

**AMENDMENT 3 TO THE
FISHERY MANAGEMENT PLAN
FOR THE
ATLANTIC MACKEREL, SQUID, AND BUTTERFISH FISHERIES**

October 1990

**Mid-Atlantic Fishery Management Council
in cooperation with the
National Marine Fisheries Service
New England Fishery Management Council
and the
South Atlantic Fishery Management Council**

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2. SUMMARY

The Amendment is intended to bring the Fishery Management Plan for the Atlantic Mackerel, Squid, and Butterfish Fisheries (FMP) into compliance with the guidelines in 50 CFR 602 which require that every FMP include a definition of overfishing. The FMP modified by this Amendment was implemented on 1 April 1983. The Amendment does not change the MSYs, OYs, or quota setting process and, therefore, does not alter the FMP's consistency with any national standard.

The management unit is all Atlantic mackerel, *Loligo pealei*, *Illex illecebrosus*, and butterfish under US jurisdiction, excluding the Gulf of Mexico and the Caribbean Sea.

The objectives of the FMP are:

1. Enhance the probability of successful (i.e., the historical average) recruitment to the fisheries.
2. Promote the growth of the US commercial fishery, including the fishery for export.
3. Provide the greatest degree of freedom and flexibility to all harvesters of these resources consistent with the attainment of the other objectives of this FMP.
4. Provide marine recreational fishing opportunities, recognizing the contribution of recreational fishing to the national economy.
5. Increase understanding of the conditions of the stocks and fisheries.
6. Minimize harvesting conflicts among US commercial, US recreational, and foreign fishermen.

Overfishing Definitions

Atlantic mackerel

Overfishing is defined as the catch of Atlantic mackerel exceeding the annual quota for the species. The provision of the FMP concerning setting annual quotas prevents overfishing.

Loligo, *Illex*, and butterfish

For every short lived and highly volatile fishery populations such as squids and butterfish, the analytical basis for defining spawning biomass thresholds or harvesting rates that buffer against recruitment overfishing has generally not been evaluated. In the absence of reliable analytical methods for computing such reference points, we define overfishing to occur based on a heuristic model relating recruitment time series data to subsequent fishery production and spawning biomasses.

For purposes of meeting the 602 Guidelines, overfishing for *Loligo pealei* is defined as occurring when the three year moving average of pre-recruits from the Northeast Fisheries Center's autumn bottom trawl survey (mid-Atlantic to Georges Bank) falls within the lowest quartile of the time series (1967 to present). This means, for example, that when the 1990 index is available (and thus a 24 year time series exists) that the sixth lowest annual index will be compared to the average of the 1988, 1989 and 1990 indices. If the three year average is below the sixth lowest index, overfishing will be defined as occurring. Quotas for this species are set annually by the Regional Director according to the FMP. Annual quotas can be set within the range of 0 to 44,000 metric tons (MSY estimate) based upon information prepared by the Council and included in the SAFE document. This overfishing definition meets the provisions of 602.11(c)(5) in that it:

- (1) has sufficient scientific merit;
- (2) is likely to result in effective action to prevent overfishing;
- (3) provides a basis for objective measurement; and
- (4) is operationally feasible.

For purposes of meeting the 602 Guidelines, overfishing for *Illex illecebrosus* is defined as occurring when the three year moving average of pre-recruits from the Northeast Fisheries

Center's autumn bottom trawl survey (mid-Atlantic to Georges Bank) falls within the lowest quartile of the time series (1968 to present). Quotas for this species are set annually by the Regional Director according to the FMP. Annual quotas can be set within the range of 0 to 30,000 metric tons (MSY estimate minus a 10,000 metric ton ecological set aside) based upon information prepared by the Council and included in the SAFE document.

For purposes of meeting the 602 Guidelines, overfishing for butterfish is defined as occurring when the three year moving average of pre-recruits from the Northeast Fisheries Center's autumn bottom trawl survey (mid-Atlantic to Georges Bank) falls within the lowest quartile of the time series (1968 to present). Quotas for this species are set annually by the Regional Director according to the FMP. Annual quotas can be set within the range of 0 to 16,000 metric tons (MSY estimate) based upon information prepared by the Council and included in the SAFE document.

Such definitions have as their main assumption that in periods of sustained poor recruitment (a 3-year moving average of years) spawning stock and thus fishable biomass will decline. In order to reduce the harvest rate of spawners during periods of low spawning biomass, allowable landings (relative to the historical average as the basis for MSY and ABC calculations) will thus be reduced.

An analysis of the overfishing definition relative to the NMFS guidelines (50 CFR 602) is presented in section 9.2.2.

The alternative to the adopted FMP is discussed in Appendix 1 of the Amendment.

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4. INTRODUCTION

4.1. HISTORY OF DEVELOPMENT OF THE FMP

In March, 1977, the Council initiated development of the Mackerel and Squid FMPs. The Council adopted the Mackerel FMP for hearings in September 1977 and the Squid FMP for hearings in October 1977. Hearings on Mackerel and Squid FMPs were held in December, 1977. The Mackerel and Squid FMPs were adopted by the Council in March 1978. The Mackerel FMP was submitted for NMFS approval in May 1978. The Squid FMP was submitted for NMFS approval in June 1978. However, based on NMFS comments, the Council requested that the Mackerel and Squid FMPs be returned.

The FMPs were revised, the revisions being identified as Mackerel FMP Supplement 1 and Squid FMP Supplement 1. These two Supplements, along with the original Butterfish FMP, were adopted for public hearings by the Council in July of 1978. Hearings on all three documents were held during September and October 1978 and all three FMPs were adopted in final form by the Council in November 1978. The Butterfish FMP was submitted for NMFS approval in December 1978. Mackerel FMP Supplement 1 and Squid FMP Supplement 1 were submitted for NMFS approval in January 1979. NMFS approved Squid FMP Supplement 1 in June 1979 and Mackerel FMP Supplement 1 in July 1979. Both FMPs were for fishing year (1 April - 31 March) 1979-80.

The Butterfish FMP was disapproved by NMFS in April 1979 because of a need for additional justification of the reasons for reducing OY below MSY. The Butterfish FMP was revised, adopted by the Council, and resubmitted for NMFS approval in June 1979. It was approved by NMFS in November 1979 for fishing year 1979-80.

The Council adopted Amendments 1 to both the Mackerel and Squid FMPs for hearings in August 1979. Hearings were held during October 1979. The Amendments were adopted by the Council and submitted for NMFS approval in November 1979. Both Amendments were approved by NMFS in March 1980. This extended the Squid FMP for an indefinite time beyond the end of fishing year 1979-80 and extended the Mackerel FMP through fishing year 1980-81. Butterfish FMP Amendment 1, extending the FMP through fishing year 1980-81, was adopted by the Council for hearings in December 1979 with hearings held during January 1980. During January 1980 the Amendment was adopted in final form by the Council and submitted for NMFS approval. It was approved in March 1980.

The Council began work on an amendment to merge the Mackerel, Squid, and Butterfish FMPs in March 1980, the document being identified as Amendment 2 to the Mackerel, Squid, and Butterfish FMP. The Amendment was adopted by the Council for public hearings in August 1980. However, NMFS commented that there were significant problems with the Amendment that could not be resolved prior to the end of the fishing year (31 March 1981). The Council then prepared separate Amendments 2 to both the Mackerel and Butterfish FMPs to extend those FMPs through fishing year 1981-82. Since Amendment 1 to the Squid FMP extended that FMP indefinitely, there was no need to take this action for the Squid FMP. Those drafts were adopted for public hearing by the Council in October 1980 with hearings held in November. The Amendments were adopted in final form by the Council and submitted for NMFS approval in November 1980. Amendment 2 to the Mackerel FMP was approved by NMFS in January 1981 and Amendment 2 to the Butterfish FMP was approved by NMFS in February 1981.

In October 1980 the merger amendment, previously designated as Amendment 2, was redesignated Amendment 3. The Council adopted draft Amendment 3 to the Squid, Mackerel, and Butterfish FMP in July 1981 and hearings were held during September. The Council adopted Amendment 3 in October 1981 and submitted it for NMFS approval. NMFS review identified the need for additional explanation of certain provisions of the Amendment. The revisions were made and the revised Amendment 3 was submitted for NMFS approval in February 1982.

The Amendment was approved by NMFS in October 1982. However, problems developed with the implementation regulations, particularly with the Office of Management and Budget through that agency's review under Executive Order 12291. In an effort to have the FMP in place by the beginning of the fishing year (1 April 1983) the FMP, without the squid OY adjustment mechanism, or a revised Atlantic mackerel mortality rate, and redesignated as the Atlantic Mackerel, Squid, and Butterfish FMP, was implemented by emergency interim regulations on 1 April 1983. By agreement of the Secretary of Commerce and the Council, the effective date of those emergency regulations was extended through 27 September 1983.

The differences between the FMP and the implementing regulations resulted in a hearing before the House Subcommittee on Fisheries and Wildlife Conservation and the Environment on 10 May 1983.

Amendment 1 to the Atlantic Mackerel, Squid, and Butterfish FMP was prepared to implement the squid OY adjustment mechanism and the revised mackerel mortality rate. That Amendment was adopted by the Council on 15 September 1983, approved by NMFS on 19 December 1983, and implemented by regulations published in the Federal Register on 1 April 1984.

Amendment 2 was adopted by the Council on 19 September 1985 and approved by NOAA 6 March 1986. Amendment 2 changed the fishing year to the calendar year, revised the squid bycatch TALFF allowances, put all four species on a framework basis, and changed the fishing vessel permits from permanent to annual.

This Amendment 3 was adopted by the Council in two actions. The Atlantic mackerel overfishing definition was adopted by the Council at its October 1990 meeting. The *Loligo, Illex*, and butterfish overfishing definitions were adopted at the December 1990 meeting. This was done because the Northeast Fisheries Center proposed changes to the overfishing definitions proposed in the hearing draft for the squids and butterfish. The Center's concerns were incorporated in the version adopted at the December 1990 meeting.

4.2. PROBLEM FOR RESOLUTION

4.2.1. Introduction

National standard 1 [301(a)(1)] of the Magnuson Fishery Conservation and Management Act (MFCMA) provides "Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry." The National Marine Fisheries Service (NMFS) interpretation of standard 1 is set forth in 50 CFR 602.11 (54 FR 30711-30880). The procedural part of 602.11(c) provides:

(9) After February 25, 1991 all new and existing FMPs should contain a definition of overfishing for the stock or stock complex managed under the affected FMP.

(i) An FMP or amendment being developed and not yet adopted as final by the Councils at the time these guidelines become effective should contain a definition of overfishing when submitted for approval by the Secretary.

(ii) On or before 21 November 1989, Councils should examine each existing FMP as amended and notify the Regional Director if, in the opinion of the Council, the FMP is currently consistent with the provisions of paragraph 602.11(c) without amendment. Within 90 days of notification, the Secretary will review any such FMP for consistency with paragraph 602.11(c), and notify the Council of concurrence or disagreement.

(iii) On or before November 23, 1990, an amendment should be prepared and submitted to the Secretary for all existing FMPs not approved under paragraph (b)(9)(ii) of this section to add a definition of overfishing for the stock or stock complex managed under the affected FMP.

Mid-Atlantic Fishery Management Council concluded that the Atlantic Mackerel, Squid, and Butterfish FMP was currently consistent with the provisions of paragraph 602.11(c) without amendment and submitted that determination to the Northeast Regional Director of NMFS in October 1989 (Bryson pers. comm.). The Council's position was that, while the FMP did not include an explicit definition of overfishing, the provisions of the FMP assured the conservation of the resource such that overfishing was not an issue. The Regional Director's final ruling (Roe pers. comm.) was:

I do not disagree with your contention that the Mackerel, Squid, and Butterfish FMP prevents overfishing. However, Washington has asked that, as a matter of policy, an explicit statement defining overfishing be included in all management plans. For this reason, I would appreciate it if you would draft a non-regulatory amendment and forward it for approval.

The Council has therefore, prepared this Amendment.

The substantive provisions of 602.11(c) are:

(c) **Overfishing.** (1) Overfishing is a level or rate of fishing mortality that jeopardizes the long-term capacity of a stock or stock complex to produce MSY on a continuing basis. Each FMP must specify, to the maximum extent possible, an objective and measurable definition of overfishing for each stock or stock complex covered by that FMP, and provide an analysis of how the definition was determined and how it relates to reproductive potential.

(2) The definition of overfishing for a stock or stock complex may be developed or expressed in terms of a minimum level of spawning biomass ("threshold"); maximum level or rate of fishing mortality; or formula, model, or other measurable standard designed to ensure the maintenance of the stock's productive capacity. Overfishing must be defined in a way to enable the Council and the Secretary to monitor and evaluate the condition of the stock or stock complex relative to the definition.

(3) Different fishing patterns can produce a variety of effects on local and areawide abundance, availability, size, and age composition of a stock. Some of these fishing patterns have been called "growth", "localized", or "pulse" overfishing; however, these patterns are not necessarily overfishing under the national standard 1 definition, which focuses on recruitment and long-term reproductive capacity. (Also see paragraph (c)(6)(v) of this section and Appendix A to Subpart B of this part.)

(4) Overfishing definitions must be based on the best scientific information available. Councils must build into the definition appropriate consideration of risk, taking into account uncertainties in estimating domestic harvest, stock conditions, or the effects of environmental factors (see section 602.16 of this part). In cases where scientific data are severely limited, the Councils' informed judgment must be used, and effort should be directed to identifying and gathering the needed data (see sections 602.12 and 605.14 of this part).

(5) Secretarial approval or disapproval of the overfishing definition will be based on consideration of whether the proposal:

(i) Has sufficient scientific merit;

(ii) Is likely to result in effective Council action to prevent the stock from closely approaching or reaching an overfished status;

(iii) Provides a basis for objective measurement of the status of the stock against the definition; and

(iv) Is operationally feasible.

(6) In addition to a specific definition of overfishing for each stock or stock complex, an FMP must contain management measures necessary to prevent overfishing.

(i) If overfishing is defined in terms of a threshold biomass level, the Council must ensure that fishing effort does not cause spawning biomass to fall and remain below that threshold.

(ii) If overfishing is defined in terms of a maximum fishing mortality rate, the Council must ensure that fishing effort on that stock does not cause the maximum rate to be exceeded.

(iii) If data indicate that an overfished condition exists, a program must be established for rebuilding the stock over a period of time specified by the Council and acceptable to the Secretary.

(iv) If data indicate that a stock or stock complex is approaching an overfished condition, the Council should identify actions or combination of actions to be undertaken in response.

(v) Depending on the objectives of a particular FMP and the specific definition of overfishing established for the stock or stock complex under management, a Council may recommend measures to prevent or permit pulse, localized, or growth overfishing. (See Appendix A to Subpart B of this part for explanatory material.)

(7) Significant adverse alterations in environment/habitat conditions increase the possibility that fishing effort will contribute to a stock collapse. Care should be taken to identify the cause of any downward trends in spawning stock sizes or average annual recruitment. (See Appendix A to Subpart B of this part for discussion of indicators of existing or impending overfishing.)

(i) Whether these trends are caused by environmental changes or by fishing effort, the only direct control provided by the Act is to reduce fishing mortality.

(ii) Unless the Council asserts, as supported by appropriate evidence, that reduced fishing effort would not alleviate the problem, the FMP must include measures to reduce fishing mortality regardless of the cause of the low population level.

(iii) If man-made environmental changes are contributing to the downward trend, in addition to controlling effort Councils should recommend restoration of habitat and other ameliorative programs, to the extent possible, and consider whether to take action under section 302(i) of the Act.

(8) There are certain limited exceptions to the requirement of preventing overfishing. Harvesting the major component of a mixed fishery at its optimum level may result in the overfishing of a minor (smaller or less valuable) stock component in the fishery. A Council may decide to permit this type of overfishing if it is demonstrated by analysis (paragraph (f)(5) of this section) that it will result in net benefits to the Nation, and if the Council's action will not cause any stock to require protection under the Endangered Species Act (ESA).

Atlantic mackerel, *Loligo pealei*, *Illex illecebrosus*, and butterfish each have their own quota setting parameters (section 9.1). All four species are managed through quantified MSYs, OYs, and quotas. Since all four species were combined in the FMP because they were underutilized at the time of implementation of the FMP and had Total Allowable Levels of Foreign Fishing (TALFFs), management measures include formulas for calculating bycatch TALFFs. Additionally, the FMP includes a provision for closure of the US fishery when 80% of the year's quota (Domestic Annual Harvest; DAH) is taken.

4.3. MANAGEMENT OBJECTIVES (this section is unchanged from the current FMP)

The objectives of the FMP are:

1. Enhance the probability of successful (i.e., the historical average) recruitment to the fisheries.
2. Promote the growth of the US commercial fishery, including the fishery for export.
3. Provide the greatest degree of freedom and flexibility to all harvesters of these resources consistent with the attainment of the other objectives of this FMP.
4. Provide marine recreational fishing opportunities, recognizing the contribution of recreational fishing to the national economy.
5. Increase understanding of the conditions of the stocks and fisheries.
6. Minimize harvesting conflicts among US commercial, US recreational, and foreign fishermen.

4.4. MANAGEMENT UNIT (this section is unchanged from the current FMP)

The management unit is all Atlantic mackerel, *Loligo pealei*, *Illex illecebrosus*, and butterfish under US jurisdiction, excluding the Gulf of Mexico and the Caribbean Sea.

5. DESCRIPTION OF STOCKS

There is no need to change this section of the FMP at this time.

6. HABITAT

There is no need to change this section of the FMP at this time.

7. DESCRIPTION OF FISHING ACTIVITIES

There is no need to change this section of the FMP at this time.

8. DESCRIPTION OF ECONOMIC CHARACTERISTICS OF THE FISHERY

There is no need to change this section of the FMP at this time.

9. FISHERY MANAGEMENT PROGRAM

9.1. MEASURES TO ATTAIN MANAGEMENT OBJECTIVES

9.1.1. Specification of ABC, OY, DAH, DAP, JVP, and TALFF

9.1.1.1. General (this section is unchanged from the current FMP)

The fishing year is 1 January - 31 December. OY, ABC, IOY, DAH, DAP, JVP, and TALFF will be specified annually through an administrative process which requires that the Regional Director (RD), in consultation with the Council, prepare the required estimates as described below for *Loligo*, *Illex*, Atlantic mackerel, and butterfish, and also provide for public comment on those estimates. The estimates will be prepared annually, however, as discussed below, and for certain species may be changed during the year. The ABC is set within the OY range based on biological information and becomes the upper limit for OY for the particular year and may not be changed during a year. The initial DAH for any of the species may be adjusted during any fishing year by increases within the OY range if actual catches by US vessels exceed the initial DAH estimates.

It is possible that a US/Canadian bilateral fisheries agreement may be developed and implemented during the life of the FMP. In order for the FMP to remain valid following such an agreement, and to the extent that the species included in this FMP are jointly managed pursuant to such an agreement, all of the allowable catch levels are conditioned so that the allowable catch levels would be developed as provided in the FMP or would be the US share of the total catch of the species allowed by joint management procedures, whichever is less. If the US share of the catch was less than the allowable catch level calculated pursuant to the FMP in any year, the allowable catch level would be reduced by reducing the TALFF by the appropriate amount, unless the TALFF was only for bycatch that year.

9.1.1.2. Overfishing Definitions

9.1.1.2.1. Atlantic mackerel

Overfishing is defined as the catch of Atlantic mackerel exceeding the annual quota for the species. The provision of the FMP concerning setting annual quotas prevents overfishing.

9.1.1.2.2. *Loligo*, *Illex*, and butterfish

For every short lived and highly volatile fishery populations such as squids and butterfish, the analytical basis for defining spawning biomass thresholds or harvesting rates that buffer against recruitment overfishing has generally not been evaluated. In the absence of reliable analytical methods for computing such reference points, we define overfishing to occur based on a heuristic model relating recruitment time series data to subsequent fishery production and spawning biomasses.

For purposes of meeting the 602 Guidelines, overfishing for *Loligo pealei* is defined as occurring when the three year moving average of pre-recruits from the Northeast Fisheries Center's autumn bottom trawl survey (mid-Atlantic to Georges Bank) falls within the lowest quartile of the time series (1967 to present). This means, for example, that when the 1990 index is available (and thus a 24 year time series exists) that the sixth lowest annual index will be compared to the average of the 1988, 1989 and 1990 indices. If the three year average is below the sixth lowest index, overfishing will be defined as occurring. Quotas for this species are set annually by the Regional Director according to the FMP. Annual quotas can be set within the range of 0 to 44,000 metric tons (MSY estimate) based upon information prepared by the Council and included in the SAFE document. This overfishing definition meets the provisions of 602.11(c)(5) in that it:

- (1) has sufficient scientific merit;
- (2) is likely to result in effective action to prevent overfishing;
- (3) provides a basis for objective measurement; and
- (4) is operationally feasible.

For purposes of meeting the 602 Guidelines, overfishing for *Illex illecebrosus* is defined as occurring when the three year moving average of pre-recruits from the Northeast Fisheries Center's autumn bottom trawl survey (mid-Atlantic to Georges Bank) falls within the lowest quartile of the time series (1968 to present). Quotas for this species are set annually by the Regional Director according to the FMP. Annual quotas can be set within the range of 0 to 30,000 metric tons (MSY estimate minus a 10,000 metric ton ecological set aside) based upon information prepared by the Council and included in the SAFE document.

For purposes of meeting the 602 Guidelines, overfishing for butterfish is defined as occurring when the three year moving average of pre-recruits from the Northeast Fisheries Center's autumn bottom trawl survey (mid-Atlantic to Georges Bank) falls within the lowest quartile of the time series (1968 to present). Quotas for this species are set annually by the Regional Director according to the FMP. Annual quotas can be set within the range of 0 to 16,000 metric tons (MSY estimate) based upon information prepared by the Council and included in the SAFE document.

Such definitions have as their main assumption that in periods of sustained poor recruitment (a 3-year moving average of years) spawning stock and thus fishable biomass will decline. In order to reduce the harvest rate of spawners during periods of low spawning biomass, allowable landings (relative to the historical average as the basis for MSY and ABC calculations) will thus be reduced.

9.1.1.3. *Loligo* (this section is unchanged from the current FMP)

The maximum OY for *Loligo* is 44,000 mt. The RD in consultation with the Council, determines annual specifications relating to Initial Optimum Yield (IOY), Domestic Annual Harvest (DAH), Domestic Annual Processing (DAP), Joint Venture Processing (JVP), and Total Allowable Level of Foreign Fishing (TALFF). The RD reviews yearly the most recent biological data pertaining to the stock. If the RD determines that the stock cannot support a level of harvest equal to the maximum OY, he establishes a lower Allowable Biological Catch (ABC) for the fishing year. This level represents essentially the modification of the maximum sustainable yield (MSY) to reflect changed biological circumstances. If the stock is able to support a harvest level equivalent to the maximum OY, the ABC is set at that level.

From the ABC, the RD, in consultation with the Council, determines the IOY for the fishing year. The IOY represents a modification of ABC, based on economic factors. It is intended to provide the greatest overall benefit to the nation by incorporating all relevant factors. The IOY is composed of an initial DAH and initial TALFF. The RD projects the DAH by reviewing the data concerning past domestic landings, projected amounts of *Loligo* necessary for domestic processing and for joint ventures during the fishing year, and other data pertinent for such a projection. The Joint Venture Processing (JVP) component of DAH is the portion of DAH which domestic processors either cannot or will not use. In assessing the level of IOY, the RD provides for a TALFF of at least a minimum bycatch of *Loligo* squid that would be harvested incidentally in other directed fisheries. This bycatch level is 1.0% of the allocated portion of the *Illex*, 0.04% of the allocated portion of the mackerel (if a directed fishery is allowed), and 0.5% of the allocated portions of the silver and red hake TALFFs. In addition, this specification of IOY is based on the application of the following factors:

1. total world export potential by squid producing countries;
2. total world import demand by squid consuming countries;
3. US export potential based on expected US harvests, expected US consumption, relative prices, exchange rates, and foreign trade barriers;
4. increased/decreased revenues to the US from foreign fees;
5. increased/decreased revenues to US harvesters (with/without joint ventures);
6. increased/decreased revenues to US processors and exporters;
7. increases/decreases in US harvesting productivity due to decreases/increases in foreign harvest;
8. increases/decreases in US processing productivity; and
9. potential impact of increased/decreased TALFF on foreign purchases of US products and services and US caught fish, changes in trade barriers, technology transfer, and other considerations.

Proposed annual specifications of the ABC and IOY and its component amounts are published in the *Federal Register* and provide for a public comment period. At the close of the public comment period, a notice of final annual specifications with the reasons therefore are published in the *Federal Register*.

The IOY may be adjusted by the RD, in consultation with the Council, upward to the ABC at any time during the fishing year. An adjustment may be made to IOY to accommodate DAH needs, including when the application of the above factors warrants an adjustment in TALFF. However, TALFF may not be adjusted to a quantity less than that already allocated to and accepted by foreign nations or less than that needed for bycatch. Any adjustments to the IOY are published in the *Federal Register* and may provide for a public comment period.

9.1.1.4. *Illex* (this section is unchanged from the current FMP)

The maximum OY for *Illex* is 30,000 mt. The RD, in consultation with the Council, determines annual specifications relating to IOY, DAH, DAP, JVP, and TALFF. The RD reviews yearly the most recent biological data pertaining to the stock. If the RD determines that the stock cannot support a level of harvest equal to the maximum OY, he establishes a lower ABC for the fishing year. If the stock is able to support a harvest level equivalent to the maximum OY, the ABC is set at that level.

From the ABC, the RD, in consultation with the Council, determines the IOY for the fishing year. The IOY represents a modification of ABC, based on economic factors. It is intended to provide the greatest overall benefit to the nation by incorporating all relevant factors. The IOY is composed of an initial DAH and initial TALFF. The RD determines the IOY and any adjustments by the same procedures and factors set out above for *Loligo*, except that it provides for a minimum bycatch of *Illex* squid that would be harvested incidentally in other directed fisheries. This bycatch level is 10.0% of the allocated portion of the *Loligo* TALFF and 0.2% of the allocated portions of the silver and red hake TALFFs. In addition, this specification of IOY is based on the application of the factors listed above under *Loligo*.

9.1.1.5. Atlantic Mackerel (this section is unchanged from the current FMP)

The RD, in consultation with the Council, determines annual specifications relating to IOY, DAH, DAP, JVP, and TALFF. The Council and RD review yearly the best available biological data pertaining to the stock. ABC in US waters for the upcoming fishing year is that quantity of mackerel that could be caught in US and Canadian waters (T) minus the estimated catch in Canadian waters (C) and maintain a spawning stock size (S) in the year following the year for which catch estimates and quotas are being prepared equal to or greater than 600,000 mt.

From the ABC, the RD, in consultation with the Council, determines the IOY for the fishing year. The IOY represents a modification of ABC, based on biological and economic factors. It is intended to provide the greatest overall benefit to the nation by incorporating all relevant factors. Ordinarily, IOY will be specified so that the fishing mortality rate associated with T is less than or equal to $F_{0.1}$. However, if development of the US fishery requires a fishing mortality rate greater than $F_{0.1}$, but still less than or equal to ABC, IOY may be set at the higher level. This modification will be for that fishing year only and will revert to $F_{0.1}$ unless modified again in subsequent years. Such development requirements are intended to be limited to catch by US fishermen for US processing and to such over the side joint ventures and directed foreign fishing as has a clear and significant (not token) benefit to the US fishery in terms of increases in the amount of US harvested and processed mackerel. The deviation from $F_{0.1}$ is intended to allow the US fishing industry the opportunity to market additional mackerel into the world market during high demand periods such as may occur if a stock problem with the northeastern European Atlantic mackerel stocks developed. Determining these allocations involves estimating both the US and foreign harvesting potential.

The IOY is composed of an initial DAH and initial TALFF. The RD projects the DAH by reviewing data concerning past domestic landings, projected amounts of mackerel necessary for domestic processing and for joint ventures during the fishing year, and other data pertinent for such a projection. The recreational fishery component of DAH is determined by the equation $Y = (0.01)(X) - (166)$ where Y is the predicted recreational catch and X is the mackerel spawning stock size in the upcoming fishing year, in metric tons. The JVP component of DAH is the portion of DAH which domestic processors either cannot or will not use. In assessing the level of IOY, the RD must provide for a TALFF of at least a minimum bycatch of mackerel that would be harvested incidentally in other directed fisheries. This bycatch level is 0.4% of the allocated portion of the silver and red hake, 1.0% of the allocated portion of the *Loligo*, and 0.1% of the allocated portion of the *Illex* TALFFs. In addition, this specification of IOY is based on such criteria as contained in the Magnuson Act, specifically section 201(e), and the application of the following factors:

1. total world export potential by mackerel producing countries;
2. total world import demand by mackerel consuming countries;
3. US export potential based on expected US harvests, expected US consumption, relative prices, exchange rates, and foreign trade barriers;
4. increased/decreased revenues to the US from foreign fees;
5. increased/decreased revenues to US harvesters (with/without joint ventures);
6. increased/decreased revenues to US processors and exporters;

7. increases/decreases in US harvesting productivity due to decreases/increases in foreign harvest;
8. increases/decreases in US processing productivity; and
9. potential impact of increased/decreased TALFF on foreign purchases of US products and services and US caught fish, changes in trade barriers, technology transfer, and other considerations.

Proposed annual specifications of the ABC and IOY and its component amounts are published in the *Federal Register* and provide for a public comment period. At the close of the public comment period, a notice of final annual specifications with the reasons therefore are published in the *Federal Register*.

The IOY may be adjusted by the RD, in consultation with the Council, upward to the ABC at any time during the fishing year. An adjustment may be made to IOY to accommodate DAH needs, including when the application of the above factors warrants an adjustment in TALFF. However, TALFF may not be adjusted to a quantity less than that already allocated to and accepted by foreign nations or less than that needed for bycatch. Any adjustments to the IOY are published in the *Federal Register* and may provide for a public comment period.

The specification of mackerel OY, DAH, DAP, and TALFF is:

ABC = allowable biological catch in US waters for the upcoming fishing year.

T = total catch in all waters (US and Canadian) for the upcoming fishing year.

C = estimated mackerel catch in Canadian waters for the upcoming fishing year.

S = mackerel spawning stock biomass in the year after the upcoming fishing year.

Bycatch = 0.4% of the allocated portion of the silver and red hake, 1.0% of the allocated portion of the *Loligo*, and 0.1% of the allocated portion of the *Illex* TALFFs.

ABC = T - C such that S greater than or = 600,000 mt.

OY less than or = ABC and additionally, ordinarily, the fishing mortality associated with OY less than or = $F_{0.1}$.

DAH less than or = OY - Bycatch.

DAP less than or = OY - Bycatch.

TALFF greater than or = Bycatch.

9.1.1.6. Butterfish (this section is unchanged from the current FMP)

Butterfish maximum OY is 16,000 mt. The RD in consultation with the Council, determines annual specifications relating to IOY, DAH, DAP, JVP, and TALFF. The RD reviews yearly the most recent biological data, including data on discards, pertaining to the stock. If the RD determines that the stock cannot support a level of harvest equal to the maximum OY, he establishes a lower ABC for the fishing year. This level represents essentially the modification of the MSY to reflect changed biological circumstances. If the stock is able to support a harvest level equivalent to the maximum OY, the ABC is set at that level.

From the ABC, the RD, in consultation with the Council, determines the IOY for the fishing year. The IOY represents a modification of ABC. The IOY is composed of an initial DAH and initial TALFF. The RD projects the DAH by reviewing the data concerning past domestic landings, projected amounts of butterfish necessary for domestic processing and for joint ventures during the fishing year, and other data pertinent for such a projection. The JVP component of DAH is the portion of DAH which domestic processors either cannot or will not use. In assessing the level of IOY, the RD provides for a bycatch TALFF equal to 3.0% of the allocated portion of the *Loligo* TALFF and 0.5% of the allocated portion of the *Illex*, 0.08% of the allocated portion of the Atlantic mackerel, and 0.1% of the allocated portion of the silver and red hake TALFFs. Note that the nine factors considered in establishing IOY for the squids and mackerel do not apply for butterfish because the butterfish TALFF is established for bycatch only in accordance with the preceding percentages.

Proposed annual specifications of the ABC and IOY and its component amounts are published in the *Federal Register* and provide for a public comment period. At the close of the public comment period, a notice of final annual specifications with the reasons therefore are published in the *Federal Register*.

The IOY may be adjusted by the RD, in consultation with the Council, upward to the ABC at any time during the fishing year. An adjustment may be made to IOY to accommodate DAH needs. However, TALFF may not

be adjusted to a quantity less than that needed for bycatch. Any adjustments to the IOY are published in the *Federal Register* and may provide for a public comment period.

The precise specification of OY is:

ABC less than or = 16,000 mt.

OY less than or = ABC.

DAH less than or = OY - bycatch.

DAP less than or = OY - bycatch.

TALFF = bycatch = 3.0% of the allocated portion of the *Loligo* TALFF and 0.5% of the allocated portion of the *Illex*, 0.08% of the allocated portion of the Atlantic mackerel, and 0.1% of the allocated portion of the silver and red hake TALFFs.

9.1.2. Specification of management measures (this section is unchanged from the current FMP)

9.1.2.1. Permits and fees

Any owner or operator of a vessel desiring to take any Atlantic mackerel, squid, or butterfish within the FCZ, or transport or deliver for sale, any Atlantic mackerel, squid, or butterfish taken within the FCZ must obtain an annual permit for that purpose. Each foreign vessel engaged in or wishing to engage in harvesting the TALFF must obtain a permit from the Secretary of Commerce as specified in the Act. This section does not apply to recreational fishermen taking Atlantic mackerel, squid, or butterfish for their personal use, but it does apply to the owners of party and charter boats (vessels for hire).

The owner or operator of a US vessel may obtain the appropriate permit by furnishing on the form provided by NMFS information specifying, at least, the names and addresses of the vessel owner and master, the name of the vessel, official number, directed fishery or fisheries, gear type or types utilized to take Atlantic mackerel, squid, or butterfish, gross tonnage of vessel, radio call sign, length of the vessel, engine horsepower, year the vessel was built, type of construction, type of propulsion, navigational aids (e.g., Loran C), type of echo sounder, crew size including captain, fish hold capacity (to the nearest 100 lbs), quantity of *Loligo*, *Illex*, mackerel, and butterfish landed during the year prior to the one for which the permit is being applied, principal port of landing, and the home port of the vessel. The permit shall be subject to inspection by an authorized official upon landing.

Permits expire on 31 December of each year. Permits may be revoked for violations of this FMP.

9.1.2.2. Time and area restrictions

Foreign nations fishing for Atlantic mackerel, squid or butterfish shall be subject to the time and area restrictions in 50 *CFR* 611.50 and the fixed gear avoidance regulations in 50 *CFR* 611.50(e).

9.1.2.3. Catch limitations

9.1.2.3.1. General

The fishing year for Atlantic mackerel, *Illex*, *Loligo*, and butterfish is the twelve (12) month period beginning 1 January.

The specification of OYs and other values for the squids, Atlantic mackerel, and butterfish are described in Section 9.1.1 and need not be repeated here. On an annual basis, the RD, in consultation with the Council, and after giving opportunity for public notice and comment, sets initial annual values for the terms specified in Section 9.1.1.

On or before 15 October of each year, the Council will prepare and submit recommendations to the RD of the initial annual amounts for the fishing year beginning 1 January, based on information gathered from sources including: (1) results of a survey of domestic processors and joint venture operators of estimated processing capacity and intent to use that capacity; (2) results of a survey of fishermen's trade associations of estimated fish harvesting capacity and intent to use that capacity; (3) landings and catch statistics; (4) stock assessments; and (5) any other relevant scientific information.

By 1 November each year, the Secretary will publish a notice in the *Federal Register* that specifies preliminary initial amounts of OY, DAH, DAP, JVP, and TALFF for each species. The amounts will be based on information submitted by the Council and from relevant sources including those sources specified above. In the absence of a Council report, the amounts will be based on information from the sources specified and other informa-

tion considered appropriate by the RD. The *Federal Register* notice will provide for a comment period. The Council's recommendation and all relevant data will be available in aggregate form for inspection at the office of the RD during the public comment period.

On or before 15 December of each year, the Secretary will make a final determination of the initial amounts for each species, considering all relevant data and any public comments and will publish a notice of the final determination and response to public comments in the *Federal Register*.

Additional adjustments may be made to annual values for OY, DAH, and TALFF for the *Loligo*, *Illex*, mackerel, and butterfish fisheries during the year. The RD, in consultation with the Council, may modify these values up to ABC, applying the factors described in Section 9.1.1, for the benefit of the nation. The Secretary will publish a notice in the *Federal Register* and provide for comment before such revisions may take effect.

NMFS shall close the US fishery for *Loligo*, *Illex*, mackerel, or butterfish when US fishermen have harvested 80% of the allowable domestic harvest if such closure is necessary to prevent the allowable domestic harvest from being exceeded. The closure will be in effect for the remainder of the fishing year. If such a closure is necessary, NMFS will provide adequate notice to US fishermen and to the Executive Directors of the New England, Mid-Atlantic, and South Atlantic Fishery Management Councils. During a period of closure, the trip limit for the species for which the fishery is closed is 10% of the weight of the total amount of fish on board.

9.1.2.3.2. Joint ventures

The Amendment continues the procedure of permitting joint ventures on a case-by-case basis, so long as joint ventures do not result in a negative impact on US processors. The Council believes that this is a reasonable approach. In other words, joint ventures are considered on a case-by-case basis for Atlantic mackerel, *Illex*, *Loligo*, and butterfish and are permitted if such joint ventures would not have a negative impact on the development of the US harvesting and processing sectors.

9.1.2.4. Types of vessels, gear, and enforcement devices

Foreign nations fishing for Atlantic mackerel, squid, or butterfish are subject to the gear restrictions set forth in 50 *CFR* 611.1.50(c).

9.1.2.5. Other measures

Each US fishing vessel shall display its official number on the deckhouse or hull and on an appropriate weather deck. Foreign fishing vessels shall display their International Radio Call Signs (IRCS) on the deckhouse or hull and on an appropriate weather deck. The identifying markings shall be affixed and shall be of the size and style established by NMFS. Fishing vessel means any boat, ship or other craft which is used for, equipped to be used for, or of a type which is normally used for, fishing, except a scientific research vessel. Fishing vessel includes vessels carrying fishing parties on a per capita basis or by charter which catch Atlantic mackerel, squid, or butterfish for any use.

Vessels conducting fishing operations pursuant to this FMP are subject to the sanctions provided for in the Act.

Pursuant to Section 204(b)(12) of the MFCMA, if any foreign fishing vessel for which a permit has been issued has been used in the commission of any act prohibited by section 307 of the MFCMA the Secretary may, or if any civil penalty imposed under section 309 of the MFCMA has not been paid and is overdue the Secretary shall: (a) revoke such permit, with or without prejudice to the right of the foreign nation involved to obtain a permit for such vessel in any subsequent year; (b) suspend such permit for the period of time deemed appropriate; or (c) impose additional conditions and restrictions on the approved application of the foreign nation involved and on any permit issued under such application, provided, however, that any permit which is suspended pursuant to this paragraph for nonpayment of a civil penalty shall be reinstated by the Secretary upon payment of such civil penalty together with interest thereon at the prevailing US rate. Foreign nations fishing for Atlantic mackerel, squid, or butterfish are subject to the incidental catch regulations set forth in 50 *CFR* 611.13, 611.14, and 611.50.

No foreign fishing vessel operator, including those catching Atlantic mackerel, squid, or butterfish for use as bait in other directed fisheries, shall conduct a fishery for mackerel, squid, or butterfish outside the areas designated for such fishing operations in this FMP.

9.1.3. Specification and sources of pertinent fishery data (this section is unchanged from the current FMP)

The butterfish fishery is approaching or possibly exceeding a safe harvest rate due to fishing practices and annual variations in stock distribution. The squids are being taken to a greater extent by US fishermen each year and TALFFs are rapidly diminishing such that it is expected that there may be no directed foreign fishing within the next two years. The markets are certainly available in the US and abroad for US utilization of total quotas. The Council now needs more timely data than in the past to allow a more accurate accounting of changing fishing practices and to allow the setting of annual allocations that will prevent recruitment overfishing as well as allowing for in season adjustments.

The Magnuson Act (303(a)(5)) requires that FMPs "specify the pertinent data which shall be submitted to the Secretary with respect to the fishery, including, but not limited to, information regarding the type and quantity of fishing gear used, catch by species in numbers of fish or weight thereof, areas in which fishing was engaged in, time of fishing, number of hauls ... ". NMFS data systems (e.g., the NEFC Three-Tier System) collect much information on the squid, mackerel, and butterfish fisheries and the reporting procedures in this FMP are based on those systems continuing in operation and being revised so that vessel identification information is retained in the data files in a manner that facilitates necessary analyses.

Foreign fishermen are subject to the reporting and recordkeeping requirements set forth in 50 CFR 611.9.

9.2. ANALYSIS OF BENEFICIAL AND ADVERSE IMPACTS OF ADOPTED MANAGEMENT MEASURES

9.2.1. The FMP Relative to the National Standards

9.2.1.1. Conservation and management measures shall prevent overfishing while achieving, on a continuous basis, the optimum yield from each fishery

The best scientific information available indicates that squid, mackerel, and butterfish are not currently overfished. Harvests at the OY levels described in the FMP should not endanger future harvests at comparable levels. Overfishing has been defined (section 9.1.1.2). The provisions of the FMP concerning setting annual quotas prevents overfishing. An analysis of the overfishing definition relative to the NMFS guidelines (50 CFR 602) is presented in section 9.2.2.

9.2.1.2. Conservation and management measures shall be based upon the best scientific information available

The FMP is based on the best and most recent scientific information.

9.2.1.3. To the extent practicable, an individual stock of fish shall be managed as a unit throughout its range, and interrelated stocks of fish shall be managed as a unit or in close coordination

The FMP meets the requirements of this standard by simultaneously managing Atlantic mackerel, *Loligo, Illex*, and butterfish in a complementary manner. The FMP also takes into account the catch of mackerel outside US waters. The Council continues to review data on the squid and butterfish fisheries in the Gulf of Mexico to determine whether the management unit should be amended in the future to include this area.

9.2.1.4. Conservation and management measures shall not discriminate between residents of different States. If it becomes necessary to allocate or assign fishing privileges among various United States fishermen, such allocation shall be (A) fair and equitable to all such fishermen; (B) reasonably calculated to promote conservation; and (C) carried out in such a manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges

The OY and DAH estimates described in the FMP will accommodate all US demand for squid, Atlantic mackerel, and butterfish in the commercial and recreational fisheries without prejudice to residents of any State. The seasonal movements and distributions of these species make it extremely unlikely that fishermen of any State could harvest the DAH before the species become available to other US fishermen.

9.2.1.5. Conservation and management measures shall, where practicable, promote efficiency in the utilization of the fishery resources; except that no such measure shall have economic allocation as its sole purpose

The FMP permits growth of the US fishery up to maximum biological levels. The only restrictions placed on US fishermen are the overall quotas, and the permitting requirement. No measures would change the economic structure of the industry or the economic conditions under which the industry operates.

9.2.1.6. Conservation and management measures shall take into account and allow for variations and contingencies in, fisheries, fishery resources, and catches

The FMP anticipates fluctuations in species abundance and expected trends in demand for mackerel, the squids, and butterfish.

9.2.1.7. Conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication

The FMP is consistent with and complements, but does not duplicate, management measures contained in other FMPs and PMPs.

9.2.2. Overfishing definition relative to 50 CFR 602.119(c)

Since the Amendment is only an attempt to have the FMP comply with 50 CFR 602, and there is no change to the implementing regulations, there are no costs and benefits except the cost of preparing and processing the Amendment.

With this Amendment, the Atlantic Mackerel, Squid, and Butterfish FMP is consistent with the definition provisions of 602.11(c) and continues to prevent overfishing. MSYs are quantified based on the best scientific information available. Maximum OYs are set at or below MSY. These are modified annually through ABCs, which may not be greater than the maximum OYs for the squids and butterfish or at generally accepted fishing mortality rates coupled with a minimum spawning stock size for Atlantic mackerel. The $F_{0.1}$ maximum level for mackerel is, by definition, designed to prevent overfishing. Before commercial quotas are set, there is a calculation of the anticipated recreational catch of Atlantic mackerel, which is then treated as a further deduction prior to setting commercial quotas (there are no significant recreational fisheries for the squids or butterfish). There is a further accounting for bycatch in any allowed foreign fishery. The quota setting process is reproduced as Section 9.1.1 of this Amendment.

With regard to maximum sustainable yield (MSY), NMFS guidance is provided in Appendix A to Subpart B of section 602:

Much of the past controversy concerning MSY has related to its adequacy as a management goal. As used in the Act, however, calculation of MSY is only a baseline step in the overall process of determining OY. Recognizing that MSY must represent the underlying biological rationale for determination of OY in a variety of fisheries, the guidelines set forth a flexible framework for its calculation. Recognition of the need for flexibility in calculation MSY has come as a result of FMP review experience and Council innovation in adapting this concept to the characteristics of different fisheries

It is clear that every attempt should be made to satisfy the Act's requirement for specification of MSY. However, there may be cases where scarcity of data or tentativeness of scientific understanding renders MSY specification impossible, or where biological resiliency or high fecundity of some stocks or other fishery characteristic may allow OY to become a descriptive statement only--making a numerical calculation of MSY unnecessary. In such cases, NOAA believes that Congressional intent is served if OY derives from the best biological information available, e.g., the proportional abundance of associated species. Descriptive OYs should be convertible to annual numerical estimates for the purpose of deriving the total allowable level of foreign fishing (TALFF).

As a subsequent step in the process of determining OY, MSY may be adjusted (deviated from) for economic, social, or ecological reasons. One type of adjustment is illustrated by the concept of biologically acceptable catch (ABC), used by some Councils. ABC is an annually determined number that may be set lower or higher than MSY for a number of reasons, e.g., to take advantage of abnormally high recruitment, to allow rebuilding of stocks, or to be conservative when there are inadequate data on the status of the stocks.

The FMP follows this exactly for the two squids and butterfish and quite closely for Atlantic mackerel. The MSYs, as specified in the FMP are:

Loligo

Sissenwine and Tibbetts (1977) estimated MSY at about 44,000 mt, based on the assumptions of a moderate stock-recruitment relationship and an annual recruitment of about 1.5 billion individuals. Lange *et al.* (1984) examined the results of yield per recruit (YPR) analyses for *L. pealei* in conjunction with a Beverton and Holt (1957) type stock recruitment relationship to obtain estimates of equilibrium yield, as described by Shepherd (1982). By assuming a moder-

ate density dependent relationship between spawning biomass and recruitment, maximum equilibrium yield for an offshore/inshore (typical US/foreign catch pattern since early 1970s) fishery would be 27,900 mt and would occur at an instantaneous rate of fishing mortality (F) equals 0.70. Beyond $F = 0.93$, yield would not be sustainable. For an inshore (traditional US) fishery, the maximum F at which equilibrium yield could occur would also be 0.93, and the maximum equilibrium yield of 33,200 mt would occur at $F = 0.80$. Initial iterations of the Lange et al. (1984) model (Lange, 1983) simulated YPR values of 54,300-54,800 mt from an offshore/inshore fishery and 60,300-66,900 mt from an inshore fishery. It must be noted that these estimates represent long-term averages and do not take into account annual variations caused by environmental factors. Long term potential catch is currently estimated at 44,000 mt (USDC, 1985).

There are no current valid estimates of natural mortality (M) or $F_{0.1}$ (USDC, 1984). Lange (1984) estimated the average fishing mortality (F) during 1978-1981 as 0.41.

Yield analysis for *L. pealei* based on a simulation model described by Lange et al. (1984) provided estimates of YPR at various levels of fishing mortality (F) and average abundance based on different assumptions of squid catchability in the survey trawl. In that analysis, YPR was estimated for two types of fisheries with different exploitation patterns: a dominant offshore winter fishery coupled with a relatively small inshore summer fishery as has existed since the early 1970s (offshore/inshore), and a dominant inshore summer fishery similar to that traditionally conducted by US fishermen with no offshore winter fishery (inshore fishery). Yield per 1,000 recruits at the average level of fishing mortality estimated for 1978-1981 ($F = 0.41$) and assuming 45% catchability (Lange et al., 1984) was 11.8 kg from an offshore/inshore fishery and 13.1 kg from an inshore fishery. Given the range of estimates of long-term yield predicted by the simulation model and the fact that the management regime allows for changes in ABC on an annual basis, there is no reason to change the MSY estimate at this time.

Illex

There are no reliable estimates of stock size nor certainty as to catches of *Illex* until recent years. The MSY of *Illex* was estimated by Anderson (1976) as 40,000 mt. Although much of the biology is currently being described (Section 5.3.2), adequate estimates of natural and fishing mortality and thus YPR or equilibrium yield are not available. Based on a review of the latest stock assessment (Lange, 1984b), there is no reason to change the MSY estimate at this time. However, Lange (1984b) did address the present maximum OY (30,000 mt), which is comparable to the "long-term potential catch" estimated in USDC (1984, 1985).

Atlantic Mackerel

The current MSY estimate is 152,000-182,000 mt, based on the long-term equilibrium yield projections in Anderson (1982). The long-term equilibrium yield has been updated (Anderson 1985) to 134,000-148,000 mt. It is not considered necessary to revise the MSY estimate at this time since the long-term equilibrium yield estimates change and the management regime is not directly related to MSY.

Natural mortality (M) has been estimated at 0.20 based on analysis of catch and effort data (Anderson, 1982). Fishing mortality (F) over the past several years has been estimated as: 0.05 in 1984, 0.06 in 1983, 0.11 in 1982, and averaged 0.08 during 1978-1982. In 1976, F reached a high of 0.74.

$F_{0.1}$ (the fishing mortality rate for a given method of fishing at which the increase in YPR for a small increase in fishing mortality results in only a 10% increase in YPR for the same increase in fishing mortality from a virgin stock) has been estimated for Atlantic mackerel to be equal to 0.29, while F_{max} (the fishing mortality rate which maximizes the harvest in weight taken from a single year class over its entire life span) may be about 0.62 (Anderson, 1985). Simulated long-term equilibrium yields under conditions of constant recruitment at the geometric mean level observed during 1962-1984 and same mean weights at age (1982-1983) and exploitation pattern as existed for the 1978-1983 period, yield values about 134,000 mt ($F_{0.1}$) and about 148,000 mt (F_{max}). Thus, the theoretical Atlantic mackerel YPR curve (Ricker, 1975) is relatively flat topped. In other words, a relatively large amount of fishing effort (the difference between $F_{0.1}$ and F_{max}) would be required in order to increase total catches by a

relatively small amount (the difference between 134,000 and 148,000 mt). This consideration is the primary reason why the practice of limiting catches to the $F_{0.1}$ level was recommended under ICNAF regulation, and why the FMP used it in the determination of OY during years of high abundance.

Anderson (1985) examined the stock recruitment relationship for mackerel and found the relationship between year class size at age 1 and spawning stock biomass that produced that year class indicates a high probability of low spawning stock levels producing poor year classes. Although there is not a distinct separation between levels of spawning stock biomass which have typically produced poor year classes and those which have produced a high proportion of strong year classes, a level of about 700,000 mt appeared appropriate for Anderson. During 1962-1984, the estimated spawning stock biomass was 634,000 mt or less during 15 of those 23 years (averaging 391,000 mt per year) and only 4 of the 15 year classes produced were above median size (740 million fish at age 1). In the remaining 8 years, spawning stock biomass was 721,000 mt or higher (averaging 1,145,000 mt per year) and 7 of the 8 year classes produced were above median size. All year classes were above median size when spawning stock biomass was 763,000 mt or higher.

Anderson (1985) concluded that there seemed to be a stock recruitment relationship sufficient to be of guidance for management purposes. From the standpoint of ensuring a high probability of good recruitment, the existing data base would suggest maintaining a spawning stock biomass of 700,000 mt or higher (7 of the 9 year classes produced when spawning stock biomass was above 600,000 mt were above the median year class also). However, since environmental factors also exert a strong influence on year class size, maintenance of the stock at or above such a level also helps to ensure an adequate and stable resource on which to base a fishery and which will provide a buffer in the event of the production of a poor year class.

The FMP currently contains a minimum spawning stock biomass constraint of 400,000 mt. This level was based on earlier assessment results which, at the time, indicated that 400,000 mt was appropriate. Anderson (1985) believed that, in light of the results of the current assessment, a minimum of 700,000 mt may be more appropriate than 400,000 mt. The Council has chosen a minimum of 600,000 mt since 7 of the 9 year classes produced from that size spawning stock biomass were above the median year class.

Butterfish

A preliminary estimate of MSY was 21,500 mt (Murawski and Waring, 1978). This estimate, however, presupposed certain mesh sizes were used in the fishery and an average level of annual recruitment to the stock. These conditions may not be completely met. Mesh sizes used by foreign and domestic vessels frequently vary from that which theoretically will produce MSY. In addition, the best scientific evidence available indicates that annual recruitment to this fishery is not constant and that the substantial variations in yearly recruitment which have been observed in the past will probably continue.

A realistic estimate of MSY, based on the present mix of gear in the fishery, may be between 15,000-19,000 mt. The best conservative estimate of MSY under current fishery conditions is approximately 16,000 mt. This is the MSY estimate used in the FMP. It is also the "long-term potential catch" projected by USDC (1984). There is no reason to change the estimate at this time since there appear to be sufficient fish available to support a catch up to the maximum currently allowed (USDC, 1985).

The annual instantaneous natural mortality rate (M) for butterfish has been estimated to be 0.8 (Murawski and Waring, 1979). Estimates of fishing mortality (F) on fully recruited fish (age 2 and older) dropped from 2.14 in 1976 to 0.91 in 1977 and then underwent a gradual increase to 1.04 in 1981. Mean F on ages 2 and older dropped sharply to 0.77 in 1982 and declined further to an estimated 0.67 in 1983 (USDC, 1984). No estimates are available for 1984.

Anderson (pers. comm.) ran some computer simulations of catch and stock size assuming a constant level of recruitment and several fishing strategies. The range in fishing strategies included the average exploitation pattern (proportion of fishing mortality at age) at ages 1-4 observed during 1976-1983 with no fishing on age 0 fish and the average exploitation pattern

at ages 0-4 during 1982-1983 which exhibited the highest observed proportions of fishing mortality on both age 0 and age 1. If fishing mortality were maintained at the $F_{0.1} = 1.5$ level, catch would be about 9% less under the strategy of no fishing of age 0 fish, but stock biomass would be about 23% greater. Since butterfish are short lived and have a very high natural mortality rate ($M = 0.80$), delaying the age of first harvest from age 0 to an older age does not lead to higher yields, which would be the case for longer lived species with lower natural mortality rates. The only possible benefit with respect to catch from delaying harvest to an older age would be that a larger size fish would probably command a higher price. There is, however, a benefit to the stock by not harvesting age 0 fish (23% increase in the above example). Assuming that a stock-recruitment relationship exists for butterfish, increasing stock size will improve the spawning potential and hopefully ensure a higher probability of producing good recruitment. In addition, a larger stock would serve as a buffer to help support the fishery in the event of a poor year class recruiting to the stock.

Having established that the FMP contains quantified MSY specifications, the next task is to relate the specification of optimum yield (OY) to MSY.

The FMP (section 9.1.1) specifies *Loligo* OY at up to 44,000 mt, *Illex* OY at up to 30,000 mt, and butterfish OY at up to 16,000 mt. Since the *Loligo* and butterfish maximum OYs equal MSY and the *Illex* maximum OY is 10,000 mt less than MSY, a conservative bias is built into the management system at the first step. MSY is not used as an average around which OY moves, but rather, is used as a maximum that OY does not exceed. For all four species, the annual quota setting process involves an examination of "information gathered from sources including: (1) results of a survey of domestic processors and joint venture operators of estimated processing capacity and intent to use that capacity; (2) results of a survey of fishermen's trade associations of estimated fish harvesting capacity and intent to use that capacity; (3) landings and catch statistics; (4) stock assessments; and (5) any other relevant scientific information" (section 9.1.1).

For both squids and for butterfish, this results in an Allowable Biological Catch (ABC), which may be smaller than, but may not exceed, maximum OY. Therefore, the annual quotas take into account the latest stock conditions as well as habitat considerations as necessary ("other relevant scientific information"). Once set, the ABC may not be changed during a year.

The Atlantic mackerel regime is somewhat more complicated to reflect the stock characteristics of a pelagic schooling species such as mackerel. The two driving parameters in the mackerel system are a minimum spawning stock size of 600,000 mt and a fishing mortality rate of $F_{0.1}$ (as explained above). ABC in US waters for the upcoming fishing year is that quantity of mackerel that could be caught in US and Canadian waters (T) minus the estimated catch in Canadian waters (C) and maintain a spawning stock size (S) in the year following the year for which catch estimates and quotas are being prepared equal to or greater than 600,000 mt. From the ABC, the RD, in consultation with the Council, determines the IOY for the fishing year. The IOY represents a modification of ABC, based on biological and economic factors. It is intended to provide the greatest overall benefit to the nation by incorporating all relevant factors. Ordinarily, IOY will be specified so that the fishing mortality rate associated with T is less than or equal to $F_{0.1}$. However, if development of the US fishery requires a fishing mortality rate greater than $F_{0.1}$, but still less than or equal to ABC, IOY may be set at the higher level. This modification will be for that fishing year only and will revert to $F_{0.1}$ unless modified again in subsequent years. Such development requirements are intended to be limited to catch by US fishermen for US processing and to such over the side joint ventures and directed foreign fishing as has a clear and significant (not token) benefit to the US fishery in terms of increases in the amount of US harvested and processed mackerel. The deviation from $F_{0.1}$ is intended to allow the US fishing industry the opportunity to market additional mackerel into the world market during high demand periods such as may occur if a stock problem with the northeastern European Atlantic mackerel stocks developed. Determining these allocations involves estimating both the US and foreign harvesting potential. Before the annual commercial quota is set, there is an additional calculation to estimate the catch of recreational fishermen (section 9.1).

For all four species, there is a provision that the OY calculation include provision for any foreign bycatch of any of the four species in any directed foreign fisheries during the year. These bycatch allowances are calculated from formulas specified in the FMP (section 9.1).

Finally, the FMP provides (section 9.1.2.3.1): "NMFS shall close the US fishery for *Loligo*, *Illex*, mackerel, or butterfish when US fishermen have harvested 80% of the allowable domestic harvest if such closure is necessary to prevent the allowable domestic harvest from being exceeded. ... During a period of closure, the trip

limit for the species for which the fishery is closed is 10% of the weight of the total amount of fish on board." Clearly, this measure completes the overall conservative bias of the FMP.

While not technically part of the FMP process, annual ABC recommendations are submitted to the Council's Scientific and Statistical Committee prior to presentation to the Council. This procedure is now a requirement of 50 CFR 602.

In light of the above, it is the opinion of the Council that the Atlantic Mackerel, Squid, and Butterfish FMP is consistent with the provisions of paragraph 602.11(c). MSYs are quantified based on the best scientific information available. Maximum OYs are set at or below MSY. These are modified annually through ABCs, which may not be greater than the maximum OYs for the squids and butterfish or at generally accepted fishing mortality rates coupled with a minimum spawning stock size for Atlantic mackerel. The $F_{0.1}$ maximum level for mackerel is, by definition, designed to prevent overfishing. Before commercial quotas are set, there is a calculation of the anticipated recreational catch of Atlantic mackerel, which is then treated as a further deduction prior to setting commercial quotas (there are no significant recreational fisheries for the squids or butterfish). There is a further accounting for bycatch in any allowed foreign fishery. Finally, there is a provision to close any of the fisheries when the catch is 80% of quota and set a 10% trip limit for the balance of the year.

The annual review assures that the Council and NMFS will know if the resources are in danger of being overfished. The annual quota setting and closure procedures assure that overfishing will be prevented. Clearly, the FMP meets national standard 1 and complies with the intent, if not the letter, of 50 CFR 602.11.

The proposed overfishing definition is considered acceptable. It is the same as the definition in Amendment 8 to the Surf Clam and Ocean Quahog FMP, which has already been approved. Both FMPs have virtually identical quota based regimes with framework measures to assure that the annual quotas are based on the most recent stock assessments.

Clearly, the FMP meets national standard 1 and complies with 50 CFR 602.11.

9.3. RELATION OF RECOMMENDED MEASURES TO APPLICABLE LAWS AND POLICIES

9.3.1. FMPs

This Amendment is related to other plans to the extent that all fisheries of the northwest Atlantic are part of the same general geophysical, biological, social, and economic setting. US and foreign fishing fleets, fishermen, and gear often are active in more than a single fishery. Thus regulations implemented to govern harvesting of one species or a group of related species may impact upon other fisheries by causing transfers of fishing effort. Many fisheries of the northwest Atlantic result in significant non-target species fishing mortality on other stocks and as a result of other fisheries. Atlantic mackerel, squid, and butterfish are food items for many commercially and recreationally important fish species, as well as themselves utilizing many finfish and invertebrate species as food items. Furthermore, research programs often provide data on stock size, levels of recruitment, distribution, age, and growth for many species regulated by preliminary fishery management plans, FMPs, and proposed FMPs.

9.3.2. Treaties or international agreements

No treaties or international agreements, other than GIFAs entered into pursuant to the Act, relate to these fisheries. It is possible that a fisheries agreement with Canada will be developed in the future.

9.3.3. Federal law and policies

The US Department of Commerce, acting through the Council, pursuant to the Act, has authority to manage the stocks under US jurisdiction. Foreign fishing for mackerel, squid, and butterfish is regulated by the Act pursuant to which Governing International Fishery Agreements (GIFA) are negotiated with foreign nations for fishing within the FCZ.

While Outer Continental Shelf (OCS) development plans may involve areas overlapping those contemplated for offshore fishery management, no major conflicts have been identified to date. The Council, through involvement in the Intergovernmental Planning Program of the MMS monitors OCS activities and has opportunity to comment and to advise MMS of the Council's activities. Certainly, the potential for conflict exists if communication between interests is not maintained or appreciation of each other's efforts is lacking. Potential conflicts include, from a fishery management position: (1) exclusion areas, (2) adverse impacts to sensitive biologically important areas, (3) oil contamination, (4) substrate hazards to conventional fishing gear, and (5) competition for crews and harbor space. We are not aware of pending deep water port plans which would

directly impact offshore fishery management goals in the areas under consideration, nor are we aware of potential effects of offshore fishery management plans upon future development of deep water port facilities.

9.3.3.1. Marine Mammals and Endangered Species

Numerous species of marine mammals and sea turtles occur in the northwest Atlantic Ocean. The most recent comprehensive survey in this region was done from 1979-1982 by the Cetacean and Turtle Assessment Program (CETAP), at the University of Rhode Island (University of Rhode Island 1982), under contract to the Minerals Management Service (MMS), Department of the Interior. The following is a summary of the information gathered in that study, which covered the area from Cape Sable, Nova Scotia, to Cape Hatteras, North Carolina, from the coastline to 5 nautical miles seaward of the 1000 fathom isobath.

Four hundred and seventy one large whale sightings, 1547 small whale sightings and 1172 sea turtles were encountered in the surveys (Table 1). The "estimated minimum population number" for each mammal and turtle in the area, as well as those species currently included under the Endangered Species Act, were also tabulated.

CETAP concluded that both large and small cetaceans were widely distributed throughout the study area in all four seasons, and grouped the 13 most commonly seen species into three categories, based on geographical distribution. The first group contained only the harbor porpoise, which is distributed only over the shelf and throughout the Gulf of Maine, Cape Cod, and Georges Bank, but probably not southwest of Nantucket. The second group contained the most frequently encountered baleen whales (fin, humpback, minke, and right whales) and the white-sided dolphin. These were found in the same areas as the harbor porpoise, and also occasionally over the shelf at least to Cape Hatteras or out to the shelf edge. The third group indicated a "strong tendency for association with the shelf edge" and included the grampus, striped, spotted, saddleback, and bottlenose dolphins, and the sperm and pilot whales.

Loggerhead turtles were found throughout the study area, but appeared to migrate north to about Massachusetts in summer and south in winter. Leatherbacks appeared to have had a more northerly distribution. CETAP hypothesized a northward migration of both species in the Gulf Stream with a southward return in continental shelf waters nearer to shore. Both species usually were found over the shoreward half of the slope and in depths less than 200 feet. The northwest Atlantic may be important for sea turtle feeding or migrations, but the nesting areas for these species generally are in the South Atlantic and Gulf of Mexico.

This problem may become acute when climatic conditions result in concentration of turtles and fish in the same area at the same time. These conditions apparently are met when temperatures are cool in October but then remain moderate into mid-December and result in a concentration of turtles between Oregon Inlet and Cape Hatteras, North Carolina. In most years sea turtles leave Chesapeake Bay and filter through the area a few weeks before the summer flounder fishery becomes concentrated. Efforts are currently under way (by VIMS and the US Fish and Wildlife Service refuges at Back Bay, Virginia, and Pea Island, North Carolina) to more closely monitor these mortalities due to trawls. Fishermen are encouraged to carefully release turtles captured incidentally and to attempt resuscitation of unconscious turtles as recommended in the 1981 *Federal Register* (pages 43976 and 43977).

The only other endangered species occurring in the northwest Atlantic is the shortnose sturgeon (*Acipenser brevirostrum*). The Councils urge fishermen to report any incidental catches of this species to the Regional Director, NMFS, One Blackburn Drive, Gloucester, MA 01930, who will forward the information to persons responsible for the active sturgeon data base.

The range of Atlantic mackerel, *Loligo, Illlex*, and butterfish and the above mentioned marine mammals and endangered species overlap and there always exists a potential for an incidental kill. Except in unique situations, such accidental catches should have a negligible impact on marine mammal or abundances of endangered species, and the Councils do not believe that implementation of this FMP will have any adverse impact upon these populations.

Commercial and recreational fisheries lose thousands of pounds of fishing gear annually. Incidences of entanglement in and ingestion of this gear is common among sea turtles and marine mammals, and may result directly or indirectly in some deaths.

9.3.3.2. Marine Sanctuaries

The USS *Monitor* Marine Sanctuary was officially established on January 30, 1975, under the Marine Protection, Research, and Sanctuaries Act of 1972. Rules and regulations have been issued for the Sanctuary (15 CFR 924). They prohibit deploying any equipment in the Sanctuary, fishing activities which involve "anchoring in

any manner, stopping, remaining, or drifting without power at any time" (924.3 (a)), and "trawling" (924.3(h)). Although the Sanctuary's position off the coast of North Carolina at 35°00'23"N, 75°24'32" W is located in the FMP's designated management area, it does not occur within, or in the vicinity of, any foreign fishing area. Therefore, there is no threat to the Sanctuary by allowing foreign fishing operations under this FMP. Also, the *Monitor* Marine Sanctuary is clearly designated on all National Ocean Survey charts by the caption "protected area". This minimizes the potential for damage to the Sanctuary by US fishing operations.

9.3.3.3. Indian treaty fishing rights

No Indian treaty rights are known to exist relative to mackerel, squid, or butterfish.

9.3.4. State, Local, and Other Applicable Law and Policies

9.3.4.1. Management activities of adjacent States and their effects on the FMP's objectives and management measures

Several States have minimum size limits for the commercial sale or possession of mackerel: Massachusetts, 6"; Connecticut, 7"; New York, 7"; and New Jersey, 7".

All of the east coast States mandate a permit or license for the commercial harvest and sale of finfish. The criteria for defining "commercial" harvest and sale, however, vary among the States. It is impossible to gauge the degree to which such requirement may affect domestic harvests, since fees for such permits and the enforcement of the applicable regulations also vary among the States.

All of the States have various regulations which prohibit or restrict the use of various kinds of commercial (and sometimes recreational) fishing gear within certain portions of state waters during all or parts of the year. For example, New Jersey prohibits all trawling within 2 miles of shore. Maryland prohibits the use of otter and beam trawls within 1 mile of shore. Delaware prohibits fishing with trawls, dragnets, and dredges operated by any power vessel within 3 miles of shore. Virginia prohibits fishing with trawl nets or 'similar devices' within the 3 mile limit of the Virginia Atlantic shoreline (with limited exceptions). In addition, several States restrict and/or regulate commercial harvesting within their jurisdiction by non-residents. Such regulations may or may not inhibit the magnitude of the commercial and recreational harvests of these species. It is probable, however, that these kinds of restrictions, particularly on trawling, serve to maintain or increase the proportion of the commercial catch which is harvested from the FCZ. This should support the effectiveness of the management measures in this FMP, since it would be difficult in many States for individuals to circumvent the regulations accompanying the FMP by transferring their harvests of these species to the territorial sea.

Several States also have mesh size specifications which may affect the magnitude of and/or the sizes of the fish in the catch.

No other State or local laws that control the fisheries that are the subject of this FMP are known to exist.

There are no implications regarding E.O. 12612 (Federalism) with regard to this Amendment.

9.3.4.2. Coastal Zone Management (CZM) Program consistency

The CZM Act of 1972, as amended, is primarily protective in nature, and provides measures for ensuring stability of productive fishery habitat within the coastal zone. It is recognized that responsible management of both coastal zones and fish stocks must involve mutually supportive goals. States with approved CZM programs are Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, and Virginia. Copies of this Amendment will be mailed to States with CZM programs with a determination that the programs were either not affected by the Amendment or were consistent with it.

As of this date, Delaware, Pennsylvania, Massachusetts, New Jersey, Connecticut, New York, and New Hampshire have concurred with the Council's position. The other States have not responded.

9.4. COUNCIL REVIEW AND MONITORING OF THE FMP

There is no need to amend this section at this time.

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Table 1. Cetaceans and Turtles Found in Survey Area

<u>Scientific name</u>	<u>Common name</u>	<u>Est. Minimum Number in Study Area</u>	<u>Endan- gered</u>	<u>Threat- ened</u>
LARGE WHALES				
<i>Balaenoptera physalus</i>	fin whale	1,102	X	
<i>Megaptera novaeangliae</i>	humpback whale	684	X	
<i>Balaenoptera acutorostrata</i>	minke whale	162		
<i>Physeter catodon</i>	sperm whale	300	X	
<i>Eubalaena glacialis</i>	right whale	29	X	
<i>Balaenoptera borealis</i>	sei whale	109	X	
<i>Orcinus orca</i>	killer whale	unk		
SMALL WHALES				
<i>Tursiops truncatus</i>	bottlenose dolphin	6,254		
<i>Globicephala</i> spp.	pilot whales	11,448		
<i>Lagenorhynchus acutus</i>	Atl. white-sided dolphin	24,287		
<i>Phocoena phocoena</i>	harbor porpoise	2,946		
<i>Grampus griseus</i>	grampus (Risso's) dolphin	10,220		
<i>Delphinus delphis</i>	saddleback dolphin	17,606		
<i>Stenella</i> spp.	spotted dolphin	22,376		
<i>Stenella coeruleoalba</i>	striped dolphin	unk		
<i>Lagenorhynchus albirostris</i>	white-beaked dolphin	unk		
<i>Ziphius cavirostris</i>	Cuvier's beaked dolphin	unk		
<i>Stenella longirostris</i>	spinner dolphin	unk		
<i>Steno bredanensis</i>	rough-toothed dolphin	unk		
<i>Delphinapteras leucas</i>	beluga	unk		
<i>Mesoplodon</i> spp.	beaked whales	unk		
TURTLES				
<i>Caretta caretta</i>	loggerhead turtle	4,017		X
<i>Dermochelys coriacea</i>	leatherback turtle	636	X	
<i>Lepidochelys kempi</i>	Kemp's ridley turtle	unk	X	
<i>Chelonia mydas</i>	green turtle	unk		X

Source: University of Rhode Island 1982.

APPENDIX 1. ALTERNATIVE TO THE AMENDMENT

ALTERNATIVE 1. TAKE NO ACTION AT THIS TIME

Description

This would mean that the FMP would continue in effect unchanged.

Beneficial and Adverse Impacts

Adoption of this alternative would mean that the FMP would not comply with 50 CFR 602.

ENVIRONMENTAL ASSESSMENT ON AMENDMENT #3 TO THE ATLANTIC MACKEREL, SQUID, AND BUTTERFISH FISHERY MANAGEMENT PLAN (FMP)

1. INTRODUCTION

In March, 1977, the Council initiated development of the Mackerel and Squid FMPs. The Council adopted the Mackerel FMP for hearings in September 1977 and the Squid FMP for hearings in October 1977. Hearings on Mackerel and Squid FMPs were held in December, 1977. The Mackerel and Squid FMPs were adopted by the Council in March 1978. The Mackerel FMP was submitted for NMFS approval in May 1978. The Squid FMP was submitted for NMFS approval in June 1978. However, based on NMFS comments, the Council requested that the Mackerel and Squid FMPs be returned.

The FMPs were revised, the revisions being identified as Mackerel FMP Supplement 1 and Squid FMP Supplement 1. These two Supplements, along with the original Butterfish FMP, were adopted for public hearings by the Council in July of 1978. Hearings on all three documents were held during September and October 1978 and all three FMPs were adopted in final form by the Council in November 1978. The Butterfish FMP was submitted for NMFS approval in December 1978. Mackerel FMP Supplement 1 and Squid FMP Supplement 1 were submitted for NMFS approval in January 1979. NMFS approved Squid FMP Supplement 1 in June 1979 and Mackerel FMP Supplement 1 in July 1979. Both FMPs were for fishing year (1 April - 31 March) 1979-80.

The Butterfish FMP was disapproved by NMFS in April 1979 because of a need for additional justification of the reasons for reducing OY below MSY. The Butterfish FMP was revised, adopted by the Council, and resubmitted for NMFS approval in June 1979. It was approved by NMFS in November 1979 for fishing year 1979-80.

The Council adopted Amendments 1 to both the Mackerel and Squid FMPs for hearings in August 1979. Hearings were held during October 1979. The Amendments were adopted by the Council and submitted for NMFS approval in November 1979. Both Amendments were approved by NMFS in March 1980. This extended the Squid FMP for an indefinite time beyond the end of fishing year 1979-80 and extended the Mackerel FMP through fishing year 1980-81. Butterfish FMP Amendment 1, extending the FMP through fishing year 1980-81, was adopted by the Council for hearings in December 1979 with hearings held during January 1980. During January 1980 the Amendment was adopted in final form by the Council and submitted for NMFS approval. It was approved in March 1980.

The Council began work on an amendment to merge the Mackerel, Squid, and Butterfish FMPs in March 1980 the document being identified as Amendment 2 to the Mackerel, Squid, and Butterfish FMP. The Amendment was adopted by the Council for public hearings in August 1980. However, NMFS commented that there were significant problems with the Amendment that could not be resolved prior to the end of the fishing year (31 March 1981). The Council then prepared separate Amendments 2 to both the Mackerel and Butterfish FMPs to extend those FMPs through fishing year 1981-82. Since Amendment 1 to the Squid FMP extended that FMP indefinitely, there was no need to take this action for the Squid FMP. Those drafts were adopted for public hearing by the Council in October 1980 with hearings held in November. The Amendments were adopted in final form by the Council and submitted for NMFS approval in November 1980. Amendment 2 to the Mackerel FMP was approved by NMFS in January 1981 and Amendment 2 to the Butterfish FMP was approved by NMFS in February 1981.

In October 1980 the merger amendment, previously designated as Amendment 2, was redesignated Amendment 3. The Council adopted draft Amendment 3 to the Squid, Mackerel, and Butterfish FMP in July 1981 and hearings were held during September. The Council adopted Amendment 3 in October 1981 and submitted it for NMFS approval. NMFS review identified the need for additional explanation of certain provisions of the Amendment. The revisions were made and the revised Amendment 3 was submitted for NMFS approval in February 1982.

The Amendment was approved by NMFS in October 1982. However, problems developed with the implementation regulations, particularly with the Office of Management and Budget through that agency's review under Executive Order 12291. In an effort to have the FMP in place by the beginning of the fishing year (1 April 1983) the FMP, without the squid OY adjustment mechanism, or a revised Atlantic mackerel mortality rate, and redesignated as the Atlantic Mackerel, Squid, and But-

terfish FMP, was implemented by emergency interim regulations on 1 April 1983. By agreement of the Secretary of Commerce and the Council, the effective date of those emergency regulations was extended through 27 September 1983.

The differences between the FMP and the implementing regulations resulted in a hearing before the House Subcommittee on Fisheries and Wildlife Conservation and the Environment on 10 May 1983.

Amendment 1 to the Atlantic Mackerel, Squid, and Butterfish FMP was prepared to implement the squid OY adjustment mechanism and the revised mackerel mortality rate. That Amendment was adopted by the Council on 15 September 1983, approved by NMFS on 19 December 1983, and implemented by regulations published in the Federal Register on 1 April 1984.

Amendment 2 was adopted by the Council on 19 September 1985 and approved by NOAA 6 March 1986. Amendment 2 changed the fishing year to the calendar year, revised the squid bycatch TALFF allowances, put all four species on a framework basis, and changed the fishing vessel permits from permanent to annual.

This Amendment 3 was adopted by the Council in two actions. The Atlantic mackerel overfishing definition was adopted by the Council at its October 1990 meeting. The *Loligo*, *Illex*, and butterfish overfishing definitions were adopted at the December 1990 meeting. This was done because the Northeast Fisheries Center proposed changes to the overfishing definitions proposed in the hearing draft for the squids and butterfish. The Center's concerns were incorporated in the version adopted at the December 1990 meeting.

2. PURPOSE OF AND NEED FOR ACTION

The Amendment is intended to bring the Fishery Management Plan for the Atlantic Mackerel, Squid, and Butterfish Fisheries (FMP) into compliance with the guidelines in 50 CFR 602 which require that every FMP include a definition of overfishing. It is proposed that overfishing be defined as the catch of Atlantic mackerel, *Loligo pealei*, *Illex illecebrosus*, or butterfish that exceeds the annual quota for each species. The provision of the FMP concerning setting annual quotas will prevent overfishing. The FMP modified by this Amendment was implemented on 1 April 1983.

The management unit is all Atlantic mackerel, *Loligo pealei*, *Illex illecebrosus*, and butterfish under US jurisdiction, excluding the Gulf of Mexico and the Caribbean Sea.

The objectives of the FMP are:

1. Enhance the probability of successful (i.e., the historical average) recruitment to the fisheries.
2. Promote the growth of the US commercial fishery, including the fishery for export.
3. Provide the greatest degree of freedom and flexibility to all harvesters of these resources consistent with the attainment of the other objectives of this FMP.
4. Provide marine recreational fishing opportunities, recognizing the contribution of recreational fishing to the national economy.
5. Increase understanding of the conditions of the stocks and fisheries.
6. Minimize harvesting conflicts among US commercial, US recreational, and foreign fishermen.

The problem in the fishery is set forth in Section 4.2 of the FMP.

The Amendment does not change the MSYs, OYs, or quota setting process and, therefore, does not alter the FMP's consistency with any national standard. Overfishing is defined as the catch of Atlantic mackerel, *Loligo pealei*, *Illex illecebrosus*, or butterfish exceeding the annual quota for each species. The provision of the FMP concerning setting annual quotas prevents overfishing.

The alternative to the adopted Amendment is discussed in Appendix 1 of the Amendment.

3. ALTERNATIVES

A description and evaluation of the alternative considered, but not adopted for Amendment 3 is contained in Appendix 1.

4. ENVIRONMENTAL IMPACTS

The environmental impacts of the management regime instituted in the original FMP were described in the Environmental Impact Statement accompanying the FMP, and in the Supplemental Environmental Impact Statements or Environmental Assessments accompanying the Amendments.

The change made to the FMP by this Amendment brings it into compliance with 50 CFR 602, but does not change the management regime or regulations.

Effect on Endangered Species and on the Coastal Zone

Neither the Amendment or the alternatives would constitute an action that "may affect" endangered or threatened species or their habitat within the meaning of the regulations implementing Section 7 of the Endangered Species Act of 1973. Thus, consultation procedures under Section 7 will not be necessary on the Amendment.

The CZM Act of 1972, as amended, is primarily protective in nature, and provides measures for ensuring stability of productive fishery habitat within the coastal zone. It is recognized that responsible management of both coastal zones and fish stocks must involve mutually supportive goals. States with approved CZM programs are Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, and Virginia. Copies of this Amendment will be mailed to States with CZM programs with a determination that the programs were either not affected by the Amendment or were consistent with it.

As of this date, Delaware, Pennsylvania, Massachusetts, New Jersey, Connecticut, New York, and New Hampshire have concurred with the Council's position. The other States have not responded.

Effects on Flood Plains or Wetlands

The Amendment or its alternative will not adversely affect flood plains or wetlands, or trails and rivers listed or eligible for listing on the National Trails and Nationwide Inventory of Rivers.

List of Agencies and Persons Consulted in Formulating the Proposed Action

In preparing Amendment 3, the Council consulted with NMFS, the Fish and Wildlife Service, the Department of State, and the States of New York, New Jersey, Pennsylvania, Delaware, Maryland, and Virginia through their membership on the Council. In addition to the States that are members of the Council, Maine, New Hampshire, Massachusetts, Rhode Island, and Connecticut will be consulted through the Coastal Zone Management Program consistency process.

List of Preparers of Environmental Assessment and Plan Amendment

Amendment 3 was prepared by John C. Bryson, David R. Keifer, and Thomas Hoff of the Council staff. The Squid, Mackerel, and Butterfish Committee of the Council is made up of Tom McVey, Bill Wells, Roger Locandro, Warren Hader, Al Goetze, Stetson Tinkham, and Bob Smith (New England Council). Kathi Rodrigues (NMFS, NERO), and Joel MacDonald (NOAA, GCNE) also assisted with the Amendment.

For the reasons discussed above, it is hereby determined that neither approval and implementation of the proposed action nor the alternative would affect significantly the quality of the human environment, and that the preparation of an environmental impact statement on the Amendment is not required by Section 102(2)(c) of the National Environmental Policy Act nor its implementing regulations.

Assistant Administrator for Fisheries, NOAA

Date

APPENDIX 3. PUBLIC HEARING SUMMARY

There was a hearing on Amendment 3 at the Holiday Inn, Essington, PA, on 31 October 1990. The hearing began at 7:29 pm. The moderator was MAFMC member Dr. William Hargis, Jr. Also present were Dr. Robert Lippson, NMFS, David R. Keifer, MAFMC staff, and six members of the public.

Mr. Keifer reviewed the provisions of Amendment #3.

The hearing was closed at 8:05 pm.

