



Mid-Atlantic Fishery Management Council

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MEMORANDUM

Date: May 10, 2012
To: Chris Moore, Executive Director
From: Jessica Coakley and José Montañez, Staff
Subject: Surfclam Management Measures (2014, 2015, 2016)

Executive Summary

The Atlantic surfclam resource in the US exclusive economic zone (EEZ) is not overfished and overfishing is not occurring in 2011 (NEFSC 2013). The 2011 stock is at 109% of the biomass at maximum sustainable yield ($B_{MSY-TARGET}$). Staff recommend specifications be set for 3 years. The staff recommendation for acceptable biological catches (ABCs) for 2014, 2015, and 2016 are 54,434 mt, 47,021 mt, and 43,816 mt, respectively. This is based on the new stock assessment being classified as level 3, and the application of the Council risk policy for an atypical stock. The FMP specifies that the annual catch limit (ACL) equals the ABC. Staff recommend an annual catch target (ACT) = commercial quota of 26,218 mt for 2014, 2015, and 2016.

Introduction

The MSA requires each Council's 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. 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. In this memorandum, information is presented to assist the SSC in developing recommendations for the Council to consider for the 2014 (and possibly 2015 and 2016) fishery for surfclams.

More detailed descriptions of the fishery and stock status are provided in the Atlantic Surfclam Fishery Information Document (May 2013; attached) and in the Stock Assessment Work 56 (SAW 56) Assessment Summary Report (NEFSC 2013). Reports on "Stock Status," including annual assessment and reference point update reports, SAW reports, and Stock Assessment Review Committee (SARC) panelist reports are available online at the NEFSC website: <http://www.nefsc.noaa.gov>

Review of SSC Recommendations from May 2010

In May 2010, the SSC met to recommend an ABC for surfclam for fishing year 2011-2013. The SSC's ABC control rule levels and Council risk policy were not implemented until July 2011; therefore, the new process was not fully applied during the development of these SSC recommendations.

The SSC determined that the assessment, which at that time utilized a model program called KLAMZ, was a level 3 assessment. The overfishing limit (OFL) for 2010, 2011, 2012, and 2013 were specified as 129,300 mt, 114,000 mt, 102,300 mt, and 93,400 mt, respectively. The SSC noted that catches at $F_{MSYPROXY}$ have a high probability of leading to stock declines below the $B_{MSYPROXY}$ target level in 2015, and are projected to lead to high probabilities of overfishing in 2015. Therefore, the SSC recommended an ABC equal to the catch at $0.75 * F_{OFL} * \text{Biomass}$, based on Restrepo et al. (1998: <http://www.nmfs.noaa.gov/sfa/NSGtkgd.pdf>):

$$\begin{aligned} &= 0.75 * 0.15 * 878,000 \text{ mt} \\ &= 0.11 * 878,000 \text{ mt} \\ &= 96,600 \text{ mt (includes incidental mortality) = ABC} \end{aligned}$$

The range of optimum yields (OY) specified in the fishery management plan (FMP) is between 14,300 and 26,200 mt. The upper value has been used as a quota from 2005-2010. The SSC noted in May 2010, the stock was not overfished, and overfishing is not occurring; however, Delmarva and New Jersey components are well below 50% of the 1999 biomass in the respective regions (= B_{MSY} proxy).

At that May 2010 meeting, the SSC considered the following to be the most significant sources of uncertainty: 1) Heterogeneity of life history and production parameters over the range of the stock means that model results may be accurate on average, but inaccurate in any particular region (e.g., regional differences in surplus production). This is exacerbated by uncertainty in the distribution of future fishing effort on GB (currently closed to fishing for surfclams) and fact that effort is currently not distributed uniformly. 2) The use of $F=M$ as an FMSY proxy is not supported by recent apparent negative surplus production: growth and recruitment are insufficient to compensate for natural and fishing mortalities. There is no sustainable yield. Even in the absence of fishing mortality, the stock will not increase, especially in southern areas. 3) Uncertainty in using F_{msy} proxy = M (no uncertainty characterization in OFL); 4) Uncertainty in M (there are no direct estimates of natural mortality); 5) If surfclams in the George's Bank region are near carrying capacity, then their surplus production could be low; 6) Survey dredge efficiency is highly variable; Georges Bank role with respect to recruitment contribution is unclear. 7) It is unavailable to exploitation; and 8) Projections assumed 1999 biomass = virgin biomass.

Stock Status and Biological Reference Points

The Atlantic surfclam stock assessment was peer reviewed and approved for use by management at Stock Assessment Workshop 56 (SAW 56). A statistical catch at age and length model called SS3 was

used and incorporates age and length structure, and was conducted as two assessment area pieces and then combined (NEFSC 2013). The Atlantic surfclam resource in the US EEZ is not overfished and overfishing is not occurring in 2011. Estimated biomass of the entire resource during 2011 (approximate 120+ mm shell length, SL) was 1,060,000 mt meats with a 95% confidence interval of 802,000 - 1,401,000 mt. Estimated annual fishing mortality during 2011 for the entire resource was $F = 0.027$ (95% confidence interval 0.016 - 0.045).

SAW 56 biological reference points for Atlantic surfclam include a fishing mortality threshold of $F_{MSYPROXY} = M = 0.15$ and $B_{MSYPROXY} = 972,000$ mt). The minimum stock size threshold, one-half $B_{MSYPROXY}$, is estimated to be 486,000 mt.

Basis for 2014-2016 ABC Recommendation

Staff recommend measures be developed for 3-years, the maximum allowed under the fishery management plan (FMP) to provide for continued stability in the fishery and markets.

If the SSC considers the new stock assessment for surfclams to be Level 3, then the annual OFL's are as provided in the stock assessment based on fishing at $F_{MSYPROXY}$ on the projected stock biomass for each year (2014-2016). Specifically:

Year	OFL (mt)	Biomass (mt)
2014	81,150	886,251
2015	75,178	813,077
2016	71,512	792,205

It is clear that recommendations for ABC, which would equal the OFL, would not account for any scientific uncertainty associated with estimation of OFL and the assessment of the surfclam stock.

Given the life history and longevity of this species, including the multi-decadal recruitment patterns, which does not appear to be explicitly addressed in the stock assessment, staff recommend surfclam be considered an atypical stock under the Council's risk policy. In addition, staff remain concerned that recruitment has been below average for the whole stock since 1999, and the implications of this pattern on the uncertainty in the projections.

Based on the 2014 projected $B/B_{MSY} = 91\%$, the Council risk policy for an atypical stock ($P^* = 0.316$), and an assumed lognormal distribution with a $CV = 100\%$, the staff recommend an ABC of 54,434 mt for 2014. For 2015, the staff recommend an ABC of 47,021 mt based on a projected $B/B_{MSY} = 84\%$, the Council risk policy for an atypical stock $P^* = 0.286$, and a lognormal distribution $CV = 100\%$. For 2016,

the staff recommend an ABC of 43,816 mt based on the projected $B/B_{MSY} = 82\%$, the Council risk policy for an atypical stock $P^* = 0.278$, and a lognormal distribution with a $CV = 100\%$.

ABC (mt)		
	Typical	Atypical
2014	60,313	54,434
2015	51,804	47,021
2016	48,197	43,816

Other Management Measures

In the FMP, the $ABC=ACL=TAC$ and the Council specifies an ACT that accounts for management uncertainty and other relevant factors (Table 3). Discards are assumed to be zero; therefore, the ACT is equal to the commercial quota (landings).

Atlantic Surfclam Flowchart

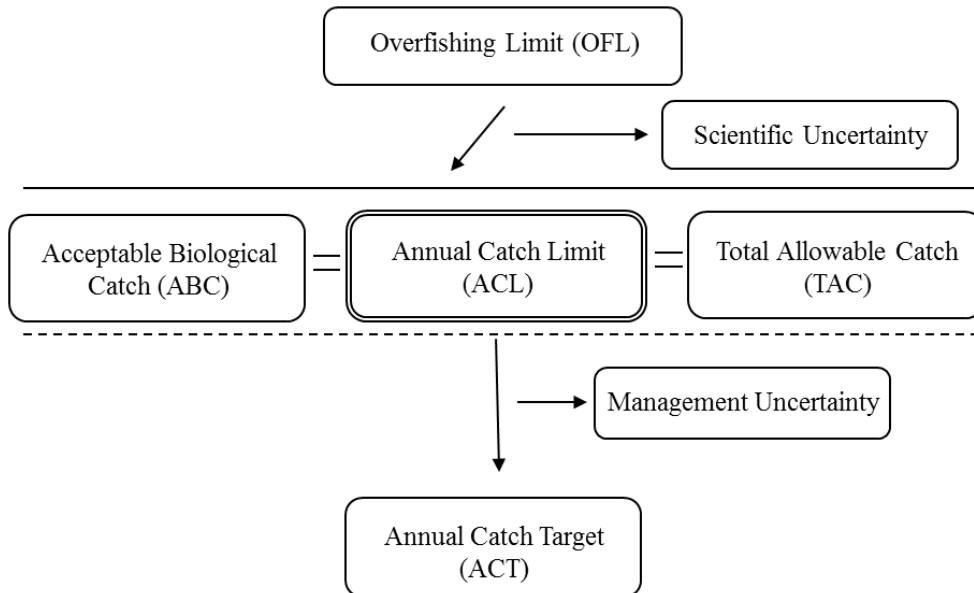


Figure 1. Atlantic surfclam catch limit structure.

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 tends to be low.

The FMP specifies an OY range from 14,265 to 26,218 mt be used to set the commercial quota. Staff recommend the ACT = commercial quota be set at 26,218 mt for 2014, 2015, and 2016. About 70% of the commercial quota of 26,218 mt has been harvested in the last few years (2010-2012).

As stated in the assessment summary (NEFSC 2013), "A term of reference for this assessment was to address stock structure. The SAW Working Group (WG) considered the alternative of splitting GBK from the southern area, but failed to reach a consensus. The WG provided a summary of its arguments in the report for the SARC panel to consider. The SARC Panel concluded the material presented did not contain sufficient information to allow it to reach a decision on stock definition. The Panel notes this decision does not prevent the stock assessment from being conducted by subareas, nor does it preclude area-based management." SARC 56 did not definitively resolve the issue of spatial structure for the surfclam stock on the basis that the information and also time (1 hour on SARC schedule) was not adequate to address an issue of this magnitude. One panelist suggested that an issue of stock structure would require a full meeting to adequately address the subject.

While this issue has not been resolved by this SARC, the Council could consider the use of area-based management approaches to address the spatial variability in surfclam catches, biomass, and productivity. The two-compartment modeling approach utilized for the assessment appears to be sufficiently flexible to support area-based management.

References

Northeast Fisheries Science Center. 2013. 56th Northeast Regional Stock Assessment Workshop (56th SAW) Assessment Summary Report. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 13-04; 42 p. Available from: National Marine Fisheries Service, 166 Water Street, Woods Hole, MA 02543-1026, or online at <http://nefsc.noaa.gov/publications/>