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## 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

**Date:** September 18, 2019

**Subject:** Terms of Reference for Northeast Skate Complex MSY and ABC recommendations for fishing years 2020 and 2021.

The SSC met on August 21, 2019 in Providence, Rhode Island, to address the following terms of reference (TORs):

1) Recommend an allowable biological catch (ABC) for the Northeast Skate Complex consistent with the fishing mortality limit (FMSY or its proxy) and the ABC control rule or rebuilding program for fishing years 2020-2021.

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

C.0 - Terms of Reference for Northeast Skate Complex MSY and ABC recommendations for fishing years 2020 and 2021

C.1 - PDT Memo to SSC regarding the NE Skate Complex ABCs for FY 2020 - 2021

C.2 - 2018 NE Skate Stock Status Update

C.3 – NE Skate Risk Policy Matrix

### **TOR**

The SSC reviewed the PDT memo as well as the assessment update for skates. The SSC continues to support the use of the index-based empirical approach for recommending an ABC for the Northeast Skate Complex, and notes that this method has performed well except for thorny skate. Although the index-based approach does not allow formal estimation of population reference points, proxy values have been developed for each of the species in the Northeast Skate Complex using research vessel survey data and fisheries catch information. Hence, stock status is evaluated with respect to these reference point proxies.

**The SSC concludes that OFL for the Northeast Skate Complex remains unknown for fishing years (FY) 2020 and FY 2021.** OFL cannot be determined in the absence of analytical assessments.

**The SSC recommends an ABC of 32,715 metric tons (MT) for fishing years 2020 and 2021.** This is consistent with the PDT recommendation, and results from the use of modified research survey indices to account for survey strata not sampled in 2017 and 2018.

### **RATIONALE INCLUDING SIGNIFICANT SOURCES OF UNCERTAINTY**

As noted by the PDT, the specifications for FY 2020 and 2021 are affected by issues with non-sampled strata in the 2017 and 2018 NEFSC trawl surveys (as outlined in the 2018 NE Skate Stock Status Update). **The PDT evaluated the use of different smoothers to account for the missing**



survey data to determine if something other than a two-year average (e.g., a 3-year average) would give a more robust depiction of stock status that could be used in ABC calculations but concluded that a 2-year average performed well.

Basing the ABC recommendation on the modified survey information was considered the best scientific advice from the SSC, thereby addressing the TOR for the skate species complex.

### **ADDITIONAL COMMENTS**

Overall, management seems to be effective, given that six of the seven species (winter, little, barndoor, smooth, clearnose, and rosette) are near or above their species-specific biomass targets, and all six are above their respective biomass thresholds. The exception in the complex is thorny skate, whose stock status remains poor. The SSC recommends that thorny skate research currently underway be presented to the SSC when completed, so that the SSC can evaluate the research findings in the context of the poor stock status of this species. Some of the ongoing research focuses on thorny skate movements, which could alter the interpretation of the status of this species.

The SSC also discussed calculating an ABC for the complex, excluding thorny skate. As thorny skate is already a prohibited species, removing this species from the skate ABC calculation would appropriately discount the overall amount of skates allowed to be harvested. This would not have a large influence on the current advice but would be consistent with the finding that this is the one species with seemingly poor stock status.

The SSC appreciated the exploration of ways to account for the missing trawl survey strata including Loess smoothers, the Kalman filter approach, and averaging over different time periods. The SSC agreed with the PDT's conclusion that the averaging approach provides adequate information on which to base catch advice. However, the SSC felt there was a need for a more systematic approach to address non-sampled strata in the trawl surveys, rather than using a case-by-case approach. Non-sampled strata may become more common in the future due to both natural and anthropogenic events (e.g. offshore wind energy areas; adverse weather conditions; etc.). Evaluating approaches that are robust to missing values is therefore important.

The SSC also discussed the potential for alternative abundance indices for skates, including the possibility of using longline survey data for these species.

### **Summary of recommendations**

- 1. The SSC concludes that OFL for the Northeast Skate Complex remains unknown.**
- 2. The SSC recommends that the ABC for fishing years 2020 and 2021 be no greater than 32,715 MT.**
- 3. The SSC requests updates on thorny skate research findings as the studies underway are completed.**
- 4. The SSC requests the following be added to the NEFMC's 2020 research priorities: (a) an evaluation of setting ABC for the Northeast Skate Complex, excluding thorny skate; (b) an examination of using alternative abundance indices for skates (i.e., obtained from longline surveys); and (c) development of a more systematic approach to account for non-sampled strata in trawl surveys.**