



Mid-Atlantic Fishery Management Council

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MEMORANDUM

Date: July 7, 2020
To: Chris Moore, Executive Director
From: Jessica Coakley and José Montañez, Staff
Subject: Surfclam Management Measures (2021-2026)

Executive Summary

The most current assessment of the Atlantic surfclam (*Spisula solidissima*) stock is a management track assessment of the existing 2016 benchmark Stock Synthesis (SS) assessment which indicated the stock is not overfished and overfishing is not occurring in 2019 (Hennen 2020). Based on the previous assessment the stock was also not overfished, and overfishing was not occurring (in 2016; NEFSC 2017). Assessment reports can be found here: https://fish.nefsc.noaa.gov/saw/reviews_report_options.php.

Specifications were last developed for 2018-2020. For this cycle, staff recommend specifications be set for 6 years (2021-2026) to create administrative efficiencies in addressing the National Environmental Policy Act (NEPA) requirements as a result of the new stock assessment process, which is expected to assess surfclam and ocean quahog on a 4 and 6 year cycle, respectively. The staff recommendation for acceptable biological catches (ABCs) for each year for 2021-2026 is around 39,000 - 47,000 mt each year (see box on page 4 for exact values). The fishery management plan specifies that the annual catch limit (ACL) equals the ABC. Staff recommend an annual catch target (ACT) = 29,363 mt and a commercial quota of 26,218 mt (3.40 million bushels) for each year, 2021-2026. This is the same ACT and commercial quota that has been implemented since 2004. Staff recommend the surfclam minimum size be suspended in 2021, but also recommend that the Council encourage the fishing industry to work to avoid landing large numbers of undersized clams.

Introduction

The Magnuson Stevens Act requires each Council's Scientific and Statistical Committee (SSC) to provide, among other things, ongoing scientific advice for fishery management decisions, including recommendations for ABC, preventing overfishing, and maximum sustainable yield. The Council's catch limit recommendations for the upcoming fishing year(s) cannot exceed the ABC recommendation of the SSC. In this memorandum, information is presented to assist the development of measures for the Council to consider for the 2021-2026 fishery for surfclam. The SSC will recommend an ABC for the surfclam fishery that addresses scientific uncertainty. Based on the SSC recommendations, the Council will make recommendations for ACLs, ACTs, and other implemented measures, and provide those recommendations to the NMFS Northeast Regional Administrator.

Review of SSC Recommendations for Fishing Years 2019-2020

In December 2018, the SSC recommended ABCs for surfclam for fishing years 2019-2020 based on the report on the joint SSC/Northeast Fisheries Science Center (NEFSC) Working Group assigned to develop an estimate of overfishing limit (OFL) for Atlantic Surfclam, which was not previously available. The Working Group concluded that enough information was available to determine an OFL and the best approach is to use the outputs from the benchmark assessment to establish an Atlantic Surfclam OFL for 2019 and 2020. However, the Working Group noted the high level of uncertainty associated with knowledge of the stock and recommended using the point estimate of the OFL from the benchmark assessment and a coefficient of variation (OFL CV) of 150%. The SSC agreed to support the findings and recommendations of the Working Group and used information provided in the Working Group report to recommend new ABCs for 2019 and 2020.

The SSC recommended that the assessment be considered a stock with an SSC-modified OFL probability distribution with a coefficient of variation (OFL CV) of 150%.

Year	OFL (mt)	ABC (mt)
2019	74,281	56,419
2020	74,110	56,289

The SSC’s choice of 150% CV for the OFL is for several reasons:

- The uncertainty in biomass estimates derived from the assessment is several-fold higher than seen in assessments for other species.
- The Georges Bank component of the survey declined unexpectedly with use of a higher efficiency gear in the new survey series.
- Fishing mortality is low.
- The Georges Bank component of the survey is highly uncertain due to small sample sizes.
- There are few years in the new survey time series.
- Recruitment is difficult to estimate.

The SSC noted the principle sources of scientific uncertainty associated with determination of OFL and ABC were:

- Absolute estimates of spawning stock biomass (SSB), recruitment (R), and fishing mortality (F) are scale uncertain.
- Uncertainty from combining absolute SSB, F, and R estimates, and projected trends for the northern and southern areas into a “whole stock.”
- Ecosystem analyses suggest surfclam habitat is changing – decreasing in Delmarva and increasing in NJ and Long Island. The net effects on total habitat area and carrying capacity are unknown.
- Model assumption of a 12% incidental mortality, which also may have changed.
- Dredge efficiency is a major factor for setting the scale of the model.

- Catchability was estimated differently for the old and new surveys.
- The assumed dome-shaped selectivity patterns for the survey were based on gear selectivity experiments and are not identical to the way selectivity is defined in the model.
- The distribution of size-at-age in the assessment has largest individuals at intermediate ages (probably because the CVs on size at age for the older ages are too small). This may cause a bias in estimates of F.
- There were conflicts between prior distributions of parameters and some other data sets for both models, but especially for the Southern Area. This is a common problem in integrated stock assessments but may be indicative of structural problems that could be explored (e.g., heterogeneity in growth, recruitment, or mortality, which are not modeled in the assessment).
- The recent survey indices based on the new survey on Georges Bank are lower, which is inconsistent with use of a higher efficiency gear.

Stock Status and Biological Reference Points

The most current assessment of the Atlantic surfclam (*Spisula solidissima*) stock is a management track assessment of the existing 2016 benchmark Stock Synthesis (SS) assessment (SAW 61; NEFSC 2017; Hennen 2020). SAW 61 biological reference points were developed and revised from the prior SAW. The reference points are ratios rather than absolute values.

- $SSB/SSB_{\text{Target}} = 2$ is the new biomass target (or $SSB_{\text{MSY-Proxy}}$), where SSB_{Target} is calculated as $SSB_0/2$,
- $SSB/SSB_{\text{Threshold}} = 1$ is the new minimum stock size threshold which defines overfished status, where $SSB_{\text{Threshold}}$ is calculated as $SSB_0/4$,
- $F/F_{\text{Threshold}} = 1$ is the new fishing mortality threshold which defines overfishing, where $F_{\text{Threshold}}$ is calculated as 4.136 times the mean F during 1982-2015.

Based on the previous 2016 assessment the stock was not overfished, and overfishing was not occurring. In the updated assessment (Hennen 2020), the Atlantic surfclam stock is not overfished and overfishing is not occurring. Retrospective adjustments were not made to the model results. Spawning stock biomass (SSB) in 2019 was estimated to be 1,222 ('000 mt) which is 119% of the biomass target ($SSB_{\text{MSY proxy}} = 1,027$ mt). The 2019 fully selected fishing mortality was estimated to be 0.036 which is 25.8% of the overfishing threshold proxy ($F_{\text{MSY proxy}} = 0.141$).

Basis for 2021-2026 ABC Recommendation

Staff recommend specifications be set for 6 years (2021-2026) to create administrative efficiencies in addressing the NEPA requirements as a result of the new stock assessment process, which is expected to assess surfclam and ocean quahog on a 4 and 6 year cycle, respectively.

Projections the management track assessment provided estimates of OFLs for 2021-2026 (Hennen 2020). If the SSC applied their previous methods that include an SSC-modified OFL probability distribution and an assumed lognormal OFL distribution with a CV = 150%, the ABCs would be calculated as given here.

Year	OFL (mt)	ABC (mt)	SSB/SSB_{Threshold} (ratio)^a	P (overfishing)
2021	51,361	46,919	2.21	0.47
2022	48,202	43,460	2.15	0.46
2023	45,959	41,166	2.12	0.46
2024	44,629	39,888	2.11	0.46
2025	44,048	39,282	2.10	0.46
2026	43,886	39,223	2.11	0.46

^a The target biomass ratio = 2. See section on BRPs above.

Other Management Measures

Catch and Landings Limits

In the FMP, the ABC=ACL=TAC and the Council specifies an ACT that accounts for management uncertainty and other relevant factors (Figure 1). There is an incidental fishing mortality rate of 12% that applies to landings (commercial quota).

Management uncertainty is comprised of two parts: uncertainty in the ability of managers to control catch and uncertainty in quantifying the true catch (i.e., estimation errors). Because this is an ITQ fishery, and clams cannot be landed without cage tags, the implementation uncertainty is generally considered to be insignificant.

Catch is defined as the sum of landings, a 12% incidental mortality applied to landings, and discards. The ACL is equal to the ABC as prescribed in the FMP.

The assessment results are robust with respect to stock status and suggest that the current catch levels are reasonable. Staff recommend an ACT = 29,363 mt each year for 2021-2026, which is the commercial quota of 26,218 mt (3.40 million bushels) plus an additional 12% for incidental mortality. Since 2010, the fishery has landed around 70% of the total commercial quota, and the fishery has not landed 100% of the quota since 2003. The industry has indicated this is because they are market limited.

Atlantic Surfclam Flowchart

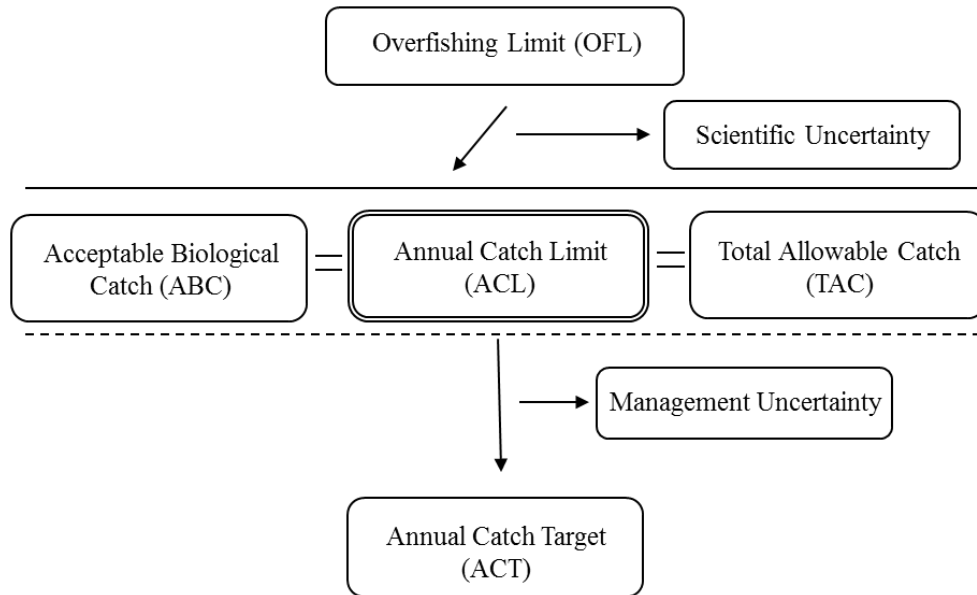


Figure 1. Atlantic surfclam catch limit structure.

Surfclam Minimum Size

In the regulations it states that, "Upon recommendation of the MAFMC, the [NMFS] Regional Administrator [RA] may suspend annually, by publication in the Federal Register, the minimum shell-length standard, unless discard, catch, and survey data indicate that 30 percent of the surfclams are smaller than 4.75 inches (12.065 cm) and the overall reduced shell length is not attributable to beds where the growth of individual surfclams has been reduced because of density dependent factors."

Each year an analysis of the size composition of the landings is developed to inform the RA regarding minimum size regulations. The report titled, "Estimated Proportion of Undersized Surfclam Landings for 2019" (Sullivan 2019), indicates that:

An estimated 22.0% of the coast wide surfclam landings to date in 2019 were undersized. The lower and upper 95% confidence intervals (CI) for this estimate were 21.1% and 22.8%. However, it should be noted that there are regional differences. In the Delmarva statistical areas, the estimated percent of undersized clams in the landings is 32.5% (95% CI of 32.2-32.7%), New Jersey is 11.0% (95% CI of 10.9-11.0%), and Georges Bank is 18.2% (95% CI of 18.2-18.3%).

Staff recommend continued suspension of the minimum shell-length standard for 2021 given that the coastwide 30% threshold for suspension was not triggered. However, the Council should encourage the fishing industry to work to avoid landing large numbers of undersized clams, as the overall percentage of undersized clams is getting closer to the 30% coastwide trigger to automatically implement a minimum size.

Small Surfclam Areas

The regulations state that, the "[NMFS] Regional Administrator [RA] may close an area to surfclams and ocean quahog fishing if he/she determines, based on logbook entries, processors' reports, survey cruises, or other information, that the area contains surfclams of which:

- (i) Sixty percent or more are smaller than 4.5 inches (11.43 cm); and
- (ii) Not more than 15 percent are larger than 5.5 inches (13.97 cm) in size."

The last time this provision was applied was during the 1980's with three area closures (Atlantic City, NJ, Ocean City, MD, and Chincoteague, VA), with the last of the three areas reopening in 1991.

An analysis of surfclam size distribution has been provided by the NEFSC (Hennen 2020). Because the commercial fishing gear selects for larger clams and does not sample small clams well, fishery-dependent data would not be representative of the proportions at size in an area. The fishery-independent clam survey conducted by the NEFSC does capture smaller surfclam than the commercial fishery lands, has randomly selected stations within each survey strata, and provides a sample of the proportions of small (<4.5 inches), large (>4.5 inches and <5.5 inches), and extra-large clams (>5.5 inches) in the sampling strata. However, it should be noted that the survey is conducted with a large commercial dredge and likely does not sample small clams well; although it is probably the best information available to address this regulation. Stations within each strata that were candidates for the criteria listed in the regulations (see i and ii above) were mapped (Figures 2 and 3).

This information is presented so the Council can monitor changes in the distribution of surfclam size composition over time and determine if a closure is appropriate. Staff recommend the Council continue to monitor these spatial differences in the fishery.

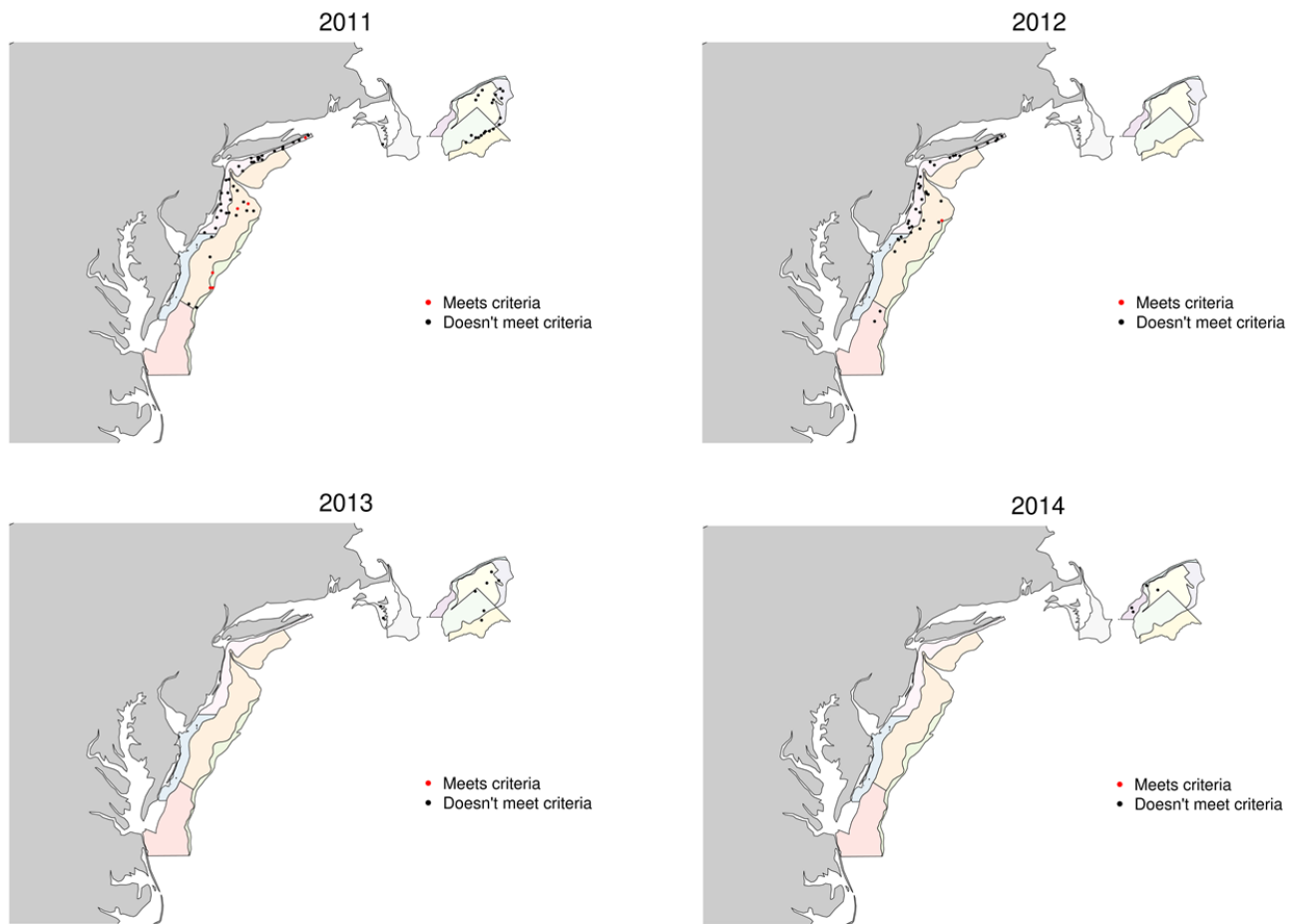


Figure 2. 2011-2014 NEFSC Clam survey stations where surfclams sampled met the small clam area criteria. Source: Hennen 2020.

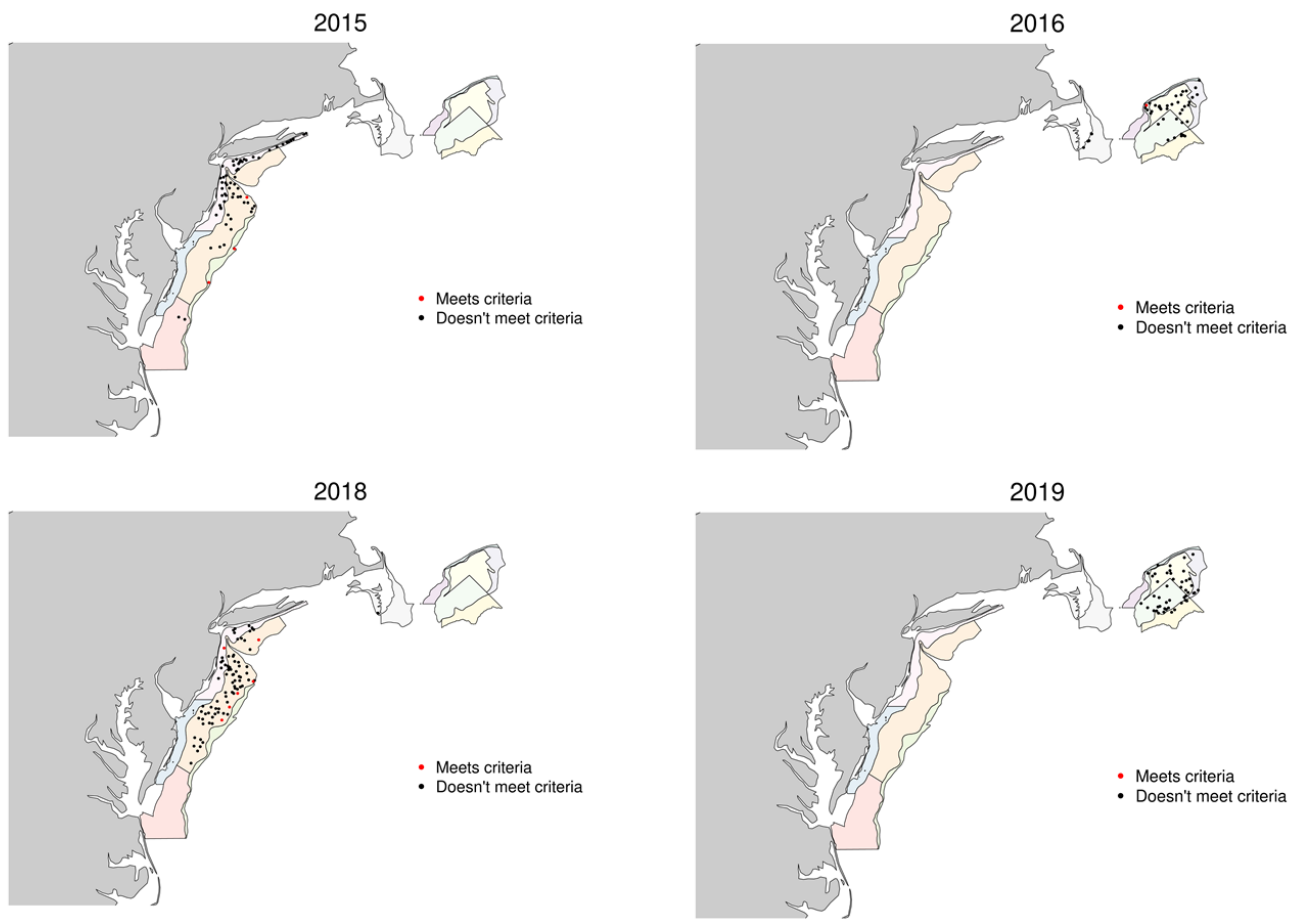


Figure 3. 2015-2019 NEFSC Clam survey stations where surfclams sampled met the small clam area criteria. Source: Hennen 2020.

References

Hennen, Dan. Personal Communication. June 14 and 24, 2020. NOAA Fisheries, Northeast Fisheries Science Center, 166 Water St., Woods Hole, MA 02543.

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