



Mid-Atlantic Fishery Management Council
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MEMORANDUM

Date: July 7, 2020
To: C. Moore
From: J. Didden
Subject: Butterfish, Longfin Squid, and Mackerel ABCs

Butterfish

The current butterfish acceptable biological catch (ABC) of 32,063 metric tons¹ (MT) is based on projections conducted in 2017 when the last update of the butterfish assessment occurred. The projections used the Council's risk policy at the time and the SSC's assignment of a 100% coefficient of variation (CV) to the projected overfishing level (OFL).

The 2019 butterfish landings totaled 3,431 MT with 1,651 MT of discards. This was the highest catch since directed fishing was allowed to increase in 2012. The Fishery Performance Report notes there are limited domestic markets for butterfish and the re-establishment of export markets is a long-term process that also requires butterfish of a particular size and quality.

The 2020 butterfish management track assessment found butterfish to be not overfished without overfishing in 2019, but if the full 2020 ABC was caught, projections suggest overfishing would have occurred and the stock would have become overfished. The last projections from 2017 overestimated stock biomass trends, largely due to the disconnect between projected and realized recruitment. Recruitment, while variable, has been generally declining since 1999 and recent years have seen historically low recruitment.

Due to this disconnect, Council staff requested that NMFS Northeast Fisheries Science Center (NEFSC) staff run projections sampling potential recruitments from just the last 10 years rather than the full time series (i.e. consider using lower recruitment). Given the trends in recruitment and the recent overly optimistic assessment projections, staff is recommending that 2021-2022 ABCs be based on averaged ABC projections using just the last 10 years for potential recruitment and a 150% CV, combined with the Council's new risk policy. The projections also assume a 2020 catch of 5,443 MT (instead of the full 2020 ABC). This was developed based on the 2019 catch of 5,082 MT and accounting for increasing the trend since 2013 (Excel trend calculation). Preliminary 2020 landings through July 1 are about half of 2019 landings through

¹ One metric ton equals approximately 2,205 pounds, so 32,063 metric tons equals about 70.7 million pounds.

July 1, so 5,443 MT may still be an overestimate for 2020 (landings before July 1 constituted the majority of 2019 landings). Projection details are provided in materials from NEFSC staff. **The staff recommendation would produce averaged ABCs of 13,442 MT for 2021-2022** given the associated parameters discussed above.

Longfin Squid

The current longfin squid ABC of 23,400 metric tons (MT), is based on the catch in the year of the highest exploitation ratio (1993) from the 2010 longfin squid benchmark assessment. That year remains the year of the highest annual exploitation index based on the 2020 management track assessment, though the catch in that year has been re-estimated to be 23,950 MT due to revised discards. Staff notes that catch in 1994 was also about the same as 1993.

The 2019 longfin squid landings totaled 12,458 MT with 314 MT of discards. This is within the typical range of variable landings since in-season quotas were established in 2000. The Fishery Performance Report notes that demand remained high through 2019, but various regulatory measures constrain the fishery.

There are no fishing mortality reference points for longfin squid, but the 2020 longfin squid management track assessment found that the annualized 2-year moving average of biomass was above the target in 2019. The annualized 2-year moving average exploitation rate was near the long term median. The 2-year moving averages for non-annualized (examining the spring and fall surveys separately) were also near or above potential proxy biomass targets, and the 2-year moving averages for non-annualized exploitation indices were near or below their long term medians in 2019. The median fall swept-area biomass estimate is about five times bigger than the median spring biomass, though uncertainties about potential differences in catchability between the fall and spring surveys make that scale difference somewhat difficult to interpret.

Staff appreciates the investigation of sub-annual biomass and exploitation conducted as part of the 2020 longfin squid management track assessment. However, staff's interpretation is that the two primary literature sources cited regarding cohorts (Brodziak and Macy, 1996; Macy and Brodziak, 2001) may not necessarily point to two particular "dominant" cohorts that can be effectively monitored with the current surveys. Brodziak and Macy 1996 found differences in growth rate between squid hatched during Nov-May and July-October, and that "monitoring the stock for in-season management would likely require several assessments throughout the year." They also noted that "If the long-finned squid stock is managed on a seasonal basis, revised stock assessment procedures are likely to require rapid collection of catch and effort data and efficient data analysis during periods of peak fishing activity," with a final concluding statement that "Owing to its short lifespan, the immediate benefits of harvesting the long-finned squid resource are probably best measured by average seasonal yield and its variance, and an adaptive approach to management may be needed to ensure sufficient spawning escapement and to foster efficient utilization of this resource." Macy and Brodziak, 2001 discuss "the large number of possibilities for micro-cohort production, due to continuous spawning throughout the year." Macy and Brodziak 2001's commercial samples for aging also appear to have been collected

during a limited portion of the year. Macy and Brodziak 2001 do note that *L. gahi* has two main spawning periods, and that longfin squid make similar ontogenetic descents in the water column as *L. gahi*. Staff supports continued development of sub-annual assessment and management approaches to longfin squid, but at this time **recommends the current annual longfin squid ABC of 23,400 MT for 2021-2023.**

Atlantic Mackerel

The current mackerel 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 by June 2023. Catches in 2020 and 2021 were originally slated to increase given the projected increases in biomass. These projections were predicated on a rebuilding strategy that recognized a strong 2015 year class in the assessment results and moderate 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 original higher 2020 ABC level based on recruitment levels in 2016-2018 that may be lower than those anticipated in the rebuilding plan. Instead, the SSC recommended maintaining the ABC for 2020 at the level established for 2019 (29,184 MT). A management track assessment was anticipated in 2020 but has been delayed to 2021 due COVID-19-related data delays.

The 2019 U.S. mackerel landings totaled 5,379 MT with 200 MT of discards. 2019 recreational catch was 2,119 MT (new MRIP methodology which the last assessment did not use), and 2019 Canadian catch was 8,557 (preliminary). Total catch was 16,255 MT, among the lowest in the time series, but as noted in the Fishery Performance Report, U.S. commercial landings were constrained after a river herring and shad cap closure early in the year. Canadian landings were constrained by a quota closure in early September 2019. 2018 landings were also restricted, though less so than 2019, by the same mechanisms in both countries.

Compared to the original rebuilding projections, 2017 catch was 3,494 MT higher (+20%) than assumed, 2018 catch was almost the same as assumed, and 2019 catch was 12,929 MT less (-44%) than projected. The 2017/2018 catches were approximated for projections due to data limitations at the time, and the 2019 catch was limited by the various closures discussed above.

The NEFSC provided a mackerel data update including information on: catch, the NEFSC spring bottom trawl survey, egg/ichthyoplankton surveys, catch location, commercial landings at age, U.S. commercial discards at age, U.S. recreational catch-at-age, and the most recent Canadian assessment. Based on a review of the available information, the mackerel situation does not appear substantially changed since last reviewed. Accordingly, **staff recommends maintaining the current mackerel ABC of 29,184 metric tons (MT) for 2021-2022** (until the 2021 assessment can be used).