

Framework Adjustment 56
to the
Northeast Multispecies FMP

Appendix I

**SSC Recommendations for Northeast Multispecies ABCs,
FY 2017 – FY 2019**



New England Fishery Management Council

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Ernest F. Stockwell III, *Chairman* | Thomas A. Nies, *Executive Director*

To: Tom Nies, Executive Director
From: Scientific and Statistical Committee
Date: August 22, 2016
Subject: Overfishing levels (OFLs) and acceptable biological catch (ABC) recommendations for Georges Bank yellowtail flounder for fishing years 2017 and 2018.

The SSC met on August 10, 2016 in Boston, Massachusetts, to address the following term of reference (TOR):

Provide the OFL and an ABC for each year for fishing years 2017 and 2018 that will meet management objectives and prevent overfishing.

To address this TOR, the SSC considered the following information:

B.1 PDT presentation

B.2 Memo from PDT to SSC re GB yellowtail flounder ABCs (August 4, 2016)

B.3 Transboundary Resources Assessment Committee (TRAC) Status Report for GB yellowtail flounder (August 2016)

B.4 DRAFT TRAC Stock Assessment Report for GB yellowtail flounder for 2016 (July 2016)

B.5 2016-2017 SSC ABC and OFL recommendations for GB yellowtail flounder (September 8, 2015 Memo from SSC to Tom Nies)

Since the 2014 diagnostic benchmark assessment for Georges Bank yellowtail flounder, the stock has been assessed using an empirical approach based on the fishery-independent surveys conducted by DFO and NOAA (spring and fall), rather than an analytical model. This approach precludes formal estimation of reference points and status of the stock. Therefore, OFL for Georges Bank yellowtail flounder remains unknown.

The 2014 assessment recommended that ABC for the stock be set based on an exploitation rate ranging from 2% to 16% applied to the mean swept-area biomass estimate from the three surveys. The SSC accepted this recommendation in 2014, using the upper end of the range of exploitation rates, which resulted in a recommendation that ABC should not exceed 354 mt for FY2015.

In 2015, the SSC recommended that the status quo ABC of 354 mt should remain the upper limit for FY2016 because the biomass estimate had not changed substantially. Furthermore, despite endorsing the empirical approach as the best basis for developing catch advice, the SSC expressed concerns about the uncertainties inherent in the approach, including high variance and inconsistencies among the three surveys. The SSC concluded in our September 8, 2015 report that,

“...annual adjustments to the ABC are not warranted in the absence of evidence of substantial changes in biomass...” However, the SSC did not specify what would constitute a “substantial” change, although we did reiterate a suggestion from our August 29, 2014 report on Georges Bank yellowtail flounder that basing the ABC on the three-year moving average of biomass estimates might help to dampen both noise in the survey data and resulting inter-annual fluctuations in catch.

The 2016 TRAC assessment reports a larger change in the average biomass estimate from 2015 to 2016 (-32%) than the change from 2014 to 2015 (<1%). The Groundfish PDT recommended to the SSC that 245 mt, based on an exploitation rate of 16% applied to the average of the three survey-based biomass estimates (1,532 mt), should be considered an upper limit for the FY2017 ABC.

The SSC considered a recommendation that ABC should not exceed 245 mt, but ultimately decided to recommend that the status quo ABC of 354 mt be retained as the upper limit. The primary reason for this recommendation is similar to the SSC advice last year: The considerable uncertainties in survey-based estimates, especially high variability and inconsistencies among surveys, suggest that a one-year change might not reflect a meaningful change in the stock to which management needs to respond.

Uncertainties notwithstanding, given that the magnitude of change in the biomass estimate from 2015 to 2016 is more substantial than the change from 2014 to 2015, the SSC discussed in more detail some of the risk considerations accompanying our advice. In particular, we considered the likelihood that the advice will result in overfishing. This is a difficult question to answer given that OFL for the stock is unknown. However, OFL being unknown does not mean that OFL does not exist, and the challenge lies in determining whether an ABC recommendation is likely to be below the unknown OFL.

The SSC identified several factors that suggest the risks associated with status quo ABC might be low:

- Both catch limits and actual catches for Georges Bank yellowtail flounder have been the lowest on record, by far, in recent years.
- Actual catches have been well below the ABC for several years due to market factors, active avoidance by fishermen and other factors. This provides an additional layer of buffering against the risks of overfishing.
- Relative exploitation rates (catch divided by survey index) associated with recent catches are also by far the lowest on record, suggesting that the fishing mortality rate is also the lowest on record.
- Despite the drastic reduction in catch and very low relative exploitation rates, biomass has not shown a positive response, as indicated by the surveys, suggesting that environmental factors are having a strong effect delaying recovery.
- Although biomass has not shown a positive response, the proportion of fish in age classes 6+ is the highest observed in many years in the catch and the DFO survey. This is another indirect indication of low fishing mortality. Recovery of these older and more reproductively valuable fish, which has occurred under the status quo ABC, could be the precursor of a future biomass response. Comparable recovery of age structure has not been observed in the NOAA surveys.
- Because the TRAC assessment of Georges Bank yellowtail flounder is conducted annually, with catch specifications also adjusted annually, we expect that our advice that ABC should not exceed 354 mt will be revisited and potentially adjusted for FY2018.

It is important to reiterate the point from the SSC's September 8, 2015 report that if the ABC is set at the upper limit of 354 mt and if that full amount were to be caught, the risk profile may change. However, it is difficult to determine the scale of the change in risk. On the one hand, 354 mt would be proportionally much greater than catches from 2013-2015. On the other hand, 354 mt would remain considerably lower than any catches prior to 2013. Catch at that level would therefore maintain the dramatic reduction in removals achieved in recent years, albeit to a lesser degree. The SSC was not provided with any information to suggest that catches will increase dramatically in the near future, and are therefore likely to remain below ABC for the foreseeable future, but acknowledges the greater risks that would be faced if catch is closer to the ABC than it has been recently.

Finally, because the SSC was limited by the absence of clear metrics that would constitute "substantial" changes in the stock and trigger a change in the ABC, we have decided to form a sub-group that will develop a list of potential metrics and the pros and cons of each. These might include, but would not necessarily be limited to:

- A threshold (i.e., percentage) change in the average biomass estimate.
- Use of the three-year moving average of biomass estimates, rather than a single year estimate, with or without a threshold that would trigger a change.
- The trend in biomass estimates instead of or in addition to single year or multi-year estimates.
- Use of the 95% confidence interval or other measures of spread to determine whether inter-annual changes are significant and warrant a change.
- Changes in other relevant metrics beyond the biomass estimates and trends, e.g.:
 - Characteristics of the population structure (e.g., proportion of fish in older age classes).
 - Magnitude and trends in condition indices.
 - Changes in the ratio of catch:ABC.
 - Other biological, ecological or socio-economic indicators (e.g., price trends).

We will likely request time on the agenda at an upcoming SSC meeting to review the work of the sub-group and develop recommendations as appropriate. This process will be important in establishing greater transparency in future development of catch advice for the Georges Bank yellowtail flounder stock.

Summary of recommendations

- 1. ABC for the Georges Bank yellowtail flounder stock should not exceed 354 mt for FY2017 and FY2018, with the expectation that the FY2018 catch specifications will be revisited and possibly adjusted following the 2017 TRAC assessment. OFL for the stock remains unknown.**
- 2. An SSC sub-group should be formed to develop alternatives for quantitative metrics that would trigger an upward or downward adjustment of the ABC. We expect that the SSC will request time at an upcoming meeting to review the work of the sub-group and develop recommendations, as appropriate.**



New England Fishery Management Council

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John F. Quinn, J.D., Ph.D., *Chairman* | Thomas A. Nies, *Executive Director*

MEMORANDUM

DATE: January 23, 2017
TO: Tom Nies, Executive Director
FROM: Scientific and Statistical Committee
SUBJECT: Overfishing levels (OFLs) and acceptable biological catch (ABC) recommendations for witch flounder

The Scientific and Statistical Committee (SSC) met on January 17, 2017 in Boston, Massachusetts, to address the following terms of reference (TORs):

1. Taking into account the Council's Risk Policy Statement, provide the OFL and an ABC for each year for fishing years 2017, 2018, and 2019 that will prevent overfishing and meet the management objective to rebuild the stock, and is consistent with the Council's ABC control rule for groundfish stocks.
2. The Council requests that the SSC provide a final report by noon on January 23, 2017 so that it can be considered at the January Council meeting that week.

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

- 1.1 The Risk Policy Road Map
- 1.2 SARC 62 Assessment Summary Presentation
- 1.4 Memo from the PDT to the SSC regarding witch flounder OFL and ABCs
- 1.5 Witch Flounder Risk Policy Matrix
- 1.6 SAW 62 Assessment Summary Report
- 1.6 SARC 62 Review Panel Summary Report
- 1.7 Witch Flounder Assessment Report
- 1.8 SSC report to the NEFMC on Witch Flounder (January 22, 2016)
- 1.9 Letter from the Northeast Seafood Coalition, Gloucester Fishing Community Preservation Fund, and the Associated Fisheries of Maine

Terms of Reference #1

The meeting began with a review of the recent benchmark assessment for witch flounder followed by a report from the groundfish PDT. Based on the outcome of the SAW/SARC 62 process, the witch flounder benchmark analytical model did not pass peer review in large part due to large and unexplained retrospective patterns. During the same process, an empirical "area swept" approach, similar to that used for Georges Bank yellowtail flounder, was also reviewed. Due to the failure of the analytical assessments reviewed and comments from the review committee that the previously approved assessment for witch flounder (Virtual Population Analysis) was also deemed unacceptable for management advice, the SARC recommended the

use of the empirical approach for setting catch advice. This empirical approach suggests that biomass has declined from the 1960s to the mid-1990s, increased in the early 2000s before declining to approximately 2005 with biomass being relatively stable for the past ten years. There is evidence of age truncation in the population based on survey and commercial catch-at-age.

The PDT noted in their report to the SSC that there was a calculation error in the mean exploitation rate as presented at the assessment review workshop. The PDT corrected this error and presented the results of that correction to the SSC in their report (revised estimate of exploitation rate of 0.060 versus previous estimate of 0.05). In addition to the information presented in the PDT report, an economic analysis was presented based on a procedure used for groundfish stocks presented to the SSC in the past called the Quota Change Model (QCM). The QCM showed a loss in total net revenue as the ABC is increased between the range of ABCs evaluated (393, 658, and 1600 MT). Predictions of revenue gains from a lower witch flounder ACL results from the expectation that as ABCs are lower, operators that were dependent on witch flounder, mostly smaller inshore vessels, would likely drop out of the fishery altogether, allowing their shares to flow to vessels with higher revenue coming from less constraining stocks such as redfish and pollock.

The SSC's understanding is that while net revenues decrease as the overall ABC's increase, implying that a lower ABC might produce more net revenue, there were considerable negative impacts of low ABCs on the small boat operators which created disproportionate and negative impacts on these participants. As will become clear below, the SSC did not take net revenues into account in formulating its advice.

Several industry members submitted information and comments. A letter from the Northeast Seafood Coalition, Gloucester Fishing Community Preservation Fund, and the Associated Fisheries of Maine was submitted and commented on by some of the attendees. The letter agreed with the review panel's rejection of the statistical models and the VPA for management use, but also expressed concerns with the range of exploitation rates offered by the PDT as well as expressing concerns about the characterization of the exploitation rate as an OFL. The letter offered a different exploitation rate for consideration. Observations from active members of the groundfish fishery indicated higher availability of witch flounder than had occurred in the past as well as witch flounder being available longer throughout the year and in areas where they were not seen before. These observations conflict with some of the analyses done by the assessment working group, namely landing per unit effort information, thereby highlighting an important source of uncertainty. There were several comments indicating that a low quota for witch flounder would constrain the groundfish fishery and would disproportionately impact the day-boat fleet.

The SSC deliberated on the information presented by the PDT and stepped through a number of questions to reach their final determination. The first question was whether to use the empirical approach to set catch advice or adopt some other procedure. The SSC adopted the empirical approach as the only option available that had been reviewed and had not been rejected during the review process. Additionally, similar empirical approaches have been used by the SSC in the past to set catch advice for other species; therefore, the approach was not an unfamiliar procedure for the committee.

The second question addressed was with regard to the nature of the information being presented, namely whether the empirical approach result should be considered as an OFL, which would then require an additional calculation step to determine the ABC. The SSC determined that the result presented was an ABC, and went on to state that the overfishing status was unknown for witch flounder, therefore rejecting the characterization of the proposed exploitation rates as Fmsy proxy values. There was some discomfort in using exploitation rates due to the fact that regulations had changed during the time period which could impact the exploitation rate, however after additional discussion with the PDT, the SSC chose to move forward with the exploitation rate metric as recommended by the PDT. This was based on the fact that management can result in reducing exploitation rates by lowering catch, but if mortality is low, it should result in a response in population indicators (fishery independent indices and age or size structure). For witch flounder at this point, a response is not evident in both fishery dependent or independent sources.

Once this was settled, the SSC went on to discuss the exploitation rate. There was discussion of the fact that stock status was unknown, though the empirical approach indicated a period with relatively stable, yet low, biomass (Figure 1). Given the signal of stable biomass, the SSC adopted the average exploitation rate of 0.060 presented by the PDT, based on the average exploitation rate for the previous 9 years. During this period the Bigelow was used for the survey in all years and was used exclusively in at least 8 of the 9 years.

The next set of decisions were made with regard to the precision appropriate for the exploitation rate and strategies for dampening inherent variability of trawl survey data. It was deemed that a three decimal precision was appropriate for use in the exploitation rate based on maintaining the available precision within each step of the calculations and applying the most imprecise precision in the final calculation. The SSC also felt it was appropriate to use a three year running average for the terminal estimate of the trawl survey data. The discussion on this topic revolved around the need to dampen the interannual variability that is inherent in the trawl survey data, but to not dampen it so much that the signal of a changing population is lost. The SSC agreed with the PDT recommendation that using a three year average represented a reasonable trade-off between these two risks, which would not create instability in catch advice, nor risk the witch flounder population declining or increasing for multiple years without detection. This approach aligns with the concepts of the NEFMCs risk policy, although no simulation analyses were presented to quantitatively evaluate trade-offs.

This decision process led the SSC to accept the results presented in Table 3 of the PDT memo thereby recommending an ABC for 2017 – 2019 of no more than 878 MT (Table 1). To summarize, this recommendation is based on applying the empirical approach using a three year moving average of exploitable biomass estimates from the NOAA Fisheries trawl survey (fall and spring for all three years, therefore six surveys in total) and the mean exploitation rate observed over the last nine years, 2007-2015, of 0.060. The SSC agreed to keep this as the ABC for the entire specification period because there are no projections available nor other information on which to base any change in ABC through the three year period. It was noted that updates of all of the groundfish stock assessments will be carried out in the fall of 2017, therefore the SSC will receive updated information at that time and could adjust their advice for future periods.

After the catch advice was agreed to, the SSC discussed research recommendations to better inform future witch flounder research in the hope that there would be a shift back towards an

analytical assessment in the next benchmark. The first recommendation was to explore other data-limited methods (e.g., surplus-production in continuous time (SPiCT)) recognizing that witch flounder is not data-limited but rather has conflicting data and that all the data should be evaluated in whatever method is used. The committee emphasized the importance of the “Plan B” working group’s effort with regard to setting up a better procedure for dealing with failed assessments. The SSC noted that many of the groundfish assessments in our region have shown strong retrospective patterns similar to the pattern that caused the rejection of the analytical model for witch flounder. The presence of these retrospective patterns has been highlighted in the past as a major source of scientific uncertainty and creates a substantial negative risk in quota setting. The challenges faced by the review committee, PDT, and SSC with witch flounder are likely to appear again in the fall when reviewing the results of the groundfish operational assessments. Some members of the SSC were uncomfortable with accepting the empirical approach used for witch flounder for fear that it will set an unintended precedent that will be applied to other stocks without careful evaluation. In addition to examining other modeling approaches, another important area of research focus would be to examine the potential influence of environmental factors on various population dynamic aspects for witch flounder. These factors should be examined independent of each other and in combination. Unknown sources of mortality (i.e. changing natural mortality, missing catch, etc.) was another important topic that came up during the benchmark assessment. The SSC thought it would be important to simulate these various sources of uncertainty. This has been done in the past (one by one examination), but there is a need to evaluate their effect in combination with each other. The SSC credits the assessment working group for examining all of these concepts, and the SSC can provide additional specificity for future research endeavors if desired. A final comment was to continue to examine the trawl survey design and its uncertainties. This is particularly important for situations where catch advice is based on survey trends, which is happening more frequently for NEFMC managed species. Of particular importance is gear efficiency. The witch flounder working group examined this and found differences between the gear types used. The impacts of these findings should be investigated further for witch flounder and other species that may be impacted by these differences in trawl survey information.

Terms of Reference #2

The date of this report being sent to the executive director of the NEFMC meets term of reference 2.

Summary

In summary, the SSC recommendations are:

- The SSC states that **OFL is unknown** for the witch flounder stock.
- The SSC recommends an **ABC for FY 2017- FY 2019** of no more than **878 MT**.
- The ABC is based on applying the empirical approach and using a three year moving average of exploitable biomass estimates from the NOAA Fisheries trawl surveys and a mean exploitation rate of 0.060 from the rates observed over the last nine years (2007-2015).
- The SSC offers a number of research recommendations with the hope that the witch flounder assessment can move back in to an analytical framework in the next benchmark.

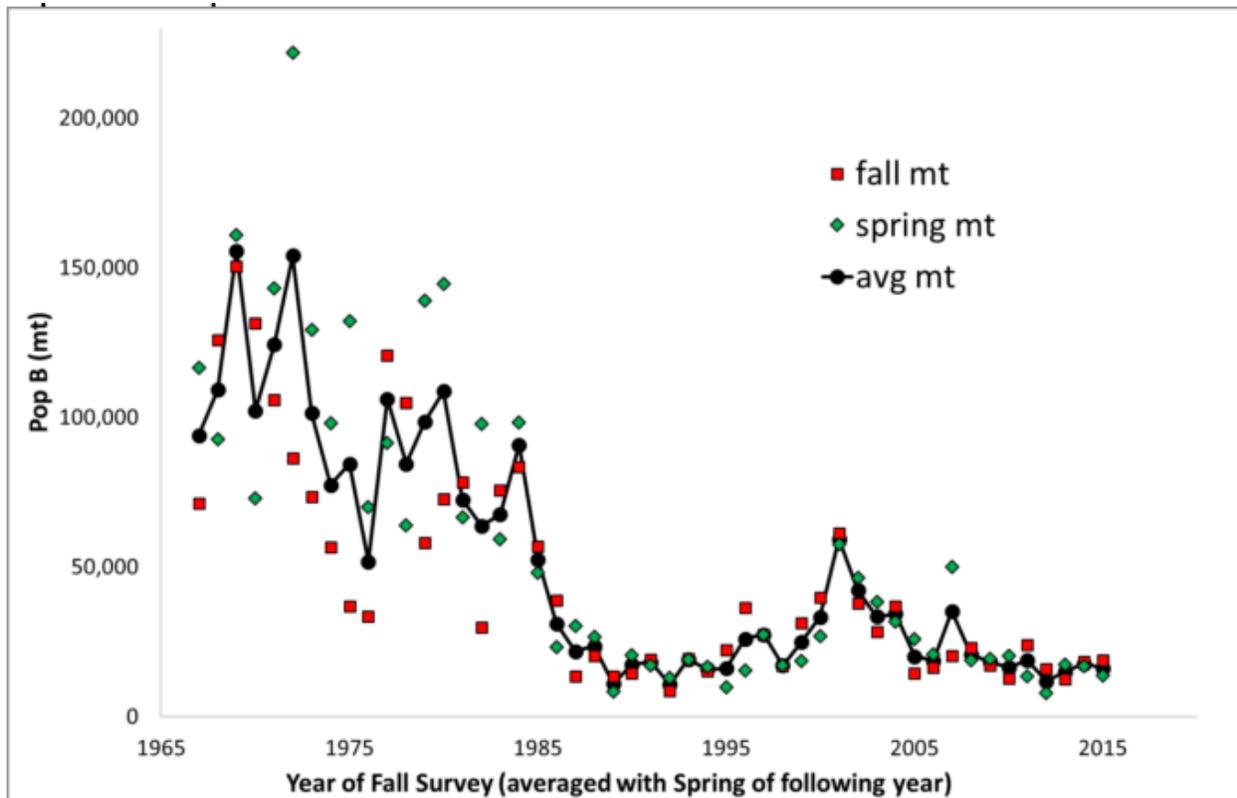


Figure 1 – Trawl survey information for the time series examined by the empirical approach used for setting catch advice.

Table 1 – SSC Recommendation for FY 2017 – 2019 ABC.

Year	ABC based on 3 year average exploitable biomass estimate (14,637 MT) and average exploitation rate of 0.060
2017	878 MT
2018	878 MT
2019	878 MT