AMENDMENT #1 TO THE ATLANTIC MACKEREL FISHERY MANAGEMENT PLAN

AND

SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

November, 1979

Mid-Atlantic Fishery Management Council

in cooperation with the

National Marine Fisheries Service

Draft approved by MAFMC: 9 August 1979
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Abbreviations and Definitions Of Terms Used In This Document

cm = centimeter
DAH = Domestic Annual Harvest = the capacity of US fishermen to harvest mackerel and their intent to use that capacity
DAP = Domestic Annual Processing = the capacity of US processors to process, include freeze, mackerel and their intent to use that capacity
EIS = Environmental Impact Statement
FCZ = Fishery Conservation Zone
fishing year = the 12 month period beginning April 1
FMP = Fishery Management Plan
FRG = Federal Republic of Germany
GDR = German Democratic Republic
GIFA = Governing International Fishery Agreement
ICNAF = International Commission for the Northwest Atlantic Fisheries
km = kilometer
metric ton = mt = 2204.5 pounds
MSY = Maximum Sustainable Yield
NMFS = National Marine Fisheries Service
NOAA = National Oceanic and Atmospheric Administration
NPF = Non-Processed Fish = the capacity of US fishermen to harvest mackerel which is not processed; essentially mackerel caught by marine recreational anglers.
OY = Optimum Yield
PMP = Preliminary Fishery Management Plan
Secretary = Secretary of Commerce
SEIS = Supplemental Environmental Impact Statement
TAC = Total Allowable Catch
TALFF = Total Allowable Level of Foreign Fishing

II. SUMMARY

The Fishery Management Plan (FMP) for Atlantic Mackerel was approved by the Assistant Administrator for Fisheries, National Oceanic and Atmospheric Administration (NOAA) on 3 July 1979. The FMP is for fishing year 1979-1980 (1 April 1979 - 31 March 1980). The basic purpose of Amendment #1 to this FMP is to extend it beyond the end of fishing year 1979-1980.

The natural range of, and fishery for, Atlantic mackerel extends from approximately Cape Hatteras, North Carolina, to Labrador, Canada. Within US waters this resource and its harvest are found both in the territoral sea and the FCZ. The management unit for this FMP is all Atlantic mackerel under US jurisdiction. The objectives of the plan are to:

1. Provide opportunity for increased domestic recreational and commercial catch;

2. Maximize the contribution of recreational fishing for Atlantic mackerel to the national economy;

3. Maintain the spawning stock size of Atlantic mackerel at or above its size in 1978;

4. Achieve efficient allocation of capital and labor in the mackerel fishery; and

5. Minimize costs to taxpayers of development, research, management, and enforcement in achieving these objectives.

The following management measures are included in the FMP:

1. Restriction of Atlantic mackerel catches in the FCZ so that the total domestic catch from the territorial sea and the FCZ does not exceed 14,000 metric tons for the 1979-1980 fishing year, allocating 9,000 metric tons to the sport fishery and 5,000 metric tons to the domestic commercial fishery. The Council will reevaluate these allocations in October, 1979, or at capture of 5,000 tons of mackerel in either the sport or commercial fishery, or when 70% of either allocation has been taken in the FCZ, whichever comes first. The Regional Director of the NMFS, with the concurrence of the Council, may then redistribute these allocations between the US recreational and commercial fisheries for the balance of the fishing year.

2. Restriction of accumulative foreign Atlantic mackerel harvest to 1,200 metric tons for the 1979-1980 fishing year. This amount is intended to provide only for incidental foreign catches of mackerel. At such time as a foreign nation takes its allocation of Atlantic mackerel, it will be required to cease fishing operations that would lead to an additional catch of Atlantic mackerel.

3. All vessels fishing commercially for Atlantic mackerel, either directly or as a by-catch from other fisheries, must be registered. This provision also applies to all vessels for hire for fishing recreationally directly or indirectly for mackerel.

4. Weekly reports on mackerel catches must be filed by foreign and domestic fishermen and domestic dealers and processors must submit weekly reports on any transactions involving mackerel.

Alternatives considered for Amendment #1 were:

1. Take No Action At This Time - No action to limit the catches of Atlantic mackerel could result in a decrease of Atlantic mackerel abundance. This alternative would mean that the FMP would lapse at the end of fishing year 1979-1980. The NMFS would be required to prepare a Preliminary Management Plan (PMP) to

regulate the foreign fishery. It is likely that the PMP would result in a large reallocation of mackerel to foreign fleets.

PMPs regulate foreign, but not domestic, fishermen. One effect of this alternative would be that data that would be collected on domestic fishing and processing efforts as a result of this plan could not be collected as effectively, and that assessments of the scope and development of the domestic fishery would not be as accurate as they would be with the FMP.

2. Continue The Current FMP Through Fishing Year 1980-1981 With No Other Changes - This would result in an Optimum Yield of 15,200 mt, Domestic Annual Harvest of 14,000 mt, Domestic Annual Processing of 5,000 mt and a Total Allowable Level of Foreign Fishing of 1,200 mt. It would require that the FMP be amended again for fishing year 1981 - 1982.

3. Continue The FMP Without Time Limit - This would eliminate the need for annual amendments to the FMP merely to extend it into the next fishing year. The FMP could still be amended when necessary to incorporate changes in Optimum Yield, Domestic Annual Harvest, Domestic Annual Processing, or other management measures.

4. Continue The FMP With Changes To Optimum Yield And Quotas - The most recent biological assessment indicates that mackerel stock size has greatly increased over the 1978 level. This suggests that the stock rebuilding objective of the original FMP can still be met with a total catch (in US and Canadian waters) and Optimum Yield in fishing year 1980-1981 (and beyond) significantly greater than those in the original FMP. This and other information also indicates that increases in Domestic Annual Harvest, i.e., the overall US mackerel harvesting capacity, and Non-Processed Fish, defined here to equal the mackerel harvesting capacity of US recreational fishermen, estimates are justified, because the US recreational harvesting capacity is expected to increase with increases in mackerel stock size. Data on the US commercial harvesting capacity and on the intent and desire of US processors to process mackerel, however, are limited at present.

Based on the best scientific information available, a reasonable alternative, therefore, is to specify Optimum Yield at 30,000 mt, Domestic Annual Harvest at 20,000 mt, Non-Processed Fish at 15,000 mt, and Domestic Annual Processing at 5,000 mt. This would leave a surplus of 10,000 mt. Given the developing nature of the US commercial fishery, as well as imprecise recreational fishery data, it is desirable that at least a portion of any surplus (10,000 mt, as modified by changes in any of the above values) should initially be placed in a reserve and not totally allocated to the Total Allowable Level of Foreign Fishing. It is therefore proposed that the initial Total Allowable Level of Foreign Fishing be 4,000 mt, and that a reserve of 6,000 mt be provided. The above values, as modified after the review process, could be used for a finite (e.g., one or two year) or indefinite extension of the FMP as discussed in Alternative 3.

5. Revise Objective 4 - Objective 4 states "Achieve efficient allocation of capital and labor in the mackerel fishery." It is proposed that the objective be revised to read "Achieve efficiency in harvesting and use." The revision more clearly states the Council's intent than does the objective as currently worded.

A detailed discussion of these alternatives is given in Section XII of Amendment #1.

The Council has adopted Alternatives 4 and 5 for a one year extension of the FMP. Therefore, for fishing year 1980-1981, the Optimum Yield will be 30,000 mt, initial Domestic Annual Harvest will be 20,000 mt, the estimate of Non-Processed Fish is 15,000 mt, the initial TALFF is 4,000 mt, and the Reserve is 6,000 mt.

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IV. INTRODUCTION

This Amendment #1 to the Atlantic Mackerel FMP is designed to extend the FMP beyond the end of fishing year 1979-1980 (31 March 1980) and to make appropriate changes to optimum yield and quotas. The basic data about the fishery has not changed since the FMP was adopted by the Mid-Atlantic Fishery Management Council in November, 1978.

The latest stock assessment is presented in Appendix I of Amendment #1.

The alternatives presented in Amendment #1 are essentially refinements of the regime in the FMP.

V. DESCRIPTION OF STOCKS

The most recent stock assessment is presented as Appendix I to Amendment #1, and is discussed in Section XII-5. This report updates the assessment used in the original FMP. It includes catch statistics, abundance indices, fishing mortality and stock size estimates, and projected options for catch in 1980, given various levels of catch in 1979, with resulting spawning stock biomass in 1981.

The assessment states, "...the 1978 year-class is the largest to enter the fishery since the 1969 year-class ... Spawning stock biomass available at the beginning of 1980 will vary from an estimated 488,000 tons (36% increase from 1979), assuming a (total international) catch of 30,000 tons, to 421,000 tons (18% increase from 1979), assuming a catch of 100,000 tons." The assessment data indicate that, "...under all catch assumptions presented for 1979-1980, there is an accompanying projection of stock increase in 1980-1981 ..."

VI. DESCRIPTION OF HABITAT

No data are available which would necessitate a change to this section of the FMP.

VII. FISHERY MANAGEMENT JURISDICTION, LAWS, AND POLICIES

No data are available which would necessitate a change to this section of the FMP.

VIII. DESCRIPTION OF FISHING ACTIVITIES

No data are available which would necessitate a change to this section of the FMP.

IX. DESCRIPTION OF ECONOMIC CHARACTERISTICS OF THE FISHERY

No data are available which would necessitate a change to this section of the FMP.

X. DESCRIPTION OF BUSINESSES, MARKETS, AND ORGANIZATIONS ASSOCIATED WITH THE FISHERY

No data are available which would necessitate a change to this section of the FMP.

XI. DESCRIPTION OF SOCIAL AND CULTURAL FRAMEWORK OF DOMESTIC FISHERMEN AND THEIR COMMUNITIES

No data are available which would necessitate a change to this section of the FMP.

XII. DETERMINATION OF OPTIMUM YIELD

XII-1. Specific Management Objectives

The Mid-Atlantic Council adopted the following objectives for the original FMP:

1. Provide opportunity for increased domestic recreational and commercial catch;

2. Maximize the contribution of recreational fishing for Atlantic mackerel to the national economy;

3. Maintain the spawning stock size of Atlantic mackerel at or above its size in 1978;

4. Achieve efficient allocation of capital and labor in the mackerel fishery; and

5. Minimize costs to taxpayers of development, research, management, and enforcement in achieving these objectives.

XII-2. Description of Alternatives and XII-3. Analysis of Beneficial and Adverse Impacts Of Potential Management Options

The following management measures are included in the FMP:

1. Restriction of Atlantic mackerel catches in the FCZ so that the total domestic catch from the territorial sea and the FCZ does not exceed 14,000 metric tons for the 1979-1980 fishing year, allocating 9,000 metric tons to the sport fishery and 5,000 metric tons to the domestic commercial fishery. The Council will reevaluate these allocations in October, 1979, or at capture of 5,000 tons of mackerel in either the sport or commercial fishery, or when 70% of either allocation has been taken in the FCZ, whichever comes first. The Regional Director of the NMFS, with the concurrence of the Council, may then redistribute these allocations between the US recreational and commercial fisheries for the balance of the fishing year.

2. Restriction of accumulative foreign Atlantic mackerel harvest to 1,200 metric tons for the 1979-1980 fishing year. This amount is intended to provide only for incidental foreign catches of mackerel. At such time as a foreign nation takes its allocation of Atlantic mackerel, it will be required to cease fishing operations that would lead to an additional catch of Atlantic mackerel.

3. All vessels fishing commercially for Atlantic mackerel, either directly or as a by-catch from other fisheries, must be registered. This provision also applies to all vessels for hire for fishing recreationally directly or indirectly for mackerel.

4. Weekly reports on mackerel catches must be filed by foreign and domestic fishermen and domestic dealers and processors must submit weekly reports on any transactions involving mackerel.

Alternatives considered for Amendment #1 were:

1. Take No Action At This Time - This alternative would mean that the FMP would lapse at the end of fishing year 1979-1980. If this occurred, the NMFS would be required to prepare a PMP for this fishery. A PMP would annually set an OY and would estimate DAH and, thus, TALFF. A PMP, however, regulates foreign, but not domestic, harvesting. A reversion to PMP management might result in a relatively large annual reallocation of mackerel to foreign fisheries.

Another effect of this alternative would be that data on the domestic harvesting and processing capacities that would be collected as a result of the recordkeeping

provisions of the FMP could not be collected, or could be collected as effectively. This would seriously limit assessments of the scope and development of the US commercial and recreational fisheries, and would eliminate other fishery and biological information needed to assess OY, DAH, DAP, and condition of the stock.

In addition, it is probable that the US and Canada will conclude and implement a bilateral fisheries treaty in the near future. Since the mackerel fishery extends significantly into Canadian waters, it is highly probable that such a treaty will specify bilateral management of this resource. Should this occur, the US would be required to manage the domestic (sport and commercial) and foreign harvest of this species in US waters in order to conform with the terms of such a treaty and whatever management measures (such as quotas) as might be promulgated on an annual basis by the international management regime. Established FMP management will greatly facilitate implementation of such bilateral management measures, since bilateral management would require regulation of US fishermen and, under the FCMA, such regulation is possible only with an FMP, and will ensure equitable treatment of the domestic fisheries sectors under such a regime.

2. Continue The Current FMP Through Fishing Year 1980-1981 With No Other Changes - This would require that the FMP be amended again for the period beyond 31 March 1981. Under this alternative, OY, DAH, DAP, and TALFF would remain the same as those in the original FMP (OY = 15,200 mt, DAH = 14,000 mt, DAP = 5,000 mt, and TALFF = 1,200 mt).

This alternative might result in a closure of the US fisheries in fishing year 1980-1981 if US landings exceeded 14,000 mt during that time. A closure would be likely because of the predicted increased abundance of mackerel which should significantly increase the recreational catch as well as the commercial by-catch. Since the US mackerel fisheries are highly seasonal by region, this possibility would have grave implications for the economic welfare of the US fisheries, not only for mackerel, but also for other species with which mackerel is usually taken. Because mackerel migrate along the coast, a closure during the second half of the fishing year could result in a violation of National Standard 4 (See Section XII-5) because fishermen from certain areas would not have their historic opportunity to fish for mackerel. Since the OY specified by the original FMP is significantly less than the expected surplus production from the mackerel stock, and since the stock currently appears to be increasing in abundance, a closure of the US fisheries after their harvest of 14,000 mt would result in adverse economic impacts on US interests with minimal concomitant conservation benefits.

3. Continue The FMP Without Time Limit With No Other Changes - This would eliminate the need for annual amendments to the FMP. The FMP would only require amendments as necessary when significant changes occurred in the US industry and/or in stock abundance. The values of OY, DAH, DAP, and TALFF specified in the current FMP would be set without change for each fishing year.

The adverse impacts of this alternative are identical to those identified for Alternative 2 and would, in fact, be exacerbated by this Alternative, due to the developing nature of the US fisheries and the rapidly increasing abundance of mackerel. The only potential beneficial impact of this Alternative would be a reduction in administrative and regulatory costs. These savings, however, would probably be offset or exceeded by the resultant additional costs of stringent quota enforcement.

4. Continue The FMP With Changes To OY And Quotas - The most recent biological assessment indicates that mackerel stock size has greatly increased over the 1978 level. This suggests that the stock rebuilding objective of the original FMP can still be met with a total catch (in US and Canadian waters) and Optimum Yield in fishing year 1980-1981 (and beyond) significantly greater than those in the original FMP. This and other information also indicate that increases in DAH (Domestic

Annual Harvest, i.e., the overall US mackerel harvesting capacity) and NPF (Non-Processed Fish, defined here to equal the mackerel harvesting capacity of US recreational fishermen) estimates are justified, because the US recreational harvesting capacity is expected to increase with increases in mackerel stock size. Data on the US commercial harvesting capacity and on the intent and desire of US processors to process mackerel, however, are limited at present.

Based on the best available scientific information, a reasonable alternative, therefore, is to specify Optimum Yield at 30,000 mt, DAH at 20,000 mt, NPF at 15,000 mt, and DAP at 5,000 mt. This would leave a surplus of 10,000 mt. Given the developing nature of the US commercial fishery, as well as imprecise recreational fishery data, it is desirable that at least a portion of any surplus (10,000 mt, as modified by changes in any of the above values) should initially be placed in a reserve and not totally allocated to TALFF. It is therefore proposed that the initial TALFF be 4,000 mt, and that a reserve of 6,000 mt be provided. The above values, as modified after the review process, could be used for a finite (e.g., one or two year) or indefinite extension of the FMP as discussed in Alternative 3.

5. Revise Objective 4 - Objective 4 states "Achieve efficient allocation of capital and labor in the mackerel fishery." It is proposed that the objective be revised to read "Achieve efficiency in harvesting and use." The revision more clearly states the Council's intent than does the objective as currently worded.

XII-4. Tradeoffs Between The Beneficial And Adverse Impacts Of The Preferred Management Option

Alternatives 4 and 5 have been adopted as the preferred management option. Alternative 4 will have a beneficial impact on the US fisheries in that it will allow for their expansion up to a (commercial and recreational) harvest of 26,000 mt without the need for closures and without the requirement to amend the FMP if US landings increase above the current best estimate of DAH (20,000 mt).

The FMP is extended through this Amendment for one fishing year. The Council believes this to be necessary given (a) the rapidly changing abundance of mackerel which makes difficult recommendations for TACs and OYs for the period beyond fishing year 1980-1981; (b) uncertainties regarding the capacity of the US commercial fishery beyond fishing year 1980-1981; (c) uncertainties as to the terms of bilateral mackerel management should a fisheries agreement be concluded with Canada; (d) uncertainties regarding the catch of mackerel in Canadian waters in 1979, 1980, and beyond; (e) the desire of the Council to develop a long-term management regime for this resource in the near future. It is possible that such a long-term FMP will entail significantly different capacity assessment and regulatory techniques than are contained in the current FMP and this Amendment.

The original FMP contained an allocation of the US harvesting capacity (DAH) between recreational and commercial fishermen. The preferred option (Alternative 4) eliminates that allocation. The US quota proposed in Alternative 4 (20,000 mt) plus the provision of an additional allocation of up to 6,000 mt from the Reserve, is considered adequate for all US fishermen. The division of that overall quota between the recreational and commercial sectors would, therefore, be an unnecessary provision that would only complicate management and increase management costs.

For purposes of Amendment #1, Domestic Annual Harvest (DAH) is defined to mean the harvesting capacity of the US recreational and commercial fisheries and the intent of those fisheries to harvest that capacity. Non-Processed Fish (NPF) is defined to mean mackerel caught by the recreational fishery. The capacity of the commercial fishery (harvesting and processing) is the difference between Domestic Annual Harvest and Non-Processed Fish (DAH - NPF). In the mackerel fishery, Domestic Annual Processing (DAP) is defined to include all processing methods used by the US commercial fishery, including all handling associated with the domestic fresh fish

market. Available information indicates that there are no technical or physical constraints on domestic processing capacity up to the theoretical maximum DAP level of 11,000 mt at this time.

Under Alternative 4, the initial capacity of the domestic recreational mackerel fishery would be 15,000 mt. Since the magnitude of the recreational mackerel catch is dependent to some degree on abundance, and since mackerel abundance appears to be increasing, a reasonable initial estimate of the US recreational capacity (i. e., NPF) is 15,000 mt.

Data on the commercial fishery and on the processing sector are limited at this time. The Council has conducted a survey of processors to assist in developing the estimate of DAP. Based on the limited findings of that survey and other available data, there is no reason at this time to change the estimated commercial catch (and DAP) from the quantities estimated in the original FMP. The initial capacity of the US commercial fishery would, therefore, be 5,000 mt.

Given uncertainties as to the harvesting capacities of the US sport and commercial mackerel fisheries, and in order to provide an opportunity for gradual expansion of the commercial mackerel fishery for export, Alternative 4 would introduce a Reserve into the mackerel management regime. The purpose of the Reserve would be to set aside a portion of the OY remaining after the initial estimate of DAH has been subtracted. This Reserve would be transferred to DAH if actual landings by the US recreational and/or commercial fisheries exceeded the initial estimates in Amendment #1. The portion of the Reserve not needed by the US fishery could be allocated to TALFF.

This option would also increase the initial TALFF to 4,000 mt from the 1,200 mt provided in the original FMP. While this is well below the historic foreign mackerel catch, it does represent a significant increase over the quantity provided in the original FMP. There is also the possibility that the TALFF would be further increased by an allocation from the Reserve to the extent that the Reserve would not be needed by the US fishery. Given the recent increases in mackerel abundance, it is possible that a TALFF of 4,000 mt will not allow directed foreign fishing for this species, but will allow only for a reasonable by-catch of mackerel in directed fisheries for other species. In other words, while the 1,200 mt TALFF in the original FMP was considered to be a reasonable by-catch allowance given the abundance of mackerel during fishing year 1979-1980, the increased abundance of mackerel for fishing year 1980-1981 requires an increased by-catch allowance if foreign fisheries for other species are not to be unreasonably restricted.

The revision to Objective 4 would have no real impact on the management regime. It is intended to clarify the Council's intent. Objective 4 as currently stated ("Achieve efficient allocation of capital and labor in the mackerel fishery") could be interpreted to mean that the Council intends to take a direct role in the economic operation of the fishery. The revised wording ("Achieve efficiency in harvesting and use") more clearly states the Council's intent to not introduce measures in the management regime that would contribute to inefficiency.

The primary positive impact of the adopted options is that quotas would be increased over the levels set in the original FMP while, concurrently, the stock rebuilding program of the original FMP would be continued. A lower OY would accelerate the rate of stock rebuilding and a higher OY would decelerate that rate. Obviously, quotas would need to be changed to reflect changes in OY. It is the Council's conclusion that the OY proposed represents the best present balance between harvest levels and stock rebuilding. The OY and resultant quotas, combined with the Reserve, should not have a adverse impact on the US fishery. To the extent that the proposed initial TALFF is below historic foreign catch levels, it represents a negative impact on the foreign fishery. However, the TALFF proposed, especially when combined with the possible allocation from the Reserve, represents a

substantial increase from the TALFF in the original FMP.

XII-5. Specification of Optimum Yield

This Fishery Management Plan proposes an optimum yield based on: (1) the best scientific evidence currently available; (2) the probable impacts of any TAC and bilateral agreement reached with Canada for this species; (3) estimated economic and social impacts of various catch levels to the US fisheries and affected communities; and (4) environmental considerations. The maximum sustainable yield of mackerel has been estimated at 210,000 - 230,000 mt (Section V-4 of the original FMP). Harvest at this level on an annual basis, however, presupposes annual levels of recruitment well in excess of those observed in most of the last several years. Although the relationship between spawning stock size and recruitment to the fishery is unknown (and may be affected by environmental fluctuations), it is probable that at low levels of abundance, as has recently been the case, there is a positive correlation between spawning stock size and recruitment. Thus, analyses within the FMP and this Amendment include the assumption that the larger the spawning stock size (up to an as yet undetermined level), the higher the probability of larger recruitment to the fishery; conversely, that poor recruitment is more likely to result from small spawning stocks than from very abundant ones.

The most recent mackerel stock assessment (Anderson, 1979; NEFC Lab. Ref. 79-35; Appendix I) indicates that the total mackerel stock size (1979) has increased significantly over the 1978 level (Table I-10). This is due primarily to a very abundant 1978 year-class, which was estimated at age 1 to be 3-4 times as large as the 1975-1977 year-classes at age 1. Because the 1978 year-class will not begin to enter the spawning stock until 1980, however, increases in mackerel spawning stock size will lag increases in overall stock size. The spawning stock size in 1979 is estimated to be about 40% (by weight and number) of the 1962-1979 average spawning stock size, and slightly smaller than the estimated spawning stock size in 1978. The spawning stock size is expected to increase significantly starting in 1980, due to the maturation of the abundant 1978 year-class.

Table I-18 in Appendix I illustrates possible combinations of total mackerel catches in 1979 and 1980 and their consequential effects upon mackerel spawning stock size in 1981. Possible total catches in 1979 from 30,000 to 100,000 mt and possible total catches in 1980 from 15,000 to 150,700 mt have been considered. Table I-18 suggests that if the total (US and Canadian waters) mackerel catch in 1979 is approximately 65,200 mt, then a total catch of about 90,000 mt could be taken in 1980, with a resulting spawning stock size in 1981 at least 50% greater than that in 1979, and at least 20% greater than in 1980. Table I-18 indicates that a total catch of between (approximately) 16,000 and 140,000 mt in 1980 will result in a spawning stock size in 1981 of between (approximately) 620,000 to 490,000 mt, respectively (assuming a total 1979 catch of about 65,000 mt). A spawning stock size of 490,000 mt in 1981 would be approximately 1.4 times the size of the 1979 spawning stock (in weight), but would also represent a spawning stock size of about 55% of the average size from 1962-1979. Similarly, a 1980 total catch of about 16,000 mt would yield a 1981 spawning stock size of about 1.7 times the 1979 size and about 70% of the 1962-1979 average size. If, however, the 1979 mackerel catch in Canadian waters exceeds that assumed above (i.e., is significantly greater than 50,000 mt), then the increases in stock sizes for 1981 at the above 1980 catch levels would be less.

In order to make a meaningful prediction of the biological consequences of various Optimum Yield levels, it was necessary to assume that the entire OY provided in the original FMP for fishing year 1979-1980 (15,200 mt) will be harvested and that the catch of mackerel in Canadian waters (by Canadian and foreign vessels) for fishing year 1979-1980 will be at least 50,000 mt. Table 1 lists possible TACs for 1980 and the resultant total 1980 catches under the assumptions of (1) a 60%/40% ratio of US/Canadian quotas; (2) a total 1979 catch of 100,000 mt; and (3) full harvest of

the 1980 Canadian quota. The most recent provision of the US/Canadian bilateral negotiations is that the US will receive 60% and Canada 40% of whatever TAC is agreed upon yearly for this species. If, for example, a TAC of 100,000 mt for 1979 were negotiated, the US would, under this provision, receive 60,000 mt as its quota.

Table 1. Possible TACs For 1980, Resultant 1980 Total Catches, And Approximate Resultant Spawning Stock Size in 1981, Under The Assumptions: (1) A 60%/40% Ratio Of US/Canadian Quotas Within A TAC; (2) Total Catch of 100,000 mt; (3) A US 1980 Optimum Yield of 30,000 mt; and (4) Full Harvest of the 1980 Canadian Quota. (In Thousands of Metric Tons)

1980 TAC	1980 US Quota	1980 US Catch	1980 Canadian Quota	1980 Total Catch (All Waters)	Stock Size In 1981	% Change In Stock Size From 1979	% Change In Stock Size From 1980
60	36	30	24	54	552.4	54.3	31.1
80	48	30	32	62	543.8	51.9	29.0
100	60	30	40	70	535.1	49.5	27.0
120	72	30	48	78	526.5	47.1	24.9
140	84	30	56	86	517.9	44.6	22.9
160	96	30	64	94	509.2	42.2	20.8
180	108	30	72	102	500.6	39.8	18.8
200	120	30	80	110	491.9	37.4	16.7
220	132	30	88	118	483.3	35.0	14.7
240	144	30	96	126	474.6	32.6	12.6

The estimated US DAH for mackerel in fishing year 1980-1981 is 20,000 mt (15,000 mt by sport fishermen and 5,000 mt by commercial fishermen). This capacity is above that estimated for 1979 due to an increase in abundance of the species. The capacity of the recreational fishery is considered reasonable in light of the reported 1970 recreational catch of approximately 32,000 mt. On the basis of a limited processor survey recently conducted, the Council cannot justify an increase in DAH or DAP over the 5,000 mt level.

It is the Council's conclusion that the mackerel fishery should be managed so as to increase spawning stock size to a level nearing the estimated average spawning stock size from 1962-1979. The average mackerel spawning stock level during that period was approximately 850,000 - 900,000 mt. Although the spawning stock size is expected to increase significantly in 1981 (compared to 1979) regardless of relatively large catches in 1979 and 1980 (e.g., 100,000 mt or greater), even relatively small total catches in 1979 and 1980 (e.g., 50,000 mt each year) will yield a spawning stock size in 1981 no greater than about 70% of the average spawning stock size since 1962.

In addition to this consideration, the Council believes that uncertainties regarding (a) the magnitude of mackerel catches in 1979 and 1980 in Canadian waters; (b) the implementation of bilateral management; and (c) the magnitude of negotiated mackerel TACs should bilateral management be instituted, make prudent a precautionary OY for

mackerel in US waters, at least in fishing year 1980-1981 and at least until major uncertainties regarding Canadian policy with regard to this resporce have been resolved. Given the significant increase in mackerel abundance, however, the Council believes that a significant increase in OY over the fishing year 1979-1980 level should be made for fishing year 1980-1981.

The OY for fishing year 1980-1981 for all Atlantic mackerel under US jurisdiction (the management unit of this FMP) is 30,000 mt. This catch level in fishing year 1980-1981 represents the best present balance between the Council's desires to (a) ensure continued increases in mackerel abundance, and (b) accomodate the full capacities of the US recreational and commercial fisheries to harvest this species. The Council believes that an OY significantly less than this amount will not materially enhance stock rebuilding, regardless of the magnitude of the mackerel catch in Canadian waters in 1979 and 1980, given the most recent and best scientific assessment of the stock. The Council believes an OY significantly in excess of the 30,000 mt level is unjustified in light of the stock rebuilding objective of the FMP. As detailed in Sections XII-2 through XII-4, the surplus of the OY left after DAH is subtracted, 10,000 mt, is not initially allocated entirely to TALFF. Given present uncertainties as to the ultimate DAH for mackerel in fishing year 1980-1981, 6,000 mt of this surplus is placed in a Reserve. Thus, the initial TALFF for mackerel is 4,000 mt.

Table 2. MSY, OY, DAH, DAP, NPF, and TALFF (in metric tons)

Maximum Sustainable Yield	210,000 - 230,000[1]
Optimum Yield	30,000[2]
DAH	20,000[2]
DAP (US commercial harvesting and processing capacity)	5,000[2]
NPF (US recreational capacity)	15,000[2]
Reserve	6,000[2]
Total Allowable Level of Foreign Fishing	4,000[2]

1 Throughout species range
2 For the management unit

Section 301(a) of the Fishery Conservation and Management Act states that: "Any fishery management plan prepared, and any regulation promulgated to implement such plan ... shall be consistent with the following national standards for fishery conservation and management." The following is a discussion of the standards and how this amended FMP meets them:

"(1) Conservation and management measures shall prevent overfishing while achieving, on a continuous basis, the optimum yield from each fishery." The optimum yield specified in this Amendment is designed to prevent further reductions in mackerel spawning stock size. The provisions of this Amendment constitute a continuation of the program to rebuild the stocks to higher levels of abundance.

"(2) Conservation and management measures shall be based upon the best scientific information available." This Amendment is based on the best and most recent scientific evidence.

"(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." This Amendment has been designed in anticipation of, and to complement, a possible US/Canadian bilateral agreement for the species.

"(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." Estimates of US capacity for mackerel used in this Amendment include expected catches by all fishermen (sport and commercial) in all affected coastal States. Thus, although mackerel is a migratory species which each year becomes available first to fishermen in more southern States, no closure of this fishery to fishermen in northern Mid-Atlantic or New England States should result from the provisions of this Amendment. In addition, most of the expected increase in domestic commercial catches probably will occur in New England States, which renders remote the likelihood of closure of this fishery prior to arrival of this species in northern waters.

"(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." Since domestic fisheries presently harvest mackerel beneath the OY level, no economic inefficiencies due to surplus investment or fishing effort, or similar considerations, should result from the provisions of this FMP. As US capacity estimates anticipate an increase in commercial fishing for mackerel, this FMP will not create economic inefficiency in domestic commercial fisheries.

"(6) Conservation and management measures shall take into account and allow for variations among, and contingencies in, fisheries, fishery resources, and catches." This FMP and the OY and allocations described herein take into account possible fluctuations in species abundance, expected trends in US demand for mackerel, and the possible effects of Canadian mackerel catches and US/Canadian bilateral negotiations as they relate to this species.

"(7) Conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication." The management measures outlined in this Amendment are consistent with and complement, but do not duplicate, management measures contained in other FMPs or PMPs. Costs of management should not differ from the costs of the original FMP.

XIII. MEASURES, REQUIREMENTS, CONDITIONS, OR RESTRICTIONS PROPOSED TO ATTAIN MANAGEMENT OBJECTIVES

Note: All references to the Foreign Fishing Regulations are intended to adopt by reference the Foreign Fishing Regulations as they may exist at the time of the adoption of this FMP by the Secretary of Commerce and as they may be amended from time to time following FMP adoption.

XIII-1. Permits and Fees

No changes are proposed as a result of Amendment #1.

XIII-2. Time and Area Restrictions

Foreign nations fishing for mackerel shall be subject to the time and area restrictions set forth in part 611.50 of Title 50 Code of Federal Regulations (CFR).

Fixed Gear Avoidance

Foreign nations fishing for mackerel shall be subject to the fixed gear avoidance regulations set forth in part 611.50(e) of 50 CFR.

XIII-3. Catch Limitations

The fishing year for mackerel shall be the twelve (12) month period beginning April 1.

The annual TALFF for mackerel is 4,000 metric tons.

The US Domestic Annual Harvest (quota) for mackerel is 20,000 metric tons.

A Reserve of 6,000 mt is established.

It is the policy of the Mid-Atlantic Fishery Management Council that the Assistnat Administrator for Fisheries, NOAA, be allowed to make an in-season adjustment to the estimated domestic annual harvest (DAH) and Total Allowable Level of Foreign Fishing (TALFF) for mackerel from the Reserve based on the criteria specified by the Council as set forth below. The Council further establishes that any allocation made by the Assistant Administrator in consultation with the Council must be consistent with the objectives of this management plan for the mackerel fishery. An adjustment is a temporary in-season increase of DAH and annual domestic quota and an equivalent temporary in-season decrease of Reserve. These adjustments may be made if actual US landings of mackerel are expected to exceed DAH. A portion of the Reserve not needed to meet actual DAH may be allocated to TALFF. At the end of the fishing year (March 31), DAH, annual domestic quota, and TALFF shall revert to the amounts specified by the Mid-Atlantic Fishery Management Council in Section XII-5 of this FMP.

The Council's criteria to guide the Assistant Administrator in the allocation process are as follows:

> The National Marine Fisheries Service (NMFS) shall review reported domestic harvest (including off-loadings at sea) for mackerel on a monthly basis. Domestic harvest shall be determined based upon vessel and processor reports required by Section XIV of this FMP, additional statistical port sampling data collected by NMFS, and surveys of marine angler catches.
>
> The Assistant Administrator shall project the total amount of Atlantic

mackerel that will be harvested by US fishermen during the entire fishing year.

If the estimated amount of Atlantic mackerel to be harvested by US fishermen exceeds DAH, the Assistant Administrator shall allocate a sufficient quantity of Atlantic mackerel to DAH from the Reserve. Such allocation shall ensure that the US fishery for Atlantic mackerel will not be subject to closure except in the event that domestic landings of that species threaten to exceed DAH plus the Reserve for Atlantic mackerel.

At the end of the first six months of the fishing year, if the estimated total amount of Atlantic mackerel to be harvested by US fishermen is less than 80 per cent of the total of domestic DAH plus the Reserve (i. e., 20,800 mt), the Assistant Administrator shall consider an allocation of the remainder of the Reserve for Atlantic mackerel to TALFF.

Any allocations made under this provision shall be timely, and implemented in a manner which facilitates the conduct of the fishery with a minimum of disruption.

The Assistant Administrator shall accomplish any allocation of mackerel through the regulatory process. Notice of proposed rulemaking stating the amount of Atlantic mackerel to be allocated shall be published in the Federal Register. The public shall be given a 15-day comment period from the date of publication. During this time the Assistant Administrator or his designee shall consult with the appropriate committee of the Council to ensure that the proposed allocation is consistent with the objectives contained in the FMP. The Assistant Administrator shall publish final regulations as appropriate in the Federal Register to accomplish any allocation. The Council believes these final regulations should be published in the Federal Register in a timely manner, to allow for proper notice. When the final regulations are published in the Federal Register, all comments and relevant information received including catch statistics shall be summarized.

The Council has determined that it is inappropriate to provide for allocation of the entire Reserve for Atlantic mackerel to TALFF for the following reasons:

(1) The traditional pattern of US harvesting of mackerel throughout the latter part of the fishing year, including the last month of the fishing year.

(2) The unknown amount of incidental catch of mackerel which may be unreported.

(3) The possiblity of unforeseen entry into the mackerel fishery by domestic fishermen late in the season.

(4) The development of the mackerel export market.

The Council anticipates that the Secretary, after consultation with the Council, will implement the intent of the FMP to restrict US harvest in excess of DAH plus the Reserve by imposing such measures including, but not limited to, trip limitations, quarterly or half yearly quotas, and closed areas, as she deems appropriate in the final regulations. Such measures should ensure the achievement of OY in a manner that does not result in a sudden dislocation of those involved in the fishery. The Council intends that these measures will enable fishermen to redirect their effort in a timely manner should a closure of the fishery or a substantial diminution in allowable catch become necessary.

XIII-4. Types of Gear

Foreign nations fishing for mackerel shall be subject to the gear restrictions set forth in part 611.50(c) of 50 CFR.

XIII-5. Incidental Catch

Foreign nations fishing for mackerel shall be subject to the incidental catch regulations set forth in parts 611.13, 611.14, and 611.50 of 50 CFR.

XIII-6. Restrictions

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

XIII-7. Habitat Preservation, Protection and Restoration

The Council is deeply concerned about the effects of marine pollution on fishery resources in the Mid-Atlantic Region. It is mindful of its responsibility under the FCMA to take into account the impact of pollution on fish. The extremely substantial quantity of pollutants which are being introduced into the Atlantic Ocean poses a threat to the continued existence of a viable fishery. In the opinion of the Council, elimination of this threat at the earliest possible time is determined to be necessary and appropriate for the conservation and management of the fishery, and for the achievement of the other objectives of the FCMA as well. The Council, therefore, urges and directs the Secretary to forthwith proceed to take all necessary measures, including but not limited to, the obtaining of judicial decrees in appropriate courts, to abate, without delay, marine pollution emanating from the following sources: (1) the ocean dumping of raw sewage sludge, dredge spoils, and chemical wastes; (2) the discharge of raw sewage into the Hudson River, the New York Harbor, and other areas of the Mid-Atlantic Region; (3) the discharge of primary treated sewage from ocean outfall lines; (4) overflows from combined sanitary and storm sewer systems; and (5) discharges of harmful wastes of any kind, industrial or domestic, into the Hudson River or surrounding marine and estuarine waters.

XIII-8. Development of Fishery Resources

No changes are required as a result of Amendment #1.

XIII-9. Management Costs and Revenues

It is expected that the costs of implementing Amendment #1 should be similar to the cost of implementing the original FMP. The licensing and reporting requirements are essentially unchanged. The monitoring necessary to allocate the Reserve should not result in costs significantly different from the costs of monitoring required in the original FMP to allocate between the US commercial and recreational sectors.

XIV. SPECIFICATIONS AND SOURCES OF PERTINENT FISHERY DATA

No changes are required as a result of Amendment #1.

XV. RELATIONSHIP OF THE RECOMMENDED MEASURES TO EXISTING APPLICABLE LAWS AND POLICIES

XV-1. Fishery Management Plans

Amendment #1 to the Atlantic Mackerel FMP is related to other FMPs, PMPs, and proposed FMPs as follows:

1. It will amend the FMP regulating fishing for mackerel.
2. All fisheries of the northwest Atlantic are part of the same general geophysical, biological, social, and economic setting. Domestic 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.
3. Many fisheries of the northwest Atlantic result in significant non-target species fishing mortality. Therefore, each management plan must consider the impact of non-target species fishing mortality on other stocks and as a result of other fisheries.
4. Mackerel are a food item for many commercially and recreationally important fish species. Also, mackerel utilize many finfish species as food items.
5. Present ongoing research programs often provide data on stock size, levels of recruitment, distribution, age, and growth for many species regulated by the PMPs, FMPs, and proposed FMPs.

XV-2. Treaties or International Agreements

No treaties or international agreements, other than GIFAs entered into pursuant to the FCMA, relate to this fishery.

XV-3. Federal Laws and Policies

The only Federal law that controls the fishery covered by this management plan is the FCMA.

Marine Sanctuary and Other Special Management Systems

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 Part 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 latitude - 75°24'32" W longitude is located in the plan'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 mackerel fishing operations under this FMP. Also, the Monitor Marine Sanctuary is clearly designated on all National Ocean Survey (NOS) charts by the caption "protected area". This minimizes the potential for damage to the Sanctuary by domestic fishing operations.

Potential Impact on Marine Mammals and Endangered Species

Numerous species of marine mammals occur in the northwest Atlantic Ocean, yet definitive species composition is unknown. Indications are that the most numerous species in the area are the common (saddleback) dolphin (Delphinus delphis), harbor porpoise (Phocoena phocoena), and harbor seal (Phoca vitulina). Data on population abundance for various species, however, is sketchy at best, and for some species is non-existent. In addition, feeding behavior and preference for certain prey species are not well understood. These facts in combination make it extremely difficult to assess, even qualitatively, the potential impact of the mackerel management program on marine mammal populations.

The proposed harvest level for the 1979-1980 fishing year of 11,000 mt is not expected to cause any declines in abundance of this species. Therefore, no change in the availability of these species to those toothed cetaceans and pinnipeds that

utilize mackerel as a food item is expected to occur.

Whenever fishing gear and marine mammals occur in the same area, there always exists a potential for an incidental kill of marine mammals. Except in unique situations (e.g., tuna-porpoise in the central Pacific), the incidental kill as a result of commercial fishing activities usually has an insignificant impact upon the stability of marine mammal populations. This is because the number of animals killed is relatively small compared to total population size.

Outside of certain marine mammals, the only threatened/endangered species occurring in the northwest Atlantic are the shortnose sturgeon (Acipenser brevirostrum) and several species of sea turtles. Because data on occurrences of shortnose sturgeon are vital to understanding its current status, the Council urges fishermen to report any incidental catch of this species to the Shortnose Sturgeon Recovery Project of the NMFS.

Available data appear to indicate that several species of sea turtles are regularly found in New England waters. These turtles are the Kemp's ridley (Lepidochelys kempi), leatherback (Dermochelys coriacea), loggerhead (Caretta caretta), and green (Chelonia mydas). In addition, hawksbill turtles (Eretmochelys imbricata) occasionally stray into the area. The Kemp's ridley sea turtle, while probably the most endangered reptile on earth (total population estimated at several thousand adult individuals), is also the most frequently observed sea turtle in New England waters, especially Cape Cod Bay. Strandings of Kemp's ridley are routine, have been known to occur for some time , and result in some mortality to the stranded animals. One hypothesis is that individuals remain in the Bay until late autumn, and with the decrease in water temperature as winter approaches, these animals become subject to hypothermia and subsequently die.

In late autumn, 1978, seven Kemp's ridley turtles were found on the beaches along Cape Cod Bay. While several of these individuals were reportedly cut and bleeding when first observed, recent examination of the preserved specimens did not reveal any major physical damage to the individuals. It is possible that these animals were injured by fishing activity either through entanglement in the trawl nets or by contact with a vessel's propeller. However, there is no solid evidence to indicate that fishing operations were responsible for the kills. Based on inquiries to fishermen conducted by NMFS and Massachusetts Division of Marine Fisheries personnel, the general conclusion can be drawn that regular and numerous killings of Kemp's ridley turtles in Cape Cod Bay do not occur as a result of normal commercial fishing operations. Additional monitoring of turtles is needed.

In conclusion, the Council does not believe that implementation of the mackerel FMP will have any adverse impact upon populations of marine mammals and endangered species. As additional understanding of the status and dynamics of marine mammal and sea turtle populations becomes available, the Council will integrate this information into the examination of potential impacts upon the environment as a result of FMPs.

Current and/or Proposed Oil, Gas, Mineral, and Deep Water Port Development

While Outer Continental Shelf (OCS) development plans may involve areas overlapping those contemplated for offshore fishery management, we are unable to specify the relationship of both programs without site specific development information. 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. The Council has recommended that the nomination of the Georges

Bank Marine Sanctuary be reinstated and that an EIS be prepared for it.

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.

XV-4. State, Local, and Other Applicable Laws and Policies

No State or local laws control the fisheries that are the subject of this management plan other than those listed in Section VII-4.

State Coastal Zone Management (CZM) Programs

The proposed action entails management of mackerel stocks in an effort to ensure sustained productivity at some optimum level. In order to achieve this goal, all management plans must incorporate means to achieve integrity of fish stocks, related food chains, and habitat necessary for this integrated biological system to function effectively. Inasmuch as CZM plans are presently in the developmental stages, we are not aware of specific measures on the part of the individual states which would ultimately impact this fishery plan. However, 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. Therefore, each State's CZM plan will probabily assimilate the ecological principles upon which this particular fishery management plan is based. It is recognized that responsible long-range management of both coastal zones and fish stocks must involve mutually supportive goals. At the time that the draft of Amendment #1 was distributed for review, the Council had been advised that Maine, Massachusetts, Rhode Island, New Jersey, Maryland, and North Carolina had approved CZM Programs. Copies of the draft were sent to the CZM agencies in those States for review and no comments were received.

XVI. COUNCIL REVIEW AND MONITORING OF THE PLAN

The Council will review the plan each year following the close of the mackerel fishery and the publication of the results of the spring NMFS survey cruse. This schedule will permit a review of MSY, OY, DAH, DAP, NPF and TALFF prior to the development of foreign fishing allocations. This schedule may be modified in the future as the domestic fishery evolves. An additional factor in this evaluation will be the findings of the NMFS marine angler survey.

XVII. REFERENCES

All requests for background information, biological assessments, etc., should be directed to the offices of the Mid-Atlantic Fishery Management Council. Additions to the references listed in the original FMP are:

Mid-Atlantic Fishery Management Council. 1978. Final environmental impact statement/fishery management plan for the Atlantic mackerel fishery of the northwest Atlantic Ocean, supplement #1. 134 p.

Anderson, E. D. 1979. NMFS, Northeast Fisheries Center, Woods Hole Lab. Lab Reference 79-35.

APPENDIX I. STATUS OF THE NORTHWEST ATLANTIC MACKEREL STOCK - 1979*

INTRODUCTION

This report analyzes the status of the Atlantic mackerel (Scomber scombrus) stock distributed throughout ICNAF Subareas 3, 4, and 5 and Statistical Area 6 (SA 3-6) (Figure I-1). This analysis reported herein is an update of the assessment by Anderson and Overholtz (1979a) and utilizes procedures described in Anderson (1979) and Anderson and Overholtz (1979a). Included in this report are international commercial and US recreational catch statistics; US research vessel bottom trawl survey abundance indices; fishing mortality and stock size estimates from cohort analysis; recruitment estimates; and projected options for catch in 1980, given various levels of catch in 1979, with resulting spawning stock biomasses in 1981.

CATCH

The international mackerel catch (commercial and recreational) in ICNAF SA 3-6 increased from 12,310 tons in 1960 to 431,606 tons in 1972, and subsequently dropped to only 33,450 tons in 1978 (Table I-1). The US commercial catch has ranged between 938 and 4,364 tons during 1960-1978 and averaged 2,200 tons per year; the 1978 catch was 1,604 tons. Estimated US recreational catches have varied from 522 to 33,303 tons (average of 13,200 tons) and increased sharply from 522 tons in 1977 to 6,571 tons in 1978. Canadian catches during 1960-1978 have varied from 5,459 to 24,444 tons (1978) and averaged 13,400 tons each year. Catches by countries other than the US and Canada increased from 11 tons in 1961 to 396,759 tons in 1973 and decreased to only 831 tons in 1978.

The 1978 catch statistics are presently provisional (Table I-2). The Canadian catch of 24,444 tons comprised 73% of the total, followed by the US with 8,175 tons or 24% (commercial and recreational). A total of 24,913 tons was taken in SA 3-4 and 8,537 tons in SA 5-6. The US imposed a catch limitation for 1978 of 15,500 tons for the portion of the overall stock under US jurisdiction, with only 1,200 tons allocated to distant water fleets as incidental catch in other fisheries. Of this latter amount, only 362 tons were taken; the balance (469 tons) of the distant water fleet catch was taken in SA 4 (Canadian waters).

The estimate of mackerel catch from the US recreational fishery in 1978 was based on a survey of the spring recreational mackerel fishery in the Middle Atlantic area conducted by personnel of the NMFS, Northeast Fisheries Center, Sandy Hook Laboratory, in cooperation with personnel from New Jersey, Delaware, and New York (Christensen et al., 1979a). It was estimated that 6,103 tons were caught by anglers aboard party, charter, and private boats in the area from Virginia to Maine. Assuming that the proportion of mackerel caught from boats compared to that caught from shore was the same in 1978 as estimated in the national marine angler survey conducted in 1970 (Deuel, 1973) (Virginia - New Jersey, 99.6%; New York - Maine, 90.9%), an additional 468 tons were caught by shore-based anglers. The total estimated recreational catch of mackerel in 1978 was, therefore, 6,571 tons.

* Reprinted from: Anderson, E. D., and W. J. Overholtz. 1979., Status of the Northwest Atlantic Mackerel Stock - 1979, NMFS, Northeast Fisheries Center, Woods Hole, Lab. Ref. No. 79-35.

CATCH COMPOSITION

The international mackerel catch in numbers at age for 1978 is presented in Table I-3. The bulk of the data are Canadian (calculated by Hunt[1] and Moores[2]), although numbers at age were estimated for portions of the US recreational and commercial catch. There were no sampling data from distant water fleet catches. About 86% of the total catch in tons was accounted for by sampling data (Canada - 73%; US - 13%). The remaining 14% was assumed to be of the same age composition as the cumulative age composition of the sampled catch.

The 1974 and 1973 year-classes comprised 29% and 22%, respectively, of the total 1978 catch in numbers. The catch of age 1 - 3 fish was low in comparison to other years. Age 1 (1977 year-class) and age 2 (1976 year-class) fish comprised only 0.2% and 0.4%, respectively, of the 1978 catch, which were the lowest percentage contributions by either age group during 1962 - 1978. The catch in numbers of age 3 fish (1975 year-class) was 7.6%, the lowest percentage contribution by that age group since the mid-1960s. These unusually poor catches of age 1 - 3 fish reflect, in large part, the apparent low abundance of these year-classes (1975, 1976, and 1977), and, to a lesser extent, the decrease in distant-water-fleet (DWF) catches. In the past, the percentage contribution of age 1 - 3 fish was greater in DWF catches than in Canadian and USA catches. Mean age of the catch increased from 2.8 years in 1975 to 3.8 years in 1977 and then climbed sharply to 5.8 years in 1978 (Table I-5), reflecting the passage of the 1973 and 1974 year-classes through the fishery and the scarcity of younger fish in the catch in the last several years.

An estimate of the age composition of the 1978 US spring recreational catch of mackerel was made by Christensen et al. (1979b). Approximately half of the catch was comprised of fish from the strong 1967 (age 11 - 27%) and 1969 (age 9 - 23%) year-classes (Table I-4). In contrast, only about 6% of the sampled commercial catch consisted of these two year-classes. Furthermore, mackerel catches during a January - March, 1978, USSR bottom trawl survey and the US spring bottom trawl survey indicated low proportions of these older age groups and 50-60% of age 4 (1974 year-class) and 5 (1973 year-class) fish (Anderson and Overholtz, 1978b). Since the survey catches occurred primarily in offshore waters whereas the recreational fishery is conducted generally within 10-15 miles of shore, the difference in catch composition is consistent with what is known about the size and age composition of spring migrating and spawning mackerel. Sette (1943, 1950) reported that the larger, older fish were the first to move inshore to spawn followed later by smaller, younger fish.

Sampling of the spring recreational catch was also done in 1979 (Christensen [3]). Results indicate that the 1969 and 1967 year-classes again comprised about half of the catch (Table I-4). The age composition in 1978 and 1979 is consistent in indicating that the spring recreational catch is comprised mainly of large, old mackerel. Unfortunately, since sampling data were not collected prior to 1978, it is not known if this represents the typical situation or is unique to the last several years. In view of Sette's findings, however, it is likely that this is typical. The summer recreational catch of mackerel in the New England region, although less than that in the spring Middle Atlantic fishery based on past national marine angler survey results, likely includes a greater proportion of smaller fish, particularly when strong year-classes of young fish are present. Although sampling

[1] Hunt, J. J. Fisheries and Oceans Canada, Fisheries and Marine Service, Marine Fish Division, St. Andrews, New Brunswick E0G 2X0, Canada. personal communication.

[2] Moores, J. A. Fisheries and Oceans Canada, Research and Resource Services, Newfoundland Environment Center, P.O. Box 5667, St. John's, Newfoundland A1C 5X1, Canada. personal communication.

[3] Christensen, D. J. NMFS, Northeast Fisheries Center, Sandy Hook Lab., Highlands, NJ 07732. personal communication.

data from this component of the recreational fishery are lacking, young fish are frequently caught from shore in summer (Bigelow and Schroeder, 1953).

The international mackerel catch in numbers at age for 1962-1978 is given in Table I-5.

MEAN WEIGHTS AT AGE

Mean weights at age, adopted by scientists in the ICNAF Assessments Subcommittee (ICNAF 1974), were used in this assessment (Table I-6). As described by Anderson (1979), these values were multiplied by the appropriate numbers at age (Table I-5) and summed by calendar year to obtain calculated catches (tons). Ratios between observed and calculated catches varied from 0.906 to 1.302 (Table I-5) and averaged 1.031. Mean weight values were applied to stock size numbers at age calculated from cohort analysis (Table I-10), with the products summed by calendar year to obtain stock biomass. Annual biomass values were corrected using the appropriate observed/calculated catch ratios. Projected catch and stock biomass levels for 1979-1981 were not corrected.

STOCK ABUNDANCE INDICES

US spring and autumn research vessel bottom trawl survey catch-per-tow indices (Table I-7, Figure I-3) have generally monitored trends in mackerel abundance since 1963. Surveys conducted since the previous assessment (Anderson and Overholtz, 1979a) indicate a substantial increase in mean catch per tow (kg, retransformed) during the autumn survey from 0.027 in 1977 to 0.191 in 1978, but a decrease during the spring survey from 0.447 in 1978 to 0.221 in 1979. Year-to-year changes exhibited by survey catch-per-tow indices are much less reliable than longer-term trends due to the high variability of the data (Grosslein, 1971; Anderson, 1976, 1979; Pennington and Grosslein, 1978; Sissenwine, 1978). As a result, the changes in the survey indices in 1978-1979 should be interpreted cautiously. Both the spring and autumn indices increased sharply from 1977 to 1978, but the actual improvement in stock abundance was probably less than either the 2-fold or 6-fold increase indicated by the two surveys, respectively. Results from cohort analysis (Table I-10) indicate the beginning of stock recovery from 1977 to 1978, but the increase was estimated as less than 10%. There is no logical basis for an abrupt change in actual stock size as indicated by the drop in the spring survey index from 1978 to 1979. Available information suggests that the low survey catch of mackerel in 1979 relative to 1978 was due, in part, to warmer bottom water temperatures at the time of the survey in 1979. A greater proportion of the mackerel was caught in sampling strata farther north and east (southern New England - Georges Bank area) in 1979 compared to 1978. It is likely, therefore, that a substantial portion of the mackerel normally sampled in SA 5-6 during the spring survey may, in 1979, have already migrated east and north into Canadian waters enroute to the Gulf of St. Lawrence. Anderson and Almeida (1977) were able to associate northward shifts in spring survey catches of mackerel during 1968-1976 with increases in water temperature.

The standardized US commercial catch-per-day index (Anderson, 1976) decreased slightly from 0.52 tons in 1977 to 0.48 tons in 1978 (Table I-8, Figure I-4). This index has remained fairly constant since 1975. Although this measure of relative stock abundance has generally monitored the gross fluctuations in mackerel abundance since 1964, it is limited as a reliable indicator of year-to-year change, particularly in recent years, since the index is determined from catches which have averaged less than 1% of the total catch from the stock (Anderson, 1979).

NATURAL MORTALITY

Instantaneous natural mortality (M) was assumed to be 0.30 for all ages in all years, as adopted earlier by scientists in the ICNAF Assessment Subcommittee (ICNAF

1974).

FISHING MORTALITY

Instantaneous fishing mortality (F) for fully-recruited age groups in 1978 was estimated using a method first proposed by Anderson et al. (1976) and employed in subsequent assessments. The technique, based on a linear relationship between mean annual F values (ages 3 and older) derived from cohort analysis and relative exploitation indices (ratio between international catch and spring survey catch per tow), predicted an F of 0.153 for 1978 (Table I-9, Figure I-5). In previous assessments (Anderson, 1979; Anderson and Overholtz, 1979a), the 1968-1977 survey values were smoothed by exponential curve and values predicted from the curve were used in calculating the relative exploitation indices. The 1968-77 time-series was smoothed because of the aberrant 1969 value and the year-to-year fluctuations in the other values; an exponential curve appeared to best describe the continuously decreasing trend. Since the 1978 value deviated sufficiently from the decreasing trend of the previous years to reflect a true increase in abundance, the actual 1978 survey value was used to calculate the relative exploitation index for 1978.

Age-specific fishing mortality (F) rates for 1962-1977 (Table I-10) were determined from cohort analysis (Pope, 1972) assuming F = 0.153 at ages 4 and older in 1978. Mean annual F values for ages 3 and older increased from 0.04 in 1962-1964 to a high of 0.67 in 1976 and then decreased to 0.34 in 1977 and to an estimated 0.15 (ages 4 and older) in 1978.

RECRUITMENT

The sizes of the 1961-1974 year-classes at age 1, estimated from cohort analysis, ranged from 433 million (1963 year-class) to 8,417 million fish (1967 year-class)(Table I-10, Figure I-9), with a mean size of 2,138 million and a median size of 1,551 million.

Power curve relationships, fitted by least squares, between (1) autumn survey catch per tow at age 0 (numbers, retransformed), and year-class size at age 1 estimated from cohort analysis for 1963-1974 (Table I-12, Figure I-6), (2) spring survey catch per tow at age 1 and year-class size at age 1 for 1967-1974 (Table I-12, Figure I-7), and (3) spring survey catch per tow at age 2 and year-class size at age 2 for 1966-1974 (Table I-12, Figure I-8) were used to estimate the sizes of the 1975-1978 year-classes. Previous assessments (Anderson et al., 1976; Anderson, 1979; Anderson and Overholtz, 1979) utilized linear catch-per-tow indices for ages 0, 1, and 2. The present analysis, however, modified the procedure by using a natural log transformation of the station catches prior to calculation of the catch-per-tow indices, followed by a retransformation to the linear scale. Natural log transformation and retransformation for the catch-per-tow-at-age indices employed the same general procedures (Anderson 1979) as used for the catch-per-tow indices (kg) given in Table I-7. The purpose for and result of this modification to the technique was to reduce some of the variability inherent to the unadjusted linear survey data (Anderson, 1979).

The 1975 year-class was estimated to be 538 and 966 million fish at age 1 based on the autumn (age 0) and spring (age 1) survey catch per tow indices, respectively, and 374 million at age 2 based on the spring age 2 index (Table I-12, Figures I-6 - I-8). The catch (C_2) of 26.9 million fish at age 2 in 1977 (Table I-5) and a year-class size (N_2) of 374 million fish implied from:

$$C_2 = N_2 \frac{F_2}{Z_2} (1-e^{-Z_2}) \qquad (1)$$

an F_2 of 0.087. A year-class size of 519 million at age 1 then followed from cohort

analysis. Based on three estimates of its size at age 1 (538, 966, and 519 million fish), which averaged 674 million, and considering that two of the three estimates were less than the mean, the 1975 year-class size was assumed to be 600 million at age 1.

Estimates were also obtained similarly for the 1976 year-class at age 1 (0, 416, and 749 million). The zero estimate obtained from the autumn survey age 0 index, although indicative of a poor year class, was not used quantitatively in determining the size of the 1976 year class. The mean of the remaining estimates was 582 million, and, therefore, the 1976 year-class was considered to be 600 million at age 1.

The 1977 year-class was estimated to be 709 and 813 million fish at age 1, based on the autumn (age 0) and spring (age 1) survey catch-per-tow indices, respectively, but only 94 million fish at age 2 based on the spring age 2 index (Table I-12, Figures I-6 - I-8). The catch (C_1) of 115,000 fish at age 1 in 1978 (Table I-3) and a year-class size (N_2) of 94 million at age 2 in 1979 implied from

$$\frac{N_2}{C_1} = \frac{Z_1 e^{-Z_1}}{F_1 (1 - e^{-Z_1})} \qquad (2)$$

an F of 0.00105. A year-class size (N_1) of 126 million at age 1 was then implied from Equation 1. However, in view of the above two estimates of this year-class at age 1 (709 and 813 million), 126 million was considered to be unrealistically low. It was indicated previously that the catch per tow of mackerel during the spring survey decreased from 1978 to 1979 although other evidence indicates that stock abundance improved, and that the decrease was related to increased water temperature which may have stimulated an earlier migration of mackerel from the survey area into Canadian waters. Therefore, the estimate of 126 million fish at age 1 was ignored, and the 1977 year-class was assumed to be 700 million at age 1.

The 1978 year-class was estimated to be 3,342 million fish at age 1 based on the autumn (age 0) survey catch-per-tow index (Table I-12, Figure I-6). Because of the low mackerel catch during the 1979 spring survey, as described earlier, this year-class was estimated to be only 468 million at age 1 based on the spring (age 1) index (Table I-12, Figure I-7). This latter value was considered to be a gross underestimate of the true size of the 1978 year-class. In addition to the results of the 1978 US autumn survey which predicted a large 1978 year-class, results from a bottom trawl survey conducted during 10 February - 4 March, 1979, in the Georges Bank - southern New England area by the Federal Republic of Germany R/V Anton Dohrn also tend to suggest a large 1978 year-class. The mackerel catch during this survey was larger than that from the last several Anton Dohrn spring surveys and consisted almost entirely of 1978 year-class fish. These fish were all caught in stratum 10 (Figure I-2), south of Cape Cod. Since this survey was conducted 1-2 months prior to the US spring survey, it is possible that the bulk of these fish had migrated from the survey area into Canadian waters by the time the US survey sampled the same area.

An attempt was made to correct for the unusually low catch-per-tow index at age 1 in 1979. As mentioned above, the catch-per-tow index at age 2 in 1979 (1977 year-class) predicted a year-class of only 126 million at age 1 compared to estimates of 709 and 813 million at age 1 based on age 0 and 1 survey indices (Table I-11). Assuming that the mean (761 million) of the latter two estimates represented the true size of the year-class at age 1, the catch of 115,000 fish at age 1 in 1978 (Table I-3) implied a year-class size of 564 million at age 2 in 1979, instead of 94 million. The survey catch per tow index at age 2 in 1979 needed to predict 564 million fish from the calculated power curve relationship (Table I-12, Figure I-8) would be 0.229 instead of 0.009. The hypothetical index (0.229) differed from the observed index (0.009) by a factor of 25.44. Assuming that the survey catch of age

1 mackerel in the spring of 1979 was proportionately as low as the catch of age 2 mackerel, increasing the observed age 1 catch per tow index (0.029) by a factor of 25.44 resulted in a hypothetical index of 0.738. A year-class size of 1,555 million fish at age 1 was predicted from the calculated power curve relationship (Table I-12, Figure I-7) using the index of 0.738. Given two estimates of 3,342 million and 1,555 million (average = 2,448 million), the 1978 year-class was, therefore, considered to be 2,400 million fish at age 1.

For purpose of catch and stock size projections and lacking any information, the 1979 year-class was arbitrarily set at 600 million fish at age 1, or equal to the low 1975 and 1976 year-classes.

Based on results of cohort analysis and estimates based on survey catch-per-tow-at-age indices, the 1978 year-class is the largest to enter the fishery since the 1969 year-class (Table I-10), followed by the 1973 year-class. The 1975-1977 year-classes appear to be low in abundance (2-3 times smaller than the 1973-1974 year-classes) and of a size comparable to the 1962-1964 year-classes.

PARTIAL RECRUITMENT

Partial recruitment of an age group to the fishery in a given calendar year is defined here as the ratio of the fishing mortality (F) at that age to the average fishing mortality of fully-recruited ages in that year. Based on age-specific F values from cohort analysis (Table I-11), mackerel appear to have become fully recruited to the fishery in many years by about age 3. Exceptions to this have occurred as a result of the variability in year-class sizes and to shifts in fishing patterns and effort. Partial recruitment coefficients for ages 1-3 during 1962-1978 are given in Table I-13. Partial recruitment during 1962-1978 has varied from 0.1 to 100.0% (average = 29.3%) at age 1, 0.4 to 100.0% (average = 48.7%) at age 2, and 7.0 to 100.0% (average = 70.9%) at age 3. Partial recruitment was especially high (76%) at age 1 in 1975 (1974 year-class) with 100% recruitment of that year-class at ages 2 and older. The 1973 year-class did not experience high partial recruitment at age 1 (13%), but was fully recruited at ages 2 and older. Full recruitment (at or near 100%) at age 3 occurred in about half of the years (1962-1978), but in 8 of the last 12 years which was the period of the recent intensive international fishery.

Partial recruitment at age 1 decreased sharply from 76% in 1975 to 3.6% in 1976 and continued to drop to only 0.1% in 1978 (Table I-13). Partial recruitment also declined at age 2 from 100% in 1976 to 22% in 1977 and 0.4% in 1978, and at age 3 from 100% in 1977 to 12% in 1978. These coefficients may not be totally accurate as the F values from which they were derived were determined from estimated year-class sizes and known catches. However, the decreases do reflect changing conditions in the mackerel fishery. The abrupt drop in partial recruitment at age 1 in 1976 is due in part to a minimum size limit of 25 cm (total length) adopted beginning that year by ICNAF to effectively exclude the harvest of age 1 mackerel. However, this regulation in itself would not have resulted in such a decrease in fishing mortality relative to older ages, as it authorized up to 25% by number of the total catch on board vessels to be undersized fish. The decreased fishing mortality and partial recruitment evident for the 1975-1977 year-classes in 1976-1978 appears to be due primarily to the low abundance of these year-classes and the fact that the fishery during the last several years has been supported by older fish, particularly the 1973 and 1974 year-classes.

The sudden change in partial recruitment in recent years complicates the selection of coefficients for the projection of catches in 1979 and 1980. Since 73% of the catch in numbers in 1978 was Canadian (Table I-14), and indications are that the bulk of the catch in 1979 and possibly in 1980 will also be Canadian, it was decided to examine the age composition of the Canadian catch and estimate the age-specific fishing mortalities of that component of the international catch. Age composition

in thousands of fish at age of the Canadian mackerel catch in SA 3-6 during 1968-1978 is given in Table I-14 (see Anderson and Paciorkowski, in press). These data indicate considerable year-to-year variability in the age composition reflecting in large part the passage of dominant as well as weak year-classes through the fishery. About 50% of the 1968 catch was age 1 fish from the outstanding 1967 year-class; the catch from this year class at ages 1 - 6 exceeded the catch of any other age group each year through 1973. In 1971 and 1973, small quantities of age 0 mackerel were caught. Until the last several years and the entry of the 1975-1977 year-classes to the fishery, age 1-3 mackerel were well represented in the Canadian catch. Estimates of age-specific fishing mortality attributable to the Canadian fishery were determined by applying the ratio between the Canadian catch in numbers (Table I-14) and the international catch in numbers (Table I-5) at each age in each calendar year to the appropriate F calculated from cohort analysis for the entire fishery (Table I-11). From this analysis it appeared, as for the entire fishery, that fish in most years were fully recruited to the Canadian fishery at age 3. Partial recruitment coefficients were determined for ages 1-3 as ratios of F at each age to the mean F (F at each age weighted by stock size at that age) at ages 3 and older (Table I-14). As with the partial recruitment coefficients determined for the entire fishery (Table I-12), the Canadian values exhibited considerable variation and the same general year-to-year pattern, although, on average for 1968-1978, they were lower at each age (18% vs. 20% at age 1; 33% vs. 50% at age 2; 67% vs. 81% at age 3). The 1978 values for both the Canadian and the entire fishery were low at ages 1-3 (0.1, 0.4, and 12%, respectively). With an estimated strong 1978 year-class entering the fishery in 1979 and the 1974 and older year-classes continuing to decline in abundance as they advance through the fishery, it was felt that partial recruitment coefficients at ages 1-3 fish in 1979-1980 would increase from those estimated for 1978. Lacking any additional rationale for selecting coefficients for 1979-1980, means for each age were determined by eliminating from consideration the high and low values at each age in the 1968-1978 series. The resulting values were 15% at age 1, 33% at age 2, and 70% age age 3, with full or 100% recruitment at ages 4 and older (Table I-16).

STOCK SIZE

Age-specific stock size estimates generated from cohort analysis and annual biomass values obtained by applying mean weights at age (Table I-6) to the stock size estimates are given in Table I-10. Total stock biomass (ages 1 and older) increased from about 600,000 tons during 1962-1965 to 2.5 million tons in 1969 (Figure I-9) and then declined sharply to 485,000 tons at the beginning of 1977. The total stock has since increased about 30% to an estimated 631,000 tons at the beginning of 1979. Spawning stock biomass, defined as 50% of the age 2 fish and 100% of the age 3 and older fish, increased from about 500,000 tons in 1962-1967 to 1.9 million tons in 1970-1972 and then declined to an estimated 358,000 tons at the beginning of 1979.

CATCH AND STOCK SIZE PROJECTIONS

Projections of spawning stock biomass available at the beginning of 1980 were made assuming various levels of catch in 1979 ranging from 30,000 to 100,000 tons (Table I-17). Fishing mortality estimated to generate these catches varied between 0.103 (30,000 tons) and 0.380 (100,000 tons). Spawning stock biomass available at the beginning of 1980 will vary from an estimated 488,000 tons (36% increase from 1979) assuming a 1979 catch of 30,000 tons, to 421,000 tons (18% increase from 1979), assuming a catch of 100,000 tons.

Projected catches in 1980 at fishing mortality rates ranging from 0.05 to 0.50 and resultant spawning stock biomass levels available at the beginning of 1981 were made (Table I-18) for each 1979 catch option. If the 1979 catch was only 30,000 tons, or about the same level as in 1978, catches in 1980 would vary from 17,600 tons at F = 0.05 to 150,700 tons at F = 0.50. Resultant spawning stock biomass at the beginning of 1981, given this range in catch in 1980, would vary from 657,000 tons (84%

increase from 1979 and 35% increase from 1980) to 515,000 tons (44% increase from 1979 and 6% increase from 1980).

If the 1979 catch was as high as 100,000 tons, catches in 1980 would vary from 15,000 tons at F = 0.05 to 128,900 tons at F = 0.50. Resultant spawning stock biomass in 1981, given this range in catch in 1980, would vary from 595,000 tons (66% increase from 1979 and 41% increase from 1980) to 472,000 tons (32% increase from 1979 and 12% increase from 1980).

Given the range in catch in 1979 from 30,000 to 100,000 tons, fishing in 1980 at $F_{0.1}$ = 0.40 would result in catches ranging from 124,600 to 106,500 tons and result in spawning stock biomass increases of 52%-38% from 1979 to 1981 and of 11% to 18% from 1980 to 1981.

Under all catch assumptions presented for 1979-1980, there is an accompanying projection of stock increase in 1980-1981, which is due to the recruitment of the estimated strong 1978 year-class. Continued recovery of the stock will depend largely on the strength of this and subsequent year-classes as well as the magnitude of the catch in the next few years. There is no definite basis for predicting levels of future recruitment given present and projected levels of spawning biomass. However, examination of the 1962-1978 spawning stock-recruitment pattern indicates a greater probability of stronger recruitment with a spawning stock biomass in excess of 700,000 tons. During the 17-year period of 1962-1978, the estimated spawning biomass was less than 700,000 tons during 8 of those years, and only 25% (2) of the year-classes spawned during those 8 years were above median size. During the remaining 9 years, spawning biomass was equal to or greater than 900,000 tons and 78% (7) of the year-classes were at or above the median size. Since all of the years which resulted in good recruitment were consecutive, it is possible that favorable environmental conditions may have persisted during that time which were equally or more influential in determining year-class size than spawning stock size. The available knowledge is not sufficient to distinguish the key factor(s), but does suggest a higher probability of improved recruitment as the stock continues to rebuild.

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Table I-1. Mackerel Catch (tons) from SA 3-6 During 1960-1978.

Year	United States		Canada	Other Countries	Total
	Commercial	Recreational			
1960	1,396	4,957(a)	5,957	-	12,310
1961	1,361	6,828	5,459	11	13,659
1962	938	8,698	6,801	175	16,612
1963	1,320	8,348	6,363	1,299	17,330
1964	1,644	8,486	10,786	801	21,717
1965	1,998	8,583(a)	11,185	2,945	24,711
1966	2,724	10,172	11,577	7,951	32,424
1967	3,891	13,527	11,181	19,047	47,646
1968	3,929	29,130	11,134	65,747	109,940
1969	4,364	33,303	13,257	114,189	165,113
1970	4,049	32,078(a)	15,690	210,864	262,681
1971	2,406	30,642	14,735	355,892	403,675
1972	2,006	21,882	16,254	391,464	431,606
1973	1,336	9,944	21,247	396,759	429,286
1974	1,042	7,640(a)	16,701	321,837	347,220
1975	1,974	5,968	13,544	271,719	293,205
1976	2,712	4,202(a)	13,746	223,275	245,935
1977	1,376	522(a)	22,477(b)	53,745(b)	78,120
1978	1,604	6,571(a)	24,444(b)	831(b)	33,450

(a) From angler survey; remaining years estimated (see Anderson, 1977)

(b) Provisional.

Table I-2. Provisional Mackerel Catch in 1978 by Country from SA 3-6 (tons)

Country	Total
Bulgaria	30
Canada	24,444
Cuba	18
Italy	64
Japan	13
Mexico	1
Poland	2
Romania	20
Spain	28
USSR	655
US (commercial)	1,604
US (recreational)	6,571
TOTAL	33,450

Table I-3. Age Composition (thousands of fish at age) of 1978 Commercial and Recreational Catch of Mackerel in SA 3-6

	Sampled Catch						
	Canada		US Rec.	US Commercial			
Age	SA 3	SA 4	SA 6	Div 5Y (Jun-Jul)	Subdiv 5Zw (Apr)	Total	Grand Total[1]
1	-	2.0	-	96.8	-	98.8	115.3
2	-	174.7	8.5	24.3	2.8	210.3	245.4
3	1,087.9	2,595.0	188.8	82.1	6.1	3,959.9	4,620.6
4	6,025.7	8,135.7	611.6	148.2	20.0	14,941.2	17,434.1
5	6,381.9	4,745.2	442.5	25.0	10.9	11,605.5	13,541.8
6	4,044.3	2,068.1	938.5	27.8	3.2	7,081.9	8,263.5
7	2,053.8	981.3	789.1	-	1.4	3,825.6	4,463.9
8	865.1	791.5	225.5	-	0.3	1,810.4	2,112.5
9	459.4	388.6	1,789.6	18.6	1.5	3,157.7	3,684.6
10	671.7	383.1	188.8	8.8	-	1,252.4	1,461.4
11+	1,119.4	225.3	2,646.3	8.8	1.7	4,001.5	4,669.1
TOTAL	22,709.2	20,918.5	7,829.2	440.4	47.9	51,945.2	60,612.2
TONS	13,630	10,814	4,032	171	20	28,667	33,450

[1] Total numbers at age from sampled catch raised to include unsampled catch.

Unsampled catch distributed as follows:

US (rec) SA 5-6	2,539 tons
US (comm) SA 5-6	1,413
Others SA 4-6	831
Total	4,783

Table I-4. Percentage Age Composition of US Recreational Mackerel Catch in the Middle Atlantic Area in 1978-1979.

	Year	
Age	1978	1979
1	-	-
2	0.1	0.2
3	2.4	0.2
4	7.7	0.5
5	5.6	5.7
6	12.0	1.7
7	10.1	5.2
8	2.9	3.5
9	22.9	8.3
10	2.4	30.5
11	26.8	7.2
12	3.4	20.7
13+	3.7	16.3

Table I-5

Year	AGE 0	1	2	3	4	5	6	7	8	9	10	11+	Total	Observed Weight[a]	Calculated Weight[a,b]	Observed Calculated	Mean Age
1962	-	23.3	4.0	22.1	5.5	1.7	2.3	2.1	1.1	0.6	0.2	0.4	63.3	16.6	15.3	1.085	2.8
1963	-	1.5	5.6	1.7	35.2	8.1	0.4	0.2	0.2	0.2	0.2	0.2	53.5	17.3	18.2	0.951	3.9
1964	-	15.9	8.6	5.1	4.9	24.0	5.1	4.8	0.8	1.0	0.3	-	70.5	21.7	23.1	0.939	3.8
1965	-	10.9	4.3	3.5	4.9	6.3	23.6	5.1	4.8	0.9	-	-	64.3	24.7	25.5	0.969	4.7
1966	-	29.0	13.9	6.4	3.2	5.7	9.6	26.4	0.6	0.2	-	-	95.0	32.4	30.7	1.055	3.9
1967	2.2	1.0	33.0	24.4	4.3	4.1	6.3	7.5	39.8	0.4	-	-	123.0	47.6	48.0	0.992	4.8
1968	1.4	175.5	76.3	73.6	47.3	17.8	8.2	0.8	1.2	7.6	0.1	-	409.8	109.9	84.0	1.302	2.3
1969	4.5	8.1	298.8	183.2	75.0	6.5	3.4	2.3	3.5	2.5	9.5	-	597.3	165.1	144.7	1.141	2.8
1970	5.1	206.1	58.1	556.0	173.5	29.4	7.5	5.6	10.5	10.6	4.0	3.0	1069.4	262.7	276.8	0.949	3.0
1971	2.5	77.3	304.8	132.0	579.0	210.8	35.8	9.2	3.7	4.4	8.4	7.5	1375.4	403.7	429.2	0.941	3.6
1972	3.6	22.4	87.0	260.0	185.3	396.2	88.6	24.4	4.3	8.3	3.8	5.7	1089.6	431.6	396.2	1.089	4.2
1973	4.0	161.4	282.4	284.3	233.0	191.9	196.7	31.1	10.9	4.1	3.8	1.6	1405.2	429.3	435.4	0.986	3.6
1974	2.0	95.9	242.2	264.4	101.5	114.3	111.8	108.3	25.7	6.4	2.5	0.8	1075.8	347.2	346.9	1.001	3.8
1975	3.7	374.7	432.6	114.0	101.1	58.8	68.0	52.0	50.6	12.5	2.3	1.0	1271.3	293.2	308.1	0.952	2.8
1976	-	12.5	353.5	272.5	85.2	52.4	27.3	40.5	34.6	22.6	13.4	1.4	916.4	245.9	271.3	0.906	3.5
1977	-	2.0	26.9	100.7	53.9	11.9	9.9	5.6	6.3	3.8	3.6	0.6	225.2	78.1	73.1	1.068	3.8
1978	-	0.1	0.2	4.6	17.4	13.5	8.3	4.5	2.1	3.7	1.5	4.7	60.6	33.4	28.0	1.193	5.8

(a) Thousands of metric tons

(b) Using mean weights at age from Table I-6

Atlantic Mackerel Commercial And Recreational Catch At Age (Millions Of Fish)
From ICNAF Subareas 3 - 5 And Statistical Area 6 During 1962 - 1978

Table I-6. Mean Weights at Age (kg) of Atlantic Mackerel (from ICNAF, 1974)

Age									
1	2	3	4	5	6	7	8	9	10+
.095	.175	.266	.350	.432	.506	.564	.615	.659	.693

Table I-7. Stratified Mean Catch (kg) per tow (linear, ln, and retransformed) of Mackerel from US Bottom Trawl Surveys in the Spring (strata 1-25, 61-76) and Autumn (strata 1-2, 5-6, 9-10, 13, 16, 19-21, 23, 25-26) (see Figure 2 for location of sampling strata)

	Spring[1]			Autumn[2]		
Year	Linear	Ln	Retransformed	Linear	Ln	Retransformed
1963	-	-	-	.016	.013	.016
1964	-	-	-	<.001	<.001	<.001
1965	-	-	-	.089	.046	.073
1966	-	-	-	.098	.057	.085
1967	-	-	-	.740	.195	.372
1968	18.228	.575	3.998	.299	.117	.217
1969	.177	.029	.065	2.592	.154	.459
1970	7.138	.471	2.039	.110	.068	.099
1971	10.213	.425	1.969	.082	.052	.073
1972	5.012	.354	1.332	.126	.070	.107
1973	21.901	.228	.748	.045	.034	.043
1974	2.103	.277	.769	.205	.046	.108
1975	.500	.121	.225	.018	.010	.016
1976	.823	.144	.317	.043	.028	.039
1977	.266	.118	.199	.029	.020	.027
1978	1.125	.181	.447	.306	.104	.191
1979	.288	.117	.221	-	-	-

[1] Based on catches with No. 41 trawl; 1968-1972 catches were with No. 36 trawl and were adjusted to equivalent No. 41 catches using a 3.25:1 ratio (41/36).

[2] Based on catches with No. 36 trawl.

Table I-8. Mackerel Catch per Standardized US Day Fished (tons)

Year	Catch Per Day
1964	0.43
1965	0.49
1966	0.84
1967	1.75
1968	2.80
1969	1.92
1970	2.07
1971	1.29
1972	0.84
1973	0.53
1974	0.17
1975	0.53
1976	0.59
1977	0.52
1978	0.48

Table I-9. Estimation of Fishing Mortality (F) in 1978 for the SA 3-6 Mackerel fishery

Year	Spring Survey Catch Per Tow (a)	Catch (tons)(b)	Relative Exploitation Index (c)	Mean F (d) Age 3+
1968	4.518	109,940	24,334	.152
1969	3.199	165,113	51,614	.142
1970	2.265	262,681	115,974	.173
1971	1.604	403,675	251,668	.251
1972	1.135	431,606	380,270	.291
1973	.804	429,286	533,938	.426
1974	.569	347,220	610,228	.468
1975	.403	293,205	727,556	.437
1976	.285	245,935	862,930	.673
1977	.202	78,120	386,733	(.330)(e,f)
1978	.447	33,450	74,832	(.153)(e)

(a) Stratified mean catch (kg) per tow indices for 1968-77 smoothed by exponential curve (see Anderson, 1979); 1978 is actual value.

(b) International commercial and recreational catch.

(c) Ratio between catch and survey catch per tow.

(d) Obtained from cohort analysis assuming F = 0.153 in 1978.

(e) Calculated from regression of relative exploitation index on mean F for 1968-76: $Y = 0.110 + 0.000000568\ X$, $r = 0.970$.

(f) Actual value calculated from cohort analysis was 0.337.

Year-Class	YEAR 1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
1951	12.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	7.6	5.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	8.1	5.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1954	18.1	12.5	9.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1955	57.8	41.0	30.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1956	56.1	39.6	29.2	20.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1957	40.1	28.2	20.6	11.1	4.1	-	-	-	-	-	-	-	-	-	-	-	-	-
1958	53.8	35.1	19.1	9.7	2.8	1.6	0.8	-	-	-	-	-	-	-	-	-	-	-
1959	891.7	641.5	445.0	309.0	208.6	131.8	63.4	40.4	21.8	-	-	-	-	-	-	-	-	-
1960	773.5	569.5	420.5	307.3	222.2	156.4	109.4	80.0	57.1	38.9	-	-	-	-	-	-	-	-
1961	956.3	688.4	505.2	369.8	269.8	194.9	139.0	102.3	72.8	44.8	25.9	-	-	-	-	-	-	-
1962	-	434.2	320.4	230.0	167.3	121.2	86.3	56.9	40.1	20.7	11.5	5.3	-	-	-	-	-	-
1963	-	-	433.1	307.1	223.8	160.3	115.1	69.9	48.9	31.4	20.1	7.7	2.4	-	-	-	-	-
1964	-	-	-	551.6	399.2	283.8	189.2	99.5	68.1	44.0	24.7	14.6	7.3	3.2	-	-	-	-
1965	-	-	-	-	1217.4	876.9	621.2	396.9	229.5	144.7	76.4	35.6	17.0	7.1	3.3	-	-	-
1966	-	-	-	-	-	3181.5	2356.0	1679.7	1086.7	655.7	304.3	149.2	83.8	39.9	18.8	2.4	-	-
1967	-	-	-	-	-	-	8416.9	6084.3	4250.2	2670.1	1479.7	755.2	390.1	195.8	101.5	55.7	38.2	-
1968	-	-	-	-	-	-	-	3155.7	2330.8	1676.7	1128.5	676.5	336.0	152.7	68.4	20.9	12.2	32.0
1969	-	-	-	-	-	-	-	-	3404.6	2344.8	1474.7	868.7	443.2	229.8	111.7	47.9	30.1	19.1
1970	-	-	-	-	-	-	-	-	-	1550.9	1082.4	727.0	293.9	130.3	46.0	10.5	3.0	1.9
1971	-	-	-	-	-	-	-	-	-	-	1792.5	1308.6	726.4	310.6	143.1	60.9	36.6	23.3
1972	-	-	-	-	-	-	-	-	-	-	-	1401.8	899.6	458.0	241.2	104.9	67.5	42.9
1973	-	-	-	-	-	-	-	-	-	-	-	-	1885.1	1314.0	601.1	210.7	109.7	69.7
1974	-	-	-	-	-	-	-	-	-	-	-	-	-	1550.8	826.3	307.9	141.4	89.9
1975	-	-	-	-	-	-	-	-	-	-	-	-	-	-	a(600.0)	433.8	298.4	217.1
1976	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	a(600.0)	442.8	327.9
1977	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	a(700.0)	518.5
1978	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	a(2400.0)
Stock size (age 1+)																		
Total (10^6)	2875.8	2501.0	2232.4	2116.5	2715.2	5108.4	12097.3	11765.6	11610.6	9222.7	7420.7	5950.2	5084.8	4392.2	2761.4	1855.6	1879.9	3742.3
Weight (10^3 tons)(b)	641.3	599.7	597.6	593.0	690.7	901.3	2245.6	2515.1	2401.7	2268.2	2219.0	1635.4	1284.8	971.4	650.8	485.0	515.0	631.3
Spawning stock size (50% age 2, 100% age 3+)																		
Total (10^6)	1532.8	1722.6	1639.1	1411.4	1298.2	1488.5	2502.4	5567.8	7040.6	6499.4	5086.7	3894.1	2749.9	2184.4	1748.3	1038.7	958.5	1083.0
Weight (10^3 tons)(b)	469.3	503.2	532.7	516.1	531.8	525.4	936.2	1565.6	1901.2	1936.5	1930.4	1391.2	1026.8	721.7	533.6	383.6	389.4	357.9

(a) Estimated

(b) Adjusted using observed/calculated catch ratios in Table I-5

Table I-10

Mackerel Stock Size By Age In ICNAF Subareas 3 - 5 And Statistical Area 6 (Millions Of Fish)
Derived From Cohort Analysis Assuming M = 0.30 And F = 0.153 At Ages 4 And Older In 1978

YEAR

Year-Class	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
1951	(.037)[b]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1952	.031	(.043)[b]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1953	.090	(.043)[b]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1954	.073	.019	(.039)[b]	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1955	.043	.006	(.039)[b]	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1956	.049	.006	.032	(.051)[b]	-	-	-	-	-	-	-	-	-	-	-	-	-
1957	.051	.017	.316	.697	(.058)[b]	-	-	-	-	-	-	-	-	-	-	-	-
1958	.126	.312	.373	.940	.285	.351	(.152)[b]	-	-	-	-	-	-	-	-	-	-
1959	.029	.066	.065	.093	.159	.432	.150	.319	(.173)[b]	-	-	-	-	-	-	-	-
1960	.006	.003	.014	.024	.051	.057	.013	.037	.085	(.251)[b]	-	-	-	-	-	-	-
1961	.029	.009	.012	.016	.025	.038	.007	.041	.185	.246	(.291)[b]	-	-	-	-	-	-
1962	-	.004	.032	.018	.022	.040	.117	.048	.362	.284	.482	(.426)[b]	-	-	-	-	-
1963	-	-	.044	.016	.034	.032	.198	.058	.143	.147	.655	.848	(.468)[b]	-	-	-	-
1964	-	-	-	.023	.041	.105	.343	.079	.137	.278	.226	.396	.510	(.437)[b]	-	-	-
1965	-	-	-	-	.028	.045	.148	.248	.161	.339	.464	.440	.576	.475	(.673)[b]	-	-
1966	-	-	-	-	-	<.001	.038	.135	.205	.468	.413	.277	.441	.452	1.756	(.337)[b]	-
1967	-	-	-	-	-	-	.025	.059	.165	.290	.373	.360	.389	.357	.299	.078	.153
1968	-	-	-	-	-	-	-	.003	.029	.096	.212	.400	.489	.504	.887	.238	.153
1969	-	-	-	-	-	-	-	-	.073	.164	.229	.373	.356	.421	.547	.166	.153
1970	-	-	-	-	-	-	-	-	-	.060	.098	.606	.513	.743	1.172	.960	.153
1971	-	-	-	-	-	-	-	-	-	-	.015	.289	.550	.475	.554	.209	.153
1972	-	-	-	-	-	-	-	-	-	-	-	.144	.375	.341	.533	.141	.153
1973	-	-	-	-	-	-	-	-	-	-	-	-	.061	.482	.748	.353	.153
1974	-	-	-	-	-	-	-	-	-	-	-	-	-	.330	.687	.478	.153
1975	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(.024)[c]	(0.74)[c]	(.018)[c]
1976	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(.004)[c]	(.001)[c]
1977	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(<.001)[c]
$\bar{F}$ (age 3+)	.037	.043	.039	.051	.058	.084	.152	.142	.173	.251	.291	.426	.468	.437	.673	.337	.153[d]

(a) Mean F for ages 3 and older weighted by stock size at age.
(b) Mean F for ages 3 and older in that year.
(c) Determined from estimated stock size and known catch.
(d) Ages 4 and older.

Table I-11

Fishing Mortality Rates (F) For Mackerel In ICNAF Subareas 3 - 5 And Statistical Area 6

Derived From Cohort Analysis Assuming M = 0.30

Table I-12. Stratified Mean Catch per Tow (number) at Age 0, 1, and 2 Mackerel from US Autumn and Spring Bottom Trawl Surveys and Year-Class Sizes at Ages 1 and 2 from Cohort Analysis Assuming F = 0.153 at Ages 4 and Older in 1978

Year-Class	Autumn Survey Age 0	Spring Survey Age 1	Spring Survey Age 2	Cohort Analysis Age 1	Cohort Analysis Age 2
1963	0.080	-	-	433.1	307.1
1964	0.021	-	-	551.6	399.2
1965	0.114	-	-	1,217.4	876.9
1966	0.158	-	1.726	3,181.5	2,356.0
1967	1.833	40.240	0.198(a)	8,416.9	6,084.3
1968	0.095	0.238(a)	2.625	3,155.7	2,330.8
1969	0.690	1.010	2.779	3,404.6	2,344.8
1970	0.023	0.929	1.368	1,550.9	1,082.4
1971	0.169	1.894	0.787	1,792.5	1,308.6
1972	0.085	0.915	0.383	1,401.8	899.6
1973	0.214	0.826	1.277	1,885.1	1,314.0
1974	0.141	3.186	0.787	1,550.8	826.3
1975	0.012	0.204	0.109	(538.5)(b) (965.8)(c)	(373.6)(d)
1976	0.000	0.021	0.221	(0.0)(b) (415.9)(c)	(553.0)(d)
1977	0.021	0.128	0.009	(709.2)(b) (812.6)(c)	(93.6)(d)
1978	0.490	0.029	-	(3,341.8)(b) (468.0)(c)	-

(a) Values not used in calculating curves.

(b) Calculated from power curve relationship between survey catch per tow at age 0 and year-class size at age 1 for 1963-74 year-classes: $\ln Y = \ln 4747.251 + 0.492 \ln X$, $r = 0.761$.

(c) Calculated from power curve relationship between survey catch per tow at age 1 and year-class size at age 1 for 1967-74 year-classes: $\ln Y = \ln 1740.750 + 0.371 \ln X$, $r = 0.801$.

(d) Calculated from power curve relationship between survey catch per tow at age 2 and year-class size at age 2 for 1966-74 year-classes: $\ln Y = \ln 1278.129 + 0.555 \ln X$, $r = 0.847$

Table I-13. Percentage of Fishing Mortality (f) at Ages 1, 2, and 3 Compared to Mean F at Ages 3 and Older (partial recruitment) for the International Mackerel Fishery in SA 3-6

Year	Age 1	Age 2	Age 3
1962	78.4	16.2	78.4
1963	9.3	20.9	7.0
1964	100.0	82.1	30.8
1965	45.1	31.4	35.3
1966	48.3	70.7	58.6
1967	0.4	53.6	100.0
1968	16.4	25.0	97.4
1969	2.1	41.5	95.1
1970	42.2	16.8	95.4
1971	23.9	65.3	38.2
1972	5.2	33.7	78.7
1973	33.8	67.8	100.0
1974	13.0	80.1	100.0
1975	75.5	100.0	78.0
1976	3.6	100.0	100.0
1977	1.2	22.0	100.0
1978(a)	0.1	0.4	11.8

(a) F at ages 1-3 compared to mean F at ages 4 and older.

Table I-14. Age Composition (thousands of fish at age) of Canadian Mackerel Catch in SA 3-6 during 1968-78

Age	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
0	-	-	-	909	-	250	-	-	-	-	-
1	22,991	4,049	15,146	4,305	-	5,051	3,223	5,306	803	714	2
2	3,821	18,751	2,730	4,445	99	11,351	9,103	9,302	10,082	6,892	175
3	5,522	12,845	25,085	1,024	3,199	5,311	9,987	4,874	12,910	21,793	3,683
4	3,947	1,442	6,010	21,613	4,028	5,137	5,461	4,346	5,230	10,930	14,162
5	1,505	661	1,865	4,584	18,046	7,690	4,710	2,634	3,686	3,557	11,127
6	720	608	337	1,054	3,616	12,270	4,644	2,811	1,842	2,481	6,112
7	385	782	318	1,325	3,815	4,578	5,751	2,038	2,344	782	3,035
8	885	313	1,178	918	56	1,525	1,516	1,463	1,894	1,393	1,585
9	5,566	329	1,228	1,130	397	461	641	308	1,487	867	1,348
10	52	6,869	870	597	2	369	315	121	340	1,329	1,055
11+	-	-	2,368	2,722	4,965	514	339	96	215	333	1,345
Total	45,394	46,649	57,135	44,626	38,223	54,507	45,690	33,299	40,833	51,071	43,629
Tons	11,134	13,257	15,690	14,735	16,254	21,247	16,701	13,544	15,746	22,477	24,444
% of Total Catch	10.1	8.0	6.0	3.7	3.8	4.9	4.8	4.6	6.4	28.8	73.1

Table I-15. Percentage of Fishing Mortality (F) at Ages 1, 2, and 3 Compared to Mean F at Ages 3 and Older (partial recruitment) for the Canadian Mackerel Fishery in SA 3-5 During 1968-78

Year	Age 1	Age 2	Age 3
1968	16.7	11.1	61.1
1969	12.5	50.0	100.0
1670	62.5	12.5	87.5
1971	33.3	22.2	11.1
1972	0.0	1.0	30.0
1973	31.3	75.0	68.8
1974	8.0	56.0	84.0
1975	27.8	55.6	83.3
1976	5.6	55.6	97.2
1977	1.4	25.7	100.0
1978(a)	<0.1	0.4	12.8

(a) F at ages 1-3 compared to mean F at ages 4 and older.

Table I-16. Summary of Parameters Used in Projection of Catch and Stock Size Options for Mackerel in SA 3-6

Parameter		Value
Fishing mortality (F) in 1978 (ages 4 and older)		0.153
Recruitment at age 1:	1975 year-class	600 X 10^6 fish
	1976 year-class	600 X 10^6 fish
	1977 year-class	700 X 10^6 fish
	1978 year-class	2,400 X 10^6 fish
	1979 year-class	600 X 10^6 fish
Partial recruitment in 1979-1980:	Age 1	15%
	Age 2	33%
	Age 3	70%
	Ages 4 & older	100%
Total stock biomass at beginning of 1979		631,300 tons
Spawning stock biomass at beginning of 1979		357,900 tons

Table I-17. Various Levels of Catch of Mackerel in SA 3-6 in 1979 and Associated fishing Mortality at Ages 4 and Older with Resulting Spawning Stock Biomass in 1980 and its Percentage Cahnge from 1979. Catch and Stock are Expressed in thousands of Tons.

Stock in 1979	Catch in 1979	F in 1979	Stock in 1980	% Change in Stock from 1979
357.9	30.0	0.103	488.0	+36.4
357.9	40.0	0.139	478.5	+33.7
357.9	50.0	0.176	468.9	+31.0
357.9	60.0	0.215	459.3	+28.3
357.9	70.0	0.254	449.8	+25.7
357.9	80.0	0.295	440.3	+23.0
357.9	90.0	0.337	430.8	+20.4
357.9	100.0	0.380	421.3	+17.7

1979 Catch = 30.0

F	Catch In 80	Stock In 81	% Change In Stock From 79	% Change In Stock From 80
0.05	17.6	657.0	+83.6	+34.6
0.10	34.6	638.9	+78.5	+30.9
0.15	50.9	621.5	+73.6	+27.3
0.20	66.7	604.6	+68.9	+23.9
0.25	82.0	582.3	+64.4	+23.6
0.30	96.7	572.6	+60.0	+17.3
0.35	110.9	557.5	+55.8	+14.2
0.40	124.6	542.9	+51.7	+11.2
0.45	137.9	528.8	+47.7	+ 8.4
0.50	150.7	515.1	+43.9	+ 5.6

1979 Catch = 40.0

F	Catch In 80	Stock In 81	% Change In Stock From 79	% Change In Stock From 80
0.05	17.2	648.2	+81.1	+35.5
0.10	33.8	630.4	+76.2	+31.8
0.15	49.9	613.3	+71.4	+28.2
0.20	65.3	596.8	+66.7	+24.7
0.25	80.2	580.8	+62.3	+21.4
0.30	94.6	565.4	+58.0	+18.2
0.35	108.6	550.6	+53.8	+15.1
0.40	122.0	536.2	+49.8	+12.1
0.45	135.0	522.4	+46.0	+ 9.2
0.50	147.5	509.0	+42.2	+ 6.4

1979 Catch = 50.0

F	Catch In 80	Stock In 81	% Change In Stock From 79	% Change In Stock From 80
0.05	16.8	639.3	+78.6	+36.3
0.10	33.1	621.9	+73.8	+32.6
0.15	48.8	605.1	+69.1	+29.1
0.20	63.9	588.9	+64.6	+25.6
0.25	78.5	573.3	+60.2	+22.3
0.30	92.6	558.2	+56.0	+19.0
0.35	106.2	543.6	+51.9	+15.9
0.40	119.4	529.5	+48.0	+12.9
0.45	132.1	515.9	+44.2	+10.0
0.50	144.4	502.8	+40.5	+ 7.2

1979 Catch = 60.0

F	Catch In 80	Stock In 81	% Change In Stock From 79	% Change In Stock From 80
0.05	16.6	630.4	+76.2	+37.3
0.10	32.4	613.4	+71.4	+33.6
0.15	47.7	596.9	+66.8	+30.0
0.20	62.5	581.1	+62.4	+26.5
0.25	76.8	565.7	+58.1	+23.2
0.30	90.6	550.9	+53.9	+20.0
0.35	103.9	536.6	+49.9	+16.8
0.40	116.8	522.8	+46.1	+13.8
0.45	129.3	509.5	+42.4	+10.9
0.50	141.3	496.6	+38.8	+ 8.1

1979 Catch = 70.0

F	Catch In 80	Stock In 81	% Change In Stock From 79	% Change In Stock From 80
0.05	16.1	621.5	+73.7	+38.2
0.10	31.6	604.8	+69.0	+34.5
0.15	46.6	588.7	+64.5	+30.9
0.20	61.1	573.2	+60.1	+27.4
0.25	75.1	558.2	+56.0	+24.1
0.30	88.6	543.6	+51.9	+20.9
0.35	101.6	529.6	+48.0	+17.7
0.40	114.2	516.1	+44.2	+14.7
0.45	126.4	503.0	+40.5	+11.8
0.50	138.2	490.4	+37.0	+ 9.0

1979 Catch = 80.0

F	Catch In 80	Stock In 81	% Change In Stock From 79	% Change In Stock From 80
0.05	15.7	612.6	+71.2	+39.1
0.10	30.9	596.3	+66.6	+35.4
0.15	45.5	580.5	+62.2	+31.8
0.20	59.7	565.2	+57.9	+28.4
0.25	73.4	550.5	+53.8	+25.0
0.30	86.6	536.3	+49.9	+21.8
0.35	99.3	522.6	+46.0	+18.7
0.40	111.6	509.3	+42.3	+15.7
0.45	123.6	496.5	+38.7	+12.8
0.50	135.1	484.1	+35.3	+ 9.9

1979 Catch = 90.0

F	Catch In 80	Stock In 81	% Change In Stock From 79	% Change In Stock From 80
0.05	15.3	603.6	+68.7	+40.1
0.10	30.2	587.6	+64.2	+36.4
0.15	44.5	572.2	+59.9	+32.8
0.20	58.3	557.3	+55.7	+29.4
0.25	71.6	542.9	+51.7	+26.0
0.30	84.5	529.0	+47.8	+22.8
0.35	97.0	515.5	+44.0	+19.7
0.40	109.1	502.5	+40.4	+16.6
0.45	120.7	490.0	+36.9	+13.7
0.50	132.0	477.8	+33.5	+10.9

1979 Catch = 100.0

F	Catch In 80	Stock In 81	% Change In Stock From 79	% Change In Stock From 80
0.05	15.0	594.6	+66.1	+41.1
0.10	29.4	579.0	+61.8	+37.4
0.15	43.4	563.9	+57.6	+33.8
0.20	56.9	549.3	+53.5	+30.4
0.25	69.9	535.2	+49.5	+27.0
0.30	82.5	521.6	+45.7	+23.8
0.35	94.7	508.4	+42.1	+20.7
0.40	106.5	495.7	+38.5	+17.7
0.45	117.9	483.4	+35.1	+14.7
0.50	128.9	471.5	+31.7	+11.9

Table I-18

Projected mackerel catch in SA 3-6 in 1980 with fishing mortality ranging from 0.05 to 0.50 assuming eight options for catch in 1979, and the resulting spawning stock biomass in 1981 and its percentage change from 1979 and 1980. Catch and stock sizes are expressed as thousands of metric tons.

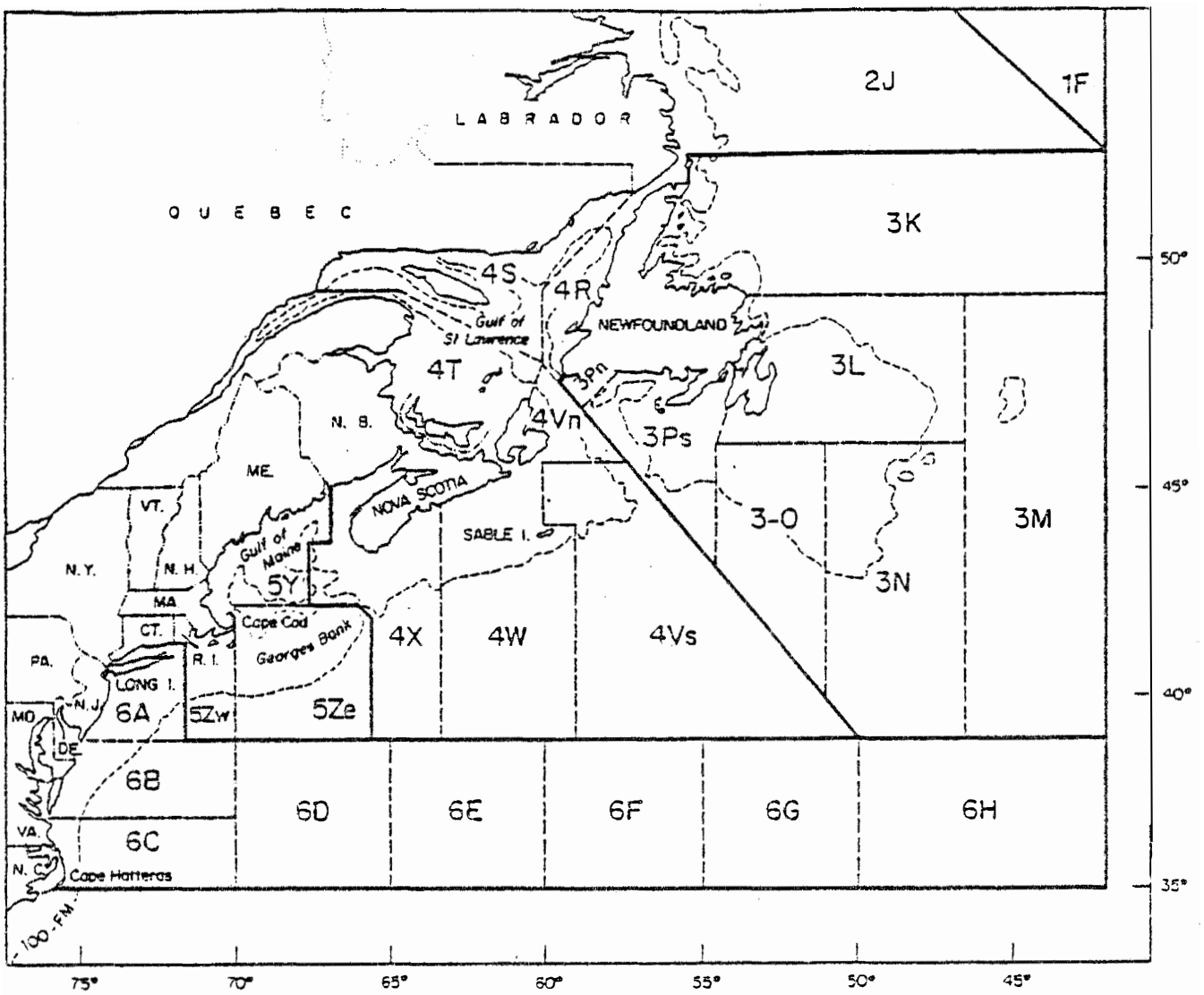


Figure I-1

Northwest Atlantic From North Carolina To Labrador Showing ICNAF SA 3 - 6

Figure I-2

US Bottom Trawl Survey Sampling Strata In The
Northwest Atlantic Between Cape Hatteras And Nova Scotia

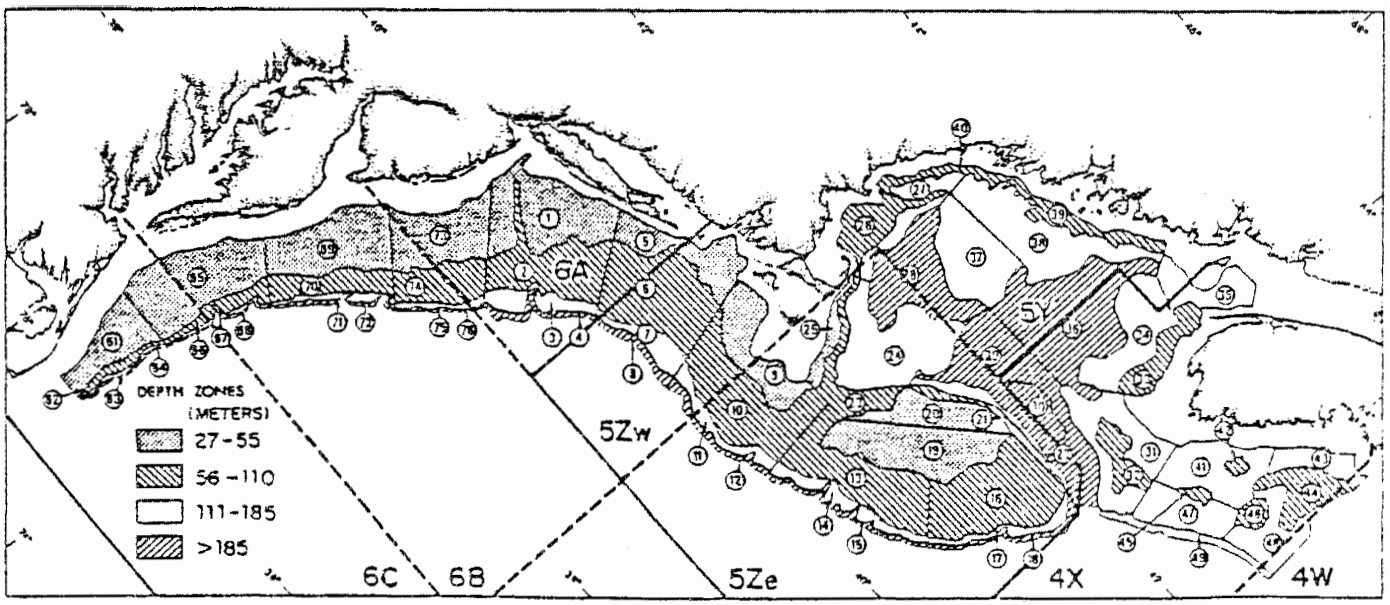
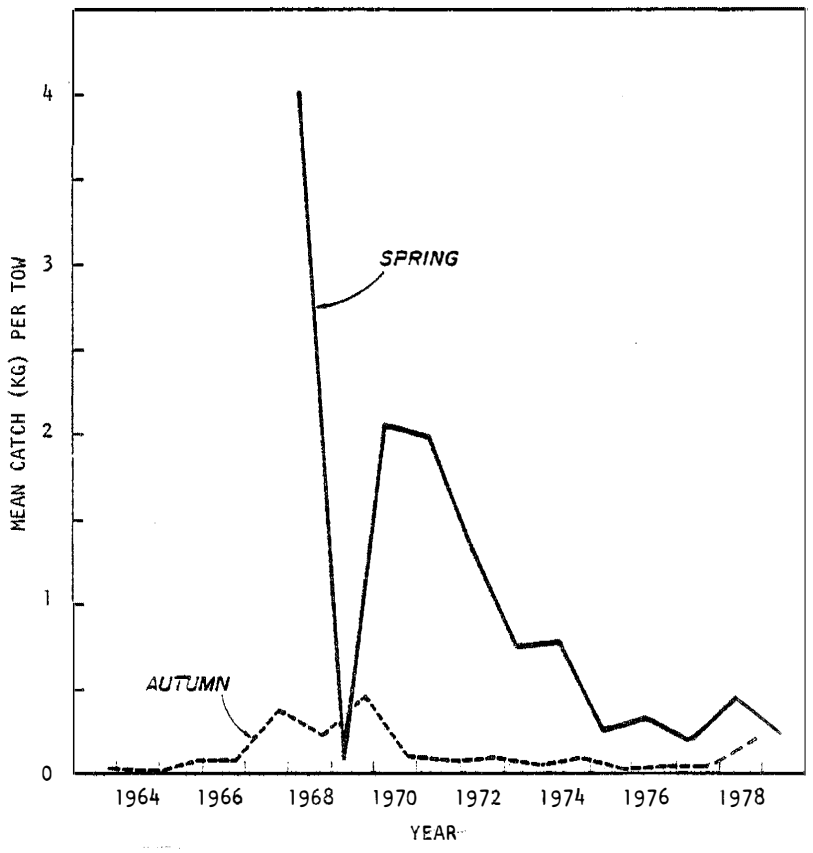


Figure I-3. Stratified Mean Catch Per Tow (KG, Retransformed) Of Mackerel From US Spring (1968-79) And Autumn (1963-78) Bottom Trawl Surveys In SA 3-6.



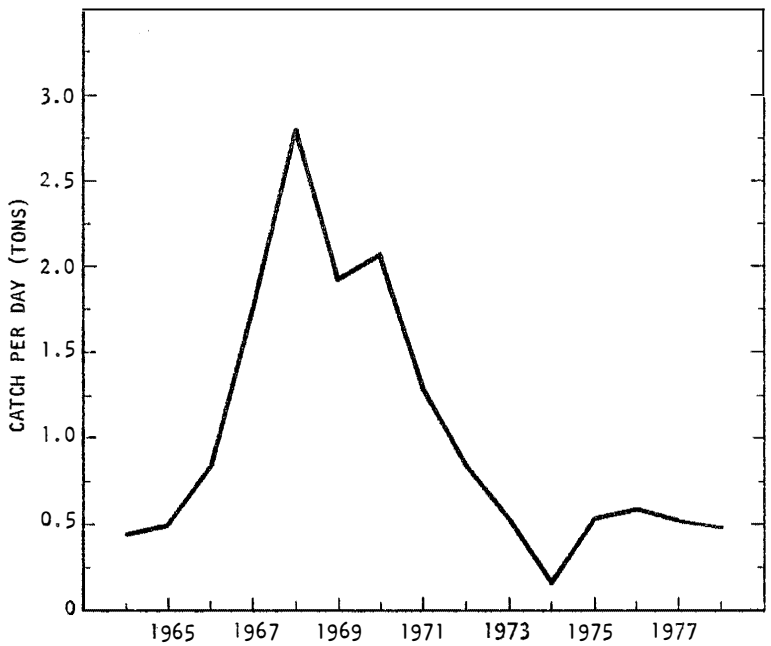


Figure I-4. Catch Per Standardized Day Fished For The US Commercial Mackerel Fishery In SA 5-6.

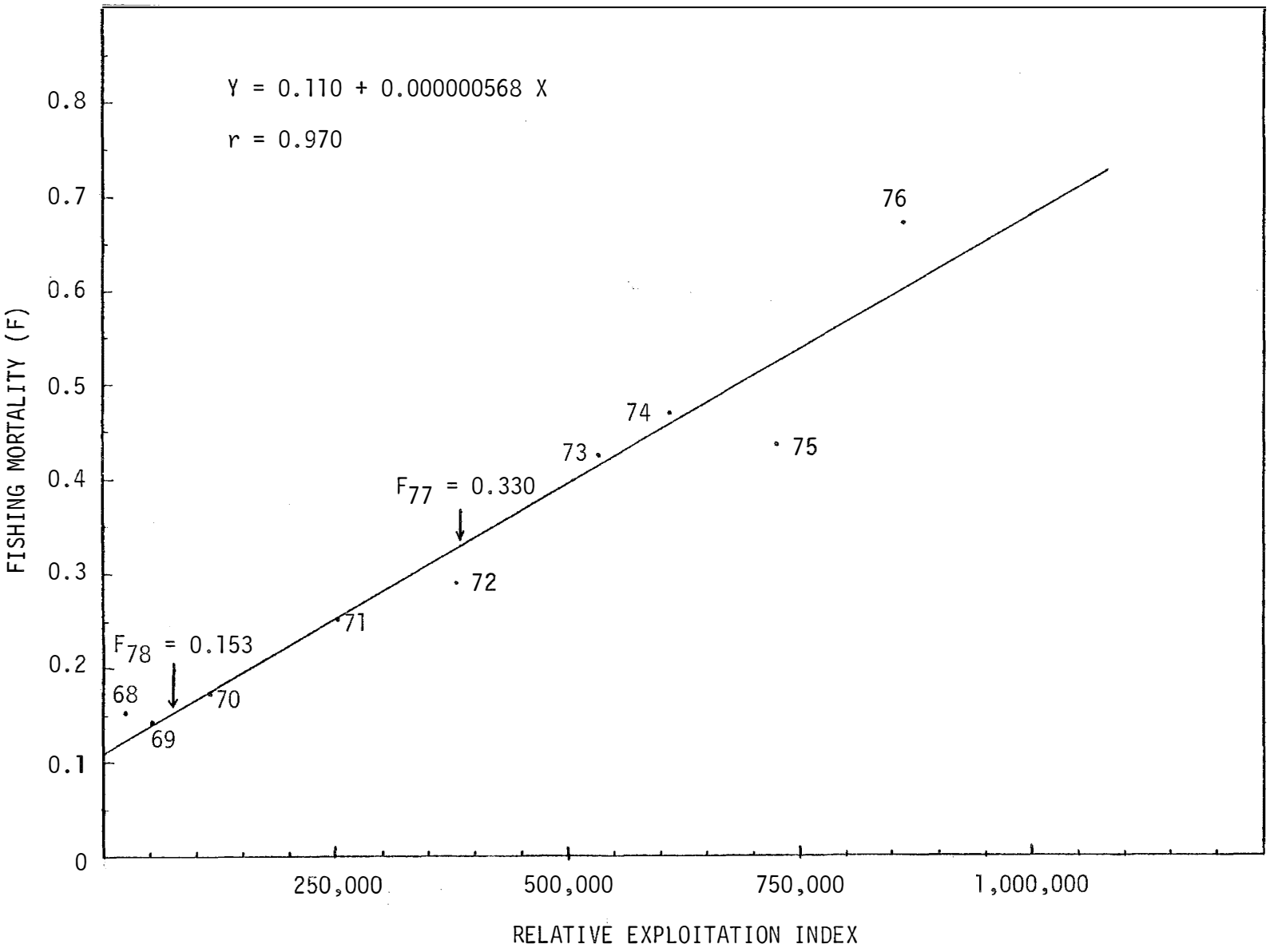
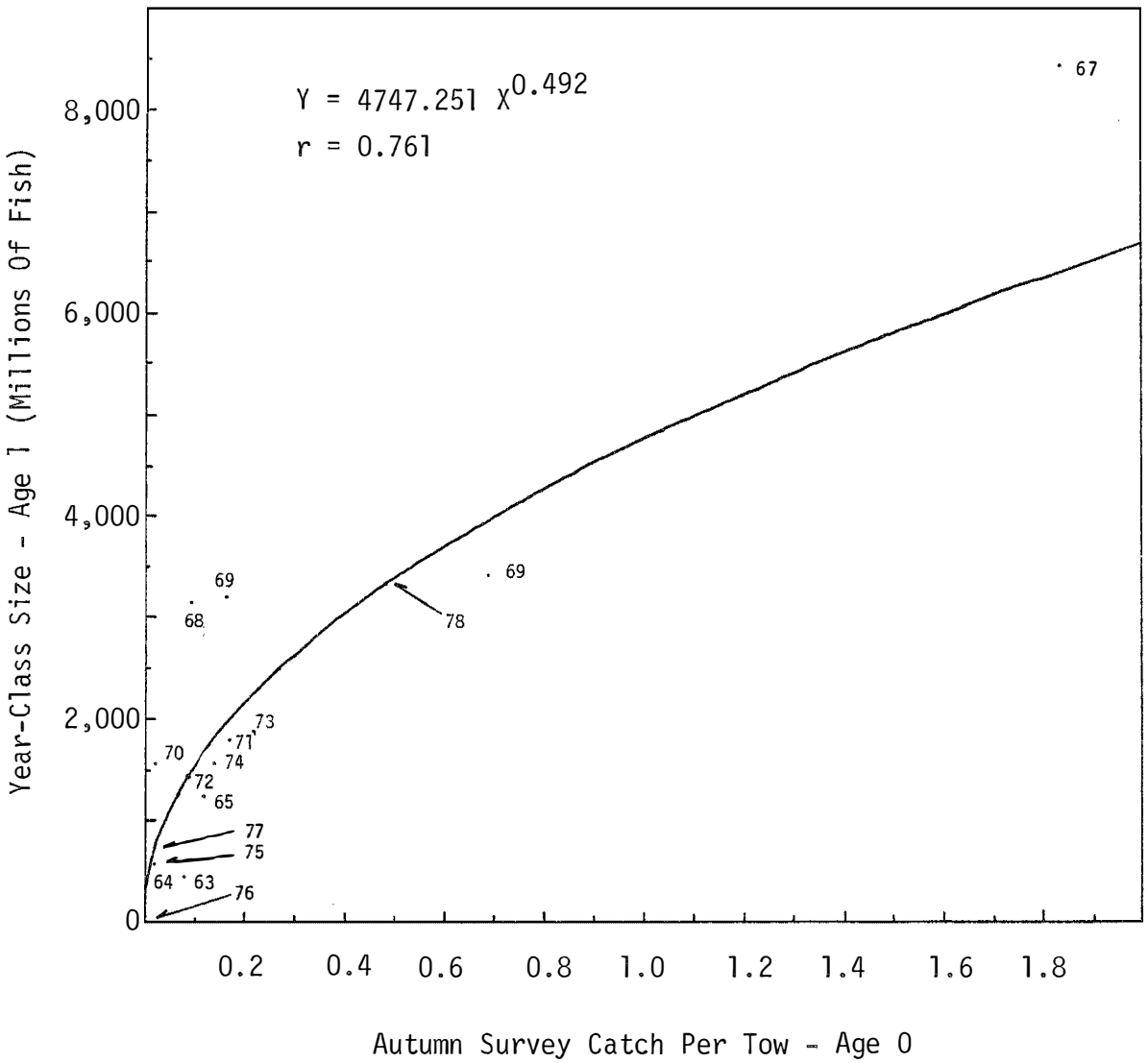


Figure I-5. Relationship Between Fishing Mortality From Cohort Analysis Assuming F = 0.153 At Ages 4 And Older In 1978 And A Relative Exploitation Index Derived From US Spring Survey Catch Per Tow For Mackerel And The International Catch Of Mackerel In ICNAF SA 3 - 6.

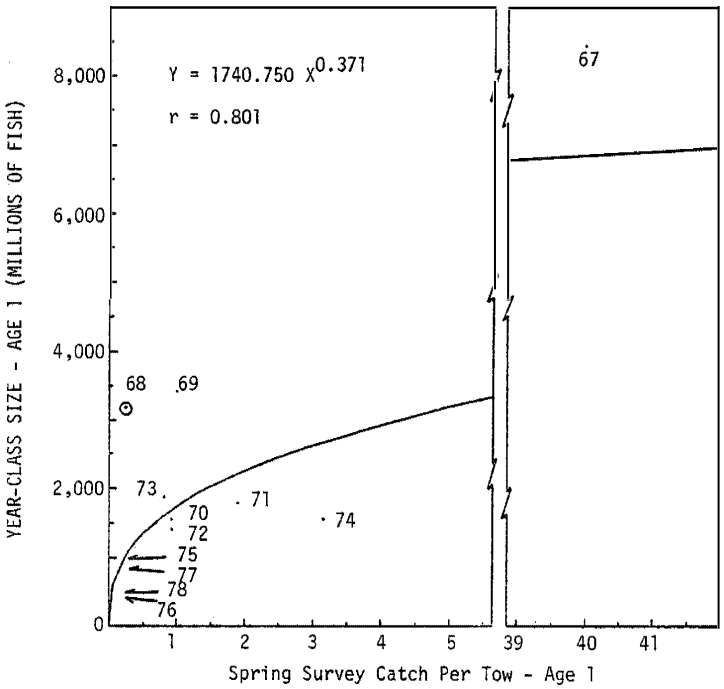
Figure I-6



Power Curve Relationship Between Mackerel Year-Class Size At Age 1 From Cohort Analysis Assuming F=0.153 At Ages 4 And Older In 1978 And Autumn Survey Catch Per Tow At Age 0

Figure I-7

Power Curve Relationship Between Mackerel Year-Class Size At Age 1 From Cohort Analysis Assuming F=0.153 At Ages 4 And Older In 1978 And Spring Survey Catch Per Tow At Age 1
(1968 Value Omitted From Calculation)



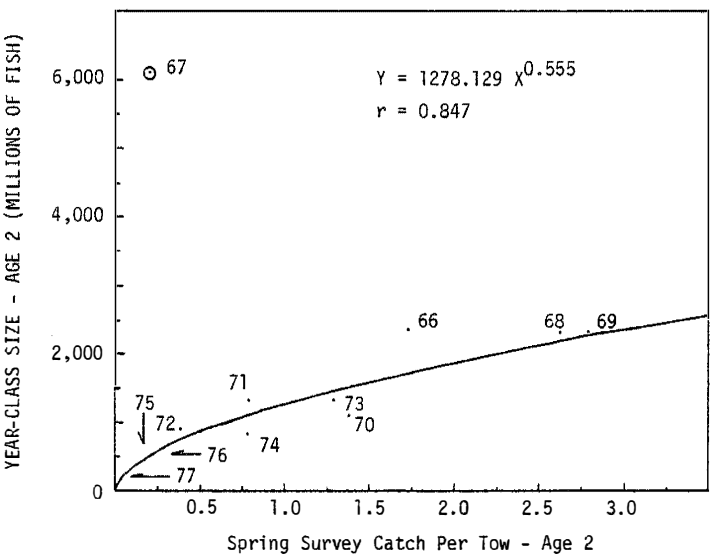


Figure I-8

Power Curve Relationship Between Mackerel Year-Class Size At Age 2 From Cohort Analysis Assuming F=0.153 At Ages 4 And Older In 1978 And Spring Survey Catch Per Tow At Age 2
(1967 Value Omitted From Calculation)

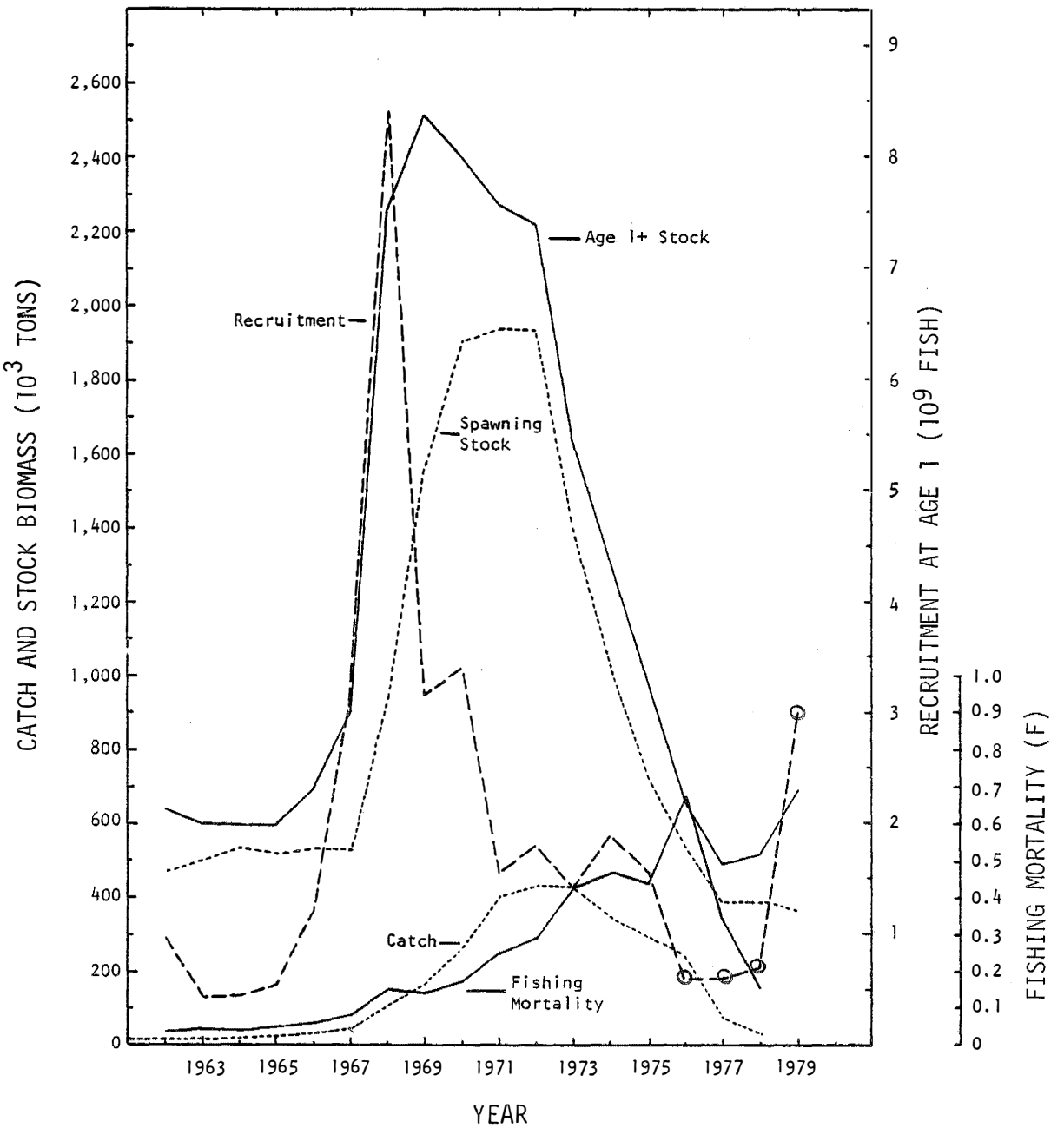


Figure I-9. Total Mackerel Stock Biomass (Ages 1+) and Spawning Stock Biomass (50% Age 2 and 100% Ages 3+) During 1962-1979 From Cohort Analysis Assuming F = 0.153 At Ages 4+ In 1978, Abundance At Age 1 Of The 1961-1978 Year-Classes (Open Circles Represent Estimates Based On Survey Data; Others Determined From Cohort Analysis), Total International Catch (Commercial And Recreational) During 1961-1978, And Fishing Mortality (Mean For Ages 3+, Except In 1978 When Ages 4+) During 1962-1978 In ICNAF SA 3 - 6.

APPENDIX II: SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT FOR AMENDMENT #1 TO THE ATLANTIC MACKEREL FISHERY MANAGEMENT PLAN

Responsible Federal Agency:

US Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service

Jurisdiction Where the Action is Applicable:

The northwest Atlantic Ocean

For Further Information Contact:

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Abstract of Statement:

The statement relates to Amendment #1 to the Atlantic Mackerel Fishery Management Plan. That FMP was approved by NOAA on 6 June 1979. The purpose of the amendment is to extend the FMP beyond the end of fishing year 1979-1980 (31 March 1980) and incorporate necessary changes to quotas and other provisions in the FMP.

Comments Must be Received by:

5 November 1979

Description of the Action

The proposed action consists of amending the Atlantic Mackerel FMP to extend it beyond the end of fishing year 1979-1980 and to change quotas and other management measures as necessary. A summary of the action is presented in Section II of Amendment #1 and the amended management measures, including alternatives, are discussed in Sections XII and XIII of Amendment #1.

Summary of Impact

The measures recommended in the amended plan will provide for the long term viability of the mackerel stocks while permitting the US fisheries for this species to develop fully.

Alternatives

Alternatives considered for Amendment #1 were:

1. Take No Action At This Time - No action to limit the catches of Atlantic mackerel could result in a decrease of Atlantic mackerel abundance. This alternative would mean that the FMP would lapse at the end of fishing year 1979-1980. The National Marine Fisheries Service (NMFS) would be required to prepare a Preliminary Management Plan (PMP) to regulate the foreign fishery. It is likely that the PMP would result in a large reallocation of mackerel to foreign fleets.

PMPs regulate foreign, but not domestic, fishermen. One effect of this alternative would be that data that would be collected on domestic fishing and processing efforts as a result of this plan could not be collected as effectively, and that assessments of the scope and development of the domestic fishery would not be as accurate as they would be with the FMP.

2. Continue The Current FMP Through Fishing Year 1980-1981 With No Other Changes - This would result in an OY of 15,200 mt, DAH of 14,000 mt, DAP of 5,000 mt and a TALFF of 1,200 mt. It would require that the FMP be amended again for fishing year 1981 - 1982.

3. Continue The FMP Without Time Limit - This would eliminate the need for annual amendments to the FMP merely to extend it into the next fishing year. The FMP could still be amended when necessary to incorporate changes in OY, DAH, DAP, or other management measures. In the absence of such amendment, the values of OY, DAH, DAP, and TALFF specified in the original FMP would be continued without change for each fishing year.

4. Continue The FMP With Changes To OY And Quotas - The most recent biological assessment indicates that mackerel stock size has increased significantly over the 1978 level. This suggests that the stock rebuilding objective of the original FMP can still be met with a total catch (in US and Canadian waters) and Optimum Yield in fishing year 1980-1981 (and beyond) significantly greater than those in the original FMP. This and other information also indicate that increases in DAH (Domestic Annual Harvest, i.e., the overall US mackerel harvesting capacity) and NPF (Non-Processed Fish, defined here to equal the mackerel harvesting capacity of US recreational fishermen) estimates are justified, because the US recreational harvesting capacity is expected to increase with increases in mackerel stock size. Data on the US commercial harvesting capacity and on the intent and desire of US processors to process mackerel, however, are limited at present.

Based on the best scientific information available, a reasonable alternative,

therefore, is to specify Optimum Yield at 30,000 mt, DAH at 20,000 mt, NPF at 15,000 mt, and DAP at 5,000 mt. This would leave a surplus of 10,000 mt. Given the developing nature of the US commercial fishery, as well as imprecise recreational fishery data, it is desirable that at least a portion of any surplus (10,000 mt, as modified by changes in any of the above values) should initially be placed in a reserve and not totally allocated to TALFF. It is therefore proposed that the initial TALFF be 4,000 mt, and that a reserve of 6,000 mt be provided. The above values, as modified after the review process, could be used for a finite (e.g., one or two year) or indefinite extension of the FMP as discussed in Alternative 3.

5. Revise Objective 4 - Objective 4 states "Achieve efficient allocation of capital and labor in the mackerel fishery." It is proposed that the objective be revised to read "Achieve efficiency in harvesting and use." The revision more clearly states the Council's intent than does the objective as currently worded.

The council has adopted Alternatives 4 and 5 for a one year extension of the FMP. Therefore, for fishing year 1980-1981, the Optimum Yield will be 30,000 mt, initial Domestic Annual Harvest will be 20,000 mt, the estimate of Non-Processed Fish is 15,000 mt, the initial TALFF is 4,000 mt, and the Reserve is 6,000 mt.

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PURPOSE OF AND NEED FOR THE PROPOSED ACTION

The Mid-Atlantic Fishery Management Council has prepared this Amendment to the Atlantic Mackerel FMP to incorporate in that FMP the results of a new stock assessment for mackerel. Quotas for this species have been developed based on these revised assessments and updated estimates of DAH and DAP. It was also necessary to revise certain management measures to improve implementation of the FMP.

ALTERNATIVES INCLUDING THE PROPOSED ACTION

The alternatives including the proposed action are listed in Section XII-2 of the amended FMP. They are analyzed in Sections XII-3 and XII-4 of the amended FMP.

AFFECTED ENVIRONMENT

The environment affected by this amended FMP is the northwestern Atlantic Ocean. It is described in Section VI of the FMP.

ENVIRONMENTAL CONSEQUENCES

Direct Effects and Their Signifcance

The effects of the Alternatives presented in Amendment #1 are discussed in Section XII of the Amendment. The only alternative with possible direct environmental effects is the No Action alternative, since, without control over the US fisheries, this alternative could lead to overfishing as the US fisheries develop.

Indirect Effects and Their Significance

Sufficient data are not available to predict effects of the proposed action on total productivity of the region. To do so would require knowledge of the trophic interactions among mackerel and other species beyond our present understanding. Therefore, the proposed action is designed to result in continued yields on at least the present level based on the best scientific evidence available. It is impossible to completely forecast the long-term effects of the proposed action.

No irreversible commitments of resources will result from the implementation of this Amendment. Implicit in the implementation of the FMP is the periodic monitoring of the catch to provide data for management decisions.

> Biological Resources - No loss of aquatic flora or fauna populations has been identified. Periodic monitoring of the catch is required and the management plan is flexible and could be modified or amended if adverse impacts appeared.
> Land Resources - No irreversible or irretrievable commitments of land resources have been identified in the management plan.
> Water and air Resources - No irreversible or irretrievable commitments of water or air have been identified.

Short-term irretrievable commitments of public funds, however, can be identified.

Mackerel is a public resource and, therefore, belongs to no one particular interest group. The concept envisioned by Congress as stated in the FCMA is to conserve and manage the fisheries so as to maximize the benefits derived from these resources to all Americans. The species considered herein is treated much like any other natural resource of the public domain. Given these circumstances, the conservation measures proposed are examples of direct and responsible actions to ensure long-term resource availability at adequate levels for the foreseeable future.

Possible Conflicts Between the Proposed Action and the Objectives of Federal, Regional, State, and Local Land Use Plans, Policies, and Controls

These issues are discussed in Section XV of Amendment #1.

Environmental Effects of Alternatives Including the Proposed Action

The only alternative that would have a negative effect on the natural environment would be no action since no control could lead to overfishing.

The alternatives, including the proposed action, are discussed in Sections XII-3 and XII-4 of the amended FMP.

Energy Requirements and Conservation Potential of Various Alternatives

None of the alternatives appear to have particular energy impacts greater or less than any other on the harvesting or processing sectors.

Urban Quality, Historic, and Cultural Resources, and the Design of the Built Environment Including the Reuse and Conservation Potential of Various Alternatives and Mitigation Measures

These considerations do not appear to be significant relative to the amended FMP.

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APPENDIX III. LIST OF PUBLIC MEETINGS, SUMMARY OF COMMENTS, COMMENT LETTERS, AND RESPONSES TO COMMENTS

Location	Date	Number of Public Attending*
Galilee, RI	15 October 1979	7
Falmouth, MA	16 October 1979	1
Gloucester, MA	17 October 1979	8
Portland, ME	18 October 1979	4
Asbury Park, NJ	18 October 1979	3
Cape May, NJ	19 October 1979	21
Riverhead, NY	22 October 1979	7
Ocean City, MD	22 October 1979	6
Norfolk, VA	23 October 1979	7

* Does not include Council, Federal, or State personnel

15 OCTOBER 1979 - GALILEE, RI

The meeting was called to order at approximately 7:00 p.m. by Mr. Keene. Others present were Robert H. Lowry (New England Fishery Management Council), Glen K. Mahoney (Northeast Regional Office, NMFS), Anne M. Lange (NMFS, Northeast Fisheries Center, Woods Hole), and Anne Williams (MAFMC staff). Seven members of the public were present.

Amendment No. 1 To The Squid FMP

Dr. Holmsen asked what consideration had been given in the Amendment to the Squid FMP to the mixed fishery for squid and butterfish, i.e., if there were an incidental catch quota for butterfish in the Squid Plan. Ms. Williams replied that the fisheries for butterfish are to be managed under a separate butterfish FMP, which had not yet been officially approved, and that both Plans addressed the issue of interrelated fisheries. Mr. Keene stated that one alternative the Council is considering is eventual merger of the Squid and Butterfish Plans.

Dr. Holmsen stated that although the squid and butterfish fisheries are interrelated, the domestic fishermen and processors are presently primarily interested in the butterfish fishery for export. He stated that although butterfish exports were large last year, there were few exports to date this year. Dr. Holmsen stated that many people were of the opinion that this resulted from the reallocation procedures. Ms. Williams replied that the butterfish fishery had been operating under the same legal regime for the past three years, and that the potential for reallocation to foreign nations is no different this year than last. Mr. Macnow said that because of restrictions on fishing off the US coast, the Japanese have sought other areas to fish for butterfish, e.g., off China, Australia, and New Zealand, and those butterfish compete with supplies from US waters in the Japanese marketplace. Mr. Macnow said this fishing in other countries' waters did not occur last year.

Mr. Stasiukiewicz expressed surprise that the Amendment to the Butterfish FMP was not being scheduled for the same public hearing as the Amendment to the Squid Plan, and/or that the two Plans had not been merged. Mr. Keene explained why the delay in approval of the original Butterfish Plan had precluded the Amendment being included in this group of public hearings. Mr. Stasiukiewicz asked if the proposed squid permits would just be added to the existing permits, and if squid permits would be restricted in any way. Mr. Keene responded that any domestic fisherman could apply for and receive a squid and/or mackerel permit. Mr. Mahoney added that the squid permit would simply be added on to a fisherman's existing federal license.

Dr. Rorholm asked what measures in the Plan addressed Objective 3 ("minimize capture

of non-target species"). Ms. Williams replied that the Plan's adoption of the Foreign Fishing Regulations addressed this issue, and that those regulations had been designed by NMFS to deal specifically with these problems. Dr. Rorholm also asked if there were any limit on how many times a year a review of US harvesting capacity could take place. Ms. Williams replied that such a review could take place at any time, but that the reallocation procedures in Amendment No. 1 were designed so that no closures to the American fishery would occur, even if the catches exceeded the initial estimate of harvesting capacity, as long as the US catch did not exceed the sum of the initial US capacity estimate and the Reserve.

Dr. Holmsen asked if there were any possibility of the State Department obtaining tradeoffs between foreign fishing quotas and reduction of tariff barriers in other countries. Mr. Keene replied that this was outside of the purview of a FMP, but that he believed that the present State Department policy was to "trade fish for fish" (instead of tying fish to other commodities). He stated that he did not know whether this policy extended to tariffs on US fish products in other countries.

Mr. Macnow made a statement on behalf of the Japan Deep-Sea Trawlers Association: "My clients would like to point out that there has been a great deal of wastage of the squid resource because it is not being caught either by American fishermen or foreign fishermen. Foreign fishermen are having problems catching squid because of severe restrictions, limitations to five windows, and restrictions within those windows because of fixed gear conflicts. In the past two years of operating under the Preliminary Management Plan, they estims e that some 150-200 million pounds of squid available for harvest have gone uncaught and unutilized, a very large amount. This also resulted in a loss to the US of fishing fees from foreign fishermen which had to be rebated to them, since they could not catch the amounts of fish which they were originally allocated. The US lost about $1 million in fees because of these restrictive regulations, and also because of late reallocations of fish which had been originally reserved for American fishermen but which were not caught. The FMP, we believe, continues to compound this situation by overestimating to a large degree the ability and intention of American fishermen to catch squid. There are 24,000 metric tons of squid reserved for US fishermen, but in the recent past, the annual US catch has not exceed 3,700 tons. This year the catch has gone up, to probably about 6,000 tons, but this is a far cry from 24,000 tons. Japanese fishermen do not want to take anything away from American fishermen, but if American fishermen are not going to catch these amounts, why not let other countries take it? Under the reallocation system proposed in the FMP and this Amendment, there is only one reallocation period per year, and that comes very late in the season. It only allows for a portion of the unused amount reserved for American fishermen to be reallocated to foreign fishermen. It makes the reallocation so late in the fishing season that Illex, for example, is unavailable by the time reallocation occurs. My clients would like to see a more equitable reallocation system, whereby the American and foreign catches are reevaluated at more frequent intervals, and reallocations are made more frequently, so as to utilize the resource which is available for harvest, but which has been largely wasted in the past.

"My clients have been trying to help develop the market for fish among New England and Mid-Atlantic fishermen. Last month they sent a delegation to Gloucester to see which species of fish they could buy for the Japanese market, and to give advice on how to better handle squid and butterfish so that these species would be more acceptable to the Japanese market. Squid is caught by many fishermen here, usually as a by-catch. Apparently, the fishermen are treating it very badly, allowing it to get bruised, not getting it back to shore fast enough, and not freezing it fast enough. And although Japanese companies had contracted for squid last year, the product that they got from US processors was in such poor condition that most of the squid could not be sold for human consumption in Japan; it had to be used for pet food. The same is true of butterfish. Much of the butterfish that the Japanese had contracted to buy arrived in Japan in deteriorated condition, with bellies swollen and bruised skin, and much of it was sold at a loss or was thrown away.

We're trying to set up a program which will show US fishermen and processors how these products should be handled and what the Japanese want to buy and pay top dollar for. My clients are making an effort to help US fishermen and processors, but I think they want to be treated fairly in return for helping to develop markets in Japan for these underutilized species. We would very much like to have the Regional Council reconsider its reallocation formulas, and work out something which is a lot more equitable.

"This Amendment proposes a Reserve concept, but here again, this concept hardly seems fair, because most of the Reserve comes out of the foreign allocation. In effect, it will reduce the ability of the foreign vessels to know at the beginning of the season how much they will be allowed to catch and make plans. It leaves untouched the 24,000 tons which have been reserved over the past two years for Americans, and which US fishermen haven't taken. I think it would be a lot more equitable to reduce the DAH figures to more realistic levels, and then put in a Reserve on top of that. If US fishermen can catch that Reserve, fine. But if they can't, we would like to see a faster, more equitable reallocation of that surplus."

Ms. Williams asked Mr. Macnow if his clients believed that the DAH estimates in the Squid FMP were too high, or if they also believed the estimates in the proposed Amendment were too high. He replied that both sets of estimates were unrealistically high.

Mr. Coons asked if the estimate of US capacity was based only on people presently active in the fishery, or if it included future activity. Ms. Williams responded that the Council had done a limited survey of US processors to estimate future activity, and that the DAH and DAP estimates were not limited to only those fishermen and processors already in the fishery.

Amendment No. 1 To The Atlantic Mackerel FMP

Mr. Macnow asked to make a statement on behalf of his clients, the Japan Deep-Sea Trawlers Association: "My clients feel that mackerel has been treated as a by-catch species for the foreigners. In view of the abundance of mackerel, they feel the TALFF has been set much too low for a realistic operation. Mackerel have been virtually swimming into the nets of Japanese fishermen fishing for squid. The very low mackerel allocations have been restricting their ability to catch their squid quotas. I think there is general agreement that there is a great deal of mackerel out there. Most of it is young and the Council, reasonably I think, wants to keep the OY down for another year and let these mackerel grow a bit. Even though the Council has increased the OY for next year, we would like to see a larger TALFF, because of the great abundance, and it will cause a problem unless foreign fishermen get enough to cover the problems in the squid fishery."

The hearing was adjourned at approximately 8:30 p.m.

16 OCTOBER 1979 - FALMOUTH, MA

The hearing was opened by Mr. Keene at approximately 7:00 p.m. Others present were Patrick L. Carroll (New England Fishery Management Council), Thomas D. Morrissey (Northeast Regional Office, NMFS), Anne M. Lange (NMFS, NEFC, Woods Hole), and Anne Williams (MAFMC staff). One member of the public was present.

Mr. Bridges asked if permits would have to be obtained for the squid and mackerel fisheries. Mr. Keene responded that the original FMPs for squid and Atlantic mackerel contain permitting provisions, and that these Amendments would continue those requirements. Mr. Bridges stated that such requirements were very harassing, especially for a fisherman such as he, who works mainly inshore and who only fishes such species for at most ninety days per year. Mr. Bridges stated that he had to submit annual reports for the town and for the state, a monthly report for the

Atlantic bluefin fishery, and a weekly report for groundfish, and that he felt these reporting requirements were unreasonable, especially for a fishermen who switches fisheries frequently and who may not know what he will be fishing for in the near future. He suggested that the Council work towards some simple and uniform system, monthly rather than weekly, which would reduce the amount of paperwork required of fishermen.

17 OCTOBER 1979 - GLOUCESTER, MA

Mr. Keene called the hearing to order at approximately 7:00 p.m. Others present were Thomas A. Norris (New England Fishery Management Council), Anne Lange (NMFS, NEFC, Woods Hole), Glen Mahoney (Northeast Regional Office, NMFS), and Anne Williams (MAFMC staff). Eight members of the public were present.

Amendment No. 1 To The Atlantic Squid FMP

Ms. Campen asked that a statement be made for the record by Mr. Matsuzawa, representing Japan Deep Sea Trawlers Association. Mr. Matsuzawa read from a prepared statement (Attachment A).

Ms. Leber asked a question on behalf of her husband who is constructing of a boat for the squid fishery. Ms. Leber asked what plans were underway to regulate fixed gear. She stated that there were apparently many lobster pots in areas that are good squid fishing grounds, but that the number of pots in these areas make towing very difficult. Mr. Keene responded that gear conflict regulations had been developed in conjunction with the New England Fishery Council, and that these regulations were almost ready for inclusion in FMPs and implementation. Mr. Mahoney stated that the NMFS had just recently completed a series of public hearings that were jointly sponsored by the NMFS, the Councils and the Coast Guard. As a result of the public comments at those hearings, the four co-sponsors will be revising the proposed regulations. Mr. Mahoney said that publication of these proposed regulations in the Federal Register for formal public comment should occur early next year, perhaps sooner.

Amendment No. 1 To The Atlantic Mackerel FMP

Mr. Santapaola commented that mackerel had not been abundant in recent years in inshore waters, and that his catches had decreased dramatically over the last ten years. Ms. Lange stated that in the last few years, water temperatures appear to have been warming each year more rapidly than usual, that mackerel may have migrated north more rapidly than usual, and consequently that mackerel have not moved inshore as much as they have historically. Mr. Santapaola stated that he had been in the mackerel fishery for several decades, that he had witnessed low abundance periods before, but that the present scarcity since the foreign fishery began was the longest and most severe. Mr. Santapaola stated that a foreign fishery early in the spring would significantly decrease the amounts available to the inshore fishermen. Mr. Santapaola stated his opinion that no American fishery for squid or mackerel would develop if large allocations are given to foreign nations.

18 OCTOBER 1979 - PORTLAND, MAINE

Mr. Keene opened the public hearing at approximately 7:00 p.m. Others present were Robert C. Morrill (NMFS, Portland, Maine), Bruce C. Nicholls (Northeast Regional Office, NMFS), Stephen H. Clark (NMFS, NEFC, Woods Hole), and Anne Williams (MAFMC staff). Four members of the public were present.

Amendment No. 1 To The Atlantic Squid FMP

Ms. Campen introduced herself and representatives from the Japan Deep Sea Trawlers Association. Ms. Campen stated that this group had submitted an official statement

at the public hearing on these Amendments at the 17 October 1979 public hearing in Gloucester, Massachusetts, and that copies of this statement had been made available to these audiences. She volunteered to have the statement repeated if any one wished it, and offered to answer any questions.

Mr. Taber stated that while he had no basic disagreement that resources should not be wasted, it was important that the US not ruin the market potential for US fishermen and processors by giving large allocations to foreign fishing nations. He stated that any TALFF allocated should be conditional upon market development in a country, regardless of the species in question. He stated that while the squid export market was strong for a period of time, it had recently softened, and that there were sizable inventories of unsold squid.

Ms. Campen responded that the Japanese were cognizant of the fact that as the US fishery developed, the TALFF would be decreased. She stated that the reason that the export market is currently not strong is not because the Japanese will not buy US fish, but the quality was lacking. She stated that Japan is presently importing squid from eleven other countries, with whom the US has to compete. Ms. Campen stated that the quality of US squid at the present time is not competitive. She stated that reducing the TALFF by itself would not increase Japanese imports. Ms. Campen stated that last year the Japanese government assured the US government that if the quality of US squid improved, there would be a market for all the squid the US could sell.

Mr. Matsuzawa stated that Japanese vessels were working in Canadian waters in a cooperative fishery with the Canadians. Half of the catch by Japanese vessels in the cooperative venture was processed on land in Canada. The other half of the catch was taken home by Japanese vessels. Mr. Matsuzawa stated that Canadians had made very good profits from this arrangement.

Mr. Keene asked what price the Canadians got for that squid. Mr. Matsuzawa stated that the half of the catch that was taken home to Japan was priced depending on the market at the particular time. Mr. Matsuzawa gave an example of prices paid to Canada for squid in August this year. The price varied according to the size of the squid. The F.O.B. price for Illex weighing more than 300 grams was $700 per metric ton. The price for 250 - 300 gram squid was $650 per metric ton. The price for 200 - 250 gram squid was $600 per metric ton (US dollars).

Mr. Matsuzawa said that the situation this year is different, however. This year Japan is getting squid from New Zealand and other areas, and squid imports from Canada have decreased very rapidly. He said that the frozen squid inventories in Canada are very high. Mr. Matsuzawa stated that Japan had received trade missions from Canada pleading with the Japanese to buy those unsold inventories. He stated that the Minister of Agriculture in Canada is scheduled to come to Japan to ask the Japanese to buy these supplies. He stated that he questioned why Americans were not making a similar effort in Japan to expand sales. He stated that there was presently a mission in Japan from the US Department of Commerce, attempting to expand sales into the Japanese markets, but none of the sample goods is seafood. Mr. Matsuzawa said the impression was that the US was not particularly anxious to expand its sales of seafood. He stated that a reduction of the TALFF in US waters was not the right way to try to develop the market in Japan, and would actually hamper the development of the industry here.

Mr. Taber stated that his suggestion was not necessarily to reduce the TALFF, but perhaps to receive a guarantee that a certain allocation would insure a place in the Japanese market.

Amendment No. 1 To The Atlantic Mackerel FMP

There were no comments on this Amendment.

The meeting was adjourned at approximately 8:30 p.m.

18 OCTOBER 1979 - ASBURY PARK, NJ

The hearing was opened at approximately 7:20 pm by William Feinberg (MAFMC). Others present were Bruce Halgren (New Jersey Division of Fish, Game, and Shellfisheries), Glen Mahoney (Northeast Regional Office, NMFS), and David R. Keifer (MAFMC staff). Three members of the public were present.

Mr. Keifer reviewed proposed Amendment #1 to the Atlantic Squid FMP and proposed Amendment #1 to the Atlantic Mackerel FMP. There were several questions about the Plans and the Amendments, but no comments on any of the proposals.

The hearing was closed at approximately 8:15 p.m.

19 OCTOBER 1979 - CAPE MAY, NJ

The hearing was opened at approximately 7:15 pm by Capt. David H. Hart (MAFMC Chairman). Others present were Bruce Halgren (New Jersey Division of Fish, Game, and Shellfisheries), Glen Mahoney (Northeast Regional Office, NMFS), and David R. Keifer (MAFMC staff). Twenty-one members of the public were present.

Mr. Keifer reviewed proposed Amendment #1 to the Atlantic Squid FMP and proposed Amendment #1 to the Atlantic Mackerel FMP. There were several questions about the Plans and the Amendments. A representative of the Japan Deep-Sea Trawlers Association presented a paper commenting on proposed Amendment #1 to the Atlantic Squid FMP (Attachment A). There were no other comments on any of the proposals.

The hearing was closed at approximately 8:30 p.m.

22 OCTOBER 1979 - RIVERHEAD, NEW YORK

The hearing was opened at approximately 7:30 pm by Anthony Taormina (MAFMC). Also present was David R. Keifer (MAFMC staff). Seven members of the public were present.

Mr. Keifer reviewed the proposed amendments to the Atlantic Squid and Atlantic Mackerel FMPs.

There was considerable discussion on the recommended alternative for Amendment #1 to the Squid FMP dealing with the probability of developing a US fishery for export so long as there is a significant TALFF provided for in the Plan. Several persons present felt that no export fishery would be developed unless foreign nations could no longer harvest squid themselves. One person suggested that nations that agree to purchase US-caught squid should be allocated TALFF on an agreed upon basis so that TALFF would increase to the extent that foreign purchases of US caught squid increased. One person suggested that the FMP should be permitted to lapse, that FMP management should be reintroduced, and that there should be no TALFF, on the grounds that the US fishing fleet does have the capacity to harvest the OYs if there is a market.

It was suggested that the proposed Optimum Yield in the Council's proposed alternative for Amendment #1 to the Atlantic Mackerel FMP might be too high in light of the most recent stock assessment, since much of the basis for the increase is the NMFS fall 1978 survey cruise and no significant numbers of mackerel were found in the spring 1979 survey cruise.

It was also suggested that, while the 4,000 mt TALFF might be reasonable if there has, in fact, been an increase in abundance of Atlantic mackerel, the possible additional 6,000 mt TALFF provided in the Reserve in the recommended alternative

might be high enough to provide for a directed foreign fishery for Atlantic mackerel. It might be more conservative to allow the 6,000 mt to go unharvested to accelerate stock rebuilding if the 6,000 mt are not harvested by US fishermen.

It was suggested that the reporting requirements be revised to require only catch and effort data rather than the data required on the current logbooks and that the word "logbook" not be used to describe the reporting requirements.

The hearing was closed at approximately 9:15 p.m.

22 OCTOBER 1979 - OCEAN CITY, MARYLAND

The hearing was opened at approximately 7:15 P.M. by Robert Rubelmann (MAFMC). Others present were Peter Colosi (Northeast Regional Office, NMFS) and John Bryson (MAFMC staff). Six members of the public were present.

Mr. Bryson reviewed proposed Amendment #1 to the Atlantic Squid FMP and proposed Amendment #1 to the Mackerel FMP.

The prime concern was over the allocation for foreigners, when it would take place and how it would affect the US fishermen. There were objections to any large allocation to the foreigners.

There were several questions about the Plans and Amendments.

The hearing was closed at approximately 8:45 p.m.

23 OCTOBER 1979 - NORFOLK, VA

The hearing was opened at approximately 7:20 P.M. by Arthur Fass (MAFMC). Others present were Peter Colosi (Northeast Regional Office, NMFS) and John Bryson (MAFMC staff). Seven members of the public were present.

Mr. Bryson reviewed proposed Amendment #1 to the Atlantic Squid FMP and proposed Amendment #1 to the Mackerel FMP.

Concern was expressed over the foreign allocation, when it would take place and how it would affect the US fishermen.

It was felt that the amount of TALFF should be as low as possible and no allocation should be given to the foreigners until the US fishermen received their share.

One individual stated he was advised by foreigners that his catch was of good quality but they would not buy from him. At this point he feels that they are simply waiting for a new allocation to occur.

Mr. Gustave Fritschie, Director of Government Relations for the National Fisheries Institute, read a statement into the record. (Attachment B).

Mr. McHugh expressed concern that the OY for mackerel was being raised too fast and it should be held down for another year and provide some safety factors for stock rebuilding.

The hearing was closed at aproximately 9:10 p.m.

ATTACHMENT A

COMMENTS BY THE JAPAN DEEP-SEA TRAWLERS ASSOCIATION ON AMENDMENT #1 TO THE ATLANTIC SQUID FMP

A. Reserve System:

Amendment #1 to the Atlantic Squid FMP recommends the following reserve system as a management measure:

(In MT)	ILLEX	LOLIGO
OY	30,000	44,000
DAH	5,000	7,000
DAP	5,000	7,000
TALFF	12,000	18,000
Reserve	13,000	19,000

The reallocation of Reserve would be on the following basis:

a) Reallocations from Reserves to U.S. (domestic) quotas--

...to be made continuously in such manner as will not disrupt fishing activity.

b) Reallocations from Reserves to TALFF --

...to be limited in accordance with the following extremely strict criteria:

(NOTE: Items outside parentheses refer to Loligo; those inside parentheses to Illex.)

...When the U.S. catch from April to September inclusive (April - August) equals or exceeds

50% or more (40% or more) of the annual domestic quotas, no reallocations would be made.

...When the U.S. catch falls short of 50% (40%) of annual domestic quotas, reallocations would be limited to not more than half the difference between reported domestic harvest and annual domestic quota.

...Effective dates: Loligo -- January 1
Illex -- December 1

B. Problem Areas:

The following problems would arise from application of the system described in (A) above:

(1) With the TALFF volume greatly reduced in comparison with the present FMP, there would be an unduly severe impact on foreign vessels.

TALFF: (In Metric Tons)

FMP	20,000	30,000
Amendment #1	12,000	18,000

(2) In view of the severe criteria for reallocating Reserves to TALFF, when U.S. catch is insufficient, a large amount of the total potential harvest would remain unutilized.

Example:

Estimating the U.S. catch of Loligo at 7,000 MT a year, if the April to September portion exceeded

3,500 MT, there would be no reallocation to TALFF and the 19,000 MT Reserve would be left unutilized.

(3) The essential objective in taking the above measure (as per (1) and (2))--i.e., a policy of lowering TALFF for the purpose of developing the U.S. fishery -- is assumed to be to expand the U.S. squid fishery at a time when it is still in at an early stage of development as an export fishery. This policy is diagrammed in Figure 1 (1).

However, there is a danger that this policy may in fact thwart the development of the squid fishery as an industry and so run counter to this objective (as diagrammed in Figure 1 (2).

Taking the Japanese market as an example, in 1978 domestic (Japanese) production was roughly 384,000 MT, while imports came to some 50,000 MT. A slight increase in both production and imports is expected during 1979, so that the outlook is for total supply to exceed 450,000 MT.

Estimated import volume from January - July, 1979 was as follows:

Country of Origin	Total Volume (MT)
Canada	8,480
New Zealand	5,450
Singapore	4,000
Argentina	3,750
Republic of Korea	3,500
Cuba	2,770
Spain	2,000
Poland	1,500
U.S.A.	1,350
Federal Republic of Germany	1,100
Ireland	110
TOTAL	34,010

Furthermore, squid prices in Japan tend to be determined largely on the basis of the Japanese off-shore catch, which accounts for over 300,000 MT per year. Thus, for squid to be imported into Japan, both price and quality must be very competitive.

If, therefore, Japanese fishing vessels were to cease their squid operations off the U.S. coast, given the present situation in which the U.S. squid fishery is not competitive either in price or quality, the decline in supply resulting from a cessation of operations by the Japanese fishery would be promptly covered by imports from such countries as Argentina, New Zealand, and Canada which also have their eyes on the Japanese export market.

Far from contributing to an increase in exports by U.S. squid fishermen to Japan, the result would be to further reduce the already low share of "squid from U.S. waters" in the Japanese market (defining "squid from U.S. waters" as the sum of squid caught by Japanese fishing vessels in U.S. waters and the amounts exported by U.S. fishermen to Japan).

In that way, there is the danger that Japanese market acceptance of squid from U.S. waters would steadily decline, with a consequent loss of competitive strength.

Accordingly, given the above realities, it is our view that,rather than reducing TALFF, a policy providing for suitable reallocations from OY to TALFF would, in the final analysis, better serve the development of the U.S. squid export fishery (as per the pattern shown in Figure 1 (3)).

FIGURE 1 (1)

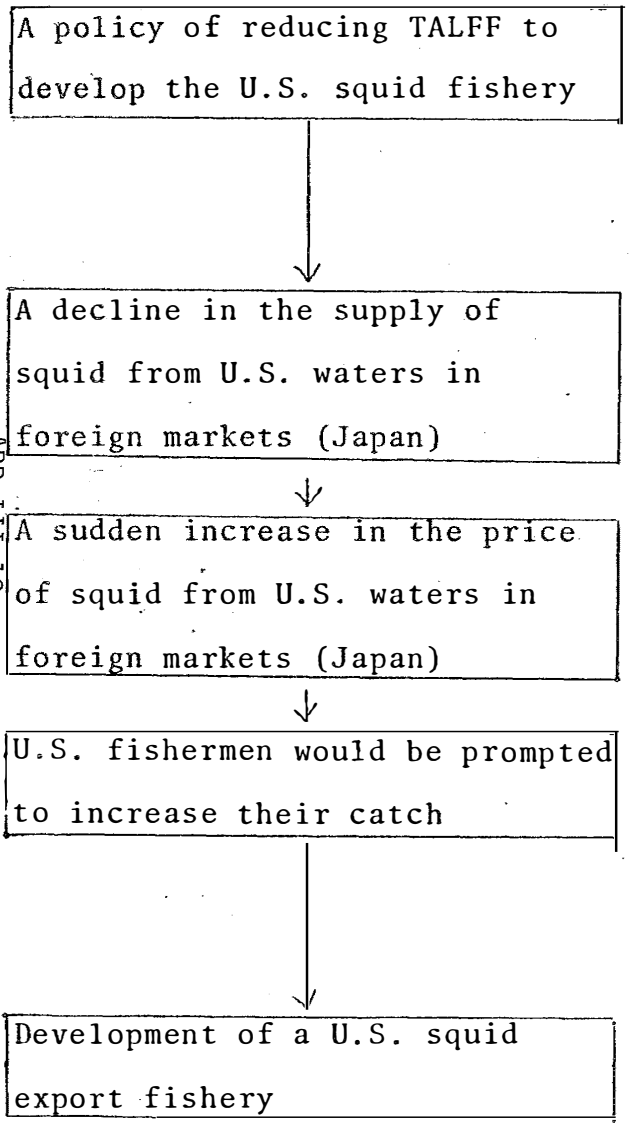


Figure 1 (2)

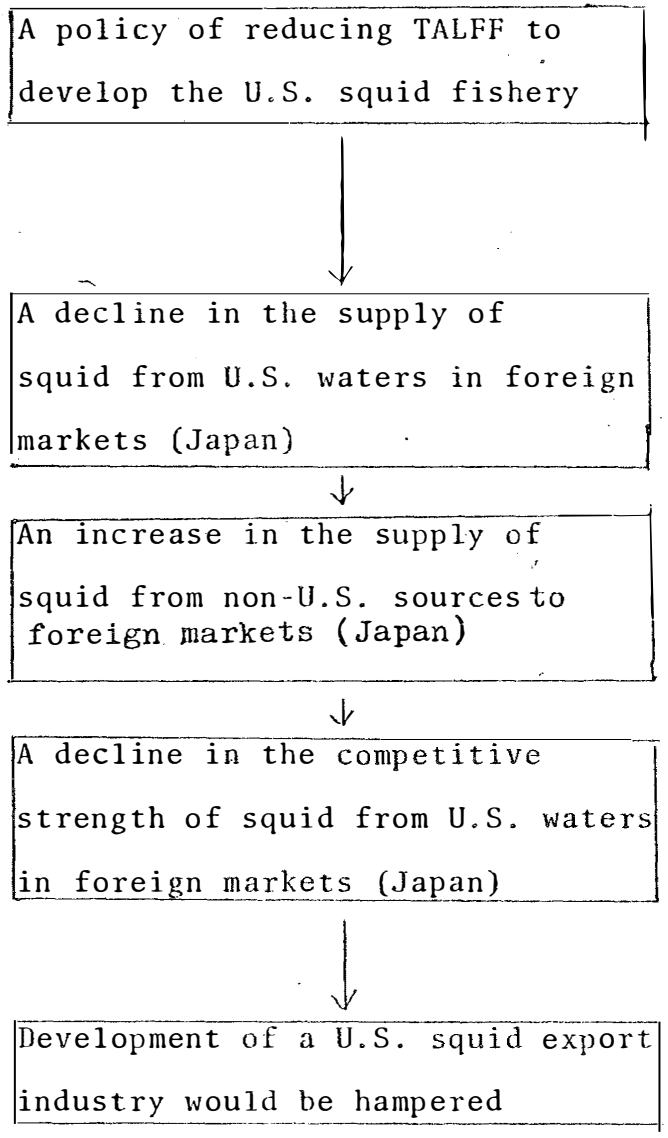
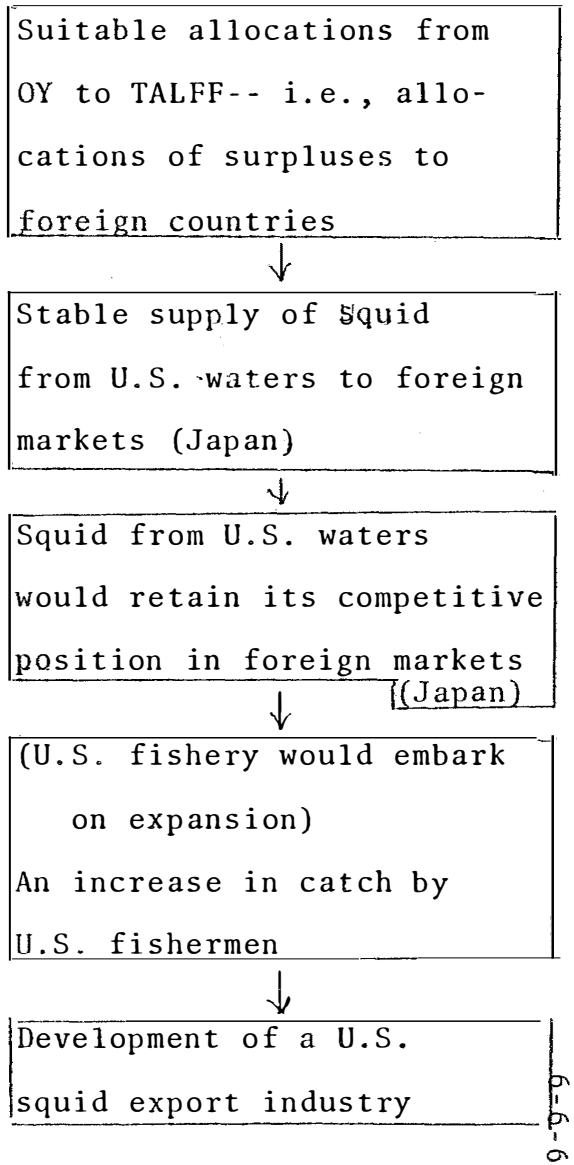


Figure 1 (3)



C. Our Recommendations and Requests:

Following are our thoughts with respect to the above matters:

(1) We recognize the fact that the basic policy embodied in Amendment #1 is to promote the future development of the U.S. squid fishery. However, with this fishery presently in a developing stage, for U.S.-caught squid to capture overseas markets, we believe that it is actually in the interests of U.S. fishermen that surpluses beyond their catch capabilities be fairly distributed to TALFF (with special consideration being given to countries with export potential).

Accordingly, in connection with TALFF determination, we propose the following improvements in the reallocation system with a view to averting a sharp decline in the supply of squid from U.S. waters in foreign markets (e.g., Japan).

(In MT)	LOLIGO	ILLEX
OY	44,000	30,000
DAH	7,000	5,000
DAP	7,000	5,000
TALFF	23,000	15,000
Reserve	14,000	10,000

(2) We propose that reallocations to TALFF be made twice a year so that foreign countries can fully catch any surpluses left over by U.S. fishermen.

(a) LOLIGO:

First Reallocation:

When the U.S. catch for the four-month period April-July equals or exceeds one third of the sum of the DAH + Reserve, no reallocation would take place.

When the U.S. catch falls short of this target during the above time period, reallocations would be limited to not more than:

(DAH + Reserve) minus

(U.S. 4-month catch) x 3

Effective date: September 1

Second Reallocation:

When the U.S. catch for the eight-month period April - November equals or exceeds 2/3 of the DAH + Reserve, no reallocation would take place.

When the U.S. catch falls short of this target during the above time period, the reallocation would be limited to not more than:

(DAH + Reserve) minus

(U.S. 8-month catch) x 1.5

However, if a first reallocation has been made, this would be deducted from the second reallocation.

Effective date: January 1

(b) ILLEX (based on an eight-month fishing season from April to November)

First Reallocation:

When the U.S. catch for the three-month period April- June equals or exceeds 3/8 of the sum of the DAH + Reserve, no reallocation would take place.

When the U.S. catch falls short of this target during the above time period, the reallocation would be limited to not more than:

(DAH + Reserve) minus

(3-month U.S. catch) x 8/3

Effective date: August 1

Second Reallocation:

When the U.S. catch for the five-month period

April - August equals or exceeds 5/8 of the DAH + Reserve, no reallocation would take place.

When the U.S. catch falls short of this target during the above time period, the reallocation would be limited to not more than:

(DAH + Reserve) minus
(5 month U.S. catch) x 8/5

However, if a first reallocation has been made, this would be deducted from the second reallocation.

Effective date: October 1

(3) We, of course, appreciate that, as the U.S. squid fishery develops, TALFF will be decreased. We hope to be able to continue future operations on the basis of new cooperative arrangements with U.S. fishermen. In this respect, there has been a steady development in approaches to and cooperative arrangements with U.S. fishermen on the part of individual Japanese enterprises-- a trend which we have every intention of continuing.

However, until such time as U.S. fishermen gain a strong competitive position in world markets, we trust that you will give due consideration to the importance of the Japanese squid market and of cooperative relationships with Japan.

ATTACHMENT B

STATEMENT OF GUSTAVE FRITSCHIE

DIRECTOR OF GOVERNMENT RELATIONS

NATIONAL FISHERIES INSTITUTE

Before

THE MID-ATLANTIC FISHERY MANAGEMENT COUNCIL

On

AMENDMENT #1 TO THE ATLANTIC SQUID FISHERY MANAGEMENT PLAN

October 23, 1979

Mr. Chairman, I am Gustave Fritschie, Director of Government Relations for the National Fisheries Institute. NFI represents more than 850 member firms which harvest, process and distribute fish and seafood products. The Institute is pleased to have this opportunity to comment on draft Amendment number 1 to the Atlantic Squid Fishery Management Plan. This Amendment places a portion of the optimum yield for both Illex and Lolligo squid in Reserve and would provide for a distribution of that Reserve during the fishing year to the Domestic Annual Harvest and the Total Allowable Level of Foreign Fishing. The establishment of a Reserve appears to be in accordance with the FMP's 8th management objective, "to encourage increased American participation in the Squid Fishery."

The Institute fully supports that objective and recently testified before the House Subcommittee on Fisheries, Wildlife Conservation and the Environment in opposition to H. R. 4360, a bill which would have permitted foreign vessels to fish within the fishery conservation zone and land their catch in U. S. ports while serving as so-called training vessels. In that testimony, NFI called for Government action to minimize or eliminate overseas trade barriers and to lower the continued high levels of foreign fishing by countries which would be prime U. S. markets. A copy of my statement before the House Committee is attached for the Council's consideration.

While the establishment of a Reserve is a step in the right direction, NFI is concerned that the size of the reserve and the assumption by foreign nations that all or much of the Reserve will be reallocated will lower those nation's demands for U. S. caught and processed squid. The Foreign Allocation Report prepared by the Secretary of the Treasury pursuant to Public Law 95-354, indicates a number of foreign trade barriers to U. S. squid exports. Italy, Japan, Spain, Korea, Poland, Romania and Taiwan all have tariff and nontariff barriers. NFI has requested the

Department of Commerce to seek the eliminiation of such barriers. However, it is unlikely that the countries will remove the barriers if they believe they will ultimately harvest the TALFF and all or most of the Reserve.

For this reason, the Institute suggests that the Council consider alternative management measure number 6 which would provide for a reduction in the OY for Illex and Lolligo squid. NFI recognizes that the Council has reviewed this option and has taken the position that "the most likely result is that a resource available for harvest would be underutilized." While this may be the case, there is no specific requirement under the FCMA that the yield be equal to the maximum sustainable yield.

The term 'optimum' as defined in the Fishery Conservation and Management Act clearly provides that the yield from the fishery will be that amount of fish which will provide the greatest overall benefit to the Nation and which is prescribed as such on the basis of the MSV of such fishery as modified by economic social or ecological factors. It is likely that the greatest overall benefit to the Nation will accrue from an expanded American fishing and processing fleet for squid in conjunction with new and expanded shoreside processing and distribution facilities. The resulting increased exports in squid products would assist in decreasing the present negative balance in our balance of trade in fishery products and will create new employment opportunities.

The Act specifically requires that economic considerations can be a factor in determining the OY and experience in other fisheries appears to indicate that a reduction in the TALFF will result in the development of an increased export market in foreign nations. This result has been observed in the Butterfish Fishery, The Tanner Crab Fishery and the Pacific Salmon Fishery. Tanner Crab exports, for example, went from negligible levels in 1975 to 14,000 metric tons in 1978. The salmon exports have also increased from the 4,000 metric ton level in 1975 to almost 40,000 metric tons in 1978. Experience in these fisheries would appear to indicate that a decrease in

the optimum yield for the squid fishery would result in increased export sales to foreign nations. The Institute respectfully suggests to the Council that careful consideration be given to the concept of reducing the OY as a preferable management measure to reach, what we believe is one of the more important management objectives for the squid fishery, to encourage increased American participation.

STATEMENT OF GUSTAVE FRITSCHIE

DIRECTOR OF GOVERNMENT RELATIONS

NATIONAL FISHERIES INSTITUTE

Before

THE HOUSE SUBCOMMITTEE ON FISHERIES WILDLIFE

CONSERVATION AND THE ENVIRONMENT

On

THE UNDERUTILIZED SPECIES DEVELOPMENT ACT OF 1979 H.R. 4360

September 11, 1979

Mr. Chairman, I am Gustave Fritschie, Director of Government Relations of the National Fisheries Institute. The Institute is a national trade association representing more than 830 member companies which harvest, process and distribute fish and seafood products. I am pleased to have this opportunity to express the Institute's opposition to H. R. 4360.

As drafted, it is the intent of this legislation to "expedite the development by United States fishermen of certain species currently underutilized or not utilized by United States fishermen." This goal seems laudable and in fact the Institute's Board of Directors is on record as supporting limited fisheries development programs to assist American industry in taking full advantage of the fishery resources found within the fishery conservation zone. The question pending before this committee is whether the bill is the proper mechanism to increase the harvesting, processing and distribution of underdeveloped fish stocks. To respond effectively to this question, there has to be an understanding of the actual impediments to the development of these fisheries.

Evidently the sponsors of the legislation view as major impediments: the lack of foreign technology; limited construction in U. S. yards of vessels of advance design; and the lack of a pool of American fishermen and crew skilled in the operation of such advanced vessels. Based on responses from NFI members, these perceived impediments do not exist. In one underutilized fishery, namely the Atlantic Squid Fishery, the real problem is access to overseas markets and trade and tariff barriers that limit entry to such markets by the U. S. industry. Another real impediment to the development of the domestic squid fishery is continued foreign fishing by countries which should be prime markets for U. S. harvested and processed squid. Other factors that may impede development of

underutilized fisheries in general include Food and Drug policy in this country which may limit the use of a more attractive nomenclature system, prices presently being offered both to fishermen and the processor for traditional species and the lag-time in bringing the necessary vessels and equipment into the American fleet.

The provisions of H.R. 4360 do not respond to the real barriers set forth above. In fact, the entry of so-called foreign training vessels with the probable shipment of that harvest to the foreign nation involved will have the effect of further restricting U. S. access to foreign markets.

What then is the proper response by the Congress and the Administration to the real impediments confronting development of our underutilized fisheries? One possibility would be to encourage, at a high level, discussions between the United States Government and the governments of foreign nations to indicate the close linkage between U. S. access to their markets and the continued granting of foreign fishing allocations under the Fishery Conservation and Management Act. This position was forcefully articulated by NOAA administrator Dick Frank and Assistant Administrator for Fisheries, Terry Leitzell, during a mission to Japan in the fall of 1978. Indeed, such action by the Administration is a component of the fisheries development policy announced at the Springfield conference. There is no reason why this position forcefully articulated by our government representatives in Japan could not be repeated in other countries.

A stated policy of the Fisheries Conservation and Management Act is to "encourage the development of fisheries which are currently underutilized or not utilized by United States fishermen . . ." Further, the Congress in its Statement of Findings and Purposes recognized that foreign fishing has contributed

to the damage of the economies in many coastal areas. This linkage between increased exports of U. S. underutilized species and continued foreign fishing allocations appears to be very much in accord with the policies and purposes enunciated in the FCMA.

A second positive step which could be taken by the government to encourage the export of underutilized species is the creation of sufficient fishery attache positions in overseas countries. Legislation introduced in the Senate by Senators Kennedy and Magnuson, and others, calls for the creation of six overseas fishery positions. Enactment of this legislation would have a beneficial effect on efforts to sell products overseas.

Government action to minimize or eliminate overseas trade barriers and to create fishery trade posts overseas will facilitate increases in U. S. fishery exports by all interested segments of the seafood industry on a competitive basis. In NFI's opinion, all the industry can request is the type of limited assistance best provided by the federal government which will enable the industry to compete on an equal basis for the world market share.

H. R. 4360 would not provide for free competition. Instead, it permits firms who are successful in securing a foreign connection to gain preferred access to the world market and the use of foreign fishing vessels which are presently equipped to fish and process underutilized species within our zone. The creation of such an unequal competitive edge at a time when many U. S. firms with long experience in the fishing industry are diligently seeking foreign markets for underutilized species and committed to the construction of suitable fishing vessels is contrary to the free enterprise system and should be rejected by this Committee.

Mr. Chairman, the most effective way of illustrating why this bill is not necessary is to briefly review activities in one of the underutilized fisheries. The squid fishery is a typical underutilized fishery. For Loligo Squid, the optimum yield is 44,000 metric tons and the annual domestic harvest as set forth in the Fishery Management Plan for the Atlantic Squid Fishery is 14,000 metric tons and the catch quota for foreign vessels is 30,000 metric tons. NFI is aware of at least five vessels with freezing capacity which are presently being constructed or renovated in the United States for participation in this fishery. Information that I have indicates one such vessel will have an on-board freezing capacity of 22,000 pounds per day and a storage capacity of 100,000 pounds of packaged squid. The boat will have capabilities geared to fish mid-water and bottom trolls. A letter from a company committed to expansion of the squid fishery states, "we do not need any foreign vessels for training us on the ways of the harvesting and handling of squid." This type of activity and the amount of money being invested by presently existing U. S. firms with long experience in the fishing industry is a compelling argument against further consideration of the pending legislation.

Another factor to be considered by the Committee is alternative approaches to the question of "Technology Transfer." Congressman Don Young has introduced H. R. 5035 which addresses this issue. In addition, research and development projects under the S-K Act can perform technological reserach. Finally, interested firms can contract for technological assistance. None of these alternatives would require the use of "foreign training vessels."

In addition to the very basic policy objections, NFI's analysis of the legislation raises many questions which we would like to share with the Committee. First, the legislation as drafted does not require the participation of the Regional Fishery Management Councils created under the FCMA. In fact, Section 5 of the legislation specifically states that notwithstanding the provision of the Fishery Conservation and Management Act, a "training vessel" may operate in the fisheries of the United States. This language is particularly troublesome in view of the major reasons for the creation of the council structure. During the House debate on H. R. 200, the former Chairman of this Subcommittee, Mr. Leggett, states, "the second major area of strong concern was that of Federal against States' rights with regard to jurisdictions and management authorities. Through the composition of the various regional fishery councils which allow for strong private and state participation, the states will have direct impact on the development of the Marine Fishery Management Plan which the Secretary of Commerce will then implement."

During the Senate debate on S. 961, Senator Stevens, "I think it would be futile for my collegue and me to argue whether Atlantic Squid is or is not overfished. We are not capable of making that determination, at least I am not capable of making that decision. I want to set up a mechanism by which the people of the region affected can select those whom they think are capable of managing their fisheries."

In fact, Mr. Chairman, the Mid-Atlantic Council has considered in some detail the status of Atlantic Squid Fishery, and one of the objectives of the Fishery and Management Plan which has been approved by the Department of Commerce, is to

"encourage increased American participation in the squid fisheries." The failure of this legislation to require approval of proposed underutilized species development plans by the appropriate regional council is a serious deficiency.

Second, while the bill appears to only permit foreign vessels to fish in the capacity of a training vessel, while suitable vessels are being constructed in the U. S., Section 5 (c) of the legislation permits the Secretary of Commerce to extend the authority granted the vessel for an open-ended period of time if a determination is made that an allowable level of foreign fishing still exists for the fishery concerned. In NFI's opinion, there should be no provision for the extended fishing time by the training vessels once the vessel constructed under the plan is operational.

Third, the legislation does not require that the applicant have a one to one ratio between training vessels and fishing vessels under construction. Under this legislation it would be possible for an applicant to bring in five training vessels and construct only one vessel in the United States.

Fourth, there is no requirement that the applicant demonstrate to the Secretary knowledge of the fishing industry and experience in that industry. Quite possibly the only individuals with fishing experience under this legislation would be the foreign company participating in the joint venture. Contrary to this, if you examine the present fishery, United States firms prepared to expand into the squid fishery have many years of experience, supported the enactment of the Fisheries Conservation and Management Act and hope to be the prime beneficiaries of that legislation which was intended in part to supplant foreign fishing dominance in U. S. waters.

Fifth, the bill would permit one applicant to harvest a catch equal to 20 percent of the total allowable level of foreign fishing and would permit all such applicants for a particular fishery to harvest a catch equal to 50 percent of the total allowable level of foreign fishing. The bill also requires that once the fish is harvested by the training vessel, it shall be deemed fish harvested by the vessels of the United States and the total allowable level of foreign fishing shall be reduced accordingly. If you apply these figures to the current Squid Management Plan, 50 percent of the allowable level of foreign fishing, or 15,000 metric tons would exceed the domestic level of fishing which is estimated to be 14,000 metric tons. The result of the application of these percentage limitations against the actual figures for the squid fishery illustrates again the need for active involvement by the Regional Fishery Management Councils.

Sixth, the bill does not require the actual construction of a vessel as a condition for approval of the plan.

Seventh, the bill does not require a sufficient percentage of the revenue from the vessel to be applied to the construction of the new vessel. If there is any argument in support of this bill it would appear to be that revenues from the training vessels are necessary to finance construction of the vessel.

Mr. Chairman, I wish to emphasize that even if the seven deficiencies set forth above are corrected, the legislation should not be approved by this Committee. The major question as outlined at the outset of my testimony is whether or not this legislation correctly identifies and then addresses the real impediments to the development of underutilized fisheries within the zone. The Institute submits that the bill does not.

Mr. Chairman, that concludes the Institute's statement, I am prepared to answer any questions that you or your Colleagues on the Committee may have.

DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD

MAILING ADDRESS:
Commander (Aol)
Atlantic Area, USCG
Governors Island
New York, NY 10004

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OCT 19 1979
MID ATLANTIC COUNCIL

Mr. John Bryson
Mid-Atlantic Fishery Management Council
Federal Building, Room 2115
North and New Streets
Dover, Delaware 19901

Dear Mr. Bryson:

I have reviewed Amendments #1 to the Atlantic Mackerel, Butterfish, and Squid Fishery Management Plans. The following comments apply to all three amendments:

a. Vessel of the United States is defined as: "(a) any vessel documented or numbered by the United States Coast Guard under United States law, or (b) any vessel under five net tons which is registered under the laws of any state." This definition excludes all vessels five net tons and over which are registered by a state and all unnumbered vessels not powered by machinery. Non-commercial vessels five net tons and over may be registered by a state and vessels not powered by machinery might not be numbered. I recommend the definition be changed to read:

"Vessel of the United States means:

(1) any vessel documented under the laws of the United States;

(2) any vessel numbered under a federal or state system under the Federal Boat Safety Act of 1971; and

(3) any vessel not powered by machinery which is owned by a United States National and which operates out of a port within the United States."

b. Personal Use is defined as: "...use as bait, for human consumption, or for other purposes not including sale or barter; in amounts not to exceed 100 pounds (45.4 kilograms) per trip." The definition does not specify whether the 100 pounds per trip is for the vessel or for each person on the vessel. I recommend this be clarified by adding after the words "100 pounds (45.4 kilograms)" either "per person' or "per vessel". The phrase "not including sale or barter" modifies only "other purposes" and not "use as bait" or "for human consumption". If it is intended that personal use include sale or barter for bait or human consumption in quantities less than 100 pounds

per person or per vessel per trip, it should be more clearly stated in the definition to avoid confusion.

Thank you for the opportunity to comment on the draft amendments.

M. Y. SUZICH

NATIONAL COALITION FOR MARINE CONSERVATION, INCORPORATED
100 FEDERAL STREET - BOSTON, MASSACHUSETTS 02110

October 2, 1979

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MID ATLAN...

Mr. John C. Bryson
Mid Atlantic Fishery Management Council
Federal Building, Room 2115
North and New Streets
Dover, Delaware 19901

Dear Mr. Bryson:

Although there is no recreational fishery for squid, except perhaps for small, isolated bait fisheries which may or may not exist on a regular basis, there is an extremely important, indirect recreational fishing interest in the species because of its function as an almost universal forage species. Squid are a basic building bloc of the food chains, and nearly all of the higher predators prey upon it; nevertheless, there is little information as to what level of abundance of squid is required to sustain a given level of any of such predator species. Squid is also a predator in its own right and its function as such is also poorly understood at this time. For these reasons, we urgently recommend that OY's for Loligo and Illex be maintained at present levels.

Furthermore, we believe as suggested in Amendment #1 to the Atlantic Squid Fishery Management Plan that squid management should be combined with butterfish management. In addition we recommend that consideration be given to combining squid with mackerel for management purposes.

Because the unknowns concerning the interspecific relationships of squid at different trophic levels, we urge the Council to restate the objectives of the plan, perhaps by amending objective No. 7, to include improving understanding of the predator-prey functions of the species.

Sincerely yours,

Christopher M. Weld

CMW/nc

"Let us face in time the fact that the ocean can be destroyed"

THOR HEYERDAHL

NATIONAL COALITION FOR MARINE CONSERVATION, INCORPORATED
15th FLOOR
BOSTON, MASSACHUSETTS

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September 25, 1979

Mr. John Bryson, Executive Director
Mid Atlantic Fishery Management Council
Room 2115 Federal Building
Dover, Delaware 19901

Dear Mr. Bryson:

This is to advise you that the National Coalition opposes any increase in the foreign allocation of Atlantic Mackerel at this time.

We are aware that National Marine Fisheries Service surveys show a tremendous increase of small fish that will recruit to the fishery next year. And we understand that the ability of the commercial fishing industry to harvest these stocks probably has not increased since the Atlantic Mackerel FMP was adopted. On the other hand, we believe the potential capacity of the recreational fishery was never fully assessed, and we are strongly of the conviction that the ecological function of the species was not given full consideration in determining OY.

The mackerel plan contains figures which adequately describe the huge mackerel catch of the recreational fishery in times of abundance. Such catch data are at best rough estimates and may be greatly overstated or greatly understated. The only known fact is that mackerel were in the 1960's and 1970's a mainstay of the party boat fleets north and south of Cape Cod. A very high level of abundance is required for fish in such numbers to be available to recreational fishermen -- most of whom fish within a few miles of shore. Also, given the inefficiency of rod and reel methods, many tons of fish must be available for every ton landed. Were these factors given due consideration before the Council recommended increasing the TALF?

Mackerel used to be a principal forage fish for bluefin tunas, striped bass and other predators throughout their range. This is no longer the case. Mackerel may be a major predator upon sand launce. Has this possibility been taken into account? Early drafts of management plans for mackerel, squid and herring indicated an ecological relationship among these three species that was not fully understood. Has this been considered?

Both the interrelationship of herring, squid and mackerel and the sudden'recovery' of the stocks seem to have caught biologists by surprise. If this is indeed the case, and our understanding of the population dynamics of this species is incomplete, then it would seem appropriate to invoke Section 301(a)(6) as good and sufficient reason for continuing to prohibit a directed foreign fishery on mackerel.

All of the above questions are OY considerations that must according to law be taken into account before a 'surplus' can be determined. Failure to give full consideration to all OY factors would constitute non-compliance with the Fisheries Conservation and Management Act.

We urge the Council to lean toward excessive caution in setting the mackerel TAC until it can be stated with confidence that the stocks have fully recovered from the excesses of the early 70's and the fisheries -- particularly the recreational fisheries -- have also recovered.

Sincerely yours,

Christopher M. Weld

CMW/nc

NATIONAL COALITION FOR MARINE CONSERVATION, INCORPORATED
[illegible]
[illegible] FEDERAL STREET - BOSTON, MASSACHUSETTS 02110
(617) 338-2[illegible]

October 2, 1979

Mr. John C. Bryson
Mid Atlantic Fishery Management Council
Federal Building, Room 2115
North and New Streets
Dover, Delaware 19901

Dear Mr. Bryson:

Since my letter to you dated September 25, 1979 I have received a copy of Amendment #1 to the Atlantic Mackerel Fishery Management Plan and would like to make the following comments and recommendations with respect thereto.

1. We urgently recommend that the TALFF should not be increased for the 1980-81 fishing year.

2. The objectives of the plan should be amended to include the following:

"6. Improve understanding of predator-prey relationships of the makerel at various stages of its life cycle."

a. The TALFF should not be increased for the following reasons:

(1) The recreational fishing catch of mackerels is taken by a very large fleet of fishing boats based on a great many ports and harbors throughout the range of the species. At present estimates of the numbers of boats and the numbers of anglers fishing for mackerels are quite imprecise. As a result, estimates of the numbers of mackerels taken by the recreational fishery are really little better than guesses. For the most part, the catch is taken for home consumption or, to a far lesser extent, used as bait; so a large portion of the catch is not visible at the ordinary points where catches are counted.

(2) During the seven years 1966-1972, which correlate roughly with the peak biomass years in Figure I-9, the average of the recreational fishery catch according to Figure I-2 was 24,000 tons; thereafter the recreational fishery catch tracks the biomass curve downward. The number of private and charter and party boats which fish for

mackerel today - or would if mackerel were available in abundance - is probably at least as great as in 1966-72. Accordingly, it could be concluded that if mackerel were available in abundance, the recreational fishery catch would rise to the levels of 1966-72. This does not appear to be reflected in the DAH.

(3) The concept of establishing a Reserve is undoubtedly appealing to those who feel that an uncaught surplus is a loss and to those who feel morally bound to share fishery resources with foreign fishermen. Nevertheless, given the unknowns stated in the plan and the inability to accurately monitor the recreational fishery catch, any estimated uncaught surplus may well be wholly illusory.

(4) Given the present depleted condition of the stocks (see XII-5 reference to the spawning stock size being 40% of the 1962-1979 average spawning stock size) and the unknown relationship of spawning stock size to recruitment, it would seem the better part of wisdom to err on the side of caution.

(5) The language of several sections of the FCMA impose a clear duty upon the Councils to adopt management strategies designed to restore, rebuild and maintain the abundance of the stocks. To increase the TALFF when the spawning stock size is only 40% of former levels is inconsistent with this duty.

(6) Another purpose incorporated in the Act was to encourage the development of the commercial and recreational fisheries. If there is a possibility of developing an export market for the domestic mackerel fishery, it would appear undesirable to increase the catch of foreign vessels in the FCZ.

(7) To restate the argument made in my earlier letter to you, which is borne out by the catch and biomass data contained in the Amendment, a healthy recreational fishery requires large numbers of mackerels in inshore waters. The mackerel biomass must be restored to former levels of abundance in order to recreate the conditions which allowed the recreational fishery to flourish.

(8) The occurrence of a single, strong year class does not necessarily signal restoration of the stock to former levels of productivity. If 1978 is followed by poorer than average spawning years, the "78's" may have to

sustain the fisheries for some years to come.

b. We urge you to adopt the further objective of increasing our understanding of the ecological functions of the mackerel for the following reasons:

(1) The prolonged period of overfishing by foreign fleets in the western Atlantic Ocean altered relationships within the food chain in ways that are not now fully understood. The tremendous growth in abundance of sand launce is probably only one symptom of such changes. Before we declare mackerel as 'underutilized', we should understand just what niche the mackerel fill in western Atlantic food webs.

(2) The importance of mackerel to the squid and herring fisheries is as yet not fully understood, and this factor should be taken into account in considering OY.

In summary, it is our opinion that the TALFF should be limited to a by-catch of 1,200 metric tons and that the OY should be reviewed and probably reduced in view of the factors set forth above.

Sincerely yours,

Christopher M. Weld

CMW/nc

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
6TH AND WALNUT STREETS
PHILADELPHIA, PENNSYLVANIA 19106

OCT 12 1979

Mr. John C. Bryson
Executive Director
Mid-Atlantic Fishery
Management Council
Federal Building, Rm. 2115
North and New Streets
Dover, DE 19901

Dear Mr. Bryson:

We have reviewed the draft Supplemental Environmental Impact Statement and Amendment #1 to the Atlantic Mackerel Fishery Management Plan of August 1979. On the basis of our review, we have assigned the document an EPA Category Rating of LO-1 (Sufficient and Lack of Objections).

We would like to note that municipal ocean dumping activities are still occurring in this Middle Atlantic Region. All dumping in this area will cease by December 31, 1980.

The classification and the date of EPA's comments will be published in the Federal Register in accord with our responsibilities promulgated under Section 309 of the Clean Air Act Amendments.

Sincerely yours,

John R. Pomponio
Chief
EIS & Wetlands Review Section

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET
ATLANTA, GEORGIA 30308

October 26, 1979

4SA-EIS

Mr. John C. Bryson, Executive Director
Mid-Atlantic Fishery Management Council
Federal Building, Room 2115
North and New Streets
Dover, Delaware 19901

Dear Mr. Bryson:

We have reviewed both Amendment #1 to the Atlantic Mackeral Fishery Management Plan and Draft Supplemental Environmental Impact Statement and Amendment #1 to the Atlantic Squid Fishery Management Plan and Draft Supplemental Environmental Impact Statement. We have no comment concerning this document.

If we can be of further assistance, feel free to call on us.

Sincerely yours,

Sheppard N. Moore
Chief, EIS Review Section

cc: Sidney R. Galler, DOC

RUTGERS
THE STATE UNIVERSITY
OF NEW JERSEY

Cooperative Extension Service
New Jersey Marine Advisory Service
Ocean County Extension Office
Agriculture Center
Whitesville Road
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Telephone: 201/349-1152

NEW JERSEY
MARINE SCIENCES
CONSORTIUM

October 29, 1979

Mr. John C. Bryson
Room 2115, Federal Building
North and New Streets
Dover, Delaware 19901

Dear John:

Although I was unable to attend the Mackerel/Squid Public Hearing in Asbury Park on October 18, I wanted to write a note to reinforce the feeling of some of those people with whom I deal.

Recently I was made aware of a study that I'm fairly sure was sent to you last spring, i.e., Age Composition of the Spring '78 Recreational Catch of Atlantic Mackerel for the Mid-Atlantic, by Christiansen, Pentilla and Dery. In this report it was shown that 50% of the recreational catch consisted of the 1967 and 1969 year classes which differed from the total commercial catch where those years represented only 4.4% of the total. This along with other data in the study, would tend to show that the older mackerel, which are recruited into the sport fishery and inshore commercial fishery near the age of six could be reduced even further if an off shore fishery for mackerel, which consists chiefly of 2,3 and 4 year olds, had more pressure on it.

I realize that at this time, there is no directed foreign fishery for Atlantic mackerel but I would like to reiterate the feelings of the recreational mackerel fishermen, who have had poor fishing lately for the species, that the foreign fishery for mackerel be kept closed and prohibit the trend for increased by-catch in the future.

I also realize that according to FCMA we are obliged to allocate a surplus to the foreign boats but I feel that at this time we should foster the recreational and inshore commercial fisheries through Fisheries Development and keep the surplus at a minimum.

Sincerely,

Gef Flimlin
Marine Extension Agent

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RESPONSES TO COMMENTS

Three major issues were raised at the public hearings and in the written comments on Amendment #1 to the Atlantic Mackerel FMP. The first dealt with the stock assessment, the second with the proposed TALFF, and the third with the impact of the Reserve on the TALFF.

Stock Assessment

The NMFS mackerel stock assessment, in discussing the spring, 1979, survey, notes that "...Available information suggests that the low survey catch of mackerel in 1979 relative to 1978 was due, in part, to warmer bottom water temperatures at the time of the survey in 1979... It is likely, therefore, that a substantial portion of the mackerel normally sampled in (ICNAF) SA 5-6 during the spring survey may, in 1979, have already migrated east and north into Canadian waters..." The estimate of a comparatively large 1978 year-class was also indicated by the results of a FRG survey in February-March of 1979. In addition to this evidence, the assessment, in its prediction of year-class sizes, future spawning stock sizes, etc., makes several conservative assumptions which render these predictions fairly cautious. One of these assumptions is that of a relatively poor 1979 year-class (see Appendix I). For these reasons, the Council believes that the OY specified in Amendment #1 for fishing year 1980-1981 is conservative and in keeping with the objective of the FMP to rebuild the stock.

Impact of Initial TALFF on Foreign Fishing

The initial TALFF established by Amendment #1 for fishing year 1980-1981 is 4,000 mt, which is over three times greater that the mackerel TALFF for fishing year 1979-1980 (1,200 mt). Initial TALFFs for squid, in which fishery mackerel may be a by-catch, are proposed to be lower in fishing year 1980-1981 than in fishing year 1979-1980. TALFFs for other species for which mackerel may be a by-catch will likely be equal to or less than similar TALFFs in fishing year 1980-1981 versus fishing year 1979-1980. The Council, therefore, believes that an initial TALFF of 4,000 mt (which may be increased during the fishing year by allocations from Reserve) should not prevent foreign nations from fully harvesting their allocations of other species. During calendar year 1978, only 28% of the mackerel TALFF was harvested, while 42% and 55% of the *Loligo* and *Illex* TALFFs, respectively, were taken.

Reserve and TALFF Relative to Stock Rebuilding

The third issue deals with the maximum possible size of the mackerel TALFF in fishing year 1979-1980 relative to the development of a significant directed foreign fishery for this species while the Council is still attempting to establish a regime that enhances stock rebuilding. Even if the entire Reserve is allocated to TALFF during fishing year 1980-1981, the resultant foreign catch of 10,000 mt would equal less than 3% of the peak foreign mackerel catch from the northwest Atlantic, and less than 7% of the average annual foreign (not including Canada) catch prior to enactment of the FCMA. In other words, a TALFF far in excess of that established by Amendment #1 would be required before a "genuine" directed foreign fishery would be reestablished.

Conversely, the assessment indicates that an OY of less than the 30,000 mt established by Amendment #1 will not significantly further the objective of stock rebuilding, especially given the uncertainties as to the magnitude of the catch in Canadian waters in 1979 and 1980, over which the US will have no control. The data in the following table, which are derived from the NMFS assessment and which include several conservation and/or "worst possible" assumptions (i.e., those built into the assessment, and the assumption of comparatively high 1979 and 1980 catches in Canadian waters) support this conclusion.

1980 US OY*	1980 Canadian Catch*	1980 Total Catch*	Percent Change in Spawning Stock Size, 1981 vs. 1979
15.2	0	15.2	+ 66.04%
21.2	0	21.2	+ 64.18%
24.0	0	24.0	+ 63.32%
30.0	0	30.0	+ 61.46%
15.2	100	115.2	+ 35.13%
21.2	100	121.2	+ 33.27%
24.0	100	124.0	+ 32.41%
30.0	100	130.0	+ 30.55%

* in thousands of metric tons

These figures indicate that a decrease of 6,000 mt in the US Optimum Yield would result in less than a 2% increase increment in spawning stock size in 1981 relative to 1979. This table, Table 1 of Amendment #1, and other data in the assessment (Appendix I) indicate that any adjustments of the OY alone, of the magnitudes discussed in the draft of Amendment #1 (i.e., 15,200 to 30,000 mt) are likely to have a near-negligible impact on stock rebuilding, regardless of the magnitude of the catch in Canadian waters.

The suggestions of the US Coast Guard in their 15 October 1979 letter have been made in the Draft Proposed Regulations (Appendix V). However, the NMFS has the responsibility for adopting final regulations to implement FMPs

Most of the issues raised in the 25 September 1979 letter from the National Coalition for Marine Conservation, Inc. are addressed above. In addition, it should be noted that the ecreational capacity will depend not only on species abundance, but also on seasonal availability, the availability of other species sought after by sport fishermen, and many other factors. Data from the most recent and previous NMFS stock assessments and angler surveys support previous and current estimates of recreational capacity and catches. It should also be noted that the years of peak US sport catches appear to have coincided with the peak years of foreign catches in what are now US waters.

The Council received two letters from the National Coalition for Marine Conservation, Inc. dated 2 October 1979. The first dealt primarily with Amendment #1 to the Atlantic Squid FMP, but it did suggest that the Atlantic Mackerel FMP be merged with the Atlantic Squid FMP. The Council has considered this possibility, but, in light of the developmental nature of the US fisheries, changing stock abundance, and uncertainties as to bilateral management of mackerel with Canada, has decided to postpone consideration of this merger.

Most of the issues raised in the second 2 October 1979 letter from the National Coalition for Marine Conservation, Inc. have been addressed above. In addition, the DAH estimate in Amendment #1, in conjunction with the Reserve, will allow significant expansion of the US sport and commercial fisheries in fishing year 1980-1981. Based on a limited survey of US processors conducted by the Council, there is little evidence that a US fishery for export will develop significantly during fishing year 1980-1981.

The issues raised in the 29 October 1979 letter from the New Jersey Marine Advisory Service are responded to under "Reserve and TALFF Relative to Stock Rebuilding" and in the reponses to the 25 September 1979 and second 2 October 1979 letters from the National Coalition for Marine Conservation, Inc.

APPENDIX IV. DRAFT PROPOSED REGULATIONS

Sec.

Authority: 16 U.S.C. 1801 et seq.

Subpart A - General Provisions

§.1 Purpose and Scope.

(a) The regulations in this Part govern fishing for Atlantic mackerel by fishing vessels of the United States within that portion of the Atlantic Ocean over which the United States exercises exclusive fishery management authority.

(b) The regulations governing fishing for Atlantic mackerel by foreign vessels in the fishery conservation zone are contained in 50 CFR Part 611.

(c) These regulations implement the Fishery Management Plan for the Mackerel Fishery of the Northwest Atlantic Ocean, which was prepared and adopted by the Mid-Atlantic Fishery Management Council and approved by the Assistant Administrator.

§.2 Definitions.

In addition to the definitions in the Act, the terms used in this Part shall have the following meanings:

Act means the Fishery Conservation and Management Act of 1976, as amended, 16 U.S.C. 1801, et seq.

Assistant Administrator means the Assistant Administrator for Fisheries of the National Oceanic and Atmospheric Administration, Department of Commerce, or an individual to whom appropriate authority has been delegated.

Atlantic mackerel means the species Scomber scombrus.

Authorized Officer means:

(1) Any commissioned, warrant, or petty officer of the U.S. Coast Guard;

(2) Any certified enforcement officer or special agent of the National Marine Fisheries Service;

(3) Any officer designated by the head of any Federal or State agency which has entered into an agreement with the Secretary of Commerce and the Commandant of the Coast Guard to enforce the provisions of the Act; or

(4) Any Coast Guard personnel accompanying and acting under the direction of any person described in paragraph (1) of this definition.

Catch, take, or harvest includes, but is not limited to, any activity which results in mortality to any mackerel or bringing any mackerel on board a vessel.

Fishery Conservation Zone (FCZ) means that area adjacent to the United States which, except where modified to accommodate international boundaries, encompasses all waters from the seaward boundary of each of the coastal States to a line on which each point is 200 nautical miles from the baseline from which the territorial sea of the United States is measured.

Fishing includes any activity, other than scientific research vessel which involves:

(1) The catching, taking, or harvesting of mackerel;

(2) The attempted catching, taking, or harvesting of mackerel;

(3) Any other activity which can reasonably be expected to result in the catching, taking, or harvesting of mackerel; or

(4) Any operations at sea in support of, or in preparation for, any activity described in paragraphs (1), (2), or (3) of this definition.

Fishing trip means a period of time during which fishing is conducted, begining when the vessel leaves port and ending when the vesel returns to port.

Fishing vessel means any vessel, boat, ship or other craft which is used for, equipped to be used for, or of a type which is normally used for: (1) fishing; (2) aiding or assisting one or more vessels at sea in the performance of any activity relating to fishing, including, but not limited to, preparation, supply, storage, refrigeration, transportation, or processing.

Metric Ton (mt) means 1,000 kilograms, which is equal to 2,204.6 pounds.

Operator, with respect to any fishing vessel, means the master or other individual on board and in charge of that vessel.

Owner, with respect to any fishing vessel, means:

(1) Any person who owns that vessel in whole or in part;

(2) Any charterer of the vessel, whether bareboat, time, or voyage;

(3) Any person who acts in the capacity of a charterer, including but not limited to parties to a management agreement, operating agreement, or any similar agreement that bestows control over the destination, function, or operation of the vessel; or

(4) Any agent designated as such by a person described in paragraphs (1), (2), or (3) of this definition.

Person means any individual (whether or not a citizen or national of the United

States), corporation, partnership, association, or other entity (whether or not organized or existing under the laws of any State), and any Federal, State, local or foreign government or any entity of any such government.

Personal use (of mackerel) means use as bait, for human consumption, or for other purposes (not including sale or barter) in amounts not to exceed 100 pounds (45.4 kilograms) per person per trip.

Regional Director means the Regional Director, Northeast Region, National Marine Fisheries Service, Federal Building, 14 Elm Street, Gloucester, Massachusetts 01930, Telephone (617) 281-3600; or a designee.

Regulated species means any species for which fishing by a vessel of the United States is regulated pursuant to the Act.

United States harvested mackerel means mackerel caught, taken, or harvested by vessels of the United States under this Part, whether or not such mackerel is landed in the United States.

Vessel of the United States means:

(a) Any vessel documented under the laws of the United States;

(b) Any vessel numbered under a federal or state system under the Federal Boat Safety Act of 1971; and

(c) Any vessel not powered by machinery which is owned by a United States national and which operates out of a port within the United States.

§.3 Relation to other laws.

(a) Nothing in this Part 655 shall be construed as relieving any person from compliance with other requirments imposed by any regulation or statute of the United States or of any State.

(b) For Federal regulations governing the harvest of Atlantic mackerel by foreign fishing vessels, see 50 CFR Part 611.

(c) All fishing activity, regardless of species sought, is prohibited pursuant to 15 CFR Part 924, on the U.S.S. Monitor Marine Sanctuary, which is located off the coast of North Carolina (35°00'23"N.,75°24'32"W.)

§.4 Vessel Permits and fees.

(a) General. Every fishing vessel, including party and charter boats, fishing for Atlantic mackerel under this Part must have a permit issued under this section. Vessels taking mackerel for personal use are exempt from this section.

(b) Eligibility. (Reserved)

(c) Application.

(1) An application for a permit under this Part must be submitted and signed by the owner or operator of the vessel on an appropriate form obtained from the Regional Director at least 30 days prior to the date on which the applicant desires to have the permit made effective.

(2) Applicants shall provide all the following information:

(i) The name, mailing address including Zip code; and telephone number of the applicant;

(ii) The name of the vessel;
(iii) The vessel's United States Coast Guard documentation number or, if the vessel is under five net tons, the vessel's State registration number.
(iv) The home port, gross tonnage, radio call sign, and length of the vessel;
(v) The engine horsepower of the vessel;
(vi) The approximate fish hold capacity of the vessel;
(vii) The type and quantity of fishing gear used by the vessel;
(viii) The average size of the crew, which may be stated in terms of a normal range; and
(ix) Any other information concerning vessel characteristics requested by the Regional Director.

(3) Any change in the information specified in paragraph (c) (2) of this section shall be submitted by the applicant in writing to the Regional Director within 15 days of the change.

(d) Fees. No fee is required for any permit issued under this Part.

(e) Issuance. The Regional Director shall issue a permit to the applicant no later than 30 days from the receipt of a completed appliation.

(f) Expiration. A permit shall expire when ownership or name of the vessel changes.

(g) Duration. A permit shall continue in full force and effect until it expires or is revoked, suspended, or modified pursuant to 50 CFR Part 621.

(h) Alteration. No person shall alter, erase, or mutilate any permit. Any permit which has been intentionally altered, erased, or mutilated is invalid.

(i) Replacement. Replacement permits may be issued by the Regional Director. An application for a replacement permit shall not be considered a new application.

(j) Transfer. Permits issued under this Part are not transferable or assignable. A permit shall be valid only for the fishing vessel for which it is issued.

(k) Display. Any permit issued under this Part must be carried on board the fishing vessel at all times. The permit shall be presented for inspection upon the request of any Authorized Officer.

(l) Revocation. Subpart D of Part 621 of this chapter (Civil Procedures) governs the imposition of sanctions against a permit issued under this part. As specified in that Subpart D, a permit may be revoked, modified, or suspended if the permitted fishing vessel is used in the commission of an offense prohibited by the Act or these regulations, or if a civil penalty or criminal fine imposed under the Act is not paid.

§.5 Recordkeeping and reporting.

(a) Fishing vessel records.

(1) The operator of any fishing vessel issued a permit to fish for mackerel under this Part shall:
(i) Maintain on board the vessel an accurate and complete fishing logbook on forms supplied by the Regional Director, according to the requirements of §.5(a)(2);
(ii) Make the fishing logbook available for inspection by any Authorized Officer, or any employee of the National Marine Fisheries Service

designated by the Regional Director to make such inspections, at any time during or after a fishing trip;
(iii) Keep each fishing logbook for one year after the date of the last entry in the logbook; and
(iv) Submit fishing logbook reports, as specified in §.5(a)(2).

(2) The owner or operator of any fishing vessel conducting any fishing operation subject to this Part shall submit a complete fishing logbook report to the Regional Director within 48 hours after the end of any fishing week or trip, whichever is longer. Fishing logbooks shall contain information on a daily basis for the entirety of any trip during which mackerel or any other regulated species are caught, and shall contain information for all fish which are caught.

(3) The Assistant Administrator may revoke, modify, or suspend the permit of a fishing vessel whose owner or operator falsifies or fails to submit the records and reports prescribed by this section, in accordance with the provisions of 50 CFR Part 621.

(b) Fish dealer or processor reports. Any person who receives Atlantic mackerel for a commerical purpose from a fishing vessel subject to this Part shall:

(1) File a weekly report (Sunday through Saturday) with the Regional Director on forms supplied by him within 48 hours of the end of any week in which mackerel is received. This report shall include information on all transfers, purchases, or receipts of all mackerel and other fish made during that week; and

(2)Permit an Authorized Officer, or any employee of the National Marine Fisheries Service designated by the Regional Director to make inspections, to inspect at the principal place of business any records or books relating to any transfers, purchases, or receipts of mackerel.

§.6 Vessel identification.

(a) Official Number. Each fishing vessel subject to this Part and over 25 feet in length shall display its Official Number on the port and starboard sides of the deckhouse or hull and on an appropiirate weather deck so as to be clearly visible from enforcement vessels and aircraft. The Official Number is the documentation number issued by the Coast Guard for documented vessels or the registration number issued by a State or the Coast Guard for undocumented vessels.

(b) Numerals.

(1) The Official Number shall be at least 18 inches in height for fishing vessels over 65 feet in length and at least 10 inches in height for all other vessels over 25 feet in length.

(2) The Official Number must be in block Arabic numerals in contrasting color.

(3) The Official Number shall be permanently affixed to or painted on the vessel. However, vessels carrying fishing parties on a per capita basis or by charter may use non-permanent markings to display the Official Number whenever the vessel is fishing for mackerel.

(c) Vessel length. The length of a vessel, for purposes of this section, is that length set forth in Coast Guard or State records.

(d) Duties of operator. The operator of each fishing vessel shall:

(1) Keep the Official Number clearly legible and in good repair, and

(2) Ensure that no part of the fishing vessel, its rigging or its fishing gear obstructs the view of the Official Number from any enforcement vessel or aircraft.

§.7 Prohibitions.

It is unlawful for any person to:

(a) Use any vessel for the taking, catching, harvesting, or landing of any Atlantic mackerel (except for personal use), unless the vessel has a valid permit issued pursuant to this Part on board the vessel;

(b) Fail to report to the Regional Director within 15 days any change in the information contained in the permit application for a vessel;

(c) Falsify or fail to make, keep, maintain, or submit any logbook, or other record or report required by this Part;

(d) Make any false statement, oral or written, to an Authorized Officer, concerning the taking, catching, landing, purchase, sale, or transfer of any Atlantic mackerel;

(e) Fail to affix and maintain markings as required by §.6;

(f) Possess, have custody or control of, ship, transport, offer for sale, sell, purchase,import, export, or land any Atlantic mackerel taken in violation of the Act, this Part, or any other regulation promulgated under the Act;

(g) Fish for, take, catch, or harvest any Atlantic mackerel from the FCZ after the fishery has been closed pursuant to §.23;

(h) Transfer directly or indirectly, or attempt to so transfer, any United States harvested mackerel to any foreign fishing vessel, while such vessel is within the FCZ, unless the foreign fishing vessel has been issued a permit, under section 204 of the Act, which authorizes the receipt by such vessel of United States harvested mackerel;

(i) Refuse to permit an Authorized Officer, or any employee of the National Marine Fisheries Service designated by the Regional Director to make such inspections, to inspect any logbooks or records relating to the taking, catching, harvesting, landing, purchase, or sale of Atlantic mackerel;

(j) Refuse to permit an Authorized Officer to board a fishing vessel subject to such person's control for purposes of conducting any search or inspection in connection with the enforcement of this Act, this part, or any other regulation promulgated under the Act;

(k) Fail to comply immediately with enforcement and boarding procedures specified in §.8;

(l) Forcibly assault, resist, oppose, impede, intimidate, threaten, or interfere with any Authorized Officer in the conduct of any search or inspection under the Act;

(m) Resist a lawful arrest for any act prohibited by this Part;

(n) Interfere with, delay, or prevent by any means the apprehension or arrest of another person knowing that such other person has committed any act prohibited by this Part;

(o) Interfere with, obstruct, delay, or prevent by any mans the lawful investigation or search in the process of enforcing this Part;

(p) Violate any other provision of this Part, the Act, or any regulation promulgated pursuant thereto.

§.8 Enforcement.

(a) General. The operator of any fishing vessel subject to this Part shall immediately comply with instructions issued by an Authorized Officer to facilitate safe boarding and inspection of the vessel, its gear, equipment, logbook, and catch for the purposes of enforcing the Act and this Part.

(b) Signals. Upon being approached by a Coast Guard vessel or aircraft, or other vessel or aircraft authorized to enforce provisions of the Act, the operator of the fishing vessel shall be alert for communications conveying enforcement instructions. VHF-FM radiotelephone is the normal method of communicating between vessels. Should radiotelephone communication fail, however, other methods of communication including signals may be employed. The following signals extracted from the International Code of Signals are among those which may be used and are included here for the safety and information of fishing vessel operators:

(1) "L" meaning "You should stop your vessel instantly."

(2) "SQ3" meaning "You should stop or heave to; I am going to board you." and

(3) "AA AA AA etc.," which is the call to an unknown station, to which the signaled vessel must respond by illuminating the vessel's Official Numbers required by §.6.

(c) Boarding. A vessel signaled to stop or heave to for boarding shall:

(1) Stop immediately and lay to or maneuver in such a way as to permit the Authorized Officer and his/her party to come aboard;

(2) Provide a ladder for the Authorized Officer and his/her party;

(3) When necessary to facilitate the boarding, provide a man rope, safety line and illumination for the ladder; and

(4) Take such other actions as are necessary to ensure the safety of the Authorized Officer and his/her party to facilitate the boarding.

§.9 Penalties.

Any person or fishing vessel found to be in violation of this Part will be subject to the civil criminal penalty provisions and forfeiture provisions prescribed in the Act, and to Parts 620 (Citations) and 621 (Civil Procedures) of this chapter.

Subpart B - Management Measures

§.20 Fishing year.

The fishing year for Atlantic mackerel is the 12-month period beginning on April 1 and ending on March 31 of the following year.

§.21 Allowable levels of harvest.

(a) Catch Quotas. The allowed level of harvest on fishing year basis for Atlantic mackerel is 30,000 mt. This level of harvest is divided into annual catch quotas for

vessels of the United States and vessels of foreign nations as follows:

(1) The initial annual catch quota for vessels of the United States is 20,000 mt.

(2) The initial annual catch quota for vessels of foreign nations is 4,000 mt.

(3) A Reserve of 6,000 mt is established.

(b) Territorial waters. These regulations do not limit harvests of Atlantic mackerel in the territorial waters of any State. Harvests from State waters, however, shall be subtracted from the annual domestic quota set forth in paragraph (a)(1).

§.22 Allocation.

(a) General. This section establishes a procedure which will be followed to make timely allocations of the Reserve during the fishing year. Any allocation shall be consistent with the objectives of the Fishery Management Plan for the Mackerel Fishery of the Northwest Atlantic Ocean and in accordance with the criteria and procedures set forth in paragraphs (b) and (c) of this section.

(b) Criteria. The National Marine Fisheries Service (NMFS) shall review reported domestic harvest (including off-loadings at sea) for mackerel on a monthly basis. Domestic harvest shall be determined based upon vessel and processor reports required by these regulations, additional port sampling data collected by NMFS, and surveys of marine angler catches.

The Assistant Administrator shall project the total amount of Atlantic mackerel that will be harvested by US fishermen during the entire fishing year.

If the estimated amount of Atlantic mackerel to be harvested by US fishermen exceeds DAH, the Assistant Administrator shall allocate a sufficient quantity of Atlantic mackerel to DAH from Reserve. Such allocation shall ensure that the US fishery for Atlantic mackerel will not be subject to closure except in the event that domestic landings of that species threaten to exceed DAH plus the Reserve.

At the end of the first six months of the fishing year, if the estimated total amount of Atlantic mackerel to be harvested by US fishermen during the fishing year is less than 80 per cent of the total of DAH plus the Reserve (i.e., 20,800 mt), the Assistant Administrator shall consider an allocation of the remainder of the Reserve for Atlantic mackerel to TALFF.

Any allocations made under this provision shall be timely, and be implemented in a manner which facilitates the conduct of the fishery with a minimum of disruption.

(c) Procedure.

(1) Initial determination. If the Assistant Administrator determines that a allocation may be made of Atlantic mackerel, he shall publish in the Federal Register a notice of intent to allocate a specified amount of the Reserve quota to the annual quotas established for United States vessels or for foreign nations specified in §.21. Notice of an intent to allocate shall also be sent to holders of permits issued under this Part, and to agents of foreign fishing vessels permitted to fish for mackerel under 50 CFR Part 611, on or before the date of publication of the notice in the Federal Register.

(2) Public comment. The public shall be given no less than 15 days from the date of publication of the notice of intent to allocate to submit written comments concerning the amount of Atlantic mackerel to be allocated. Comments

shall be sent to the Regional Director.

(3) Consultation. During the 15-day public comment period, the Assistant Administrator or a designee shall consult with the appropriate committee of the Mid-Atlantic Fishery Management Council to determine whether the proposed allocation of Atlantic mackerel is consistent with the objectives contained in the Fishery Management Plan for the Mackerel Fishery of the Northwest Atlantic Ocean.

(4) Final determination. The Assistant Administrator shall make a final determination of the amount of Atlantic mackerel to be allocated after taking into account:

(i) The intent and capability of U.S. fishing vessels to harvest Atlantic mackerel during the remainder of the fishing year;

(ii) The consistency of any allocation with the objectives contained in the Fishery Management Plan for the Mackerel Fishery of the Northwest Atlantic Ocean;

(iii) The current harvest of Atlantic mackerel by foreign nations as allowed pursuant to 50 CFR Part 611;

(iv) The most current information available concerning the biological status of Atlantic mackerel; and

(v) Any other information determined by the Assistant Administrator to be relevant.

(5) Publication of allocations. The Assistant Administrator shall publish regulations in the Federal Register to accomplish any allocations of Atlantic mackerel pursuant to paragraph (c) (4) of this section approximately 15 days prior to the effective date of the allocation. Comments received during the comment period, all relevant information used by the Assistant Administrator in making a final determination on allocation. Comments received during the comment period, all relevant information used by the Assistant Administrator in making a final determination on allocation, and the most recent catch statistics for domestic and foreign harvest of Atlantic mackerel to be allocated shall be summarized in the Federal Register.

(6) Effective dates. Any allocation of mackerel from Reserve shall remain in effect to the end of the fishing year on March 31.

§.23 Closure of fishery.

(a) General. The Regional Director shall periodically monitor catches and landings of mackerel and shall project at least once every quarter the date when the annual quota will be harvested. The fishery for mackerel shall be closed when the annual quota, as increased by any allocations from Reserve, less the anticipated incidental catch during a closure under paragraph (d) of this section, for that species is reached.

(b) Recommendation of closure. When 90 percent of the annual domestic quota specified in §.21 and as increased by any allocations from Reserve as provided for in §.22 has been harvested, the Regional Director may make a recommendation to the Assistant Administrator that the fishery for that species be closed, if projections based on vessel and dealer/processor logbook data indicate that the annual quota will be reached or exceeded before March 31.

(c) Notice of closure. If the Assistant Administrator determines that a closure of the mackerel fishery for the relevant species is necessary to prevent the annual species quota from being exceeded the Assistant Administrator shall:

(1) Notify in advance the Executive Directors of the Mid-Atlantic, New England and South Atlantic Fishery Management Councils of the closure;

(2) Mail notifications to all persons holding permits issued under §.4 of the closure at least 72 hours prior to the effective date of the closure; and

(3) Publish a notice of closure in the Federal Register.

(d) Incidental catch. During a period of closure, fishing vessels may catch, take, or harvest mackerel incidental to fishing for other species of fish, provided that mackerel constitutes no more than 10 percent by weight of the total catch of all other fish on board the vessel at the end of any fishing trip.

§.24 Size restrictions. (Reserved)

§.25 Gear restrictions (Reserved)