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# **BLUEFISH FISHERY MANAGEMENT PLAN**

**November 1982**

**Mid-Atlantic Fishery Management Council**

**in cooperation with the**

**National Marine Fisheries Service**

**New England Fishery Management Council**

**South Atlantic Fishery Management Council**

**Draft adopted by MAFMC: 11 November 1982**

**Final adopted by MAFMC:**



UNITED STATES DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
Washington, D.C. 20230

OFFICE OF THE ADMINISTRATOR

February 18, 1983

Dear Reviewer:

In accordance with provisions of the National Environmental Policy Act of 1969, we enclose for your review our draft environmental impact statement/fishery management plan for the bluefish fishery.

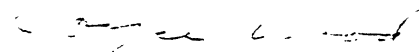
Any written comments or questions you may have should be submitted to the responsible official identified below by April 11, 1983. Also, one copy of your comments should be sent to me in Room 6800, U.S. Department of Commerce, Washington, D.C. 20230.

RESPONSIBLE PERSON

Mr. John C. Bryson, Executive Director  
Mid-Atlantic Fishery Management Council  
300 South New Street  
Dover, Delaware 19901  
Phone: 302/674-2331

Thank you.

Sincerely,

  
Joyce M. T. Wood  
Chief, Ecology and  
Conservation Division

Enclosure



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## Abbreviations and Definitions Of Terms Used in This Document

**Act or MFCMA** - the Magnuson Fishery Conservation and Management Act of 1976, as amended, 16 U.S.C. 1801 et seq.

**CFR** - Code of Federal Regulations.

**Commercial Fisherman** - one who sells his catch.

**Council** - the Mid-Atlantic Fishery Management Council.

**Domestic Annual Harvest (DAH)** - the capacity of US fishermen to harvest and their intent to use that capacity.

**Domestic Annual Processing (DAP)** - the capacity of US processors to process, including freezing, and their intent to use that capacity.

**EPA** - the Environmental Protection Agency.

**Fishery Conservation Zone (FCZ)** - the zone contiguous to the territorial sea of the US, the inner boundary of which is a line coterminous with the seaward boundary of each of the coastal States and the outer boundary of which is a line drawn in such a manner that each point on it is 200 nautical miles from the baseline from which the territorial sea is measured.

**fishing year** - the 12 month period beginning 1 January.

**conventional gill net** - a gill net fished generally in a straight line, for example, stake, anchored, and drift gill nets. Gill nets that are fished in a manner to encircle a school of fish are excluded.

**GIFA** - Governing International Fishery Agreement.

**haul seine** - strip of strong netting hung to a cork line at the top and a heavily weighted lead line on the bottom. The method of fishing is to leave one end on shore, pay out the line with a boat until the other end is reached, lay out the net parallel to the beach, and then bring the end of the second hauling line ashore.

**ICNAF** - International Commission for the Northwest Atlantic Fisheries.

**internal waters** - marine waters landward of the territorial sea.

**MSY** - maximum sustainable yield.

**NEFC** - the Northeast Fisheries Center.

**NMFS** - the National Marine Fisheries Service of the National Oceanic and Atmospheric Administration (NOAA).

**OY** - Optimum Yield.

**Recreational Fisherman** - one who fishes in marine waters primarily for recreational purposes; whose catch is primarily for home consumption, and whose catch is not sold.

**Secretary** - the Secretary of Commerce.

**TALFF** - Total Allowable Level of Foreign Fishing.

**Territorial Sea** - marine waters from the shoreline to 3 miles seaward.

**Western Atlantic Ocean** - waters off the east coast of the United States.

### NOTES:

1. Unless indicated otherwise, all data in this document are from NMFS sources.
2. Notwithstanding the definitions of commercial and recreational fishermen set forth above, all data relative to the recreational fishery in this Plan are from NMFS and are based on a definition that a recreational fisherman is one who fishes in marine waters primarily for recreational purposes; whose catch is primarily for home consumption, although occasionally a part or all of the catch may be sold or enter commercial channels.



## II. SUMMARY

The purpose of this Fishery Management Plan (Plan) is to manage the bluefish fishery in the FCZ in the western Atlantic Ocean, excluding the Gulf of Mexico.

In addition to endorsing the purposes of the MFCMA as set forth in Section 2(b) of that Act and the national standards set forth in Section 301 of that Act, the Council has adopted two specific objectives for this Plan:

1. Increase understanding of the condition of the stock and fishery.
2. Provide the highest availability of bluefish to US recreational fishermen while maintaining, within limits, traditional uses of bluefish, recognizing some natural stock fluctuations are inevitable.

**The preferred alternative is identified as alternative 7.** It would restrict the use of all gear except hook and line, conventional gill nets, traps, haul seines, and pound nets to conduct a directed fishery for bluefish in the FCZ. Optimum Yield (OY) is all bluefish caught by US fishermen in the Atlantic FCZ, excluding the Gulf of Mexico, pursuant to this Plan.

US fishermen using hook and line, conventional gill nets, traps, haul seines, and pound nets to conduct a directed fishery for bluefish in the FCZ would be allowed to harvest bluefish without limit. The use of all other gear to conduct a directed fishery for bluefish in the FCZ would be prohibited unless a waiver of the prohibition were granted by NMFS.

NMFS could grant waivers to the gear prohibition if it was consistent with the objectives of the Plan, that is, that it provided the highest availability of bluefish to US recreational fishermen while maintaining, within limits, traditional uses of bluefish. Specifically, NMFS would be required to attempt to maintain the historical catch distribution in granting such waivers, both between sectors (8% of the total catch for the FCZ commercial fishery) and geographically (11% of the FCZ commercial catch landed in New England, 37% of the FCZ commercial catch landed in the Mid-Atlantic, and 52% of the FCZ commercial catch landed in the South Atlantic). It is recognized that these relationships cannot be maintained absolutely, but it is the Council's intent that NMFS grant waivers for the use of the restricted gear types so as to minimize the chances of major changes in these relationships. NMFS would be allowed to specify the amount of bluefish that could be caught with permits granted through waivers.

The catch distribution was arrived at by examining historical data. The distribution between the recreational and commercial fisheries has been about 88% and 12%, respectively (Table 6). In order to provide some growth for the commercial fishery while still protecting the recreational fishery, it was determined to use a distribution of 80% recreational and 20% commercial. In 1981, the FCZ commercial fishery accounted for 37% of the total commercial catch. This was adjusted to 40%. If that 40% is applied to the overall 20% commercial share, the result is that the FCZ commercial fishery share is 8% of the total catch. The geographical distribution of the FCZ commercial catch (11% New England, 37% Mid-Atlantic, and 52% South Atlantic) is the average distribution for 1976-1981 (Table 4).

In order to provide a basis for granting any waivers to the gear prohibition, it would be necessary to annually estimate landings. NMFS, in consultation with the Council, prior to the beginning of each year, would be required to project the total bluefish catch, recreational catch, catch by the permitted gear types (hook and line, conventional gill nets, traps, haul seines, and pound nets) and bluefish bycatch in fisheries using the prohibited gear types. From these projections, the amount of bluefish available for catch by the prohibited gear types could be estimated, thus providing a basis for granting waivers from the gear prohibition.

NMFS would be required to establish the procedures for the waiver system. As guidance in that regard, it is suggested that persons desiring to obtain waivers from the gear prohibition file their applications by a particular date prior to the beginning of the fishing year. All of those applications could be evaluated together relative to the specified criteria with appropriate decisions made prior to the beginning of the fishing year on 1 January. Fishermen could be required to specify the amount of bluefish they caught in the most recent year using the gear for which a waiver is being sought and the amount of bluefish requested to be harvested with the waiver. NMFS could evaluate these applications against the amount of bluefish available for harvest by the prohibited gear types. This would be done through a series of iterations, initially giving all fishermen what they caught in the most recent year. If there is not enough

bluefish available, all fishermen would be reduced a proportional amount. If there is any left, it could be granted to those fishermen who want an increase. If there is any left after that, it would be saved for applications submitted later in the year. Applications could be considered after that date, i.e., any time during the year, but such applications would necessarily be evaluated in light of waivers previously granted.

Bluefish can be a bycatch in other fisheries. Therefore, this alternative provides that incidental catches of bluefish in directed fisheries for other species by fishermen without waivers using gear other than hook and line, conventional gill nets, traps, haul seines, and pound nets would be limited to 10% of the total catch on board a vessel at the end of a fishing trip.

Foreign fishermen would not be permitted to retain bluefish since US fishermen would use the entire OY.

Operators of party and charter boats and persons selling bluefish would be required to have permits and submit reports as set forth in Sections XIII-1 and XIV. However, NMFS could eliminate the reporting requirement as soon as an alternative method of obtaining the required data has been implemented. Vessels are exempt from this requirement if they catch no more than 100 pounds of bluefish per trip.

Other alternatives considered by the Council are:

**1. Take no action at this time.**

This would mean that the Preliminary Fishery Management Plan (PMP) would remain in effect. The PMP regulates only foreign fishing and prohibits foreign fishermen from retaining bluefish.

**2. Allow US fishermen unrestricted catches of bluefish.**

This alternative is intended to recognize that totally effective bluefish management requires regulation in the FCZ, Territorial Sea, and internal waters and to postpone management until such time as the States develop a management system for the Territorial Sea and internal waters. Following development of such a system, this Plan would be amended to incorporate compatible management measures.

Operators of party and charter boats and persons selling bluefish would be required to have permits and submit reports. Vessels are exempt from this requirement if they catch no more than 100 pounds of bluefish per trip.

OY would be all bluefish caught in the FCZ by US fishermen, so retention of bluefish by foreign fishermen would be prohibited.

**3. Allow US fishermen unrestricted catches of bluefish, but impose a 14 inch (fork length) size limit.**

OY would equal all bluefish 14" in length or larger caught in the FCZ by US fishermen. Therefore, foreign fishermen would not be permitted to retain bluefish.

Operators of party and charter boats and persons selling bluefish would be required to have permits and submit reports. Vessels are exempt from this requirement if they catch no more than 100 pounds of bluefish per trip.

**4. Restrict bluefish catches by commercial and recreational fishermen.**

Bluefish range throughout the FCZ, Territorial Sea, and internal waters and the fishery for the species takes place in all of these areas. Federal management jurisdiction is limited to the FCZ, which is the management unit of this Plan. However, management in the FCZ cannot proceed without regard for the portion of the stock and fishery outside the FCZ. For that reason, the concept of "total desirable catch" is introduced and defined as the total catch of bluefish from all areas (FCZ, Territorial Sea, and internal waters) that would be consistent with the objectives of the Plan. In other words, the total desirable catch would be the OY if the management unit were bluefish throughout the range of the stock. Use of the concept of total desirable catch permits the calculation of an OY for the FCZ, the management unit of the Plan, that accounts for the condition of the stock and level of the fishery throughout the range of the stock. It must be remembered that values calculated for the entire area are advisory to the States and have no Federal regulatory significance. Only the OY and allocations for the FCZ would have regulatory significance for purposes of this Plan.

With this alternative the total desirable catch (FCZ, Territorial Sea, and internal waters) would equal the average MSY (104 million pounds). Total desirable catch would be allocated between the commercial and recreational fisheries based on the distribution shown in the latest available recreational fisheries survey and commercial catch statistics (based on 1979 data, the distribution would be 88% recreational and 12% commercial). The overall catch allocations would be further divided based on 1979 data into FCZ recreational and commercial allocations (quotas), the sum of which would equal OY. Because data on the weight of recreationally caught bluefish are not currently available, it is impossible to estimate the actual quotas and OY. It is anticipated that the necessary data will be available in the near future.

Under certain conditions, such as natural population fluctuations, it might be necessary to either relax or further limit the catch of bluefish. Therefore, this alternative requires that NMFS, in consultation with the Council, examine annually the NEFC assessment of the fishery and, if appropriate, raise or lower the OY. In considering such action, information gathered from catch reports, marine recreational fishery statistics surveys, and any effort data available must be used in conjunction with the assessment. Under any circumstances, OY cannot be such that the OY, when averaged with the total catch values for the preceeding 9 years will exceed maximum MSY (119 million pounds).

Operators of party and charter boats and persons selling bluefish would be required to have permits and submit reports. Vessels are exempt from this requirement if they catch no more than 100 pounds of bluefish per trip.

#### **5. Allow US recreational fishermen unrestricted catches of bluefish and restrict commercial landings.**

While this Plan is intended to manage bluefish only in the FCZ, this alternative is based on a recognition that such management cannot ignore the fishery shoreward of the FCZ. Therefore, it provides that NMFS, based on recommendations of the Council, will annually estimate the total desirable bluefish catch along the Atlantic Coast (FCZ, Territorial Sea, and internal waters). From that estimate, an FCZ allocation will be made. This FCZ allocation will be the annual OY. The difference between the total desirable catch and the OY should provide guidance to the States so that their management in the Territorial Sea and internal waters can be compatible with Federal management in the FCZ.

The overall desirable catch would be whatever US recreational fishermen catch plus up to 15% of recreational landings of the previous fishing year or up to 18 million pounds, whichever is greater, for commercial fishermen. In order to assure that the commercial catch allocation is based on the best available data, recreational catch data for year 1 would be used in year 2 to develop the allocation for year 3.

The overall commercial allocation would then be divided into allocations for the FCZ and for the Territorial Sea and internal waters. The FCZ allocation would be up to 40% of the overall commercial allocation or up to 7,200,000 pounds, whichever is greater. Therefore, OY in the FCZ would equal whatever bluefish recreational fishermen catch in the FCZ plus whatever US commercial fishermen catch in the FCZ up to 6% of the overall recreational bluefish catch (of two years previous) or up to 7,200,000 pounds.

NMFS would be required to monitor the commercial bluefish catch in the FCZ and close the directed fishery for bluefish in the FCZ if it appeared that the commercial allocation would be exceeded. During a period of closure, commercial vessels would be permitted a bycatch of bluefish not to exceed 10% of the weight of all fish on board at the end of a trip.

Foreign fishermen would not be permitted to retain bluefish since US fishermen would use the entire OY.

Operators of party and charter boats and persons selling bluefish would be required to have permits and submit reports. Vessels are exempt from this requirement if they catch no more than 100 pounds of bluefish per trip.

#### **6. Prohibit the use of purse seines and pair trawls in the directed commercial fishery for bluefish.**

This alternative modifies alternative 5 in that it would add to alternative 5 a prohibition on the use of purse seines and pair trawls in conducting a directed fishery for bluefish in the FCZ.

All of the alternatives are discussed in Section XII.

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## IV. INTRODUCTION

### IV-1. Development of the Plan

The purpose of this Plan is to establish management of the bluefish (Pomatomus saltatrix) fisheries in the FCZ of the western Atlantic Ocean, excluding the Gulf of Mexico.

Seven fact finding meetings were held by the Council in early 1979 to give fishermen from Virginia through New England an opportunity to present information on the bluefish fishery. Public attendance at most of these meetings was exceptional. At every meeting the desire for the development of a Plan was strongly expressed by the recreational community. As a result, in May of 1979 the Council held a scoping meeting to develop a work plan for the Plan. The work plan was adopted by the Council in July of 1979 and approved by NMFS in March of 1980.

A number of drafts of the Plan were prepared with a preliminary public hearing draft adopted by the Council in November of 1981. That draft was submitted to NMFS for review. It was revised based on NMFS comments, and adopted by the Council in May, 1982, for submission to the New England and South Atlantic Councils for review. That review led to a meeting on 14 October 1982 of representatives of the three Councils and NMFS. The Plan was revised as a result of that meeting, resubmitted to the three Councils for review, further revised, and adopted by the Mid-Atlantic Council for public hearings.

### IV-2. Problems Addressed by the Plan

The primary purpose of the Plan is to address the problems that could occur if the commercial fishery in the FCZ were to expand significantly. Such expansion could negatively impact the recreational fishery, as well as the traditional commercial fishery.

The bluefish population appears to be in a relatively healthy condition under present fishing pressures. Current trends indicate that there is a possibility of future expansion of both the recreational and commercial fisheries. This would be especially true if a foreign market were to develop for this species.

Bluefish is one of the most important recreationally caught species along the Atlantic coast of the United States. Its importance has increased in recent years as a result of an increase in the number of anglers, an apparent increase in abundance, and decreased abundance of other desired species such as striped bass (Morone saxatilis). The value of the 1979 recreational fishery was estimated to be at least \$41 million, whereas commercial landings in 1979 totalled about \$2 million (see Section IX-1).

The NEFC autumn trawl survey relative abundance index over the past 15 years indicates an order of magnitude difference for bluefish along the Atlantic coast (Anderson, 1980). Any population change may have wide ranging consequences. Therefore, a system to provide improved data is necessary in order to monitor the condition of and trends in the fishery.

Bluefish management is complicated by the fact that a substantial portion of landings come from the territorial sea and internal waters (Section VIII-2). Therefore, effective management of the resource requires compatible management by the Federal government in the FCZ and by the States in the Territorial Sea and internal waters. In recognition of this problem, the Mid-Atlantic Council requested the Atlantic States Marine Fisheries Commission (ASMFC) to prepare a plan for bluefish for the territorial sea and internal waters. The ASMFC adopted the following resolution on 14 October 1982:

that the ASMFC take the draft Bluefish Plan approved by the Mid-Atlantic Fishery Management Council following public hearing. The Plan will be given to a Bluefish Board to develop recommendations for State action, recognizing it may be necessary to obtain programmatic funds from the Mid-Atlantic Fishery Management Council to assist ASMFC in completing this effort.

While this Plan addresses management of bluefish in the FCZ, the discussions in the Plan deal with bluefish throughout the range of the species in the Atlantic Ocean in order to present a complete picture of the resource and fishery.

### IV-3. Management Objectives

The Council has adopted two specific objectives for this Plan:

1. Increase understanding of the condition of the stock and fishery.
2. Provide the highest availability of bluefish to US recreational fishermen while maintaining, within limits, traditional uses of bluefish, recognizing some natural stock fluctuations are inevitable.

Objective 1 is a recognition that there is a lack of data necessary for bluefish management and a need to improve the data base for use in future refinements to the Plan.

Objective 2 is a recognition of the importance of the recreational fishery as well as an expression of the desire of the Council that, to the extent possible, the historical pattern of the fishery be maintained. This historical pattern relates to the relative catch of the recreational and commercial sectors, the geographical distribution of the fishery, and the relative importance of the various gear types in the commercial fishery. It is recognized that these distributions may vary slightly from year to year. It is also recognized that changes in stock abundance may alter the relationships. However, the basic intent is that the general relationships between user groups and between regions not change dramatically.

## V. DESCRIPTION OF THE STOCKS

### V-1. Species Or Groups Of Species And Their Distribution

Bluefish occurs widely in the world's oceans (Figure 1). It is common in the northwestern Atlantic Ocean and Gulf of Mexico from Nova Scotia to Texas; in the Caribbean; in the southwestern Atlantic to Uruguay; in the northeastern Atlantic off the Azores and from Portugal to Senegal; in the Mediterranean and Black Seas; off the east and west coasts of southern Africa and Madagascar; in the eastern Indian Ocean; and off Australia (Wilk, 1977).

Several distinct populations of bluefish are found in the Atlantic Ocean as suggested by the significant breaks in the species distribution (Figure 1). The bluefish population addressed by this Plan occurs in continental shelf waters along the eastern coast of North America from Nova Scotia through the east coast of Florida. This population appears to be distinct from that occurring in the Gulf of Mexico. Bluefish in the Gulf of Mexico are much less abundant than on the Atlantic seaboard and are less common in the western half of the Gulf than in the eastern half. All available tagging and other information indicates a significant degree of separation between Gulf of Mexico and northwestern Atlantic bluefish (Lyman, 1974; Wilk, 1977). Seasonal and areal distributions of the fish and fisheries support the theory of separate populations, as does the recent discovery of a separate bluefish spawning area in the Gulf (Barger et al., 1978).

As noted by Wilk (1977) and Anderson (1980), investigators have hypothesized that several distinct bluefish populations occur along the US Atlantic seaboard. However, stock assessments and catch data are not available for these separate populations. This Plan is based on an Atlantic seaboard unit population concept.

Wilk (1977) reports, "the bluefish is a migratory pelagic species, generally traveling in groups of like-sized fish, the groups being loosely associated in much larger aggregations which may extend over tens of square miles along the coast. Aggregations travel seasonally, generally northward in spring and summer, southward in fall and winter. Their movements are directed by several features of environment, of which temperature and photoperiod are probably the most important...On the Atlantic coast, bluefish visit some sections of the coast for brief periods, a few weeks at most, enroute to their summer or winter 'destinations'. These 'destinations', i.e., sections of coast where they gather and sojourn for several months and where the greatest numbers are caught, center, during summer, in that part of the Atlantic between Cape Cod and Chesapeake Bay, and in the northern part of North Carolina and in its adjoining sounds; and during winter, in the southeastern part of Florida. It is probable, as indicated by Lund and Maltezos (1970), that in winter much of the bluefish population remains offshore and has yet to be discovered. The groups composed of the largest fish move fastest and travel farthest. They tend to congregate in the northern part of their range."

As reported in Wilk (1977), available information indicates two general spawning areas and seasons off the east coast: offshore near the inner edge of the Gulf Stream from southern Florida to North Carolina in the spring, usually in April/May; the other in the Middle Atlantic Bight over the continental shelf in summer, usually in June through August (Figure 2). Summer-spawned bluefish seem to remain at sea, migrate south of Cape Hatteras in early fall, and over-winter offshore. These bluefish appear inshore in

the spring mainly in the North Carolina area (Wilk, 1977).

## **V-2. Abundance And Present Condition**

Based on evidence presented in Wilk (1977) and Anderson (1980), east coast bluefish abundance appears to be at or a little above the relatively high levels of the 1970s. This conclusion is based primarily on NMFS trawl survey data and recreational catch estimates since the 1960s. Because these data are incomplete and imprecise, it is difficult to make more than qualitative assessments of abundance trends.

There are no data suggesting that east coast bluefish abundance is declining, at least north of Cape Hatteras. It is possible, however, that the increase in bluefish availability in the Mid-Atlantic and New England areas may be more a result of recent high temperatures in these areas, causing a northward shift in species distribution, than a real increase in abundance (Anderson, 1980). The information on relative abundance presented by Anderson (1980) will be updated by data from the 1980 National Marine Angler Survey and the 1980 and 1981 NMFS trawl surveys when they become available.

## **V-3. Ecological Relationships**

Although some research has been directed at the ecological relationships of bluefish, little conclusive evidence on this subject of relevance to this Plan is available. The information given here deals with some of what is known on this subject, as presented in Wilk (1977).

Spawning, hatching, and early larval development take place in the ocean. Young, fully developed bluefish ( $1\frac{1}{2}$ -2"), the product of spring spawning, move into northern bays in early June where they spend the summer. Growth is rapid, with the fish reaching 7-8" by late September. Their food includes small shrimp, silversides, killifish, and anchovy and they are prey for larger bluefish, striped bass, and weakfish.

**Food and Feeding** - Bluefish feed throughout the water column on a large variety of fishes and invertebrates. Among the fishes most frequently observed in stomach contents are butterfish, menhaden, round herring, sand lance, silverside, Atlantic mackerel, anchovy, Spanish sardine, young weakfish, spotted seatrout, Atlantic croaker, and spot. Among the invertebrates are shrimp, lobsters, squid, crabs, mysids, and annelids (sand worms, bloodworms, etc.).

Feeding studies show that while bluefish are responsive to various odors in the water, such as those produced by chum, they rely primarily on vision to locate and capture their prey (Olla *et al.*, 1970). The size of the prey seems important in motivating fish to feed, as evidenced by the fact that bluefish which seem to be satiated on small baitfish can be stimulated to resume feeding when they are offered larger ones of the same species (Olla *et al.*, 1970).

**Competitors** - Bluefish, owing to their predacious nature, are in competition for food with other large predators such as striped bass, Spanish mackerel, king mackerel, and large weakfish.

**Predators** - Only the very large predators, such as sharks, tunas, swordfish, and wahoo would pose a threat to the fast swimming bluefish.

**Seasonal Activity** - The length of the day was found to be an important factor influencing activity levels. During day length which correspond to those occurring from spring to fall, captive bluefish swam at significantly higher speeds than during the shorter winter days, indicating that photoperiod changes may act to trigger the northern spring migration and southern fall migration.

**Parasites, Diseases, Injuries, and Abnormalities** - Anderson (1970) prepared an annotated list of parasites of bluefish including several newly reported species and an extensive review of the past literature. Mahoney *et al.* (1973) report bluefish to be susceptible to the "fin rot" disease of marine and estuarine fishes in the New York Bight. The most consistent and striking feature of this disease is the rotting of one or more of the fins. It is likely that this disease is limited to the heavily polluted waters of the New York Bight.

## **V-4. Estimate Of Maximum Sustainable Yield**

Anderson (1980), using a surplus production model, estimated MSY at between about 90 million and 119 million pounds (104 million pounds average), but cautioned that this estimate is very preliminary and is



based on incomplete and unreliable survey, catch, and fishing effort data. Anderson (1980) concluded that current fishing effort, as well as catch, may be near the MSY level. These estimates will be refined using information from the 1980 National Marine Angler Survey when it becomes available.

It must be noted that this MSY relates to the entire stock in the Atlantic, not just to the FCZ. It is impossible to divide the MSY to develop a meaningful MSY estimate for only the FCZ.

#### **V-5. Probable Future Condition**

As discussed in Anderson (1980) and Section V-2, there is currently no reason to anticipate a decline in bluefish abundance in the near future. Recent bluefish catch appears to be at all-time high levels. Fishing effort may be near the MSY-producing level, so greatly increased abundance is improbable. Information from the 1980 National Marine Angler Survey and the 1980 and 1981 NMFS trawl surveys will be incorporated into this section as it becomes available.

### **VI. DESCRIPTION OF HABITAT**

#### **VI-1. Condition Of The Habitat**

Climatic, physiographic, and hydrographic differences separate the ocean region from the Gulf of Maine to Florida into two distinct areas: the New England - Middle Atlantic Area and the South Atlantic Area, with the natural division occurring at Cape Hatteras.

The New England - Middle Atlantic Area is fairly uniform physically and is influenced by many large coastal rivers and the Chesapeake Bay, the largest estuary in the United States. Additional significant estuarine influences are Narragansett Bay, Long Island Sound, the Hudson River, Delaware Bay, and the nearly continuous band of estuaries behind the barrier beaches along southern Long Island, New Jersey, Delaware, Maryland, and Virginia. The southern edge of the region includes the estuarine complex of Currituck, Albemarle, and Pamlico Sounds behind the outer banks of Cape Hatteras.

At Cape Hatteras, the continental shelf extends seaward approximately 20 miles, widens gradually to 70 miles off New Jersey and Rhode Island and then broadens to 120 miles off Cape Cod forming Georges Bank. The substrate of the shelf in this region is predominantly sand interspersed with large pockets of sand-gravel and sand-shell. Beyond 100 fathoms, the substrate becomes a mixture of silt, silt-sand, and clay. As the continental slope turns into the Abyssal Plain (at depths greater than 1,000 fathoms), clay predominates over silt and becomes the major substrate.

South of Cape Hatteras, the shelf widens to a breadth of approximately 70 miles near the Georgia-Florida border (31° N latitude), narrows to 30 miles off Cape Canaveral, Florida, and further narrows to 10 miles or less off the southeast coast of Florida and the Florida Keys. Off West Palm Beach, Florida, the Atlantic coast shelf is at its narrowest, reaching seaward only about 1.5 miles. The edge of the shelf occurs at depths of less than 30 feet at this point.

Mineral resources of the area include large sand and gravel deposits, now being mined in some localities near shore. There are potentially recoverable offshore deposits of phosphate rock, placer deposits of titanium, monazite, zircon, and oil. Locally important concentrations of sulfur, salt, anhydrite, potash, and magnesium are known. It is also probable that manganese oxide nodules occur offshore. However, current technology is inadequate for economic recovery of most placer and hard rock deposits.

Water temperatures range from less than 35° F in the New York Bight in February to approximately 80° F off Cape Hatteras in August. The annual range of surface temperature at any location may be 25° F in slope waters to greater than 35° F near shore. During winter the vertical thermal gradient is minimized. In late April - early May, a thermocline develops although storm surges over Nantucket Shoals retard thermocline development there. The thermocline persists through the summer. Surface waters begin to cool in early autumn, weakening the thermocline so that by mid-November surface to bottom water temperature is nearly homogeneous.

The salinity cycle results from stream flow and the intrusion of slope water from offshore. The winter salinity maximum is reduced to a minimum in early summer by large volumes of runoff. Inward drifts of offshore saline water in autumn eventually counterbalance fresh water outflow and return the region's salinity distribution to the winter maximum. Water salinities near shore average 32‰, increase to 34-



350/00 along the shelf edge, and exceed 36.50/00 along the main lines of the Gulf Stream.

On the continental shelf, surface circulation is generally southwesterly during all seasons, although this may be interrupted by coastal indrafting and some reversal of flow at the northern and southern extremities of the area. Speeds of the drift are on the order of 5 knots per day. There may be a shoreward component to this drift during the warm half of the year and an offshore component during the cold half. This drift, fundamentally the result of temperature-salinity distribution, may be made final by the wind. A persistent bottom drift at speeds of tenths of knots per day extends from beyond mid-shelf toward the coast and eventually into the estuaries. Offshore, the Gulf stream flows northeasterly.

The New England region from Nantucket Shoals to the Gulf of Maine includes two of the worlds most productive fishing grounds: Georges Bank and Browns Bank. The Gulf of Maine, which is a deep cold water basin, is nearly sealed off from the open Atlantic by these two Banks. The outer edges of Georges and Browns Banks fall off sharply into the continental shelf. Other major features include Vineyard and Nantucket Sounds, Cape Cod Bay, and Cashes Ledge and Stellwagen Basin within the Gulf of Maine.

Water temperatures range from 35-65° F at the surface and over the banks, and 40-50° F at 100 fathoms in the inner Gulf of Maine. Mean salinity values vary from about 32 to 340/00 depending on depth and location. However, lower salinity values generally occur close to shore. In addition, both water temperatures and salinities within the region, but especially along the southern boundary of Georges Bank and the deep basins of the inner Gulf of Maine, are influenced by intrusions of slope water.

Surface circulation within the Gulf of Maine is usually counterclockwise. Cold Nova Scotian waters enter through the Eastern Channel and move across Browns Bank while slope waters enter through the Northeast (Fundian) Channel. Gulf of Maine waters spill out over Georges Bank and through Great South Channel onto Nantucket Shoals. The anticyclonic eddy over Georges Bank that develops in spring breaks down into a westerly and southerly drift by autumn.

Gulf Stream meanders and warm core eddies, two oceanographic phenomena which normally remain in deep offshore water, can profoundly affect environmental conditions on the fishing grounds off the northeast United States when either one moves close along the continental slope. The warm core eddies seen off the New England coast mostly form in the slope water region southeast of Georges Bank by detaching from meanders of the Gulf Stream. Rotation is in a clockwise direction at speeds varying from 0.6 to 1.8 knots.

Environmental effects and their possible influence on fishery resources resulting from meanders and eddies identified by Chamberlin (1977) are:

1. Warming of the upper continental slope and outer shelf by direct contact of a meander or eddy. This may influence the timing of seasonal migrations of fish as well as the timing and location of spawning.
2. Injection of warm saline water into the colder less saline waters of the shelf by turbulent mixing at the inshore boundary of a meander or eddy. This may have influences on the fishery resource similar to that of direct warming, and also cause mortality of fish eggs and larvae on the shelf when the colder water in which they live is warmed beyond their tolerance by the mixing-in of warm slope water.
3. Entrainment of shelf water off the shelf, an effect frequently seen in satellite imagery. Mortality of Georges Bank fish larvae is known to occur, presumably because of temperature elevation when shelf water in which they occur is carried into the slope water. The most profound effects of entrainment on the fishing grounds may be changes in circulation and in water mass properties resulting from the replacement of the waters lost from the shelf.
4. Upwelling along the continental slope, which may result in nutrient enrichment near the surface and increased primary biological productivity.

The annual cycle of the plankton community of the region is typical of the temperate zone. During the winter, phytoplankton (plant plankton) and zooplankton (animal plankton) populations are low. Nutrients are available, but production is suppressed by low levels of solar radiation and low temperature. As spring approaches and the level of solar radiation increases, an enormous diatom bloom occurs. As the bloom progresses, concentrations of inorganic nutrients decrease.

As water temperatures increase during late spring and summer, phytoplankton and zooplankton become increasingly abundant because of the more rapid development of early life stages, the spawning of fish and benthos, and the abundant food supply.

During summer, zooplankton reaches maximum abundance while phytoplankton declines to a level near the winter minimum. Dinoflagellates and other forms apparently better suited than diatoms to warm nutrient-poor waters become more abundant during summer. Bacteria in the sediment actively regenerate nutrients, but because of vertical temperature and salinity gradients, the water column is stable and nutrients are not returned to the euphotic zone (where solar radiation and nutrients are "fixed" into organic matter). On Georges Bank, nutrients regenerated by sedimentary bacteria are immediately available to phytoplankton because of mixing. Thus, diatoms dominate throughout the year on Georges Bank (Cohen, 1975).

During autumn, as water temperatures decrease, the water column becomes unstable due to mixing and nutrients are recycled to the euphotic zone. This stimulates another phytoplankton bloom which is limited by decreasing levels of solar radiation. Phytoplankton and zooplankton levels then decline to their winter minimum while nutrient levels increase to their winter maximum.

Anomalous conditions within the generalized annual cycles are probably common. The stability of the water column which affects nutrient availability may be disrupted by severe storms. Anomalies in temperature may disturb the timing between the annual cycles of interacting species.

## **VI-2. Habitat Areas Of Particular Concern**

During the summer and early autumn of 1976, bottom oxygen concentrations were severely depleted and widespread mortalities of benthic organisms occurred in a section of the New York Bight off New Jersey. This near-anoxic (and in places anoxic) region of oxygen levels less than 2 parts per million (ppm) was located approximately 4 miles off New Jersey and covered an area about 100 miles long and 40 miles wide during the most critical phases of the depletion (Sharp, 1976). Normal oxygen levels in this region are greater than 4 ppm.

Investigations indicate that this state was probably induced by a combination of meteorological and circulatory conditions in conjunction with a large-scale algal bloom (predominantly Ceratium tripos). Lack of normal seasonal turbulence occasioned by relatively few storms, unusual wind patterns, and above-average surface water temperatures probably all contributed to depletion of the oxygen content of waters beneath the permanent thermocline (Sharp, 1976). It is not known to what degree the routine dumping of sewage sludge and dredge spoils contributed to the depletion, but it is reasonable to assume that any effect would have been detrimental (Atkinson, 1976).

The most commercially important species affected by the anoxia were surf clam, red hake, lobster, and crabs. Finfish were observed to be driven to inshore areas to escape the anoxia, or were trapped in water with concomitant high levels of hydrogen sulfide (Steimle, 1976). Freeman and Turner (1977) pointed out that "...it is difficult to measure with any precision the extent of damage to highly mobile organisms, especially the fishes. Sublethal effects can also occur. Among the observed effects of the anoxic water on fishes were behavioral changes involving vertical distribution and migratory routes which in turn may affect feeding and spawning habits."

Reduction in oxygen levels in New York Bight below normal levels has been observed several times in recent history (Atkinson, 1976) although not to levels as low as those observed in summer 1976. The relative contribution of any of the above mentioned factors to the anoxia cannot yet and may never fully be assessed. However, it is important to note that each of these conditions, by itself, was not a unique, previously unobserved phenomenon.

Dumping is also a habitat consideration. There are 6 dump sites (Table 1) for trace metals, suspended solids, and organic wastes in the New York Bight (Environmental Protection Agency, 1979). Each area is designated for a specific type of material so that it can be monitored more effectively. EPA monitors areas to determine the effects of dumping and has established impact categories in its Ocean Dumping Regulations which specify impacts detected by site monitoring which dictate modifications in the use of disposal sites.

### **VI-3. Habitat Protection Programs**

No special habitat protection programs exist in the habitat of the species that is the subject of this Plan. Sampling for pollution is carried out by both NMFS and EPA.

Habitat protection programs are administered by a variety of Federal agencies including the Bureau of Land Management of the Interior Department, the Coast Guard, EPA, and NMFS. The NMFS Northeast Region Habitat Protection Branch actively reviews applications for permits to discharge or dump pollutants. Coastal zone management is discussed in Section XV-4.

## **VII. FISHERY MANAGEMENT JURISDICTION, LAWS, AND POLICIES**

### **VII-1. Management Institutions**

The US Department of Commerce, acting through the Fishery Management Councils, pursuant to the MFCMA, has authority to manage the stock throughout its range.

### **VII-2. Treaties And International Agreements**

Foreign fishing for bluefish is regulated by the MFCMA pursuant to which Governing International Fishery Agreements are negotiated with foreign nations.

### **VII-3. Federal Laws, Regulations, And Policies**

The only known Federal law that provides for the management of the bluefish fishery is the MFCMA. The MFCMA provides that NMFS must prepare a Preliminary Fishery Management Plan (PMP) for foreign fisheries in the FCZ for which fishery management plans have not been prepared and adopted.

Since 1 March 1977, the foreign, but not domestic, fishery for bluefish has been managed by the PMP for the Foreign Trawl Fisheries of the Northwest Atlantic. No other Federal management program for this species is known to exist now or to have existed in the past. The original PMP established an OY for 'other finfish' of 606 million pounds. Within that OY, separate OYs of 22 million pounds of river herring (alewife and blueback herring) and 40 million pounds of butterfish were established. The PMP established US Capacities (USCAP) of 28 million pounds of butterfish and 21 million pounds of river herring. The TALFF for these species were, therefore, 12 million pounds of butterfish and 1 million pounds of river herring. Of the remaining 545 million pounds, 412 million pounds was reserved for USCAP, and 132 million pounds was allocated to TALFF. The overall TALFF for 'other finfish' for 1977 was, therefore, 146 million pounds (42 FR 9978; 17 February 1977).

The 'other finfish' TALFF was intended to take into account the incidental foreign catch of many species in other directed foreign fisheries for species managed under separate PMPs (hence 'other finfish'). The 1977 PMP also restricted the foreign by-catch of bluefish, scup, sea bass, weakfish, river herring, croaker, spot, American shad, and tautog individually to 1% or 5,500 pounds (whichever was greater) of all fish on board or collectively to 7.5% or 26,400 pounds (whichever was greater) of all fish on board. No directed fishery for, or retention of, striped bass was permitted. Foreign fishing was also restricted to specific areas designated separately for each species for which foreign fishermen were allowed to conduct directed (i.e., large-scale) fisheries.

The PMP was implemented by 50 CFR Part 611, published in the Federal Register on 11 February 1977 (42 FR 8813-8845). These regulations also prohibited retention of Continental Shelf Fishery Resources (611.13a).

The final foreign fishing regulations for 1978 were published on 28 November 1977 (42 FR 60681-60699). These established the 1978 TALFF as 8.8 million pounds of butterfish, 1 million pounds of river herring, and 103 million pounds of 'other finfish'. 'Other finfish' was defined to exclude all species with specific TALFFs (butterfish, red and silver hakes, river herring, Atlantic mackerel, and long-finned and short-finned squids) as well as American shad, Atlantic cod, Atlantic menhaden, Atlantic redfish, Atlantic salmon, billfish, black sea bass, bluefish, haddock, scup, sharks (except dogfishes), spot, striped bass, tilefish, yellowtail flounder, weakfish, and Continental Shelf Fishery Resources. Directed fisheries for, and retention of, any of these species by foreign fishermen have thus been prohibited since 1 January 1978.

On 2 November 1978 NMFS published changes to the PMP for 1979 with proposed changes to the foreign fishing regulations to implement them (43 FR 51053 - 51109). The only substantive amendments were to change the butterfish OY from 40 to 35 million pounds and the butterfish Domestic Annual Harvest (DAH) from 31 to 26 million pounds. In the accompanying regulations (611.50b), 'other finfish' was defined to include all species except silver and red hakes, short-finned and long-finned squids, Atlantic mackerel, river herring (including alewife, blueback herring, and hickory shad), butterfish, American shad, Atlantic cod, Atlantic herring, Atlantic menhaden, Atlantic redfish, Atlantic salmon, all billfish, black sea bass, bluefish, croaker, haddock, pollock, scup, sea turtles, sharks (except dogfishes), spot, striped bass, tilefish, yellowtail flounder, weakfish, and Continental Shelf Fishery Resources and other invertebrates (except unallocated squids). The final foreign fishing regulations for 1979 were published 19 December 1978 (43 FR 59291 - 59325). Subsequent amendments to the Foreign Trawl PMP have taken place on 7 August 1979 (44 FR 46285), 27 December 1979 (44 FR 76539), 4 March 1980 (45 FR 14045), 8 December 1980 (45 FR 80845), and 4 January 1981 (45 FR 1738). No changes with respect to bluefish were made by these amendments. The most recent change (1 January 1981) extended the PMP in perpetuity, unless otherwise amended. After the final Bluefish Plan is approved, the PMP will be amended to delete bluefish from its text.

No Indian treaty rights are known to exist relative to this species.

#### **VII-4. State Laws, Regulations, And Policies**

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

All of the states have various regulations which prohibit or restrict the use of various kinds of commercial (and sometimes recreational) fishing gear within certain portions of state waters during all or parts of the year. In addition, several states restrict and/or regulate commercial harvesting within their jurisdiction by non-residents. Such regulations may or may not inhibit the magnitude of the commercial and recreational harvests of bluefish. It is probable, however, that these kinds of restrictions, particularly on trawling, serve to maintain or increase the proportion of the commercial catch which is harvested from the FCZ. Several states also have mesh size specifications which may affect the magnitude of the bluefish catch and/or the sizes of the fish in the catch.

In Washington County, Maine, otter or beam trawls are prohibited from 1 May through 15 December and purse seines, except for mackerel, are prohibited from 10 April through 15 October.

Purse seines and mid-water trawls are prohibited in New Hampshire between 1 June and 15 September.

Massachusetts prohibits the use of certain types of gear in certain waters during certain times of the year. Seining of bluefish is prohibited in Barnstable County.

Only bluefish greater than 9" may be retained in the commercial fishery in Connecticut. That State prohibits the use of purse seines in portions of Long Island Sound.

Only bluefish greater than 9" may be retained in the commercial fishery in New York. New York prohibits the use of purse seines for taking food fish within three miles of the Atlantic coastline and in all other tidal waters of the state. In addition, trawls (defined to include, but not be limited to, otter trawl, beam trawl, Paranzella or two-boat trawl, pair trawl, Danish seines and Scottish seines) are prohibited within one-half mile of the Atlantic Ocean coastline and in all connecting tidal waters inshore of the coastline.

Only bluefish greater than 9" may be sold in the commercial fishery in New Jersey. New Jersey prohibits purse seines within 2 miles of shore, except for menhaden. In the Territorial Sea, from two to three miles, purse seines are allowed but they must be licensed. Also, New Jersey has regulatory authority over and control of those purse seines within the outside mile.

Delaware law states "No person shall catch or take, or attempt to catch or take, from the waters of the Atlantic Ocean within 3 miles of this State, or Indian River Bay, Rehoboth Bay, Assawoman Bay or their tributaries, fish, whether edible or not, or crabs, by means of trawlnets, dragnets, fish or crab trawls or dredges operated from any power vessel". Trawling and the use of purse seines is also prohibited in

Delaware River and Bay.

Only bluefish greater than 8" may be retained in both the commercial and recreational fisheries in Maryland. The use of otter and beam trawls is prohibited within 1.5 miles of shore in the Atlantic Ocean.

Virginia prohibits trawling in internal waters and limits trawling by season and area in the territorial sea. Purse seining for menhaden only is permitted in both the Territorial Sea and internal waters.

In North Carolina, pair trawls and purse seines are prohibited, except for menhaden.

In South Carolina, purse seines are prohibited in certain areas in the Territorial Sea.

In Georgia, there are no direct regulations concerning bluefish. Commercial fishing is allowed within 3 miles of shore based on the discretion of the Commissioner of the Georgia Department of Natural Resources. Traditionally, the Commissioner opens the beach areas to shrimping and other commercial fishing from June to December. He has, in the past, allowed winter crab trawling and late spring menhaden purse seining in these waters but these decisions are made on a year to year basis. Specific gear regulations are: beach seines are required to use at least a 2-1/2 inch mesh net, however, beach seines over 300 feet in length are prohibited. Crab trawls must utilize at least a 4 inch mesh net.

In Florida, only bluefish greater than 10" may be retained in the commercial fishery. Purse seines are prohibited for the taking of food fish.

No other State laws, regulations, or policies are known to exist specifically for this fishery.

#### **VII-5. Local And Other Applicable Laws, Regulations, And Policies**

No local or other laws, regulations, or policies are known to exist relative to this fishery.

### **VIII. DESCRIPTION OF FISHING ACTIVITIES**

#### **VIII-1. History of Exploitation**

##### **Commercial Fishery**

Commercial bluefish landings have been recorded since 1880. Total US (east coast and Gulf of Mexico) commercial landings peaked in 1897 at approximately 21 million pounds. Reported landings dropped rapidly in the early 1900s due probably to a decline in abundance (Bigelow and Schroeder, 1953), and did not increase significantly until the late 1920s.

During the 1930s annual east coast landings varied between 4 and 8 million pounds (Table 2). Landings fell again during the 1940s but rebuilt to average about 4 million pounds during the 1950s. Total US landings in the 1960s and 1970s averaged about 5 million and 10 million pounds, respectively. US commercial landings in 1981 were over 15 million pounds.

One of the most critical factors in this Plan is the distribution of catch by water area. In 1976, of the approximately 10 million pounds of bluefish landed commercially, 6.1 million pounds came from internal waters, 2.9 million pounds from the Territorial Sea, 750,000 pounds from the FCZ between 3 and 12 miles offshore, and 290,000 pounds from the FCZ seaward of 12 miles (Tables 3 and 5). In other words, in that year, 90% of the commercial catch came from waters under state jurisdiction. Between 1974 and 1977 over 80% of east coast commercial bluefish catch came from within 3 miles of shore, although the percentage caught from the FCZ has been rising steadily (Table 5). Since 1976, the FCZ percentage of total catch has risen from 10% to 37% in 1981. It must be noted that all data after 1976 are considered preliminary, with the potential for revisions; especially for data reported after 1979.

In 1981, in the area from Maine to Connecticut, 48% of the catch came from state waters and 52% came from the FCZ (Table 4). For New York through Virginia, the distribution was 80% state waters and 20% FCZ. For North Carolina through the east coast of Florida, the distribution was 53% state waters and 47% FCZ.

North Carolina landings are largely responsible not only for the expansion of the entire fishery but also for

the growth of the fishery in the FCZ (Table 3). The change in total fishery landings from 1976 to 1981 is approximately 5.8 million pounds, while the corresponding change in total FCZ landings is 4.8 million pounds. Similarly, North Carolina total landings have increased by 5.3 million pounds, while North Carolina FCZ landings have increased by 3.7 million pounds (Table 3). In other words, North Carolina fishermen accounted for over 91% of the growth in the overall fishery and 77% of the growth in the FCZ fishery since 1976.

### **Recreational Fishery**

Although the relative growth of recreational bluefish catches has been somewhat smaller than the relative growth of commercial landings (about 280% vs. 340%) over the last 20 years, the sport fishery has accounted for about 90% of the total (commercial, recreational, and foreign) east coast bluefish catch (Table 7).

Bluefish has always been a component of the marine recreational sport catch, and has steadily, over at least the last 20 years, become perhaps the single most important species to marine sportfishermen on the east coast (Anderson, 1980). National and regional angler surveys since 1960 (no such surveys were made before that time) have documented this growth. Excluding tunas and sharks, bluefish accounted for 8% of the weight of the total marine recreational catch in 1960, 11% in 1965, 13% in 1970, and 31% in 1979 (Clark, 1962; Deuel and Clark, 1968; Deuel, 1973; US Dept. of Comm., 1980b). Bluefish ranked first in both weight and numbers of fish caught in the east coast recreational fishery in 1979 (Table 8). No other species of the Atlantic coast occurs during such a long season, over such a great distance, in such a variety of locations, or in such numbers, as bluefish. It is caught from shore in bays as well as the surf, and from private, rented, charter, and party boats.

### **Foreign Fishery**

Reported foreign catches of bluefish along the Atlantic coast of the United States have been minimal during the last 20 years (Table 7).

The United States signed bilateral agreements with several foreign fishing nations in the early 1970s under which those nations agreed to refrain from operating specialized fisheries for bluefish in ICNAF Subareas 5 and Statistical Area 6. Retention of bluefish by foreign fishermen has been prohibited since 1 January 1978 (see Section VII-3).

## **VIII-2. East Coast Domestic Commercial And Recreational Fishing Activities**

### **Commercial Fishery**

Commercial bluefish catches account for a small but significant share of the total fishery (about 12% in 1979; Table 6). These catches have come primarily from inshore areas, although the proportion of the total catch taken in the FCZ is increasing (Table 4). On a state by state basis, there does not appear to be any connection between the magnitude of commercial bluefish catches and the degree to which those catches come from the FCZ (Table 9). For example, North Carolina, Virginia, New York, New Jersey, and Florida (in that order) are the leading bluefish producing states, but the percentage of each state's total bluefish catch from the FCZ in 1979 was 43%, 9%, 20%, 61%, and 7%, respectively. There may, however, be some positive connection between the percentage of a state's bluefish catch from the FCZ and the percentage of that state's catch of all species from the FCZ. That is, states which obtain a relatively large share of their total commercial landings from offshore areas (such as most of the New England states and New Jersey) also obtain a relatively large share of their bluefish catches from the FCZ.

Bluefish accounts for a significant (over 1%) share of total commercial landings only in New York, east coast Florida, and Delaware (in that order). On a coast-wide basis, bluefish accounted for only slightly more than one half of one percent of the total weight commercially landed (Table 9).

Commercial bluefish landings are highly seasonal (Figure 3). The monthly patterns of these catches are similar to the bluefish sportfishing seasons in the same areas, because most of the commercial catch is taken by inshore fishing gears. East coast commercial catch by fishing gear and year (1969-1978) varied widely (Table 10). Note that a small but appreciable fraction of the commercial catch is taken by "hand lines" and "troll lines". This probably represents bluefish sold by sportfishermen. It is impossible to estimate how much bluefish is sold by recreational fishermen, i.e., how accurate the percentages given in



Table 10 for "hand lines" and "troll lines" are.

Drift gill nets, otter trawls, mid-water trawls, and purse seines are the principal gears responsible for FCZ bluefish catches in the Mid-Atlantic region (Table 11). In 1980 they accounted for 68% of the FCZ bluefish catch (the 1980 other gear FCZ catch contains 586,300 pounds caught by gill nets - run around). Bluefish catches by purse seines have been generally declining over this period (Table 11). The purse seine bluefish fishery, especially by tuna seines, is highly seasonal, and represents a very small percentage of such vessels' total catches and revenues (e.g., about 6% of the volume and 2% of the ex-vessel value in 1976). Bluefish catches by mid-water trawls have been steadier in recent years, but still contribute only a small fraction of the total commercial bluefish catch (US Dept. of Comm., 1980a). Bluefish accounted for only 6% of the volume and 5% of the ex-vessel value in 1976 for this gear. Both purse seines and mid-water trawls are far more dependent on weakfish and occasionally other species than bluefish. Catches by otter trawls have been steadily increasing since the late 1960s, but undoubtedly much of this catch is taken incidentally and reflects in large part the increase in bluefish abundance over the same period, since the ex-vessel price of bluefish has always been consistently lower than the prices of almost all other species available to these fishermen (e.g., flounders, silver hake, scup, sea bass, etc.). Bluefish catches by drift gill nets in the Mid-Atlantic are also substantial. Bluefish can represent a significant share of the volume taken by this gear, but most of their revenues come from such species as striped bass, spot, weakfish, and croaker, all of which command higher ex-vessel prices than bluefish.

North Carolina in recent years (1978-81) has been the major source of commercial expansion (Table 3). Landings have increased during the last three record years. Most of this increase has come from the winter trawl fishery, in which fishermen have been using "fly nets" and other high fishing nets to take pelagic fish (fish which remain mostly up in the water column off the bottom). Bluefish is caught in conjunction with summer flounder, spot croaker, and weakfish. The landings and values of these species have also reached record levels in recent years, suggesting that the increased bluefish landings are the result of the increase in expanded effort toward these higher valued species by North Carolina fishermen. The gears largely responsible for the growth in the North Carolina fishery are the otter trawl and gill net (Table 12). However, pound net landings increased remarkably in 1980.

### Recreational Fishery

National and regional marine angler surveys in 1960, 1965, 1970, 1974, and 1979 provided the estimates of bluefish catches, and the estimates of the importance of those catches (Tables 6, 7, and 8; estimates from the surveys before 1979 adjusted from original survey estimates - see Anderson, 1980). Bluefish sport catches occur mainly in the North and Mid-Atlantic regions (Table 7), with the "North Atlantic" defined as Maine - New York, the "Middle Atlantic" defined as New Jersey - Cape Hatteras, North Carolina, and the "South Atlantic" defined as Cape Hatteras - east coast Florida. The 1979 angler survey provided catch estimates on a different regional basis, i.e., for "New England" (Maine - Connecticut), the "Middle Atlantic" (New York - Virginia), and the "South Atlantic" (North Carolina - east coast Florida). The data from this survey were adjusted to fit the regional definitions given in Table 7, however, because the original (1960, 1965, and 1970) angler surveys used these definitions, it is impossible to adjust the data from those early surveys to fit the current regional definitions. The bluefish catch estimates for 1979 for the New England, Middle Atlantic, and South Atlantic regions were 41.0, 40.0, and 15.5 million pounds, respectively, or 43%, 41%, and 16%, respectively, of the total east coast catch estimate of 96.6 million pounds. These figures include all catches of bluefish, regardless of whether or not those catches were retained (and possibly sold), discarded, or released alive by sport fishermen.

Bluefish were the second most important recreational species in New England in 1979, the most important in the Mid-Atlantic, and the third most important in the South Atlantic (Table 13). Bluefish represented about 14% of the total number (about 31% of the total weight) of fish caught by sportfishermen on the east coast during 1979 (Table 14), with the highest relative importance in the Long Island Sound - New York Bight area (Rhode Island - New Jersey).

Coastwide in 1979, most bluefish were taken from private/rental boats and party/charter boats (48% and 25% of the total, respectively) while catches from shore, i.e., "man-made" (piers, jetties, etc.) and beaches/banks, accounted for about 27% of the total number of bluefish caught (US Dept. of Comm., 1980b). In each region, catch from private/rental boats outnumbered catches from any other "mode", and catch from party/charter boats were more important in the Middle Atlantic than in the other regions.

The single most important "area" for bluefish catch in 1979 was internal waters, where 38% of the

coastwide total, in numbers, was caught (Table 15). Catches from the "ocean beyond three miles", "ocean within three miles", and "unknown area" accounted for 30%, 22%, and 9%, respectively, of the total east coast bluefish catch of 25.4 million fish.

In terms of numbers caught, bluefish was the single most important FCZ species (25% of the coastwide total), and accounted for 22%, 53%, and 5% of all FCZ catches in the New England, Middle Atlantic, and South Atlantic regions, respectively (U.S. Dept. of Comm., 1980b).

By number, bluefish represented almost one-half of all fish caught by the party/charter boat industry in 1979 (over 60% in the Mid-Atlantic region). Data from the 1979 survey indicate that party/charter boats caught almost 10 times as many bluefish as any other species. The second most important species to Mid-Atlantic party/charter boats was weakfish, with catches estimated to have been 633,000 fish.

### **VIII-3. Foreign Fishing Activities**

Foreign catches of bluefish were reported during 1971-77, but were quite small, averaging less than 1% of the total catch (Table 7). There have been reports from US observers of foreign fishing vessels continuing to take bluefish but the total extent of these catches and the level of mortality is unknown since discards are not reported except by observers.

### **VIII-4. Interaction Between Domestic And Foreign Participants In The Fishery**

Because foreign fishing vessels have no directed bluefish fishery, there is no significant interaction with domestic fishermen.

## **IX. DESCRIPTION OF ECONOMIC CHARACTERISTICS OF THE FISHERY**

### **IX-1. Domestic Harvesting Sector**

#### **Commercial Fishery**

Between 1965 and 1981, while catches more than tripled, inflation adjusted revenues doubled, from \$515,000 to \$1,179,000 (Table 16).

Bluefish catches relative to total commercial catches of food finfish, squid, and shrimp amounted to more than 1% of the ex-vessel value for only 8 states: Connecticut, New York, New Jersey, Delaware, Maryland, Virginia, North Carolina, and Florida (Table 17).

With the exception of Virginia, bluefish does not make a major contribution to commercial seafood landings (Table 18). However, with the increased landings of 1980 and 1981, bluefish are likely to make a small but significant contribution, especially for North Carolina.

Since much of the expansion of the fishery is due to North Carolina landings, the remainder of this section will focus mainly on North Carolina. Since 1976, there has been a trend of increased landings from FCZ waters, compared with some expansion in the inshore fishery (Table 19). Ex-vessel prices reached a peak in 1979, with the ratio of FCZ prices to inshore prices peaking as well. Not only were 1979 prices high, but landings also increased signalling that there has been an expansion in the demand for bluefish.

One of the questions that arise concerning the North Carolina fishery is whether or not bluefish landings have been increasing because bluefish are an incidental catch to the other expanding North Carolina fisheries. There are indications that there will be a directed fishery for bluefish, given the proper set of prices and abundance levels for alternative species (Tables 20 and 21).

Unfortunately, landings by vessel trip in which to analyze the relative species contribution to overall vessel catch are unavailable. However, landings by month by gear may approximate this distribution. Bluefish is usually caught in conjunction with one or more of the following: flounders, croaker, and weakfish (Table 20). For example, 60% of the January fish trawl revenues were from flounder, 15% from croaker, 11% from weakfish, and 9% from sea bass while only 1% were from bluefish.

In 1976 bluefish did not comprise a large portion of the overall catch and revenue (Table 21). However, this bluefish portion has been increasingly important to the North Carolina finfish fisheries. The landings



of flounder, croaker, and weakfish had reached all time highs by 1980, but in 1981 there was a sharp decrease in the landings of these species. Bluefish landings and revenues increased sharply over this period indicating that, along with the ongoing growth in this fishery, fishermen were directing more effort towards bluefish because of the scarcity of the other normally sought-after species.

The demand for bluefish has been expanding (Table 22). Usually when landings increase, prices fall but bluefish prices have been increasing, even when they are deflated by the consumer price index to adjust for inflation. However, the consumer price index is far removed from fisheries because fishery purchases are a very minute percentage of total consumer purchases; the index is for the entire country while bluefish are mainly consumed on the east coast; and the consumer price index measures prices at the retail level, while the reported bluefish prices are at the ex-vessel level. Therefore, bluefish prices are compared to an index of New England finfish prices and the average price of North Carolina landed flounder, croaker, and weakfish in order to determine if the relative price and the economic value of bluefish has been increasing. In the latter case, the ratio of North Carolina bluefish prices to flounder, croaker, and weakfish prices reached a peak in 1979 and has declined to pre-1979 levels. Note that current landings are much higher and that the 1981 flounder, croaker, and weakfish landings declined noticeably causing a 12¢ jump in their average price, while bluefish prices have kept pace with this increase in spite of increased landings.

In comparing North Carolina prices to New England finfish prices, bluefish prices have more than kept pace. Both North Carolina and total East Coast bluefish prices are increasing relative to New England finfish prices, indicating that bluefish are becoming relatively more economically scarce (Table 22).

There are several hypotheses that industry experts have suggested as to why bluefish prices have been increasing:

1. Consumer tastes are changing as evidenced by the increased use of bluefish within the restaurant trade.
2. There is an increased substitution of bluefish for flounder and croaker by consumers.
3. Bluefish are currently being marketed with higher quality because of better distribution and packaging.
4. With considerably higher availability of bluefish there has been an increased strengthening of the market, such that the demand for bluefish has stabilized, with processors more willing to buy and sell bluefish.
5. The average weight of bluefish has been increasing, such that consumers are more willing to buy bluefish.

### Recreational Fishery

The current economic importance of bluefish can be indicated by estimating 1979 angler expenditures for bluefish by using data found in the 1979 Marine Recreational Fishery Statistics Survey (US Dept. of Comm., 1980b). The Survey gives data on the total number of trips by region, species sought by fishermen, and mean cost per trip.

The 1979 Survey estimated that 1,131,000 New England, 2,834,000 Mid-Atlantic, and 1,966,000 South Atlantic coastal state residents participated in marine recreational fishing during 1979. Those people, plus out-of-state residents, made a total of 6,983,000 fishing trips for New England, 18,433,000 trips for the Mid-Atlantic, and 13,771,000 trips for the South Atlantic (Table 23).

While the Survey does not include data on participation by species, it does report species sought by fishermen interviewed in the intercept phase of the survey. In New England, approximately 24% of those interviewed reported they were fishing for bluefish. In the Mid-Atlantic, approximately 26% were fishing for bluefish, while in the South Atlantic, only 4% were fishing for bluefish (Table 23).

If the total number of trips is multiplied by the species sought percentages for bluefish, the resulting estimates of the total number of directed bluefish trips by region are: 578 thousand for the South Atlantic, 4.7 million for the Mid-Atlantic, and 1.7 million for New England (Table 23).

The 1979 Survey gives estimates of the mean cost per angler trip by region and mode of fishing (party/charter, private/rental, man made, beach/bank). This trip cost data includes only the costs incurred while fishing. It does not include hotel or travel costs to or from the site of fishing. To be very conservative in the estimates of trip cost, the minimum cost estimate for an average trip used is the mean cost of the man-made fishing mode. For the South Atlantic, the mean cost of the man-made mode of fishing is \$7.60, for the Mid-Atlantic, \$6.50, and for New England, \$3.70 (Table 23). (The mean values of beach/bank, party/charter, and private/rental modes for the entire survey are \$7.60, \$36.60, and \$14.50 per trip, respectively. The private/rental mode is the most prevalent mode of fishing.)

By multiplying the directed number of bluefish trips by these average costs, angler expenditures on bluefish can be estimated. Marine anglers spent at least \$41.4 million in 1979 on bluefish (Table 23). This estimate is almost 20 times greater than the 1979 ex-vessel value of commercial landings which was \$2.1 million. If the minimum cost estimates are replaced by a weighted average of trip costs, taken across all recreational modes and all regions, total bluefish expenditures amount to \$75.2 million as opposed to \$41.4 million.

The Mid-Atlantic census of party and charter boats provides additional evidence of the recreational value of bluefish (see Background Paper #3. MAFMC, 1981). Over 50% of the 320 charter and party vessels within the sample reported bluefish as a major species sought. The estimates of average gross annual income for these vessels are \$38,925 for charter boats and \$113,802 for party boats. The 32 party boats and 142 charter boats that make up the bluefish sample, when combined, generated an estimated \$9.2 million in gross revenues in 1979. Given that the party/charter mode of fishing is the least prevalent mode of fishing reported within the 1979 Survey, this estimate of party and charter boat revenue indicates that total angler expenditures of \$41.4 million is certainly a conservative estimate.

### US Harvesting Capacity Estimates

This section presents forecasts of recreational and commercial catches, revenues, and prices in order to estimate US harvesting capacity for bluefish. The forecasting equations (Table 24) were developed from an analysis of NMFS commercial landing statistics and data from NMFS Marine Recreational Fishery Statistics Surveys. All variables are significant at the .01 level except D1, which is significant at the .05 level. Equations were estimated by ordinary least squares regression. Variables in equation 3 were transformed by the Cochrane-Orcutt procedure. Each of the equations is based on certain assumptions about the bluefish fishery. The recreational catch equation assumes that recreational catch is a function of disposable income. Disposable income is an estimate of the total spendable after-tax income available to consumers within the economy. As consumers' disposable incomes increase, the more likely they will go recreationally fishing; not only increasing the amount of effort directed towards bluefish, but its catch as well. Since the only data on recreational catch are the six Marine Recreational Fishery Statistics Surveys, the resulting small sample prohibited the use of other potential explanatory variables such as bluefish abundance. (Due to incomplete regional coverage the 1974 and 1975 surveys were combined).

The commercial catch equation uses disposable income, the relative abundance index of bluefish (Anderson, 1980) and a series of zero-one shift variables (D1, D2, TD). Here, the disposable income variable has the interpretation that as consumers' incomes increase, the more likely they are to buy more bluefish and that there is an expanded market for bluefish to be supplied. The interpretation of the abundance variable is straight forward; as the availability of bluefish increases, so should its catch. The price of bluefish is not used as an explanatory variable to avoid the statistical problem of simultaneous equation bias and because bluefish are primarily caught as bycatch in conjunction with higher valued species. As bycatch, bluefish landings should be more a function of abundance than ex-vessel prices.

Variables TD, D1, and D2 were developed to control structural changes in the fishery. Total commercial landings from 1960 to 1980 (Table 2) can be split into two distinct periods. Prior to 1973, commercial landings never exceeded 7.0 million pounds. In 1973, commercial landings increased 47% from the 1972 level of 6.9 million pounds to 10.1 million pounds. Since this time commercial landings have never fallen below 9.7 million pounds. The reasons for this abrupt shift are unclear. One hypothesis is that catches of bluefish have been increasing because the water temperature in the area between Cape Hatteras and the Gulf of Maine has undergone a general warming trend since the 1960s. To control for this shift the variable TD was created. It takes a value of zero for those years prior to 1973 and a value of one for the years 1973 to 1980.

In 1979 and 1980, total commercial landings of bluefish increased significantly. In 1978 total landings

were 10.9 million pounds, in 1979 total landings were 12.4 million pounds, and 1980 landings were 14.4 million pounds. Much of the increase in landings over this period is due to the development of the winter trawl fishery in North Carolina (Table 3). North Carolina landings have increased from 1.9 million pounds in 1978 to new highs of 3.4 million pounds in 1979 and 5.4 million pounds in 1980. The variables D1 and D2 are used to control for this rapid growth. The coefficients of these variables suggest that given levels of abundance and disposable income, the development of this trawl fishery contributed an additional 1.1 million pounds in 1979 and 4.3 million pounds in 1980 to total landings relative to 1978 total landings.

The price equation (Table 24) uses only the level of commercial catch as an explanatory variable. Attempts to use other explanatory variables such as disposable income, abundance, and the ex-vessel prices of potential substitutes (production or consumption) croaker, weakfish, and New England finfish all failed. This may be due to the nature of the bluefish market. Bluefish, relative to all other foodfish and shellfish, have a very small market. In 1980 bluefish accounted for only 1% of total foodfish revenues. This implies that the substitutes for bluefish available to the consumer are so numerous that no one other species is a major substitute, while the market is very small. The effects of landings on price probably outweigh any income effects such that the influence of disposable income changes on prices is imperceptible. (An alternative reason as to why disposable income is not a significant explanatory variable is due to the potential statistical problem of multicollinearity. The correlation coefficient of landings with income is .94.)

In order to forecast recreational catch, commercial catch, ex-vessel prices, and commercial revenues, independent forecasts of disposable income, the consumer price index, and the relative abundance index must be made. Forecasts of disposable income and the consumer price index were taken from the August 1981 Townsend-Greenspan Econometric Forecast. Since the relative abundance index cannot be forecasted, the low and high values of this index from 1973 to 1980 were used to generate a range of forecasts (Table 25).

Besides the assumptions discussed above, three qualitative assumptions are associated with the forecasts. First, it is assumed that the relationship between the abundance of bluefish and the abundance of other recreationally and commercially caught species will remain constant. Secondly, it is assumed that the traditional markets and uses of bluefish will be maintained throughout the forecast period. Finally, it is assumed that technology will remain constant such that bluefish will not be exploited by any new user groups.

The recreational catch forecasts indicate that the recreational catch of bluefish is likely to increase (Table 26). These forecasts are biased downward since the 1979 recreational catch is 96.6 million pounds while the equation forecasts 91.4 million pounds. The commercial catch forecasts indicate that commercial catches are increasing as well. These estimates are also biased downward. Recent data indicate that the 1981 North Carolina catches are 21% higher than catches for 1980. The forecast assumes that there is no additional growth in the fishery over its 1980 level except through increases in abundance and income. Apparently, more and more effort by the North Carolina winter trawl fishery is being directed towards bluefish as the abundance of croaker and other traditionally sought-after fish decline.

Given the nature of these biases, total catch and revenue estimates are underestimated while prices are overestimated. However, if the economy rebounds from its 1980 decline, total catch is likely to increase beyond its 1979 peak level of 109 million pounds.

## **IX-2. Domestic Processing Sector**

Bluefish today is almost strictly a fresh fish product and is generally iced on the dock at unloading and shipped directly to the market. Therefore, there is no significant processing sector in this fishery.

The extent of the fresh fish market, to date, has been one of the major limiting factors on the commercial harvest of bluefish. This market has traditionally been restricted to the coastal areas and has, therefore, kept the commercial segment of this fishery at its relatively low level. Should methods become available to maintain a quality product over longer periods of time and current efforts to develop markets in the central portions of the country prove successful, an increased demand for this product and other fresh fish could certainly occur. Once the market is available the commercial segment of this fishery could expand at a rate that would upset the historical catch ratios if uncontrolled.

### IX-3. International Trade

No official data are reported on exports of bluefish. However, unofficial reports indicate that bluefish are being exported out of Virginia. In 1981, these reports state that 900,000 pounds of bluefish and other species were shipped to Egypt, Nigeria, and Venezuela. They also indicate that at least 500,000 pounds and potentially 1 million pounds of fish could be exported in 1982.

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

### X-1. Relationship Among Harvesting and Processing Sectors

Since bluefish is generally sold fresh, there is no processing sector.

### X-2. Fishery Cooperatives Or Associations

There are three active fishermen's cooperatives in the Mid-Atlantic area. Although some purchasing of expendable equipment for fishing vessels is undertaken, their main business is marketing members' landings. Cooperative operations are typical of Mid-Atlantic packing or dock practice, supplying fuel, ice, water, and trip services to members. All three cooperatives are located in New Jersey. The three cooperatives are the Belford Seafood Cooperative Association, Inc., the Point Pleasant Fishermen's Dock Cooperative, Inc., and the Cape May Fishery Cooperative.

Because of the importance of bluefish in the recreational fishery, the many marine angler organizations along the coast represent considerable numbers of bluefish fishermen.

### X-3. Labor Organizations

Labor organizations identified with the harvesting and processing sectors of the fisheries in the Mid-Atlantic area are limited to four organizations: the Seafarers International Union of North America, the International Longshoremen's Association, the United Food and Commercial Workers International Union (UF & CW) of the AFL-CIO, and the International Brotherhood of Teamsters. The following discussion relates to Mid-Atlantic fisheries generally. Information is not available to identify activities that relate directly to bluefish.

In the Mid-Atlantic area union involvement is almost entirely limited to onshore seafood handling, processing, and distribution activities. Vessel crews are not organized by any of the identified unions although some attempts have been made in the past to include fishermen in organized unions. The UF & CW recently attempted to organize vessel crews who were employees of a seafood processing company. Although their efforts were met favorably by the crew members, the National Labor Relations Board ruled that the UF & CW was in violation of labor law because each boat was owned by a separate owner and, therefore, all boat crews could not be organized under the same union. Since that ruling, the UF & CW has not attempted to organize vessel crews in any other locations.

Onshore seafood handling is generally non-unionized. To the extent that it is, the International Longshoremen's Association is the primary national union involved in seafood handling workers. Most union activity occurs in the region's major urban centers (New York, Philadelphia, Baltimore, and Norfolk) and includes handling workers at boat docks and in warehousing facilities located at processing plants.

Fish processing workers, when unionized, are represented by the UF & CW. This union represents oyster and clam shuckers, fish cleaners and cutters, freezermen, warehousemen, some distribution workers, and wholesale retail clerks.

Transportation of seafood products, especially from processing facilities to wholesale and retail fish distributors is organized under the International Brotherhood of Teamsters, with headquarters in Washington, D.C. and regional offices in major urban centers throughout the Mid-Atlantic region.

Preliminary analysis of labor union activity in the Mid-Atlantic region indicates that the seafood harvesting, handling, and processing industry is not highly organized. Although union activity occurs in all major urban centers, the overall percentage of union members employed in the seafood industry is relatively low. For example, in the Hampton Roads area, only five percent of all workers employed in the

seafood harvesting processing industry are organized by the unions.

The reasons for limited union involvement include the low-wage, seasonal nature of employment in the processing industry and the diverse, highly competitive, independent small businessman characteristics of fishermen, brokers, and processors. In many instances, wages are extremely low, approaching minimum wage in some localities. Often fish processing employees are the lowest paid employees covered by the unions. These employees, subject to difficult working conditions and unstable employment prospects, change employment continuously, leaving employers with no work and hiring on with companies that do have work. Seasonality of employment and constant changeover from shellfish to finfish processing affect steady employment and limit the unions' ability to organize on-shore workers.

Unionization of vessel crews and fishermen is limited by the small size of individual crews and the investor-owner fishing boats. National Labor Relations Board rulings against organization of fishing fleets have added to the organization and administrative problems of including fishermen in national union structures.

#### **X-4. Foreign Investment In The Domestic Fishery**

No significant foreign investment is known to exist in this fishery.

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

Bluefish landings were examined by county to identify those counties with a significant involvement in this fishery (Table 18). Suffolk (New York), Cape May (New Jersey), Northampton (Virginia), and Carteret and Dare (North Carolina) were selected as being relatively important (Table 27).

Interpretations of census data for these counties must be made in light of the fact that they are twelve years old. However, it would seem that any negative impacts of this Plan on the commercial harvesting sector may have significant impacts on fishermen in Northumberland County. At the time of the census, unemployment was greater than the national average, 26% of the labor force worked outside of the County (compared to a national average of 18%), and 32% of the families were classified as low income (compared to a national average of 11%). While the economies of the two North Carolina Counties may not be significantly better than that of Northumberland County, and even though these Counties are near the top of the ranking for total bluefish landings, the fact that neither one is significantly dependent on bluefish landings relative to total landings indicates that any negative impacts of the Plan would not be relatively significant. Data on fisheries employment are not available at the county level.

### **XII. Determination of Optimum Yield**

#### **XII.1. Specific Management Objectives**

One of the purposes of the MFCMA is "to promote domestic commercial and recreational fishing under sound conservation and management principles." Section 301(a) of the MFCMA sets forth the following national standards:

1. Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery.
2. Conservation and management measures shall be based upon the best scientific information available.
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.
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.
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.
  6. Conservation and management measures shall take into account and allow for variations among, and contingencies in, fisheries, fishery resources, and catches.
  7. Conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication.

In addition to endorsing the above, the Council adopted the following objectives for this Plan:

1. Increase understanding of the condition of the stock and fishery.

Objective 1 is a recognition that there is a lack of data necessary for bluefish management and a need to improve the data base for use in future refinements to the Plan.

2. Provide the highest availability of bluefish to US recreational fishermen while maintaining within limits traditional uses of bluefish, recognizing some natural stock fluctuations are inevitable.

Objective 2 is a recognition of the importance of the recreational fishery as well as an expression of the desire of the Council that, to the extent possible, the historical pattern of the fishery be maintained. This historical pattern relates to the relative catch of the recreational and commercial sectors, the geographical distribution of the fishery, and the relative importance of the various gear types in the commercial fishery. It is recognized that these distributions may vary slightly from year to year. It is also recognized that changes in stock abundance may alter the relationships. However, the basic intent is that the general relationships between user groups and between regions not change dramatically.

In developing this Plan, the Council was primarily concerned with a significant and rapid expansion of the commercial bluefish fishery in the FCZ. It was also concerned that the management regime adopted not have a significant immediate negative impact on that commercial fishery.

The management unit of this Plan is bluefish within the FCZ of the western Atlantic Ocean, excluding the Gulf of Mexico.

## **XII-2. Description of Alternatives**

1. **Take no action at this time.**

This would mean that the PMP would remain in effect. The PMP regulates only foreign fishing and prohibits foreign fishermen from retaining bluefish.

2. **Allow US fishermen unrestricted catches of bluefish.**

This alternative is intended to recognize that totally effective bluefish management requires regulation in the FCZ, Territorial Sea, and internal waters and to postpone management until such time as the States develop a management system for the Territorial Sea and internal waters. Following development of such a system, this Plan would be amended to incorporate compatible management measures.

Operators of party and charter boats and persons selling bluefish would be required to have permits and submit reports. Vessels would be exempt from this requirement if they catch no more than 100 pounds of bluefish per trip.

OY would be all bluefish caught in the FCZ by US fishermen, so retention of bluefish by foreign fishermen would be prohibited.

**3. Allow US fishermen unrestricted catches of bluefish, but impose a 14 inch (fork length) size limit.**

OY would equal all bluefish 14" in length or larger caught in the FCZ by US fishermen. Therefore, foreign fishermen would not be permitted to retain bluefish. Operators of party and charter boats and persons selling bluefish would be required to have permits and submit reports. Vessels are exempt from this requirement if they catch no more than 100 pounds of bluefish per trip.

**4. Restrict bluefish catches by commercial and recreational fishermen.**

Bluefish range throughout the FCZ, Territorial Sea, and internal waters and the fishery for the species takes place in all of these areas. Federal management jurisdiction is limited to the FCZ, which is the management unit of this Plan. However, management in the FCZ cannot proceed without regard for the portion of the stock and fishery outside the FCZ. For that reason, the concept of "total desirable catch" is introduced and defined as the total catch of bluefish from all areas (FCZ, Territorial Sea, and internal waters) that would be consistent with the objectives of the Plan. In other words, the total desirable catch would be the OY if the management unit were bluefish throughout the range of the stock. Use of the concept of total desirable catch permits the calculation of an OY for the FCZ, the management unit of the Plan, that accounts for the condition of the stock and level of the fishery throughout the range of the stock. It must be remembered that values calculated for the entire area are advisory to the States and have no Federal regulatory significance. Only the OY and allocations for the FCZ would have regulatory significance for purposes of this Plan.

With this alternative the total desirable catch (FCZ, Territorial Sea, and internal waters) would equal the average MSY (104 million pounds). Total desirable catch would be allocated between the commercial and recreational fisheries based on the distribution shown in the latest available recreational fisheries survey and commercial catch statistics (based on 1979 data, the distribution would be 88% recreational and 12% commercial). The overall catch allocations would be further divided based on 1979 data into FCZ recreational and commercial allocations (quotas), the sum of which would equal OY.

Because data on the weight of recreationally caught bluefish are not currently available, it is impossible to estimate the actual quotas and OY. It is anticipated that the necessary data will be available in the near future.

Under certain conditions, such as natural population fluctuations, it might be necessary to either relax or further limit the catches of bluefish. Therefore, this alternative requires that NMFS, in consultation with the Council, examine annually the NEFC assessment of the fishery and, if appropriate, raise or lower the OY. In considering such action, information gathered from catch reports, marine recreational fishery statistics surveys, and any effort data available must be used in conjunction with the assessment. Under any circumstances, OY cannot be such that the OY when averaged with the total catch values for the preceding 9 years will exceed maximum MSY (119 million pounds).

Operators of party and charter boats and persons selling bluefish would be required to have permits and submit reports. Vessels are exempt from this requirement if they catch no more than 100 pounds of bluefish per trip.

**5. Allow US recreational fishermen unrestricted catches of bluefish and restrict commercial landings.**

While this Plan is intended to manage bluefish only in the FCZ, this alternative is based on a recognition that such management cannot ignore the fishery shoreward of the FCZ. Therefore, it provides that NMFS, based on recommendations of the Council, will annually estimate the total desirable bluefish catch in the Atlantic Ocean (FCZ, Territorial Sea, and internal waters). From that estimate, an FCZ allocation will be made. This FCZ allocation will be the annual OY. The difference between the total desirable catch and the OY should provide guidance to the States so that their management in the Territorial Sea and internal waters can be compatible with Federal management in the FCZ.

The overall desirable catch would be whatever US recreational fishermen catch plus the commercial catch which is 15% of recreational landings of the previous fishing year or up to 18 million pounds, whichever is greater. In order to assure that the commercial catch allocation is based on the best available data, recreational catch data for year 1 would be used in year 2 to develop the allocation for year 3.

The overall commercial allocation would then be divided into allocations for the FCZ and for the



Territorial Sea and internal waters. The FCZ allocation would be up to 40% of the overall commercial allocation or up to 7,200,000 pounds, whichever is greater. Therefore, OY for the FCZ would equal whatever bluefish recreational fishermen catch in the FCZ plus whatever US commercial fishermen catch in the FCZ up to 6% of the overall recreational bluefish catch (of two years previous) or up to 7,200,000 pounds.

NMFS would be required to monitor commercial bluefish catch in the FCZ and close the directed fishery for bluefish in the FCZ if it appeared that the commercial allocation would be exceeded. During a period of closure, commercial vessels would be permitted a bycatch of bluefish not to exceed 10% of the weight of all fish on board at the end of a trip.

Foreign fishermen would not be permitted to retain bluefish since US fishermen would use the entire OY.

Operators of party and charter boats and persons selling bluefish would be required to have permits and submit reports. Vessels are exempt from this requirement if they catch no more than 100 pounds of bluefish per trip.

#### **6. Prohibit the use of purse seines and pair trawls in the directed commercial fishery for bluefish.**

This alternative modifies alternative 5 in that it would add to alternative 5 a prohibition on the use of purse seines and pair trawls in conducting a directed fishery for bluefish in the FCZ.

#### **7. Restrict the use of all gear except hook and line, conventional gill nets, traps, haul seines, and pound nets to conduct a directed fishery for bluefish in the FCZ.**

OY is all bluefish caught by US fishermen in the Atlantic FCZ, excluding the Gulf of Mexico, pursuant to this Plan.

US fishermen using hook and line, conventional gill nets, traps, haul seines, and pound nets to conduct a directed fishery for bluefish in the FCZ would be allowed to harvest bluefish without limit. The use of all other gear to conduct a directed fishery for bluefish in the FCZ would be prohibited unless a waiver of the prohibition were granted by NMFS.

NMFS could grant waivers to the gear prohibition if they concluded that the waivers were consistent with the objectives of the Plan, that is, that they provided the highest availability of bluefish to US recreational fishermen while maintaining, within limits, traditional uses of bluefish. Specifically, NMFS would be required to attempt to maintain the historical catch distribution in granting such waivers, both between sectors (8% of the total catch for the FCZ commercial fishery) and geographically (11% of the FCZ commercial catch landed in New England, 37% of the FCZ commercial catch landed in the Mid-Atlantic, and 52% of the FCZ commercial catch landed in the South Atlantic, Table 4). It is recognized that these relationships cannot be maintained absolutely, but it is the Council's intent that NMFS grant waivers for the use of the restricted gear types so as to minimize the chances of major changes in these relationships. NMFS would be allowed to specify the amount of bluefish that could be caught with permits granted through waivers.

The catch distribution was arrived at by examining historical data. The distribution between the recreational and commercial fisheries has been about 88% and 12%, respectively (Table 6). In order to provide some growth for the commercial fishery while still protecting the recreational fishery, it was determined to use a distribution of 80% recreational and 20% commercial. In 1981, the FCZ commercial fishery accounted for 37% of the total commercial catch (Table 4). This was adjusted to 40%. If that 40% is applied to the overall 20% commercial share, the result is that the FCZ commercial fishery share is 8% of the total catch. The geographical distribution of the FCZ commercial catch (11% New England, 37% Mid-Atlantic, and 52% South Atlantic) is the average distribution for 1976-1981.

In order to provide a basis for granting any waivers to the gear prohibition, it would be necessary to annually estimate landings. NMFS, in consultation with the Council, prior to the beginning of each year, would be required to project the total bluefish catch, recreational catch, and catch by the permitted gear types (hook and line, conventional gill nets, traps, haul seines, and pound nets). From these projections, the amount of bluefish available for catch by the prohibited gear types could be estimated, thus providing a basis for granting waivers from the gear prohibition.



NMFS would be required to establish the procedures for the waiver system. As guidance in that regard, it is suggested that persons desiring to obtain waivers from the gear prohibition file their applications by a particular date prior to the beginning of the fishing year. All of those applications could be evaluated together relative to the specified criteria with appropriate decisions made prior to the beginning of the fishing year on 1 January. Applications could be considered after that date, i.e., anytime during the year, but such applications would necessarily be evaluated in light of waivers previously granted. Fishermen would be required to supply information on how much bluefish they caught using the gear for which a waiver is being sought with the application, as well as the amount of bluefish requested by the waiver. NMFS could evaluate these applications against the amount of bluefish available for harvest by the prohibited gear types. This would be done through a series of iterations, initially giving all fishermen what they caught in the most recent year. If there is not enough bluefish available, all fishermen would be reduced a proportional amount. If there is any left, it could be granted to those fishermen who want an increase. If there is any left after that, it would be saved for applications submitted later in the year. In no event could the regional allocations specified in the Plan be violated.

Bluefish can be a bycatch in other fisheries. Therefore, this alternative provides that incidental catches of bluefish in directed fisheries for other species by fishermen without waivers using gear other than hook and line, conventional gill nets, traps, haul seines, and pound nets would be limited to 10% of the total catch on board a vessel at the end of a fishing trip.

Foreign fishermen would not be permitted to retain bluefish since US fishermen would use the entire OY.

Operators of party and charter boats and persons selling bluefish would be required to have permits and submit reports as set forth in Sections XIII-1 and XIV. However, NMFS could eliminate this reporting requirement as soon as an alternative method of obtaining the required data has been implemented. Vessels are exempt from this requirement if they catch no more than 100 pounds of bluefish per trip.

### **XII-3. Analysis of Beneficial and Adverse Impacts of Potential Management Options**

#### **1. Take No Action at this Time.**

Not having a means to control the domestic fishery, particularly the commercial fishery, should its development continue or accelerate, might result in a reduction of stock size to a level beneath that required for an active recreational fishery. Although definitive stock-recruitment relationships for bluefish are not known, and it is not clear whether environmental factors play a role in controlling recruitment, it is probable that at low levels of abundance, spawning stock size and recruitment (i.e., future abundance) are related. The Council has determined that the stock should not be drastically reduced if the economic future of this fishery is to be safeguarded and the Council's objectives are to be attained. In addition, data on the US bluefish fishery that will be reported as a result of a Plan would not be available.

To the extent that this alternative could lead to overfishing, it would have a negative environmental impact.

This alternative would not achieve the objectives of this Plan. Necessary information would not be gathered. Overfishing could lead to a decrease in abundance. The commercial fishery would have the potential to grow beyond its traditional share of the resource. If such growth occurs, there is a potential for the recreational fishery to decline, which would further increase the commercial share of the fishery since recreational use of bluefish is a higher valued use of the resource. It could potentially result in a misallocation of the resource from the recreational fishery to the commercial fishery. This alternative seems unacceptable at this time.

#### **2. Allow US fishermen unrestricted catches of bluefish.**

This alternative recognizes the difficulty of managing bluefish pursuant to the MFCMA through which regulations are enforceable in the FCZ and, through preemption, in the Territorial Sea, but not in internal waters. As discussed in Section VIII, significant portions of the bluefish catch come from areas other than the FCZ. This alternative would postpone implementation of management measures, other than permits and reporting, until such time as the States could cooperatively develop regulations which could then be incorporated in this Plan by amendment.

To the extent that this alternative could lead to overfishing, at least until such time as State regulations were implemented, it could have a negative environmental impact. Similar to alternative 1, this alternative could potentially result in a misallocation of the resource from the recreational fishery to the commercial fishery.

This alternative would achieve objective 1 but, at least in the short run, would not achieve objective 2.

### **3. Allow US fishermen unrestricted catches of bluefish, but impose a 14 inch (fork length) size limit.**

The difference between this alternative and the no action alternative (alternative 1) is the imposition of permitting and reporting requirements and the size limit. While objective 1 would be achieved, objective 2 might not be.

As discussed in Section VII, several States currently have bluefish size limits although they are considerably smaller than the limit proposed here. However, the 14" limit is felt necessary since bluefish first spawn about 2 years of age which is approximately equal to 14" (Wilk, 1977). It does not seem appropriate to propose a size limit that does not permit spawning at least once prior to capture.

Given the large number of participants in this fishery, a size limit could be rather difficult to enforce. The size limit could also create problems relative to certain gear types used in the fishery.

Similar to alternatives 1 and 2, this alternative could potentially result in a misallocation of the resource from the recreational fishery to the commercial fishery.

This alternative would allow continuation of the existing fishery with no constraint on growth except for the size limit. This would not enable the Council to control and/or prohibit rapid growth in the US fishery and would make it difficult to meet the objectives of the Plan. Should a sudden shift in effort occur, a Plan based on this alternative could not keep it in check. Given the improvements in bluefish product preservation and quality and ongoing efforts to open new markets, the likelihood of the latter is very real.

### **4. Restrict bluefish catches by commercial and recreational fishermen.**

MSY has been estimated to be from 90 to 119 million pounds (average 104 million pounds, see Section V-4). Under this alternative, the total desirable catch would be up to 104 million pounds, allocated between the commercial and recreational fisheries based on the 1979 catch distribution (12% commercial and 88% recreational, Table 6). The overall catch allocations would be further divided based on the latest available data into FCZ and non-FCZ recreational and commercial allocations. The sum of the FCZ allocations would be OY and the FCZ allocations would be quotas on the recreational and commercial fishermen. Foreign fishermen would not be permitted to retain bluefish since US fishermen have the capacity to achieve OY. There would be permitting and reporting requirements for party and charter boats and persons selling bluefish.

This alternative would achieve both objectives of the Plan. One of the Plan's objectives is to maintain the current distribution of the traditional uses of bluefish. In order for this to be insured, OY would be divided between the recreational and commercial fisheries based on the distribution of the catch in 1979, since the most reliable recreational catch estimates available are for that year.

Specific quotas would have the advantage of tighter control on the whole fishery but would involve high management costs and be complicated, if not impossible, to enforce. They might prohibit expansion or be excessively restrictive on some parts of the fishery.

Given the conditions under which the bluefish fishery is presently conducted and the Council's desire to maintain traditional uses of bluefish, some controls to limit expansion are needed. Strict quotas on all sectors of the fishery, however, appear to be excessive and unnecessary. At least some of the participants, namely the hook and line fishermen, use a method where self regulation is a result of the natural conditions in the fishery. Enforcement involving the recreational fishery would overtax NMFS present enforcement capabilities. Therefore, a total quota system seems inappropriate.

### **5. Allow US recreational fishermen unrestricted catches of bluefish and restrict commercial landings.**

This alternative is based on the assumption that the recreational fishery cannot bring the stock of bluefish

in the Atlantic to a point where it could no longer sustain stable production. In the recreational fishery, because it is dependent on abundance, as stock abundance decreases, effort would have to increase in order to maintain a constant removal rate. If abundance were reduced and bluefish became more difficult to catch, certain factors would most likely affect the recreational fishery which would tend to stop the decline. One of the most important factors should be the shift in angler interest to other species. This has frequently occurred in the past (Freeman, 1978) with other species such as weakfish and striped bass. Secondly, if anglers continued to attempt to catch bluefish, their time spent fishing and/or their numbers would have to continually increase as the population decreased in order for catch levels to remain constant. According to Radovich (1975) this increase may not be linear, that is, the catch-per-angler might be expected to decrease more rapidly than the fish population. This would reduce pressure on the stock. Finally, it is unlikely that the pressure on bluefish could be maintained at a level that would be required to continue the stock depletion given the multi-species aspect of the environment and the number of anglers necessary to put in sufficient fishing time. This condition of angler increase to the level necessary to continue the depletion seems unrealistic.

The commercial sector is expanding. Because of the efficiency of some of the commercial gears, this expansion, if uncontrolled, could lead to severe reductions in the abundance of bluefish. Such reductions would impact on the recreational fishery and make it difficult to meet both objectives of this Plan. Quotas on the commercial fishery appear to be required. Since recreational catches are sensitive to abundance, tying this quota to recreational catches is indirectly tying it to changes in abundance. While it is recognized that current environmental conditions determine, in part, current bluefish abundance, tying the quota to a previous year's recreational catch is justified because it is the best available indicator of current year conditions and abundance.

The closure provision likely would result in a negative impact on certain fishermen, since bluefish migrate from south to north. Fishermen in the south would have access to the fish before fishermen in the north. If southern catches grew significantly, it is probable that there would be closure in the commercial fishery so that vessels at the northern end of the range might be limited to bluefish bycatch.

The analysis in Section IX-1 (see Table 26), indicates that if low abundance values are used, forecasted commercial catches for 1981 and 1982 are 16.4% and 16.6% of the forecasted recreational catches for 1980 and 1981, respectively, relative to the Plan's 15% limit. Using the high abundance values, the commercial forecasts for 1981 and 1982 are 17.5% and 17.6% of the forecasted 1980 and 1981 recreational catches, respectively. The 18 million pound lower limit should not present a problem based on the current estimates (Table 26).

Restricting the FCZ commercial quota to up to 6% of the overall recreational catch or up to 7,200,000 pounds is considered reasonable given recent developments in the fishery as well as the Plan's objectives.

If this rule is applied to the fishery, 6% of the forecasted recreational catch for 1980, 1981, and 1982 range from 5.3 to 5.5 million pounds (Section IX-1). If we assume that the forecast of recreational catch is off by 5 million pounds, as it was in 1979, an additional .3 million pounds would be added to these figures.

Clearly, all of these estimates are under 7.2 million pounds, so the question becomes whether alternative 5 will constrain total catch. The FCZ fishery grew 31% in 1979, 22% in 1980, and 38% in 1981 to a level of 5.8 million pounds. The FCZ fishery must continue this remarkable growth for the next 3 years in order for the fishery to expand beyond 7.2 million pounds by 1985. Unless the total recreational fishery expands to over 120 million pounds, commercial expansion would be constrained by the 7.2 million pound quota, since it will be greater than 6% of the recreational catch of two years previous.

Because of the significant portion of the commercial catch which has consistently come from inside three miles, successful control of the total commercial fishery cannot be accomplished without the assistance of all the coastal States. However, management in the FCZ using Federal authority under the MFCMA is the only option available to the Council at this time. Since this alternative uses overall catches to develop the FCZ commercial quota, it is sensitive to the overall distribution of the stock.

## **6. Prohibit the use of purse seines and pair trawls in the directed commercial fishery for bluefish.**

Discussions during the development of this Plan have indicated that, because of cost considerations, the most likely gears to be used if a significant increase were to occur in the commercial fishery, e.g., the

development of an export fishery, are purse seines and pair trawls. These gear have been used to a very limited extent in the past in this fishery. In 1980, the Mid-Atlantic catches by these gears were less than 1% of the total Mid-Atlantic bluefish commercial catch (Table 11). In North Carolina, landings by these gears are minimal (Pers. comm., North Carolina Dept. of Natural Resources). Therefore, the impacts of this alternative upon the existing users of these gears are slight.

This alternative is defined as a modification of alternative 5, so it would include a commercial quota as specified in that alternative as well as permitting and reporting requirements.

This alternative is intended to directly address what is considered to be a significant problem with regard to achievement of objective 2. These gear types are so efficient in catching a schooling pelagic species such as bluefish that their use could result in a reduction in availability of bluefish and could change the balance in the traditional use of bluefish.

There is no assurance that other gears could not be substituted, which could allow a rapid expansion of the commercial catch.

**7. Restrict all gear except hook and line, conventional gill nets, traps, haul seines, and pound nets to conduct a directed fishery for bluefish in the FCZ.**

This alternative is based on the hypothesis that a fishery that could significantly harm the bluefish stock and substantially alter the historical balance in the fishery (between the commercial and recreational sectors) could be carried out effectively only with certain types of gear. It is also intended to address the enforceability problems associated with some of the other alternatives, particularly those based on quota management. Given the large portion of the fishery that takes place in the Territorial Sea and in internal waters, quota management could be frustrated by misreporting as well as by fishermen shifting their effort from the FCZ to areas where the Plan would have no effect, or at least no effect without preemption.

Unlike the other alternatives, alternative 7 does not make an explicit distinction between recreational and commercial user groups. It distinguishes two broad user groups according to gear utilized. The first group consists of all users of permissible gear, which are hook and line, conventional gill nets, traps, haul seines, and pound nets. The second user group are all the other gears that desire to direct on bluefish in the FCZ, such as purse seines, otter trawlers, etc. This alternative is based on the hypothesis that if a significant expansion were to occur, it would be due to this latter group. Recreational fishermen typically use only hook and line and these are a subset of the first group. Fishermen belonging to the second group will be allowed to fish in the FCZ under any of the following conditions: (1) they catch less than 100 pounds of bluefish per trip; (2) their total trip catch is less than 10% bluefish; or (3) they have a waiver from NMFS.

Alternative 7 is unlikely to cause significant impacts on this latter user group. For the Mid-Atlantic region, purse seines, pair trawls, mid-water and otter trawls have caught from 65% to 99% of the Region's FCZ catch over the past 5 years (Table 11). For the South Atlantic, the percentage share of the FCZ catch by these gears is probably higher since this region's landings are predominantly composed of the North Carolina offshore trawler fleet (Tables 3 and 12). This implies that almost all of the FCZ catch and revenue may be derived from these gears. If all of these gears were excluded from fishing in the FCZ (assuming that 40% of the 1982 forecast of the total commercial revenue is generated from the FCZ), these gears would lose approximately \$1 million, given existing markets. However, most of these revenues are due to the incidental catch of bluefish. North Carolina trawlers have average monthly catches that range from 5%-16% bluefish (Table 20). Therefore, very few vessels are significantly directing on bluefish and most of these landings would fall under the bycatch provisions of this alternative.

Alternative 7 also charges NMFS to maintain the historical catch distribution between recreational and commercial fishermen and between commercial fishermen operating in the South Atlantic, Middle Atlantic and New England regions. This alternative differs from alternatives 4 and 5 in that these latter alternatives propose strict quotas. This alternative only seeks to maintain the historical catch distribution between user groups and between regions through the use of the waiver system. The waiver system is flexible and relatively easy to enforce (see below).

As discussed above, the 80%-20% split between recreational fishermen and commercial fishermen leads to

an FCZ commercial fishing share of the total catch. Based on the 1982 forecasts of total landings, this leads to a potential commercial FCZ catch of almost 9 million pounds. The FCZ fishery has grown remarkably to a level of 5.8 million pounds in 1981, increasing 31% in 1979, 22% in 1980 and 38% in 1981, for an average of 30%. However, the fishery would have to maintain this remarkable growth for the next two years in order to approach this level. This growth will primarily depend on the relative price of bluefish to other species and the availability of alternative species such as flounder, sea trout, and croaker to the commercial fisherman. It appears that the large increase in the North Carolina bluefish catch during the past two years may have been tied closely to a reduced shrimp catch for the area. During 1982, shrimp landings increased and bluefish landings are apparently declining.

If the estimated 9 million pounds of FCZ catch is divided according to the average regional distribution for the years 1976 - 1981, South Atlantic fishermen have the greatest potential to be impacted. This leads approximately to a 1 million pound share for New England fishermen, a 3.3 million pound share for Mid-Atlantic fishermen, and a 5.1 million pound share for South Atlantic fishermen. In 1981, South Atlantic fishermen caught 4.0 million pounds of bluefish in the FCZ, a 35% increase over 1980 (Table 4). Since this region is the major source of growth in the overall fishery, this size share would appear to be constraining. However, the majority of the South Atlantic bluefish catch is essentially at bycatch rates and, therefore, the negative impacts of maintaining the historical balance probably will not be significant. At \$.20 per pound, the fishery would have the potential to maintain this 35% increase, or its equivalent, for the next three years before \$1 million in lost revenues would accrue. This is unlikely since the growth rate percentage for South Atlantic FCZ landings has decreased steadily since 1976. This trend indicates that future growth rates will be lower than 35%, (as discussed previously and in Section IX) especially if the availability of flounder, croaker, and sea trout increase in the South Atlantic, many fishermen will reduce their catch of bluefish. As of August 1982, North Carolina landings have decreased by 1.7 million pounds relative to August 1981, a 38% decrease.

A positive impact is that enforcement would be reasonably straight forward, at least relative to the quota management and size limit alternatives. Except for alternatives 1 and 6, alternative 7 may be the least costly alternative with respect to enforcement. As discussed earlier, few vessels are currently seeking total catches with a high proportion of bluefish (Table 20). If these vessels do want to direct on bluefish in the FCZ, they must have a NMFS waiver. This procedure will readily identify the universe of potential FCZ directed fisheries which greatly enhances enforcement. Of course, the penalty for not having a waiver must be sufficiently high that, when combined with the expected probability of being detected, potential violators are deterred. Furthermore, many of the states prohibit trawlers and purse seines from fishing within their waters (Section VII-4). As states cooperate and adopt compatible regulations to those in the FCZ, the need for at sea enforcement diminishes.

With respect to maintenance of the historical distribution of FCZ catch among the various Council regions, the distribution is not envisioned as strict area quotas and, therefore, only minimal enforcement cost is expected from this provision. The historical distribution is expected to be maintained through the issuance of the waivers with few waivers being granted in those regions where catch is close to the regional allocation of that year's OY, and with as many waivers as needed granted in those areas where the catch is below the historical level.

Another positive impact is that the management scheme could be readily used by the states in developing management plans for their waters.

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

It is the Council's conclusion that the bluefish fishery should be managed so as to maintain within limits the traditional uses of bluefish. Alternative 7 seems most likely to achieve the objectives of the Plan while resulting in the least amount of regulation possible.

##### **Beneficial Impacts**

Alternative 7 does not excessively restrict utilization of the stock by historical fishing methods.

It would not drastically restrict the way the commercial fishery has been carried out in the past.

It would not restrict the recreational fishery. The Council has determined through its objectives that bluefish should be managed primarily as a recreational fishery.

Bluefish is one of the most important recreationally caught species along the Atlantic coast of the United States. Its importance has increased in recent years as a result of an increase in the number of anglers, an apparent increase in abundance, and decreased abundance of other desired species such as striped bass (*Morone saxatilis*). Bluefish is the primary recreational species sought by fishermen, especially within the Mid-Atlantic Region, and by the party and charter boat industry. There are few readily available substitute recreational species that can support the industry as well as bluefish do. Bluefish, however, make up a very small percentage of total commercial landings of food finfish, squid, and shrimp. Commercial fishermen have a relatively greater number of species and alternatives to base their livelihoods upon. Only Virginia, New York, Delaware, and Florida have commercial landings of bluefish with ex-vessel values greater than 2% of their respective total state values of food finfish, squid, and shrimp. The level of exploitation, the availability of substitutes, and the level of recreational expenditures relative to commercial revenues are indicators that the economic surplus from recreational bluefish is large in comparison to commercial fishing. (Surplus is an economic term defined as the difference between the benefits of fishing and the costs incurred.) The value of the 1979 recreational fishery was estimated to be at least \$41 million, whereas commercial landings in 1979 totaled about \$2 million (Section IX-1). Therefore, it is reasonable to assume that the recreational catch of bluefish is a higher valued use of the resource and any expansion of the commercial fishery that leads to declining recreational catches is undesirable.

Since there are two distinct user groups, the management system is likely to produce differential impacts. The Council believes that recreational fishermen should receive the largest share of the resource. First, it is believed that recreational effort is not as effective as commercial effort and that this effort is highly responsive to changes in bluefish abundance. That is, if bluefish abundance declines, recreational effort is likely to decline more rapidly, because recreational fishermen will reduce their effort or switch to other more abundant species. To maintain constant catch levels would require increased fishing time and/or increased number of anglers. Maintaining constant catch levels while abundance is declining is unlikely since recreational effort is presumably strongly related to fishing success (Radovich, 1975). Therefore, it is unlikely that recreational fishermen can overexploit a stock like bluefish.

To restrict catches to lower levels under present conditions would be:

1. unnecessary, as long as the abundance of bluefish, which in recent years appears to have been above historical levels, remains up;
2. extremely costly to enforce, because of the large number of anglers throughout the US east coast and the large fraction of the sport catch that is taken in the Territorial Sea;
3. an imposition of a severe economic and social hardship on the recreational fishing industry (especially party and charter boats) since bluefish fishing provides a significant portion of this industry's total revenues; and
4. excessive from a management view in that the associated catch declines that would accompany a decline in abundance would prevent recreational fishing from severely depleting the stock.

Quotas would not be necessary. Although a fixed OY might allow an increase in the stock, this action seems unnecessary and excessive based on the data which indicate a high abundance and adequate recruitment. It would not have the complications associated with quota management, that is, allocations to user groups or geographical area.

Since the proposed TALFF is the same as that in the PMP, where foreign fishermen are not permitted to retain bluefish, it represents no change in impact on the foreign fishery. The Council recognizes that, even though no directed foreign fishing for bluefish will be allowed, some fishing mortality from foreign fleets will still occur because foreign vessels catch bluefish incidentally to other species for which they have been given allocations. This means that foreign fleets will continue to capture bluefish incidentally, but will not be allowed to retain such catches. Although this will result in some mortality to this species, this level of catch has historically been such that it will not have a negative impact on the stock.

The reporting requirements will allow the understanding of the stock to increase and subsequent management to be carried out from a much stronger data base.

One of the most significant problems with regard to management of the bluefish fishery is the significant



portion of the catch (commercial and recreational) taken from the Territorial Sea and internal waters. The MFCMA provides only for regulation within the FCZ. It also provides that Federal authority may preempt state authority in the Territorial Sea (but not in internal waters) if state action (or inaction) "substantially and adversely" affects implementation of a plan. Section 306(b)(1) of the MFCMA states:

"If the Secretary finds, after notice and an opportunity for a hearing in accordance with Section 554 of title 5, United States Code, that (A) the fishing in a fishery, which is covered by a fishery management plan implemented under this Act, is engaged in predominately within the fishery conservation zone and beyond such zone; and (B) any State has taken any action, or omitted to take any action, the results of which will substantially and adversely affect the carrying out of such fishery management plan; the Secretary shall promptly notify such State and the appropriate Council of such finding and of his intention to regulate the applicable fishery within the boundaries of such State (other than its internal waters), pursuant to such fishery management plan and the regulations promulgated to implement such plan."

It would be difficult to effectively preempt in the bluefish fishery because of the large share of the catch taken from waters inshore of the FCZ. Even if preemption were possible, the large share of the fishery that takes place in internal waters would be exempt from preemption and, therefore, not subject to Plan regulation. The only long-term solution to this problem is for the States to develop bluefish management programs supportive of this Plan. The ASMFC has agreed to honor the Council's request to consider the preparation of a bluefish plan for internal waters.

The recommended alternative is based on the position that management cannot wait until the several States can develop and implement appropriate management measures. Rather, it permits management to proceed in the best form possible in the FCZ until such time as overall management is in effect. Further, it should not be difficult for the states to develop management schemes compatible with the preferred alternative.

Another positive impact is that many of the states already have gear prohibitions or regulations (Section VII-4).

### **Adverse Impacts**

The lack of a maximum catch limit could result in a negative impact if catches increased to levels significantly in excess of MSY. The most recent bluefish stock assessment (Anderson, 1980) indicates that the total bluefish stock size is at a relatively high level of abundance. Indices of abundance have remained relatively steady since 1971. Current catch levels, however, may not be sustainable and may result in a decline from present high levels of abundance to levels of earlier years. If this problem became significant, it would be necessary to amend the Plan.

The alternative could have an adverse impact on anyone desiring to increase significantly the use of the restricted gear types.

### **Tradeoffs**

The benefits of the preferred alternative are essentially limited controls on the fishery, simplicity of management, collection of needed data and information for future management, and adaptability for state regulation. This must be balanced against the lack of control on overall harvests and the negative impact on certain gear types. The benefits appear to outweigh the negative impacts. If stock problems develop, it will be necessary to examine the fishery at that time and amend the Plan as necessary. Limiting the growth of certain sectors is necessary to achieve the objectives of the Plan and it is the Council's conclusion that the preferred alternative accomplishes this end while minimizing the associated negative impacts.

### **The Recommended Alternative Relative to Plan Objectives**

#### **1. Increase understanding of the condition of the stock and fishery.**

The permitting and reporting requirements of the recommended alternative, along with the recommended research activities, will work to meet this objective.

2. **Provide the highest availability of bluefish to US recreational fishermen by maintaining, within limits, traditional uses of bluefish, recognizing some natural stock fluctuations are inevitable.**

The recommended alternative meets this objective by restricting the use of certain gear types, thus assuring the historical balance is maintained with the minimum possible regulation on the fishery.

### **The Recommended Alternative Relative to the National Standards**

Section 301(a) of the MFCMA states: "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 Plan meets them:

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

The recommended alternative is designed to prevent radical reductions in the bluefish stock. The jurisdictional issues involved with bluefish management, i.e., federal control in the FCZ and state control in the Territorial Sea and internal waters, make it impossible to guarantee that there will not be overfishing. The management measures in the preferred alternative should minimize the chances of overfishing the extent possible at this time and result in OY being achieved.

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

This Plan is based on the best and most recent scientific information.

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 Plan does not manage bluefish throughout its range in the Atlantic. Available data indicate that the Gulf of Mexico population is separate. Management throughout the range of the stock in the Atlantic is not possible at this time because of the jurisdictional problems discussed earlier. The MFCMA limits Federal jurisdiction to the FCZ, which is why the management unit of the Plan is the FCZ. However, the preferred alternative provides for the development of a management system for the total fishery. The result is a system that is workable for the FCZ while also providing a basis for management in non-FCZ waters (Territorial Sea and internal waters) that the states are encouraged to use to manage the fishery in their waters in a manner compatible with Federal management in the FCZ.

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 bluefish used in this Plan include expected catches by all fishermen (sport and commercial) in all affected coastal States. Thus, although bluefish 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 Plan. The permit system for the restricted gear types is designed to take into account historical catches in all areas by all fishery sectors.

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 bluefish near OY, no economic inefficiencies due to surplus investment or fishing effort, or similar considerations, should result from the provisions of this Plan.

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



This Plan and the allocations described herein take into account possible fluctuations in species abundance and expected trends in US demand for bluefish.

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

The management measures outlined in this Plan are consistent with and complement, but do not duplicate, management measures contained in other plans.

**XII-5. Specification of Optimum Yield**

OY is all bluefish caught by US fishermen in the western Atlantic FCZ, excluding the Gulf of Mexico, pursuant to this Plan. This represents the best present balance between the Council's desires to (a) ensure continuation of present levels of bluefish abundance, (b) accommodate the full capacities of the US recreational and commercial fisheries to harvest this species, (c) provide a workable management system, and (d) enhance the development of state management systems compatible with this Plan. Since, by definition, US fishermen will use the entire OY, there is no TALFF.

The recommended alternative proposes an OY based on the best information currently available and estimated economic and social impacts of various catch levels to the US fisheries. The MSY for bluefish has been estimated at 90 - 119 million pounds (Section V-4). US harvest at this level on an annual basis presupposes annual levels of recruitment similar to those observed in most of the last several years. Although the relationship between spawning stock size and recruitment is unknown (and may be affected by environmental fluctuations), it is probable that at high levels of abundance, as has recently been the case, there is a reasonable likelihood of successful recruitment. Thus, analyses within the Plan include the assumption that the present spawning stock size is adequate to insure sufficient recruitment.

The Council recognizes that this Plan does not preclude the possibility of catches in excess of the estimated MSY. However, given the high level of present abundance indicated by the scientific evidence available, such catches should not have a detrimental effect on the stock in the near future. If such catches are sustained there may be a decline in abundance which would result in a review of the Plan and possible amendment to it. However, we do not feel the catch rate would continue at a high rate if the stocks decrease due to the large percentage of recreational catch which depends on numbers of fish for a satisfactory catch ratio.

US fishermen using hook and line, conventional gill nets, traps, haul seines, and pound nets to conduct a directed fishery for bluefish in the FCZ are allowed to harvest bluefish without limit. The use of all other gear to conduct a directed fishery for bluefish in the FCZ is prohibited unless a waiver of the prohibition were granted by NMFS.

NMFS may grant waivers to the gear prohibition if it is consistent with the objectives of the Plan, that is, that it provided the highest availability of bluefish to US recreational fishermen while maintaining, within limits, traditional uses of bluefish. Specifically, NMFS is required to attempt to maintain the historical catch distribution in granting such waivers, both between sectors (8% of the total catch for the FCZ commercial fishery) and geographically (11% of the FCZ commercial catch landed in New England, 37% of the FCZ commercial catch landed in the Mid-Atlantic, and 52% of the FCZ commercial catch landed in the South Atlantic). It is recognized that these relationships cannot be maintained absolutely, but it is the Council's intent that NMFS grant waivers for the use of the restricted gear types so as to minimize the chances of major changes in these relationships. NMFS is allowed to specify the amount of bluefish that may be caught with permits granted through waivers.

The catch distribution was arrived at by examining historical data. The distribution between the recreational and commercial fisheries has been about 88% and 12%, respectively (Table 6). In order to provide some growth for the commercial fishery while still protecting the recreational fishery, it was determined to use a distribution of 80% recreational and 20% commercial. In 1981, the FCZ commercial fishery accounted for 37% of the total commercial catch. This was adjusted to 40%. If that 40% is applied to the overall 20% commercial share, the result is that the FCZ commercial fishery share is 8% of the total catch. The geographical distribution of the FCZ commercial catch (11% New England, 37% Mid-Atlantic, and 52% South Atlantic) is the average distribution for 1976-1981 (Table 4).

In order to provide a basis for granting any waivers to the gear prohibition, it is necessary to annually

estimate landings. NMFS, in consultation with the Council, prior to the beginning of each year, is required to project the total bluefish catch, recreational catch, catch by the permitted gear types (hook and line, conventional gill nets, traps, haul seines, and pound nets) and bluefish bycatch in fisheries using the prohibited gear types. From these projections, the amount of bluefish available for catch by the prohibited gear types could be estimated, thus providing a basis for granting waivers from the gear prohibition.

NMFS is required to establish the procedures for the waiver system. As guidance in that regard, it is suggested that persons desiring to obtain waivers from the gear prohibition file their applications by a particular date prior to the beginning of the fishing year. All of those applications could be evaluated together relative to the specified criteria with appropriate decisions made prior to the beginning of the fishing year on 1 January. Fishermen could be required to specify the amount of bluefish they caught in the most recent year using the gear for which a waiver is being sought and the amount of bluefish requested to be harvested with the waiver. NMFS could evaluate these applications against the amount of bluefish available for harvest by the prohibited gear types. This would be done through a series of iterations, initially giving all fishermen what they caught in the most recent year. If there is not enough bluefish available, all fishermen would be reduced a proportional amount. If there is any left, it could be granted to those fishermen who want an increase. If there is any left after that, it would be saved for applications submitted later in the year. Applications could be considered after that date, i.e., any time during the year, but such applications would necessarily be evaluated in light of waivers previously granted.

Bluefish can be a bycatch in other fisheries. Therefore, incidental catches of bluefish in directed fisheries for other species by fishermen without waivers using gear other than hook and line, conventional gill nets, traps, haul seines, and pound nets is limited to 10% of the total catch on board a vessel at the end of a fishing trip.

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

#### **XIII-1. Permits and Fees**

Any owner or operator of a vessel desiring to take any bluefish within the FCZ, or transport or deliver for sale, any bluefish taken within the FCZ must obtain a permit for that purpose. This does not apply to recreational fishermen taking bluefish for their personal use, but it does apply to the owners of party and charter boats (vessels for hire). Vessels are exempt from this requirement if they catch no more than 100 pounds of bluefish per trip.

The owner or operator of a US vessel may obtain the appropriate permit by furnishing on the form provided by NMFS information specifying, at least, the names and addresses of the vessel owner and master, the name of the vessel, official number, directed fishery or fisheries, gear type or types, gross tonnage of vessel, crew size including captain, fish hold capacity (to the nearest 100 pounds), and the home port of the vessel. Applications for vessels using gear other than hook and line, conventional gill nets, traps, haul seines, and pound nets must also specify the amount of bluefish desired to be harvested on an annual basis.

Permits of vessels fishing with hook and line, conventional gill nets, traps, haul seines, and pound nets would be granted automatically.

Permits for vessels using other gear types would be evaluated by NMFS to determine whether granting such waivers to the gear prohibition would be in accordance with the objectives of the Plan to provide the highest availability of bluefish to US recreational fishermen while maintaining, within limits, traditional uses of bluefish. Specifically, NMFS would be required to attempt to maintain the historic catch distribution in granting such waivers, both between sectors (8% of the total catch for the FCZ commercial fishery) and geographically (11% of the FCZ commercial catch landed in New England, 37% of the FCZ commercial catch landed in the Mid-Atlantic, and 52% of the FCZ commercial catch landed in the South Atlantic, Table 4). It is recognized that these relationships cannot be maintained absolutely, but it is the Council's intent that NMFS grant waivers for the use of the restricted gear types so as to minimize the chances of major changes in these relationships. NMFS would be allowed to specify the amount of bluefish that could be caught with permits granted through waivers.

The permit must be carried, at all times, on board the vessel for which it is issued, mounted clearly in the pilothouse of such vessel, and such permit, the vessel, its gear and equipment and catch shall be subject to inspection by an authorized official. Permits may be revoked by NMFS for violations of this Plan.

Each US fishing vessel shall display its official number on the deckhouse or hull and on an appropriate weather deck in a manner established by NMFS. Fishing vessel means any boat, ship or other craft which is used for, equipped to be used for, or of a type which is normally used for, fishing, except a scientific research vessel. For the purpose of this regulation, fishing vessel includes vessels carrying fishing parties on a per capita basis or by charter which catch bluefish for any use.

Vessels fishing pursuant to this Plan are subject to the sanctions provided in the MFCMA.

### **XIII-2. Time and Area Restrictions**

None are proposed.

### **XIII-3. Catch Limitations**

The fishing year is the twelve (12) month period beginning 1 January.

OY is all bluefish caught by US fishermen in the western Atlantic FCZ, excluding the Gulf of Mexico, pursuant to this Plan. Since, by definition, US fishermen will use the entire OY, TALFF equals 0.

US fishermen using hook and line, conventional gill nets, traps, haul seines, and pound nets to conduct a directed fishery for bluefish in the FCZ are allowed to harvest bluefish without limit. The use of all other gear to conduct a directed fishery for bluefish in the FCZ is prohibited unless a waiver of the prohibition were granted by NMFS.

NMFS may grant waivers to the gear prohibition if it is consistent with the objectives of the Plan, that is, that it provided the highest availability of bluefish to US recreational fishermen while maintaining, within limits, traditional uses of bluefish. Specifically, NMFS is required to attempt to maintain the historical catch distribution in granting such waivers, both between sectors (8% of the total catch for the FCZ commercial fishery) and geographically (11% of the FCZ commercial catch landed in New England, 37% of the FCZ commercial catch landed in the Mid-Atlantic, and 52% of the FCZ commercial catch landed in the South Atlantic). It is recognized that these relationships cannot be maintained absolutely, but it is the Council's intent that NMFS grant waivers for the use of the restricted gear types so as to minimize the chances of major changes in these relationships. NMFS is allowed to specify the amount of bluefish that may be caught with permits granted through waivers.

The catch distribution was arrived at by examining historical data. The distribution between the recreational and commercial fisheries has been about 88% and 12%, respectively (Table 6). In order to provide some growth for the commercial fishery while still protecting the recreational fishery, it was determined to use a distribution of 80% recreational and 20% commercial. In 1981, the FCZ commercial fishery accounted for 37% of the total commercial catch. This was adjusted to 40%. If that 40% is applied to the overall 20% commercial share, the result is that the FCZ commercial fishery share is 8% of the total catch. The geographical distribution of the FCZ commercial catch (11% New England, 37% Mid-Atlantic, and 52% South Atlantic) is the average distribution for 1976-1981 (Table 4).

In order to provide a basis for granting any waivers to the gear prohibition, it is necessary to annually estimate landings. NMFS, in consultation with the Council, prior to the beginning of each year, is required to project the total bluefish catch, recreational catch, catch by the permitted gear types (hook and line, conventional gill nets, traps, haul seines, and pound nets) and bluefish bycatch in fisheries using the prohibited gear types. From these projections, the amount of bluefish available for catch by the prohibited gear types could be estimated, thus providing a basis for granting waivers from the gear prohibition.

NMFS is required to establish the procedures for the waiver system. As guidance in that regard, it is suggested that persons desiring to obtain waivers from the gear prohibition file their applications by a particular date prior to the beginning of the fishing year. All of those applications could be evaluated together relative to the specified criteria with appropriate decisions made prior to the beginning of the fishing year on 1 January. Fishermen could be required to specify the amount of bluefish they caught in

the most recent year using the gear for which a waiver is being sought and the amount of bluefish requested to be harvested with the waiver. NMFS could evaluate these applications against the amount of bluefish available for harvest by the prohibited gear types. This would be done through a series of iterations, initially giving all fishermen what they caught in the most recent year. If there is not enough bluefish available, all fishermen would be reduced a proportional amount. If there is any left, it could be granted to those fishermen who want an increase. If there is any left after that, it would be saved for applications submitted later in the year. Applications could be considered after that date, i.e., any time during the year, but such applications would necessarily be evaluated in light of waivers previously granted.

#### **XIII-4. Types of Gear**

Hook and line, conventional gill nets, traps, haul seines, and pound nets may be used without restriction to conduct a directed fishery for bluefish in the FCZ. All other gear are prohibited. Prohibited gear may be used for a directed bluefish fishery in the FCZ if a waiver of this provision is obtained from NMFS.

#### **XIII-5. Incidental Catch**

Incidental catches of bluefish in directed fisheries for other species by US fishermen without waivers using gear other than hook and line, conventional gill nets, traps, haul seines, and pound nets is limited to 10% of the total catch on board a vessel at the end of a fishing trip.

Foreign nations catching bluefish shall be subject to the incidental catch regulations set forth in 50 CFR 611.13, 611.14, and 611.50.

#### **XIII-6. Restrictions**

No foreign fishing vessel shall conduct a fishery for bluefish.

The possession by any person, firm, or corporation of bluefish taken from the FCZ which such person, firm, or corporation knows, or should have known, to have been taken by a vessel of the US without a required valid permit is prohibited.

#### **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. It is mindful of its responsibility under the MFCMA to take into account the impact of pollution on fish. The extremely substantial quantity of pollutants which are being introduced into the Atlantic Ocean pose 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 MFCMA 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 rivers, harbors, and other areas; (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 waste of any kind, industrial or domestic, into rivers or surrounding marine and estuarine waters. Particular emphasis should be placed on the effects of PCB discharges and re-distribution through dredge spoils.

#### **XIII-8. Development of Fishery Resources**

No governmental assistance is needed at this time.

#### **XIII-9. Management Costs and Revenues**

Costs to develop and implement this Plan are estimated as follows:

Council development	\$
Council implementation (monitoring)	*
NMFS data collection and enforcement	*

NMFS Northeast Region administration	*
NMFS Washington Office administration	*
<u>Federal Register</u> publications	*
US Coast Guard costs	*
TOTAL	

\* Data to be developed and submitted by NMFS and Coast Guard, as appropriate.

#### **XIV. SPECIFICATIONS AND SOURCES OF PERTINENT FISHERY DATA**

##### **XIV-1. General**

The following requirements are recommended in order for the Councils and NMFS to acquire accurate data on the overall catch, bluefish catch, disposition of such catch, and effort in the fishery. These data reporting requirements are necessary to manage the fishery for the maximum benefit of the US. It is necessary that reporting be as comprehensive as possible and should include internal waters, the Territorial Sea, and FCZ. The following suggestions are designed to meet this need. If it is determined that the Secretary does not have the authority to mandate reporting of catches from internal waters and the Territorial Sea, alternative methods of securing these data must be developed. In addition, methods must be developed and implemented by the Secretary on a continuing basis to obtain data on the catch of marine anglers who, based on the recommendations below, are not required to maintain logs.

It is necessary that appropriate data be collected both to support the management system of the preferred alternative and to provide a basis for future refinements of the Plan.

The preferred alternative requires that annual estimates of the recreational catch, the catch by permitted gear types, and bycatch by restricted gear types be made to provide a basis for granting waivers for directed fisheries using restricted gear. To make these estimates it will be necessary to have at least current data on the recreational catch, commercial landings using the permitted gear types, commercial landings using restricted gear without waivers (bycatch), and commercial landings using gear for which waivers have been granted. These data should be tabulated on a monthly basis in order to facilitate making the required estimates.

To provide for refinements to the Plan, it is necessary that catch and effort data for both the commercial and recreational fisheries are available, along with biological samples from both fisheries. These data will supplement data from NEFC surveys to provide the basis for stock assessments.

The preferred alternative includes a logbook requirement as set forth in Section XIV-2, but provides that NMFS may remove that requirement when alternative methods of obtaining the necessary data are implemented.

##### **XIV-2. Domestic and Foreign Fishermen**

###### **Domestic Fishermen**

For a permitted vessel taking bluefish either directly or incidentally, the owner or master of such vessel must maintain on a daily basis an accurate report of fishing operations showing at least date, type and size of gear used, locality fished, duration of fishing time, time of gear set, and the estimated weight in pounds of each species taken for those operations in which bluefish were taken. These trip reports shall be available for inspection by any authorized official, including (1) any commissioned, warrant, or petty officer of the Coast Guard, (2) any certified enforcement or special agent of NMFS, (3) any officer designated by the head of any Federal or State agency which has entered into an agreement with the Secretary of Commerce or the Secretary of Transportation to enforce the Act, or (4) any Coast Guard personnel accompanying and acting under the direction of any person described in category (1), and shall be presented for examination and subsequent return to the owner or master of the vessel upon proper demand by such authorized official at any time during or at the completion of a fishing trip. Such required documentation will be maintained by the owner or master of the vessel at least one year subsequent to the date of the last entry in the logbook. Copies of all trip report forms will be submitted weekly to an authorized official or designated agent of NMFS.

All data received under this section shall be kept strictly confidential and shall be released in aggregate statistical form without individual identification as to its source, except to the extent that the use of trip

report information is required to enforce this Plan, or required to monitor the effects of the Plan and the preparation of Amendments.

### **Foreign Fishermen**

Foreign fishermen will be subject to the reporting and recordkeeping requirements in 50 CFR 611.50(d).

### **XIV-3. Processors**

All persons, individuals, firms, corporations, or business associations, at any port or place in the US, that buy and/or receive bluefish from registered US flag vessels shall keep accurate records of all transactions involving bluefish on forms supplied by NMFS. These records will be submitted monthly to NMFS. Records will show at least the name of the vessel or common carrier bluefish was received from, date of transaction, amount of bluefish received, price paid, capacity to process bluefish, and the amount of that capacity actually used.

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

### **XV-1. Fishery Management Plans**

This Plan is related to other plans to the extent that all fisheries of the northwest Atlantic are part of the same general geophysical, biological, social, and economic setting. US fishermen 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 on other fisheries by causing transfers of fishing effort.

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.

### **XV-2. Treaties or International Agreements**

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

### **XV-3. Federal Laws and Policies**

The only Federal Law that controls the fishery covered by this Plan is the MFCMA.

### **Marine Sanctuary and Other Special Management Systems**

There are four national marine sanctuaries in the area covered by the Plan: Monitor National Marine Sanctuary off North Carolina, Gray's Reef National Marine Sanctuary off Georgia, Key Largo Coral Reef National Marine Sanctuary off Key Largo, Florida, and Looe Key Coral Reef National Marine Sanctuary off Big Pine Key, Florida.

The USS Monitor Marine Sanctuary was officially established on January 30, 1975, under the Marine Protection, Research, and Sanctuaries Act of 1972. Rules and regulations have been issued for the Sanctuary (15 CFR 924). They prohibit deploying any equipment in the Sanctuary, fishing activities which involve "anchoring in any manner, stopping, remaining, or drifting without power at any time" (924.3 (a)), and "trawling" (924.3(h)). The Sanctuary's position off the coast of North Carolina at 35°00'23"N, 75°24'32"W is located in the Plan's designated management area. The Monitor Marine Sanctuary is clearly designated on all National Ocean Survey charts by the caption "protected area". This minimizes the potential for damage to the Sanctuary by fishing operations.

The Gray's Reef Sanctuary includes all waters bounded within a rectangle starting at 31°21'45"N, 80°55'17"W, to 31°25'15"N, 80°55'17"W, to 31°25'15"N, 80°49'42"W, to 31°21'45"N, 80°49'42"W, thence back to the point of origin. Regulations governing the Sanctuary appear as 15 CFR 938 (46 FR 7944, 26 January 1981). They require permits for certain fishing activities including wire trap fishing, bottom trawling, and specimen dredging.

The boundary of the Key Largo Sanctuary begins at 25°19.45'N, 80°12.0'W (that point being the northeast boundary corner of John Pennekamp Coral Reef State Park), thence southeasterly to 25°16.2'N, 80°8.7'W, thence southwesterly to 25°7.5'N, 80°12.5'W, thence southwesterly to 24°58.3'N, 80°19.8'W, thence northwesterly to 25°2.2'N, 80°25.25'W (that point being the southeast boundary corner of John Pennekamp Coral Reef State Park), thence in a northeasterly direction along the easterly boundary of the State Park to the point of origin. Regulations governing the Sanctuary appear as 15 CFR 929. Hook and line fishing is the only fishery permitted in the Sanctuary.

The Looe Key Sanctuary has the following boundary coordinates: 24°31'37"N, 81°26'00"W; 24°33'34"N, 81°26'00"W; 24°34'09"N, 81°23'00"W; and 24°32'12"N, 81°23'00"W and thence back to the point of origin. Regulations governing the Sanctuary appear as 15 CFR 937 (46 FR 7949, 26 January 1981). The use of wire fish traps is prohibited in the Sanctuary and lobster traps are prohibited in the Fore Reef area of the Sanctuary.

Details on sanctuary regulations may be obtained from the Director, Sanctuary Programs Office, Office of Coastal Zone Management, NOAA, 3300 Whitehaven Street NW, Washington, D.C. 20235.

### **Potential Impact on Marine Mammals and Endangered Species**

Numerous species of marine mammals and sea turtles occur in the northwest Atlantic Ocean. The most recent comprehensive survey in this region was done in 1979 by the Cetacean and Turtle Assessment Program (CeTap), at the University of Rhode Island (University of Rhode Island, 1981), under contract to the Bureau of Land Management (BLM), Department of the Interior. The following is a summary of some of the information gathered in that study, which covered the area from Cape Sable, Nova Scotia, to Cape Hatteras, North Carolina, from the coastline to 5 nautical miles seaward of the 1000 fathom isobath.

Twenty one cetaceans and the 4 turtle species were encountered in the 1979 survey (Table 28). Also presented in Table 28 are the study team's "estimated minimum population number" for the area, if calculated, and those species currently included under the Endangered Species Act. All information is preliminary.

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

Loggerhead turtles were found throughout the study area, but appear to migrate north to about Massachusetts in summer and south in winter. Leatherbacks appear to have a more northerly distribution. The study team hypothesized a "northward migration in the Gulf Stream with a southward return in continental shelf waters nearer to shore." Both species usually were found "over the shoreward half of the slope" and in depths less than 200 feet. No live green or Kemp's ridley turtles were found, and the latter's population has been estimated at only about 500 adults. The study area may be important for sea turtle feeding or migrations, but the nesting areas for these species generally are in the South Atlantic and Gulf of Mexico.

The only other endangered species occurring in the northwest Atlantic is the shortnose sturgeon (*Acipenser brevirostrum*). The Council urges fishermen to report any incidental catches of this species to the NMFS Shortnose Sturgeon Recovery Program.

The range of bluefish and the above marine mammals and endangered species overlap to a large degree, and there always exists a potential for an incidental kill. Except in unique situations (e.g., tuna-porpoise in the central Pacific), such accidental catches should have a negligible impact on marine mammal/endangered species abundances, and the Council does not believe that implementation of this Plan will have any adverse impact upon these populations. As additional information on this subject becomes available, it will be integrated into future Amendments to this Plan.



The regulation of commercial landings by this Plan should reduce the potential for the capture of endangered species.

### **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, no major conflicts have been identified to date. The Council, through involvement in the Intergovernmental Planning Program of the BLM monitors OCS activities and has opportunity to comment and to advise BLM of the Council's activities. Certainly, the potential for conflict exists if communication between interests is not maintained or appreciation of each other's efforts is lacking. Potential conflicts include, from a fishery management position: (1) exclusion areas, (2) adverse impacts to sensitive biologically important areas, (3) oil contamination, (4) substrate hazards to conventional fishing gear, and (5) competition for crews and harbor space. The Council is unaware of pending deep water port plans which would directly impact offshore fishery management goals in the areas under consideration, and is unaware 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 are known to control the fishery that is the subject of this Plan other than those listed in Section VII-4.

#### **Coastal Zone Management (CZM) Programs**

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, State CZM programs will probably assimilate the ecological principles upon which this Plan is based. It is recognized that responsible management of both coastal zones and fish stocks must involve mutually supportive goals. States in the region with approved CZM programs are Maine, Massachusetts, Rhode Island, Connecticut, New Jersey, Delaware, Maryland, and North Carolina. Copies of this Plan have been submitted to states with CZM programs for a determination of consistency. Available approved CZM programs have been reviewed relative to this Plan by the Council and no inconsistencies have been identified.

### **XVI. COUNCIL REVIEW AND MONITORING OF THE PLAN**

The Council will review the Plan annually. The management system in the Plan requires that NMFS Marine Recreational Fishery Statistics Survey, or an equivalent means of obtaining angler catch and effort data and biological samples of the recreational catch, be carried out on a continuing basis. In addition, data on the commercial fishery must be collected. Specifically, the data specified in Section XIV must be collected.

Additionally, improved stock assessments are necessary for Plan monitoring so that Plan amendments can be prepared in a timely manner.

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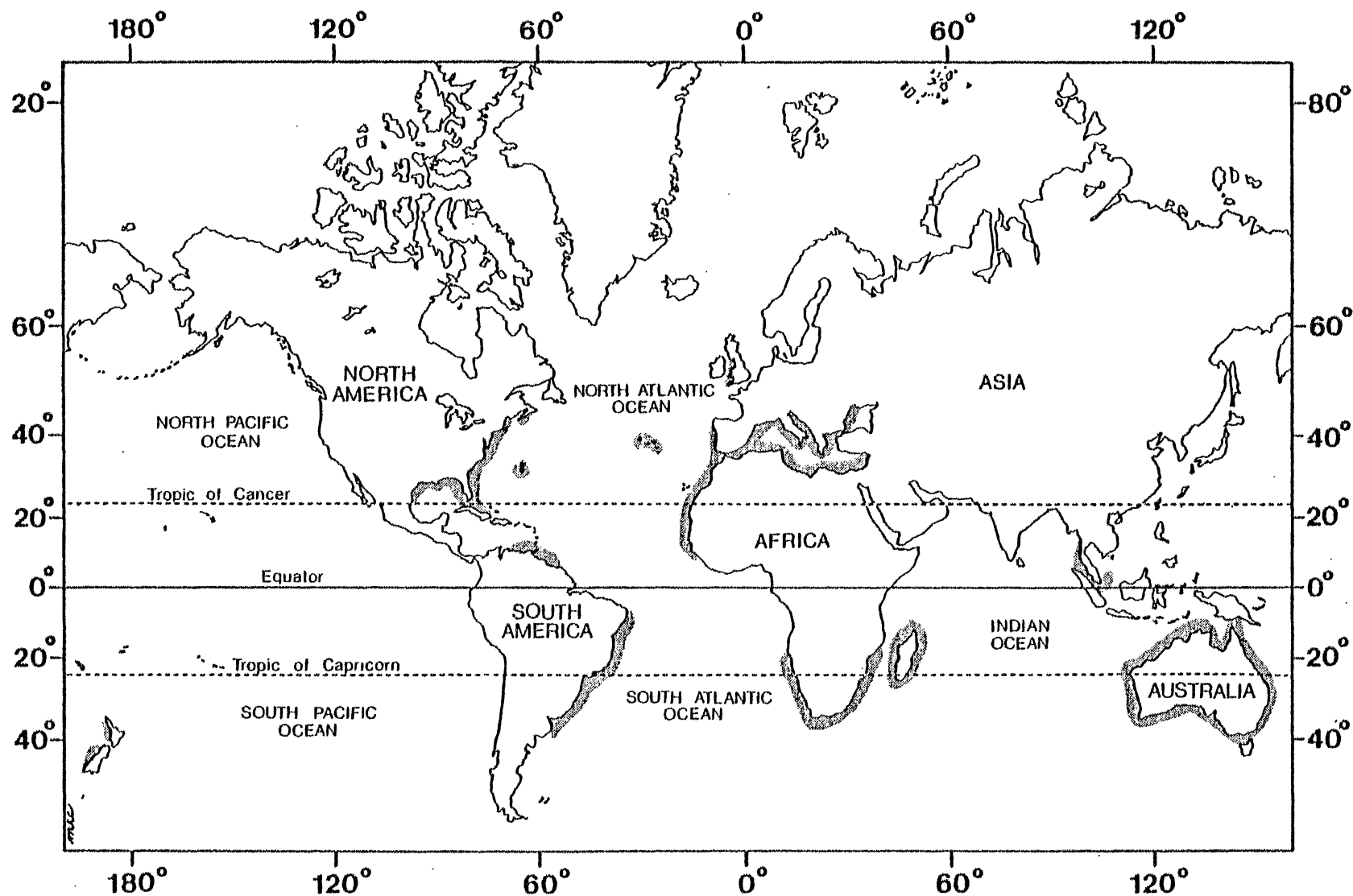


Figure 1

World Distribution Of Bluefish, *Pomatomus saltatrix*, As Reported In Literature (from Wilk, 1977)

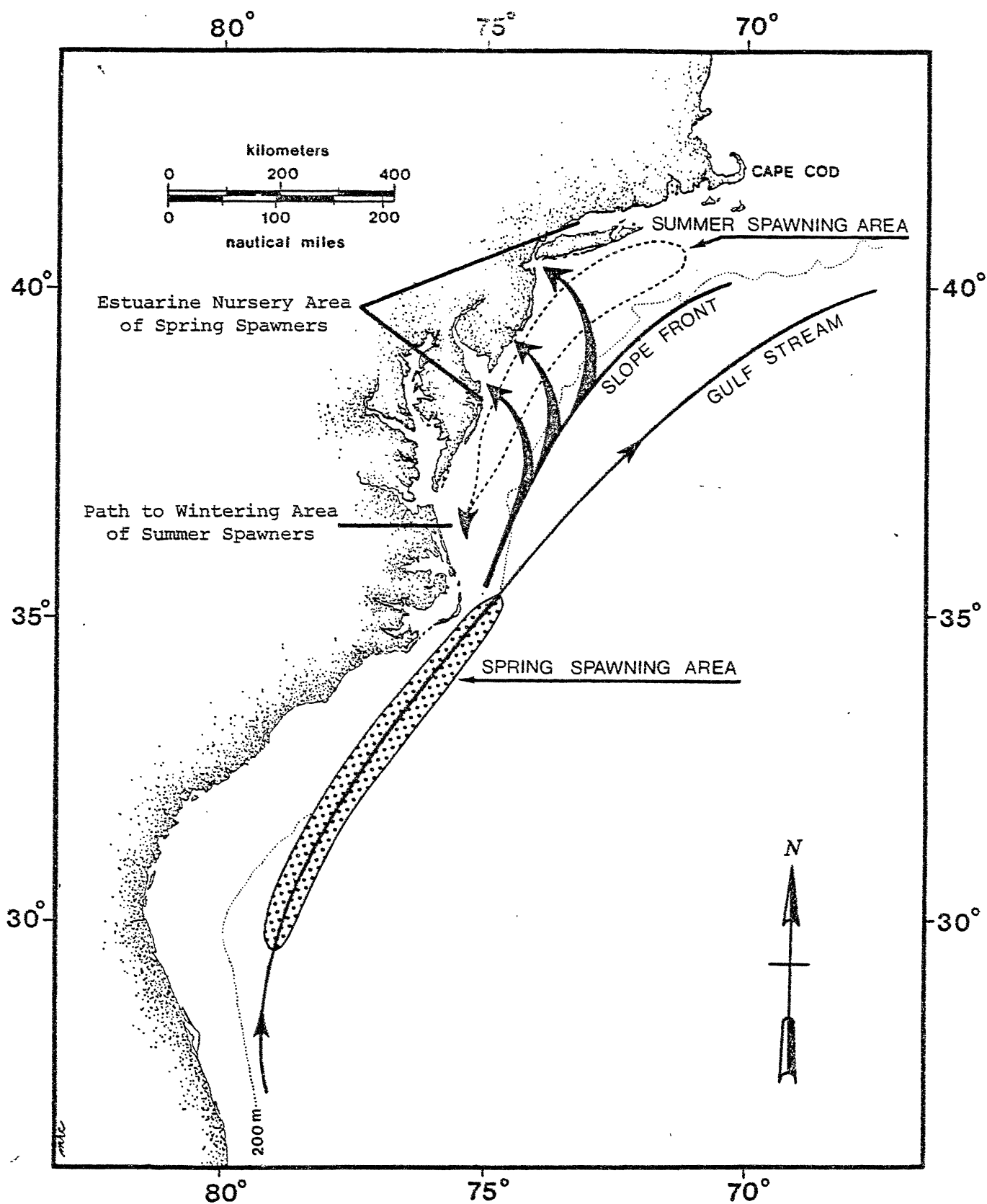
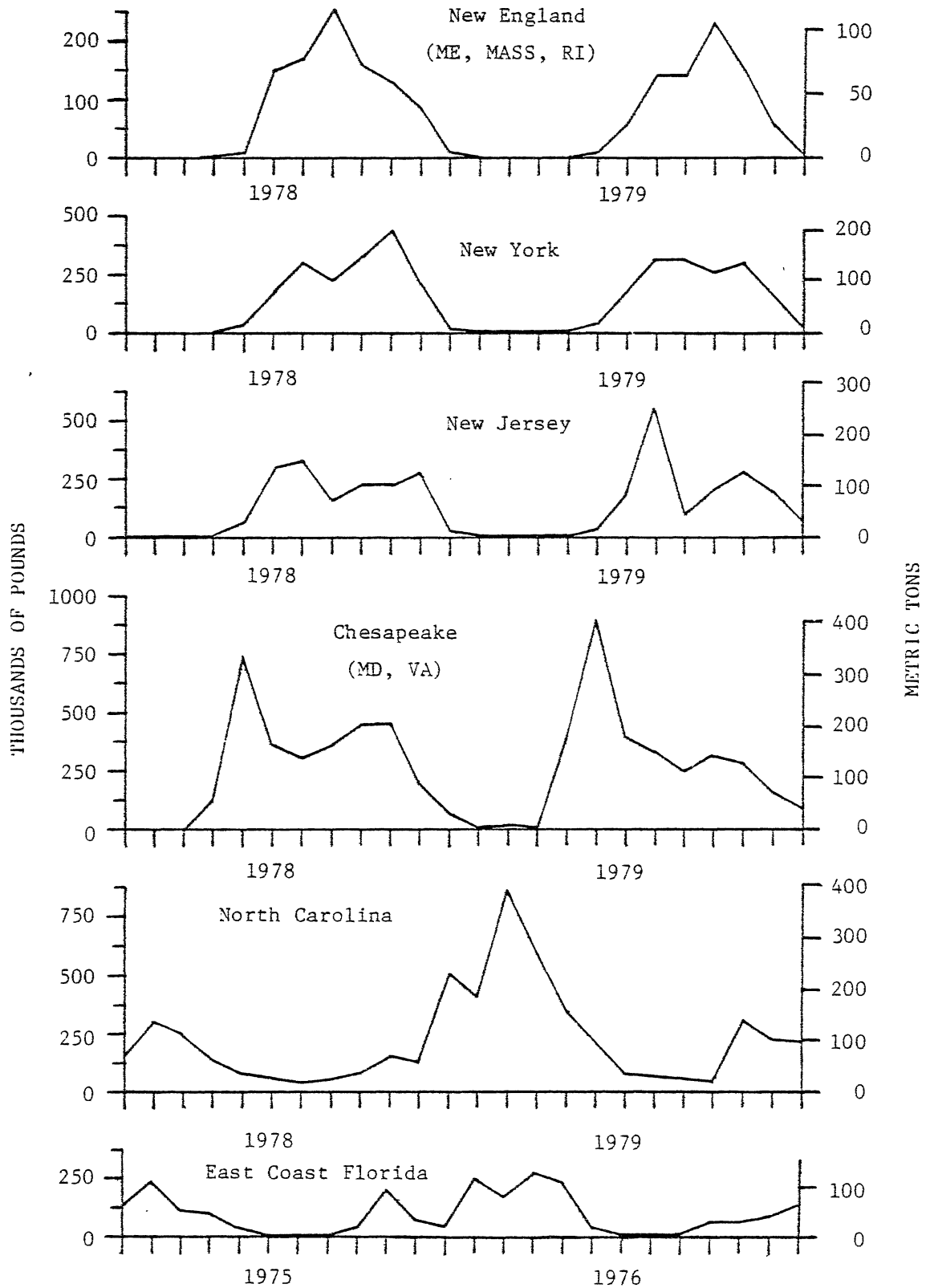


Figure 2  
Diagrammatic Representation Of Bluefish, *Pomatomus saltatrix*,  
Early Life History Along US East Coast (From Wilk, 1977)

Figure 3



Reported US Commercial Bluefish Landings By Month,  
Maine-North Carolina, 1978-1979, And East Coast Florida, 1975-1976.  
(Note New England Change Of Scale)

Table 1. Existing Dump Sites In and Near the New York Bight

Dump Site	Coordinates (latitude and longitude)	Area (sq. nautical mi.)	Depth (feet)	Approximate Distance	
				Long Island	New Jersey
Sewage Sludge	44°22'30"N to 40°25'00"N 73°41'30"W to 73°45'00"W	6.6	80	11 N. mi.	11 N. mi.
Dredged Material	40°21'48"N to 40°23'48"W 73°50'00"W to 73°51'28"W	2.0	90	11 N. mi.	5 N. mi.
Cellar Dirt	40°23'00"N, 73°49'00"W*	1.1	110	12 N. mi.	6 N. mi.
Acid Wastes	40°16'00"N to 40°20'00"N 73°36'00"W to 73°40'00"W	12.0	80	15 N. mi.	15 N. mi.
Wrecks	40°10'00"N, 73°42'00"W*	0.8	200	24 N. mi.	14 N. mi.
Chemical Wastes	38°40'00"N to 39°00'00"N 72°00'00"W to 72°30'00"W	450.0	6000	-	-

\* Center coordinates of circular dump site.

Source: EPA, 1979.



Table 2. Reported Commercial Bluefish Landings By State, 1931-1981  
(in thousands of pounds)

Year	ME	NH	MA	RI	CT	NY	NJ	DE	MD	VA	NC	SC	GA	FL**	Total
1931	1	-	191	121	408	671	2,535	71	473	343	676	2	-	566	6,058
1932	1	-	266	134	286	913	3,844	10	360	551	687	4	-	907	7,963
1933	*	-	430	194	296	1,132	2,115	5	119	648	na	na	na	na	4,939
1934	na	na	na	na	na	na	na	na	329	936	1,766	3	-	1,445	4,479
1935	-	-	91	148	118	1,002	1,960	14	313	340	na	na	na	na	3,986
1936	na	na	na	na	na	na	na	na	129	317	2,028	10	-	3,176	5,660
1937	-	-	47	140	34	858	1,484	6	81	528	1,657	30	-	2,870	7,735
1938	-	-	71	39	10	250	1,038	3	51	303	1,849	43	-	3,628	7,285
1939	-	-	10	15	8	219	682	-	57	83	1,009	6	-	2,383	4,472
1940	-	-	26	15	-	25	105	-	4	15	448	4	-	1,366	2,008
1941	na	na	na	na	na	na	na	na	16	22	na	na	na	na	38
1942	-	-	10	3	-	45	167	-	63	43	na	na	na	na	331
1943	-	-	31	3	8	122	148	-	na	na	na	na	na	na	312
1944	*	-	4	19	13	91	114	-	99	47	na	na	na	na	387
1945	-	-	3	12	11	105	265	-	102	121	627	11	-	1,274	2,531
1946	-	na	1	5	7	105	na	na	73	203	na	na	na	na	394
1947	-	-	2	14	10	116	399	*	138	254	na	na	na	na	933
1948	-	-	2	17	21	241	611	5	131	272	na	na	na	na	1,300
1949	-	-	25	26	10	251	1,055	63	87	305	na	na	na	na	1,822
1950	-	-	61	56	21	127	1,296	21	106	311	1,272	10	-	990	4,271
1951	-	-	28	37	55	191	1,100	5	85	179	926	12	-	1,431	4,049
1952	-	-	1	48	90	208	1,439	1	111	144	737	11	-	1,115	3,905
1953	-	-	30	80	56	163	1,139	2	46	175	542	7	-	1,104	3,344
1954	-	-	31	91	24	402	1,261	2	89	185	323	8	-	804	3,220
1955	-	-	37	31	32	469	1,015	3	63	220	435	39	-	1,013	3,357
1956	-	-	19	48	13	371	1,019	3	101	224	633	53	-	771	3,255
1957	-	-	25	59	19	438	916	5	93	193	816	71	*	1,107	3,742
1958	-	-	3	10	2	116	91	6	32	156	437	3	-	845	1,701
1959	-	-	5	20	6	262	376	4	30	183	740	1	-	1,284	2,911
1960	-	-	15	34	5	414	443	*	10	130	615	*	-	1,090	2,756
1961	-	-	18	49	11	505	462	-	19	294	752	1	*	979	3,090
1962	-	-	34	110	32	758	1,092	8	63	524	955	5	-	1,393	4,974
1963	-	-	47	82	52	697	823	21	42	632	813	114	*	1,361	4,684
1964	-	-	42	90	60	675	541	-	6	395	515	316	-	1,202	3,842
1965	-	-	143	108	60	1,036	870	*	7	205	704	84	-	855	4,072
1966	-	-	127	72	56	933	1,008	1	17	242	820	158	1	1,354	4,789
1967	-	-	70	79	62	550	502	*	17	120	888	48	-	1,347	3,683
1968	-	-	87	81	62	576	765	*	141	241	872	24	-	1,910	4,759
1969	-	-	150	124	83	1,120	681	-	54	223	871	5	-	2,080	5,391
1970	-	-	169	323	85	1,602	1,064	-	69	646	496	8	-	2,046	6,508
1971	-	1	272	271	83	1,211	979	-	141	611	578	13	-	1,625	5,785
1972	-	-	372	313	49	1,003	812	1	58	1,216	1,168	-	-	1,876	6,868
1973	59	-	556	278	96	1,412	888	3	275	2,905	2,008	3	-	1,583	10,066
1974	30	-	390	267	89	1,067	1,003	6	559	3,138	2,183	*	-	1,272	10,004
1975	12	-	549	382	15	890	1,281	15	277	3,285	1,975	2	*	1,021	9,704
1976	*	-	450	242	23	600	1,280	12	513	4,167	1,356	1	*	1,380	10,025
1977#	*	*	504	245	13	986	1,398	32	524	3,169	2,331	10	1	1,500	10,712
1978#	33	2	798	374	55	1,745	1,585	40	325	2,741	1,948	10	*	1,230	10,885
1979#	67	*	567	323	51	1,611	1,589	50	319	3,065	3,407	13	*	1,348	12,410
1980#	96	4	508	365	52	1,489	1,401	161	410	2,721	5,444	4	*	1,762	14,417
1981#	104	42	483	504	7	1,280	1,834	196	416	2,284	6,610	##	##	2,016	15,780

- = zero; na = not available; \* = less than 500 lbs.; # = preliminary; \*\* = east coast only; ## = 1981 landings for South Carolina and Georgia combined were 4,000 lbs.; they cannot be separated because of confidentiality.

From: Fishery Statistics of the US (US Dept. of Comm., 1980a) and unpublished NMFS data.

**Table 3. Commercial Bluefish Landings by State by Distance from Shore and  
% of Total State Bluefish Landings Taken from FCZ, 1976-1981  
(landings in thousands of pounds)**

	ME	NH	MA	RI	CT	NY	NJ	DE	MD	VA	NC	SC, GA, & E.C. FL	ME - E.C. FL Total
1976													
Int.#	-	-	184	43	17	390	131	11	455	3,990	830	81	6,132
0-3###	*	-	250	82	-	210	530	*	1	154	502	1,123	2,852
FCZ	-	-	16	117	6	-	619	-	58	23	24	177	1,041
Total	*	-	450	242	23	600	1,280	12	513	4,167	1,356	1,381	10,025
FCZ %	-	-	4	49	25	-	48	-	11	1	2	13	10
1977													
Int#	-	-	251	55	8	657	93	31	470	2,904	828	na	na
0-3###	-	-	168	101	-	328	312	-	10	33	1,092	na	na
FCZ	*	*	85	88	4	-	992	1	44	233	412	51	1,910
Total	*	*	504	245	13	986	1,398	32	524	3,169	2,331	1,511	10,712
FCZ %	100	100	17	36	34	-	71	3	8	7	18	3	18
1978													
Int#	-	-	325	na	44	1,130	na	25	242	2,311	500	na	na
0-3###	21	-	322	176	-	590	728	-	14	174	490	na	na
FCZ	12	2	151	198	11	25	857	15	68	257	958	76	2,630
Total	33	2	798	374	55	1,745	1,585	40	325	2,741	1,948	1,240	10,885
FCZ %	37	100	19	53	20	1	54	38	21	9	49	6	24
1979													
Int#	-	-	443	na	41	1,158	na	38	208	2,491	953	na	na
0-3###	37	-	92	96	-	440	577	12	8	224	992	na	na
FCZ	31	*	32	227	10	13	1,013	-	104	350	1,463	210	3,452
Total	67	*	567	323	51	1,611	1,589	50	319	3,065	3,407	1,361	12,410
FCZ %	46	100	6	70	19	1	64	-	33	11	43	15	28
1980													
Int+0-3	5	2	411	122	52	1,470	393	134	383	2,627	3,201	1,412	10,212
FCZ	91	2	97	243	-	19	1,008	27	27	94	2,243	354	4,205
Total	96	4	508	365	52	1,489	1,401	161	410	2,721	5,444	1,766	14,417
FCZ %	95	50	19	67	-	*	72	17	7	4	41	20	29
1981													
Int+0-3	54	2	243	243	7	1,275	928	196	371	2,058	2,911	1,696	9,984
FCZ	50	40	240	261	-	5	906	-	45	226	3,699	324	5,796
Total	104	42	483	504	7	1,280	1,834	196	416	2,284	6,610	2,020	15,780
FCZ %	48	95	50	52	-	-	49	-	11	10	56	16	37

\* = less than 500 pounds or 0.5%.

# = internal waters, includes all rivers, bays, and sounds.

## = 0-3 miles from shore, i.e., the Territorial Sea.

na = data not as yet available.

Note: - separate internal waters and Territorial Sea catches not available separately for 1980 and 1981 as yet.

- rows and columns may not add to totals because of rounding, percentages calculated prior to rounding.

- South Carolina, Georgia, and Florida East Coast landings combined to avoid publishing confidential data.

Source: NMFS statistics, 1977-1981 data are preliminary.

**Table 4. Commercial Bluefish Landings by Region, Total and FCZ, and  
% of Total Regional Bluefish Landings Taken from FCZ, 1976-1981  
(landings in thousands of pounds)**

		New England		Mid-Atlantic		South Atlantic		Total	
		<u>Landings</u>	<u>% of Total</u>	<u>Landings</u>	<u>% of Total</u>	<u>Landings</u>	<u>% of Total</u>	<u>Landings</u>	<u>% of Total</u>
1976	FCZ	139	13	700	67	201	19	1,041	100
	Total	715	7	6,572	66	2,737	27	10,025	100
	FCZ %	19		11		7		10	
1977	FCZ	177	9	1,270	66	463	24	1,910	100
	Total	762	7	6,109	57	3,842	36	10,712	100
	FCZ %	23		21		12		18	
1978	FCZ	374	14	1,222	46	1,034	39	2,630	100
	Total	1,262	12	6,436	59	3,188	29	10,885	100
	FCZ %	30		19		32		24	
1979	FCZ	300	9	1,480	43	1,673	48	3,452	100
	Total	1,008	8	6,634	53	4,768	38	12,410	100
	FCZ %	30		22		35		28	
1980	FCZ	433	10	1,175	28	2,597	62	4,205	100
	Total	1,025	7	6,182	43	7,210	50	14,417	100
	FCZ %	42		19		36		29	
1981	FCZ	591	10	1,182	20	4,023	69	5,796	100
	Total	1,140	7	6,010	38	8,630	55	15,780	100
	FCZ %	52		20		47		37	
1976-1981 Ave.	FCZ	336	11	1,172	37	1,665	52	3,172	100
	Total	985	8	6,323	51	5,062	41	12,372	100
	FCZ %	34		19		33		26	

Source: NMFS statistics, 1977-1981 data are preliminary.

**Table 5. US Atlantic Coast Commercial Catch of Bluefish By Distance From Shore  
(thousands of pounds)**

<u>Year</u>	<u>Inland + 0-3 Miles</u>	<u>3-12 Miles</u>	<u>12-200 Miles</u>	<u>Total</u>	<u>% Caught In FCZ</u>
1974	9,176	644	184	10,004	8%
1975	8,547	962	194	9,704	12
1976	8,984	750	290	10,025	10
1977	8,800	1,334	578	10,712	18
1978	8,254	1,818	813	10,885	24
1979	9,780	-----2,630-----		12,410	28
1980	10,965	-----3,452-----		14,417	29
1981	9,984	-----5,796-----		15,780	37
1974-81 Average	9,311	-----2,431-----		11,742	21
% of Average Total	79%	-----21%-----			

1977-1981 data are preliminary estimates.

Source: NMFS statistics.

**Table 6. Distribution of Atlantic Coast Bluefish Catch, 1960-1979**

Year	US Commercial	US Recreational	Other Countries	Total
1960	10%	90%		100%
1965	8	92		100
1970	10	90		100
1974	13	87	*%	100
1975	12	88	*	100
1979	11	88		100

\* = less than 0.5%.

**Table 7. Bluefish Catch Along the Atlantic Coast of the US, 1960-1979  
(thousands of pounds)**

Year	US Commercial				US Recreational				Other	
	NA <sup>a</sup>	MA <sup>b</sup>	SA <sup>c</sup>	Total	NA <sup>a</sup>	MA <sup>b</sup>	SA <sup>d</sup>	Total	Countries	Total
1960	469	698	1,591	2,758	5,555 <sup>e</sup>	12,925 <sup>e</sup>	6,820 <sup>e</sup>	25,300	-	28,058
1961	583	872	1,635	3,090	6,940	16,148	7,017	30,105	-	33,195
1962	934	1,931	2,108	4,973	11,119	11,703	9,047	31,869	-	36,842
1963	878	1,784	2,024	4,686	20,419	10,812	8,096	39,327	-	44,013
1964	867	1,015	1,960	3,842	20,163	6,152	7,840	43,155	-	37,997
1965	1,347	1,315	1,411	4,072	31,652 <sup>e</sup>	7,957 <sup>e</sup>	5,646 <sup>e</sup>	45,255	-	49,327
1966	1,187	1,475	2,125	4,787	27,892	8,939	8,500	45,331	-	50,118
1967	762	870	2,052	3,684	17,906	5,273	8,028	31,381	-	35,065
1968	807	1,412	2,541	4,761	18,767	18,103	10,246	47,116	-	51,877
1969	1,477	1,341	2,573	5,391	16,977	17,192	10,375	44,544	-	49,935
1970	2,178	1,936	2,392	6,507	25,080 <sup>e</sup>	24,860 <sup>e</sup>	9,636 <sup>e</sup>	59,576	-	66,083
1971	1,838	1,989	1,958	5,786	21,126	25,500	7,895	54,521	51	60,358
1972	1,738	2,436	2,694	6,868	22,868	21,000	10,863	54,731	40	61,639
1973	2,401	4,920	2,745	10,066	37,516	32,157	4,766	74,439	472	84,966
1974	1,842	5,331	2,830	10,004	28,974 <sup>e</sup>	34,907 <sup>e</sup>	4,913	68,794	218	79,016
1975	1,847	5,731	2,126	9,704	28,859	37,458	3,694 <sup>e</sup>	70,011	227	79,942
1976	1,316	6,599	2,110	10,025	20,563	43,131	3,670	67,364	2	77,391
1977	1,747	6,062	2,903	10,712	29,117	37,190	7,396	73,703	9	84,424
1978	3,005	5,542	2,337	10,884	50,083	34,000	11,129	95,212	-	106,096
1979	2,468	6,541	3,249	12,258	41,043 <sup>f</sup>	40,045 <sup>f,g</sup>	15,472 <sup>f,h</sup>	96,560	-	108,818

a North Atlantic from Maine to and including New York.

b Middle Atlantic from New Jersey to Cape Hatteras, NC.

c South Atlantic from Cape Hatteras, NC to southern Florida, excluding Florida Keys.

d South Atlantic from Cape Hatteras, NC to southern Florida, including Florida Keys.

e Angler survey estimate (divided by 2); remaining years interpolated (see text).

f NMFS Marine Recreational Fishery Statistics Survey estimate.

g Atlantic coast from New Jersey to and including Virginia.

h Atlantic coast from North Carolina to and including the east coast of Florida, excluding the Keys.

Source: Anderson (1980).

Table 8. Estimated Total Numbers<sup>1</sup> and Total Weights<sup>2</sup> of Fish Caught by Marine Recreational Fishermen, US East Coast, 1979 (weight in thousands of pounds, number in thousands of fish)

Species	Weight	Species	Number
Bluefish	96,661	Bluefish	25,428
Summer flounders	23,858	Winter flounder	22,554
Winter flounder	22,619	Spot	17,548
Dolphins	14,220	Summer flounders	14,213
Weakfish	11,166	Scup/Porgies	11,046
Scup/Porgies	8,812	Sea basses	5,861
Atlantic cod	8,505	Sea catfishes	5,734
Atlantic mackerel	7,308	Atlantic croaker	5,497
Pollock	7,068	White perch	5,494
Striped bass	6,479	Weakfish	4,417
Sea catfishes	6,391	Atlantic mackerel	4,043
Tautog	5,977	Herrings	3,967
Spot	5,860	Pinfish	3,741
Sea basses	5,088	Sea robins	3,629
King mackerel	4,286	Cunner	3,336
Atlantic croaker	3,684	Mulletts	3,209
Spotted seatrout	3,342	Grunts	3,187
Mulletts	3,316	Tautog	2,883
Groupers	2,767	Dolphins	2,774
White perch	2,542	Atlantic cod	2,627
Sea robins	2,520	Pollock	2,547
Snappers	2,498	Snappers	2,230
Grunts	2,328	Spotted seatrout	1,920
Sheepshead	2,297	Striped bass	1,180
Atlantic bonito	2,240	Kingfishes	1,115
Spanish mackerel	2,147	Toadfishes	1,111
Little tunny	2,141	Sheepshead	1,106
Toadfishes	1,991	White grunt	970
Barracudas	1,951	Skates/Rays	936
Herrings	1,854	Spanish mackerel	917
Dogfishes	1,788	Jacks	903
Jacks	1,550	Flounders	888
Pinfish	1,457	Atlantic tomcod	849
Skates/Rays	1,451	Dogfishes	812
Cunner	1,373	Blue runner	802
Black drum	1,263	Red snapper	687
Flounders	1,248	Gray snapper	660
Red drum	1,197	Smelts	644
Red snapper	1,140	Silver seatrout	544
Blue runner	1,069	Groupers	537
Trigger/Filefishes	842	Red drum	520
Gray snapper	787	Pigfish	471
Kingfishes	611	Windowpane	468
Silver seatrout	560	Atlantic bonito	436
Drums	545	Black drum	420
White grunt	527	Trigger/Filefishes	404
Hakes	487	King mackerel	396
Windowpane	410	Hakes	393
Atlantic tomcod	366	Barracudas	380
Smelts	317	Creville jack	352
Creville jack	317	America eel	332
America eel	298	Yellow perch	322
Freshwater catfishes	295	Silver perch	284
Lady fish	190	Puffers	242
Pigfish	148	Little tunny	220
Silver perch	143	Sand perch	190
Yellow perch	139	Freshwater catfishes	177
Sand perch	123	Drums	157
Puffers	95	Vermillion snapper	153
Vermillion snapper	42	Lady fish	105
Atlantic spadefish	15	Atlantic spadefish	11
Sand seatrout	4	Sand seatrout	5

1. Includes discards and fish released alive.

2. The 1979 National Anglers Survey provided estimates of recreational catches in two general categories: (A) fish which were landed whole and available for identification and measurement by surveyors; and (B) fish which were caught but not kept or were not available for identification and measurement. The Anglers Survey did not provide estimates of the weight of the total catch by species. The above estimates were derived by multiplying average weight per individual fish, as determined from category (A) data, by the estimated total catch of that species. Estimates of "sharks" "tunas and mackerels", and "other fish" excluded above. Species may appear in more than one category.

Source: US Dept. of Commerce, NOAA, NMFS, 1980.

**Table 9. 1979 Total and FCZ Bluefish Commercial Landings by State:  
% of Total Bluefish Taken in the FCZ; % of All Species Taken in the FCZ;  
FCZ Bluefish Catch as a % of Total (All Species) FCZ Catch; Total  
Bluefish Catch as a % of Total (All Species) Catch  
(data are preliminary, weights in thousands of pounds)**

Area	Total Bluefish (pounds)	FCZ Bluefish (pounds)	FCZ % of Total Bluefish	FCZ % of All Species	FCZ Bluefish % of FCZ All Species	Total Bluefish % of All Species
Maine	67	67	100%	77%	*%	*%
New Hampshire	*	*	100	93	*	*
Massachusetts	567	523	92	88	*	*
Rhode Island	323	322	100	79	*	*
Connecticut	51	23	45	62	1	1
NEW ENGLAND	1,008	935	93	83	*	*
New York	1,611	325	20	62	1	4
New Jersey	1,589	968	61	45	1	1
Delaware	50	-	-	6	-	2
Maryland	319	116	36	26	1	*
Virginia	3,065	345	9	6	1	1
MID-ATLANTIC	6,634	1,754	26	23	1	1
North Carolina	3,407	1,463	43	10	4	1
South Carolina	13	12	94	26	*	*
Georgia	*	-	-	38	-	*
East Coast Florida	1,348	93#	7#	unk	unk	2
SOUTH ATLANTIC	4,768	1,568#	33#	unk	unk	1
TOTAL	12,410	4,257	34%#	unk	unk	1

- = zero.

\* = less than 500 pounds or 0.5%.

# = estimated.

unk = unknown.

Source: Unpublished NMFS data.

**Table 10. Percent of US Atlantic Coast Commercial Bluefish Catch by Gear**

Year	Otter Trawls	Gill Nets	Pound Net & Trap	Mid- Water Trawl	Haul Seines	Long Line	Purse Seines	Troll Line	Hand Line
1969	3	50	11	-	26	*	1	2	7
1970	6	41	21	-	23	-	*	1	7
1971	9	39	15	-	27	1	*	1	8
1972	13	31	19	-	28	*	*	1	8
1973	20	18	31	-	20	*	*	1	10
1974	16	19	34	*	23	*	*	1	7
1975	14	20	33	2	20	*	*	1	10
1976	9	22	38	3	19	-	1	2	6
1977#	22	16	33	2	16	*	3	2	8
1978#	26	20	27	2	12	*	1	2	11

# = Preliminary and without Florida (east coast) catch.

\* = less than 0.5%.

Source: Unpublished NMFS data.

Table 11. Mid-Atlantic Commercial Catch (NY-VA) by Gear by Distance from Shore  
(catch in thousands of pounds: \* = less than 500 pounds)

		<u>0-3</u>	<u>3-200</u>	<u>Total</u>	<u>% from FCZ</u>	<u>% of total from FCZ</u>
1976	Purse Seines	-	91	91	100	13
	Otter Trawl	198	335	533	63	48
	Midwater Trawls	15	268	283	95	38
	Pot traps fish	-	*	*	100	-
	Gill net other	906	-	906	-	-
	Gill net drift other	551	5	556	1	1
	Hand lines other	198	1	198	-	-
	Troll lines other	-	*	*	100	-
	Other Gear Types	4,005	-	4,005	-	-
	<b>Total</b>	<b>5,873</b>	<b>700</b>	<b>6,573</b>	<b>10</b>	<b>100</b>
1977	Purse Seines	-	243	243	100	19
	Otter Trawl	148	491	639	77	39
	Midwater Trawls	-	170	170	100	13
	Pot traps fish	1	-	1	-	-
	Gill net other	559	18	577	2	1
	Gill net drift other	427	331	759	44	26
	Hand lines other	368	10	379	3	1
	Troll lines other	*	1	6	95	-
	Other Gear Types	3,334	-	3,334	-	-
	<b>Total</b>	<b>4,839</b>	<b>1,270</b>	<b>6,109</b>	<b>21</b>	<b>100</b>
1978	Purse Seines	11	40	51	78	3
	Otter Trawl	399	652	1,051	62	53
	Midwater Trawls	-	207	207	100	17
	Pot traps fish	5	-	5	-	-
	Gill net other	355	-	355	-	-
	Gill net drift other	978	294	1,272	23	24
	Hand lines other	452	25	477	5	2
	Troll lines other	3	1	4	33	-
	Lines with hooks	-	4	4	100	-
	Scallop Dredges	-	*	*	100	-
	Other Gear Types	3,008	-	3,008	-	-
	<b>Total</b>	<b>5,151</b>	<b>1,223</b>	<b>6,435</b>	<b>20</b>	<b>100</b>
1979	Purse Seines	1	4	4	88	-
	Otter Trawl	-	1,148	1,148	100	65
	Midwater Trawls	-	582	582	100	33
	Pot traps fish	-	2	2	100	-
	Gill net bass	*	-	*	-	-
	Gill net other	419	-	419	-	-
	Gill net drift other	545	7	552	1	-
	Hand lines other	470	22	492	5	1
	Troll lines other	*	-	*	-	-
	Lines with hooks	-	*	*	100	-
	Other Gear Types	3,435	-	3,435	100	-
	<b>Total</b>	<b>4,871</b>	<b>1,764</b>	<b>6,635</b>	<b>27</b>	<b>100</b>
1980	Purse Seines	4	-	4	-	-
	Otter Trawl	-	941	941	100	51
	Midwater Trawls	-	255	255	100	14
	Pot traps fish	1	*	1	8	-
	Gill net bass	1	-	1	-	-
	Gill net other	536	-	536	-	-
	Gill net drift other	559	37	595	6	2
	Hand lines other	439	18	456	4	1
	Troll lines other	-	-	-	-	-
	Lines with hooks	-	-	-	-	-
	Other Gear Types	2,905	595	3,500	17	32
	<b>Total</b>	<b>4,445</b>	<b>1,845</b>	<b>6,290</b>	<b>29</b>	<b>100</b>



Table 12. North Carolina Commercial Bluefish Catch  
(in thousands of pounds) and Percent of Total by Gear

Year	Otter Trawl		Gill Net		Pound Net		Haul Seine		Troll Line		Total Catch
	Catch	%	Catch	%	Catch	%	Catch	%	Catch	%	
1976	173	13	82	6	92	7	999	74	10	1	1,356
1977	1,235	53	125	5	44	2	898	39	30	1	2,331
1978	1,105	57	227	12	56	3	472	24	88	5	1,948
1979	1,793	59	525	17	71	2	687	22	330	11	3,047
1980	2,992	55	1,270	23	325	7	643	12	213	4	5,444
1981	4,427	67	1,392	21	142	2	502	8	148	2	6,611

Table 13. Estimated Total Recreational Catch\* by Region# and Species/Species Group, Ranked by Number of Fish Caught, 1979  
(in thousands)

New England			Mid-Atlantic			South Atlantic		
		% of Total			% of Total			% of Total
Species	Number Caught	Regional Catch	Species	Number Caught	Regional Catch	Species	Number Caught	Regional Catch
Winter flounder	12,448	31	Bluefish	15,610	19	Spot	8,840	13
Bluefish	4,824	12	Summer Flounder	12,652	15	Catfishes	5,517	8
Scup	4,796	12	Winter flounder	10,107	12	Bluefish	4,994	8
Cod	2,602	7	Spot	8,708	11	Croaker	3,778	6
Pollock	2,277	6	Scup	5,887	7	Pinfish	3,720	6
Atlantic mackerel	2,172	5	White perch	5,284	6	Sea basses	3,341	5
Cunner	2,083	5	Weakfish	4,234	5	Mulletts	3,198	5
Tautog	999	3	Searobins	2,499	3	Grunts	3,187	5
Tomcod	833	2	Sea basses	2,181	3	Herrings	2,927	4
Herrings	800	2	Tautog	1,883	2	Dolphins	2,766	4
All others	6,230	16	All others	13,406	16	All others	23,867	36

\* includes all catches including those discarded or released alive.

# New England = ME - CT; Mid-Atlantic = NY - VA; South Atlantic = NC - Florida Keys.

Source: US Dept. of Commerce, NOAA, NMFS, 1980b.

Table 14. Estimated Total Number of Bluefish and All Fish Caught  
by Recreational Fishermen, by East Coast States, 1979  
(all catches, including discarded and released alive, in thousands)

State	Bluefish	% of All Bluefish	All Fish	Bluefish % of All Fish
ME	*	*%	1,688	*%
NH	*	*	1,375	*
MA	969	4	22,554	4
RI	1,818	7	6,620	28
CT	2,015	8	7,827	26
NY	7,178	28	33,644	22
NJ	4,948	20	17,233	29
DE	238	1	3,241	8
MD	2,577	10	16,306	16
VA	670	3	12,028	6
NC	3,085	12	22,159	14
SC	226	1	2,442	10
GA	*	*	1,640	2
FL**	1,652	7	39,894	4
TOTAL	25,428	100%	188,651	14%

\* = less than 30 thousand fish or 0.5%; \*\* = east coast only.

Source: US Dept. of Commerce, NOAA, NMFS, 1980.

Table 15. Regional Recreational Bluefish Catch by Distance from Shore, 1979  
(Number of fish: includes type A, B1, B2 fish)

Region	Inland	Territorial Sea	FCZ	Unknown	Total
New England (ME to CT)	2,344,000 49%	859,000 18%	1,622,000 34%	* -	4,824,000 100%
Mid-Atlantic (NY to VA)	5,452,000 35%	3,631,000 23%	5,377,000 34%	1,151,000 7%	15,610,000 100%
South Atlantic (NC to EC-FL)	1,989,000 40%	1,216,000 24%	568,000 11%	1,221,000 24%	4,994,000 100%
Total (ME to EC-FL)	9,784,000 38%	5,706,000 22%	7,567,000 30%	2,372,000 9%	25,429,000 100%

\* = None reported.

- = zero.

Percent figures rounded to nearest whole percent.

Totals may not equal sum of rows or columns because of rounding.

Type A: Catch available for identification.

Type B1: Catch used for bait, filleted, discarded dead, etc.

Type B2: Catch released alive.

Source: Tables 16 - 20, Marine Recreational Fishery Statistics Survey, Atlantic and Gulf Coasts 1979, National Marine Fisheries Service, Dec. 1980, Washington, D.C., Current Fisheries Statistics Number 8063.

Table 16. Ex-Vessel Value of Commercial Bluefish Landings, 1965-1981  
(in thousands of dollars)

Year	New England (ME-CT)		Mid-Atlantic (NY-VA)		South Atlantic (NC-FL*)		Total	
	Current	Adjusted#	Current	Adjusted#	Current	Adjusted#	Current	Adjusted#
1965	40	42	295	312	152	161	487	515
1966	30	31	304	313	241	248	575	592
1967	28	28	185	185	254	254	467	467
1968	39	37	292	280	321	308	652	626
1969	56	51	267	243	330	301	653	595
1970	67	58	342	294	267	230	676	581
1971	66	54	351	289	258	213	675	556
1972	113	90	390	311	307	245	810	646
1973	186	140	550	413	375	282	1,111	835
1974	111	75	570	386	401	271	1,082	733
1975	166	103	624	387	321	199	1,111	689
1976	124	73	573	336	366	215	1,063	623
1977	136	75	627	345	464	256	1,227	676
1978	213	109	869	445	452	231	1,534	785
1979	183	84	996	458	917	422	2,096	963
1980	175	71	997	404	1,087	440	2,259	914
1981	206	76	1,254	461	1,748	643	3,208	1,179

\* = East coast only.

# = Total adjusted for inflation by Consumer Price Index (1967 = 100).

Source: 1965-1976: Fisheries of the US; 1977-1981: Unpub. NMFS data.

Table 17. 1980 State Commercial Bluefish Landings and Relative Importance  
(quantity in thousands of pounds, value in thousands of dollars)<sup>1</sup>

State	Bluefish		Food Finfish, Squid & Shrimp		Bluefish % of State Total Food Finfish, Squid & Shrimp	
	Quantity	Value	Quantity	Value	Quantity	Value
ME	96	13	188,715	27,895	**	**
NH#	4	*	7,873	2,242	**	**
MA	508	94	358,179	99,549	**	**
RI	365	59	61,273	20,801	1	**
CT#	52	9	1,968	709	3	1
NY	1,488	418	27,843	13,136	5	3
NJ	1,401	243	40,489	13,500	4	2
DE	164	23	2,391	521	7	4
MD	437	41	7,132	3,453	6	1
VA	2,817	272	29,806	10,244	10	3
NC	5,444	761	108,434	44,448	5	2
SC#	4	1	11,985	22,639	**	**
GA#	*	*	10,526	25,697	**	**
FL (east coast)	1,762	325	18,680	6,922	9	5

\* = less than 500 pounds or \$500.

\*\* = less than 0.5%.

# = 1979 data.

1 = preliminary data.

**Table 18. 1979 Total Commercial Bluefish Landings  
for Selected Counties and Relative Importance in the Atlantic Coastal Area#**  
(quantity in thousands of pounds, value in thousands of dollars)

State	County	Bluefish Landings		% of Total East Coast Annual Landings	Bluefish % of County Food Finfish & Squid	
		Quantity	Value		Quantity	Value
MA	Barnstable	285	53	2%	*%	*%
	Bristol	53	10	*	*	*
	Dukes	80	16	1	2	1
	Essex	71	13	1	*	*
RI	Newport	91	11	1	*	*
	Washington	232	36	2	*	*
NY	Kings	55	14	*	4	3
	Nassau	57	15	*	2	2
	Suffolk	1,499	378	12	7	4
NJ	Cape May	836	87	7	4	1
	Monmouth	206	53	2	4	6
	Ocean	482	85	4	3	1
VA	Accomack	355	40	3	8	3
	Hampton (City)	629	53	5	5	1
	Gloucester	239	24	2	8	3
	Mathews	225	24	2	14	7
	Northampton	391	52	3	24	12
	Northumberland	726	78	6	32	15
	Virginia Beach	148	20	1	21	10
	York	166	17	1	19	9
NC	Carteret	777	85	7	1	1
	Dare	709	90	7	4	2
	Hyde	103	14	1	2	1
	New Hanover	95	35	1	11	5
	Pamlico	190	24	2	1	1

# Selected Counties are counties with over 10,000 pounds of landings. Maine - Virginia data are 1979; North Carolina data are 1978.

\* = less than .5%.

**Table 19. North Carolina Commercial Bluefish Landings, Revenues, and Prices by Distance from Shore**  
(landings in thousands of pounds, revenues in thousands of dollars)

Year	Landings			Revenues			% Total			
	0-3	3-200	Total	0-3	3-200	Total	Landings		Revenues	
							0-3	3-200	0-3	3-200
1976	1,332	24	1,356	125	3	128	98	2	98	2
1977	1,920	412	2,331	172	46	219	82	18	79	21
1978	990	958	1,948	111	145	256	51	49	44	56
1979	1,944	1,463	3,407	318	337	655	57	43	49	51
1980	3,201	2,243	5,444	417	344	761	59	41	55	45
1981	2,911	3,699	6,610	503	740	1,243	44	56	40	60

Year	Ex-Vessel Price per Pound			Ratio: 3-200/0-3
	0-3	3-200	Total	
1976	\$ .09	\$ .13	\$ .10	1.3
1977	.09	.11	.09	1.2
1978	.11	.15	.13	1.3
1979	.16	.23	.19	1.4
1980	.13	.15	.14	1.2
1981	.17	.20	.19	1.2

Table 20. 1981 North Carolina Commercial Bluefish Landings and Revenues by Month and Gear\*

	Bluefish			% Monthly Revenues by Species														
	lbs. (1000)	\$ (1000)	% of total monthly lbs.	Blu	Flo	Tro	Bas	Scu	Whi	Cro	Spo	Sha	Cat	Mul	Sba	Mac	But	Amb
<b>TRAWLS FISH</b>																		
Jan	947	141	12	5	51	18	6	7	-	-	-	-	-	-	-	-	-	-
Feb	1,007	168	14	8	33	32	2	6	11	-	-	-	-	-	-	-	-	-
Mar	1,037	283	16	15	11	41	8	9	8	-	-	-	-	-	-	-	-	-
Apr	306	83	10	8	18	39	10	9	-	5	-	-	-	-	-	-	-	-
Sep	2	-	5	1	39	9	10	15	-	6	-	-	-	-	-	-	-	-
Oct	63	6	5	2	13	18	-	-	-	38	-	-	-	-	-	-	-	-
Nov	307	35	8	3	36	35	-	-	-	20	-	-	-	-	-	-	-	-
Dec	668	136	10	6	62	26	-	-	-	-	-	-	-	-	-	-	-	-
Tot	4,338	852	12	7														
<b>HAUL SEINES LONG</b>																		
May	111	11	5	2	-	14	-	-	-	76	-	-	-	-	-	-	-	-
Aug	112	14	5	3	-	28	-	-	-	47	15	-	-	-	-	-	-	-
Tot	419	75	1	1														
<b>HAUL SEINES COMMON</b>																		
Feb	22	3	42	20	-	19	-	-	-	-	-	61	-	-	-	-	-	-
Mar	9	2	12	8	-	18	-	-	-	-	-	74	-	-	-	-	-	-
Apr	25	5	32	30	-	42	-	-	-	-	-	15	-	-	-	-	-	-
May	4	-	10	3	-	29	-	-	-	34	-	-	32	-	-	-	-	-
Nov	8	1	12	9	-	-	-	-	-	-	-	-	-	88	-	-	-	-
Tot	83	14	8	7														
<b>ANCHOR NETS OTHER</b>																		
Feb	84	13	11	6	-	38	-	-	-	11	-	11	-	5	6	-	-	-
Apr	66	14	7	5	-	10	-	-	-	41	-	6	5	-	5	-	-	-
May	53	6	16	5	12	13	-	-	-	24	-	-	11	6	14	-	-	-
Jun	45	6	12	4	19	14	-	-	-	18	6	-	13	5	14	-	-	-
Jul	58	6	18	6	16	15	-	-	-	27	5	-	10	8	5	-	-	-
Aug	65	8	18	7	17	21	-	-	-	16	10	-	-	7	14	-	-	-
Sep	77	10	13	4	33	8	-	-	-	8	15	-	-	5	18	-	-	-
Oct	93	13	11	4	15	9	-	-	-	-	11	-	-	-	21	20	-	-
Nov	118	16	13	5	8	20	-	-	-	22	-	-	-	-	17	12	-	-
Dec	578	141	54	46	5	16	-	-	-	12	-	-	-	-	5	-	-	-
Tot	1,390	257	13	9														
<b>POUND NETS</b>																		
Sep	46	7	5	2	26	17	-	-	-	38	-	-	-	-	-	-	6	-
Tot	142	19	1	1														
<b>TROLL LINES</b>																		
Jan	42	10	93	81	-	-	-	-	-	-	-	-	-	-	-	16	-	-
Feb	34	9	70	45	-	-	-	-	-	-	-	-	-	-	-	46	-	8
Mar	32	8	68	39	-	-	-	-	-	-	-	-	-	-	-	57	-	-
Apr	26	6	55	22	-	-	-	-	-	-	-	-	-	-	-	75	-	-
May	5	3	10	7	-	-	-	-	-	-	-	-	-	-	-	87	-	-
Dec	7	2	30	15	-	-	-	-	-	-	-	-	-	-	-	82	-	-
Tot	148	38	34	14														

Blu = bluefish; Flo = flounder; Tro = sea trout; Bas = sea bass; Scu = scup; Whi = whiting; Cro = croaker; Spo = spot; Sha = shad; Cat = catfish; Mul = mullet; Sba = striped bass; Mac = king and cero mackerel; But = butterfish; and Amb = amberjack.

\*Months & species listed when at least 5% of total monthly gear catch & revenue, respectively, are bluefish. Totals are for all months in which bluefish was caught.

Table 21. Total North Carolina Commercial Flounder, Sea Trout, Croaker, and Bluefish Revenues and Landings

Year	Revenues		Landings	
	1000 \$	% Bluefish	1000 lbs	% Bluefish
1976	6,718	2	36,560	4
1977	8,342	3	41,134	6
1978	11,266	2	45,053	4
1979	16,783	4	57,180	6
1980	17,709	4	63,918	9
1981	16,698	7	44,498	15

Table 22. Comparative Ex-Vessel Prices of North Carolina Bluefish

Year	North Carolina Average Price of Flounder, Croaker, and Weakfish*	North Carolina Bluefish Price/Average Price of Flounder, Croaker, and Weakfish	New England Finfish Ex-Vessel Price Index	North Carolina Bluefish Price/New England Finfish Price Index	ME-FL Average Bluefish Price/New England Finfish Price Index
1976	\$.19	.50	3.057	3.1	3.5
1977	21	.45	2.989	3.1	3.8
1978	26	.52	3.439	3.8	4.1
1979	30	.64	3.739	5.1	4.2
1980	29	.48	3.570	3.9	4.4
1981	41	.47	4.016	4.7	5.1

Table 23. Expenditures by Bluefish Recreational Fishermen

Area	Total Trips	% of Fishermen Seeking Bluefish	Number of Directed Bluefish Trips	Minimum Trip Cost	Total Angler Expenditures
New England	6,983,000	24	1,705,000	\$3.70	\$ 6,309,000
Mid-Atlantic	18,433,000	26	4,720,000	6.50	30,680,000
South Atlantic	13,771,000	4	578,000	7.60	4,393,000
Total					\$41,382,000

Table 24. Forecasting Equations for Bluefish Recreational Catch, Commercial Catch, and Ex-Vessel Price

- (1)  $RC = -630891 + (109002 \times DI^*)$   
 $R^2 = .97$   $N = 5$   $DW = N/A$
- (2)  $CC = -52050 + (9217 \times DI^*) + (762.7 \times ABUND^*) + (1068 \times D1) + (4269 \times D2) + (2097 \times TD)$   
 $R^2 = .99$   $N = 14$   $DW = 1.57$
- (3)  $Price = .1401 - (5.906 \times 10^{-6} \times CC)$   
 $R^2 = .92$   $N = 20$   $DW = 1.84$   $RHO = .6875$

RC = Recreational catch (1,000 lbs.)  
 CC = Commercial catch (1,000 lbs.)  
 Price = Total ex-vessel revenues/CPI/CC  
 DI = Disposable income/CPI (\$ billion)  
 CPI = Consumer Price Index (1967 = 100)  
 D1 = 1 for 1979, 0 for other years  
 D2 = 1 for 1980, 0 for other years  
 TD = 1 for 1973-80, 0 for other years  
 \* = converted into logarithms.

Table 25. Forecasts of Real Disposable Income, Consumer Price Index, and Relative Abundance

Year	Disposable Income	Consumer Price Index	Relative Abundance	
			Low	High
1980 (actual)	738	247	.43	.43
1981	741	272	.43	1.54
1982	760	292	.43	1.54

Table 26. Baseline Forecasts: Recreational, Commercial, and Total Catch, Commercial Revenues, and Prices (catch in thousands of pounds, revenues in thousands of dollars, prices in dollars per pound)

Year	Catch			Revenues		Prices	
	Recreational	Commercial	Total	Current	Adjusted*	Current	Adjusted*
1980	88,878	14,538#	103,416	2,259#	915#	.16#	.06#
1981	89,438	14,582-15,555	104,020-104,993	2,377-2,282	875-840	.16-.15	.06-.05
1982	92,111	14,808-15,781	106,919-107,892	2,462-2,349	844-805	.17-.15	.06-.05

\* = adjusted for inflation.

# = actual.

Table 27. Selected 1970 Socio-Economic Characteristics for Counties with Significant Bluefish Landings

	US	Cape May NJ	Suffolk NY	Northumberland VA	Carteret NC	Dare NC
<u>Population</u>						
Total (000)	203,212	60	1,295	9	32	7
% Change, 60-70	13	23	69	-9	15	18
% Net mig. 60-70	2	22	49	-13	3	11
% 18 yrs. & over	66	72	60	68	66	69
% 65 yrs. & over	10	20	8	17	9	13
Median age	28	39	26	38	29	34
Over 25, median school yrs. completed	12	11	12	10	11	11
<u>Labor force</u>						
Total (000)	82,049	21	404	3	12	3
Civilian (000)	80,051	20	403	3	12	2
% Fem. with husb.	57	55	61	67	66	62
% Unemployed	4	7	4	6	5	4
% Emp. in mfg.	26	11	22	25	14	6
% Emp. outside county	18	16	34	26	26	3
% Families/female head	11	10	7	12	11	10
Median family income	\$ 9,586	\$ 8,295	\$12,081	\$6,163	\$7,155	\$6,536
% Families low income	11	9	5	23	17	14
<u>Mfg. estab.</u>						
Total	311,140	52	1,475	45	60	4
% 20-99 emp.	24	27	27	31	15	-
<u>% Total Retail Sales</u>						
Eating & drinking places	8	20	7	4	8	11
<u>% Selected Services Receipts</u>						
Hotels, etc.	12	58	7	NA	NA	NA
Amusements	14	18	16	NA	NA	NA

D = Data not reported. NA = Not available.

Source: County and City Data Book, 1972: US Bureau of Census, 1973.



Table 28. Cetaceans and Turtles Found in Survey Area

<u>Scientific name</u>	<u>Common name</u>	<u>Estimated Minimum Population Number in Study Area</u>	<u>Endangered</u>	<u>Threatened</u>
<b>LARGE WHALES</b>				
<u>B. physalus</u>	fin whale	1,102	X	
<u>M. novaeangliae</u>	humpback whale	684	X	
<u>B. acutorostrata</u>	minke whale	162		
<u>P. catodon</u>	sperm whale	300	X	
<u>E. glacialis</u>	right whale	29	X	
<u>B. borealis</u>	sei whale	109	X	
<u>O. orca</u>	killer whale			
<b>SMALL WHALES</b>				
<u>T. truncatus</u>	bottlenose dolphin	6,254		
<u>Globicephala</u> spp.	pilot whales	11,448		
<u>L. acutus</u>	Atl. white-sided dolphin	24,287		
<u>P. phocoena</u>	harbor porpoise	2,946		
<u>G. griseus</u>	grampus	10,220		
<u>D. delphis</u>	saddleback dolphin	17,606		
<u>Stenella</u> spp.	spotted dolphin	22,376		
<u>S. coeruleoalba</u>	striped dolphin	unk		
<u>L. albirostris</u>	white-beaked dolphin	unk		
<u>Z. cavirostris</u>	Cuvier's beaked dolphin	unk		
<u>S. longirostris</u>	spinner dolphin	unk		
<u>S. bredanensis</u>	rough-toothed dolphin	unk		
<u>D. leucas</u>	beluga	unk		
<u>Mesoplodon</u> spp.	beaked whales	unk		
<b>TURTLES</b>				
<u>C. caretta</u>	loggerhead turtle	4,017		X
<u>D. coriacea</u>	leatherback turtle	636		X
<u>L. kemp</u>	Kemp's ridley turtle	unk		X
<u>C. mydas</u>	green turtle	unk		X

Source: Cetacean and Turtle Assessment Program, University of Rhode Island, 1981.

# APPENDIX I. BLUEFISH FISHERY MANAGEMENT PLAN ENVIRONMENTAL IMPACT STATEMENT

November 1982

This Environmental Impact Statement (EIS) relates to the Bluefish Fishery Management Plan (Plan). That Plan would institute management of bluefish (Pomatomus saltatrix) in the US FCZ in the western Atlantic Ocean, excluding the Gulf of Mexico. The recommended alternative would permit an unrestricted directed fishery for bluefish with hook and line, conventional gill nets, traps, haul seines, and pound nets and prohibit the use of all other gear. However, the prohibited gear could be used if a waiver were granted by the National Marine Fisheries Service (NMFS). Fishermen using the prohibited gear in directed fisheries for other species would be allowed a bluefish bycatch of no more than 10% of the total weight of fish on board the vessel at the end of a trip. There would be permitting and reporting requirements for vessels for hire in the recreational fishery (party and charter boats) and for persons selling bluefish. Foreign fishermen would not be permitted to retain bluefish, a provision of the Trawl Fisheries of the Northwest Atlantic Preliminary Fishery Management Plan (PMP) which this Plan would replace for purposes of managing the fishery for bluefish in the US Fishery Conservation Zone (FCZ) by foreign nations.

The area affected by the proposed action is the northwest Atlantic Ocean.

Further information on the EIS can be provided by

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Mid-Atlantic Fishery Management Council  
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Final date by which comments on draft must be received: 11 April 1983

## SUMMARY

### Description of the Action

The Magnuson Fishery Conservation and Management Act of 1976 (MFCMA) (16 UCS 1801 et seq.) established a Fishery Conservation Zone (FCZ) and provided exclusive US regulation over all fishery resources except highly migratory species (i.e., tuna) within the FCZ. The proposed action would establish management of the US fishery for bluefish in the FCZ pursuant to the MFCMA and replace the Trawl Fisheries of the Northwest Atlantic Ocean Preliminary Fishery Management Plan (PMP) as the means of regulating the foreign fishery for bluefish.

In addition to endorsing the purposes of the MFCMA as set forth in Section 2(b) of that Act and the national standards set forth in Section 301 of that Act, the Council has adopted two specific objectives for this Plan:

1. Increase understanding of the condition of the stock and fishery.
2. Provide the highest availability of bluefish to US recreational fishermen while maintaining, within limits, traditional uses of bluefish, recognizing some natural stock fluctuations are inevitable.

**The preferred alternative is identified as alternative 7.** It would restrict the use of all gear except hook and line, conventional gill nets, traps, haul seines, and pound nets to conduct a directed fishery for bluefish in the FCZ. Optimum Yield (OY) is all bluefish caught by US fishermen in the Atlantic FCZ, excluding the Gulf of Mexico, pursuant to this Plan.

US fishermen using hook and line, conventional gill nets, traps, haul seines, and pound nets to conduct a directed fishery for bluefish in the FCZ would be allowed to harvest bluefish without limit. The use of all other gear to conduct a directed fishery for bluefish in the FCZ would be prohibited unless a waiver of the prohibition were granted by NMFS.

NMFS could grant waivers to the gear prohibition if it was consistent with the objectives of the Plan, that is, that it provided the highest availability of bluefish to US recreational fishermen while maintaining, within limits, traditional uses of bluefish. Specifically, NMFS would be required to attempt to maintain the historic catch distribution in granting such waivers, both between sectors (8% of the total catch for the FCZ commercial fishery) and geographically (11% of the FCZ commercial catch landed in New England, 37% of the FCZ commercial catch landed in the Mid-Atlantic, and 52% of the FCZ commercial catch landed in the South Atlantic). It is recognized that these relationships cannot be maintained absolutely, but it is the Council's intent that NMFS grant waivers for the use of the restricted gear types so as to minimize the chances of major changes in these relationships. NMFS would be allowed to specify the amount of bluefish that could be caught with permits granted pursuant to waivers.

The catch distribution was arrived at by examining historical data. The distribution between the recreational and commercial fisheries has been about 88% and 12%, respectively (Table 6). In order to provide some growth for the commercial fishery while still protecting the recreational fishery, it was determined to use a distribution of 80% recreational and 20% commercial. In 1981, the FCZ commercial fishery accounted for 37% of the total commercial catch (Table 4). This was adjusted to 40%. If that 40% is applied to the overall 20% commercial share, the result is that the FCZ commercial fishery share is 8% of the total catch. The geographical distribution of the FCZ commercial catch (11% New England, 37% Mid-Atlantic, and 52% South Atlantic) is the average distribution for 1976-1981.

In order to provide a basis for granting any waivers to the gear prohibition, it would be necessary to annually estimate landings. NMFS, in consultation with the Council, prior to the beginning of each year, would be required to project the total bluefish catch, recreational catch, and catch by the permitted gear types (hook and line, conventional gill nets, traps, haul seines, and pound nets). From these projections, the amount of bluefish available for catch by the prohibited gear types could be estimated, thus providing a basis for granting waivers from the gear prohibition.

NMFS would be required to establish the procedures for the waiver system. As guidance in that regard, it is suggested that persons desiring to obtain waivers from the gear prohibition file their applications by a particular date prior to the beginning of the fishing year. All of those applications could be evaluated

together relative to the specified criteria with appropriate decisions made prior to the beginning of the fishing year on 1 January. Applications could be considered after that date, i.e., any time during the year, but such applications would necessarily be evaluated in light of waivers previously granted.

Bluefish can be a bycatch in other fisheries. Therefore, this alternative provides that incidental catches of bluefish in directed fisheries for other species by fishermen without waivers using gear other than hook and line, conventional gill nets, traps, haul seines, and pound nets would be limited to 10% of the total catch on board a vessel at the end of a fishing trip.

Foreign fishermen would not be permitted to retain bluefish since US fishermen would use the entire OY.

Operators of party and charter boats and persons selling bluefish would be required to have permits and submit reports as set forth in Sections XIII-1 and XIV. Vessels are exempt from this requirement if they catch no more than 100 pounds of bluefish per trip.

Other alternatives considered by the Council are:

1. **Take no action at this time.** This would mean that the Preliminary Fishery Management Plan (PMP) would remain in effect. The PMP regulates only foreign fishing and prohibits foreign fishermen from retaining bluefish.
2. **Allow US fishermen unrestricted catches of bluefish.** This alternative is intended to recognize that totally effective bluefish management requires regulation in the FCZ, Territorial Sea, and internal waters and to postpone management until such time as the States develop a management system for the Territorial Sea and internal waters. Following development of such a system, this Plan would be amended to incorporate compatible management measures.

Operators of party and charter boats and persons selling bluefish would be required to have permits and submit reports. Vessels are exempt from this requirement if they catch no more than 100 pounds of bluefish per trip.

OY would be all bluefish caught in the FCZ by US fishermen, so retention of bluefish by foreign fishermen would be prohibited.

3. **Allow US fishermen unrestricted catches of bluefish, but impose a 14 inch (fork length) size limit.** OY would equal all bluefish 14" in length or larger caught in the FCZ by US fishermen. Therefore, foreign fishermen would not be permitted to retain bluefish.

Operators of party and charter boats and persons selling bluefish would be required to have permits and submit reports. Vessels are exempt from this requirement if they catch no more than 100 pounds of bluefish per trip.

4. **Restrict bluefish catches by commercial and recreational fishermen.** Bluefish range throughout the FCZ, Territorial Sea, and internal waters and the fishery for the species takes place in all of these areas. Federal management jurisdiction is limited to the FCZ, which is the management unit of this Plan. However, management in the FCZ cannot proceed without regard for the portion of the stock and fishery outside the FCZ. For that reason, the concept of "total desirable catch" is introduced and defined as the total catch of bluefish from all areas (FCZ, Territorial Sea, and internal waters) that would be consistent with the objectives of the Plan. In other words, the total desirable catch would be the Optimum Yield if the management unit were bluefish throughout the range of the stock. Use of the concept of total desirable catch permits the calculation of an OY for the FCZ, the management unit of the Plan, that accounts for the condition of the stock and level of the fishery throughout the range of the stock. It must be remembered that values calculated for the entire area are advisory to the States and have no Federal regulatory significance. Only the OY and allocations for the FCZ would have regulatory significance for purposes of this Plan.

With this alternative the total desirable catch (FCZ, Territorial Sea, and internal waters) would equal the average MSY (104 million pounds). Total desirable catch would be allocated between the commercial and recreational fisheries based on the distribution shown in the latest available recreational fisheries survey and commercial catch statistics (based on 1979 data, the distribution

would be 88% recreational and 12% commercial). The overall catch allocations would be further divided based on 1979 data into FCZ recreational and commercial allocations (quotas), the sum of which would equal OY. Because data on the weight of recreationally caught bluefish are not currently available, it is impossible to estimate the actual quotas and OY. It is anticipated that the necessary data will be available in the near future.

Under certain conditions, such as natural population fluctuations, it might be necessary to either relax or further limit the catches of bluefish. Therefore, this alternative requires that NMFS, in consultation with the Council, examine annually the NEFC assessment of the fishery and, if appropriate, raise or lower the OY. In considering such action, information gathered from catch reports, marine recreational fishery statistics surveys, and any effort data available must be used in conjunction with the assessment. Under any circumstances, OY cannot be such that the OY, when averaged with the total catch values for the preceeding 9 years will exceed maximum MSY (119 million pounds).

Operators of party and charter boats and persons selling bluefish would be required to have permits and submit reports. Vessels are exempt from this requirement if they catch no more than 100 pounds of bluefish per trip.

5. **Allow US recreational fishermen unrestricted catches of bluefish and restrict commercial landings.** While this Plan is intended to manage bluefish only in the FCZ, this alternative is based on a recognition that such management cannot ignore the fishery shoreward of the FCZ. Therefore, it provides that the Regional Director, based on recommendations of the Council, will annually estimate the total desirable bluefish catch along the Atlantic Coast (FCZ, Territorial Sea, and internal waters). From that estimate, an FCZ allocation will be made. This FCZ allocation will be the annual OY. The difference between the total desirable catch and the OY should provide guidance to the States so that their management in the Territorial Sea and internal waters can be compatible with Federal management in the FCZ.

The overall desirable catch would be whatever US recreational fishermen catch plus up to 15% of recreational landings of the previous fishing year or up to 18 million pounds, whichever is greater, for commercial fishermen. In order to assure that the commercial catch allocation is based on the best available data, recreational catch data for year 1 would be used in year 2 to develop the allocation for year 3.

The overall commercial allocation would then be divided into allocations for the FCZ and for the Territorial Sea and internal waters. The FCZ allocation would be up to 40% of the overall commercial allocation or up to 7,200,000 pounds, whichever is greater. Therefore, OY in the FCZ would equal whatever bluefish recreational fishermen catch in the FCZ plus whatever US commercial fishermen catch in the FCZ up to 6% of the overall recreational bluefish catch (of two years previous) or up to 7,200,000 pounds.

The Regional Director would be required to monitor commercial bluefish catches in the FCZ and close the directed fishery for bluefish in the FCZ if it appeared that the commercial allocation would be exceeded. During a period of closure, commercial vessels would be permitted a bycatch of bluefish not to exceed 10% of the weight of all fish on board at the end of a trip.

Foreign fishermen would not be permitted to retain bluefish since US fishermen would use the entire OY.

Operators of party and charter boats and persons selling bluefish would be required to have permits and submit reports. Vessels are exempt from this requirement if they catch no more than 100 pounds of bluefish per trip.

6. **Prohibit the use of purse seines and pair trawls in the directed commercial fishery for bluefish.** This alternative modifies alternative 5 in that it would add to alternative 5 a prohibition on the use of purse seines and pair trawls in conducting a directed fishery for bluefish in the FCZ.

All of the alternatives are discussed in Section XII.

### Summary of Impacts

The recommended alternative will provide for the long term viability of the bluefish fishery while minimizing to the greatest extent possible regulations imposed on fishermen.

### Alternatives

The alternatives are outlined above and discussed and evaluated in Section XII of the Plan.

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## PURPOSE OF AND NEED FOR THE PROPOSED ACTION

The Mid-Atlantic Fishery Management Council (Council) prepared this Plan following a series of fact finding meetings held in 1979 (see Section IV). Much concern was indicated relative to the possible development of a large scale commercial bluefish fishery, possibly for export, which could potentially reduce bluefish abundance to the point where bluefish would not be available at an acceptable level to the recreational fishery. Bluefish is the most important species in the recreational fishery and significantly reduced availability could result in significant negative economic impacts on the recreational industry (see Sections VIII and IX of the Plan). The latest stock assessment (Anderson, 1980) suggests that effort as well as catch may be at or near maximum sustainable yield.

## ALTERNATIVES INCLUDING THE PROPOSED ACTION

The alternatives including the proposed action are described in Section XII-2 of the Plan and analyzed in Sections XII-3 and XII-4.

## AFFECTED ENVIRONMENT

The environment affected by this Plan is the northwest Atlantic Ocean. It is described in Section VI of the Plan.

## ENVIRONMENTAL CONSEQUENCES

### Direct Effects and Their Significance

The Plan is based on the best and most recent biological and fishery information available. The most recent stock assessment indicates that bluefish abundance is high (Section V). No significant long-term adverse effects on bluefish abundance are expected to result from the proposed action. It must be noted, however, that sufficient data are not available to make precise estimates of the effects of the proposed action, nor is it possible to anticipate or prevent drastic declines in abundance caused by changes in the natural environment. For these reasons, improved monitoring and assessments of the resource are critical. As new information becomes available, modifications of the Plan may be necessary.

The recommended alternative should have positive impacts by controlling mortality due to commercial fishing. Since recreational fishing is largely a function of availability, if abundance decreases significantly, recreational catches should decrease unless effort increases to levels that are seen as unlikely (see Section XII). In other words, if abundance decreases so that bluefish are less available to recreational fishermen, it is likely that recreational fishermen will redirect their efforts to other species rather than increasing their effort aimed at bluefish so that bluefish catches remain constant.

### 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 bluefish and other species beyond present understanding of living marine resources. Therefore, the proposed action is designed to result in continued yields at about current levels based on the best scientific information available. Even so, it is impossible to completely forecast the long-term effects of the proposed action.

No irreversible commitments of resources will result from implementation of this Plan. Implicit in the implementation of the Plan 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 Plan is flexible and could be modified or amended if adverse impacts appear.

**Land Resources** - No irreversible or irretrievable commitments of land resources have been identified in the proposed 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.

Bluefish is a public resource and, therefore, belongs to no one particular interest group. The concept envisioned by Congress, as stated in the MFCMA, 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 resources 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**

##### **Fishery Management Plans and Preliminary Fishery Management Plans**

This Plan is related to other plans to the extent that all fisheries of the northwest Atlantic are part of the same general geophysical, biological, social, and economic setting. US fishermen 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 on other fisheries by causing transfers of fishing effort.

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.

##### **Marine Sanctuary and Other Special Management Systems**

There are four national marine sanctuaries in the area covered by the Plan: Monitor National Marine Sanctuary off North Carolina, Gray's Reef National Marine Sanctuary off Georgia, Key Largo Coral Reef National Marine Sanctuary off Key Largo, Florida, and Looe Key Coral Reef National Marine Sanctuary off Big Pine Key, Florida.

The USS Monitor Marine Sanctuary was officially established on January 30, 1975, under the Marine Protection, Research, and Sanctuaries Act of 1972. Rules and regulations have been issued for the Sanctuary (15 CFR 924). They prohibit deploying any equipment in the Sanctuary, fishing activities which involve "anchoring in any manner, stopping, remaining, or drifting without power at any time" (924.3 (a)), and "trawling" (924.3(h)). The Sanctuary's position off the coast of North Carolina at 35°00'23"N, 75°24'32"W is located in the Plan's designated management area. The Monitor Marine Sanctuary is clearly designated on all National Ocean Survey charts by the caption "protected area". This minimizes the potential for damage to the Sanctuary by fishing operations.

The Gray's Reef Sanctuary includes all waters bounded within a rectangle starting at 31°21'45"N, 80°55'17"W, to 31°25'15"N, 80°55'17"W, to 31°25'15"N, 80°49'42"W, to 31°21'45"N, 80°49'42"W, thence back to the point of origin. Regulations governing the Sanctuary appear as 15 CFR Part 938 (46 FR 7944, 26 January 1981). They require permits for certain fishing activities including wire trap fishing, bottom trawling, and specimen dredging.

The boundary of the Key Largo Sanctuary begins at 25°19.45'N, 80°12.0'W (that point being the northeast boundary corner of John Pennekamp Coral Reef State Park), thence southeasterly to 25°16.2'N, 80°8.7'W, thence southwesterly to 25°7.5'N, 80°12.5'W, thence southwesterly to 24°58.3'N, 80°19.8'W, thence northwesterly to 25°2.2'N, 80°25.25'W (that point being the southeast boundary corner of John Pennekamp Coral Reef State Park), thence in a northeasterly direction along the easterly boundary of the State Park to the point of origin. Regulations governing the Sanctuary appear as 15 CFR Part 929. Hook and line fishing is permitted in the Sanctuary.

The Looe Key Sanctuary has the following boundary coordinates: 24°31'37"N, 81°26'00"W; 24°33'34"N, 81°26'00"W; 24°34'09"N, 81°23'00"W; and 24°32'12"N, 81°23'00"W and thence back to the point of origin. Regulations governing the Sanctuary appear as 15 CFR Part 937 (46 FR 7949, 26 January 1981). The use of wire fish traps is prohibited in the Sanctuary and lobster traps are prohibited in the Fore Reef area of the Sanctuary.

Details on sanctuary regulations may be obtained from the Director, Sanctuary Programs Office, Office

### **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, no major conflicts have been identified to date. The Council, through involvement in the Intergovernmental Planning Program of the BLM monitors OCS activities and has opportunity to comment and to advise BLM of the Council's activities. Certainly, the potential for conflict exists if communication between interests is not maintained or appreciation of each other's efforts is lacking. Potential conflicts include, from a fishery management position: (1) exclusion areas, (2) adverse impacts to sensitive biologically important areas, (3) oil contamination, (4) substrate hazards to conventional fishing gear, and (5) competition for crews and harbor space. The Council is unaware of pending deep water port plans which would directly impact offshore fishery management goals in the areas under consideration, and is unaware of potential effects of offshore fishery management plans upon future development of deep water port facilities.

### **Coastal Zone Management (CZM) Programs**

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, State CZM programs will probably assimilate the ecological principles upon which this Plan is based. It is recognized that responsible management of both coastal zones and fish stocks must involve mutually supportive goals. States in the region with approved CZM programs are Maine, Massachusetts, Rhode Island, Connecticut, New Jersey, Delaware, Maryland, and North Carolina. Copies of this Plan have been submitted to states with CZM programs for a determination of consistency. Available approved CZM programs have been reviewed relative to this Plan by the Council and no inconsistencies have been identified.

### **Environmental Effects of Alternatives Including the Proposed Action**

Alternative 1 could have negative effects on the natural environment since it would impose no controls on the US fishery and could, therefore, lead to overfishing. Alternative 2 could have the same effects if State regulations were not developed in a timely fashion. The other alternatives would have positive impacts since they would limit catches.

The alternatives, including the proposed action, are discussed in Sections XII-2, XII-3, and XII-4 of the Plan.

### **Energy Requirements and Conservation Potential of Various Alternatives**

Alternative 1 would have no short-run energy impacts, but could increase energy requirements in the long-run if overfishing led to stock depletion with concomitant effort increases to maintain commercial harvest levels. Alternative 2 could have similar impacts if State regulations were not developed in a timely fashion. The other alternatives should have minimal energy requirement impacts.

Conservation impacts of the alternatives are discussed in Sections XII-3 and XII-4 of the Plan.

### **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 this Amendment.

### **LIST OF PREPARERS**

The following members of the Council staff has primary responsibility for the preparation of this Plan and EIS: John C. Bryson, P.E., MS, BS, Executive Director, has overall responsibility for the development of the Plan; David R. Keifer, MBA, BS, Planning and Administrative Officer, coordinated and participated in the development of the Plan; Stephen P. Freese, MA, BA, Economist, participated in the development of the Plan, particularly with regard to the Regulatory Impact Review, and Thomas Hoff, MS, BS, Statistician/Biologist participated in the development of this draft. Former staff biologist John Mason, MS, BA, participated in the development of early drafts of the Plan and EIS.

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### I. INTRODUCTION

#### A. Purpose

The purpose of this document is to present an analysis of the major proposed regulations and their alternatives for the Western Atlantic FCZ bluefish fishery. This document has been prepared in compliance with the procedures of the National Marine Fisheries Service (NMFS) to implement Executive Order 12291.

The management unit of this Plan is all bluefish (Pomatomus saltatrix) fisheries of the western Atlantic Ocean FCZ, excluding the Gulf of Mexico.

Seven fact finding meetings were held by the Mid-Atlantic Council in early 1979 to give fishermen from Virginia through New England the opportunity to present information on the bluefish fishery. Public attendance at most of these meetings was exceptional and at every meeting the desire for the development of a Plan was strongly expressed by the recreational community. As a result, the Council decided to develop a Plan.

In May of 1979 the Council held a scoping meeting to develop a work plan for the Plan. The work plan was adopted by the Council in July of 1979 and approved by NMFS in March of 1980.

A number of drafts of the Plan were prepared with a preliminary public hearing draft adopted by the Council in November of 1981. That draft was submitted to NMFS for review. It was revised based on NMFS comments and adopted by the Council in May, 1982, for submission to the New England and South Atlantic Councils for further review and comment. That review led to a meeting on 14 October 1982 of representatives of the three Councils along with representatives of NMFS. This version of the Plan is a result of that meeting.

#### B. Description of User Groups

Bluefish is harvested by recreational and commercial fishermen. In 1979, recreational fishermen caught a record 96.6 million pounds of bluefish. This represents 31% of the total weight of all sportfish taken on the East coast; an indication that bluefish is one of the most important, if not the most important, East coast recreational species. These fish are taken either by private and rental boats, party and charter boats, or taken from shore by fishermen using man made construction such as piers, jetties, etc., or from natural areas such as beaches and banks. According to the 1979 Marine Recreational Fishery Statistics Survey, these four fishing modes, in terms of the total number of bluefish landed, accounted for 48%, 25%, 16% and 11% of the total recreational catch, respectively. The party and charter boat industry particularly relies on bluefish for they take 10 times as many bluefish as any other species. Geographically, 61% of these bluefish by number were caught either within three miles or within internal waters. The Mid-Atlantic region (New York through Virginia) accounted for 61% of all recreationally landed bluefish (Table 15\*). A conservative estimate of total recreational expenditures for bluefish is \$41.4 million (Table 23).

In sharp contrast to the recreational fishery, 1979 commercial landings were 12.4 million pounds (13% of the recreational catch) with an ex-vessel value of \$2.1 million dollars (Tables 5 and 16). The principal gears used in harvesting bluefish are drift gill nets, otter trawls, mid-water trawls, pound nets, haul seines, and purse seines (Table 10). Except for the North Carolina winter trawl fishery and purse seines, it is expected that most of these landings are taken as incidental catches since their landings are slightly under 1% of the total value of all commercially landed fish (Tables 9 and 17).

Similar to the recreational fishery catch trends, commercial landings have risen to peak landings of 15.8 million pounds in 1981 and an associated record ex-vessel value of \$3.2 million (Tables 5 and 16). Much of this increase is due to the recent emergence of bluefish as a principal catch of the North Carolina winter trawl fishery, where landings increased remarkably from 1.9 million pounds in 1978 to 6.6 million pounds in 1981 (Table 12). Commercial landings, like recreational landings, are concentrated within three miles of shore, with only 37% (by weight) of the 1981 landings caught in the FCZ (Table 4).

\* All references to Tables or Sections are to the Plan.

At this time there is only unofficial evidence that an export fishery exists (Section IX-3). However, bluefish has been considered by processors to be a prime export species if freezing technology can be developed so that shelf life is increased. Recently, one processor purchased a freezer ship to receive catches from US harvestors at sea. While this ship is primarily to be used to process squid and butterfish for export, the owners have indicated that they may consider purchasing, during the off season, catches from other fisheries such as sea trout, croaker, and bluefish (International Fishing News, Oct. 1981). Whether these latter species will be exported or sent to domestic markets is unknown, but should the venture prove successful, harvesting and processing capacity for bluefish will surely increase.

### C. Problems Addressed by the Plan

The problems within the fishery, though strongly interrelated, can be separated into: (1) allocation of the resource between user groups and (2) data collection and monitoring, with management and enforcement being important related considerations.

#### 1. Allocation of the Resource Between User Groups

The primary purpose of the Plan is to address the problems that could occur if the commercial fishery in the FCZ were to expand significantly. Such expansion could negatively impact the recreational fishery, as well as the traditional commercial fishery. The Council believes it is in the best interest of the national economy to provide the highest availability of bluefish to the recreational sector.

The bluefish population appears to be in a relatively healthy condition under present fishing pressures. Current trends indicate that there is a possibility of future expansion of both the recreational and commercial fisheries. This would be especially true if a foreign market were to develop for bluefish.

Bluefish is one of the most important recreationally caught species along the Atlantic coast of the United States. Its importance has increased in recent years as a result of an increase in the number of anglers, an apparent increase in abundance, and decreased abundance of other desired species such as striped bass (Morone saxatilis). The value of the 1979 recreational fishery was estimated to be at least \$41 million, whereas commercial landings in 1979 totaled about \$2 million (Section IX-1). Therefore, it is reasonable to assume that the recreational catch of bluefish is a higher valued use of the resource and any expansion of the commercial fishery that leads to declining recreational catches is undesirable.

Since there are two distinct user groups, the management system is likely to produce differential impacts. The Council believes that recreational fishermen should receive the largest share of the resource. First, it is believed that recreational effort is not as effective as commercial effort and that this effort is highly responsive to changes in bluefish abundance. That is, if bluefish abundance declines, recreational effort is likely to decline more rapidly, because recreational fishermen will reduce their effort or switch to other more abundant species. To maintain constant catch levels would require increased fishing time and/or increased number of anglers. Maintaining constant catch levels while abundance is declining is unlikely since recreational effort is presumably strongly related to fishing success (Radovich, 1975). Therefore, it is unlikely that recreational fishermen can ever exploit a stock like bluefish.

The second reason why the recreational fishery should receive the largest share of the resource is that it is a higher valued use of the resource. As discussed above, bluefish is the primary recreational species sought by fishermen, especially within the Mid-Atlantic Region, and by the party and charter boat industry. There are few readily available substitute recreational species that can support the industry as well as bluefish do. Bluefish, however, make up a very small percentage of total commercial landings of food finfish, squid, and shrimp. Commercial fishermen have a relatively greater number of species and alternatives to base their livelihoods upon. Only Virginia, New York, Delaware, and Florida have commercial landings of bluefish with ex-vessel values greater than 2% of their respective total state values of food finfish, squid, and shrimp. While no recreational demand functions have been estimated for this fishery, the level of exploitation, the availability of substitutes, and the level of recreational expenditures relative to commercial revenues are indicators that the economic surplus from recreational bluefish is large in comparison to commercial fishing. (Surplus is an economic term defined as the difference between the benefits of fishing and the costs incurred.)

There has been some concern about what differentiates a recreational fisherman from a commercial fisherman, since some recreationally caught bluefish is sold commercially. Because of the different manner in which commercial and recreational catch statistics are collected, the probability of double

counting catches is low. Commercial catch statistics are collected by a port agent interview system and review of dealer weighout slips, where port agents are likely to know who is a commercial fisherman and who is not. Recreational catch statistics are collected by on-site interviews by census takers, as well as by a telephone household survey. If recreationally caught bluefish are sold, they are sold through informal channels such that the commercial statistics system is bypassed. Given how commercial and recreational data are collected, it is highly unlikely that recreationally caught bluefish will count against any commercial quota.

## 2. Data Collection and Monitoring

The NEFC autumn trawl survey relative abundance index over the past 15 years indicates an order of magnitude difference for bluefish along the Atlantic coast (Anderson, 1980). Any population change may have wide ranging consequences. Therefore, a system to provide improved data is necessary in order to monitor the fishery.

Presently, data with which to analyze the biological and economic impacts of alternative regulations are limited. In fact, the following quote from Anderson (1980), where the MSY calculations were presented, indicates that the available data are not sufficient to gauge adequately whether the fishery is in biological trouble or not.

"The concept of MSY has been widely criticized by fishery scientists during recent years (e.g. Larkin 1977, Sissenwine 1978). Aside from the conceptual difficulties, there are many pitfalls associated with the estimation of MSY. The traditional models ignore stochastic effects and time delays. The fitting procedure usually assumes equilibrium and applies unproven manipulations to the data to approximate an equilibrium situation. In the case of bluefish, the data itself are highly suspect. Several unverified assumptions are made to estimate total catch. Fishing effort data are lacking; therefore, research vessel survey data are used to determine an index of fishing effort. Survey data are variable, particularly for a pelagic species like bluefish. Furthermore, since the survey results apply to only a portion of the range of bluefish, changes in catch rates may reflect changes in the distribution pattern (perhaps a northerly shift) as well as in abundance. If the former is the case, estimates of MSY reported herein would be too high. Nevertheless, an estimate of MSY is usually sought by fishery managers particularly as a result of the mandate of FCMA." (Anderson, 1980, p.18)

In particular, there is only one good set of data in which to analyze the recreational fishery, the Marine Recreational Fishery Statistics Survey for 1979. Previous surveys in 1960, 1965, 1970, 1974, and 1975, as noted in this document, suffer from several survey problems and may have resulted in overestimates of catch. With respect to commercial statistics, landings and ex-vessel values are available, but traditional measures of effort such as days fished are lacking. As noted in the quote above, existing research vessel data have only covered a portion of the bluefish range. Some of the main biological issues of this Plan are: Are bluefish being overfished? If overfishing is present, what reductions of commercial effort and/or recreational effort are needed to maintain the biological viability of the stocks? How do these reductions translate into meaningful management measures such as quotas? Finally, to what extent does commercial effort impact recreational catch? Only the first of these questions has been preliminarily answered.

## 3. Management and Enforcement

The first step in managing a fishery and enforcing its regulations is detecting and identifying the fishery's participants. For the bluefish fishery, especially within a season or year, this first step is difficult because of the characteristics of the user groups and the geographic location of their catches (i.e., FCZ or State waters).

Participants in the recreational fishery can be divided into four groups according to their mode of fishing: party and charter boat fishermen, private and rental boat fishermen, fishermen who fish from man made structures, and fishermen who fish from beaches and banks. These groups caught, respectively by number, 25%, 48%, 11%, and 16% of the total bluefish recreational catch (US Dept. of Comm., 1980b, Tables 22 - 24). If detection and identification of participants for enforcement and management purposes is a function of the number of anglers and alternative intercept sites, party and charter boat fishermen are by far the most recognizable of the angler groups for they dock at well known piers and are required to have Coast Guard documentation. For all species of fish, party and charter boat anglers took 2,991 trips while private and rental boat fishermen, man-made mode fishermen, and beach/bank fishermen took 21,400,

6,700, and 8,000 trips in 1979, respectively. These latter modes of fishing account for 92% of all angler trips and 75% of the total recreational bluefish catch. Since fishermen using these latter modes have an almost infinite number of sites in which to operate from, effective management and enforcement of bluefish regulations will be extremely complicated and costly. At the present time directed trips for bluefish by mode is unavailable, but officials in their enforcing of such regulations as size limits or quotas will have to monitor essentially almost all recreational fishermen in order to discern whether they are participating in the bluefish fishery or not. For reasons similar to the ones discussed concerning the party/charter boat fishery, commercial fishing for bluefish is probably easier to detect and identify, for enforcement and management purposes, than these recreational modes.

Enforcement and management is complicated not only by the characteristics of the various user groups but also by the geographic location of their catches. As mentioned previously, 36.6% of the commercial catch by weight in 1981, while 39% of the recreational catch by number in 1979, was taken in the FCZ. Furthermore, 38% of this recreational catch and approximately 61% of the commercial catch as indicated by 1976 landings by state by water area come from internal water areas (Table 3). These numbers imply that without Federal-State cooperation effective management would be exceedingly difficult, if not impossible. Management by area quota would require costly at sea enforcement to prevent underreporting as total area catches approach area quotas and fishermen seek to minimize the probability of closures or illegally operate in the closed area.

Bluefish management is complicated by the fact that a substantial portion of landings come from the territorial sea and internal waters (Section VIII-2). Therefore, effective management of the resource requires compatible management by the Federal government in the FCZ and by the States in the Territorial Sea and internal waters. In recognition of this problem, the Mid-Atlantic Council requested the Atlantic States Marine Fisheries Commission (ASMFC) to prepare a plan for bluefish for the territorial sea and internal waters. The ASMFC adopted the following resolution on 14 October 1982:

That the ASMFC take the draft Bluefish Plan approved by the Mid-Atlantic Fishery Management Council following public hearing. The Plan will be given to a Bluefish Board to develop recommendations for State action, recognizing it may be necessary to obtain programmatic funds from the Mid-Atlantic Fishery Management Council to assist ASMFC in completing this effort.

### C. Management Objectives

The Council has adopted two specific objectives for this Plan:

1. Increase understanding of the condition of the stock and fishery.

Objective 1 is a recognition that there is a lack of data necessary for bluefish management and a need to improve the data base for use in future refinements to the Plan.

2. Provide the highest availability of bluefish to US recreational fishermen while maintaining, within limits, traditional uses of bluefish, recognizing some natural stock fluctuations are inevitable.

Objective 2 is a recognition of the importance of the recreational fishery as well as an expression of the desire of the Council that, to the extent possible, the historical pattern of the fishery be maintained. This historical pattern relates to the relative catch of the recreational and commercial sectors, the geographical distribution of the fishery, and the relative importance of the various gear types in the commercial fishery. It is recognized that these distributions may vary slightly from year to year. It is also recognized that changes in stock abundance may alter the relationships. However, the basic intent is that the general relationships between user groups and between regions not change dramatically.

### D. Management Alternatives

There are no specific federal regulations governing bluefish except for its management as an incidental catch within the Foreign Trawl Fisheries of the Northwest Atlantic Preliminary Fishery Management Plan (PMP). Several states have adopted specific size limits for bluefish, ranging from 8" to 10", and indirectly impact the taking of bluefish through commercial gear regulation and prohibition of certain gears from certain geographical regions (Section VII).

The preferred alternative is identified as alternative 7. It would restrict the use of all gear except hook

and line, conventional gill nets, traps, haul seines, and pound nets to conduct a directed fishery for bluefish in the FCZ. Optimum Yield (OY) is all bluefish caught by US fishermen in the Atlantic FCZ excluding the Gulf of Mexico, pursuant to this Plan.

US fishermen using hook and line, conventional gill nets, traps, haul seines, and pound nets to conduct a directed fishery for bluefish in the FCZ would be allowed to harvest bluefish without limit. The use of all other gear to conduct a directed fishery for bluefish in the FCZ would be prohibited unless a waiver of the prohibition were granted by NMFS.

NMFS could grant waivers to the gear prohibition if they were consistent with the objectives of the Plan that is, that it provided the highest availability of bluefish to US recreational fishermen while maintaining, within limits, traditional uses of bluefish. Specifically, NMFS would be required to attempt to maintain the historical catch distribution in granting such waivers, both between sectors (8% of the total catch for the FCZ commercial fishery) and geographically (11% of the FCZ commercial catch landed in New England, 37% of the FCZ commercial catch landed in the Mid-Atlantic, and 52% of the FCZ commercial catch landed in the South Atlantic (Table 4)). It is recognized that these relationships cannot be maintained absolutely, but it is the Council's intent that NMFS grant waivers for the use of the restricted gear types so as to minimize the chances of major changes in these relationships. NMFS would be allowed to specify the amount of bluefish that could be caught with permits granted through waivers.

The catch distribution was arrived at by examining historical data. The distribution between the recreational and commercial fisheries has been about 88% and 12%, respectively (Table 6). In order to provide some growth for the commercial fishery while still protecting the recreational fishery, it was determined to use a distribution of 80% recreational and 20% commercial. In 1981, the FCZ commercial fishery accounted for 37% of the total commercial catch (Table 4). This was adjusted to 40%. If that 40% is applied to the overall 20% commercial share, the result is that the FCZ commercial fishery share is 8% of the total catch. The geographical distribution of the FCZ commercial catch (11% New England, 37% Mid-Atlantic, and 52% South Atlantic) is the average distribution for 1976-1981.

In order to provide a basis for granting any waivers to the gear prohibition, it would be necessary to annually estimate landings. NMFS, in consultation with the Council, prior to the beginning of each year, would be required to project the total bluefish catch, recreational catch, and catch by the permitted gear types (hook and line, conventional gill nets, traps, haul seines, and pound nets). From these projections, the amount of bluefish available for catch by the prohibited gear types could be estimated, thus providing a basis for granting waivers from the gear prohibition.

NMFS would be required to establish the procedures for the waiver system. As guidance in that regard, it is suggested that persons desiring to obtain waivers from the gear prohibition file their applications by a particular date prior to the beginning of the fishing year. All of those applications could be evaluated together relative to the specified criteria with appropriate decisions made prior to the beginning of the fishing year on 1 January. Applications could be considered after that date, i.e., any time during the year, but such applications would necessarily be evaluated in light of waivers previously granted. Fishermen would be required to supply information on how much bluefish they caught using the gear for which a waiver is being sought with the application, as well as the amount of bluefish requested by the waiver. NMFS could evaluate these applications against the amount of bluefish available for harvest by the prohibited gear types. This would be done through a series of iterations, initially giving all fishermen what they caught in the most recent year. If there is not enough bluefish available, all fishermen would be reduced a proportional amount. If there is any left, it could be granted to those fishermen who want an increase. If there is any left after that, it would be saved for applications submitted later in the year. If no event could the regional allocations specified in the Plan be violated.

Bluefish can be a bycatch in other fisheries. Therefore, this alternative provides that incidental catches of bluefish in directed fisheries for other species by fishermen without waivers using gear other than hook and line, conventional gill nets, traps, haul seines, and pound nets would be limited to 10% of the total catch on board a vessel at the end of a fishing trip.

Foreign fishermen would not be permitted to retain bluefish since US fishermen would use the entire OY.

Operators of party and charter boats and persons landing and selling FCZ bluefish would be required to have permits and submit reports as set forth in Sections XIII-1 and XIV. However, NMFS could eliminate this reporting requirement as soon as an alternative method of obtaining the required data has been

implemented. Vessels are exempt from this requirement if they catch no more than 100 pounds of bluefish per trip.

Other alternatives considered by the Council are:

1. **Take no action at this time.** This would mean that the Preliminary Fishery Management Plan (PMP) would remain in effect. The PMP regulates only foreign fishing and prohibits foreign fishermen from retaining bluefish.
2. **Allow US fishermen unrestricted catches of bluefish.** This alternative is intended to recognize that totally effective bluefish management requires regulation in the FCZ, Territorial Sea, and internal waters and to postpone management until such time as the States develop a management system for the Territorial Sea and internal waters. Following development of such a system, this Plan would be amended to incorporate compatible management measures.

Operators of party and charter boats and persons selling bluefish would be required to have permits and submit reports. Vessels are exempt from this requirement if they catch no more than 100 pounds of bluefish per trip.

OY would be all bluefish caught in the FCZ by US fishermen, so retention of bluefish by foreign fishermen would be prohibited.

3. **Allow US fishermen unrestricted catches of bluefish, but impose a 14 inch (fork length) size limit.** OY would equal all bluefish 14" in length or larger caught in the FCZ by US fishermen. Therefore, foreign fishermen would not be permitted to retain bluefish.

Operators of party and charter boats and persons selling bluefish would be required to have permits and submit reports. Vessels are exempt from this requirement if they catch no more than 100 pounds of bluefish per trip.

4. **Restrict bluefish catches by commercial and recreational fishermen.** Bluefish range throughout the FCZ, Territorial Sea, and internal waters and the fishery for the species takes place in all of these areas. Federal management jurisdiction is limited to the FCZ, which is the management unit of this Plan. However, management in the FCZ cannot proceed without regard for the portion of the stock and fishery outside the FCZ. For that reason, the concept of "total desirable catch" is introduced and defined to mean the total catch of bluefish from all areas (FCZ, Territorial Sea, and internal waters) that would be consistent with the objectives of the Plan. In other words, the total desirable catch would be the Optimum Yield if the management unit were bluefish throughout the range of the stock. Use of the concept of total desirable catch permits the calculation of an OY for the FCZ, the management unit of the Plan, that accounts for the condition of the stock and level of the fishery throughout the range of the stock. It must be remembered that values calculated for the entire area are advisory to the States and have no Federal regulatory significance. Only the OY and allocations for the FCZ would have regulatory significance for purposes of this Plan.

With this alternative the total desirable catch (FCZ, Territorial Sea, and internal waters) would equal the average MSY (104 million pounds). Total desirable catch would be allocated between the commercial and recreational fisheries based on the distribution shown in the latest available recreational fisheries survey and commercial catch statistics (based on 1979 data, the distribution would be 88% recreational and 12% commercial). The overall catch allocations would be further divided based on 1979 data into FCZ recreational and commercial allocations (quotas), the sum of which would equal OY. Because data on the weight of recreationally caught bluefish are not currently available, it is impossible to estimate the actual quotas and OY. It is anticipated that the necessary data will be available in the near future.

Under certain conditions, such as natural population fluctuations, it might be necessary to either relax or further limit the catch of bluefish. Therefore, this alternative requires that NMFS, in consultation with the Council, examine annually the NEFC assessment of the fishery and, if appropriate, raise or lower the OY. In considering such action, information gathered from catch reports, marine recreational fishery statistics surveys, and any effort data available must be used in conjunction with the assessment. Under any circumstances, OY cannot be such that the OY, when averaged with the total catch values for the preceeding 9 years will exceed maximum MSY (119 million pounds).



Operators of party and charter boats and persons selling bluefish would be required to have permits and submit reports. Vessels are exempt from this requirement if they catch no more than 100 pounds of bluefish per trip.

5. **Allow US recreational fishermen unrestricted catches of bluefish and restrict commercial landings.** While this Plan is intended to manage bluefish only in the FCZ, this alternative is based on a recognition that such management cannot ignore the fishery shoreward of the FCZ. This alternative provides that the Regional Director, based on recommendations of the Council, will annually estimate the total desirable bluefish catch along the Atlantic Coast (FCZ, Territorial Sea, and internal waters). From that estimate, an FCZ allocation will be made. This FCZ allocation will be the annual OY. The difference between the total desirable catch and the OY should provide guidance to the States so that their management in the Territorial Sea and internal waters can be compatible with Federal management in the FCZ.

The overall desirable catch would be whatever US recreational fishermen catch plus the commercial catch allocation which is 15% of recreational landings of the previous fishing year or up to 18 million pounds, whichever is greater. In order to assure that the commercial catch allocation is based on the best available data, recreational catch data for year 1 would be used in year 2 to develop the allocation for year 3.

The overall commercial allocation would then be divided into allocations for the FCZ and for the Territorial Sea and internal waters. The FCZ allocation would be up to 40% of the overall commercial allocation or up to 7,200,000 pounds, whichever is greater. Therefore, OY would equal whatever bluefish recreational fishermen catch in the FCZ plus whatever US commercial fishermen catch in the FCZ up to 6% of the overall recreational bluefish catch (of two years previous) or up to 7,200,000 pounds.

The Regional Director would be required to monitor commercial bluefish catches in the FCZ and close the directed fishery for bluefish in the FCZ if it appeared that the commercial allocation would be exceeded. During a period of closure, commercial vessels would be permitted a bycatch of bluefish not to exceed 10% of the weight of all fish on board at the end of a trip.

Foreign fishermen would not be permitted to retain bluefish since US fishermen would use the entire OY.

Operators of party and charter boats and persons selling bluefish would be required to have permits and submit reports. Vessels are exempt from this requirement if they catch no more than 100 pounds of bluefish per trip.

6. **Prohibit the use of purse seines and pair trawls in the directed commercial fishery for bluefish.** This alternative modifies alternative 5 in that it would add to alternative 5 a prohibition on the use of purse seines and pair trawls in conducting a directed fishery for bluefish in the FCZ.

All of the alternatives are discussed in Section XII.

## II. REGULATORY IMPACT ANALYSIS

### A. Framework for the Analysis

The purpose of the regulatory analysis is to determine the economic impacts upon the various user groups of the alternative measures for addressing the problems in the fishery. Ideally, the impacts upon the following economic indicators would be assessed:

1. total US catch relative to recommended levels,
2. total revenues to the commercial and recreational fisheries,
3. the distribution of revenues among the various user groups,
4. the non-priced recreational user benefits,
5. the consumer and producer surplus in the commercial sector,
6. the secondary impacts upon regional income and employment, and
7. management costs.



Unfortunately, the available data only allow some discussion of the impacts upon commercial catch and revenues, the distribution of catch between recreational and commercial fisheries, and some qualitative assessment of management costs. The economic impacts of regulating this fishery cannot be fully assessed until, at the least, a recreational demand function is specified. Given the addition of a socio-economic survey coupled to the 1981 Marine Recreational Fishery Statistics Survey and future surveys, the ability to specify and estimate this function is probably 2 to 3 years away. (The analysis below utilizes the forecasting equations discussed in Section IX. Lack of more recent data prevents updating the equations so that 1983 forecasts can be made. It is assumed that the magnitude of existing forecasts for 1981 and 1982 are representative of the future.)

## **B. Alternative Measures for Addressing the Problems and Their Economic Impacts**

### **1. Allocation of the Resource Between User Groups**

The Council believes that recreational fishing relative to commercial fishing is a higher valued use of the resource, that recreational effort is highly responsive to changes in abundance and cannot cause serious overfishing of the stock, and that recreational effort is less effective than commercial effort in harvesting the stock. For these reasons, the recreational fishery should receive the major allocation of the resource.

Alternatives 1-3 indirectly allocate the resource among user groups for they all will allow the commercial fishery the potential to grow beyond its traditional share of the resource. If such growth occurs, there is a potential for the recreational fishery to decline, which would further increase the commercial share of the fishery. Since, as discussed above, recreational use of bluefish is a higher valued use of the resource, alternatives 1-3 could potentially result in a misallocation of the resource from the recreational fishery to the commercial fishery.

Alternatives 4 - 7 allocate the resource in some direct manner. Alternative 4 divides the total desirable catch which equals the MSY based on the 1979 distribution of catch between the recreational and commercial fishermen. Recreational fishermen would receive 88% of the total catch, while commercial fishermen would receive 12%. Comparison of the catch forecasts in Section IX of the Plan with such a division indicates that at all levels of OY, the current commercial fishery would be constrained. If the OY in 1982 is 119 million pounds, the commercial share would equal 14.3 million pounds while, if the OY equals 90 million pounds, the commercial share would equal 10.8 million pounds. Both of these shares are below the minimum estimate of commercial catch forecasted, 14.8 million pounds and below preliminary estimates of 1981 landings. Therefore, depending on the OY selected, the existing commercial industry could lose up to 5.0 million pounds, or at the 1981 average price level of 20¢ a pound, at least \$1 million if the commercial share is equal to 10.8 million pounds.

Forecasts of recreational catch indicate that only if the OY falls below 104 million pounds will the recreational quota be constraining. This OY leads to a 91.5 million pound recreational quota which is slightly less than the 92.1 million pound recreational catch forecast for 1982.

Alternative 5 allows unlimited recreational catch but limits FCZ commercial landings to 6% of the recreational catch of the two years previous or 7.2 million pounds, whichever is greater. This alternative is based on the assertion that recreational effort is quite sensitive to abundance and will decline more rapidly than commercial effort when the stock enters a serious declining phase. Therefore, if recreational catch will decline during these phases, tying a commercial quota to the recreational catch is one mechanism of assuring that the stock is not overfished during long periods of time.

If this rule is applied to the fishery, 6% of the forecasted recreational catch for 1980, 1981, and 1982 range from 5.3 to 5.5 million pounds (Section IX-1). If we assume that the forecast of recreational catch is off by 5 million pounds, as it was in 1979, an additional .3 million pounds would be added to these figures.

Clearly, all of these estimates are under 7.2 million pounds, so the question becomes whether alternative 5 will constrain total catch. The FCZ fishery grew 31% in 1979, 22% in 1980, and 38% in 1981 to a level of 5.8 million pounds. The FCZ fishery must continue this remarkable growth for the next 3 years in order for the fishery to expand beyond 7.2 million pounds by 1985. Unless the total recreational fishery expands to over 120 million pounds, commercial expansion would be constrained by the 7.2 million pound quota, since it will be greater than 6% of the recreational catch of two years previous.

Furthermore, if the fishery is constrained such that prices increase 25% from their current 1981 level of \$.25 per pound, the FCZ fishery would have to have the potential to expand to 11.2 million pounds in order to generate annual losses of over \$1 million at the ex-vessel level. That is, the demand for FCZ bluefish would almost have to double for current levels in order for significant impacts to be generated.

Alternative 6 prohibits the use of purse seines and pair trawls in the directed commercial fishery for bluefish, because it is expected that if a significant increase in the commercial fishery were to occur, these would be the most probable gears utilized. In 1980, the Mid-Atlantic catches by these gears were less than 1% of the total Mid-Atlantic bluefish commercial catch (Table 11). In North Carolina, landings by these gears are minimal (Pers. comm., North Carolina Dept. of Natural Resources). Therefore, the impacts of this alternative upon the existing users of these gears are slight.

Unlike the other alternatives, alternative 7 does not make an explicit distinction between recreational and commercial user groups. It distinguishes two broad user groups according to gear utilized. The first group consists of all users of permissible gear, which are hook and line, conventional gill nets, traps, haul seines, and pound nets. The second user group are all the other gears that desire to direct on bluefish in the FCZ, such as purse seines, otter trawlers, etc. This alternative is based on the hypothesis that if a significant expansion were to occur, it would be due to this latter group. Recreational fishermen typically use only hook and line and these are a subset of the first group. Fishermen belonging to the second group will be allowed to fish in the FCZ under any of the following conditions: (1) they catch less than 100 pounds of bluefish per trip; (2) their total trip catch is less than 10% bluefish; or (3) they have a waiver from NMFS.

Alternative 7 is unlikely to cause significant impacts on this latter user group. For the Mid-Atlantic region, purse seines, pair trawls, mid-water and otter trawls have caught from 65% to 99% of the Region's FCZ catch over the past 5 years (Table 11). For the South Atlantic, the percentage share of the FCZ catch by these gears is probably higher since this region's landings are predominantly composed of the North Carolina offshore trawler fleet (Tables 3 and 12). This implies that almost all of the FCZ catch and revenue may be derived from these gears. If all of these gears were excluded from fishing in the FCZ (assuming that 40% of the 1982 forecast of the total commercial revenue is generated from the FCZ), these gears would lose approximately \$1 million, given existing markets. However, most of these revenues are due to the incidental catch of bluefish. North Carolina trawlers have average monthly catches that range from 5%-16% bluefish (Table 20). Therefore, very few vessels are significantly directing on bluefish and most of these landings would fall under the bycatch provisions of this alternative.

Alternative 7 also charges NMFS to maintain the historical catch distribution between recreational and commercial fishermen and between commercial fishermen operating in the South Atlantic, Middle Atlantic and New England regions. This alternative differs from alternatives 4 and 5 in that these latter alternatives propose strict quotas. This alternative only seeks to maintain the historical catch distribution between user groups and between regions through the use of the waiver system. The waiver system is flexible and relatively easy to enforce (see below).

As discussed above, the 80%-20% split between recreational fishermen and commercial fishermen leads to an FCZ commercial fishing share of the total catch. Based on the 1982 forecasts of total landings, this leads to a potential commercial FCZ catch of almost 9 million pounds. The FCZ fishery has grown remarkably to a level of 5.8 million pounds in 1981, increasing 31% in 1979, 22% in 1980 and 38% in 1981, for an average of 30%. However, the fishery would have to maintain this remarkable growth for the next two years in order to approach this level. This growth will primarily depend on the relative price of bluefish to other species and the availability of alternative species such as flounder, sea trout, and croaker to the commercial fisherman.

If the estimated 9 million pounds of FCZ catch is divided according to the average regional distribution for the years 1976 - 1981, South Atlantic fishermen have the greatest potential to be impacted. This leads approximately to a 1 million pound share for New England fishermen, a 3.3 million pound share for Mid-Atlantic fishermen, and a 5.1 million pound share for South Atlantic fishermen. In 1981, South Atlantic fishermen caught 4.0 million pounds of bluefish in the FCZ, a 35% increase over 1980 (Table 4). Since this region is the major source of growth in the overall fishery, this size share would appear to be constraining. However, the majority of the South Atlantic bluefish catch is essentially at bycatch rates and, therefore, the negative impacts of maintaining the historical balance probably will not be significant. At \$.20 per pound, the fishery would have the potential to maintain this 35% increase, or its equivalent, for the next three years before \$1 million in lost revenues would accrue. This is unlikely since the growth

rate percentage for South Atlantic FCZ landings has decreased steadily since 1976. This trend indicates that future growth rates will be lower than 35%, (as discussed previously and in Section IX) especially if the availability of flounder, croaker, and sea trout increase in the South Atlantic, many fishermen will reduce their catch of bluefish. As of August 1982, North Carolina landings have decreased by 1.7 million pounds relative to August 1981, a 38% decrease.

## 2. Data Collection and Monitoring

Commercial and recreational effort data are lacking. Existing statistical processing of commercial and recreational catches indicate that, at best, monthly catch levels can only be determined 3 months after the fact. Effort data are needed to improve the MSY estimate while timely catch data are needed if quota management is to be effective.

Alternatives 2 - 7 require that commercial fishermen and party/charter boat operators obtain permits and submit reports (Section XIV). This information would go a long way in providing timely catch and effort data. Party/charter boats account for approximately 25% of the recreational catch. Their catch and effort levels will effectively monitor the recreational industry because they should be closely correlated with the catch and effort of the remaining recreational user groups.

Currently NMFS is undertaking annual surveys of the recreational industry. In 1981 the survey was expanded to include socio-economic questions through which recreational demand can be estimated. NMFS has recently expanded its commercial weighout data system to Virginia and Maryland such that all the major fishing states from Maine through Virginia are included. In time, uniform catch and effort statistics will be provided throughout the northern range of the fishery. Unfortunately, Florida and North Carolina are not included in this system and these two States provide a large proportion of the commercial catch with North Carolina being the source of most of the new commercial effort. At this time, neither of these data collection procedures are responsive enough to monitor catch under any quota management system, especially since the weighout system does not include inshore catches. The reporting requirements discussed in Section XIV of the Plan will include the States south of Virginia and allow closer quota monitoring. While they impose additional management costs, they may have the added benefit as double check on the existing data collection systems. These costs may be temporary, if the existing data collection systems can be modified such that statistics are reported in a timely fashion. The Council is willing to remove the requirement of mandatory logbooks if NMFS can provide alternative methods of providing the data specified in Section XIV.

The reporting requirements in Section XIV are recommended in order for the Councils and NMFS to acquire accurate data on the overall catch, bluefish catch, disposition of such catch, and effort in the fishery. These data reporting requirements are necessary to manage the fishery for the maximum benefit to the US. It is necessary that reporting be as comprehensive as possible and should include the Territorial Sea, internal waters, and FCZ. The following suggestions are designed to meet this need. If it is determined that the Secretary does not have the authority to mandate reporting of catches from the Territorial Sea, alternative methods of securing the data must be developed. In addition, methods must be developed and implemented by the Secretary on a continuing basis to obtain data on the catches of marine anglers who, based on the recommendations below, are not required to maintain logs.

It is necessary that appropriate data be collected both to support the management system of the preferred alternative and to provide a basis for future refinements of the Plan.

The preferred alternative requires that annual estimates of the recreational catch, the catch by permitted gear types, and bycatch by restricted gear types be made to provide a basis for granting waivers for directed fisheries using restricted gear. To make these estimates it will be necessary to have at least current data on the recreational catch, commercial landings using the permitted gear types, commercial landings using restricted gear without waivers (bycatch), and commercial landings using gear for which waivers have been granted. These data should be tabulated on a monthly basis in order to facilitate making the required estimates.

To provide for refinements to the Plan, it is necessary that catch and effort data for both the commercial and recreational fisheries are available, along with biological data from both fisheries. This information will supplement data from NEFC surveys to provide the basis for stock assessments.

The preferred alternative includes a logbook requirement as set forth in Section XIV-2, but provides that

NMFS may remove that requirement when alternative methods of obtaining the necessary data are implemented.

### 3. Enforcement and Management

A large portion of the recreational and commercial catch is taken within 3 miles of shore. This implies that State-Federal cooperation is needed for effective bluefish management. Furthermore, because bluefish are also taken by many different modes of fishing and have characteristics that complicate effective management and enforcement of regulations, commercial activities, on a relative basis, seem the easiest to regulate.

Alternatives 2, 4, 5, 6, and 7 address the management and enforcement issues surrounding the areal distribution of catch. Alternative 2, outside of data reporting requirements, postpones FCZ management until such time as the States develop a management system for the territorial sea and internal waters. Alternatives 4, 5 and 7 provide for FCZ commercial quotas. These quotas are likely to face the same enforcement difficulties as the east-west dividing line in the yellowtail fishery because it will produce underreporting of FCZ catches and will require at sea inspection of catches. Alternatives 6 and 7 both prohibit various gears from operating within the FCZ. These alternatives all require that sellers of bluefish and those vessels that have catch rates greater than 100 pounds per trip be permitted.

Commercial fishermen and party/charter boat operators seem the easiest groups to identify, relative to other user groups. This implies that regulations placed on recreational fishermen will be more difficult and costly to enforce than regulations placed on commercial fishermen or party/charter boat operators.

Alternatives 3 - 7 will require some expenditure of enforcement resources. Alternative 3 imposes a size limit on all fish taken in the FCZ. This alternative requires at sea enforcement which is costly and may not be an effective means of preventing excess effort in the fishery.

Alternative 4 may be the least effective management alternative and the most costly because it has a recreational catch quota. Unless private/rental boat catches are closely correlated with party/charter boat catches, some means of estimating weekly or monthly recreational catches from these two user groups must be devised, along with some method of closure should the recreational quota be exceeded. Because the intercept sites of private/rental fishermen are so numerous, no effective method of monitoring or closing the fishery can be envisioned.

Alternatives 5 and 6 impose regulations only on commercial fishermen, while alternative 7 regulates the use of all gears except hook and line, conventional gill nets, traps, haul seines, and pound nets or restricts certain gear types from operating in the FCZ. Of the three alternatives, alternative 5, because it imposes a quota, may be the most costly since it will require close monitoring of catches and at sea enforcement. Alternatives 6 and 7 appear to be easier to enforce since they are simple prohibitions of gear. However, they may be expensive and difficult because they would be totally dependent on at sea enforcement in those regions where these gear types are allowed to fish in state waters. Because alternative 6 only bans purse seines and pair trawls, it is relatively easier to enforce than alternative 7.

Except for alternatives 1 and 6, alternative 7 may be the least costly alternative with respect to enforcement. As discussed earlier, few vessels are currently seeking total catches with a high proportion of bluefish (Table 20). If these vessels do want to direct on bluefish in the FCZ, they must have a NMFS waiver. This procedure will readily identify the universe of potential FCZ directed fisheries which greatly enhances enforcement. Of course, the penalty for not having a waiver must be sufficiently high that, when combined with the expected probability of being detected, potential violators are deterred. Furthermore, many of the states prohibit trawlers and purse seines from fishing within their waters (Section VII-4). As states cooperate and adopt compatible regulations to those in the FCZ, the need for at sea enforcement diminishes.

With respect to maintenance of the historical distribution of FCZ catch among the various Council regions, the distribution is not envisioned as strict area quotas and, therefore, only minimal enforcement cost is expected from this provision. The historical distribution is expected to be maintained through the issuance of the waivers with few waivers being granted in those regions where catch is close to the regional allocation of that year's OY, and with as many waivers as needed granted in those areas where the catch is below the historical level.

### III. IMPACTS RELATIVE TO E.O. 12291

Under E.O. 12291 a proposed regulation is a "major" rule if it is likely to result in:

1. An annual effect on the economy of \$100 million or more;
2. A major increase in costs or prices for consumers, individual industries, Federal, State, or local government agencies, or geographic regions; or
3. Significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of US-based enterprises to compete with foreign-based enterprises in domestic or export markets.

Alternatives with impacts of at least \$1 million may warrant major rule status. The question arises as to what alternatives have impacts of such magnitude whether they be in reference to the entire economy (criterion 1), in reference to increased prices and costs (criterion 2), in reference to productivity (criterion 3), and in reference to export (criterion 3).

Alternatives 1, 2, and 3 are similar in that they do little to prevent any future rapid expansion in the commercial fishery and this may lead to significant losses to the economy. Alternative 3 imposes a size limit of 14". At this time neither the percentage of the recreational catch nor of the commercial catch greater than 14" is known. Impacts of this alternative upon recreational fishermen are probably small because small fish can be released with little diminution of the overall fishing experience. The impacts of increased costs to commercial fishermen because they will have to adopt more selective harvesting gear and techniques will have to be weighed against the higher prices they would receive for their larger sized catches. Data are unavailable with which to weigh these impacts. Alternative 2 differs from alternative 1 in that it assumes that the fishery will be managed at some future time.

None of these 3 alternatives will have short run impacts of million dollar magnitudes, but their long run impacts may. As discussed previously, 1979 recreational expenditures were at least \$41.9 million for 96 million pounds of bluefish, approximately 44¢ per pound. If these expenditures are constant and directly proportional to changes in landings, a decline in landings by just 2.1% due to overfishing will lead to a loss of \$1 million in angler expenditures. Even if unit expenditures decline by one half of this amount because of declining angler success to 22¢ per pound, only a 5% loss in annual landings by recreational anglers will trigger \$1 million in lost revenues to the recreational industry. Furthermore, the economic risk of leaving the fishery in an unmanaged state where overfishing may occur is high given the fact that bluefish are the "bread and butter" catch of the party and charter boat industry. The total sample of the Mid-Atlantic Census of Recreational Fishermen, 32 party and 142 charter boats, generated an estimated \$9.2 million in gross revenues (MAFMC, 1981). This sample is likely to be less than 25% of the entire party and charter boat fleet, especially since South Atlantic and New England vessels were not included in the survey. These vessels, relative to the rest of the recreational industry, are particularly vulnerable to declining bluefish abundance since they have few alternative species to switch to while their profits are closely tied to fishing success. Declining angler success due to low bluefish abundance can easily lead to losses of revenues in the million dollar range for these vessels. Therefore, leaving the fishery in a continued unmanaged state for any length of time, if overfishing occurs, is likely to produce annual million dollar revenue losses, especially with respect to party and charter boat operators.

Alternative 4, - 7 allocate the resource in some manner and their short run impacts upon the commercial and recreational fisheries were discussed earlier. In summary, these impacts fell primarily on the commercial fishery. Below is a list of the magnitudes of short run revenue losses that were discussed:

<u>Alternative</u>	<u>Revenue Losses</u>
4	\$1 million
5	slight - less than \$1 million
6	slight - less than \$1 million
7	slight - less than \$1 million

Given the qualifications to all of these estimates, it is likely that none of these alternatives generate significant annual impacts beyond a million dollars.

The costs of enforcement and data collection must be included within the impact analysis. The

incremental costs of these programs will depend on how bluefish management blends into existing systems of enforcement and data collection. The incremental costs of these programs are probably not sufficient enough in magnitude to generate total impacts that warrant major rule status.

With respect to criteria 3, competition may be impeded indirectly because quota limitations reduce the profitability of new fishing ventures. Alternative 6 prohibits the use of some gear in the FCZ while alternative 7 restricts the use of some gear to direct for bluefish in the FCZ. These alternatives may have negative impacts on existing and potential investment. Potential exports of bluefish will be limited by the quotas as well as the gear prohibitions. Since recreational fishing is the higher valued use of the fishery, these potential impacts are necessary in order to assure the optimum use of the resource. However, none of these indirect impacts are of a magnitude to warrant major rule status.

In sum, none of the proposed alternatives will produce impacts that signify major rule status. The alternative that is most likely to generate impacts of a significant nature in the long run is the no action alternative.

#### IV. Conclusion

Alternative 7 is recommended by the Council since it provides a means to control expansion of the commercial fishery so that it does not diminish significantly the recreational fishery which is a higher valued use of the resource. It does not excessively restrict utilization of the stock by historical fishing methods nor does it significantly impact the distribution of the resource between the major user groups. It recognizes that action by the states is needed to effectively manage the fishery and that some management is needed to maintain traditional uses of the fishery and to collect needed information and data for future management of the fishery. The benefits of this alternative, providing the highest availability of bluefish to recreational fishermen and increased understanding of the condition of the stock and fishery, though of a long run nature, should outweigh any short run economic costs placed on the commercial fishery.



## APPENDIX III. DRAFT PROPOSED REGULATIONS

### Subpart A - General Provisions

- §628.1 Purpose and Scope.
- §628.2 Definitions.
- §628.3 Relation to other laws.
- §628.4 Vessel permits and fees.
- §628.5 Recordkeeping and reporting requirements.
- §628.6 Vessel identification.
- §628.7 Prohibitions.
- §628.8 Enforcement.
- §628.9 Penalties.

### Subpart B - Management Measures

- §628.20 Fishing year.
- §628.21 Allowable levels of harvest.
- §628.22 Closure of fishery. (Reserved)
- §628.23 Size restrictions. (Reserved)
- §628.24 Gear restrictions.
- §628.25 Time restrictions. (Reserved)

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

### Subpart A - General Provisions

#### §628.1 Purpose and Scope.

- (a) The regulations in this Part (1) implement the Fishery Management Plan for the Bluefish Fishery of the Northwestern Atlantic Ocean, which was prepared and adopted by the Mid-Atlantic Fishery Management Council and approved by the Assistant Administrator; and (2) govern fishing for bluefish by fishing vessels of the US within that portion of the Atlantic Ocean over which the US exercises fishery management authority, excluding the Gulf of Mexico.
- (b) The regulations governing fishing for bluefish by foreign vessels in the Fishery Conservation Zone are contained in 50 CFR Part 611.

**§628.2 Definitions.** In addition to the definitions in the Act, the terms used in this Part shall have the following meanings:

**Act** means the Magnuson 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.

**Authorized officer** means:

- (a) Any commissioned, warrant, or petty officer of the US Coast Guard;
- (b) Any certified enforcement officer or special agent of the National Marine Fisheries Service;
- (c) 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 US Coast Guard to enforce the provisions of the Act; or
- (d) Any US Coast Guard personnel accompanying and acting under the direction of any person described in paragraph (a) of this definition.

**Bluefish** means the species Pomatomus saltatrix.

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

**Charter or party boat** means any vessel which carries passengers for hire to engage in fishing.

**Conventional gill net** means a gill net fished generally in a straight line, for example, staked, anchored, or drift gill nets. Gill nets that are fished in a manner to encircle a school of fish are excluded.

**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.

**Fishery Management Plan (FMP)** means the Fishery Management Plan for the Bluefish Fishery of the Northwest Atlantic Ocean, and any amendments thereto.

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

- (a) The catching, taking, or harvesting of bluefish;
- (b) The attempted catching, taking, or harvesting of bluefish;
- (c) Any other activity which can reasonably be expected to result in the catching, taking, or harvesting of bluefish; or
- (d) Any operations at sea in support of, or in preparation for, any activity described in paragraphs (a), (b), or (c) of this definition.

**Fishing trip** means a period of time during which fishing is conducted, beginning when the vessel leaves port and ending when the vessel 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: (a) fishing; or (b) aiding or assisting one or more vessels at sea in the performance of any activity related to fishing, including, but not limited to, preparation, supply, storage, refrigeration, transportation, or processing.

**Fishing week** means the weekly period beginning 0001 hours Sunday and ending 2400 hours Saturday.

**Fishing year** means the 12 month period beginning 1 January.

**Haul seine** - strip of strong netting hung to a cork line at the top and a heavily weighted lead line on the bottom. The method of fishing is to leave one end on shore, pay out the line with a boat until the other end is reached, lay out the net parallel to the beach, and then bring the end of the second hauling line ashore.

**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:

- (a) Any person who owns that vessel in whole or in part;
- (b) 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
- (d) Any agent designated as such by a person described in paragraphs (a), (b) or (c) 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.

**Person who receives bluefish for commercial purposes** means any person (excluding governments and governmental entities) engaged in commerce who is the first purchaser of bluefish. The term includes, but is not limited to, dealers, brokers, processors, cooperatives, or fish exchanges. It does not include a person who only transports bluefish between a fishing vessel and a first purchaser.

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

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

**Vessel of the United States means:**

- (a) Any vessel documented or numbered by the US Coast Guard under United States law; or
- (b) Any vessel under five net tons which is registered under the laws of any State.

### **§628.3 Relation to other laws.**

- (a) Persons affected by these regulations should be aware that other Federal and State statutes and regulations may apply to their activities.
- (b) 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).

### **§628.4 Vessel permits and fees.**

- (a) **General.** Every fishing vessel, including party and charter boats, which fishes for bluefish under this Part must have a permit issued under this section. Private recreational vessels and vessels which catch no more than 100 pounds of bluefish per trip are exempt from this requirement.

- (b) **Eligibility.**

- (1) There are no eligibility requirements for fishing vessels using hook and line, conventional gill nets, traps, and pound nets.
  - (2) Fishing vessels using gear other than hook and line, conventional gill nets, traps, and pound nets to conduct a directed fishery for bluefish in the FCZ must receive a waiver to the gear prohibition in §628.24(b) pursuant to §628.24(c) prior to receiving a permit.

- (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 Assistant Administrator 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 owner of the vessel;
    - (ii) The name of the vessel;
    - (iii) The vessel's US Coast Guard documentation number or the vessel's State registration number for vessels not required to be documented under provisions of Title 46 of the US Code;
    - (iv) The home port or principal port of landing, gross tonnage, radio call sign, and length of the vessel;

- (v) The engine horsepower of the vessel and the year the vessel was built;
  - (vi) The type of construction, type of propulsion, and type of echo sounder of the vessel;
  - (vii) The permit number of any current or previous Federal fishery permit issued to the vessel;
  - (viii) The approximate fish hold capacity of the vessel;
  - (ix) The type and quantity of fishing gear used by the vessel;
  - (x) The average size of the crew, which may be stated in terms of a normal range;
  - (xi) Number of passengers the vessel is licensed to carry (party and charter boats);
  - (xii) Geographical area to be fished and landing port for bluefish; and
  - (xiii) Any other information concerning vessel characteristics requested by the Assistant Administrator.
- (3) Any change in the information specified in paragraph (c)(2) of this section shall be submitted by the applicant in writing to the Assistant Administrator within 15 days of the change.
- (d) **Fees.** No fee is required for any permit issued under this Part.
- (e) **Issuance.** The Assistant Administrator shall issue a permit to the applicant no later than 30 days from the receipt of a completed application.
- (f) **Expiration.** A permit shall expire upon any change in vessel ownership, registration, name, length, gross tonnage, fish hold capacity, home port, or the regulated fisheries in which the vessel is engaged.
- (g) **Duration.**
- (1) A permit granted pursuant to §628.4(b)(1) shall continue in effect until it expires or is revoked, suspended, or modified pursuant to 50 CFR Part 621.
  - (2) A permit granted pursuant to §628.4(b)(2) shall continue in effect for no more than one fishing year or until it 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 Assistant Administrator when requested in writing by the owner or operator stating the need for replacement, the name of the vessel, and the fishing permit number assigned. 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 and owner 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 operator of a fishing vessel shall present the permit for inspection upon request of any Authorized Officer.
- (l) **Sanctions.** Subpart D of 50 CFR Part 621 (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.

#### §628.5 Recordkeeping and reporting requirements.

**(a) Fishing vessel records.**

- (1) The operator of any fishing vessel issued a permit to fish for bluefish under this Part shall:
  - (i) Maintain on board the vessel an accurate and complete fishing vessel record on forms supplied by the Assistant Administrator;
  - (ii) Make the fishing vessel record available for inspection or reproduction by an Authorized Officer at any time during or after a fishing trip;
  - (iii) Keep each fishing vessel record for one year after the date of the last entry in the fishing vessel record; and
  - (iv) Submit fishing vessel records, as specified in §628.5(a)(2).
- (2) The owner or operator of any fishing vessel conducting any fishing operation subject to this Part shall
  - (i) Submit a complete fishing vessel record to a location designated by the Assistant Administrator 48 hours after the end of any fishing week or fishing trip (whichever time period is longer) during which any regulated species were taken; or
  - (ii) submit a statement to a location designated by the Assistant Administrator 48 hours after the end of any calendar week within which no fishing for any regulated species occurred.
- (3) Fishing vessel records shall contain information on a daily basis for the entirety of any trip during which bluefish or any other regulated species are caught. The information shall include date of fishing, type and size of gear, areas fished, duration of fishing time, time period of tow or gear set, and the estimated weight of each species taken.
- (4) A request for exemption from the provision of §628.5(a)(2)(ii) shall be submitted in writing to the Assistant Administrator. Such requests shall state the reason for the request and the period of time for which the exemption is to apply. The Assistant Administrator may issue an exemption of a period of time greater than two months and less than ten months. If an exemption is issued, the Assistant Administrator must be notified in writing of the operator's intent to resume fishing before fishing may be resumed.
- (5) 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.**

- (1) Any person who receives bluefish for a commercial purpose from a fishing vessel subject to this Part shall file a monthly report within 48 hours of the end of any month in which bluefish is received. This report shall include information on all first purchases of bluefish, and all other fish made during the month. Such information shall include date of transaction, name of the vessel from which bluefish was received, and the amount and price paid for bluefish and all other fish received.
- (2) Domestic bluefish processing capacity. (Reserved)
- (3) Reports required by §628.5(b) shall be made on forms supplied by the Assistant Administrator and submitted to a location designated by him.
- (4) Inspection of records. (Reserved)

**§628.6 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 appropriate

weather deck so as to be clearly visible from enforcement vessels and aircraft. The Official Number is the documentation number issued by the US Coast Guard for documented vessels or the registration number issued by a State or the US 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 shall be permanently affixed to or painted on the vessel and shall be block Arabic numerals in contrasting color. However, charter or party boats may use non-permanent markings to display the Official Number whenever the vessel is fishing for bluefish.

**(c) Vessel length.** The length of a vessel, for purposes of this section, is that length set forth in US 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.

**§628.7 Prohibitions.** It is unlawful for any person to:

- (a) Use any vessel for the taking, catching, harvesting, or landing of any bluefish (except as provided for in §628.4(a)) unless the vessel has a valid permit issued pursuant to this Part, on board the vessel;
- (b) Fail to report to the Assistant Administrator 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 fishing vessel record or fish dealer or processor report 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 bluefish;
- (e) Fail to affix and maintain markings as required by §628.6 of this Part;
- (f) Possess, have custody or control of, ship, transport, offer for sale, sell, purchase, import, export, or land any bluefish taken in violation of the Act, this Part, or any regulation promulgated under the Act;
- (g) Fish for, take, catch, or harvest any bluefish from the FCZ after the fishery has been closed pursuant to §628.23;
- (h) Transfer directly or indirectly, or attempt to so transfer, any US harvested bluefish 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 US harvested bluefish;
- (i) Refuse to permit an Authorized Officer to inspect any fishing vessel record;
- (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 §628.8;
- (l) Forcefully 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, obstruct, 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 means 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.

#### **§628.8 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, fishing record, and catch for the purposes of enforcing the Act and this Part.
- (b) **Signals.** Upon being approached by a US Coast Guard vessel or aircraft, or other vessel or aircraft authorized to enforce 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 visual 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 shall respond by illuminating the vessel's Official Number required by §628.6.
- (c) **Boarding.** A vessel signaled to stop or heave to for a 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 safe ladder for the Authorized Officer and his/her party;
  - (3) When necessary to facilitate the boarding or when requested by an Authorized Officer, 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.

**§628.9 Penalties.** Any person or fishing vessel found to be in violation of this Part will be subject to the civil and criminal penalty provisions and forfeiture provisions prescribed in the Act, and to 50 CFR Part 620 (Citations) and Part 621 (Civil Procedures).

### **Subpart B - Management Measures**

**§628.20 Fishing year.** The fishing year for bluefish is the 12-month period beginning on 1 January and ending on 31 December.

#### **§628.21 Allowable levels of harvest.**

- (a) **Catch Quotas.** The annual allowable level of harvest of bluefish from the FCZ is whatever US fishermen catch pursuant to this Part. The Total Allowable Level of Foreign Fishing is 0.

US fishermen using hook and line, conventional gill nets, traps, haul seines, and pound nets to conduct a directed fishery for bluefish in the FCZ may harvest bluefish without limit. The use of all other gear to conduct a directed fishery for bluefish in the FCZ is prohibited unless a waiver of the prohibition is

granted.

The Assistant Administrator may grant waivers to the gear prohibition if such waivers are consistent with the objectives of the Plan. Specifically, the Assistant Administrator must attempt to maintain the historical catch distribution in granting such waivers, both between sectors (8% of the total catch for the FCZ commercial fishery) and geographically (11% of the FCZ commercial catch landed in New England, 37% of the FCZ commercial catch landed in the Mid-Atlantic, and 52% of the FCZ commercial catch landed in the South Atlantic). The Assistant Administrator may specify the amount of bluefish that may be caught with permits granted through waivers.

The Assistant Administrator, in consultation with the Council, prior to the beginning of each year, shall project the total bluefish catch, recreational catch, catch by the permitted gear types (hook and line, conventional gill nets, traps, haul seines, and pound nets), and bluefish bycatch in fisheries using the prohibited gear types based on a review of available data on bluefish landings, including catch reports required by §628.5 and the findings of the National Marine Recreational Fishery Statistics Survey. From these projections, the amount of bluefish available for catch by the prohibited gear types shall be estimated, thus providing a basis for granting waivers from the gear prohibition.

The Assistant Administrator may establish deadlines for applications for waivers from the gear prohibition prior to the beginning of the fishing year. All such applications shall be evaluated together relative to the specified criteria with appropriate decisions made prior to the beginning of the fishing year on 1 January. Fishermen are required to specify the amount of bluefish they caught in the most recent year using the gear for which a waiver is being sought and the amount of bluefish requested to be harvested with the waiver. The Assistant Administrator shall evaluate these applications against the amount of bluefish available for harvest by the prohibited gear types. This shall be done through a series of iterations, initially giving all fishermen what they caught in the most recent year. If there is not enough bluefish available, all fishermen shall be reduced a proportional amount. If there is any left, it shall be granted to those fishermen who want an increase. If there is any left after that, it shall be saved for applications submitted later in the year. Applications may be considered after that date, i.e., any time during the year, but such applications will necessarily be evaluated in light of waivers previously granted.

In consultation with the Council, the Assistant Administrator will develop an estimate of Domestic Annual Harvest (DAH) for the coming fishing year.

Notice of the DAH estimate and catch estimates will be published in the Federal Register and will be sent to all persons with permits issued pursuant to §628.4 and to the Executive Directors of the New England, Mid-Atlantic, and South Atlantic Fishery Management Councils in order to provide for public review and comment.

Prior to the beginning of the new fishing year and following the review and comment period, the Assistant Administrator will establish the final catch estimates for the fishery for the new fishing year, publish notice thereof in the Federal Register, and notify all persons with permits issued pursuant to §628.4 and the Executive Directors of the New England, Mid-Atlantic, and South Atlantic Fishery Management Councils.

- (b) **Territorial waters.** These regulations do not limit harvests of bluefish in the territorial waters of any state.

**§628.22 Closure of fishery.** (Reserved)

**§628.23 Size restrictions.** (Reserved)

**§628.24 Gear restrictions.**

- (a) Fishing vessels using hook and line, conventional gill nets, traps, haul seines, and pound nets may conduct a directed fishery for bluefish in the FCZ.
- (b) Fishing vessels using gear other than hook and line, conventional gill nets, traps, haul seines, and pound nets are prohibited from conducting a directed fishery for bluefish in the FCZ unless they have received a waiver from this prohibition pursuant to §628.24(c).

- (c) The Assistant Administrator may permit fishermen to use gear prohibited by §628.24(b) if he concludes that such action is consistent with the objectives of the Plan. Specifically, he is required to attempt to maintain the historical catch distribution between sectors (no more than 8% of the total annual bluefish catch made by the FCZ commercial fishery) and geographically (no more than 11% of the FCZ commercial catch landed in New England, no more than 37% of the FCZ commercial catch landed in the Mid-Atlantic, and no more than 52% of the FCZ commercial catch landed in the South Atlantic).
- (d) Fishing vessels may catch, take, or harvest bluefish incidental to fishing for other species of fish using the gear prohibited by §628.24(b); provided that bluefish constitutes no more than 10% by weight of the total catch of all other fish on board the vessel at the end of any fishing trip.

**§628.25 Time restrictions. (Reserved)**