



New England Fishery Management Council

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Dr. John F. Quinn, *Chairman* | Thomas A. Nies, *Executive Director*

To: Tom Nies, Executive Director
From: Scientific and Statistical Committee (SSC)
Date: December 1, 2020

Subject: Terms of Reference – Overfishing levels (OFLs) and acceptable biological catch (ABC) recommendations for small-mesh multispecies stocks for fishing years 2021 to 2023

The SSC met on November 12, 2020 via webinar to address the following term of reference (TOR):

Considering the Council's Risk Policy Statement, provide an OFL and an ABC for each stock for each year 2021, 2022, and 2023 that will prevent overfishing, and achieve rebuilding if needed, consistent with the Council's ABC control rule for small-mesh multispecies stocks.

To address these TORs, the SSC considered the following information:

A.1 Management Track Peer Review Panel Reports for Silver and Red Hake stocks, DRAFT (September 2020)

A.2 Research Track Peer Review Panel Report for red hake stocks (March 2020).

A.3 Supplemental Information: Stock Assessment Support Information (SASINF) – use this link to access the database which includes the assessment reports, peer review presentations, and additional information.

A.4 Background: Draft SAFE Report for Fishing Year 2019 [link to be inserted when document is ready].

A.5 Background: SSC review of the small-mesh multispecies MSY proxy reference points.

A.6 Background: Amendment 19 (established the small-mesh multispecies specification procedures).

A.7 Background: DRAFT Framework Adjustment 62 (initiates a rebuilding plan for southern red hake).

A.8 Background: NEFMC Risk Policy Roadmap that includes the Risk Policy Statement and Implementation Plan, see pp. 4-5.

A.9 Background: Description of Plan B Smooth Approach

A.10 Background: State of the Ecosystem and Current Conditions. NOAA/NEFSC. Available at: <https://www.fisheries.noaa.gov/new-england-mid-atlantic/ecosystems/state-ecosystem-reports-northeast-us-shelf>

A.11 Presentation: Whiting PDT Report and recommendations for OFL and ABC (NEFMC staff)

A.12 Presentation: Summary of silver hake assessments, with estimates for OFL and ABC (Dr. Alade)

A.13 Presentation: Summary of red hake assessments (T. Chute)

A.14 Presentation: Options for setting red hake OFL with different applications of Plan B smooth (NEFMC staff)

A.15 Presentation: Estimation of scientific uncertainty for red hake OFL estimates and application for setting ABC (Dr. Alade)

A.16 Risk Policy Matrix for Small Mesh Multispecies

INTRODUCTORY STATEMENT

This report contains four main sections. In the first section (“TOR”), the report provides the SSC’s catch advice by stock. The second section (“RATIONALE INCLUDING SIGNIFICANT SOURCES OF UNCERTAINTY”), discusses the SSC’s rationale for the catch advice made in the first section. The third section (“ADDITIONAL COMMENTS”), provides additional relevant SSC discussion. The fourth section is a summary table with the OFL and ABC advice for the stocks.

TOR

Northern silver hake

The SSC accepts use of the results of the survey-based assessment as the source for catch advice, estimation of reference points, and stock status based on the reference points as set forth during SARC 51. Based on this information, the SSC recommends that Northern silver hake be considered not overfished, with no overfishing occurring. The SSC considered the calculations provided by the PDT and recommends the following OFLs and ABCs (metric tons):

| Year | OFL | ABC |
|------|--------|--------|
| 2021 | 39,930 | 20,410 |
| 2022 | 39,930 | 20,410 |
| 2023 | 39,930 | 20,410 |

Southern whiting complex

The SSC accepts use of the results of the survey-based assessment as the source for catch advice, estimation of reference points, and stock status based on the reference points as set forth during SARC 51. Based on this information, the SSC recommends that the Southern whiting complex be considered not overfished, with no overfishing occurring. The SSC considered the calculations provided by the PDT and recommends the following OFLs and ABCs (metric tons):

| Year | OFL | ABC |
|------|--------|--------|
| 2021 | 72,160 | 40,990 |
| 2022 | 72,160 | 40,990 |
| 2023 | 72,160 | 40,990 |

Southern red hake

The SSC accepts the use of the Plan B Smooth approach for setting ABC for Southern red hake. The SSC recommends that the OFL is unknown as the Plan B Smooth approach does not calculate biological reference points (BRPs), which is consistent with the PDT and Management Track Review Panel comments on the BRPs. The SSC recommends a static ABC for the years 2021-2023 and chose the years of 2001 – 2019 to calculate the exploitation rate (3.1%) for use in the Plan B Smooth approach. The SSC recommends the following OFLs and ABCs (metric tons):

| Year | OFL | ABC |
|------|---------|-------|
| 2021 | unknown | 2,006 |
| 2022 | unknown | 2,006 |
| 2023 | unknown | 2,006 |

Northern red hake

The SSC accepts the use of the Plan B Smooth approach for setting ABC for Northern red hake. The SSC recommends that the OFL is unknown as the Plan B Smooth approach does not calculate biological reference points, which is consistent with the PDT and Management Track Review Panel comments on the BRPs. The SSC recommends a static ABC for the years 2021-2023 and chose the years of 1981 - 1994 to calculate the exploitation rate (1.5%) for use in the Plan B Smooth approach. The SSC recommends the following OFLs and ABCs (metric tons):

| Year | OFL | ABC |
|------|---------|-------|
| 2021 | unknown | 3,452 |
| 2022 | unknown | 3,452 |
| 2023 | unknown | 3,452 |

RATIONALE INCLUDING SIGNIFICANT SOURCES OF UNCERTAINTY

Northern silver hake

The survey for Northern silver hake has been declining in recent years, but the survey biomass remains at a high level relative to the reference points and the relative exploitation rates are very low. The recommendation from the SSC represents a 34% decrease from previous ABC recommendations, but this amount is still far above recent catch levels so should not negatively impact the fishery, and the decrease is appropriate given that biomass appears to be declining from historically high levels. This decline does not appear to be driven by fishing given the very low exploitation levels, however, exploitation could become relatively more important if the biomass continues to decline at the same rate into the future. This stock lacks an analytical assessment so static catch advice is the only option available for setting catch advice for the next three years.

Southern whiting complex

The survey for the Southern whiting complex has been increasing in recent years and the survey biomass is now above the survey-based reference points and the relative exploitation rates are very low. The recommendation from the SSC represents a 103% increase from previous ABC recommendations, appropriate given that the stock appears to be doing well. An additional uncertainty considered by the SSC is the fact that this is a mixed stock including two different species: Southern silver hake and offshore hake. The PDT suggested that this likely only has a minor impact on stock status. Finally, this stock was impacted by missing information from the Fall 2017 survey. The assessment analyst did a good job investigating this uncertainty, so the catch advice does account for this uncertainty. This stock lacks an analytical assessment so static catch advice is the only option available for setting catch advice for the next three years.

Southern red hake

The rejection of the previous assessment method for this stock coupled with the lack of explicit review for the method used for setting catch advice created a fair amount of uncertainty for the SSC to consider, but the PDT did a good job of providing the SSC with a robust set of options to consider. In the end, the SSC decided to set the exploitation rate used for the Plan B Smooth approach based on the years of 2001 – 2019, resulting in an exploitation rate of 3.1 to apply into the Plan B Smooth approach. This was not exactly one of the options presented by the PDT, but the SSC justified the selection of these years due to the fact that this was a period during which the stock appears to have responded to management through changes in its biomass levels followed by a period of stability. The difference between what the SSC decided as the appropriate years for

selecting the exploitation rate and those suggested by the PDT are likely not meaningfully different with regard to the biological effect on the stock. The stock appears to be in a stable condition and the exploitation of the stock has been very low so the SSC felt this recommendation would not risk creating overfishing on this stock. This stock lacks an analytical assessment so static catch advice is the only option available for setting catch advice for the next three years.

Northern red hake

As was the case for Southern red hake, the rejection of the previous assessment method for this stock coupled with the lack of explicit review for the method used for setting catch advice created a fair amount of uncertainty for the SSC to consider, but the PDT did a good job of providing the SSC with a robust set of options to consider. The SSC decided to set the exploitation rate used for the Plan B Smooth approach based on the years of 1981 – 1994, resulting in an exploitation rate of 1.5% to apply into the Plan B Smooth approach. This was not exactly one of the options presented by the PDT nor were they the same years as those used for Southern red hake, but the SSC justified the selection of these years due to the fact that this was a period where the stock appears to have responded to management through changes in its biomass levels followed by a period of stability. The difference between what the SSC decided as the appropriate years for selecting the exploitation rate and those suggested by the PDT are likely not meaningfully different with regard to the biological effect on the stock. The stock appears to be in good condition and the exploitation of the stock has been very low so the SSC felt this recommendation would not risk creating overfishing on this stock. This stock lacks an analytical assessment so static catch advice is the only option available for setting catch advice for the next three years.

ADDITIONAL COMMENTS

Northern silver hake

Given that the assessment is index based, important population quantities such as growth, natural mortality, and recruitment cannot be explicitly considered in the advice, so revisiting as frequently as practical is warranted as there is no way to predict the impacts of catch on the stock in to the future. Additionally, the basis for the existing BRPs assumes conditions have remained relatively static since the reference period (1973 – 1982). Alternative BRPs should be investigated and one simple method could be to look at the sensitivity of stock status to the reference time period selected. One final recommendation made by the SSC was to investigate some external information to determine if there were any troubling signals coming from other sources of biological information. The example discussed during the meeting was to investigate changes in size-at-age through time or other indicators that might signal that the population is undergoing or about to undergo a change. These external indicators can be helpful in the absence of an analytical assessment by way of corroborating information. Some of this information is already contained in the state of the ecosystem report, so it would just need to be synthesized and presented with the information provided for setting catch advice.

Southern whiting complex

As was the case for Northern silver hake, the assessment is index based, therefore important population quantities such as growth, natural mortality, and recruitment cannot be explicitly considered in the advice, so revisiting as frequently as practical is warranted as there is no way to predict the impacts of catch on the stock into the future.

As well, the basis for the existing BRPs assumes conditions have remained relatively static since the reference period (1973 – 1982). Alternative BRPs should be investigated and one simple method could be to look at the sensitivity of stock status to the reference time period selected.

The uncertainty with the missing survey strata was well investigated by the analyst. The SSC offered an additional approach, namely a Bayesian statistical approach such as the Bayesian state-space approaches being investigated for index-based groundfish stocks as another approach that may be worth investigating.

One final recommendation made by the SSC was to investigate some external information to determine if there were any troubling signals coming from other sources of biological information. The example discussed for this stock was looking at condition factors for signals that the population is undergoing or about to undergo a change. These external indicators can be helpful in the absence of an analytical assessment by way of corroborating information. As noted for Northern silver hake, some of this information is already contained in the state of the ecosystem report, so it would just need to be synthesized and presented with the information provided for setting catch advice.

Southern and Northern red hake

As was the case for the silver hake stocks, the assessment is index based, therefore important population quantities such as growth, natural mortality, and recruitment cannot be explicitly considered in the advice, so revisiting as frequently as practical is warranted as there is no way to predict the impacts of catch on the stock in to the future.

The SSC did the best it could to set catch advice during the meeting that would not lead to overfishing, but the years selected for setting the exploitation rates for use in the Plan B Smooth approach for both stocks should be investigated further. At least, the response of the stocks based on this catch advice should be reevaluated in future specification setting cycles, and adjustments should be made if warranted.

As a final note, the SSC felt that the spawning potential ratio (SPR) method that went forward at the research track assessment should continue to be developed as a potential future assessment approach for these stocks. The approach was rejected by the research track peer review panel, but the SSC believes it still has potential for use if it can be developed further.

SSC MEMBER ATTENDANCE

Mr. Carroll, Dr. Chen, Dr. Collie, Dr. Jordaan, Dr. Kerr, Mr. Maguire, Dr. McNamee, Dr. Merrick, Dr. O'Keefe, Dr. Serchuk, Dr. Sullivan, Dr. Uchida, Dr. Wiedenmann, Dr. Williams

SUMMARY OF RECOMMENDATIONS

The following is a summary table for all of the OFL and ABC recommendations made during the November 2020 meeting.

| Year | Stock | OFL | ABC | Method (Control Rule; Other) |
|------|----------------------|---------|--------|------------------------------|
| '21 | Northern silver hake | 39,930 | 20,410 | Control rules were applied |
| '22 | | 39,930 | 20,410 | |
| '23 | | 39,930 | 20,410 | |
| '21 | Southern whiting | 72,160 | 40,990 | Control rules were applied |
| '22 | | 72,160 | 40,990 | |
| '23 | | 72,160 | 40,990 | |
| '21 | Southern red hake | unknown | 2,006 | Control rule, option D |
| '22 | | unknown | 2,006 | |
| '23 | | unknown | 2,006 | |
| '21 | Northern red hake | unknown | 3,452 | Control rule, option D |
| '22 | | unknown | 3,452 | |
| '23 | | unknown | 3,452 | |