Mid-Atlantic Fishery Management Council
800 North State Street, Suite 201, Dover, DE 19901
Phone: 302-674-2331 | FAX: 302-674-5399 | www.mafmc.org
Michael P. Luisi, Chairman | G. Warren Elliott, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

MEMORANDUM

Date: March 31, 2017

To: Council

From: Julia Beaty

Subject: Chub mackerel amendment development and scoping plan

The following documents are included behind this tab for Council consideration:

1) Request for proposals for chub mackerel assessment work
2) Draft scoping document (includes scoping hearing schedule)
3) Revised amendment action plan

Request for Proposals

Atlantic Chub Mackerel Stock Assessment

Proposal Submission Deadline: April 30, 2017
Term of Contract: Approximately 8 months

The Mid-Atlantic Fishery Management Council (Council) seeks a highly-qualified contractor to facilitate development of a quantitative stock assessment for Atlantic chub mackerel (*Scomber colias*) to support development of management measures for chub mackerel fisheries.

Background
The Council initiated an amendment to consider adding Atlantic chub mackerel to the Atlantic Mackerel, Squids, and Butterfish Fishery Management Plan (FMP). This amendment will require specification of status determination criteria for chub mackerel. Status determination criteria include the level of biomass which corresponds to an overfished status and the fishing mortality rate that, if exceeded, would result in overfishing (F_{msy} or suitable proxy). These criteria form the basis for overfishing limits (OFLs) and acceptable biological catch (ABC) recommendations from the Council's Scientific and Statistical Committee (SSC). OFLs and ABCs are in turn used to develop annual catch limits.

These measures are required by the Magnuson-Stevens Fishery Conservation and Management Act. The Council's Ecosystem Approach to Fisheries Management (EAFM) Guidance Document[1] outlined additional considerations for management of forage species. Atlantic chub mackerel are considered a forage species due to their schooling behavior, relatively small size, and role as prey for a variety of predators. The EAFM Guidance Document states that the Council may consider using more restrictive status determination criteria for forage species than is otherwise required.

Status determinations for stocks managed by the Council are typically based on the results of peer-reviewed stock assessments developed through the Stock Assessment Workshop/Stock Assessment Review Committee (SAW/SARC) process, facilitated by the Northeast Fisheries Science Center (NEFSC). Some species lack an analytical stock assessment, necessitating the use of data-limited methods.

There are no previously accepted stock assessments for Atlantic chub mackerel in the U.S. EEZ and the NEFSC has limited capacity to perform a chub mackerel stock assessment in a timeframe that would align with the planned timeline for development of this amendment. A data-limited approach may be required, given the limited amount of fisheries-independent and fisheries-dependent data on chub mackerel and the current lack of an analytical stock assessment. Given the limitations on the NEFSC's ability to take on a chub mackerel stock assessment at this time, the Council plans to work with an outside contractor to develop analyses to support the development of status determination criteria, OFLs, and ABCs for chub mackerel.

[1] Available at: http://www.mafmc.org/eafm/

Scope of Work
The contractor, supported by Council staff and partners with the National Marine Fisheries Service, will explore various methodologies to assess status of the Atlantic chub mackerel stock in U.S. waters and will develop analyses to support development of status determination criteria, OFLs, and ABCs for chub mackerel. Council staff will provide the contractor with relevant fisheries-independent and fisheries-dependent data. The contractor will present interim progress reports to Council staff and a subgroup of the SSC in mid to late 2017. The contractor will present a final report to the SSC in early 2018.

Contractor Qualifications
Applicants should have demonstrated experience with fisheries stock assessments, including data-limited approaches. Experience working with fisheries management agencies is preferred.

How to Apply
Applicants should submit a proposal to Dr. Chris Moore, Executive Director, by email (cmoore@mamfc.org) by 11:59 pm on Sunday, April 30, 2017. Proposals should include the following elements:

- *Executive Summary*: A summary of the proposed scope of work as well as brief summary of the applicant's qualifications.
- *Proposed Scope of Work*: A detailed plan for addressing the scope of work described above. This should include a summary of potential analysis approaches, a project schedule, a brief summary of how the project will be managed, and a list of all personnel who may work on the project.
- *Qualifications of Applicant*: A summary of the qualifications of the applicant and other team members, if applicable. Curriculum vitae should be included for all individuals who will work on the project.
- *Proposed Budget:* A detailed budget, including the basis for the charges (e.g. hourly rates, fixed fees).
- *References:* Names, full addresses, and phone numbers for three clients for whom the applicant has provided similar services to those requested.

Proposal Evaluation Criteria
Proposals will be evaluated based on methodology, prior experience, references, qualifications, and budget. The Council may request additional information as deemed necessary or negotiate modifications to an accepted proposal.

Requests for Further Information
Christopher M. Moore, Ph.D., Executive Director
Mid-Atlantic Fishery Management Council
800 North State Street, Suite 201
Dover, DE 19901
tel: 302-526-5255
email: cmoore@mafmc.org

Disclaimer

1. All costs associated with the preparation and presentation of the proposal will be borne by applicants.
2. Proposals and their accompanying documentation will not be returned.

3. Respondents must disclose any relevant conflicts of interest and/or pending civil/criminal legal actions.
4. The Council reserves the right to accept or reject any or all applications received, negotiate with all qualified applicants, cancel or modify this request for proposals in part or in its entirety, or change the application guidelines, when it is in its best interests.

Scoping Document for

An Amendment to Manage Atlantic Chub Mackerel (*Scomber colias*) as a Stock in the Mackerel, Squid, and Butterfish Fishery Management Plan

April 2017

What is Scoping?

Scoping is the process of identifying issues, potential impacts, and a reasonable range of alternatives associated with fisheries management actions being developed by the Council. **Scoping provides the first and best opportunity for the public to make suggestions and raise concerns about new Council actions.** Your comments early in the development of this action will help the Council identify effective management alternatives and issues of concern.

The regulatory actions outlined in this document are not a list of preferred alternatives, nor will they necessarily be included in this action. The Council has not yet analyzed any management measures for their effectiveness or impacts. At this early stage, the Council will consider all reasonable options.

Please comment on which management measures may or may not be useful or practical for meeting the goal of this action (including measures not described in this document) and explain your reasoning. Please also comment on any other relevant issues the Council should consider as part of this action.

Contents

List of acronyms and abbreviations

ABC	Acceptable Biological Catch
ACL	Annual Catch Limit
Council	Mid-Atlantic Fishery Management Council
EAFM	Ecosystem Approach to Fisheries Management
FMP	Fishery Management Plan
NEFSC	Northeast Fisheries Science Center
NMFS	National Marine Fisheries Service
OFL	Overfishing Limit
SSC	Scientific and Statistical Committee
VTR	Vessel Trip Report

1) Introduction

The Mid-Atlantic Fishery Management Council (Council) seeks public input on a developing management action which may add Atlantic chub mackerel (*Scomber colias*) as a stock in the Atlantic Mackerel, Squid, and Butterfish Fishery Management Plan (FMP). The Magnuson-Stevens Fishery Conservation and Management Act requires catch limits, accountability measures, and other conservation and management measures for stocks "in the fishery". Through this action, the Council will consider various management alternatives aimed at preventing overfishing of and achieving optimum yield[1] for Atlantic chub mackerel in U.S. waters.

2) Why is the Council pursuing this action?

Atlantic chub mackerel are considered a forage species due to their schooling behavior, relatively small size, and role as prey for a variety of predators (see section 6 for more information). The Council's Ecosystem Approach to Fisheries Management (EAFM) Guidance Document[2] states: "it shall be the policy of the Council to support the maintenance of an adequate forage base in the Mid-Atlantic to ensure ecosystem productivity, structure and function and to support sustainable fishing communities".

A targeted commercial chub mackerel fishery developed in the Mid-Atlantic and Southern New England in recent years, averaging 1.32 million pounds of landings per year over 2013-2016 (see section 6 for more information). In August 2016, the Council approved an annual landings limit and a possession limit for chub mackerel as part of the Unmanaged Forage Omnibus Amendment (described in more detail on page 11). Once implemented (expected in mid-2017), these will be the first regulations on chub mackerel fisheries off the U.S. east coast. These measures are temporary and will expire three years after implementation. The Chub Mackerel Amendment aims to develop alternatives for long-term management of chub mackerel fisheries to ensure sustainability. It is the Council's intent to develop measures through this amendment to replace the temporary measures implemented through the Unmanaged Forage Omnibus Amendment.

3) What is a "stock in the fishery"?

When the Council took final action on the Unmanaged Forage Omnibus Amendment in August 2016 (aspects relevant to chub mackerel are described in more detail on page 11), they clearly expressed their intent to develop an additional amendment to consider managing chub mackerel as a stock in the fishery.[3] The National Standards Guidelines (50 CFR 600.305 et seq.) define

[1] The Magnuson-Stevens Fishery Conservation and Management Act defines optimum yield as "the amount of fish which (A) will provide the greatest overall benefit to the Nation, particularly with respect to food production and recreational opportunities, and taking into account the protection of marine ecosystems; (B) is prescribed as such on the basis of the maximum sustainable yield from the fishery, as reduced by any relevant economic, social, or ecological factor; and (C) in the case of an overfished fishery, provides for rebuilding to a level consistent with producing the maximum sustainable yield in such fishery."

[2] Available at: http://www.mafmc.org/eafm/

[3] This intent is expressed in the motions passed by the Council for chub mackerel management measures in the Unmanaged Forage Omnibus Amendment. These motions are available at: http://www.mafmc.org/briefing/august-2016. The Council reaffirmed this intent in December 2016 when they approved their 2017 implementation plan (available at http://www.mafmc.org/strategic-plan/), which includes initiation of this chub mackerel amendment.

stocks in the fishery as "stocks that require conservation and management." Such stocks are subject to several requirements under the Magnuson-Stevens Fishery Conservation and Management Act. Key requirements are listed in the following section.

Any stocks that are predominately caught in Federal waters and are overfished or subject to overfishing, or likely to become overfished or subject to overfishing in the absence of management measures, require conservation and management by the Council under the Magnuson-Stevens Fishery Conservation and Management Act. The National Standards Guidelines state that beyond these criteria, the Council should consider a variety of factors when deciding whether a stock requires conservation and management, including whether the stock is harvested in a directed fishery (see 50 CFR 600.305(c) for more information). [4]

The Council has clearly expressed their intent to consider managing chub mackerel as a stock in the fishery, in part due to the directed fishery which developed in the Mid-Atlantic and New England in recent years (see section 6 for more information). The Council is not considering managing chub mackerel through other designations such as the ecosystem component designation, which is not subject to the same requirements as stocks in the fishery. The Council considered, but decided against, using the ecosystem component designation for chub mackerel when they developed the Unmanaged Forage Omnibus Amendment.[5]

4) Issues for consideration

The Council is soliciting public input on all aspects of this action. This section highlights several key issues for consideration. Please provide comments on which measures may be most appropriate for the chub mackerel fishery.

The Magnuson-Stevens Fishery Conservation and Management Act lists several required provisions of FMPs for stocks in the fishery (defined in the previous section). Required management measures include:

- Annual catch limits specified in relation to acceptable biological catch limits recommended by the Council's Scientific and Statistical Committee
- Accountability measures for when the annual catch limits are exceeded
- Essential fish habitat descriptions
- Definition of the management unit (i.e. the geographic extent of management measures)

Other management measures are not explicitly required by the Magnuson-Stevens Fishery Conservation and Management Act, but may be necessary to prevent overfishing and promote long-term stability of the Atlantic chub mackerel fishery. Such measures could include, but are not limited to:

- Permit requirements
- Limited access provisions

[4] The National Standards Guidelines are available at: http://www.fisheries.noaa.gov/sfa/laws_policies/national_standards/

[5] See http://www.mafmc.org/actions/unmanaged-forage for more information.

- Annual catch targets
- Landings limits (e.g. commercial quotas, recreational harvest limits)
- Possession limits
- Minimum fish size restrictions
- Gear restrictions
- Reporting requirements
- Seasonal closures
- Control dates

These measures are described in more detail in section 7 of this document. Over the next year, the Council will develop and evaluate alternatives related to these, and potentially other, measures.

5) How to get involved

The Council is in the early stages of developing this amendment. You will have additional opportunities to provide comments; however, now is the best time to provide input and raise concerns about the general scope of the amendment.

Attend a Scoping Hearing

Public scoping hearings will be held at the following dates and locations. Scoping hearings provide an opportunity to learn more about the amendment, ask questions, and provide verbal and/or written comments.

Date	Time	Location	Address	Phone Number
May 4, 2017	7:00 – 9:00 pm	Kingsborough Community College	Room V-219 2001 Oriental Boulevard Brooklyn, NY, 11235	718-368-5000
May 15, 2017	6:00 – 7:30 pm	Virginia Marine Resources Commission 4th Floor Meeting Room	2600 Washington Avenue Newport News, VA, 23607	757-247-2200
May 16, 2017	6:30 – 8:00 pm	Princess Royale Oceanfront Resort & Conference Center	9100 Coastal Highway Ocean City, Maryland 21842	410-524-7777
May 23, 2017	6:30 – 8:00 pm	Congress Hall Hotel	200 Congress Place Cape May, NJ, 08204	888-944-1816
May 24, 2017	6:30 – 8:00 pm	University of Rhode Island Bay Campus Corless Auditorium	215 South Ferry Road Narragansett, RI, 02882	401-874-6222
May 25, 2017	6:00 – 7:30 pm	Webinar	http://mafmc.adobeconnect.com/chubscoping/	1-800-832-0736, room #5068871

Submit Written Comments

You may submit written comments at a public scoping hearing, or through one of the following methods:

1) **Online** at XXXX (to be set up)
2) **Email** jbeaty@mafmc.org
3) **Mail or Fax** to:

Dr. Chris Moore, Executive Director
Mid-Atlantic Fishery Management Council
800 North State Street, Suite 201
Dover, DE 19901
FAX: 302-674-5399

Written comments must be received by 11:59 pm Eastern Standard Time on May 31, 2017.

Please include "chub mackerel scoping comments" in the subject line if using email or fax, or on the outside of the envelope if submitting written comments.

All comments, regardless of submission method, will be shared with the Council and made publicly available on the Council's website.

Stay Informed

For additional information and updates on development of this amendment, please visit: http://www.mafmc.org/actions/chub-mackerel-amendment.

The Council will publish announcements about future opportunities for public comment in the Federal Register and at www.mafmc.org.

If you have any questions, please contact Julia Beaty at jbeaty@mafmc.org or 302-526-5250.

6) Background and recent fishery developments

Biology

Atlantic chub mackerel are a schooling, migratory, pelagic species. They resemble Atlantic mackerel (*Scomber scombrus*), but are smaller, generally reaching 8-14 inches in length, and have a more mottled coloration. Unlike Atlantic mackerel, chub mackerel have a swim bladder. Their distribution is more southerly than that of Atlantic mackerel, ranging from southern New England through Argentina, including the Gulf of Mexico. They are found on the continental shelf to depths of about 250-300 meters (about 137-165 fathoms) on both sides of the Atlantic, as well as in the Mediterranean (Collette and Nauen 1983, Collette 1999, Collette and Klein-MacPhee 2002, Martins et al. 2013).

A closely related species, *Scomber japonicus* (the Pacific mackerel or Pacific chub mackerel) exists in the Pacific and Indian Oceans. Atlantic and Pacific chub mackerel have many similar life history and morphological characteristics and were once considered the same species. Mitochondrial and nuclear DNA evidence support classification of the two as separate species (Scoles et al. 1998, Collette 1999, Infante et al. 2007, Espiñeira et al. 2009, Catanese et al. 2010).

Atlantic chub mackerel have been documented to reach age 13 (Carvalho et al. 2002); however, in most regions, ages 0-5 are most commonly observed (e.g. Krivospitchenko 1979, Martins et al. 2013). The age structure off the U.S. east coast is not well documented. Chub mackerel grow rapidly during the first year of life (Lorenzo et al. 1995, Hernández and Ortega 2000, Perrota et al. 2005, Velasco et al. 2011). They typically spawn in water temperatures of 15-20°C (about 60-70°F). Berrien (1978) found evidence of chub mackerel spawning from North Carolina to Florida during January through July. Richardson et al. (2010) documented Atlantic chub mackerel larvae in the straits of Florida in nearshore waters during January – May. Atlantic chub mackerel spawn in several batches (Collette and Nauen 1983). The closely related Pacific chub mackerel is believed to spawn several times throughout the year whenever oceanographic conditions are favorable and sufficient food is available (Crone and Hill 2015).

Large fluctuations in Atlantic chub mackerel abundances have been recorded around the world, including in New England and the Mid-Atlantic (Goode 1884, Krivospitchenko 1979, Hernández and Ortega 2000, Martins et al. 2013). These fluctuations may be partly the result of environmental influences such as temperature and upwelling strength on recruitment (Hernández and Ortega 2000). Given that chub mackerel are a fully pelagic species, ocean processes likely influence their availability in any given area, in addition to their recruitment.

Chub mackerel are opportunistic predators of copepods, other crustaceans, fish, and squid (Collette and Nauen 1983). Their diet varies seasonally (Server et al. 2006). In the Mid-Atlantic, chub mackerel are frequent prey for tunas and billfishes (personal communication, Dr. John Graves, Virginia Institute of Marine Science, July 2016). They are also occasional prey for spiny dogfish, monkfish, summer flounder,[6]and a variety of marine mammals[7] (Smith et al. 2015) and shark species[8] (personal communication, Nancy Kohler, Apex Predators Program, NEFSC, Narragansett Laboratory, December 2015).

Fishery

Atlantic chub mackerel support important commercial fisheries in several countries (e.g. Collette and Nauen 1983, Carvalho et al. 2002, Velasco et al. 2011, Vasconcelos et al. 2012, Martins et al. 2013). By comparison, the recent fishery in the Mid-Atlantic and New England is fairly small, averaging 444,245 pounds per year between 1994 and 2016[9] with a peak of 5.25 million pounds in 2013, as shown in northeast commercial fish dealer data. Commercial fish dealers paid an average of $0.19 per pound of chub mackerel (adjusted to 2016 dollars) over 1994-2016 (Table 1).

[6] Based on records of scombrids (likely including chub mackerel) in stomach samples from spiny dogfish, monkfish, and summer flounder caught in the Northeast Fisheries Science Center's spring and fall bottom trawl surveys in Mid-Atlantic and southern New England offshore strata from 1973 through 2015.

[7] Based on observations of scombrids in stomach contents, likely including chub mackerel. See Smith et al. (2015) for more information.

[8] Based on observations of scombrids in stomach contents, likely including chub mackerel.

[9] 2016 data are preliminary.

According to data from northeast commercial fish dealers, vessel trip reports (VTRs), the Northeast Fisheries Observer Program, and the Northeast Fisheries Science Center's (NEFSC) study fleet, nearly all chub mackerel landings (>95%) during 1996-2016 were reported during the months of June-October. The highest proportion of landings occurred in September, followed by August.

All life stages of Atlantic chub mackerel are pelagic; however, in recent years, most landings in the Mid-Atlantic and southern New England were from bottom trawl vessels. This is likely a result of the spatial and temporal overlap of chub mackerel availability and the bottom trawl *Illex* squid fishery. Bottom trawls accounted for at least 90% of the chub mackerel landings reported in observer, VTR, and study fleet data over the past several years, (i.e. 1996-2016 or 2007-2016, depending on the data set). Ten percent or less (depending on the dataset) came from midwater trawls. Over the past 10 years in the Mid-Atlantic and New England, chub mackerel were mostly landed on bottom trawl trips which also landed *Illex* squid, longfin squid, and/or butterfish. On trips which landed at least 10,000 pounds of chub mackerel, *Illex* squid accounted for the majority of landings.[10] Lesser amounts of chub mackerel were caught (though not always landed) in other bottom trawl fisheries and in gill net fisheries.[11]

During 1996-2016, as many as 29 federally-permitted vessels per year landed chub mackerel in the Mid-Atlantic and New England. The number of vessels without federal permits which landed chub mackerel is unknown. As many as 8 federally-permitted dealers per year in 5 states purchased these landings. A small number of vessels and dealers were responsible for the majority of these landings. A few relatively large vessels (by Mid-Atlantic standards; i.e. greater than 140 feet in length) which also participate in the *Illex* squid fishery targeted chub mackerel in recent years. According to some of the dominant captains and dealers in the recent chub mackerel fishery, only a few large, fast vessels in the region are capable of harvesting chub mackerel in large quantities (e.g. tens of thousands of pounds at a time). Over the past several years, a few vessels and dealers worked to build a market for chub mackerel. One captain reported that chub mackerel has become an important part of his business, especially in years when *Illex* squid are not available. Commercial dealer data show an inverse correlation between chub mackerel and *Illex* squid landings in recent years (Figure 1).

Over the past 20 years, most chub mackerel landings reported on VTRs, or through the study fleet or the observer program, were from statistical area 622 or 626 (depending on the dataset; e.g. Figure 2). Most landings (about 80%) resulted from catch at about 50-100 fathoms depth. Over 90% of these landings were from catch south of Hudson Canyon in statistical areas which included areas in or near the shelf break (e.g. Figure 2).

Over the past 20 years, recreational chub mackerel landings were sporadically reported in the Mid-Atlantic, New England, the South Atlantic, and the Gulf of Mexico through the Marine

[10] Based on commercial fish dealer data from 2006 through 2015 and supported by public comments received during development of the Unmanaged Forage Omnibus Amendment (more information is available at: http://www.mafmc.org/actions/unmanaged-forage).

[11] According to Northeast Fisheries Observer Program data from 1996 through March 2016.

Recreational Information Program and the Southeast Region Headboat Survey. Chub mackerel are likely rarely targeted by recreational anglers.

Table 1: Northeast dealer-reported landings and average price per pound of chub mackerel and Illex squid, 1994-2016. Data from some years are combined to protect confidential information representing fewer than three vessels and/or dealers. Prices are adjusted to 2016 dollars using the gross domestic product deflator index. 2016 landings are preliminary.

Year	Chub mackerel landings (lb)	Average chub mackerel price per pound	*Illex* squid landings (lb)	Average *Illex* squid price per pound
1994-1996	44,706	$0.13	108,676,400	$0.18
1997	5,013	$0.12	29,444,276	$0.14
1998	40,219	$0.13	51,958,751	$0.13
1999	6,443	$0.26	16,289,021	$0.17
2000	16,246	$0.24	19,866,592	$0.14
2001	4,384	$0.74	8,837,567	$0.16
2002	471	$0.33	6,061,729	$0.18
2003	488,316	$0.04	14,090,521	$0.22
2004	126	$0.41	57,534,687	$0.23
2005	0	--	26,526,087	$0.26
2006	0	--	30,740,382	$0.22
2007-2009	55,562	$0.23	95,549,924	$0.20
2010-2011	192,301	$0.16	76,326,551	$0.37
2012	164,846	$0.36	25,813,134	$0.39
2013	5,249,567	$0.19	8,359,998	$0.27
2014	1,230,311	$0.26	19,327,085	$0.30
2015	2,108,337	$0.23	5,339,292	$0.29
2016*	610,783	$0.17	14,736,843	$0.49
1994-2016 Average	444,245	$0.19	26,759,950	$0.19

*2016 landings are preliminary

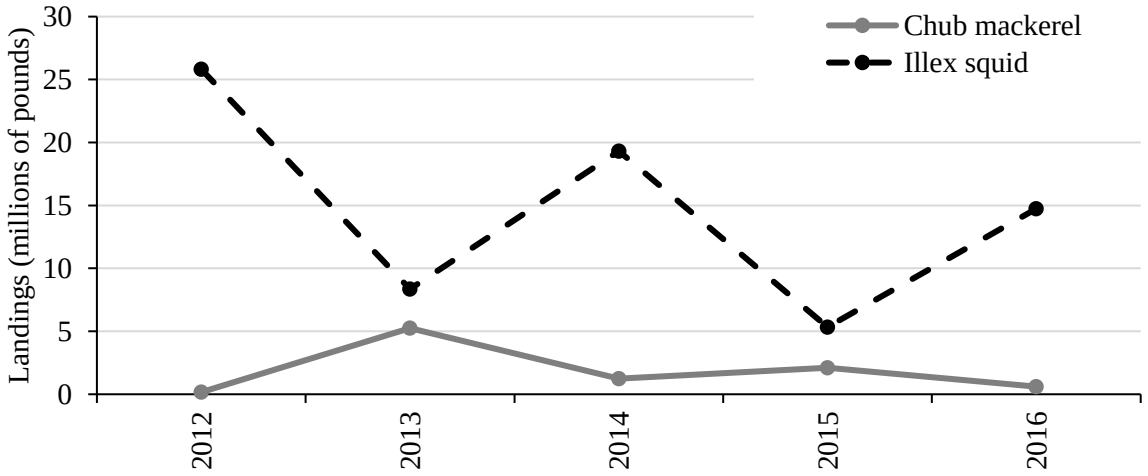

Figure 1: Landings of chub mackerel and Illex squid from 2012 through 2016, as shown in northeast commercial dealer data. 2016 values are preliminary.

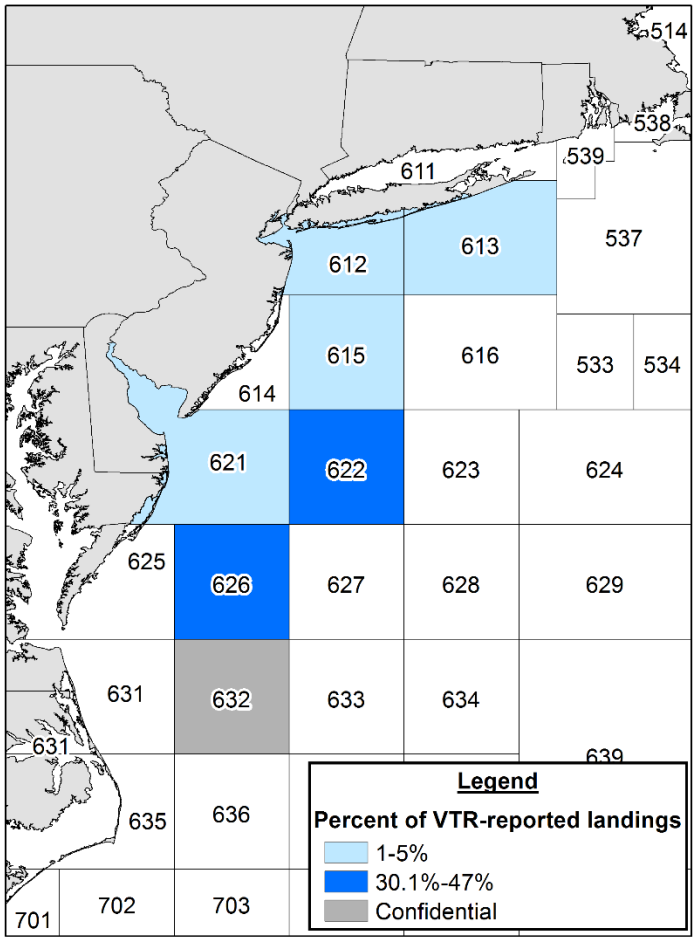

Figure 2: Percent of commercial chub mackerel landings (by weight) by statistical area, 1996-2016 as shown on Vessel Trip Reports. Data for statistical areas accounting for less than 1% of landings are not shown. Landings from statistical area 632 are confidential because they are associated with fewer than three vessels and/or dealers; however, they accounted for less than 30% of overall landings.

Existing management measures

The Council developed a set of management measures for chub mackerel through the Unmanaged Forage Omnibus Amendment.[12] Once implemented (expected mid-2017), these will be the first management measures for Atlantic chub mackerel in the U.S. These measures include an annual landings limit of 2.86 million pounds, which will apply to all commercial landings of chub mackerel by federally-permitted vessels throughout the Mid-Atlantic and New England. Once this limit is reached, commercial fishing vessels will be restricted to a 40,000 pound possession limit in Mid-Atlantic federal waters. This possession limit will only come into effect once the annual landings limit is met and will only apply to vessels fishing in Mid-Atlantic federal waters. The landings and possession limit are not expected to result in a reduction in landings compared to recent levels (table 1).

These measures are temporary and will expire three years after they are implemented. The Council plans to complete development of this amendment within three years so that new measures can be implemented prior to expiration of the temporary measures.

7) Types of Management Measures Which May Be Considered

Section 4 summarizes examples of required and discretionary management measures which the Council may consider through this amendment. These measures are described in more detail below.

Required Measures

The Magnuson-Stevens Fishery Conservation and Management Act requires the following management measures for stocks that are managed as stocks in the fishery.

Annual catch limits

Annual catch limits are implemented to ensure that overfishing does not occur. Annual catch limits account for both landings and discards.

Acceptable biological catch (ABC) recommendations from the Council's Scientific and Statistical Committee (SSC) serve as the upper bounds for annual catch limits; Councils cannot set annual catch limits that exceed the ABCs recommended by the SSC. The SSC typically derives ABCs from stock assessment model outputs in combination with the Council's risk policy. The Council's risky policy defines the acceptable probability of overfishing based on stock size such that the lower the stock size, the lower the acceptable risk of overfishing. ABCs typically represent the overfishing limit (OFL; which is based on the concept of maximum sustainable yield) reduced to account for scientific uncertainty and the Council's risk policy (*Figure 3*). In some cases, an OFL cannot be derived from a stock assessment and the SSC uses other methods to recommend an ABC. In these cases, the ABC still serves as the upper limit for the annual catch limit.

The Council may choose to set annual catch limits equal to the respective ABCs, or they may set them at lower levels to account for biological, ecological, social, or economic factors. For

[12] More information is available at: http://www.mafmc.org/actions/unmanaged-forage

example, the Council's Ecosystem Approach to Fisheries Management Guidance Document suggests that, to account for the important role of forage species in the ecosystem, the Council may consider using more restrictive catch limits for forage species than is otherwise required.

In some of the Council's fishery management plans, the annual catch limit is divided among different sectors of a fishery (e.g. commercial and recreational sectors).

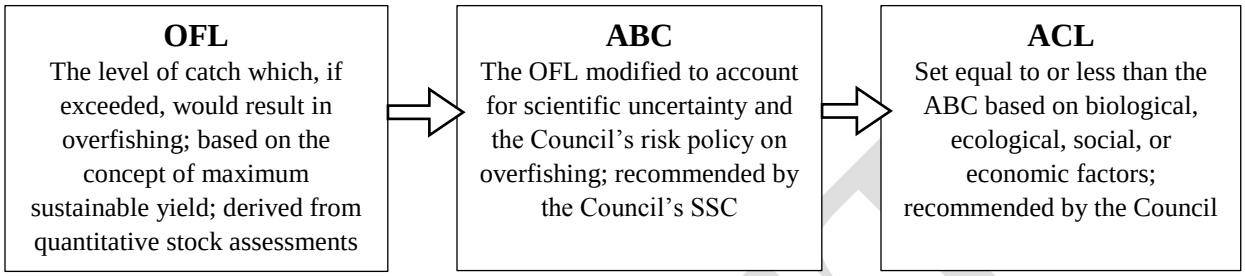

Figure 3: Schematic of the process for developing annual catch limits.

Accountability measures

Accountability measures are measures that are automatically implemented when annual catch limits are exceeded. They are intended to mitigate the negative biological impacts of annual catch limit overages and can help prevent overages from reoccurring in subsequent years.

Accountability measures can include fishery closures, gear restrictions, deductions of overages from a subsequent year's catch or landings limit, and/or adjustments to possession limits, fishing seasons, or minimum fish size limits in subsequent years. Accountability measures may be proactive or reactive.

Essential fish habitat descriptions

The Magnuson-Stevens Fishery Conservation and Management Act defines essential fish habitat (EFH) as those waters and substrates necessary to fish for spawning, breeding, feeding, or growth to maturity. Councils must describe and identify EFH for each managed species and must also describe and identify adverse impacts on EFH from fishing and other activities. The National Marine Fisheries Service uses EFH designations when consulting with federal agencies on ways to avoid or minimize adverse effects of various activities on fish habitat. EFH designations are also used in review of Council actions and are also sometimes used to review state actions.

Definition of the management unit

"Management unit" refers to a fishery or a portion of a fishery that is subject to a set of regulations in a fishery management plan. The management unit defines the geographic area over which a set of regulations applies. The management unit should, to the extent practical, cover the geographic range of the species or stock.

Discretionary Measures

Other management measures are not explicitly required by the Magnuson-Stevens Fishery Conservation and Management Act, but may be necessary to prevent overfishing and promote long-term stability of the fishery. Some of these measures are described below.

Permit requirements

Federal commercial fishing permits are typically required to fish for, possess, or land any Council-managed species. Federal permits also typically require that vessels sell their landings to a federally-permitted dealer. Federal recreational permits are required for certain party or charter vessels.

Reporting requirements

Owners/operators of vessel issued federal fishing permits are typically required to maintain logs of estimates of catch and landings for each trip, regardless of target or retained species.

Limited access provisions

Limited access provisions limit participation in a fishery to those satisfying certain eligibility criteria. For example, fishermen may need to demonstrate a certain volume of past landings of a species to qualify for a permit to continue fishing for that species. Limited access provisions are used to regulate effort and capacity in a fishery. They can also be used to ensure that those with a vested interest in the fishery maintain some rights to continue fishing when restrictions on fishing effort are deemed necessary. Most, but not all, of the commercial fisheries managed by the Council are limited access fisheries.

Annual catch targets specific to the commercial and/or recreational sectors

The Magnuson-Stevens Fishery Conservation and Management Act requires annual catch limits (described on pages 11-12) for managed species. Councils may develop annual catch targets at their discretion. All the Council's fishery management plans include provisions for annual catch targets. Annual catch targets are set equal to annual catch limits, or are reduced from the annual catch limits to account for management uncertainty. The magnitude of the reduction is determined at the Council's discretion with input from advisory bodies, including the Council's Monitoring Committees.

Annual catch targets can help prevent a fishery from exceeding the annual catch limit. As previously described, catch in excess of the annual catch limit requires use of accountability measures to mitigate the negative biological impacts of such overages (see page 12). Annual catch targets can help reduce the likelihood of accountability measures being triggered.

Landings limits (e.g. commercial quotas, recreational harvest limits)

Annual catch limits and annual catch targets include both landings and discards. Landings limits, usually in the form of commercial quotas and/or recreational harvest limits, account only for landings. Landings limits are typically derived from annual catch limits or targets by subtracting expected levels of discards. When landings limits are reached, the fishery typically closes for the

remainder of the fishing year. Landings can usually be accounted for more accurately than catch (i.e. landings and discards).

Possession limits

Possession limits are limits on the amount (e.g. pounds) of a species that an individual may legally possess at a time. Possession limits can help regulate the pace of landings, which can help ensure that annual landings limits are not exceeded.

Minimum fish size restrictions

Minimum fish size restrictions prohibit retention of fish smaller than a certain size. These restrictions are intended to minimize catch of fish which have not yet had a chance to spawn. Minimum fish size limits are typically set at a length at which most individuals are sexually mature.

Gear restrictions

Gear restrictions can include restrictions on the type of gear that can be legally used in a fishery and requirements for certain gear configurations (e.g. minimum mesh sizes, hook sizes, turtle excluder devices, escape panels, etc.). Councils can develop gear restrictions for an entire fishery, for certain sectors of a fishery, or for certain areas and/or seasons. Gear restrictions are typically aimed at minimizing catch of undersized (typically juvenile) individuals and/or non-target species. They can also help to minimize interactions between fishing gear and protected species and to minimize damage to sensitive physical habitats caused by fishing gear.

Seasonal closures

Seasonal closures are regularly occurring fishery closures during certain times of year. Seasonal closures can be used to protect spawning fish, to minimize catch of non-target species, or to minimize interactions between fishing gear and protected species.

Control dates

Control dates are used to define the potential participants in a management program based on fishing activities prior to that date. For example, the Council can specify that individuals must demonstrate a certain level of landings prior to the control date to qualify for participation in a limited access program (page 13).

8) Next Steps

Figure 4 illustrates the major steps in development of a fishery management plan amendment. Scoping is the initial phase of information gathering and public comment, after which the Council will evaluate potential management alternatives. There will be several additional opportunities for public input on development of these management alternatives. Announcements of relevant public meetings will be posted to the Council's website (www.mafmc.org).

The Council will develop a draft amendment with a range of management alternatives for public review. The Council will also prepare a draft environmental impacts analysis as required by the

National Environmental Policy Act. This analysis will be subject to review and public comment as appropriate.

After development and consideration of management alternatives and environmental analysis, the Council will choose preferred management measures for submission to the National Marine Fisheries Service for review and consideration for approval. Approved management measures will be implemented through publication of proposed and final rules in the *Federal Register*, which will include additional public comment periods.

While there will be many additional opportunities for public comment on this amendment, the scoping period is particularly important for assisting the Council in establishing the overall focus and direction of the amendment.

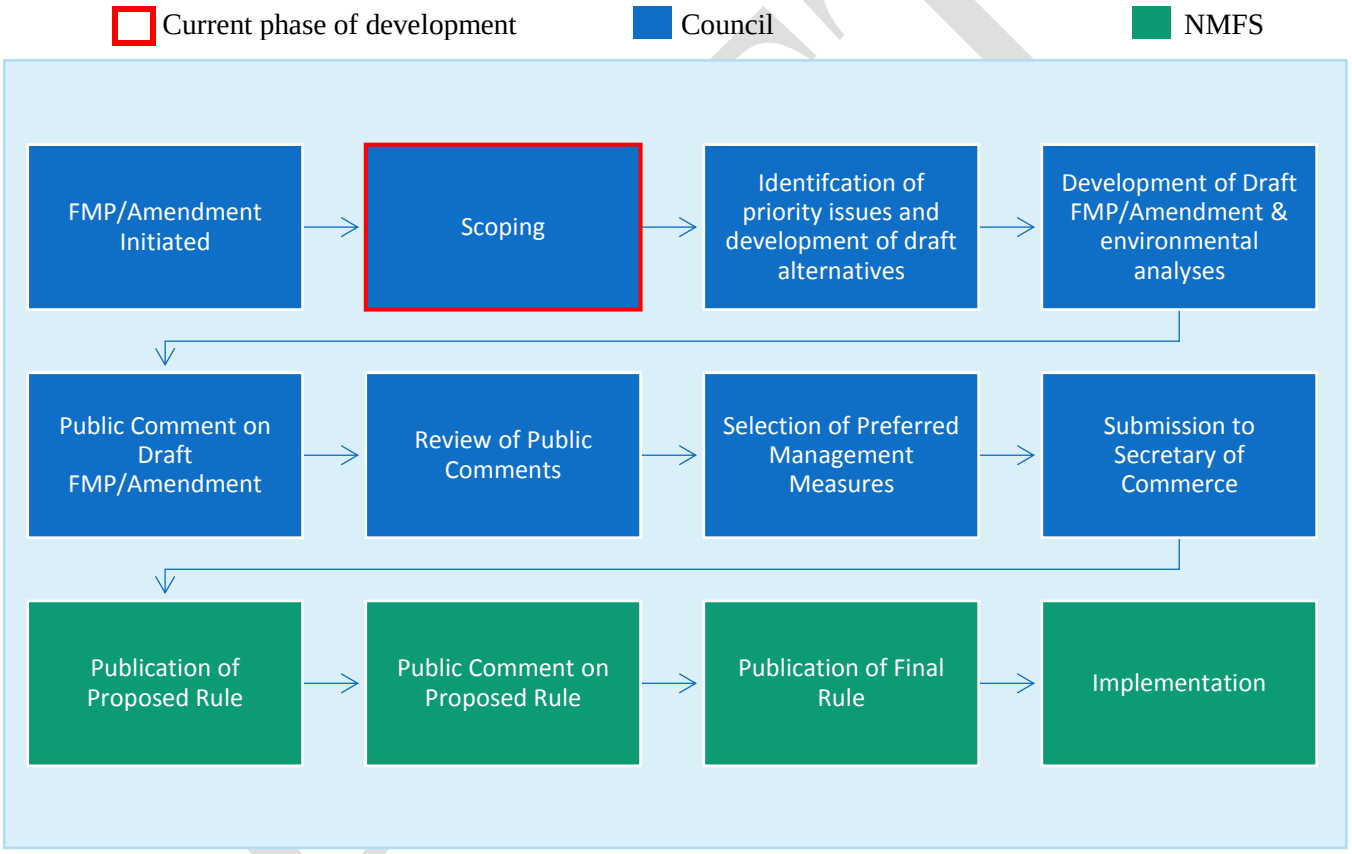

Figure 4: General process for development of a fishery management plan amendment. Items in blue are the responsibility of the Council. Items in green are the responsibility of the National Marine Fisheries Service (NMFS).

9) References

Berrien, P. L. 1978. Eggs and larvae of *Scomber scombrus* and *Scomber japonicus* in continental shelf waters between Massachusetts and Florida. *Fishery Bulletin*. 76(1):95-115.

Carvalho, N., R. G. Perrotta, and E. Isidro. 2002. Age, growth and maturity in the chub mackerel (*Scomber japonicus* Houttuyn, 1782) from the Azores. *Arquipélago Life and Marine Sciences.* 19A: 93-99.

Catanese, G., M. Manchado, and C. Infante. 2010. Evolutionary relatedness of mackerels of the genus *Scomber* based on complete mitochondrial genomes: Strong support to the recognition of Atlantic *Scomber colias* and Pacific *Scomber japonicus* as distinct species. *Gene*. 452(2010):35-43.

Collette, B. B. and C. E. Nauen. 1983. FAO species catalogue. Vol. 2 Scombrids of the word: An annotated and illustrated catalogue of tunas, mackerels, bonitos, and related species known to date. Available at: http://www.fao.org/docrep/009/ac478e/ac478e00.htm

Collette, B. B. 1999. Mackerels, Molecules, and Morphology. In: *Proceedings of the 5th Indo-Pacific Fish Conference, Nouméa 1997.* (B. Séret and J. Y. Sire eds.). pp. 149-164. Société Fraçaise D'Ichtyologie, Paris.

Collette, B. B and G. Klein-MacPhee, editors. 2002. *Bigelow and Schroeder's Fishes of the Gulf of Maine*, third edition. Smithsonian Institution Press. Washington, D.C.

Crone, P. R. and K. T. Hill. 2015. Pacific mackerel (*Scomber japonicus*) stock assessment for USA management in the 2015-16 fishing year. Report to Pacific Fishery Management Council. NOAA Fisheries Southwest Fisheries Science Center. La Jolla, CA. 135 pp.

Espiñeira, M., N. Gonzalez-Lavín, J. M.Vieites, and F. J. Santaclara. 2009. Development of a method for the identification of scombroid and common substitute species in seafood products by *FINS*. *Food Chemistry*. 117(2009):698-704.

Goode, G. B. 1884. The food fishes of the U.S. part 3: natural history of useful aquatic animals. In: *The Fisheries and Fishery Industries of the United States.* U.S. Government Printing Office. Washington, D.C. Available at: http://celebrating200years.noaa.gov/rarebooks/fisheries/welcome.html

Hernández, J. J. C. and A. T. S. Ortega. 2000. Synopsis of biological data on the chub mackerel (*Scomber japonicus* Houttuyn, 1782). FAO Fisheries Synopsis No. 157.

Infante, C, E. Blanco, and E. Zuasti. 2007. Phylogenetic differentiation between Atlantic *Scomber colias* and Pacific *Scomber japonicus* based on nuclear DNA sequences. *Genetica.* 130:1-8.

Krivospitchenko, S.G. 1979. Mackerel *Scomber japonicus* of the Saharan littoral region. Meeting of the Ad Hoc Working Group on West African Coastal Pelagic Fish from Mauritania to Liberia. Dakar, Senegal. June 19, 1978. FAO Fisheries Department, Rome. Available at: http://www.fao.org/docrep/003/N0952E/n0952e0t.htm

Lorenzo, J. M., J. G. Pajuelo, and A. G. Ramos. 1995. Growth of the chub mackerel *Scomber japonicus* (Pisces: Scombridae) off the Canary Islands. *Scientia Marina.* 59(3-4):287-291.

Martins, M. M., D. Skagen, V. Marques, J. Zwolinski, and A. Silva. 2013. Changes in the abundance and spatial distribution of the Atlantic chub mackerel (*Scomber colias*) in the pelagic ecosystem and fisheries off Portugal. *Scientia Marina.* 77(4): 551-563.

Perrotta, R. G., N. Carvalho, and E. Isidro. 2005. Comparative study on growth of chub mackerel (*Scomber japonicus* Houttuyn, 1782) from three different regions: NW Mediterranean, NE and SW Atlantic. *Rev. Invest. Desarr. Pesq.* 17: 67-79.

Richardson, D. E., J. K. Llopiz, C. M. Guignard, and R. K. Cowen. 2010. Larval assemblages of large and medium-sized pelagic species in the Straits of Florida. *Progress in Oceanography*. 86(2010):8-20.

Scoles, D. R., B. B. Collette, and J. E. Graves. 1998. Global phylogeography of mackerels of the genus *Scomber*. *Fishery Bulletin.* 96: 823-842.

Vasconcelos, J., M. Afonso-Dias, and G. Faria. 2012. Atlantic chub mackerel (*Scomber colias*) spawning season, size and age at first maturity in Madeira waters. *Arquipélago Life and Marine Sciences*. 29:43-51.

Sever, T. M., B. Bayhan, M. Bilecenoglu, and S. Mavili. 2006. Diet composition of the juvenile chub mackerel (*Scomber japonicus*) in the Aegean Sea (Izmir Bay, Turkey). *Journal of Applied Ichthyology*. 22(2006):145-148.

Smith, L. A., J. S. Link, S. X. Cadrin, and D. L. Palka. 2015. Consumption by marine mammals on the Northeast U.S. continental shelf. *Ecological Applications.* 25(5):373-389.

Velasco, E. M., J. D. Arbol, J. Baro, and I. Sobrino. 2011. Age and growth of the Spanish chub mackerel *Scomber colias* off southern Spain: a comparison between samples from the NE Atlantic and the SW Mediterranean. *Revista de Biolgía Marina y Oceanografía.* 46(1):27-34.

Chub Mackerel Amendment
Draft Action Plan
(updated 3/23/2017)

Amendment Goal

Through this amendment, the Council will consider adding Atlantic chub mackerel (*Scomber colias*) to the Atlantic Mackerel, Squids, and Butterfish Fishery Management Plan with catch limits, accountability measures, and other conservation and management measures required for stocks in the fishery. This action is needed to achieve optimum yield for, and prevent overfishing of, Atlantic chub mackerel off the U.S. east coast.

Fishery Management Action Team

The Council formed a team of technical experts, known as a Fishery Management Action Team (FMAT) to develop and analyze management alternatives for this amendment. The FMAT is led by Council staff and includes management partners from the National Marine Fisheries Service (NMFS) Greater Atlantic Regional Fisheries Office (GARFO) and the Northeast Fisheries Science Center (NEFSC). The FMAT will work with other experts to address specific issues, as needed.

FMAT Membership		
Name	**Role/Expertise**	**Agency**
Julia Beaty	FMAT Chair	MAFMC
Douglas Christel	Fisheries management	NMFS GARFO
Dr. John Manderson	Habitat ecology and cooperative research	NEFSC
Katie Richardson	NEPA	NMFS GARFO
Alison Verkade	Habitat	NMFS GARFO

Management Measures Considered

The Magnuson-Stevens Fishery Conservation and Management Act (MSA) lists several required provisions of FMPs for stocks that are in the fishery. Required management measures to be considered by the FMAT include:

- Annual catch limits (ACLs) specified in relation to acceptable biological catch limits (ABCs) recommended by the Council's Scientific and Statistical Committee (SSC)
- Accountability measures (AMs) for when the ACLs are exceeded
- Essential fish habitat (EFH) designations
- Definition of the management unit (i.e. the geographic extent of management)

The FMAT may also consider measures not explicitly required by the MSA, but which may be necessary to prevent overfishing and promote long-term stability of the fishery. These measures could include, but not limited to:

- Permit requirements
- Limited access
- Commercial and/or recreational annual catch targets (ACTs)
- Commercial quotas
- Recreational harvest limits
- Possession limits
- Commercial and/or recreational minimum fish size restrictions
- Gear restrictions
- Reporting requirements
- Commercial and/or recreational fishing seasons

Affected Fisheries

This amendment will affect targeted commercial chub mackerel fisheries and, depending on the management measures considered, may also affect fisheries which catch chub mackerel incidentally (e.g. the *Illex* squid fishery) and recreational chub mackerel fisheries.

Applicable Laws

Name of law	**Applicable to this action?**
Magnuson-Stevens Act	Yes
National Environmental Policy Act	Yes – will require an Environmental Assessment or Environmental Impact Statement
Administrative Procedure Act	Yes
Regulatory Flexibility Act	Yes
Paperwork Reduction Act	Possibly; depends on data collection needs
Coastal Zone Management Act	Possibly; depends on effects of the action on the resources of the coastal states in the management unit
Endangered Species Act	Possibly; level of consultation will depend on the actions taken
E.O. 12866 (Regulatory Planning and Review)	Yes
E.O. 12630 (Takings)	Possibly; legal review will confirm
E.O. 13123 (Federalism)	Possibly; legal review will confirm
Information Quality Act	Yes

Draft Timeline for Amendment Development and Implementation

Task Description	**Date** (subject to change)
Initiation (approval date for 2017 implementation plan)	December 2016
Formation of FMAT	February 2017
Council meeting - discuss timeline	February 2017
SSC meeting - discuss available data and possible approaches to developing ABCs	March 2017
Initial FMAT analysis	April - June 2017
Council meeting - review scoping plan, SSC recommendations (if any), and alternative development	April 2017
Scoping hearings/scoping comment period	May 4-31, 2017
Contract work on status determination criteria	June 2017 – January 2018
Further FMAT analysis and development of alternatives	July 2017 - April 2018
AP meeting - review scoping comments and FMAT recommendations, develop recommendations for alternatives	Late November or early December 2017
Committee meeting - review scoping comments, FMAT recommendations, and AP input; develop recommendations for alternatives	December 2017
Council meeting - review scoping comments, and FMAT, AP, and Committee recommendations; discuss management alternatives	December 2017
SSC meeting - recommend ABCs	March 2018
Council meeting - approve range of alternatives for public hearings, adopt ABC	April 2018
Public hearings	May or June 2018
AP meeting - recommendations for final action	July 2018
Committee meeting - recommendations for final action	August 2018
Council meeting - final action	August 2018
Submission of draft EA/EIS to GARFO	November 2018
Draft EA/EIS revisions and resubmission	January 2019
Rulemaking (proposed rule)	Spring 2019
Rulemaking (final rule)	Summer 2019