



Mid-Atlantic Fishery Management Council
800 North State Street, Suite 201, Dover, DE 19901
Phone: 302-674-2331 | FAX: 302-674-5399 | www.mafmc.org
Michael P. Luisi, Chairman | P. Weston Townsend, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

MEMORANDUM

Date: July 13, 2021
To: C. Moore
From: J. Didden
Subject: Mackerel Rebuilding Modification/Re-assessment and Potential Emergency Action; SSC Meeting

Atlantic Mackerel

The current mackerel Acceptable Biological Catch (ABC) of 29,184 metric tons (MT), is based on the projected catch in the first year (2019) of a rebuilding program designed to rebuild mackerel in 2023. Catches in 2020 and 2021 were originally slated to increase above 29,184 MT given the projected increases in biomass. These projections were predicated on a strong 2015 year class and typical year classes subsequently. At its May 2019 meeting, the SSC considered results from the 2019 Canadian Atlantic mackerel assessment, which indicated lower than expected recruitment in 2016-2018. The SSC determined that it would not be appropriate to recommend the planned higher ABCs with 2016-2018 recruitment levels likely lower than anticipated (i.e. lower than typical). Instead, in 2019 the SSC recommended maintaining the 29,184 MT ABC, and in 2020 endorsed the same ABC for 2021-2022 pending the 2021 mackerel management track assessment.

The 2018 stock assessment (2016 terminal year) and the 2021 assessment (2019 terminal year) both estimate that the mackerel stock reached a low point around 2012-2014 at around 8%-9% of the biomass target at that time¹. They both found that by their respective terminal years, the stock had increased to 22% and 24% of the biomass target. However, the 2018 assessment and associated projection methods estimated that more substantial stock rebuilding would have occurred by 2019 given the observed catches. The current estimates and trends indicate that rebuilding is very unlikely by the original target (2023) though staff notes that almost none of the data in the new assessment occurred while a rebuilding plan was in effect (since November 29, 2019). Potential causes of the apparent trends appear to be continued lower than typical recruitment, and changes in maturity and/or weight at age.

Several projections conducted for the current SSC meeting demonstrate the sensitivity of stock trajectory to recruitment. Using a lower recruitment draw for projections from 2009-on compared

¹ This would have led to a complete fishery closure based on the Council's risk policy that states the P* (probability of overfishing) should = 0 (i.e. catch = zero) when stock biomass is at or less than 10% the target.

to 1975-on reduces recruitment by almost a quarter. While 5-year average catch (18,419 MT) is predicted to rebuild in about 5 years (2022-2027) with the higher recruitment, at the lower recruitment with the same catch, the stock would be predicted to be only at 39% of the biomass target after 10 years (2022-2032). This creates a conundrum for setting future rebuilding catches, as assuming the higher recruitment may not be reflective of current conditions, but assuming lower recruitment makes it very difficult to achieve a target biomass that is itself based on the higher recruitment.

According to the most recent Canadian stock assessment conducted in 2021, Atlantic mackerel (in its 2020 terminal year of data) was “in the critical zone” (at about 58% of the limit reference point — the stock level below which productivity of the resource is sufficiently impaired to cause serious harm), with limited chance for rebuilding in the near future.²

Staff notes that stock-wide total mackerel catches have been relatively stable from 2011-2019, ranging from about 14,200 MT to 22,300 and that fishing mortality has decreased substantially over that time period as biomass has apparently more than doubled (a 148% increase). If A) Canada catches its 4,000 MT quota in 2021 (which seems likely), B) the U.S. commercial fishery performs similarly to last year from this point in time and ends around 6,000 MT for 2021, and C) the U.S. recreational fishery catches its recent five year average (about 3,500 MT), then the total 2021 catch would be about 13,500 MT³. This would be lower than any catch in the entire time series and would be closer to ending overfishing according to the assessment projections. The lowest catch in the time series occurred in 2015, 14,185 MT.

Given the observed apparent stock growth (at lower stock sizes) since 2011 with similar or higher catches, and pending the outcome of the SSC meeting, staff is considering recommending that as a rebuilding plan is modified or re-assessed, the Council request A) for NMFS to take emergency action to close the commercial mackerel fishery when landings are expected to reach 95% of 6,685 MT [14,185 MT (lowest time series catch) - 4,000 MT (Canadian quota) - 3,500 MT (expected U.S. Recreational catch) = 6,685 MT] and also B) close federal waters to harvest of mackerel by recreational fishermen. The 2018-2019 precision estimates of recreationally-harvested mackerel in federal waters were reasonable (Proportional Standard Error below 30%) and indicated federal waters (which the Council can affect) accounted for 10%-13% of harvest by weight. The Magnuson-Stevens Act requires that rebuilding harvest restrictions or recovery benefits be allocated fairly and equitably among sectors, so some impact on the recreational sector would appear warranted (U.S. recreational catch accounted for 28% of U.S. mackerel catch in 2019). These measures could likely be in effect until additional action regarding rebuilding is implemented, i.e. for part of the remainder of 2021 and initially for 2022.

Such an action, if catch was limited to around 14,185 MT, would further reduce fishing mortality to nearer to the overfishing reference point (regardless of the assumed recruitment scenario). Based

² <https://www.gazette.gc.ca/rp-pr/p2/2021/2021-05-26/html/sor-dors100-eng.html> When available, the Canadian assessment will be posted, and a draft may be available for the SSC members before the meeting.

³ It has also been estimated by Canadian DFO Science that there could be between 2,000 and 5,000 metric tons of unreported catches per year, which includes fishing mortality from various sources, notably recreational and some unreported commercial (including bait) harvests, discards and other mortalities. (see footnote 1 link above) These potential catches have not been included in any assessments.

on observations since 2011 and approximating from the available projections, some rebuilding would still be expected at this catch from 2020 to 2021 and again from 2021 to 2022 even if realized recruitment is the median of the more recent, lower time series. Under the lower recruitment scenario, catches of 23,184 MT in 2021 (current ABCs/quotas) and 18,419 MT (5-year average recent catch) in 2022 (41,603 MT combined) are projected to reduce biomass from 2020 to 2022 by 5% (but still be 34% above 2019), while Fmsy catches of 11,622 MT in 2021 and 12,762 in 2022 (24,384 MT combined) are projected to increase biomass from 2020 to 2022 by 18% (and be 66% above 2019). Catches of 28,370 MT (two times 14,185 MT) would be substantially closer to the lower (i.e. Fmsy) of the above-referenced projections, so some additional stock growth would be expected at annual catches of 14,185 MT (staff hopes that the NEFSC can run a projection for 14,185 MT to confirm). Staff notes that recruitment was estimated to actually have been above the lower assumed median amount in 4 out of the last 5 years.

Staff hopes that additional projections are available for the SSC meeting that can be considered and used to craft advice for the Council as further action on mackerel rebuilding is considered. These should include the standard P* calculations based on the Council's risk policy even though the risk policy to use P* is likely not binding for 2021-2022 given the Council's previous decision to base decisions on a rebuilding fishing mortality for 2019-2023. At the same time however, the recent assessment would appear to preclude continued implementation of the existing rebuilding fishing mortality (it would constitute overfishing). Accordingly, SSC recommendations for 2021 and initially 2022 may be better conceptualized as interim fishing level recommendations rather than traditional ABCs. A framework action (meeting #1) is scheduled for the August Council meeting (preceded by a joint MSB Committee and Advisory Panel meeting), and additional projections can be requested based on discussions/recommendations by the SSC, MSB Committee, MSB Advisory Panel, and Council for SSC review and rebuilding recommendations in September prior to Council action in October. For example, Council staff has asked NEFSC staff if assumed recruitment could be stepped from the lower to higher time series medians over 10 years, to build in some caution at the beginning, but acknowledge that to really get to a normal rebuilt stock you have to have normal recruitment (by definition, the current biomass and catch reference points could not be maintained without typical recruitment).

Given the divergence from P* was specific to the original rebuilding plan initiation, if the Council wants the next rebuilding time series to also have higher catches than P*, a similar risk policy modification would need to be included (the base risk policy dictates choosing the lower of a rebuilding F catch or a P*-derived catch). This was an intentional design of the rebuilding plan, so that divergence from P* would have to be directly considered in each instance. While not yet available when this document was written, it is anticipated that, P*-derived catches would likely be very low, possibly below just the combined anticipated Canadian and recreational catch, especially if the more recent, lower recruitment time series is used.

While the above-proposed course of action is a relatively rapid response, it is in line with the spirit of the Council's original rebuilding plan, which stated "...we also expect that a 2020 mackerel stock assessment update will be available to provide relatively quick feedback on initial rebuilding results."