recommended that additional biological data on chub mackerel (e.g. ages, lengths, maturity), be collected through the existing port sampling program.

One advisor asked if the Northeast Fisheries Science Center's Apex Predator Program collects diet data which could be used to assess the importance of chub mackerel to the diets of any predators.[1]

Two advisors said they were frustrated that the Council decided not to fund a chub mackerel stock assessment.[2]

Chub Mackerel and Highly Migratory Species

Advisors discussed concerns raised by some stakeholders about the potential for negative impacts of commercial chub mackerel harvest on recreationally-important predators such as marlins and tunas.

One advisor asked if the commercial chub mackerel fishery operates in canyon areas where recreational marlin and tuna fisheries occur. Other advisors said the fishery operates inshore of the canyons.

One advisor said his son fishes recreationally for marlins and tunas and he's not aware of any relationship between chub mackerel abundance and marlin or tuna abundance. He added that fisheries must be managed based on science, not politics, and although public opinion is very important to the process, opinions are not facts until they are proven. Specifically, claims regarding the importance of chub mackerel in the diets of tunas and marlins are not supported by science. He added that his own opinion is that chub mackerel are not important prey. He said the requests for spatial/temporal closures of chub mackerel and herring fisheries are driven by recreational fishermen who simply don't want commercial vessels to fish near them.

One advisor expressed frustration that the Council funded a study on chub mackerel in the diets of marlins and tunas instead of funding a chub mackerel stock assessment. He said the November 2017 webinar on the diets of highly migratory species (HMS) should have been the end of the Council's efforts to evaluate HMS diets. During that webinar, three researchers said they did not identify any chub mackerel in HMS stomach contents. One researcher described his own observations of chub mackerel in tuna stomachs, but these observations were not quantified.[3] This AP member argued that any results of the new diet study will be inconclusive and based on low sample sizes.

One advisor emphasized the importance of public comments in the Council process and said

[1] Council staff were unable to answer this question at the meeting. The Apex Predator Program is focused on commercially and recreationally important shark species. Food habits are one area of research within the program. More information is available at: https://www.nefsc.noaa.gov/nefsc/Narragansett/sharks/.

[2] For more information, see http://www.mafmc.org/s/Chub_RFP_outcome.pdf.

[3] For more information, see http://www.mafmc.org/s/Chub_HMS_diet_webinar_summary.pdf.

spatial/temporal management of the chub mackerel fishery based on HMS concerns should be considered given the number of public comments received on the subject.

Catch Limit Recommendations

One advisor recommended that the Council's Scientific and Statistical Committee consider a range of acceptable biological catch (ABC) levels ranging from 2,000 to 5,000 MT (about 4-11 million pounds). He saw room for expansion of the current fishery and did not support catch limits any lower than that implemented through the Unmanaged Forage Omnibus Amendment (i.e. 2.86 million pounds, or about 1,300 MT, per year).

Another advisor said he did not see the justification for a higher limit than 2.86 million pounds given the unknown ecosystem impacts of any catch level.

Speaking in support of a higher catch limit, one advisor said, given the restrictions in other pelagic fisheries in this region, the chub mackerel fishery can be a way for pelagic fishermen to stay in business.

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Michael P. Luisi, Chairman | G. Warren Elliott, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

Mackerel, Squid, Butterfish Advisory Panel and Committee Meeting Summary

May 15, 2018

The Mid-Atlantic Fishery Management Council's (Council's) Mackerel-Squid-Butterfish (MSB) Advisory Panel (AP) and Committee met jointly on May 15, 2018 to discuss goals and objectives, the management unit, considerations related to acceptable biological catch (ABC), and other aspects of the Chub Mackerel Amendment. Unless otherwise noted, statements summarized in this document are not consensus or majority statements.

Advisory Panel members in attendance: Katie Almeida, Vito Calomo, Gregory DiDomenico, Joseph Gordon, Jeffrey Reichle

Committee members in attendance: Peter Hughes (Committee chair), Sara Winslow (Committee vice chair), Terry Alexander, Peter Christopher, Roger Mann, Stew Michels, Laurie Nolan, Adam Nowalsky, Eric Reid

Others in attendance: Julia Beaty (Council staff), Purcie Bennett-Nickerson (Pew Charitable Trusts), Douglas Christel (GARFO), Taylor Daley (University of Southern Mississippi), Jeff Kaelin (Lund's Fisheries), Meghan Lapp (SeaFreeze ltd.), Robert Leaf (University of Southern Mississippi)

Goals and Objectives

Council staff summarized the Fishery Management Action Team's (FMAT's) recommendations for amendment goals and objectives. She also reminded the Committee and AP of the goal of the Unmanaged Forage Omnibus Amendment[1] (through which the Council developed the first management measures for chub mackerel), the Council's ecosystem approach to fisheries management (EAFM) goal statement,[2] and the current MSB fishery management plan (FMP) goals and objectives.[3] The Unmanaged Forage Amendment and EAFM goal statements describe

[1] To prohibit the development of new and expansion of existing directed commercial fisheries on unmanaged forage species in Mid-Atlantic Federal waters until the Council has had an adequate opportunity to both assess the scientific information relating to any new or expanded directed fisheries and consider potential impacts to existing fisheries, fishing communities, and the marine ecosystem.

[2] To manage for ecologically sustainable utilization of living marine resources while maintaining ecosystem productivity, structure, and function. Ecologically sustainable utilization is defined as utilization that accommodates the needs of present and future generations, while maintaining the integrity, health, and diversity of the marine ecosystem.

[3] 1) Enhance the probability of successful (i.e., the historical average) recruitment to the fisheries. 2) Promote the growth of the U.S. commercial fishery, including the fishery for export. 3) Provide the greatest degree of freedom and flexibility to all harvesters of these resources consistent with the attainment of the other objectives of this

a precautionary approach, while the MSP FMP objectives are more focused on promoting fishing opportunities.

One AP member, two Committee members, and one member of the public argued that because this amendment will add chub mackerel to the MSB FMP, the goals and objectives for the chub mackerel amendment should be more in line with the MSB FMP objectives than the Unmanaged Forage Amendment and EAFM goals. Further, the Council treated chub mackerel differently than the other species in the Unmanaged Forage Amendment, providing additional justification for applying the MSB FMP objectives, rather than the Forage Amendment goals and objectives.

The Committee approved two specific modifications to the FMAT-recommended amendment goals and objectives (see Committee motions at the end of this document). The goals and objectives recommended by the Committee are listed below.

- **Goal 1:** Maintain a sustainable chub mackerel stock.
    - **Objective 1.1:** Prevent overfishing and achieve and maintain sustainable biomass levels that achieve optimum yield in the fisheries and meet the needs of chub mackerel predators.
    - **Objective 1.2:** Consider, to the extent practicable, the role of chub mackerel in the ecosystem, including its role as prey, as a predator, and as food for humans.
- **Goal 2:** Optimize economic and social benefits from utilization of chub mackerel, balancing the needs and priorities of different user groups.
    - **Objective 2.1:** Allow opportunities for commercial and recreational chub mackerel fishing, considering the opportunistic nature of the fisheries, changes in availability that may result from changes in climate and other factors, and the need for operational flexibility.
    - **Objective 2.2:** To the extent practicable, allow the *Illex* squid fishery to proceed without additional limiting restrictions.
    - **Objective 2.3:** Balance social and economic needs of various sectors of the chub mackerel fisheries (e.g. commercial, recreational, regional) and other fisheries, including recreational fisheries for highly migratory species.
- **Goal 3:** Support science, monitoring, and data collection to enhance effective management of chub mackerel fisheries.
    - **Objective 3.1:** Improve data collection to better understand the status of the chub mackerel stock, the role of chub mackerel in the ecosystem, and the biological, ecological, and socioeconomic impacts of management measures, including impacts to other fisheries.
    - **Objective 3.2:** Promote opportunities for industry collaboration on research.

The Committee discussed the significant overlap between the chub mackerel fishery and the *Illex* squid fishery. Given that the two species are often caught together, measures to constrain chub mackerel harvest have the potential to also constrain the *Illex* squid fishery. Objective 2.2 is intended to minimize the potential for negative impacts of chub mackerel management measures

FMP. 4) Provide marine recreational fishing opportunities, recognizing the contribution of recreational fishing to the national economy. 5) Increase understanding of the conditions of the stocks and fisheries. 6) Minimize harvesting conflicts among U.S. commercial, U.S. recreational, and foreign fishermen.

on the *Illex* squid fishery. The Committee and AP discussed examples of how this could be achieved. For example, if an incidental possession limit is used as a chub mackerel accountability measure, then that limit could be set at a level that does not cause chub mackerel to become a choke species for the *Illex* squid fishery. One AP member said some refrigerated sea water vessels can retain up to 300 tons of *Illex* squid at a time. Chub mackerel are typically not mixed in with *Illex* squid to a great extent; however, when high volumes of squid are retained, a small percentage of chub mackerel mixed in with squid could quickly add up. One Committee member said the Council's considerations of longfin squid catch in the *Illex* squid fishery could be looked at as an example of how to minimize the potential for creating a choke species.

One Committee member asked how the Council could succeed in meeting objective 1.1 given existing data limitations. He asked if an inability to address this objective could be an argument for not managing chub mackerel at all. Another Committee member said objective 1.1 reflects National Standard 1 and the Council's actions must be consistent with the National Standards. Another Committee member said even if it is not possible to measure success in meeting a goal or objective, these aspirational statements still help guide Council actions.

Management Unit

The National Standard 3 guidelines define the management unit as "a fishery or that portion of a fishery identified in an FMP as relevant to the FMP's management objectives". The ABC should apply to the entire management unit and could also apply to areas outside of the management unit. For example, catch from Maine through Texas could count towards the ABC but the management unit could be Maine through Texas, Maine through Florida, or Maine through North Carolina. All these options could be considered as management alternatives in the amendment.

Atlantic mackerel was briefly discussed as an example of the ABC applying to a larger area than the management unit. Canadian catch counts towards the Atlantic mackerel ABC; however, Canada is not part of the management unit. The annual catch limit (ACL), or domestic ABC, is derived by subtracting expected Canadian catch from the ABC. Canadian catch is not considered when determining if the ACL has been exceeded and if accountability measures are triggered.

If chub mackerel catch from Maine through Texas counted towards the ABC, the management unit could include that entire area, or a smaller area such as Maine through North Carolina or Maine through Florida. Management measures do not need to be uniform across the entire management unit. The AP and Committee focused discussion on management measures applicable only from Maine through North Carolina.

The Mid-Atlantic Council might establish specific management measures for all vessels that have an MSB permit regardless of where they fish. Other Councils do not necessarily need to approve management measures developed by the Mid-Atlantic Council, depending on the specifics of those measures, even if the measures apply to areas typically within the jurisdictions of other Councils. For example, the regulations for bluefish and dogfish require GARFO fishery permits and catch reporting through Florida.

Multiple FMAT members recommended that the South Atlantic and Gulf of Mexico be included in the management unit given that they may be used more extensively by chub mackerel than the mid-Atlantic and New England, they likely include spawning areas, and there is some amount of commercial and recreational harvest in those regions. However, the FMAT also noted that it may

be more difficult to control catch and implement measures for a management unit from Maine through Texas and a smaller management unit could simplify development and implementation of this amendment.

One Committee member said vessels based in New England have harvested chub mackerel in the Gulf of Mexico.

Multiple Committee members said they were not comfortable recommending a management unit without knowing the catch limit that would be associated with that management unit. The Committee had concerns about catch in the South Atlantic and Gulf of Mexico counting towards an ABC that is shared with Mid-Atlantic. One Committee member summarized these concerns by saying it's difficult to discuss different management unit options without considering regional allocations. When considering allocations, it is essential to start with the "right" number for the catch limit.

ABC

The SSC plans to discuss chub mackerel ABCs in July 2018. One Committee member asked if the Council will be required to manage chub mackerel as a stock in the fishery once the SSC recommends an ABC. Another Committee member and GARFO representative said the Council may have to decide to manage chub mackerel as a stock in the fishery with an ABC and other required measures, or not manage it at all. Managing chub mackerel as neither a stock in the fishery nor an ecosystem component may not be justified under the Magnuson-Stevens Fishery Conservation and Management Act. Given the existing targeted commercial fishery, it is not appropriate to manage chub mackerel as an ecosystem component.

One AP member said the Council already indicated that they plan to manage chub mackerel as a stock in the fishery. Through the Unmanaged Forage Omnibus Amendment, the Council developed temporary management measures without designating chub mackerel as a stock in the fishery or an ecosystem component. This approach was justified because it was intended to be temporary and the Council planned to develop a separate amendment to manage chub mackerel as a stock in the fishery.

Given existing data limitations, the SSC may recommend an ABC based on catch history. One committee member said the recent fishery operates in just one small area, but the stock covers much of the Atlantic. He said the SSC should consider catch data from the eastern Atlantic when developing ABC recommendations. Another Committee member questioned the logic behind developing an ABC for Maine through Texas based on catch history when only four boats are capable of targeting chub mackerel in profitable quantities.

One Committee member suggested that the Council request multiple ABC options from the Scientific and Statistical Committee (SSC) based on multiple management unit options (e.g. Maine through Texas, Maine through Florida, and Maine through North Carolina).

One Committee member said the ad hoc approaches used to develop ABCs based on catch history, rather than stock assessments, for black sea bass (prior to 2016) and blueline tilefish had negative impacts on the fisheries. He said careful consideration needs to be given to how fish caught in one area but landed in another count towards the ABC.

Multiple Committee members expressed support for an ABC of at least 5 million pounds, which is approximately the historic high for annual commercial landings in the mid-Atlantic and New England.

One Committee member put forward the following suggestion, which was not intended to be a motion as by this point in the meeting a there was no longer a quorum:

"The Committee recommends the SSC consider a range of ABC options to include the current ABC to a maximum landings not to exceed 5,000 MT. In the event that the ABC is reached in three consecutive years, potential management options to limit the ABC will be considered by the Council and implemented through frameworking or changes to the FMP."

"The current ABC" refers to the 2.86 million pound annual landings limit implemented through the Unmanaged Forage Omnibus Amendment. No Committee members voiced opposition to a 5,000 MT ABC (about 11 million pounds). One Committee member said it is fine to recommend a range of ABCs for consideration; however, the SSC will recommend whichever level of catch they deem most appropriate. The Council cannot direct the SSC to consider only a certain range and once the SSC recommends an ABC, the Council is bound by that recommendation.

Another Committee member was concerned that the statement above does not include an automatic reaction to exceeding the ABC in three consecutive years (e.g. an accountability measure). One AP member agreed and asked why the Council would commit to not modifying measures until the ABC is reached in three consecutive years instead of modifying measures as appropriate as new information becomes available. Two other Committee members clarified that the intent was not to have no paybacks for ABC overages.

After much discussion of current data limitations, the group agreed that the main intent behind the statement above is to have a high ABC to allow for as much fisheries-dependent data collection as possible. The high ABC could be coupled with extensive data-collection requirements. Chub mackerel catches in fisheries-independent surveys are generally low and sporadic, likely due to their fast swimming speed and preference for warm temperatures. Fisheries-dependent data are especially valuable given this lack of fisheries-independent data. Restricting the fishery to a low ABC would limit the amount of data that could be collected. However, one Committee member said the SSC shouldn't set an ABC based on a data need.

One Committee member suggested that the Council suspend development of this amendment until more data is available to support development of ABCs.

One Committee member asked what options are available to use a constant catch limit, besides managing chub mackerel as a stock in the fishery. Staff asked if the measures implemented through the Unmanage Forage Amendment could remain in place for an additional three years in the hopes that more information to support management as a stock in the fishery would become available during that time. One Committee member said the legal justification for this is uncertain.

Spatial/Temporal Management

The AP and Committee discussed the possibility of removing spatial/temporal closure alternatives from consideration in this amendment. Specifically, these alternatives would address concerns about the potential for localized depletion of chub mackerel and displacement of recreationally-important predators such as marlins and tunas.

As discussed earlier in the meeting, there is little scientific information to support claims that a commercial chub mackerel fishery could result in displacement of marlins and tunas. A scientist who attended the meeting summarized an evaluation of 16 studies of the diets of highly migratory species such as marlins and tunas. None of those studies identified a single chub

mackerel in the stomachs of the predators sampled. A separate study found that predators tend to consume smaller, younger chub mackerel than are harvested by the fishery.

Most AP and Committee members present agreed that spatial/temporal management alternatives aimed at protecting marlins and tunas should not be pursued at this time given the lack of scientific data to suggest that chub mackerel are important prey. One Committee member said he did not necessarily support removing this type of management alternative from consideration at this time. One AP member said he did not support it.

Committee Motions

I move to modify objective 2.2 to say: "To the extent practicable, allow the *Illex* squid fishery to proceed without additional limiting restrictions."
Reid/Alexander: 8/0/0 motion carries

I move to change "promote" in objective 1.1 to "achieve", as recommended by the FMAT.
Alexander/Winslow: 8/0/0 motion carries

Move to change "practical" to "practicable" in obj. 1.2
Moved by consent

From:	Greg DiDomenico
To:	Beaty, Julia; Advisors - MSB (minus Calomo); COM - Squid Mack
Cc:	"Douglas Christel - NOAA Federal"
Subject:	RE: Materials for next week"s meeting
Date:	Friday, May 11, 2018 11:24:32 AM

Julia,
I would like you to please clarify the “Management Measures to Address Localized Depletion of Chub Mackerel Predators”.

When this topic was discussed I should have asked for clarification but thought at the time it was just a mistake.
Previous discussions related to “localized depletion” consider removals of a targeted species and the temporal and spatial changes due to fishing. The determination of “localized depletion” is difficult to quantify scientifically but is being explored in numerous cases.
I do not agree that the objective of this amendment should consider the “depletion of predators” as it related to fishing.
Please clarify the position of the FMAT as it relates to this topic.
Thank you
Greg DiDomenico
Garden State Seafood Association

From: Beaty, Julia [mailto:jbeaty@mafmc.org]
Sent: Thursday, May 10, 2018 4:02 PM
To: Advisors - MSB (minus Calomo); COM - Squid Mack
Cc: Douglas Christel - NOAA Federal
Subject: RE: Materials for next week's meeting

Hi everyone,

Please see attached for a summary of the April 27 meeting of the chub mackerel FMAT.

Thanks,

Julia

Julia Beaty
Fishery Management Specialist
Mid-Atlantic Fishery Management Council

800 North State Street, Suite 201
Dover, DE 19901-3901

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jbeaty@mafmc.org

From: Beaty, Julia
To: DiDomenico, Gregory; Advisors - MSB (minus Calomo); COM - Squid Mack
Cc: "Douglas Christel - NOAA Federal"
Subject: RE: Materials for next week"s meeting
Date: Friday, May 11, 2018 11:58:00 AM

Hi Greg,

Given the limited currently available data on predator diets, chub mackerel movements, and the locations of recreational fishing effort, the FMAT agreed that it would be difficult to quantitatively assess the impacts of any seasonal commercial chub mackerel fishing closures on white marlin availability and on recreational white marlin fisheries (just to give an example of the type of alternative that could be considered). If the Council is interested in considering such alternatives through this amendment, then a qualitative analysis could be done. However, since the Council is funding an HMS diet study, the FMAT thought it would be better to wait until after the results of that study are available to decide if such alternatives should be considered or not. Given the planned timeline for the chub mackerel amendment, this would mean such alternatives would be considered through a separate action, if the Council wants to consider them at all.

I hope that helps. Let me know if you have any other questions.

Thanks,

Julia

p.s.
Just an FYI for everyone, if you want to access all the meeting materials for Tuesday in one place, see the calendar page: http://www.mafmc.org/council-events/2018/msb-ap-committee-chub-mackerel-meeting

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MID-ATLANTIC
FISHERY MANAGEMENT COUNCIL

From:	Greg DiDomenico
To:	Beaty, Julia; Advisors - MSB (minus Calomo); COM - Squid Mack
Cc:	"Douglas Christel - NOAA Federal"
Subject:	RE: Materials for next week"s meeting
Date:	Friday, May 11, 2018 12:37:07 PM

Julia…
The issue of “localized depletion” has been in the context of the species that is the target of the directed fishery.
The document suggests that the issue is “localized depletion” of the predators due to fishing.
I understand the forage link but that is a separate topic.
This needs to be clarified.
Thank you.
Greg D

From:	Joseph Gordon
To:	Beaty, Julia; DiDomenico, Gregory; Advisors - MSB (minus Calomo); COM - Squid Mack
Cc:	"Douglas Christel - NOAA Federal"; Purcie Bennett-Nickerson; Moore, Christopher
Subject:	RE: Materials for next week"s meeting
Date:	Monday, May 14, 2018 9:07:05 AM

All,

Good morning. I look forward to our meeting tomorrow, but I want to comment on this exchange since it represents the wrong direction that I've seen developing recently. We lack information about chub mackerel, but much of fisheries management involves judgment and reasonable decisions related to uncertainty. When faced with great uncertainty, particularly for a known forage species, it's even more important to be cautious and not assume a lack of information implies a lack of ecological connection or importance.

One of the FMAT members on the last call suggested that chub mackerel are probably too fast for predators, that they are basically the one animal in the ocean that gets a free pass to school in large numbers and travel vast distances in safety. I don't think that's reasonable. It's much more reasonable to think that the fastest predators in the ocean like billfish and sharks have evolved to catch exactly this kind of prey and to migrate to places at times when such a species is abundant. The way that offshore tournaments are sometimes timed and located based on chub abundance supports this theory.

That was the nature of much of the discussion during the Council debate over the Unmanaged Forage Amendment, and public's thousands of comments in writing and at hearings at scoping. For example there was testimony about significant interactions between chub and HMS off Virginia. Another example was at the Ocean City hearing I attended on the Unmanaged Forage Amendment where the head of the White Marlin Open brought his grandson and talked about the past and future importance of forage fish like chub.

If there is an effort now to dismiss chub's role as forage or the potential importance of time/area considerations it would be a disservice to the public and stakeholders like HMS fishermen who may, when we learn more in the future, in reality depend heavily on chub abundance in a way we just don't realize today. There have not been any detailed HMS diet studies throughout the Council jurisdiction. Until those are completed, management options should not be removed. Unfortunately, the FMAT suggestion and staff proposal Julia describes below to potentially expand the fishery, without having basic information about its ecosystem role, reflects the exact opposite approach the Council took with the Unmanaged Forage Amendment from which this chub plan originated.

The Council isn't considering catch reductions with chub. We are talking about an appropriate way to establish conservation and management under the law, and a rational way to protect the ecosystem and other existing fisheries if a larger chub fishery develops.

Best wishes,

Joseph

Joseph Gordon
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From:	Greg DiDomenico
To:	Gordon, Joseph; Beaty, Julia; Advisors - MSB (minus Calomo); COM - Squid Mack
Cc:	"Douglas Christel - NOAA Federal"; "Purcie Bennett-Nickerson"; Moore, Christopher
Subject:	RE: Materials for next week"s meeting
Date:	Monday, May 14, 2018 10:13:02 AM

Joe,

1) There has been detailed studies on chub mackerel diets. The two conducted in the South Atlantic saw little or no connection.

2) What information can you share about HMS management and specifically billfish tournaments? Besides billfish being overfished and overfishing occurring?

Thanks

Greg DiDomenico

GSSA

From: Joseph Gordon
To: Beaty, Julia
Subject: FW: Materials for next week"s meeting
Date: Monday, May 14, 2018 5:59:31 PM

Julia,

Could you please send this response?

Thanks for following up Greg. The South Atlantic and Mid-Atlantic are different regions. Oftentimes migratory species only interact in key places and times, like red knots and horseshoe crabs. Two studies is a limited amount of information, especially taken from another region. Even more so when we are talking about fast moving and highly migratory predators and prey. Again, there have not been detailed HMS studies in the Mid-Atlantic Council's jurisdiction.

The fact that HMS are depleted and poorly managed makes forage conservation more important. I'm not defending the actions of HMS fishermen, nor am I an expert in tournaments. Dr. Graves is, and he sent a letter on this subject saying chub are important to HMS. The point I made is that the Council should be cautious when considering whether to expand a chub fishery, and to do its best to understand the impact on predators and other fishermen first.

This gets back to how to approach uncertainty. The burden of proof should be on the side arguing against what seems most reasonable (and what many fishermen reported based on their experience in recent public comment periods): that there is a predator/prey connection between chub and HMS. And if HMS aren't eating chub in the Mid-Atlantic, what is? What is the consequence to the broader ecosystem and other fisheries if we start taking millions more out of the ocean? We don't know yet.

I have some other questions we could cover in the meeting tomorrow. Why have landings been lower in recent years, and so low in 2017? Is it possible that taking more than 5 million pounds in one year has reduced the overall population? Why not wait for the Council's 2018-2019 HMS diet study to be done before considering an increase in catch? Why is there so much pressure to eliminate time/area management before a regional diet study is done and the FMP has even begun development?

I look forward to seeing you all tomorrow.

Best wishes,

Joseph

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From: Pam Lyons Gromen
To: Beaty, Julia
Subject: RE: Materials for next week"s meeting
Date: Monday, May 14, 2018 8:41:16 AM
Attachments: WildOceansCommentsChubMackerelScoping.pdf

Hi Julia-

Thank you for sending out this summary and the previous meeting materials. Attached is the letter I submitted for scoping (so you do not have to dig). Thank you for flagging this for my fellow AP members. I apologize again for not being able to travel to Baltimore. After reading the FMAT summary, I have just a few additional comments:

- Goals and Objectives: I support the FMAT recommendations and appreciate the breadth of considerations reflected in the goals and objectives. The draft goals and objectives accurately capture concerns and ideas submitted by the public during scoping. In the June 2017 FMAT memo, FMAT members mention the project, scheduled for later this year, to revisit the goals and objectives of the Mackerel, Squid and Butterfish FMP. I agree that this initiative should consider chub mackerel in addition to the current suite of managed species. The overarching topics addressed in the current draft of chub mackerel amendment goals and objectives would be a good discussion starting point for updating the FMP goals and objectives. I believe it is important to recognize how the two separate projects intersect.
- Diet Data: It became clear to me during the November 9, 2017 webinar on chub mackerel in HMS diets that a systematic and comprehensive HMS diet study for the Mid-Atlantic region is lacking. I commend the Council for funding the study underway and look forward to the results in 2020. Will the Council receive regular project updates while the study is progressing? Forage considerations should extend beyond HMS to seabirds and marine mammals. (The lack of predation data for HMS, seabirds and mammals was highlighted as a deficiency in the recent Atlantic mackerel stock assessment.)
- Spatial/Temporal Measures: Comments received from the recreational community during scoping stressed the need for the Council to investigate spatial/temporal measures to avoid conflicts between the chub mackerel commercial fishery and recreational fisheries dependent on chub mackerel indirectly as forage. "Localized depletion" doesn't fully capture the concern. Disruption of HMS migratory pathways is at the heart of the issue. I believe it is very important to move forward with a spatial/temporal analysis of HMS migratory patterns and fishing effort (i.e., commercial chub mackerel fishing and offshore HMS tournaments), so we can better understand the potential for conflict and how conflict could be minimized. In short, I believe it is too early in the process to rule out spatial and temporal measures. Even if the Council chose not to implement spatial and temporal measures as this stage, analyses done as part of this amendment could help expedite a future action to address

spatial/temporal issues (i.e., using a framework action as a vehicle as opposed to a full amendment). The Council should closely coordinate with NMFS HMS Division to identify and address data needs and deficiencies.

- Expertise for Development of Amendment Measures: I support the FMAT's idea of bringing in ecosystems expertise, including SSC members, to consider how to use OY to address ecosystem concerns. As the Council repopulates the Mackerel, Squid, & Butterfish AP, individuals with direct experience in offshore angling tournaments would be a valuable addition.

Thanks again, Julia! I look forward to hearing the outcomes of tomorrow's meeting.

Pam

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May 31, 2017

Dr. Chris Moore, Executive Director
Mid-Atlantic Fishery Management Council
Suite 201, 800 North State St.
Dover, DE 19901

RE: Chub Mackerel Scoping Comments

Dear Dr. Moore,

On behalf of *Wild Oceans*, a non-profit organization supported by conservation-minded anglers since 1973, I am pleased to provide recommendations for moving forward with the development of the Amendment to Manage Atlantic Chub Mackerel as a stock in the Atlantic Mackerel, Squid, and Butterfish Fishery Management Plan (MSB FMP). How the Mid-Atlantic Council proceeds with the chub mackerel amendment, the first forage species action to follow the finalization of the *Ecosystem Approach to Fisheries Management (EAFM) Guidance Document*, will be critical to advancing Council EAFM policies and working toward the Council's vision of "healthy and productive marine ecosystems supporting thriving, sustainable marine fisheries that provide the greatest overall benefit to stakeholders."

In the Mid-Atlantic, chub mackerel "occurs in high frequency" in the diets of highly migratory species (HMS), especially billfishes and large tunas,[1] attracting these highly valuable recreational species to the region. According to a 2014 NOAA Technical Memorandum, "Atlantic HMS Angling Permit holders were estimated to have spent $23.2 million on HMS trip expenditures (e.g., fuel, ice, bait, food), and $151 million on durable goods (e.g., boats, vehicles, rods and reels). These expenditures are estimated to have contributed $266 million in total economic output to the economy of the Northeast and Mid-Atlantic regions, $153 million in value added outputs, $96 million in labor income, and 1,824 jobs from Maine to North Carolina."[2]

[1] Letter to Mid-Atlantic Fishery Management Council Chairman Richard B. Robins from VIMS Fisheries Department Chair Dr. John Graves, July 8, 2016.

[2] Hutt, C.P., Lovell, S.J. and Silva, G., 2014. The Economic Contribution of Atlantic Highly Migratory Species Angling Permit Holders in New England and the Mid-Atlantic, 2011, NOAA Technical Memorandum NMFS-F/SPO-147.

In recognition of chub mackerel's important role as prey for highly migratory species and its great indirect economic value in sustaining HMS fisheries, we request that the Council incorporate the following recommendations as its moves ahead with the development of amendment alternatives.

- **Incorporate the EAFM Guidance Document goal and forage policies as part of the purpose and need statement for this amendment.**

  With an overarching goal "to manage for ecologically sustainable utilization of living marine resources while maintaining ecosystem productivity, structure, and function," the EAFM Guidance Document lays out a roadmap for protecting marine ecosystems that includes a policy "to support the maintenance of an adequate forage base in the Mid-Atlantic to ensure ecosystem productivity, structure and function and to support sustainable fishing communities." For forage species targeted by fisheries, the Council has committed to establishing optimal harvest strategies based on evaluations of trade-offs between their indirect value of being left in the water as forage versus their direct harvest market value. The ecosystem goal and the forage objectives should be reflected in the purpose and need statement to ensure that amendment alternatives are consistent with and advance the Council's commitment to EAFM as described in the Guidance Document.

- **Consistent with the purpose and need of the Unmanaged Forage Omnibus Amendment from which this action stemmed, prevent the expansion of directed fisheries for chub mackerel "until the Council has had an adequate opportunity to assess the scientific information relating to any new or expanded directed fisheries and consider potential impacts to existing fisheries, fishing communities, and the marine ecosystem."[3]**

  Alternatives should include holding the quota at 2.86 million pounds until a scientific assessment, as described above, is conducted to evaluate potential impacts, especially impacts to the marine ecosystem and fishing communities dependent on chub mackerel as forage for their target species. Establishing a fishery control date that does not permit the fishery to grow beyond the current fleet of fishery participants should also be presented as an alternative.

- **In order to provide the greatest benefit to all stakeholders, conduct an evaluation of relevant economic, social and ecological factors to inform harvest strategy options for chub mackerel.**

  To determine how chub mackerel should be managed for the greatest overall benefit to the Nation – Optimum Yield (OY) [i] – the Council must look beyond core requirements for preventing overfishing. In the case of chub mackerel, the protection of marine

[3] MAFMC. 2017. Unmanaged Forage Omnibus Amendment.

ecosystems and recreational opportunities provided by leaving chub mackerel in the water to fulfill its ecological role as forage must also be taken into account. National Standard 1 Guidelines give direction to councils for assessing Optimum Yield,[ii] and we request that this assessment take the form of an explicit evaluation of management strategies against the ecosystem goal and policies described above. Management strategy evaluation (MSE) is a tool highlighted in the EAFM Guidance Document for determining if management actions are likely to achieve specified objectives and is intended to be an inclusive stakeholder process. We request that the feasibility for conducting an MSE, as a purposeful assessment of Optimum Yield, be explored as part of this amendment.

- **Include alternatives for ecological reference points for chub mackerel. Alternatives should include a biomass threshold of 40% of an unfished population and a biomass target of 75% of an unfished population, reference points that have been widely endorsed for conservatively managing forage fish stocks.**

  It is important to acknowledge that, because of the many components, variables, uncertainties and trade-offs involved, "ecological reference points" do not become apparent from even the most rigorous study. They are ultimately a policy decision. Consequently, in the quest to develop ecological reference points for forage species, an overwhelming consensus has emerged around setting a minimum biomass threshold of 40% of an un-fished population (approximating the MSY level) and a target level of 75% of an un-fished population, a level thought to most fairly balance the needs of fisheries with those of the ecosystem.[4]

  We are pleased that the Council is seeking a contractor to develop a quantitative assessment for Atlantic chub mackerel and hope that the assessment will deliver information necessary for understanding the condition of the population as well as establishing ecological reference points. As the Council considers applicants who responded to the recent request for proposals, we urge you to prioritize assessment methods most suited for forage fish, methods that can produce biomass estimates and biomass-based reference points, and that explicitly incorporate ecosystem considerations into the assessment model, such as methods described by Moustahfid et al for explicitly modeling predation mortality. [5]

[4] Hinman, K. 2015. Resource Sharing: The Berkeley Criterion. Wild Oceans. http://wildoceans.org/wp-content/uploads/2016/01/RESOURCE-SHARING-Updated-4-19-16.pdf

[5] Moustahfid, H., Link, J.S., Overholtz, W.J. and Tyrrell, M.C., 2009. The advantage of explicitly incorporating predation mortality into age-structured stock assessment models: an application for Atlantic mackerel. ICES Journal of Marine Science:66(3), pp.445-454.

- **Construct time/area/gear closure options for minimizing conflict among HMS anglers and commercial chub mackerel fishermen.**

  HMS fishing in the Mid-Atlantic is dependent on a healthy supply of forage to attract and sustain migrating predators like billfishes and tunas. A spatial and temporal analysis of commercial chub mackerel fishing effort should be compared with the locations and timing of HMS tournaments and other offshore recreational activity. Such an analysis could reveal areas of potential overlap between the directed chub mackerel fishery and HMS fishing. Options for closures, including rolling closures, that safeguard a supply of chub mackerel for dependent HMS predators and minimize conflict between the commercial sector and HMS anglers should be explored and presented as alternatives in this amendment. Effectiveness of area-based measures would be enhanced by better understanding foraging patterns of HMS species while they are in the Mid-Atlantic, and we ask the Council to make this a research priority and provide the necessary oversight and funding.

- **Invite HMS recreational fishermen and scientists to serve on technical, scientific and advisory groups to ensure that HMS economics, ecology and fishery knowledge are sufficiently incorporated into amendment analyses and alternatives.**

  The Ecosystem and Ocean Planning Committee and its advisory panel should also be involved to provide input and recommendations for upholding EAFM Guidance Document policies.

In closing, we reiterate that the precedent set by this amendment will set the stage for advancing ecosystem-based approaches to forage fishery management both in our region and nationwide. We hope the Mid-Atlantic Council will seize upon this opportunity to demonstrate its commitment to the EAFM Guidance Document policies, and we look forward to working with you as the chub mackerel amendment develops.

Sincerely,

Pam Lyons Gromen
Executive Director

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[i] The benefits of recreational opportunities include "the quality of the recreational fishing experience" and "the contribution of recreational fishing to the national, regional, and local economies." Protection of marine ecosystems includes "maintaining adequate forage for all components of the marine ecosystem." *See*, 50 CFR §600.310(e)(3).

[ii] 50 CFR § 600.310 (e)(3) (iii): Assessing OY: An FMP must contain an assessment and specification of OY (MSA section 303(a)(3)). The assessment should include: a summary of information utilized in making such specification; an explanation of how the OY specification will produce the greatest benefits to the nation and prevent overfishing and rebuild overfished stocks; and a consideration of the economic, social, and ecological factors relevant to the management of a particular stock, stock complex, or fishery.

Commonly Confused Mackerel & Tuna Species

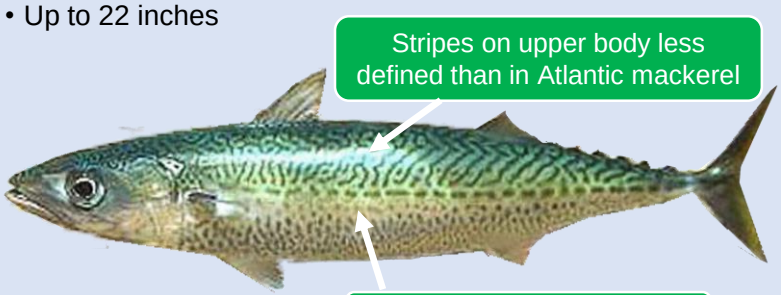
Atlantic mackerel, *Scomber scombrus*

- Other common names: tinker mackerel, Boston mackerel, common mackerel
- Up to 2 feet

VTR CODE: MACK

Chub mackerel, *Scomber colias*

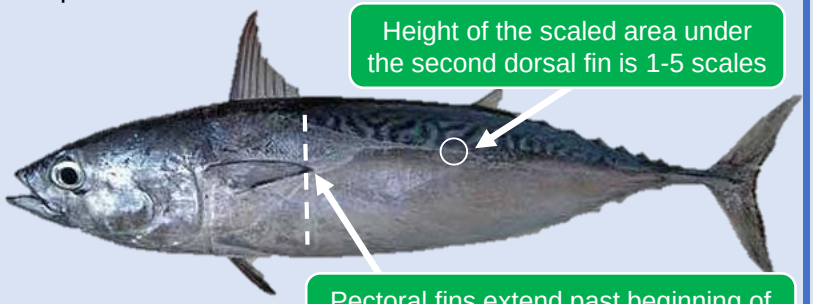
- Other common names: tinker mackerel, hardhead, bullseye
- Up to 22 inches



VTR CODE: MACC

Frigate mackerel/tuna, *Auxis thazard*

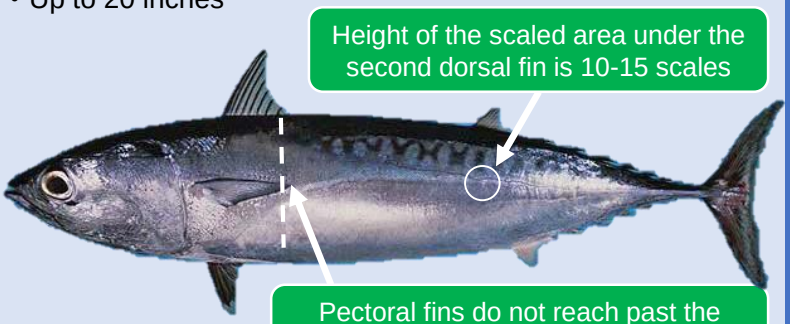
- Up to 2 feet



VTR CODE: MACF

Bullet mackerel/tuna, *Auxis rochei*

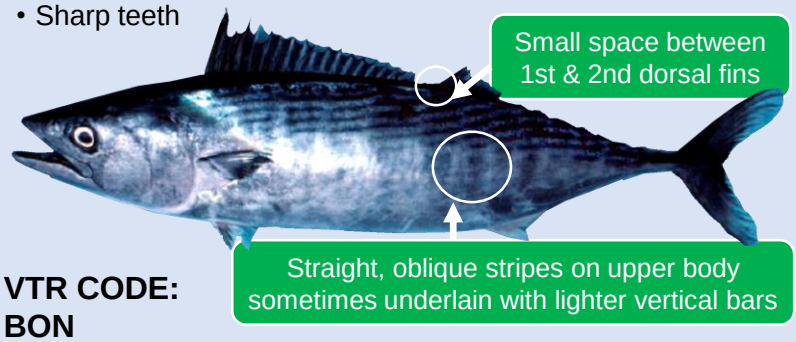
- Up to 20 inches



VTR CODE: MACB

Atlantic bonito, *Sarda sarda*

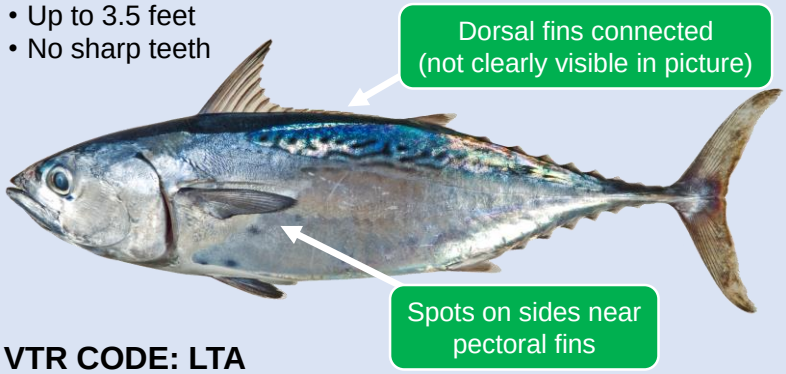
- Up to 3.2 feet
- Body covered in scales; larger scales below striped area
- Sharp teeth



VTR CODE: BON

Little tunny, *Euthynnus alletteratus*

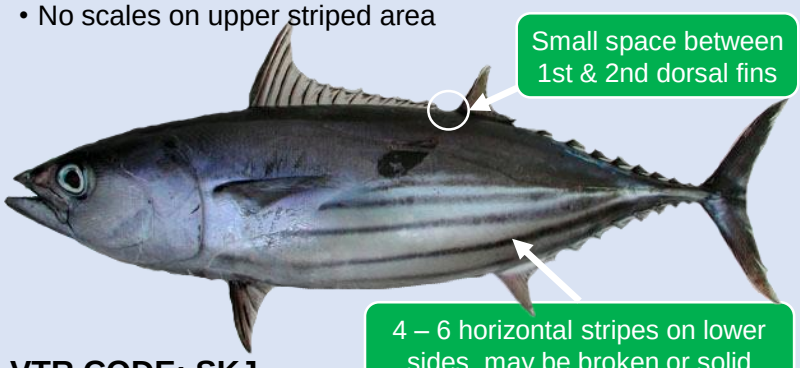
- Other common names: false albacore, vaquita, bonito
- Up to 3.5 feet
- No sharp teeth



VTR CODE: LTA

Skipjack tuna, *Katsuwonus pelamis*

- Up to 3.8 feet
- No scales on upper striped area



VTR CODE: SKJ

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