



New England Fishery Management Council

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To: Tom Nies, Executive Director
From: Scientific and Statistical Committee
Date: November 10, 2016

Subject: Overfishing levels (OFLs) and acceptable biological catch (ABC) recommendations for sea scallops.

The SSC met on October 18, 2016 in Boston, Massachusetts, to address the following terms of reference (TORs):

1. Review the work of the Scallop PDT on updated projections for the scallop resource and provide the Council with OFL and ABC recommendations for fishing years 2017 and 2018 (default).
2. Review changes to the growth and meat weight parameters used to estimate and model biomass in portions of the Nantucket Lightship area, and provide the Council with a recommendation as to whether or not these changes are appropriate.

To meet these TORs, the SSC considered the following documents:

1. October 12, 2016 SSC Meeting Terms of Reference for Sea Scallops
2. SSC Final Report on OFL and ABC for Scallop Framework 27, November 17, 2015
3. Hart, D.R. Quantifying the tradeoff between precaution and yield in fishery reference points. *ICES Journal of Marine Science*, doi.10.1093/icesjms/fss204.
4. Sea scallop assessment summary for 2014 (SARC59, July 2014)
5. Draft Framework 28 measures under consideration
6. Scallop PDT recommendations for 2017-2018 (default) ABC
7. Risk Policy Matrix - Atlantic Sea Scallops

The SSC addressed TOR2 first, given that the response would affect the response to TOR1. Spatial differences in growth of scallops have been observed previously, and there is strong empirical evidence that the growth rate recently decreased in the Nantucket Lightship area. The SSC considered potential causative mechanisms for the differing growth patterns, including lower food availability in the deeper water of the Nantucket Lightship area and cooler temperatures. The SSC also considered whether smaller maximum size in the Nantucket Lightship area is due to higher mortality that shortens the mean lifespan, or whether slower than average growth inhibits the sizes attained over lifespans comparable to other areas, and concluded that this is a growth effect rather than a mortality effect. Therefore, in response to TOR2, the SSC supports use of a different growth function for the Nantucket Lightship Area for the current development of catch advice. However, the SSC also recommends that additional research be conducted to further elucidate the drivers and rates of growth, size distribution should be monitored, and that the issue be revisited when catch advice is next developed.

The SSC then received detailed information on projections for the scallop fishery through 2018. Several SSC members raised concerns about the unweighted averaging of the three surveys used for the projections and whether this was a potentially unaccounted for source of uncertainty. Alternate approaches were discussed such as inverse variance weighted means, but concerns with comparability of the variance estimates among the survey approaches makes this difficult. The PDT felt that even though the average was unweighted, it is representative. Additionally, the PDT has identified as possible reasons for the differences among survey estimates, including a reduction of dredge efficiency in high scallop densities and issues with the biomass estimation methods from optical surveys. The SSC recommended continuing to investigate different approaches for weighting the aggregated surveys that are used for projections, but felt that the current procedure was appropriate and therefore that weighting or other adjustments are not needed at this time.

The SSC addressed the proposal to change the starting month for the scallop fishing year, which would lead to FY2017 having 13 months. Different approaches for prorating the ABC for 2017 were discussed including an increase of 1/12th the 12-month ABC and a proration based on observed patterns of catch and effort in March, the month that would be added in to the end of the 2017 fishing year. The latter approach would mean a smaller proration. The SSC concluded that an adjustment based on data for March might not be appropriate because fishing behavior in that month might differ depending upon whether it is the beginning or end of the fishing year. Therefore, the SSC recommends that the additional catch added to generate a 13-month ABC for FY2017 not exceed 1/12th of the 12-month ABC, if such an adjustment is needed. This allows the Council flexibility to add a lower amount if additional data, analyses or insights warrant.

Finally, the SSC agreed that, given some of the uncertainties regarding growth and recruitment affecting the estimates underlying the catch advice, and also that the catch advice is expected to be revisited and possibly revised next year based on updated information, the 12-month 2017 OFL and ABC values should carry over as the default values for 2018.

Therefore, in response to TOR1, OFL and ABC values resulting from these deliberations are as follows:

Year	ABC_Land	ABC_Disc	ABC_Tot	OFL_Land	OFL_Disc	OFL_Tot
2017 (12-month)	43,142	13,850	56,992	52,184	17,494	69,678
2017 (13-month)	46,737	15,004	61,741	56,533	18,952	75,485
2018	43,142	13,850	56,992	52,184	17,494	69,678

The SSC also considered the unique approach to development of catch advice for scallops between benchmark assessments, wherein specifications are generally adjusted annually but without the benefit of the peer review applied in the operational assessment process. The lack of peer review and the limited information provided to the SSC for review raised concerns that changes to the data, methods and results are not receiving sufficient review. However, the annual cycle allows more regular, even if less intensive, review, at least by the SSC. Providing additional information to the SSC each year on model settings, diagnostics, other supplementary analyses, or new data is necessary to support the interim review function of the SSC, but would take more time. The SSC did not reach consensus on whether the assessment and review process for scallops should be

revised, and if so how. Rather, we highlight these concerns for further consideration by the Council, NEFSC and NRCC as appropriate.

Summary of recommendations

- 1. Growth data specific to the Nantucket Lightship Area should be used for the present analysis, but additional research and monitoring should be conducted and presented to the SSC before the same approach is used in future specification setting.**
- 2. OFL for sea scallops is 69,678 mt in 2017 and 2018 (default), unless a prorated additional month is needed in 2017. In that case, up to 1/12th of the 12-month 2017 OFL should be added, and the 13-month 2017 OFL should be 75,485 mt.**
- 3. ABC for sea scallops should not exceed 43,142 mt in 2017 and 2018 (default), unless a prorated additional month is needed in 2017. In that case, up to 1/12th of the 12-month 2017 ABC should be added, and the 13-month 2017 ABC should not exceed 46,737 mt.**
- 4. The PDT should continue to investigate alternate weighting scenarios for combining the three surveys used in the projections and report on these analyses during the 2017 specification setting process.**