Mid-Atlantic Fishery Management Council
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MEMORANDUM

Date: September 2, 2020

To: Chris Moore, Executive Director

From: Julia Beaty, staff

Subject: 2021 specifications for Atlantic chub mackerel

Executive Summary

This memorandum includes information to assist the Mid-Atlantic Fishery Management Council's (Council's) Scientific and Statistical Committee (SSC) and Mackerel, Squid, and Butterfish (MSB) Monitoring Committee in reviewing and potentially revising the previously approved 2021 catch and landings limits for Atlantic chub mackerel (*Scomber colias*), as well as the other management measures which can be modified through the annual specifications process.

Additional information on fishery performance and past management measures can be found in the 2020 Chub Mackerel Fishery Information Document and the 2020 Chub Mackerel Fishery Performance Report developed by advisors.[1]

The Council approved 2020-2022 catch and landings limits for Atlantic chub mackerel in March 2019 based on the acceptable biological catch (ABC) recommendations of the Council's SSC. These previously approved catch and landings limits are shown in Table 1. They were implemented through Amendment 21 to the MSB Fishery Management Plan (FMP) and will become effective on September 3, 2020 (85 Federal Register 47103).

During their September 2020 meeting, the SSC will review their previously recommended 2021 ABC and consider if revisions are necessary. The Monitoring Committee will then meet to review and, if appropriate, recommend changes to the previously approved 2021 annual catch limit (ACL), annual catch target (ACT), and total allowable landings limit (TAL), and other management measures which can be modified through the annual specifications process.

The Council will meet in October 2020 to review the recommendations of the SSC and Monitoring Committee, as well as input from advisors. They will then consider revising their previously approved catch and landings limits for 2021, and any other management measures which can be modified through the annual specifications process.

[1] The Fishery Information Document is available at: https://www.mafmc.org/msb. The Advisory Panel Fishery Performance Report will be posted to the same page once available.

Pending additional input provided by advisors during their meeting on September 3rd, staff recommend no revisions to the previously approved 2021 specifications for chub mackerel at this point in time.

Table 1. Previously approved 2020-2021 catch and landings limits for Atlantic chub mackerel.

Measure	mil lb	mt	Basis
ABC	5.07	2,300	SSC recommendation
Expected SC-FL catch	0.08	38	A conservative estimate based on the highest annual SC-FL landings shown in commercial dealer and MRIP data (i.e., 76,835 pounds in 2011, mostly from the recreational fishery), increased by about 10% to account for discards, which are not well quantified.
ACL	4.99	2,262	ABC minus expected SC-FL catch.
ACT	4.79	2,171	ACL minus a 4% management uncertainty buffer.
Expected total dead discards, ME-NC	0.29	130	6% of ACT based on based on the commercial discard rate during 2003-2017 according to northeast observer data.
TAL	4.50	2,041	ACT minus expected total dead discards.

Recent Catch and Landings

After remaining below 0.5 million pounds per year for many years, commercial chub mackerel landings spiked to 5.25 million pounds in 2013, but decreased to pre-2013 levels by 2016. Recreational chub mackerel landings are variable and averaged 13,788 pounds per year during 2000-2019 (Table 2). In 2019, a total of 522,390 pounds of chub mackerel were landed by commercial and recreational fishermen from Maine through North Carolina.

The Marine Recreational Information Program (MRIP) provides estimates of recreational chub mackerel discards in numbers of fish. MRIP data suggest that an average of 9,102 chub mackerel were discarded per year during 2000-2019. As with recreational landings, recreational discards were variable.

Commercial and recreational discards in weight are typically provided by the NEFSC. Chub mackerel was formally added as a stock in the MSB FMP in 2020; therefore, this will be the first year that the NEFSC calculates chub mackerel discards in weight. This information will be included in a data update provided by the NEFSC. The data update was not available at the time of writing this memo and will be provided separately to the SSC and Monitoring Committee.

Additional information on commercial and recreational chub mackerel fisheries is available in the 2020 Chub Mackerel Fishery Information Document (available at https://www.mafmc.org/msb).

Table 2. Commercial and recreational chub mackerel landings, 2000-2019, from Maine through North Carolina. Landings in some years are combined to protect confidential data associated with fewer than three vessels and/or dealers.

Year	**Commercial landings** (pounds)	**Recreational landings** (pounds)	**Total landings** (pounds)
2000	16,246	6,991	23,237
2001	4,384	0	4,384
2002	471	0	471
2003	488,316	0	488,316
2004	126	0	126
2005	0	0	0
2006	0	0	0
2007-2009	21,039	0	21,039
2010-2011	192,301	355	192,656
2012	164,867	0	164,867
2013	5,249,686	0	5,249,686
2014	1,230,411	48,087	1,278,498
2015	2,108,337	0	2,108,337
2016	610,783	2,093	612,876
2017	2,202	14,831	17,033
2018	22,356	128,949	151,305
2019	60,498	74,462	134,960
2000-2019 avg	**508,601**	**13,788**	**522,390**

Stock Status and Biological Reference Points

The stock status of chub mackerel in the western Atlantic Ocean is unknown as there have been no quantitative assessments of this species in this region. In July 2018, the SSC assumed that biomass is currently at or above biomass at maximum sustainable yield, as described in more detail in the following section.

The Council requested a data update from the NEFSC with information on chub mackerel catches in fisheries-independent surveys through 2019. Once this document is available, it will be provided to the SSC and Monitoring Committee and posted to https://www.mafmc.org/ssc-meetings/2020/september-8-9.

Review of Prior SSC Recommendations

The SSC recommended the current chub mackerel ABC during their July 2018 meeting. They concluded that insufficient information exists to assess the status and trends of chub mackerel in the northwest Atlantic. They concluded that an overfishing limit could not be specified and recommended an ABC of 2,300 mt (5.07 million pounds) based on expert judgement. Their ABC recommendation is based loosely on the historic high for commercial and recreational landings (i.e., around 5.25 million pounds in 2013) and assumptions about discards. This level of ABC will prevent the fishery from achieving its historic high, but will allow landings to exceed those

in every other year over at least the past 20 years (Table 2). The SSC agreed that this level of catch is unlikely to result in overfishing given the general productivity of this species in fisheries throughout the world combined with the relatively low fishery capacity in U.S. Atlantic waters. Based on their recommendations, the ABC applies to total dead catch (i.e., commercial and recreational landings and dead discards) from Maine through the east coast of Florida.

The SSC determined the following to be the most significant sources of scientific uncertainty associated with the ABC:

- Stock size and productivity cannot be determined, there is no information to determine reference points for stock biomass levels, and little information exists to determine reference points for fishing mortality rates.
- There is no information on the source of recruits; it is unknown whether chub mackerel are episodic in the Mid-Atlantic, whether this is a range expansion with localized spawning, or neither.
- There is no information on predation mortality, or on the role of chub mackerel in predator diets.
- There is very high uncertainty in recreational landings and discards. Observer coverage on fisheries likely to catch chub mackerel may be low (*Illex* fleet, Mid-Atlantic small mesh bottom trawl).

Annual Catch Limit

The ACL for chub mackerel is derived by subtracting expected South Carolina through Florida catch from the ABC (Figure 1). When the Council adopted 2020-2022 specifications in March 2019, they approved a value of 84,500 pounds of expected catch from South Carolina through Florida. This represents about 2% of the ABC and is a conservative estimate based on the highest annual South Atlantic landings shown in commercial dealer and MRIP data through 2017 (i.e., 76,835 pounds in 2011), increased by about 10% to account for discards. Discards in SC-FL are highly uncertain.

The value of expected South Carolina through Florida catch used in the currently implemented chub mackerel specifications was calculated based on an examination of data through 2017. The Atlantic Coastal Cooperative Statistics Program provided updated South Carolina through Florida commercial landings data through 2019. These data reflect recent revisions to the data in earlier years. These revised data, as well as MRIP data, suggest that highest commercial and recreational landings in South Carolina through Florida over the past 20 years occurred in 2001 at 268,110 pounds. Average annual South Carolina through Florida landings were 89,885 pounds.

At this time, staff recommend no changes to the 2021 chub mackerel ACL of 4.99 million pounds (2,262 mt).

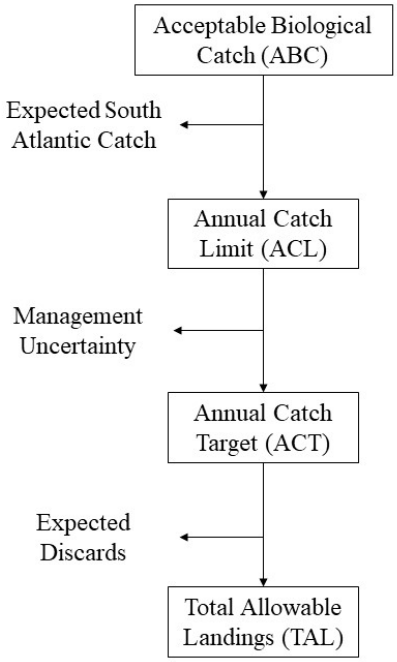

Figure 1. Flowchart summarizing chub mackerel catch and landings limits.

Annual Catch Target

As defined in the FMP, The ACT can be set less than or equal to the ACL to account for management uncertainty (Figure 1). Potentially relevant sources of management uncertainty for chub mackerel include misreporting due to challenges with species identification and under-reporting on VTRs due to misunderstanding of the requirement to report all catch on VTRs, including catch of unmanaged species and discarded catch. In addition, when setting the 2020-2022 specifications, the Council noted that there is some uncertainty regarding how the fishery will respond to the management measures implemented through Amendment 21. Several of the implemented management measures (e.g., ACL overage paybacks, recreational permit requirements) have never been used for chub mackerel off the U.S. east coast, though they have been used in many other fisheries.

The Council adopted a 4% management uncertainty buffer when they set the 2020-2022 specifications in March 2019. Considered in combination with the in-season commercial fishery closure regulations described on the next page, this was expected to be a reasonable buffer between the ACL and ACT to prevent ACL overages.

Council staff recommend no changes to the previously implemented ACT of 4.79 million pounds (2,171 mt) at this time.

Discards

Expected commercial and recreational discards in weight are subtracted from the ACT to derive the TAL (Figure 1). When setting 2020-2022 specifications in March 2019, the Council agreed to reduce the ACT by 6% to account for expected discards. This was based on the commercial discard rate during 2003-2017 according to northeast observer data (Table 3). The Council selected this as a preferred alternative because it is based on 15 years of data. It does not explicitly account for recreational data; however, based on information available at the time,

recreational chub mackerel discards were assumed to be generally very low compared to commercial discards, especially in years with targeted commercial fishing effort. The previously implemented catch and landings limits are based loosely on years with targeted commercial fishing effort. As previously stated, more information on commercial and recreational discards in weight will be provided in a forthcoming data update from the NEFSC. Pending additional information provided in that document, staff recommend no changes to the previously implemented 2021 TAL of 4.50 million pounds (2,041 mt) at this time.

Table 3. Percent of commercial chub mackerel catch that was discarded, based on northeast fisheries observer and northeast vessel trip report (VTR) data, 2003-2017. The associated number of trips is in parentheses.

Years	Observer Discard %	VTR Discard %
2003-2017 (15 years)	6% (217 trips)	3% (1,894 trips)
2008-2017 (10 years)	5% (199 trips)	3% (1,869 trips)
2013-2017 (5 years)	4% (156 trips)	3% (1,540 trips)
2013-2015 (top 3)	4% (95 trips)	3% (740 trips)
2013 (historic high)	3% (27 trips)	1% (120 trips)

Possession Limits

Under the currently implemented specifications, there is no commercial possession limit for chub mackerel until 90% of the TAL is projected to be landed. At that point, a 40,000 pound (18 mt) possession limit is in effect. Once 100% of the TAL is projected to be landed, commercially-permitted vessels are limited to a 10,000 pound (4.5 mt) possession limit. When setting 2020-2022 specifications, the Council agreed that the commercial fishery possession limits prior to in-season closure were unnecessary as the preferred in-season AMs were likely sufficient to constrain the fishery to prevent ACL overages.

According to stakeholder input provided during development of the Unmanaged Forage Omnibus Amendment, 40,000 pounds is approximately the amount of chub mackerel needed to fill a bait truck. Given the low value of chub mackerel (e.g., $0.49 per pound on average during 2000-2019), fishermen 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. The number of trips which landed more than 40,000 pounds of chub mackerel over the past 20 years is confidential as it is associated with fewer than three vessels and/or dealers.

Ten thousand pounds is approximately the average trip-level landings of chub mackerel based on northeast commercial fishery data for 1998-2017. A small number of vessels are responsible for most chub mackerel landings. If those vessels are excluded from the calculation, about 99% of the trips which landed chub mackerel during 1998-2017 landed less than 10,000 pounds. This analysis has not been updated through 2019; however, given that only 22,356 pounds in total were landed in the commercial fishery in 2018 and 60,498 pounds in 2019, it is assumed that there were few, if any, large commercial chub mackerel trips during 2018 and 2019.

As previously stated, unless modified, the 2021 TAL will be 4.50 million pounds (2,041 mt). Therefore, a commercial possession limit will be triggered once 4.05 million pounds (1,837 mt) of chub mackerel are projected to be landed by commercial and recreational fishermen. This level of landings has been reached only once over the past 20 years (i.e., in 2013, Table 2).

As described in more detail in the next section, there are currently no recreational possession limits for chub mackerel.

Council staff recommend no changes to the commercial or recreational chub mackerel possession limits at this time.

Other Management Measures

The Council did not develop recreational management measures such as possession limits, minimum fish sizes, and closed seasons for chub mackerel through Amendment 21. Recreational catch of chub mackerel appears to be low; however, the data are limited, making it difficult to develop effective recreational management measures. There are also concerns about potential misidentification as chub mackerel are similar in appearance to Atlantic mackerel. Chub mackerel may be misidentified at Atlantic mackerel and misreported in charter/party logbooks and as part of data collections for MRIP. There are no federal possession limits, minimum fish sizes, or season restrictions for recreational Atlantic mackerel fisheries.

Minimum fish size limits are typically used to reduce fishing mortality on immature fish; however, a minimum size limit for chub mackerel may provide little additional biological benefits considering current fishery selectivity. According to an analysis of observer data done for Amendment 21, about 88% of the chub mackerel caught in bottom otter trawls are at least 20 cm in length. As suggested in Daley and Leaf (2019)[2] and supported by comments from fishermen, it is possible that chub mackerel's fast swimming speed reduces the potential for capture of larger individuals. Several scientific studies have documented the length at maturity for chub mackerel in various regions. The length at maturity varies by study. Daley (2018)[3] examined chub mackerel caught in commercial fisheries in the Mid-Atlantic and Southern New England and found that 50% of females reached maturity at about 27 cm. According to observer data, about 73% of the chub mackerel caught in bottom trawls are at least 27 cm.

Given that chub mackerel are predominantly caught with bottom otter trawls off the U.S. east coast, it can be assumed that most discarded chub mackerel would not survive. Therefore, a minimum fish size likely would increase mortality on this species without notable benefits of protecting immature fish.

Most chub mackerel landed on the U.S. east coast over the past 20 years were caught on bottom trawl vessels which also participate in the *Illex* squid fishery. Regulations for that fishery specify gear requirements (see 50 CFR 648.23), including gear restrictions for specific regulated mesh areas (50 CFR 648.80). The Council did not see a need to develop additional gear restrictions for chub mackerel beyond what vessels are currently subject to in other fisheries.

At this point in time, Council staff do not recommend that the Council implement new chub mackerel management measures such as minimum fish sizes, closed seasons, or gear restrictions.

[2] Daley, T. T. and R. T. Leaf. 2019. Age and growth of Atlantic chub mackerel (*Scomber colias*) in the Northwest Atlantic. *Journal of Northwest Atlantic Fisheries Science.* 50: 1-12.

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