



Atlantic States Marine Fisheries Commission

1050 N. Highland Street • Suite 200A-N • Arlington, VA 22201
703.842.0740 • 703.842.0741 (fax) • www.asmfc.org

MEMORANDUM

TO: American Lobster Management Board

FROM: Caitlin Starks, FMP Coordinator

DATE: January 15, 2021

SUBJECT: REVISED - Review of American Lobster Stock Status, Reference Points, and Recommendations from 2020 Benchmark Assessment and Peer Review

At its October 2020 meeting, the American Lobster Board (Board) reviewed the 2020 Benchmark Stock Assessment and Peer Review Report, and accepted it for management use. The Board also adopted the new reference points as recommended by the assessment, and committed to considering management responses to the assessment findings at its next meeting in February 2021. This memo provides a summary of new reference points, stock status determinations, and recommendations from the assessment and peer review for each lobster stock, which the Board should consider in its discussion on appropriate management responses to the assessment findings.

Abundance and Exploitation Reference Points

New abundance and exploitation reference points were adopted based on the recommendations of the 2020 stock assessment, with the rationale that the former reference points were not appropriate given changes in environmental conditions. The updated reference points were derived from a new methodology that accounts for changing environmental conditions and new baselines for stock productivity. Regime shift analysis indicated that the GOM/GBK stock shifted from a low abundance regime during the early 1980s through 1995 to a moderate abundance regime during 1996-2008, and shifted once again to a high abundance regime during 2009-2018 (Figure 1). Conversely, the SNE stock shifted from a high abundance regime during the early 1980s through 2002 to a low abundance regime during 2003-2018 (Figure 3).

Three reference points are used to characterize stock abundance. The abundance threshold is calculated as the average of the three highest abundance years during the low abundance regime. A stock abundance level below this threshold is considered significantly depleted and in danger of stock collapse. This was the only abundance reference point recommended for the SNE stock due to its record low abundance and low likelihood of reaching this threshold in the near future. The abundance limit is calculated as the median abundance during the moderate abundance regime. Stock abundance that falls below this limit is considered depleted because the stock's ability to replenish itself is diminished. The fishery/industry target is calculated as the 25th percentile of the abundance during the high abundance regime. In this case, when abundance falls below this target, the stock's ability to replenish itself is not jeopardized, but it may indicate a degrading of economic conditions for the lobster fishery.

M21-10

Two reference points are used to evaluate the fishing mortality condition of the stocks. The exploitation threshold is calculated as the 75th percentile of exploitation (annual catch in numbers divided by abundance) during the current abundance regime. The stock is considered to be experiencing overfishing if exploitation exceeds the exploitation threshold. The exploitation target is calculated as the 25th percentile of exploitation during the current abundance regime.

Gulf of Maine/Georges Bank Stock Status

Based on the updated reference points, the GOM/GBK stock is not depleted and overfishing is not occurring (Figures 1 and 2, respectively). The average abundance from 2016-2018 was 256 million lobster, which is greater than the fishery/industry target of 212 million lobster. The average exploitation from 2016-2018 was 0.459, below the exploitation target of 0.461. Stock projections conducted as part of the assessment suggested a low probability of abundance declining below the abundance target over the next 10 years.

Southern New England Stock Status

Based on the updated reference points, the SNE stock is significantly depleted and overfishing is not occurring (Figures 3 and 4, respectively). The average abundance from 2016-2018 was 7 million lobster, well below the abundance threshold of 20 million lobster. The average exploitation from 2016-2018 was 0.274, falling between the exploitation threshold of 0.290 and the exploitation target of 0.257. Exploitation is not considered favorable as it exceeds the target.

Stock projections conducted as part of the assessment show a low probability of the stock condition changing among the most credible scenarios. In the absence of mortality, reference abundance would be projected to increase with recruit abundance exceeding the maximum abundance for the current regime (Figure 5). However, increases in abundance are likely to be limited due to the projected continuing decline in recruitment.

The assessment's model estimates and non-model based stock indicators results suggest careful consideration of key issues for the SNE stock:

1. Recruitment indices indicate that the stock is not rebuilding and is in recruitment failure.
2. The contraction of the stock distribution has continued and is becoming apparent in the offshore portion as well as the inshore.
3. The total SNE landings have continued to decline, and the 2018 landings were a time series low.
4. Disease remains high in Rhode Island and Massachusetts, and all four temperature indicators are negative. The stressful environment may be having both lethal and sublethal effects.
5. There is evidence that environmental influences have resulted in a decreasing recruitment rate. Substantive measures are needed to increase adult abundance in order to improve recruitment success.

Assessment and Peer Review Recommendations

GOM/GBK

Based on the favorable condition of the GOM/GBK stock, the 2020 Stock Assessment and Peer Review Reports did not recommend any management action for the stock at this time. Both reports did recommend an economic analysis be performed to provide advice on appropriate action to stabilize the fishery when abundance falls below the target.

SNE

For the SNE stock, the Assessment and Peer Review Reports did not recommend specific management measures to address the overfished stock status determination. However, in the definition of the abundance threshold reference point, the report states “significant management action to halt the decline of abundance and increase reproductive capacity and recruitment to the stock, such as a moratorium, is recommended if abundance falls below this threshold.”

Both Stocks

The Peer Review Panel agreed with the Stock Assessment Subcommittee recommendation to initiate an annual data update to monitor changes to stock abundance. The Panel supported annual updates of all indicators to provide insights into lobster and fishery dynamics, and the development of a science-based rule to specify conditions that would trigger an earlier than scheduled assessment. For example, if three of four indicators change from positive to neutral, the timing of the next benchmark assessment would be advanced.

The Panel also recommends continued use and exploration of the indicators to understand the relative merits of indicator-based management for various types of management controls. For example, preliminary analyses conducted during the review suggested relatively strong correlations between model outputs and select indicators that may be useful for management, with continued exploration.

Lastly, the Panel suggested a management strategy evaluation could inform appropriate management targets or measures to meet defined objectives.

Figure 1. Abundance for GOM/GBK Relative to Reference Points

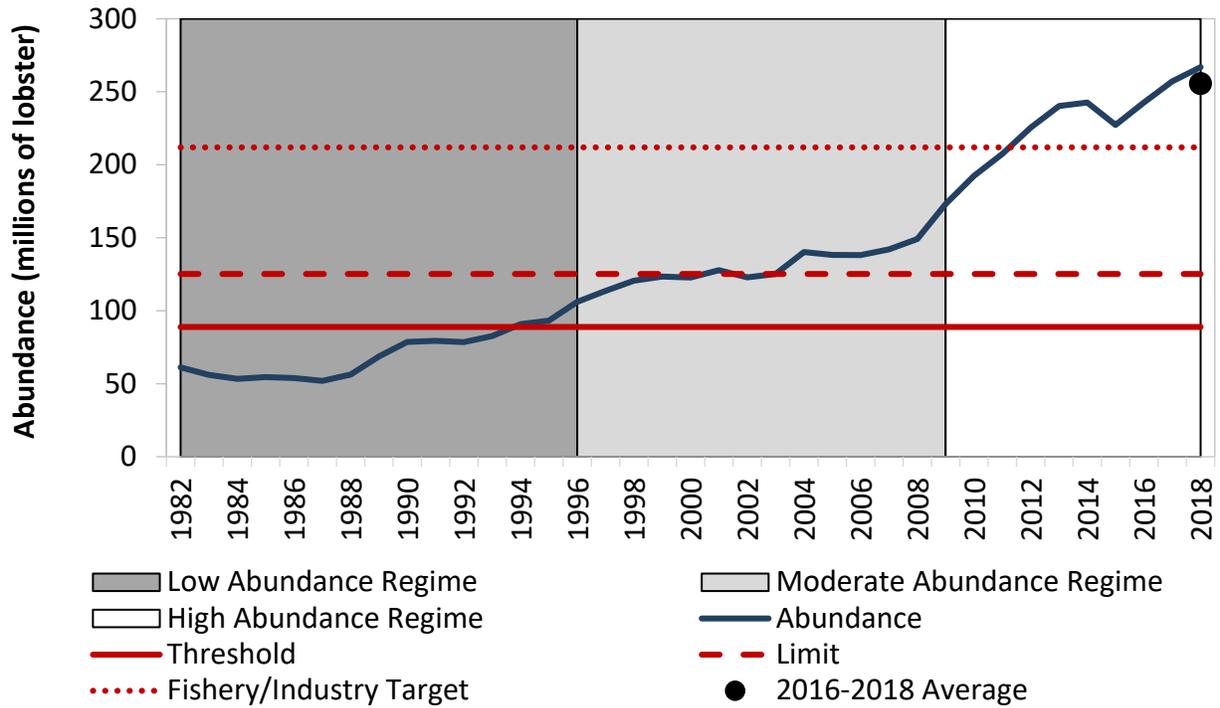


Figure 2. Exploitation for GOM/GBK Relative to Reference Points

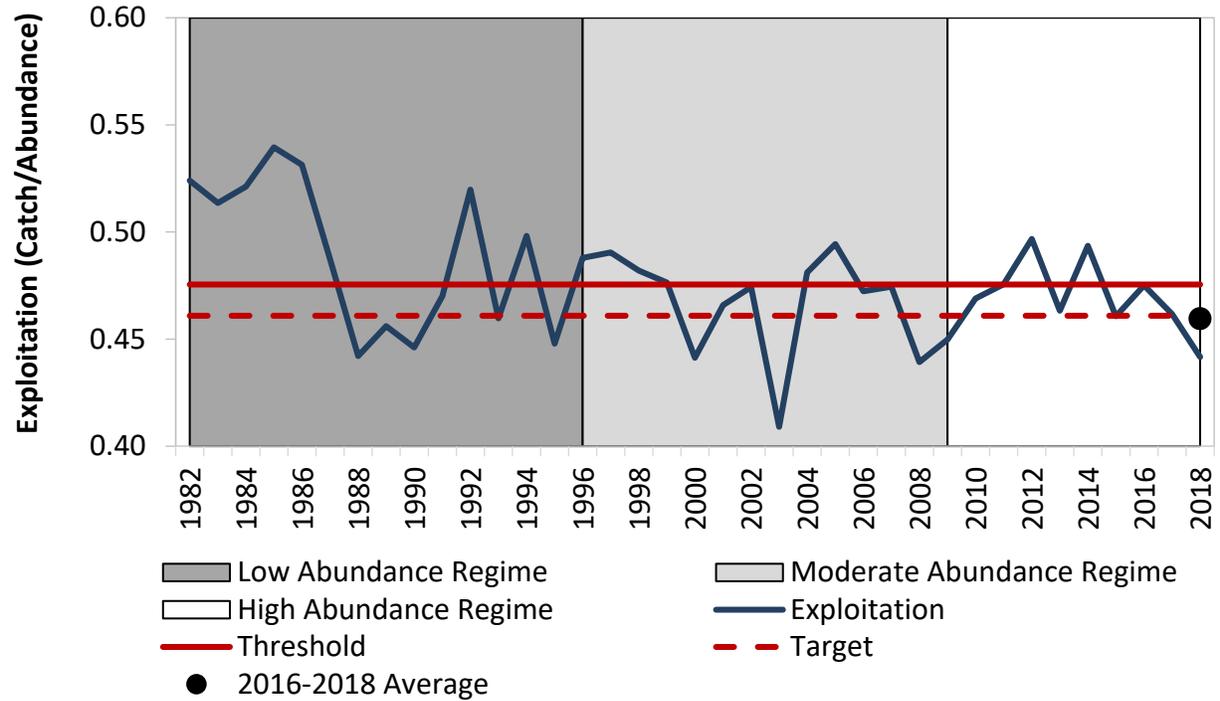


Figure 3. Abundance for SNE Relative to Reference Points - REVISED

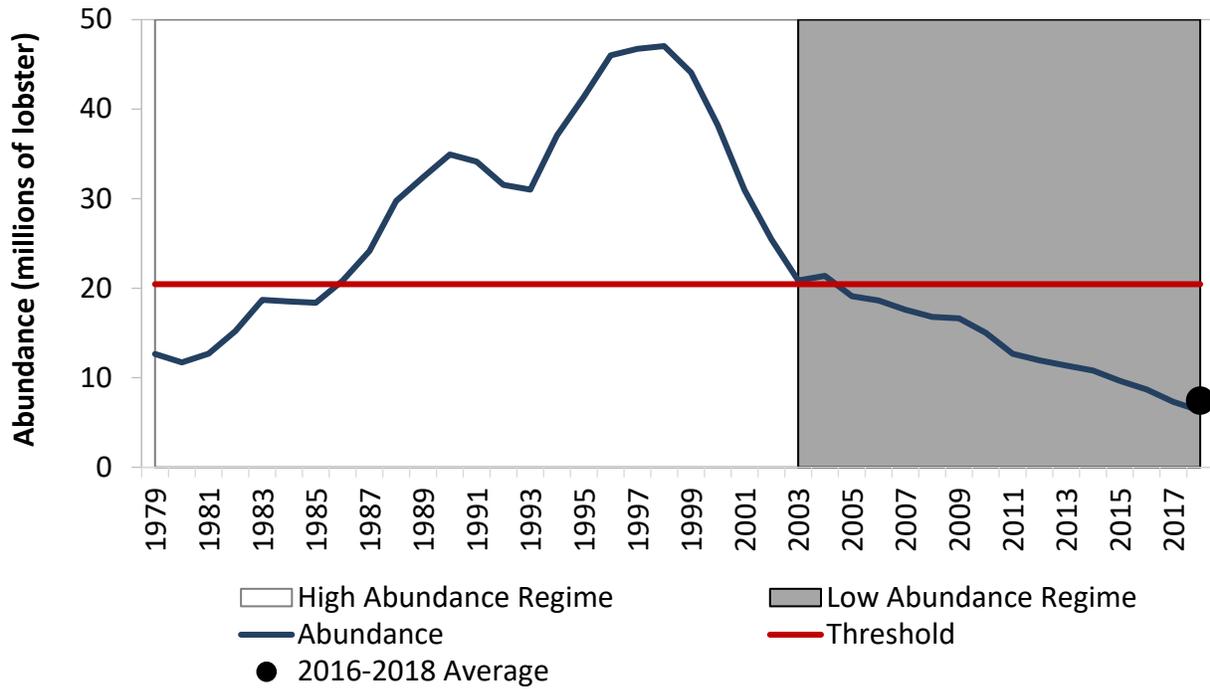
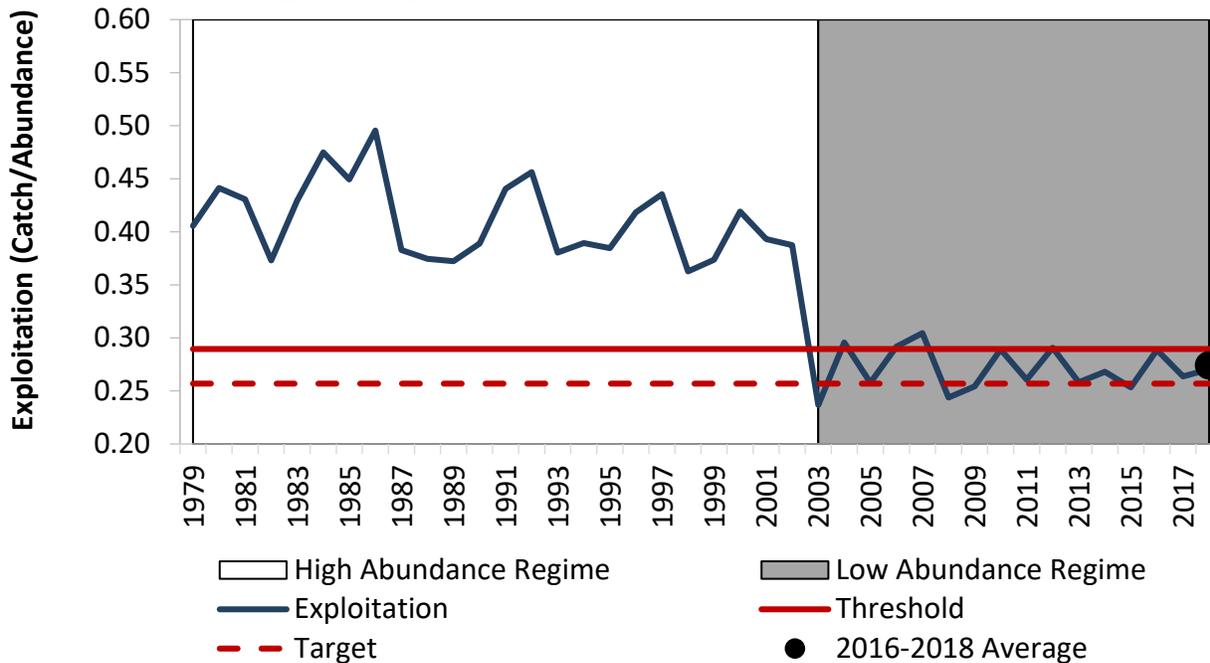


Figure 4. Exploitation for SNE Relative to Reference Points - REVISED



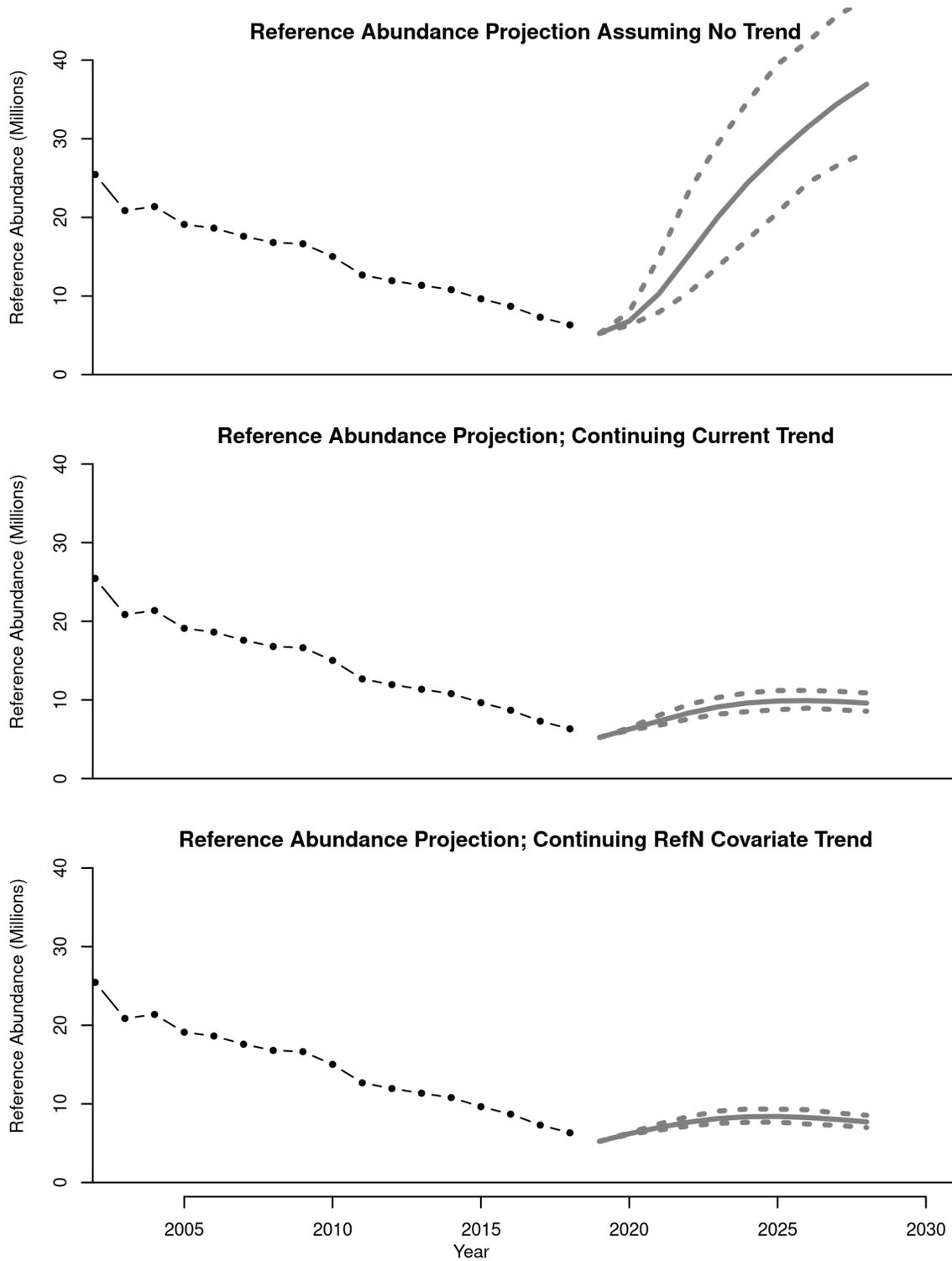


Figure 5. SNE reference abundance estimates for the current regime and projection scenarios for a no fishing mortality scenario. Source: 2020 American Lobster Benchmark Stock Assessment.