

Atlantic States Marine Fisheries Commission

**ADDENDUM I TO AMENDMENT 1 TO THE
ATLANTIC CROAKER FISHERY MANAGEMENT
PLAN**



*ASMFC Vision Statement:
Healthy, self-sustaining populations for all Atlantic coast fish species or successful
restoration well in progress by the year 2015*

Approved March 23, 2011

Introduction

The Atlantic States Marine Fisheries Commission (ASMFC) has coordinated interstate management of Atlantic croaker (*Micropogonias undulatus*) from 0–3 miles offshore since 1987. The management area extends from New Jersey through the east coast of Florida. Atlantic croaker is currently managed under Amendment 1 to the Fishery Management Plan (FMP), implemented in 2006. Management authority from 3–200 miles from shore lies with NOAA Fisheries.

The purpose of this addendum is to modify the management area and biological reference points for Atlantic croaker, based on the updated 2010 stock assessment. The Board initiated this addendum at its August 2010 meeting, following the updated stock assessment. The Board approved the addendum for public comment at the November 2010 meeting, and the addendum was open for public comment from November 29, 2010 through January 31, 2011. The Board approved this Addendum at its March 23, 2011 meeting and was implemented immediately.

1.0 Management Program

1.1 Statement of the Problem

The 2010 Atlantic croaker stock assessment evaluated the resource in a manner that is incompatible with the existing management plan. The plan's regional management areas need to be removed and the biological reference points revised in accordance with the stock assessment to allow full utilization of the assessment in managing the resource. Additionally, the current plan requires an addendum or amendment to modify the biological reference points, which adds an unnecessary administrative burden when the proposed modification results from a stock assessment that has undergone a rigorous scientific review and been accepted for management use.

1.2 Background

1.2.1 Amendment 1

Amendment 1 was approved in November 2005 and fully implemented by January 2006 (ASMFC 2005a). The amendment was largely undertaken to implement biological reference points to manage the croaker resource, update the fishery management plan with ASMFC standards and procedures, and allow for the timely implementation of mandatory management measures in the future should they be deemed necessary. Three elements of the plan are of high relevance to the management revisions proposed in this document: the management area, the biological reference points (BRPs), and the measures subject to change via adaptive management.

1.2.1.1 Management Area

Amendment 1 extended the management area in the original fishery management plan to include the resource off Delaware and New Jersey, thus making the management area from New Jersey through the east coast of Florida. The amendment also established two management regions

within the management area: a mid-Atlantic region covering New Jersey through North Carolina, and a south-Atlantic region covering South Carolina through Florida. The management regions are based on the Atlantic croaker stock assessment completed in 2005 which assessed the resource separately in the two regions due to difficulty assessing the resource as a single unit (ASMFC 2005b). Under the existing plan, the Management Board may approve different management measures for the two regions.

1.2.1.2 Biological Reference Points

The BRPs implemented through Amendment 1 are also based on the 2005 stock assessment (ASMFC 2005a, 2005b). The assessment produced usable results for the mid-Atlantic region, but could not do the same for the south-Atlantic region. Thus, the BRPs in Amendment 1 are only applicable to, and can be used to define stock status for, the mid-Atlantic region. The BRPs include target and threshold levels of biomass (in particular, spawning stock biomass or SSB) and fishing mortality (F). They are based on maximum sustainable yield (MSY), and are given as follows:

$$\begin{array}{ll} \text{F target} = 0.75 * F_{\text{MSY}} = 0.29 & \text{SSB target} = \text{SSB}_{\text{MSY}} = 28,932 \text{ MT} \\ \text{F threshold} = F_{\text{MSY}} = 0.39 & \text{SSB threshold} = 0.70 * \text{SSB}_{\text{MSY}} = 20,252 \text{ MT} \end{array}$$

If F exceeds the F threshold, overfishing is occurring. If SSB falls below the SSB threshold, the stock is considered overfished. The management program in Amendment 1 is designed to achieve the target F and SSB levels.

1.2.1.3 Measures Subject to Change via Adaptive Management

Amendment 1 requires Atlantic croaker stock status to be assessed, with the assessment undergoing a formal scientific peer review, every five years. The last two peer-reviewed (“benchmark”) assessments were reviewed as part of the Southeast Data, Assessment, and Review (SEDAR) process, although future peer reviews may occur through several other rigorous peer review processes described in the Commission’s guidelines for benchmark stock assessments (ASMFC 2008). Updates to a benchmark assessment can also occur at the discretion of the Management Board based on input from the Atlantic Croaker Technical Committee. Update assessments do not undergo peer review, but use the same data sets and methods as benchmark assessments, except for the inclusion of additional years of data. Both benchmark and update stock assessments may result in recommended changes to the existing BRPs.

The adaptive management section of Amendment 1 allows the Management Board to modify certain, specified elements of the amendment through an addendum to the amendment. Included in the list of measures subject to change via adaptive management are the overfishing and overfished definitions¹, MSY, and optimum yield (OY). Thus, currently, in order to implement new BRPs that may result from peer-reviewed science, the Board must enact an addendum or amendment to the Atlantic Croaker FMP. The addendum process requires, generally, six months minimum from initiation to implementation, and requires a sizable investment of financial and personnel resources. The amendment process is longer and requires more resources. Both the

¹ Section 4.5.2 *Measures Subject to Change* in Amendment 1 lists the overfishing definition, MSY, and OY. The omission of the overfished definition is assumed to be a typo.

addendum and amendment process have certain requirements for public involvement, including a comment period and public hearings (ASMFC 2009).

1.2.2 2010 Stock Assessment

In August 2010, the South Atlantic State-Federal Fisheries Management Board approved for management use an assessment of Atlantic croaker through 2008 (ASMFC 2010). Unlike the previous assessment, it evaluates the status of the resource as one coastwide population. Data were viewed as inadequate to support the existence of two stocks. The results of the assessment can not be compared to the Amendment 1 BRPs (which are specific to the mid-Atlantic region), thus new BRPs were developed during the assessment for the coastwide resource.

The proposed BRPs are very similar to those in Amendment 1. They use the same definitions for the targets and thresholds (e.g., F threshold = F_{MSY}), but they differ in that absolute estimates of SSB and F are not estimated. Estimates are not given because of uncertainty in the assessment resulting from inadequate data on the magnitude of croaker discards in the South Atlantic shrimp trawl fishery. The determination of stock status is thus based on the ratios of F and SSB to their respective target and threshold, which are compared to one. The proposed targets and thresholds are given as follows:

$$F \text{ target} = 0.75 * F_{MSY}$$

$$F \text{ threshold} = F_{MSY}$$

$$SSB \text{ target} = SSB_{MSY}$$

$$SSB \text{ threshold} = 0.70 * SSB_{MSY}$$

Under the proposal, if F/F_{MSY} is greater than 1, then overfishing is occurring. If $SSB/(0.70 * SSB_{MSY})$ is less than 1, the stock is overfished (see Figures 1 and 2). In other words, F must be lower than its threshold, and SSB must be higher than its threshold, or the stock will be considered experiencing overfishing or overfished, respectively. The targets would still represent the levels that management measures are designed to achieve.

Using the ratio-based BRPs and the results of the 2010 stock assessment, the (coastwide) Atlantic croaker stock is not experiencing overfishing. It is not possible to determine if the stock is overfished based on the model results; however, it is considered unlikely based on information from the data compiled for the assessment, namely increasing indices of relative abundance and expanding age structure in the catch and indices. It is not possible to be confident with regard to stock status, particularly a biomass determination, until the discards of Atlantic croaker from the South Atlantic shrimp trawl fishery can be adequately estimated and incorporated into the stock assessment.

While absolute estimates of total F and SSB are unavailable because of model uncertainty, the general trends in the estimates from the model are considered reliable due to support from the data. Sensitivity runs of the model including rough estimates of shrimp trawl discards also do not change the overall trends. The trend in total F decreases substantially during the first five years of the time series (1988-1992) and shows an overall decline over the remainder of the time series, except for occasional, brief spikes. The trend in SSB is nearly consistently increasing since 1989. A series of sensitivity runs conducted over a range of plausible values of shrimp-trawl fishing mortality found that the ratio of directed fishing mortality to F_{MSY} was less than one in all cases, indicating overfishing was not occurring. Based on these results, the Atlantic

Croaker Technical Committee found no biological basis for additional management restrictions at this time.

1.3 Management

1.3.1 Management Area

The mid-Atlantic and south-Atlantic management regions are eliminated from the management area. Stock status will be assessed and management measures implemented on a coastwide basis.

1.3.2 Biological Reference Points

The definitions of overfished and overfishing are broadened to allow for greater flexibility while maintaining objective and measurable BRPs and apply to the coastwide resource. This action also establishes acceptable categories of peer review for providing assessment results that may be used to modify the definitions outside of an addendum. When the peer review metrics are met and new or updated information is available, the new or revised definitions can be incorporated directly into the annual management measures by Management Board action. This action will not have a direct influence on fishing effort or fishery removals but instead facilitate use of the most current scientific information available to define stock status and set appropriate management measures for Atlantic croaker without undue delay or administrative burden. If the peer review process rejected, for management purposes, different overfished or overfishing definitions or if no new information were available, the existing definitions will remain in place.

The BRPs are:

- F threshold = F_{MSY} (or a reasonable proxy thereof) based upon the best available scientific information. The F threshold may be defined as a function of (but is not limited to): total stock biomass, spawning stock biomass, and total egg production, and may include males, females, both, or combinations and ratios thereof which provide the best measure of productive capacity for Atlantic croaker. Exceeding the established F threshold constitutes overfishing.
- F target = a fraction of the F threshold. F target is the rebuilding rate.
- Biomass target = B_{MSY} (or a reasonable proxy thereof) based on the best available scientific information. The B target may be defined as (but is not limited to): total stock biomass, spawning stock biomass, and total egg production, and may include males, females, both, or combinations and ratios thereof which provide the best measure of productive capacity for Atlantic croaker. B target is the rebuilt level.
- Biomass threshold: a fraction of the biomass target. Should the measure of productive capacity for the stock fall below the B threshold, the stock is considered overfished.

The acceptable categories of peer review will be established as:

- Any of the external peer review processes identified in the Commission's guidelines for benchmark stock assessments (ASMFC 2008, or as revised and replaced in the future).

The Management Board also approved by Board action the BRPs recommended as a result of the 2010 stock assessment as annual management measures.

The BRPs for the coastwide resource are:

$$F \text{ target} = 0.75 * F_{MSY}$$

$$SSB \text{ target} = SSB_{MSY}$$

$$F \text{ threshold} = F_{MSY}$$

$$SSB \text{ threshold} = 0.70 * SSB_{MSY}$$

If $F/F_{MSY} > 1$, overfishing is occurring.

If $SSB/(0.70 * SSB_{MSY}) < 1$, the stock is overfished.

Based on these BRPs and the results of the 2010 stock assessment, Atlantic croaker is not experiencing overfishing but the overfished status can not be determined (see Section 2.2.2). Additional changes in the BRPs occurring through Board action will be documented in meeting summaries as well as in the annual Fishery Management Plan Review.

2.0 Compliance

The changes are effective immediately.

3.0 References

- ASMFC (Atlantic States Marine Fisheries Commission). 2005a. Amendment 1 to the Interstate Fishery Management Plan for Atlantic Croaker. ASMFC: Washington (DC). Fishery Management Report No 44. 92 p.
- ASMFC. 2005b. Atlantic Croaker Stock Assessment & Peer Review Reports. ASMFC: Washington (DC). 370 p.
- Atlantic States Marine Fisheries Commission. 2008. Benchmark Stock Assessments: Data and Assessment Workshop & Peer Review Process. ASMFC: Washington (DC). 54 p.
- Atlantic States Marine Fisheries Commission. 2009. Interstate Fisheries Management Program Charter. ASMFC: Washington (DC). 26 p.
- Atlantic States Marine Fisheries Commission. 2010. Atlantic Croaker 2010 Benchmark Stock Assessment. Washington (DC): ASMFC. 366 p.

4.0 Figures

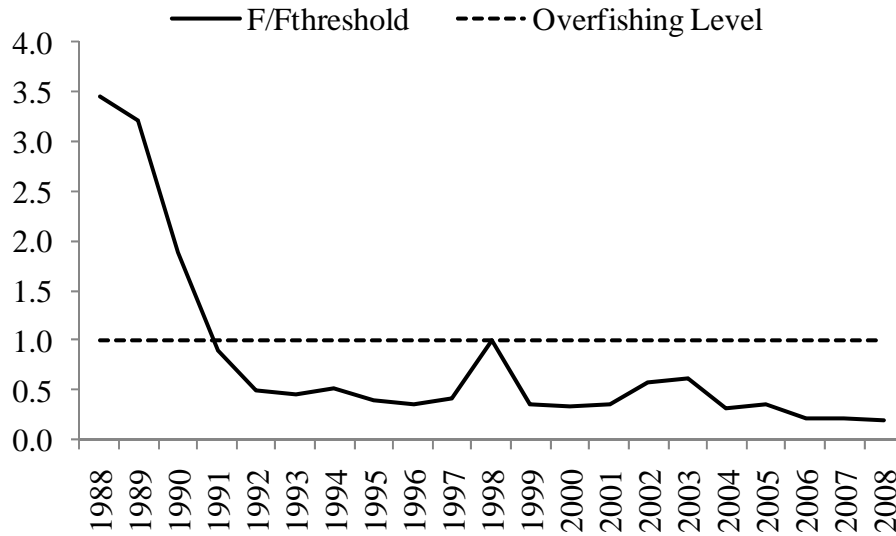


Figure 1. The ratio of F to F_{MSY} (the F threshold) from the base run of the 2010 Atlantic croaker stock assessment. Under the proposed biological reference point, if the ratio is less than 1.0, the stock is not experiencing overfishing. For the 2010 stock assessment, the ratio was also produced with various estimates of croaker discards from the shrimp trawl fishery included in the model. The ratio for 2008 was lower than 1.0 in all cases and thus considered robust. As a result, the stock was found to be not experiencing overfishing in 2008.

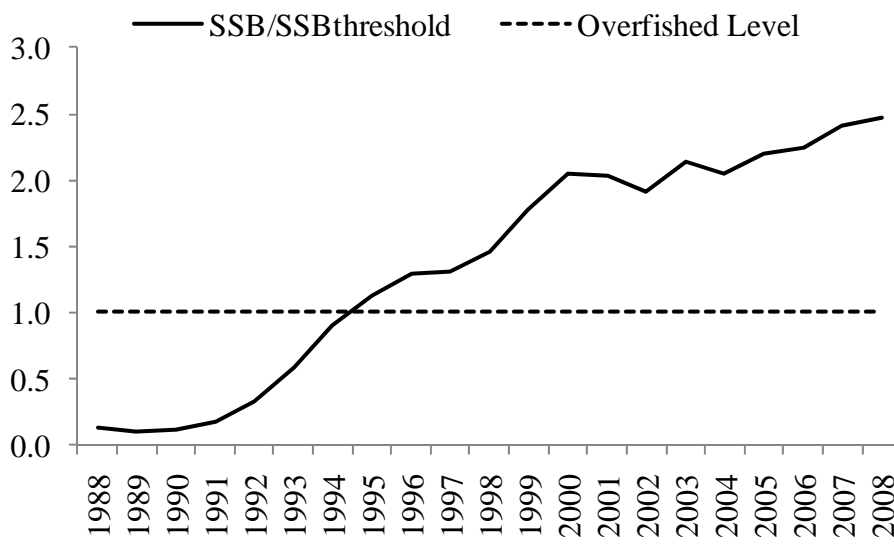


Figure 2. The ratio of SSB to $0.70 \cdot SSB_{MSY}$ (the SSB threshold) from the base run of the 2010 Atlantic croaker stock assessment. Under the proposed BRP, if the ratio is more than 1.0, the stock is not overfished. For the 2010 stock assessment, the ratio was also produced with various estimates of croaker discards from the shrimp trawl fishery included in the model. The ratio for 2008 was higher or lower than 1.0 depending on the discard estimate included, thus the ratio was considered too sensitive to allow for a biomass stock status determination. The above graph is used to demonstrate the recommended BRP, and should not be used to depict stock status.