AMENDMENT 8 TO THE SUMMER FLOUNDER FISHERY MANAGEMENT PLAN:

FISHERY MANAGEMENT PLAN AND FINAL ENVIRONMENTAL IMPACT STATEMENT

FOR THE

SCUP FISHERY

January 1996

Mid-Atlantic Fishery Management Council

in cooperation with the

Atlantic States Marine Fisheries Commission,

the

National Marine Fisheries Service,

the

New England Fishery Management Council,

and the

South Atlantic Fishery Management Council

Draft adopted by MAFMC: 21 December 1994
Final Adopted by MAFMC: 7 November 1995
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A Publication of the Mid-Atlantic Fishery Management Council pursuant to National Oceanic and Atmospheric Administration Award No. NA57FC0002

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2. SUMMARY

This Fishery Management Plan for the Scup Fishery (FMP), prepared by the Mid-Atlantic Fishery Management Council (Council), is intended to manage the scup (*Stenotomus chrysops*) fishery pursuant to the Magnuson Fishery Conservation and Management Act of 1976, as amended (MFCMA). The management unit is scup (*Stenotomus chrysops*) in US waters in the western Atlantic Ocean from Cape Hatteras northward. The objectives of the FMP are to:

1. Reduce fishing mortality in the scup fishery to assure that overfishing does not occur.

2. Reduce fishing mortality on immature scup to increase spawning stock biomass.

3. Improve the yield from the fisheries.

4. Promote compatible management regulations between state and federal jurisdictions.

5. Promote uniform and effective enforcement of regulations.

6. Minimize regulations to achieve the management objectives stated above.

Overfishing for scup is defined as fishing in excess of F_{max}. The Council and the Atlantic States Marine Fisheries Commission (Commission) have adopted a fishing mortality rate reduction strategy that will implement minimum fish sizes and commercial gear regulations in year 1 (1996) of the FMP. Beginning in year 2 (1997), exploitation rates will be reduced until a level of 19% (the exploitation rate associated with the current estimate of F_{max}) is reached in year 7. The recovery schedule is as follows:

	Exploitation rates
Current	69%
Year 2	47%
Year 5	33%
Year 7	19%

The following is a summary of the management measures adopted by the Council and Commission to implement the fishing mortality rate reduction strategy (a complete description of the adopted management measures is in section 9.1):

Management measures for all years

1. Operator permits for commercial and party and charter boats.

2. Vessel permits for party and charter boats.

3. Vessel permits for commercial vessels (permits to sell) under a moratorium on entry. Vessels with documented landings of scup for sale between 26 January 1988 and 26 January 1993 qualify for a moratorium permit to land and sell scup under this moratorium program.

4. Dealer permits (permits to purchase).

5. Permitted vessels may only sell to permitted dealers and permitted dealers may only buy from permitted vessels.

6. Party and charter boat, commercial vessel, and dealer reports.

7. Scup pots or traps are defined by the state regulations that apply to a vessel's principal port of landing.

8. Scup pots or traps are required to have an escape vent of 2.25" square, 3.1" diameter circular,

or the equivalent.

9. The hinges and fasteners of one panel or door in scup pots or traps must be made of one of the following degradable materials:

a. untreated hemp, jute, or cotton string of 3/16" (4.8 mm) diameter of smaller;

b. magnesium alloy, timed float releases (pop-up devices) or similar magnesium alloy fasteners; or

c. ungalvanized or uncoated iron wire of 0.094" (2.4 mm) diameter or smaller.

10. A maximum size of 18" in diameter for rollers used in roller rig trawl gear.

Management Measures for Year 1

1. A 9" total length (TL) minimum fish size in the commercial fishery in federal and state waters. Scup less than 9" TL could not be sold.

2. A 4.0" minimum mesh size for vessels retaining more than 4,000 pounds of scup.

3. A 7" total length (TL) minimum fish size in the recreational fishery in both state and federal waters. States having larger minimum size limits would be encouraged to keep them.

Management Measures for Years 2 and Subsequent

Prior to year two and annually thereafter, the Council, working through a Monitoring Committee, would evaluate the success of the FMP relative to the overfishing reduction goal and propose adjustments to the management system. Beginning with year two, management measures would include:

For the commercial fishery:

1. A 9" TL minimum fish size which may be adjusted annually through framework action. Scup less than the size limit could not be sold.

2. A 4.0" minimum mesh size for vessels retaining more than 4,000 pounds of scup. The mesh size and the threshold may be adjusted annually through framework action.

3. A coastwide quota with federal permit holders being prohibited from landing (selling) after the quota had been landed. Quota overruns would be deducted from the quota for the subsequent year. All states would need to prohibit scup sales following Federal sales prohibition.

4. A framework for time/area closures to reduce bycatch and prevent quota overruns.

For the recreational fishery:

1. A 7" TL minimum fish size, which may be adjusted annually through framework action.

2. A possession limit, which may be adjusted annually through framework action.

3. An open season in the recreational fishery, which may be adjusted annually through framework action.

4. A coastwide recreational harvest limit. Landings in excess of the limit would be deducted from the harvest limit for the subsequent year.

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4. INTRODUCTION

4.1. DEVELOPMENT OF THE PLAN

The Council began the development of a fishery management plan (FMP) for scup in 1978. Although preliminary work was done to support the development of an FMP, a plan was not completed.

In January 1990, the Council and the Atlantic States Marine Fisheries Commission (Commission) began the development of a fishery management plan for scup as an amendment to the Summer Flounder FMP. However, the development of a scup plan was delayed through a series of amendments to the Summer Flounder FMP and work on a separate Scup FMP was not resumed until 1993.

The Council and the Commission adopted the Scup FMP for Secretarial approval in November, 1995. Subsequently, the National Marine Fisheries Service (NMFS) requested that the scup regulations be incorporated into another FMP to reduce the number of separate fisheries regulations issued by the federal government. As a result, the Scup FMP was incorporated into the summer flounder regulations as Amendment 8 to the Summer Flounder FMP.

4.2. PROBLEMS FOR RESOLUTION

4.2.1. Scup are Overexploited

Commercial scup landings have declined substantially since peak landings in the 1960's. In fact, in 1989, commercial landings decreased to 8.2 million pounds, the lowest value recorded during the ten-year period 1983 to 1992 and only about 17% of the 49 million pounds landed in 1960. Landings increased to approximately 15 million pounds in 1991 and then declined to 9.1 million pounds in 1993. Recreational landings in 1993 of 3.2 million pounds were below the ten year average of 5.4 million pounds. In addition, preliminary data indicate low landings in 1994 with commercial and recreational landings of 9.9 and 2.6 million pounds, respectively.

Abundance indices from NMFS trawl surveys and surveys conducted by the states of Massachusetts, Rhode Island, and Connecticut indicate recent adult biomass at low levels. For example, the NEFSC autumn offshore survey indices of scup (age 1+) abundance have declined dramatically in recent years. The 1993 index was the third lowest value observed in the time series and the 1994 index was the all-time lowest value observed since the survey began in 1967.

Reduced abundance is also evident in data collected for US commercial otter trawl vessels. Standardized catch per unit effort (CPUE) of these vessels peaked in 1978 at greater than 2.5 mt/day and have since trended downward to about 1.0 mt/day in recent years. Based on the trawl survey and the CPUE indices, the NEFSC concluded that "the overall declining trend in survey indices suggest that recent exploitation has reduced stock abundance substantially" (NEFSC 1993).

In addition, length frequency distributions of scup in commercial landings have shifted to smaller, younger fish including young-of-year. Although scup may attain ages of 20 years, recent landings have been composed primarily of age 2 and 3 year old scup with a general absence of larger, older fish in the landed catch (NEFSC 1993). This truncated age distribution also suggests a reduced population level.

Overfishing for scup is defined as fishing in excess of the F_{max} level. Based on current conditions in the fishery, yield per recruit analysis indicates that F_{max} for scup is 0.24 (19% annual exploitation rate). Current estimates of fishing mortality indicate that the current mortality rate is 1.3 (67% annual exploitation rate). This, coupled with the above information, that is, the decrease in landings, reduced CPUE, and low survey indices, as well as the truncated age distributions, indicate that scup are overexploited.

4.2.2. Mixed Species Fishery

The Mid-Atlantic mixed species trawl fishery relies principally on summer flounder, scup, and black sea

bass, but also harvests significant quantities of *Loligo* squid, winter flounder, witch flounder, yellowtail flounder, and other species either as bycatch or in directed fisheries. Many of these species are also principal components

of the southern New England trawl fisheries since stock migrations occur between the Mid-Atlantic Bight and this area.

Generally, fishing activity follows these species as they make annual migrations from south to north and from offshore to inshore waters. Fishing effort is concentrated northerly and inshore in summer when a wide range of vessels have access to the stocks. In winter, effort is concentrated southerly and offshore, primarily by larger vessels. Although the majority of landings are taken by otter trawls, scup are landed by many other types of fishing gear: midwater trawls, pots and traps, pound nets and hand lines. At any particular time, fishermen may target a single species with certain gear, but significant bycatch of other species usually occurs in conjunction with the targeted species, depending on the fishing technique.

The occurrence of scup and other species in commercial catches of the Mid-Atlantic and southern New England regions complicates the identification of appropriate and effective management strategies. Close coordination of regulatory measures is therefore necessary to properly manage this species assemblage.

The Council has included no measures in this FMP at this time to specifically address the mixed trawl fishery problem, although the Council considered the implications of the mixed trawl fishery when developing the proposed measures. The Council is working to develop a mixed trawl fishery management strategy and the framework management measures put in place through this FMP could be used to implement the measures developed through this process.

4.2.3. Increased Fishing Pressure

Nearly all the major groundfish fisheries in New England (haddock, yellowtail flounder, redfish, cod, etc.) have had their stocks severely depleted or have current catch levels which exceed long term potential catch (NEFSC 1993). There have also been declines in South Atlantic and Gulf of Mexico fishery resources. Consequently, it is probable that more effort will be directed towards the southern New England/Mid-Atlantic scup, exacerbating current problems of high exploitation rates. Because of the potential for an increased number of entrants into the fisheries, increases in effort by present participants, as well as technological advances that have increased the efficiency of gear, there is a need to limit and reduce effort in the scup fishery.

4.2.4. Lack of Uniform Management

The highly migratory nature of scup complicate the development of management strategies since fishing activities in the EEZ or waters of a few states could adversely impact the stocks. For example, the Atlantic coastal states have different size regulations pertaining to the harvest of scup.

4.2.5. Inconsistent and Inadequate Enforcement

There is a lack of uniform regulations affecting the scup fishery which is partly due to the inconsistent regulations among states and between states and federal jurisdictions. FMP advisors report a lack of consistency in enforcement between states, the EEZ, and/or parts thereof, due to various interpretations of the rules by enforcement officers, which led to confusion and resulted in fishermen seeking ways to avoid the rules. Adequate funding at the state and federal level for enforcement personnel, training, and equipment is problematic. In addition, sanctions resulting from noncompliance with regulations are insufficient to encourage conformity to state and federal laws. Permit sanctions combined with fines are likely to be a more effective deterrent than fines alone.

Effective enforcement requires that fishery participants perceive both the likelihood of enforcement contact and the application of standards to be uniform throughout the management unit. The perception of fairness is essential in the promotion of voluntary compliance. Proper training of fishery enforcement officers is

important in this regard.

4.2.6. Lack of Data

National Standard 2 states that "measures shall be based upon the best scientific information available." Although recreational and commercial catch data for scup are adequate to formulate and implement management measures, data collection should be improved. An improved data base will allow the Council to more finely tune the management system to the needs of the fishery. These data are necessary to assess the impact and effectiveness of management measures, as well as monitor reductions in fishing mortality and increases in stock size to determine if additional amendments to the FMP will be necessary. For example, the absence of a permit to sell requirement in some states, which allows direct sale of catch to retail establishments by fishermen, may result in under reporting of commercial landings that complicates the development, implementation, and enforcement of fishery management strategies.

4.2.7. Habitat Degradation

Scup are a continental shelf species that spend significant portions of their lives in coastal waters. Scup make inshore and northern migrations during warm months and are found in tidal bays and sounds as well as the ocean environment. Those same areas are known to be increasingly affected by coastal development (e.g., dredging, marinas, docks, etc.) and the related declines in habitat quality and quantity. This increase in habitat degradation plays an important role in scup population health.

4.3. MANAGEMENT OBJECTIVES

The objectives of the FMP are to:

1. Reduce fishing mortality in the scup fishery to assure that overfishing does not occur.

2. Reduce fishing mortality on immature scup to increase spawning stock biomass.

3. Improve the yield from the fisheries.

4. Promote compatible management regulations between State and Federal jurisdictions.

5. Promote uniform and effective enforcement of regulations.

6. Minimize regulations to achieve the management objectives stated above.

4.4. MANAGEMENT UNIT

The management unit is scup (*Stenotomus chrysops*) in US waters in the western Atlantic Ocean from Cape Hatteras, North Carolina northward to the US-Canadian border.

4.5. MANAGEMENT STRATEGY

Overfishing for scup is defined as fishing in excess of the F_{max} level. F_{max} is a biological reference point that corresponds to the level of fishing mortality (F) that produces the maximum yield per recruit. Based on current conditions in the fishery, F_{max} is 0.24.

The Council and the ASMFC Management Board approved a recovery strategy that reduces overfishing on scup over a 7 year time frame. The recovery strategy calls for minimum fish sizes and commercial gear regulations in year 1. These regulations would reduce mortality on small scup, i.e., those scup less than 9" TL . Beginning in year 2, additional regulations would be implemented to reduce mortality on larger fish. These regulations will include a commercial quota and a recreational harvest limit. In years 2 through 4, target exploitation rates would be 47% for scup. In years 5 and 6, the target exploitation rates would be 33% and in year 7 and subsequent years, the target exploitation rate would be based on F_{max}.

Currently, the exploitation rate associated with F_{max} is 19%.

5. DESCRIPTION OF THE STOCK

5.1. Species Description and Distribution

Scup are a schooling, continental shelf species of the Northwest Atlantic that are common from Cape Cod, Massachusetts to Cape Hatteras, North Carolina (Morse 1978). Scup and *Stenotomus chrysops* are the common and scientific names for the species (American Fisheries Society 1980). Scup are also known as porgy, porgee, scuppaug, mushcup, maiden, fairmaid and ironside (Morse 1978). Scup may attain ages as great as 20 years (Campbell *et al.* unpublished manuscript) but rarely exceed 18 inches in length or weights of over 4 pounds (Bigelow and Schroeder 1953). Scup have an ovate-elliptical body, a steep anterior profile, and are brownish/silver in color. A complete generic description of the species can be found in Jordan and Evermann (1896).

Scup undertake extensive seasonal migrations at least partially in response to changes in temperature. Scup winter in coastal water from southern NJ to Cape Hatteras at depths from 40 to 100 fathoms (Neville and Talbot 1964). Density and geographic distribution of scup during winter varies from year to year depending on water temperature, primarily the location of the 45 °F isotherm since this is their lower preferred temperature limit (Neville and Talbot 1964).

As water temperatures rise, scup migrate north and inshore to spawn. Scup appear during April off Chesapeake Bay (Hildebrand and Schroeder 1928) and off southern New England by early May (Baird 1873, Perlmutter 1939, Neville and Talbot 1964, and Finkelstein 1971). During these inshore migrations large fish (1.5 to 4 pounds) arrive first followed by successive waves or runs of smaller individuals (Baird 1873, Hildebrand and Schroeder 1928, Neville and Talbot 1964, Sisson 1974) suggesting that scup school by size.

During the summer, larger, older scup are found near the mouth of larger bays or in the ocean within the 20 fathom contour. Smaller fish are found in the shallow areas of bays (Morse 1978). As temperatures drop in the fall, scup migrate south within the 10 fathom isobath and then offshore (Hamer 1970) with most scup arriving at offshore wintering grounds by early December (Morse 1978).

Based on tagging data collected in the 1930's, Neville and Talbot (1964) hypothesized that two separate populations of scup existed along the Atlantic coast with a separation at New York-New Jersey during the summer. However, the authors indicated that these two populations probably mix on offshore wintering grounds and as a result form a common stock. Subsequent tagging data also supported the separation of scup into northern and southern contingents and but in contrast to earlier views, suggested that separation of these two groups occurred on the offshore wintering grounds (Hamer 1970). However, additional analyses of these data indicated no evidence to support the idea of two separate stocks (Pierce 1981). In addition, Mayo (1982) indicated that data on size composition and distribution of scup from NEFSC bottom trawl surveys supported the concept of a single unit stock. As such, all scup in the management unit are considered a unit stock in this management plan.

5.2. Abundance and Present Condition

Abundance indices from NMFS trawl surveys and surveys conducted by the states of Massachusetts, Rhode Island, and Connecticut indicate recent adult biomass at low levels. For example, the NEFSC autumn offshore survey indices of scup (age 1+) abundance have declined dramatically in recent years (Figure 1). The 1993 index was the third lowest value observed in the time series and the 1994 index was the all-time lowest value observed since the survey began in 1967.

Reduced abundance is also evident in data collected for US commercial otter trawl vessels. Standardized catch per unit effort (CPUE) of these vessels peaked in 1978 at greater than 2.5 mt/day and have since trended downward to about 1.0 mt/day in recent years (NEFSC 1995). Based on the trawl survey and the CPUE indices, the NEFSC concluded that "the overall declining trend in survey indices suggest that recent

exploitation has reduced stock abundance substantially" (NEFSC 1993).

In addition, length frequency distributions of scup in commercial landings have shifted to smaller, younger fish including young-of-year indicating that the fishery is dependent primarily on new year classes. Although scup may attain ages of 20 years, recent landings have been composed primarily of age 2 and 3 year old scup with a general absence of larger, older fish in the landed catch. In addition to commercial and recreational data, Simpson (pers. comm.) found that the age structure of scup in the CT trawl survey had truncated from 11 to 14 age groups in 1984-1986 to 7 age groups in 1992. This truncated age distribution suggests a reduced population level and reduced abundance of larger, older fish. In fact, the maximum length observed in NEFSC autumn surveys dropped from a mean of 14 inches between 1982 and 1986 to 9.5 inches for the years 1987 to 1992 (NEFSC 1993).

The scup stock was recently assessed using an age based virtual population analysis which provides annual estimates of total and adult stock biomass, recruitment and age specific fishing mortality for the period 1984-1993 (NEFSC 1995). Spawning stock biomass (SSB) increased from 20.1 m lbs (9,120 mt) in 1984 to roughly 26.0 m lbs (11,815 mt) in 1986 and has since declined to a record low of 10.2 m lbs (4,643 mt) in 1993 (Table 1). Although VPA derived estimates of SSB are available only for the years 1984-1993, NEFSC survey data indicate that much higher levels of adult stock biomass occurred in the mid-1970's (NEFSC 1995).

Declining trends in recruitment are also evident. Recruitment declined from 141 million age 0 fish in 1985 to an average of roughly 83 million during 1986-1993 (Table 1). The 1991 and 1992 year classes were among the poorest in the time series at 67 and 72 million fish, respectively. The 1993 year class was slightly below the 1984-1993 average (NEFSC 1995).

Results of virtual population analysis indicate that the fishing mortality rate for age 2-5 scup has been high in recent years, exceeding 1.0 every year from 1984-1993 except in 1990 when F was 0.96. Mean annual F peaked at 2.1 and has since fluctuated around 1.3 in recent years (NEFSC 1995). The most recent stock assessment concluded that the current fishing mortality rate for scup is 1.3 (67% annual exploitation rate). Based on the results of the analyses described above, NEFSC (1995) concluded that "the scup stock is over-exploited and near record low levels of abundance."

5.3. Ecological Relationships and Stock Characteristics

5.3.1. Spawning and Early Life History

Approximately 50% of scup are sexually mature by age 2 at a fork length of 6.1 inches (total length of approximately 6.8 inches) (NEFSC 1993). Scup spawn only once a year with spawning occurring over weed and sandy covered areas (Morse 1978). The sex ratio of scup on inshore spawning grounds was approximately 1:1 based on studies conducted by NMFS (Morse 1978).

Scup spawn from May through August at various locations along the coast with peak spawning activity in June. Reported spawning areas include locations from Southern New England to Long Island, NY (Goode 1884, Kuntz and Radcliffe 1918, Nichols and Breder 1927, Perlmutter 1939, Wheatland 1956, Bigelow and Schroeder 1953, Finkelstein 1969, Sisson 1974). Ferraro (1980) concluded that scup spawn during the morning hours based on plankton collection made in Peconic Bays, NY in 1972, 1973 and 1974.

Scup produce transparent, buoyant eggs that are spherical and approximately .03 inches in diameter (Kuntz and Radcliffe 1918). The relationship between body size and fecundity has not been determined. However, Finkelstein (1969) found that the ratio of ovary weight to body weight was highest during May for female scup collected in the Peconic Bays, NY. In addition, Howell and Simpson (1985) collected 36 female scup, 175 to 230 mm (9 inches) FL, during the spawning season and found an estimated mean fecundity of 7,000 eggs per female.

Fertilized scup eggs hatch in 40 hours at a temperature of 72° C. Kuntz and Radcliffe (1918) described the embryonic and larval phase of scup and Griswold and McKenney (1984) completed a more complete

morphological description of scup larvae. Larvae are pelagic until they are about 15 to 30 mm (0.1 in) in length, assuming the basic shape of adults at 40 to 60 mm (0.24 inches) in length (Morse 1978). Juvenile scup are 50 to 80 mm (3.15 inches) long during September, 60 to 100 mm (3.9 inches) long in November, and about 160 mm (6.3 inches) in length the following spring (Morse 1978).

5.3.2. Age and Growth

Scup are characterized as slow-growing, relatively long-lived fish (Crecco et al. 1981). Scup length-age data have been reported by Smith and Norcross (1968), Finkelstein (1969), Hamer (1979), Pierce (1980), Crecco *et al.* (1981), and Howell and Simpson (1985). Although difficulty in ageing scup scales has been identified by several researchers (Smith and Norcross 1968, Sisson 1974, Hamer 1979), scup up to age 19 have been aged (Campbell *et al.* unpub. manuscript). These age-growth studies indicated that mean lengths for scup doubled between ages 1 and 3, with a steady decline in growth thereafter (Table 2). Total lengths at age 1 ranged from 2.9 to 5.6 inches, whereas the lengths at age 2, when some scup become sexually mature, ranged from 6.2 to 8.6 inches.

The von Bertalanffy growth equation was also developed from length-age data in each of these separate studies. This equation, which relates age to length, is:

$$L_t = L_{inf} (1-e^{-k(t-t0)})$$

where L_t is mean length at age, L_{inf} is theoretical maximum length, K is the rate at which L_t approaches L_{inf}, $t_0$is the age at zero length, and t is the age of the fish (years). The L_{inf} (asymptotic size) estimates for the separate studies ranged from 14.4 to 18.8 TL inches and the K values from 0.22 to 0.34 (Table 3).

Most studies on age-length relationships for scup report lengths in fork length (FL). However, minimum size regulations in the states, as well as those proposed in this FMP, refer to total length (TL) measurements. Hamer (1979) developed a relationship between total length and fork length (both lengths in centimeters) of scup based on a sample of 129 fish:

$$TL = 1.14FL - 0.44.$$

5.3.3. Length-Weight Relationship

Length-weight relationships have been developed for scup in several studies (Smith and Norcross 1968, Briggs 1968, Hamer 1979, Pierce 1980, Crecco *et al.* 1981, Howell and Simpson 1985). Wilk *et al.* (1978) developed the following length-weight relationship for 2,234 scup, 27 to 380 mm in length, collected in the NY Bight from June 1974 to June 1975:

$$\log W = 3.1693 (\log FL) - 5.0222$$

where W is weight (grams) and FL is fork length in mm. The length-weight exponent (b=3.1693) is similar to the value reported by the other researchers (Smith and Norcross 1968, Briggs 1968, Hamer 1970, Howell and Simpson 1985). Wilk *et al.* (1978) found no significant difference between length-weight relationships of male and female scup.

5.3.4. Mortality

The instantaneous natural mortality rate (M) is defined as annual losses experienced by scup from all natural and anthropogenic factors except commercial and recreational fishing. Crecco et al. (1981) used the methodology of Taylor (1958) and the von Bertalanffy parameters of Campbell *et al.* (unpub. manuscript) to derive an estimate of M for scup of 0.2. Using a maximum age of 20 years, Howell and Simpson (1985) derived an identical value (0.2) using Hoenig's (1982) equation which relates natural mortality to longevity. The most recent stock assessment assumed a natural mortality rate of 0.2 (NEFSC 1995).

Studies conducted by the NEFSC and personnel from the state of Connecticut indicate that the level of instantaneous fishing mortality (F) has risen significantly over the last two decades. Mayo (1982) used catch at age data from the Southern New England scup fishery to determine that the level of F from 1974 to 1980 was approximately 0.3. Based on length frequencies of commercial and experimental trawl samples collected from 1981 to 1983, Howell and Simpson (1985) estimated that F was approximately 0.38.

Howell (1990) used annual age and length frequencies for scup collected in Connecticut and Massachusetts surveys to derive estimates of mortality using both catch curve and length-based (Parrish and Macall 1978) methods. Estimates of fishing mortality from the two surveys indicated that F had increased from a level of 0.4 in the late 1970s to over 1.0 in the mid to late 1980s. Estimates based on Connecticut survey data indicated that F was 1.11 based on 1986-1988 data.

Additional analyses conducted with more recent Connecticut trawl survey data (1984-91) indicate that total mortality has fluctuated between 1984 and 1991. Age based mortality estimates based on cohorts and pooled cohorts indicated that total mortality rates (Z) were approximately 1.4 in 1991. Based on this analysis, the ASMFC Scup technical committee concluded that current fishing mortality rates were 1.2 or higher.

In the most recent stock assessment, updated estimates of fishing mortality based on survey data were consistently greater than 1.0 and were as high as 2.4 in some years (NEFSC 1995). Although estimates of fishing mortality based on survey data are variable, annual means suggest that F has been above 1.0 during the period 1984-1992. These findings were verified based on the results of virtual population analysis which indicates that the fishing mortality rate for age 2-5 scup exceeded 1.0 every year from 1984-1993, except in 1990 when F was 0.96. Mean annual F peaked at 2.13 and has since fluctuated around 1.3 in recent years (NEFSC 1995). Based on the analyses described above, the most recent stock assessment concluded that the current fishing mortality rate for scup is 1.3 (67% annual exploitation rate).

5.3.5. Food and Feeding

Scup are bottom or near bottom feeders (Morse 1978) that eat a wide variety of food including small crustacea, worms, mollusks, squid, vegetable debris, hydroids, and sand dollars (Goode 1884, Nichols and Breder 1927, Bigelow and Schroeder 1953). Maurer and Bowman (1975) found that scup fed principally on polychaetes and coelenterates based on the stomach contents of 346 scup collected in southern New England and the Mid-Atlantic from 1969 to 1972. Scup may abstain from feeding during spawning (Morse 1978).

5.3.6. Predators and Competitors

Scup are preyed upon by a wide variety of piscivorous fish including striped bass, weakfish, and bluefish (Morse 1978). Scup share common food resources with a number of species including a number of northwest Atlantic finfish (Langton 1982).

5.3.7. Parasites, Diseases, Injuries and Abnormalities

Yamaguti (1963) found the parasitic Branchiuran *Argulus intectus* on scup and *Vibriosis* infection was found on scup held in tanks for tagging experiments (Sisson 1974). Stunkard (1980) identified scup as a host for the digenetic trematode *Neopechona cablei*. Scup collected from the Beaufort-Cape Hatteras area were found to be parasitized by three species of monogenetic trematodes (Suydam 1971).

5.4. Maximum Sustainable Yield

Maximum sustainable yield (MSY) has not been calculated for scup. MSY estimates are generally derived from production models and these models have not been used in scup stock assessments. However, participants of a Northeast Fisheries Science Center (NEFSC) Stock Assessment Workshop concluded that long-term potential catch (LPTC) can be used as a surrogate for MSY. The NEFSC has derived an estimate

of LPTC for scup that ranges from 22 to 33 million pounds (10,000 to 15,000 MT). Preliminary data indicate that landings in 1994 were about 9.9 million pounds (4490 MT).

The Scup FMP would implement a fishing mortality rate (F) reduction strategy that would reduce fishing mortality rates on scup from current levels (1.3) to F_{max} (0.24) over a 7 year time frame. F_{max} is the biological reference point used to define overfishing and is the fishing mortality rate that maximizes the yield per recruit. This reduction in fishing mortality coupled with minimum fish size and gear regulations will allow for significant stock rebuilding such that sustainable yields (i.e., annual landings) that equal the LTPC of 10,000 to 15,000 MT will be possible.

5.5. Probable Future Condition

The NEFSC concluded that scup are over-exploited and at record low levels of abundance. This conclusion was based on the truncated nature of the age structure of the stock, estimates of fishing mortality in excess of 1.0, declines in commercial CPUE indices to low levels in the late 1980's, and declining trends in spawning stock biomass.

Stock abundance will continue to decline without reductions in fishing mortality and improved recruitment to the stock. NEFSC (1995) concluded that "if both fishing mortality and recruitment remain at current levels, catch and SSB will remain near the record-low levels estimated for 1993." The Report of the 19th Northeast Regional Stock Assessment Workshop (19th SAW) also cautioned that "recruitment failure in a single year could result in a collapse of the fishery."

6. DESCRIPTION OF HABITAT

6.1. DISTRIBUTION OF THE SPECIES, HABITAT REQUIREMENTS, AND HABITATS OF SCUP

6.1.1. Distribution of Scup and Habitat Requirements

Scup is a continental shelf species of the northwest Atlantic that occurs regularly from Cape Hatteras to about Cape Cod (section 5.1). Bigelow and Schroeder (1953) report sporadic occurrences as far north as Sable Island Bank, but never in commercial quantities. During warm months both young and adults are found in tidal bays and sounds as well as in the ocean but generally inshore of the 120 foot contour (Morse 1978). In winter, scup are distributed in the offshore region from about Block Canyon to Cape Hatteras in depths of 420 to 600 feet of water (Neville and Talbot 1964, Pearson 1932, and Scarlett 1984). Their winter distribution seems to be closely associated with the 45 °F isotherm which is their lower preferred limit.

The spring migration is made between the offshore winter grounds and the inshore summer grounds and appears to be associated with spawning (Morse 1978). Scup arrive inshore during April off Chesapeake Bay (Hildebrand and Schroeder 1928) and off southern New England by early May (Baird 1873, Permutter 1939, Neville and Talbot 1964, and Finkelstein 1971). There is some evidence that larger fish arrive inshore first, followed by waves of increasingly smaller fish (Morse 1978). During summer, fish four years and older tend to stay in the ocean or near the mouth of larger bays while the younger fish enter the shallow areas and bays. The fall migrations begin during September with most fish arriving at the winter grounds by December (Morse 1978).

The winter distribution appears to be primarily associated with water temperature. Neville and Talbot (1964) report scup occur in water 45 °F or higher and that density and geographic distribution varies from year to year based on the 45 °F isotherm. The spring migration and summer residence are closely associated with spawning and increase in feeding activity. Very little growth occurs during the winter (Bigelow and Schroeder 1953) and it appears feeding is at a minimum during the winter.

Scup spawn mainly in nearshore ocean waters and in Long Island Sound bays from May to August with peak spawning occurring in June (Morse 1978). Juveniles tend to be found in shallower waters within bays and estuaries. Scup tend to inhabit the more saline areas of estuaries (Kendall 1973). Eggs are

buoyant and larvae are pelagic. Scup probably end the pelagic stage at about 0.6 to 1.2 inches and become bottom dwelling (Lux and Nichy 1971). Scup can live to an age of 20 years, but for the last few years the population has been dominated by 1 to 3 year old fish.

Scup are prone to occur and move in schools on and off reef habitats (F. Steimle pers. comm.), as opposed to black sea bass that have a more restricted but diffuse usage of reef habitats. Steimle (pers. comm.) also speculates that scup also are likely to use small bivalves, such as blue mussels, as food and thus the habitat needs and quality for small bivalves might be an important issue for future consideration in the discussion of scup essential habitat.

6.1.2. Habitats of Scup

The near shore spawning areas and the inshore nursery areas are essential for the survival of scup. These areas are also utilized for summer feeding by adults. Major alterations to the habitat could be disruptive to the species' life cycle.

The Council, attempting to coordinate and obtain the best information available, requested each state from North Carolina to Maine to identify the critical scup habitat under their jurisdiction. The following paragraphs are paraphrased from the responses of the states' scup experts.

Large quantities of scup are not found inshore of about 120 feet off of North Carolina (J. Ross pers. comm.). Scup are traditionally harvested during the deep water component of the trawl fishery in 180 to 420 ft of water from December through April. They are commonly caught around the Cigar off Virginia, around Norfolk Canyon, and the shelf edge north of Norfolk Canyon to Washington and Wilmington Canyons.

Scup were previously considered common to Virginia's Territorial Sea, seaside bays and lower Chesapeake Bay during spring, summer and fall months, moving offshore during winter (J. Travelstead pers. comm.). Although still consistently caught in some areas of the Chesapeake Bay, the occurrence of large numbers of scup in State waters is now infrequent. Commercial landings of this species from 1989-1992 have declined to approximately one tenth the poundage of scup caught between 1980 and 1984 (S. Davis pers. comm.). Trawl surveys conducted by the Virginia Institute of Marine Science collected scup from Chesapeake Bay waters primarily during the months of June through October (Bonzak *et al.* 1991, 1992, and 1993). Peak population abundances occur north of Virginia during warmer months (J. Musick pers. comm.). Young of the year scup occur annually in the Chesapeake Bay, but apparently not in large numbers. Adults prefer smooth to rocky bottoms, usually schooling in summer months at depths between 6 and 120 ft; overwintering occurs off Virginia and North Carolina from 120 to 300 ft, sometimes to 500 ft (Johnson 1978).

The use of coastal bay habitat by scup in Maryland appears minor (J. Casey pers. comm.). The vast majority of commercial scup landings occurs from beyond 12 miles and primarily by otter trawl. In 16 years of research trawl sampling in the coastal bay habitat by Maryland Department of Natural Resources personnel, only 18 individuals have been caught. Because of this and the low commercial landings, little is known of their use of Maryland coastal bay and near shore habitat (J. Casey pers. comm.).

Scup are collected in a large portion of Delaware Bay (Figure 2) with the northern most limit just off Port Mahon and the southern limit extending into the Atlantic Ocean (R. Cole pers. comm.). Generally 15 - 32‰ salinity regimes are considered suitable for scup. R. Cole (pers. comm.) reports that numbers of one and two year old scup taken in samples during 1990 and 1991 were among the highest recorded during the past two decades indicating that Delaware Bay can be an important summer nursery area. In addition, survey data collected from Indian River and Rehoboth Bays in 1989 indicated record catches of scup. The entire Delaware Bay and lower Delaware River to the C & D Canal serve as both nursery areas for juveniles and summer feeding areas for adult scup (R. Cole pers. comm.).

Scup migrate from offshore, overwintering grounds to inshore coastal and estuarine waters of New Jersey in April and May (P. Scarlett pers. comm.). Important summering, nursery or spawning habitat include

inshore ocean waters out to the 120 ft contour along the shores of New Jersey and estuaries from Sandy Hook Bay to Delaware Bay. Sandy Hook Bay and Delaware Bay are probably more important than other smaller, shallower coastal estuaries. Scup begin an offshore migration in the fall and congregate within a migratory corridor inside the 60 ft contour off coastal New Jersey (P. Scarlett pers. comm.).

The critical habitat for scup in New York waters is similar to that defined below for Connecticut waters by Simpson (J. Mason pers. comm.). Structured bottom habitat is important to scup.

Scup (Figures 3 and 4) are among the most common species taken in Long Island Sound (LIS), occurring in local waters between May and November, with greatest numbers found from June through October (D. Simpson pers. comm.). Scup are found at all depths sampled (15 - 150 ft) and exhibit a strong preference for transitional sediments (mixed sand/mud). Young-of-year are also taken in large numbers on shallow sand/shell bottom along the north shore of Long Island, New York. Outside the geographic range of the trawl survey large numbers of scup are also taken by anglers in Fishers Island Sound located in eastern Connecticut near the borders with New York and Rhode Island. Limited numbers of young-of year scup have also been recorded from small (three foot) beam trawl samples in inshore estuaries where salinities are above 20 ppt. Eggs and larvae have been collected in eastern LIS in the course of power plant impact monitoring by Northeast Utilities Company providing evidence of spawning in LIS. Food habits have been reported by Richards (1963) who found that scup in LIS feed principally on polychaetes, amphipods, other crustaceans and mollusks. Copepods were most common in young-of-year, whereas mollusks were more common in age one and older fish.

Scup begin to move from offshore waters, into the coastal waters of Rhode Island and into Narragansett Bay and Mt. Hope Bay in April (Gray pers. comm.) and remain there through November until the fall migrations have begun (Jeffries *et al.* 1988). All life stages of scup have been observed within Rhode Island waters, which provides critical habitat for each stage. Scup eggs have been collected in the waters of Narragansett Bay from May through August (Herman 1963, Bourne and Govoni 1988, Klein-MacPhee pers. comm.). Larval scup have been collected from May through September (Herman 1963 and Sisson *et al.* 1994). Indices of relative abundance indicate that Rhode Island coastal waters, especially Narragansett Bay, constitute a nursery area for 0 - 1 year old scup (Lynch and Karlsson 1990). Sisson (1974) found that Narragansett Bay provides important summer habitat for scup in age classes one through four. Young of the year scup have been collected over intertidal/subtidal sand, marine silty sand, mussel beds, eelgrass beds, and mud (Lynch pers. comm., Sisson *et al.* 1994, and Powell 1989). Adult scup have been collected throughout Narragansett Bay over hard to soft sandy bottoms, marine silty sand usually associated with or near submerged obstructions, rock piles, shoals and ledges (Lynch pers. comm., Satchwill and Gray 1994).

In Massachusetts, scup migrate to spawning and feeding grounds located in Buzzards Bay, Nantucket Sound, Vineyard Sound, and coastal waters south of Martha's Vineyard beginning in April (Figure 5). Larger individuals are the first to arrive from offshore wintering grounds. Schools of successively smaller fish arrive through May and June. Spawning fish are found in shoal areas (<30 ft) until late June when they move into deeper waters (between 30 and 60 ft). Recreational shore-based anglers capture juvenile scup from early July through September. In most years, commercial scup landings from Massachusetts waters peak in May, decrease in June, and continue to decline at a lower rate through October. Dates of larval capture range from May through September (Collings *et al.* 1981). Scup larvae decreased in density with sampling stations proceeding west to east from Buzzards Bay to Cape Cod Bay. Scup larvae were collected in Buzzards Bay at water temperatures ranging from 57 to 75 °F with greatest densities between 60 and 68 °F. Scherer (1984) collected scup eggs and larvae in Cape Cod Bay from June through August. He thought that scup did not spawn in Cape Cod Bay but rather their eggs and/or larvae were transported into the Bay via the Cape Cod Canal. However, eggs and larvae were captured north of Boston in the Beverly - Salem Harbor area (Elliot and Jimenez 1981) indicating that some spawning occurs north of Cape Cod. Southern Massachusetts estuaries, coastal embayments and near shore waters are primary nursery grounds for age 0 scup. The appearance of 0 age group scup (0.6 - 1.2 inches) in shoal waters in early July indicate that some end their pelagic post larval life at that time. They remain throughout the summer. Their departure to deeper water coincides with sharp drops in water temperature (Lux and Nichy 1971). Most scup leave inshore Massachusetts waters during late October and early November, although some

individuals remain in local waters until at least December (T. Currier pers. comm.).

Scup are virtually unknown in New Hampshire waters (D. Grout pers. comm.).

Scup are also nearly absent from Maine waters (R. Langton pers. comm.).

In 1985, the National Oceanic and Atmospheric Administration (NOAA) began a program to develop a comprehensive data base on the distribution and relative abundance of selected fish and invertebrate species in the Nation's estuaries. The Estuarine Living Marine Resources (ELMR) program was conducted jointly by the National Ocean Services's Strategic Environmental Assessments (SEA) Division and the National Marine Fisheries Service (NMFS). The objective was to develop a consistent data base on the spatial and temporal distribution, relative abundance, and life history characteristics of fishes and invertebrates to enable comparisons among species and estuaries. These data are to be combined with other NOAA data sets to better define and understand the biological coupling of estuarine and marine habitats (USDC 1994a and 1994b.).

While the importance of estuarine areas to fish and invertebrate populations is well documented, few consistent and comprehensive data sets exist that allow examinations of the relationships of many species found in or among groups of estuaries. Most of the distribution and abundance data for estuarine-dependent species is for the offshore life stages where major sampling programs have focused, and does not adequately describe estuarine distributions. Because life stages of many species use both estuarine and marine habitats, it is necessary to combine information on distribution, temporal utilization, and life history strategies to understand the linkages between estuaries and nearshore/offshore areas. No nationwide data base that would allow these evaluations existed prior to ELMR.

Three salinity zones provide the spatial framework for organizing information on species distribution and abundance within each estuary. These zones are tidal fresh (0.0 to 0.5 ppt), mixing (0.5 to 25.0 ppt), and seawater (25.0 ppt and greater). Four criteria were used to identify species: commercial value, recreational value, indicator of environmental stress, and ecological value. A data sheet was developed for each species in each estuary, including information on spatial distribution by salinity zone, temporal distribution by life history stage, and relative abundance level. Each data sheet was then reviewed by experts with local knowledge of particular species and/or estuaries.

The ELMR program is an important step in developing an information base to bridge the gap between site-specific estuarine problems and regional management strategies. Filling this gap is more important now than ever, as it is clear that the cumulative effects of small changes in many estuaries may have a total systemic effect throughout large segments of the Nation's estuaries and coastal ocean. Although the knowledge available to conserve and protect estuaries continues to be limited, the ELMR data base will allow comparisons among species, groups of species, specific life stages and times of year within an estuary, and geographic regions. The estuaries evaluated for the North Atlantic and Mid-Atlantic are presented in Figures 6a and 6b, respectively.

The spatial distribution and relative abundance of scup was evaluated for both the North Atlantic (Table 4) and Mid-Atlantic (Table 5). The ELMR program in the South Atlantic did not delineate scup. The monthly temporal distribution of scup in the North Atlantic estuaries is identified in Tables 6 and 7. The monthly temporal distribution of scup in the Mid-Atlantic (south of Cape Cod) is identified in Tables 8 and 9.

6.2. HABITAT CONDITION

Scup are exposed to the full range of human activities and environmental conditions during their life history. Assessments made by the Ocean Pulse and Northeast Monitoring Programs indicate extensive, detrimental amounts of toxic organic and inorganic contaminants, such as heavy metals, PCBs, and petroleum hydrocarbons in the various physical compartments of the marine ecosystem (Boehm and Hirtzer 1982, Boehm 1983, Pearce 1979, Reid *et al.* 1982). This is particularly true for sediments in the Mid-Atlantic Bight that receive contaminated dredged materials, sewage sludge, and industrial wastes. Elevated levels of petroleum hydrocarbons have even been found in all estuaries as far north as Maine.

Elevated PCB levels have been found in sediments and biota in Buzzards Bay, in the New York Bight apex, as well as other locations (Reid *et al.* 1982).

Generally, the nation's most contaminated estuaries are in highly urban areas (Turgeon *et al.* 1989) such as those around much of the Mid-Atlantic coast. Turgeon *et al.* (1989) describe concentrations of toxic metals and toxic organics in Long Island Sound and relate them to nation wide levels as found in mussel tissues and fish livers. Zdanowicz and Gadbois (1990) provide a data summary for the baseline phase of the National Status and Trends Program during 1984-1986. Estuaries over the entire range of scup were sampled for concentrations of selected chemical contaminants, as well as indicators of potential biological effects from 20 sites throughout the northeast region. Unfortunately, no data specific to scup are presented.

Most research on the toxicological effects of various contaminants in fish is recent and ongoing. Many anomalies probably have not been described or their magnitude documented. The Councils encourage fishermen to report or provide fish with tumorous type growths to: Dr. John C. Harshberger, Director, Registry of Tumors in Lower Animals, Smithsonian Institution, Museum of Natural History, Washington, DC 20560 (202-357-2647) or to Dr. Sharon MacLean, 28 Tarzwell Dr., Narragansett, RI (401-782-3258).

Chemical contaminants of coastal waters include inputs from municipal and industrial wastewater, agricultural pesticides and fertilizers, animal waste, urban nonpoint sources, stormwater runoff and atmospheric deposition. Within the Mid-Atlantic region (Cape May to Cape Fear, as defined in the Mid-Atlantic Marine Research Program (1994)), there are more than 75 coastal counties and cities that have one or more publicly owned treatment works discharging to coastal waters. Toxic components of these contaminants include heavy metals such as lead, cadmium, chromium, zinc, copper, silver and mercury, and organic compounds such as DDT, chlordane, polychlorinated biphenyls (PCBs), and polycyclic aromatic hydrocarbons (PAHs). All of these compounds are generally due to discharges to coastal waters from human activities, although there are some cases of natural concentrations. In the Mid-Atlantic region, northern Chesapeake Bay (especially Baltimore Harbor) and the Elizabeth River in Virginia contain the highest levels of these contaminants except for DDT (Mid-Atlantic Marine Research Program 1994). Lead, silver, zinc, DDT, chlordane, and PCBs have high concentrations at sites within Delaware Bay (Figures 7-10). DDT, chlordane and PCBs are now banned for the most part, but continue to exist in the environment and are used in other countries. Atmospheric deposition of toxins such as pesticides and PCBs may be more of a problem in marine waters than on land, since there may be more bioconcentration of pesticides and PCBs in marine food chains (NRC 1993). The National Research Council recommends source control of pollutants, since many toxic substances are difficult and/or expensive to remove from wastewater.

Coastal areas are vitally important as feeding, spawning, and nursery grounds for scup. However, population shifts to coastal areas and associated industrial and municipal expansion have accelerated competition for use of the same habitats. It has been projected (48 FR 53142-53147) that demographic shifts during the 1980's and 1990's will result in, 75% of the US population living within 50 miles of the coastlines (including the Great Lakes). As a result, these habitats have been substantially reduced and continue to suffer the adverse effects of dredging, filling, coastal construction, energy development, pollution, waste disposal, and other human related activities. In the case of wetlands, from 1954 to 1978 there was an average annual loss of 104,000 acres which was a ten fold annual increase in acreage lost between 1780 and 1954 (48 FR 53142 - 53147). The pressure on coastal and ocean habitats is nowhere greater than in the densely populated, industrialized Northeast. It is obvious that new systems are needed to conserve habitats and living marine resources, while facilitating the completion of necessary, compatible economic developments.

Toward this goal, NMFS issued its formal Habitat Conservation Policy in November 1983 (48 FR 53142-53147). The goal of the policy is: "to maintain or enhance the capability of the environment to ensure the survival of marine mammals and endangered species and to maintain fish and shellfish populations which are used, or are important to the survival and/or health of those used, by individuals and industries for both public and private benefits: jobs, recreation, safe and wholesome food and products." The Habitat Conservation Policy provided impetus to NMFS's Regional Action Plan (RAP) process which is to foster coordinated management and research responses to major habitat conservation issues and prob-

lems, and to develop better steps to address them in the future (USDC 1985).

The RAP process identified six water management units in the Northeast region (Figure 11). The boundaries of each water management unit (WMU) were established on the basis of the biogeographic consistency of the entire WMU and its distinctness from other WMUs. Each WMU is relatively consistent in its physical and chemical characteristics with normal latitudinal and seasonal variations in temperature, salinity, and nutrient content. The biota include both endemic and migratory species that exhibit normal seasonal fluctuations in species composition, individual population size, and geographic distribution. These six units are: Coastal Gulf of Maine, Gulf of Maine, Georges Bank West to Block Channel, Coastal Middle Atlantic, Middle Atlantic Shelf, and Offshelf (USDC 1985).

The Coastal Gulf of Maine WMU encompasses an area bounded seaward by the observable limits of coastal processes, including riverine and estuarine plumes, coastal upwelling and diurnal tidal fluxes. Geographically, the area is bounded on the northeast by the Canadian Border and on the southwest by Cape Cod. This zone is generally marked by steep terrain and bathymetry, joining at a rock bound coastline with numerous isles, embayments, pocket beaches, and relatively small estuaries. Circulation is generally to the southwest along Stellwagen Bank, and finally offshore at Cape Cod. The habitats are presently affected by ocean disposal and effluents from major urban areas, along with significant nonpoint source pollution associated with the various rivers. Continued pressure to fill already depleted marsh and shallow water areas occurs in most parts of the area (USDC 1985).

The Gulf of Maine is a partly enclosed sea of 55,000 square miles separated from the Atlantic Ocean by Browns and Georges Banks. It is an area of five major basins, floored with clays and gravelly silts, and broken by rocky outcroppings, numerous ledges and banks. The circulation is only generally understood: a seasonal clockwise gyre swings around the Gulf and joins the clockwise gyre on the northern edge of Georges Bank. Presently, threats to the area are from the coastal Gulf of Maine and from ships transiting the area (USDC 1985).

The Georges Bank West to Block Channel WMU includes Georges Bank, the Great South Channel, and Nantucket Shoals. These areas have similar habitats, biota and hydrographic regimes. Overall, this WMU is highly productive and heavy fishing pressure is exerted on its numerous fish and shellfish. It is threatened by OCS exploratory drilling and by nonpoint source pollution from atmospheric fallout, general circulation patterns, and marine transportation activities (USDC 1985).

The Coastal Middle Atlantic WMU encompasses a zone from Cape Cod southwest to Cape Hatteras. The area is characterized by a series of sounds, broad estuaries, large river basins and barrier islands. The predominantly sand bottom is characterized by a ridge and swale topography. The waters of the Coastal Middle Atlantic have a complex and seasonally dependent pattern of circulation. Seasonally varying winds and irregularities in the coastline result in the formation of a complex system of local eddies and gyres. Currents tend to be strongest during the peak river discharge period in late spring and during periods of highest winds in the winter. In late summer, when winds are light and estuarine discharge is minimal, currents tend to be sluggish, and the water column is generally stratified. The Coastal Middle Atlantic provides major habitats for anadromous, estuarine, and endemic species. Migratory species play a major role in this WMU, and make up the predominant stocks in various seasons. Estuaries provide major spawning and nursery areas for many of the endemic and migratory species. These species are presently affected by nonpoint and point sources of pollution from major rivers and urban areas, as well as by direct loss of habitat caused by filling of wetlands, damming and diversion of rivers, and mosquito ditching in marshes (USDC 1985).

The Middle Atlantic Shelf WMU covers the area from the Block Island Front southward to Cape Hatteras. The inshore boundary follows the observable limits of coastal processes, primarily estuarine plumes, and lies approximately 30 miles from the coast. This WMU generally is characterized as a sandy plain, with a ridge and swale topography. Numerous submarine canyons intersect this area. The surface circulation over the shelf can be divided into a two celled system, separated at the Hudson Valley. The subsurface and bottom circulation tends to flow in a westerly-southwesterly direction that varies with the passage of weather systems and offshore warm core rings. Hydrographic conditions vary seasonally from vernal

freshening and warming, through summer stratification, to fall/winter breakdown and cooling. This WMU has a different faunal composition than the Gulf of Maine or Georges Bank. Fish populations are predominantly migratory, and species composition varies with season. It is threatened by OCS exploratory drilling; by nonpoint source pollution from atmospheric fallout, general circulation patterns, and marine transportation activities; and by ocean disposal of sewage sludge and industrial wastes (USDC 1985).

The Offshelf WMU encompasses the zone defined by the mean observable limits of the shelf-slope front seaward to the mean axis of the Gulf Stream. The area is overlain by the Slope Water Regime, a mass of relatively warm saline water having a generally weak circulation to the southwest. The upwelling area along the inner boundary of the shelf-slope front is high in productivity and rich in commercially valuable fish and shellfish. Offshore, the Gulf Stream undulates as it moves to the northeast, forming a dynamic boundary from which warm core rings are borne. These rings spawned at a rate of about eight per year, are about 50 to 100 miles in diameter; they break off east of the area and transit to the southwest, eventually coming in contact with the shelf at southwestern Georges Bank. The passage of each ring marks a major event in the hydrographic regime and may significantly affect the biota of the shelf-slope front and possibly of the shelf itself. Other than ring passages, impacts on the offshelf waters are primarily from nonpoint source pollution from atmospheric fall out, marine transportation, and from point source pollution from dumping at Deep Water Dump Site 106 and ocean incineration (USDC 1985).

Each of the oceanic areas identified in section 6.1 as important for scup is subject to numerous man caused habitat threats. Rather than spend extensive efforts detailing degradation in individual local systems (an effort generally being addressed by some of the individual States), this section will broadly address the major types of abuse (i.e., agricultural, urbanization, and industrialization) dominant in the largest, most important areas (i.e., Chesapeake Bay, Hudson River/Long Island Sound, and the New England coast).

Extensive urban development along the western shore of the Chesapeake Bay has resulted in human population and industrial growth at the expense of the natural environment. The Baltimore - Washington - Norfolk corridor is a major demographic region where numerous commercial and industrial activities are centered. These activities have adversely affected the environment through habitat modification and destruction, and the introduction of contaminants in point and nonpoint source discharges. The eastern shore of the Bay is primarily agricultural and residential. Uncontrolled agricultural and suburban runoff, however, also introduces significant quantities of sediments, trace metals, and chemicals that degrade water quality.

The Hudson River/Long Island Sound area is heavily urbanized and in parts industrialized or supportive of large scale agriculture. The middle and upper Hudson River valley and eastern Long Island support extensive agricultural areas and large populations with the associated habitat abuses. The lower portion of the Hudson River area, northern New Jersey, and western Long Island are inhabited by the greatest concentration of people anywhere in the US as well as supporting extensive utility, petro-chemical, and other heavy industry.

The New England coast, since heavily developed, has some of all three major types of abuse. However, the areas are generally localized (i.e., an individual power generating station or urbanized center) and since the estuaries are used less by this species, the abuses do not seem as detrimental as those in the previously mentioned systems.

In summary, the most concise synopsis of the health of the Nation's marine environments can be viewed as that presented in the findings of the Office of Technology Assessment (1987) report:

"Estuaries and coastal waters around the country receive the vast majority of pollutants introduced into marine environments. As a result, many of these waters have exhibited a variety of adverse impacts, and their overall health is declining or threatened."

"In the absence of additional measures, new or continued degradation will occur in many estuaries and some coastal waters around the country during the next few decades (even in some areas that exhibited

improvements in the past)."

"In contrast, the health of the open ocean generally appears to be better than that of the estuaries and coastal waters. Relatively few impacts from waste disposal in the open ocean have been documented, in part because relatively little waste disposal has taken place there and because wastes disposed of there usually are extensively dispersed and diluted. Uncertainty exists, however, about the ability to discern impacts in the open ocean."

6.3. GENERAL CAUSES OF POLLUTION AND HABITAT DEGRADATION

6.3.1. General Habitat Degradation Threats

The Council, in efforts to coordinate with NMFS, has adopted the NMFS Regional Action Plan (USDC 1985) identified environmental threats as potential issues that may affect the scup habitat.

Estuarine and coastal lands and waters are used for many purposes that often result in conflicts for space and resources. Some uses may result in the absolute loss or long term degradation of the general aquatic environment or specific aquatic habitats, and pose theoretically significant, but as yet unquantified, threats to the biota and their associated habitats. Issues arising from these activities, and the perceived threats associated with them, are of serious concern to the public.

Multiple use issues are constantly changing, as are the real or perceived impacts of certain activities on living marine resources. The coastal and oceanic activities that generate these issues can threaten living marine resources and their habitats. Threats to resources occur when human activities cause changes in physical habitat, water and sediment chemistry, and structure and function of biological communities.

The Coastal Middle Atlantic and Coastal Gulf of Maine WMU share similar activities that threaten habitats and the well being of living marine resources in estuarine and near shore areas (USDC 1985). Likewise, the Gulf of Maine, Georges Bank, Middle Atlantic Shelf and Offshore WMUs share similar activities that threaten the welfare of biota and habitats in offshore areas.

The following discussion identifies and describes each multiple use issue and the potential threats associated with that issue (USDC 1985). For the purposes of this discussion, an "issue" is a point of debate or controversy evolving from any human activity, or group of activities, that results in an effect, product, or consequence. Environmental and socio-economic issues remaining to be resolved satisfactorily with regard to their impacts on marine organisms, their habitats, and man developed from the multiple, often conflicting uses of coastal lands and waters.

6.3.1.1. Waste Disposal and Ocean Dumping

The Atlantic Ocean off the northeastern United States has been used for the disposal of wastes, including sewage sludge, dredged material, chemical wastes, cellar dirt, and radioactive material. Some waste treatment methods, such as chlorination, pose additional problems to aquatic species. Habitats and associated organisms have been degraded by long term ocean disposal, particularly of sewage wastes. Sewage pollution causes closure of shellfish beds, and occasionally, of public swimming areas. Additional research on the impacts of ocean disposal at deep water dump sites is urgently needed (USDC 1985). A recent potentially serious problem is the at sea incineration of toxic wastes.

Ocean disposal of sewage sludge, industrial waste products, dredged material, and radioactive wastes degrades water quality and associated habitats. The deep water dump site is 106 miles offshore off of New Jersey. Concentrations of heavy metals, pesticides, insecticides, petroleum products, and other toxics all contribute significantly to degradation of waters off the northeastern States. Organic loading of estuarine and coastal waters is an emerging problem. Symptoms of elevated levels include excessive algae blooms, shifts in abundance of algal species, biological oxygen demand (BOD) increases in sediments of heavily affected sites, and anoxic events in coastal waters. Changes in biological components are a consequence of long term ocean disposal. Harmful human pathogens and parasites can be found in biota

and sediments in the vicinity of ocean dump sites. In addition, shellfish harvesting grounds have been closed because of excessive concentrations of pathogenic and indicator species of bacteria.

Many of the above issues and concerns may also be germane to the dumping of fish and shellfish waste in the ocean. The closure of land based processing plants because of the plants inability to meet National Pollution Discharge Elimination System (NPDES) or State Pollution Discharge Elimination System (SPDES) effluent requirements encourages the attempts for at sea disposal. While fishery byproducts may be nutritive in value, problems of BOD increases, excessive algal blooms, and concentrations of pathogenic bacteria, may all be associated with ocean disposal of fisheries products. The onus of proof of no environmental harm must fall to the group that wants to use the ocean for disposal purposes.

The deeper waters of the offshore WMUs present a different set of problems, compared with shallower waters, with respect to oceanic currents, warm core rings, and other physical and chemical oceanographic processes. Furthermore, less is known and understood about deep water ecosystems than their shallow water counterparts. It is imperative that studies be undertaken to reveal the fate and role of contaminants in deep water ecosystems, and to refine information about the shelf ecosystem through which these materials may be transported (USDC 1985).

6.3.1.2. Coastal Urbanization

Half of the human population makes its home within 60 miles of one ocean or another (Zero Population Growth Reporter 1994a). In the US, the home is often accompanied by: a car, and an oil leak that trickles into the nearby stream and down to the shore; a lawn, showered with pesticides that wash "away" in the rain; a neighboring farm, and manure that seeps down to the bay, firing an algae bloom; and a paper mill, spilling traces of toxic dioxin into the river. The list goes on.

The US population rose 85 percent within 50 miles of the coastlines between 1940 and 1980, compared to 70 percent for the nation as a whole (Zero Population Growth Reporter 1994b). To accommodate development and create beach view property, mangroves, marshes and dunes are torn away. Some 110 million Americans live in marine coastal zones, and their number is growing. Each year more beaches close because of contamination as waste from overloaded sewage systems is dumped into oceans. In 1992, the 60 million Americans that live along the Atlantic coastal region saw 1,713 beach closings.

The US Census Bureau projects that by the year 2000, the US population will reach 275 million, more than double its 1940 population. The United States has the fourth highest population in the world.

The U.N. Food and Agriculture Organization now estimates that all 17 of the world's major fishing areas have either reached or exceeded their natural limits, and that 9 are in serious decline (Postel 1994). It is widely acknowledged that many of the North Atlantic fisheries are seriously depleted and arguments rage over who is to blame. Pogo had the answer: "We have met the Enemy, and he is Us."

Brouha (1994) points out our dilemma and states: "All our scientific work will be for naught if world human population growth and resource consumption are not stabilized soon. Unchecked growth, subsidies that support unsustainable resource use, and natural resource policies focused on short-term economic gains have created a conundrum for the long-term economic integrity and productivity of global ecosystems."

Ehrlich (1990) states the problem best: "No matter how distracted we may be by the number of problems now facing us, one issue remains fundamental: Overpopulation. The crowding of our cities, our nations, underlies all other problems."

Tremendous development pressures exist throughout the coastal area of the Northeast Region. More than 2,000 permit applications are reviewed and processed annually by the NMFS Northeast Region for commercial, industrial, and private marine construction proposals from other regulatory agencies. The proposals range from generally innocuous, open pile structures, to objectionable fills that encroach into aquatic habitats, thereby eliminating their productive contribution to the marine ecosystem. The projects

range from small scale recreational endeavors to large scale commercial ventures to revitalize urban waterfronts.

Associated with marine construction are a number of impacts which affect living marine resources directly, and indirectly through habitat loss or modification. Many of these projects are of sufficient scope to singly cause significant, long term or permanent impacts to aquatic biota and habitat; however, most are small scale causing minor losses or temporary disruptions to organisms and environment. The significance of small scale projects lies in the cumulative effects resulting from the large number of these activities.

Urban construction is not limited to the shore, but upland development, too, which can adversely impact aquatic areas. One of the major problems arising from urban development is the increase in nonpoint source contamination of estuarine and coastal waters. Highways, parking lots, and the reduction in terrestrial vegetation and fringe marshes facilitate runoff loaded with soil particles, fertilizers, biocides, heavy metals, grease and oil products, PCBs, and other material deleterious to aquatic biota and their habitats. Atmospheric emissions resulting from certain industrial processes contain sulphurous and nitrogenous compounds that contribute to acid precipitation, a growing source of concern in some fresh water sections of tidal streams. Nonpoint pollution is incorporated in water, sediments, and living marine resources. Although nonpoint sources of pollution do not usually cause acute problems, they can contribute to subtle changes and increases of contaminants in the environment (USDC 1985).

As residential, commercial, and industrial growth continues, the demand for potable, process, and cooling water, flow pattern disruption, waste water treatment and disposal, and electric power increases. As ground water resources become depleted or contaminated, greater demands are placed on surface water through dam and reservoir construction or some other method of freshwater diversion. The consumptive use of significant volumes of surface freshwater causes reduced river flow that can affect down stream salinity regimes as saline waters intrude further upstream.

Water that is not lost through consumptive uses is returned to the rivers or streams as point source waste water discharges. Although the waste water generally is treated, it still contains contaminants. Domestic waste water contains residual chlorine compounds, nutrients, suspended organic and inorganic compounds, trace metals and bacteria. Industrial discharges may contain many dissolved and suspended pollutants, including metals, toxic substances, halogenated hydrocarbons, petroleum products, nutrients, organics and heat.

Construction in and adjacent to waterways often results in elevated suspended solids emanating from the project area. The distance the turbidity plume moves from the point of origin is dependent upon tides, currents, nature of the substrate, scope of work, and preventive measures employed by the contractor.

Excessive turbidities can abrade sensitive epithelial tissues, clog gills, decrease egg buoyancy, reduce light penetration; thereby affecting photosynthesis of phytoplanktonic and submerged vegetation, and cause localized oxygen depression. Suspended sediments subsequently settle, which can destroy or degrade productive shellfish beds and nursery sites.

The effects of turbidity and siltation are generally, but not always, temporary and short term. Other construction activities can result in permanent loss or long term disruption of habitat. The impacts of dredging and sediment resuspension on submerged aquatic vegetation can also be long term or permanent. Dredging can degrade productive shallow water and destroy marsh habitat or resuspend pollutants, such as heavy metals, pesticides, herbicides, and other toxins. Concomitant with dredging is spoil disposal, which traditionally occurred on marshes or in open water. Shoreline stabilization can result in gross impacts, through filling of intertidal and sublittoral habitat; or cause subtle effects, resulting in the elimination of the ecotone between shore and water, or through the scouring of benthic habitat by reflective wave energy.

Sewage treatment effluent produces changes in biological components as a result of chlorination and increased contaminant loading. Sewage treatment plants constructed where the soils are highly saturated often allow suburban expansion in areas that would have otherwise remained undeveloped, thereby exacerbating already severe pollution problems in some areas.

Another aspect of urban development is nonpoint source pollution, which is caused by land based activities that result in materials being transported to aquatic areas. Certain pollutants (pathogens, phosphorus, sediments, heavy metals, and acid precipitation) from nonpoint sources are demonstrable problems in Atlantic coastal and estuarine waters (USDC 1985). Nonpoint source pollution appears to be a chronic threat that will affect the Northwest Atlantic Ocean in the upcoming decades.

Diversion of freshwater to other streams, reservoirs, industrial plants, power plants, and municipalities can change the salinity gradient downstream and displace spawning and nursery grounds. Patterns of estuarine circulation necessary for larval and plankton transport could be modified. Such changes can expand the range of estuarine diseases and predators associated with higher salinities that affect commercial shellfish.

Industrial waste water effluent is regulated by EPA through permits. While the NPDES provides for issuance of waste discharge permits as a means of identifying, defining, and where necessary, controlling virtually all point source discharges, the problems remain due to inadequate monitoring and enforcement. It is not possible presently to estimate the singular, combined, and synergistic effects on the ecosystem impacted by industrial (and domestic) waste water.

6.3.1.3. Energy Production and Transport

Energy production facilities are widespread along Atlantic coastal areas. Electric power is generated by various methods, including land based nuclear power plants, hydroelectric plants, and fossil fuel stations. These facilities compete for space along the coastal zone; they require water for cooling and, in the case of coal fired plants, generate voluminous amounts of fly ash and sulfur dioxide, as well as electricity. In addition, hydroelectric plants, with their need for dams, substantially modify river courses and affect anadromous fish runs and/or restoration programs.

The impacts on the marine and estuarine environment resulting from the various types of power plants include water consumption, heated water and reverse thermal shock, entrainment and impingement of organisms, discharge of heavy metals and biocides in blow down water, destruction and elimination of habitat, and disposal of dredged materials and fly ash (USDC 1985).

The Outer Continental Shelf (OCS) exploratory and production drilling and transport may affect biota and their habitats through the deposition of drilling muds and cuttings. Oil spills resulting from well blowouts, pipeline breaks, and tanker accidents are of major concern. Seismic testing operations can interfere with fishing operations and damage or destroy fishing gear. In addition, exclusion areas around drilling rigs can result in conflicts between fishermen, both recreational and commercial, and the oil companies.

6.3.1.4. Port Development and Utilization

All ports require shoreside infrastructure, mooring facilities, and adequate channel depth. Ports compete fiercely for limited national and international markets and continually strive to upgrade their facilities. Dredging and dredged material disposal, filling of aquatic habitats to create fast land for port improvement or expansion, and degradation of water quality are the most serious perturbations arising from port development. All have well recognized implications to living marine resources and habitat.

6.3.1.5. Agricultural Development

Agricultural development can affect fisheries habitat directly through physical alteration and indirectly through chemical contamination. Fertilizers, herbicides, insecticides, and other chemicals are washed into the aquatic environment with the uncontrolled nonpoint source runoff draining agricultural lands. These chemicals can affect the growth of aquatic plants, which in turn affects fish, invertebrates, and the general ecological balance of the water body. Additionally, agricultural runoff transports animal wastes and sediments that can affect spawning areas, and generally degrade water quality and benthic substrate. Excessive uncontrolled or improper irrigation practices often exacerbate the contaminant flushing as well as deplete and contaminate ground water. One of the most serious consequences of erosional runoff is that

the frequent dredging of navigational channels results in dredged material that requires disposal, often in areas important to living marine resources (USDC 1985). Additional impacts of erosion include the effects of sedimentation and decreased light on submerged aquatic vegetation, as well as changing harder bottom types to soft.

6.3.1.6. Marine Mineral Extraction

Mining for sand, gravel, and shell stock in near shore coastal and estuarine waters can result in the loss of benthic organisms, modifications of substrate, changes in circulation patterns, and decreased dissolved oxygen concentrations at deeply excavated sites where flushing is minimal. Sand and gravel mining tends to result in suspended materials at the mining sites, and turbidity plumes may move several miles from individual sites. Mining also results in ranges in sediment type or sediment quality, often over areas measurable in square miles. Deep borrow pits created by mining may become seasonally or permanently anaerobic (USDC 1985).

6.3.1.7. Other Effects of Nonpoint Pollution (NPS)

Many of the adverse impacts associated with NPS were discussed above under individual threats. Cumulatively, however, the effects of this environmental insult may have much more far reaching implications for fisheries resources. Estuarine and riverine plumes entering coastal waters are influenced by Coriolis and other dynamic forces. These plumes may remain as discrete water masses flowing close to the coast for hundreds of miles. Consequently, plumes from different estuaries may converge and act synergistically to affect changes in the structure of biological communities.

6.3.1.8. Coastal and Wetland Use and Modification

Intense population pressures have adversely affected many estuarine and marine habitats along the Atlantic coast. Demand for land suitable for home sites, resorts, marinas, and industrial expansion has resulted in the loss or alteration of large areas of wetlands through dredging, filling, diking, ditching, upland construction, and shoreline modification.

As residential and commercial use of coastal lands increased, so does the recreational use of coastal waters. Marinas, public access landings, private piers, and boat ramps all vie for space. Boating requires navigational space, a place to berth for some boat owners, and boat yards for repair and storage.

As population densities increase in these areas, greater pressures are exerted to develop remaining lands, and the demand for nuisance insect control on adjacent undeveloped wetlands either through chemical or physical (i.e., ditching) methods, also intensifies.

In addition to residential and recreational development, other competing uses further contribute to the destruction or modification of wetland areas. Agricultural development can significantly affect wetlands. Common flood control measures in low lying coastal areas include dikes, ditches, and stream channelization. Wetland drainage is practiced to increase tillable land acreage. Wildlife management techniques that also destroy or modify wetland habitat include the construction of dredged ponds, low level impoundments, and muskrat ditches and dikes (USDC 1985).

In general wetland loss is not something the Council can directly affect. The Council's Congressional mandate is to reduce fishing mortality when a resource is overfished. Loss of habitat and reduced ability to reproduce because of environmental degradation are generally considered part of the natural mortality estimate when stock assessments are performed and thus outside the control of the MFCMA. The Council does play an indirect role in environmental issues by commenting under the limitations of the Magnuson Act. It is becoming increasingly apparent that fishing mortality reductions are significantly hampered by the constant loss of species habitat.

Significant coastal wetlands have been lost recently. Tiner (1987) in a report entitled "Mid-Atlantic wetlands: A disappearing natural treasure," quantifies the current status and recent trends in wetlands in

the mid-Atlantic. The trends are alarming. Between 1955 and 1981, Delaware lost about 42,000 acres of coastal wetlands and inland vegetated wetlands. Delaware lost 3.8% of its coastal wetlands. Between 1955 and 1978, about 24,000 acres of Maryland's coastal wetlands and inland vegetated wetlands disappeared. Maryland lost 9% of its coastal wetlands. Between 1956 and 1977, over 63,000 acres of Virginia's coastal and inland vegetated wetlands were lost, with an overall loss of 6.3% of the coastal wetlands.

The NMFS 1985 priorities on the multiple use issues and threats to living marine resources were identified in the RAP document (USDC 1985). Activities identified as high priority included urban and port development, ocean disposal, dams and agricultural practices. Medium priority activities included industrial waste discharges, domestic waste discharges, and OCS oil and gas development (Table 10). These priorities are currently being re-evaluated (A. Peterson pers. comm.).

Finally, habitat alteration by the fishing activities themselves is perhaps the least understood of the important environmental effects of fishing (National Research Council 1994a). Alterations to resource habitats due to fishing may result from the loss of habitats of non-target species, such as species encrusting cobbles, or of other epibenthic habitats, which may be important nursery areas for juvenile fish; from the alteration of nutrient levels and bottom sediment, including destruction of habitat by bottom trawling, dredging, and other fishing and processing operations; and from the generation of suspended debris that can have lethal effects long after fishing activities have ceased.

6.4. PROGRAMS TO PROTECT, RESTORE, PRESERVE, AND ENHANCE THE HABITAT OF THE STOCKS FROM DESTRUCTION AND DEGRADATION

The MFCMA provides for the conservation and management of living marine resources (which by definition includes habitat), principally within the EEZ, although there is significant concern for management throughout the range of the resource which includes the state controlled waters. The MFCMA also requires that a comprehensive program of fishery research be conducted to determine the impact of pollution on marine resources and how wetland and estuarine degradation affects abundance and availability of fish.

The MFCMA established Regional Fishery Management Councils that have the responsibility to prepare fishery management plans which address habitat requirements, describe potential threats to that habitat, and recommend measures to conserve those habitats critical to the survival and continued optimal production of the managed species. The NMFS Habitat Conservation Policy (48 FR 53142 - 53147), specifically Implementation Strategy 3, established the basis for a partnership between NMFS and the Councils to assess habitat issues pertaining to individual manages species. Under MFCMA, the action agencies (such as the Corps of Engineers) have to respond within 45 days to any Council's comments on habitat issues.

Other NMFS programs relative to habitat conservation are found in the Marine Mammal Protection Act of 1972, the Endangered Species Act of 1973, and the Anadromous Fish Conservation Act of 1965. The NMFS shares responsibilities with the FWS for conservation programs under these laws.

In addition to the above mentioned NMFS programs, other laws regulate activities in marine and estuarine waters and their shorelines. Section 10 of the River and Harbor Act of 1899 authorizes the Army Corps of Engineers (COE) to regulate all dredge and fill activities in navigable waters (to mean high water shoreline). Section 404 of the Clean Water Act of 1980 authorizes EPA to regulate the discharge of dredged or fill material wastes into waters and adjacent wetlands. EPA has delegated authority under Section 404 to the COE to administer all dredge and fill activities under one program. Section 401 of the Clean Water Act authorizes EPA, or delegated states with approved programs, to regulate the discharge of all industrial and municipal wastes. The EPA and COE also share regulatory responsibilities under the Marine Protection, Research, and Sanctuaries Act of 1972.

All of the activities regulated by these programs have the potential to adversely affect living marine resources and their habitat. The NMFS, EPA, FWS, and state fish and wildlife agencies have been

mandated to review these activities, assess the impact of the activities on resources within their jurisdiction, and comment on and make recommendation to ameliorate those impacts to regulatory agencies. Review and comment authority is provided by the Fish and Wildlife Coordination Act of 1934 (as amended 1958) and the National Environmental Policy Act of 1969. Consultative authority extends to all projects requiring federal permits or licenses, or that are implemented with federal funds.

Other legislation under which NMFS provides comments relative to potential impacts on living marine resources, their associated habitats, and the fisheries they support include, but are not limited to, the Coastal Zone Management Act of 1972; the Marine Protection, Research, and Sanctuaries Act of 1972; and the Endangered Species Act of 1973 (Section 7 consultation).

A more detailed discussion of the pertinent legislation affecting their protection, conservation, enhancement, and management of living marine resources and habitat can be found in the NMFS Habitat Conservation Policy (48 FR 53142-53147).

In addition, NMFS and the other Federal resource agencies are involved in other programs with the States (e.g., NMFS administers Saltonstall-Kennedy and Fish and Wildlife Service administers Wallop-Breaux programs) that provide grants to conserve fish habitats and improve fisheries management.

Individual states also regulate wetlands, which complements Federal habitat conservation programs. Over the past two decades, the United States has devised various public and private programs to protect and manage this valuable wetland resource. Unfortunately, most of these programs have addressed only limited aspects of the wetlands protection problem, and they have been adopted haphazardly and incoherently (The Conservation Foundation 1988). This has led to duplication and uncertainty, at times imposing burdensome costs. The existing programs also leave major gaps in the protection effort.

The members of the National Wetlands Policy Forum (The Conservation Foundation 1988) firmly believe the nation cannot afford to allow the present situation -- with its inadequate wetlands protection, its confusion, its costs and frustration -- to continue. The National Wetlands Policy Forum members recognize that wetlands protection is only one of many issues the nation is facing, but they believe it clearly merits a higher priority than it has received in the past.

The preservation and restoration of wetlands and essential estuarine habitats are mainly state responsibilities as well as the Federal EPA and Corps of Engineers. The Council's Habitat Committee which generally includes personnel from ASMFC, Fish and Wildlife Service and the Coast Guard works closely with the ASMFC Habitat Committee and the EPA and Corps. Numerous meetings have been held with these agencies during the development of this FMP and its Amendments. Several projects (Cedar Island development, marina development in Ocean City, Dam Neck dredge spoil disposal, Assawoman canal dredging, etc.) have been commented on and modified because of impacts to habitat for species managed by MAFMC.

6.5. MID-ATLANTIC FISHERY MANAGEMENT COUNCIL HABITAT POLICY (adopted by Council January 1987)

Recognizing that all species are dependent on the quantity and quality of their essential habitats, it is the policy of the Mid-Atlantic Fishery Management Council (1987) to:

Conserve, restore and develop habitats upon which commercial and recreational marine fisheries depend, to increase their extent and to improve their productive capacity for the benefit of present and future generations. (for the purposes of this Policy, "HABITAT" is defined to include all those things, physical, chemical and biological that are necessary to the productivity of the species being managed.)

This policy shall be supported by three policy objectives which are to:

(1) Maintain the current quantity and productive capacity of habitats supporting important commercial and recreational fisheries, including their food base. (This objective will be implemented using a guiding

principle of NO NET HABITAT LOSS.)

(2) Restore and rehabilitate the productive capacity of habitats which have already been degraded.

(3) Create and develop productive habitats where increased fishery productivity will benefit society.

The Council shall assume an aggressive role in the protection and enhancement of habitats important to marine and anadromous fish. It shall actively enter Federal decision making processes where proposed actions may otherwise compromise the productivity of fishery resources of concern to the Council.

COUNCIL HABITAT RESPONSIBILITIES

The Council will assist in the development of each fishery management plan to insure that:

(1) Habitat significant to the species to be managed as well as its prey (where information is available) is adequately defined in the plan, and

(2) Recommendations to responsible agencies are included in the plan which identify habitat improvement or changes in Federal policies, which are necessary to achieve the objectives of the plan.

The Council will review those proposed habitat alterations, policy or other human actions which may have a significant adverse impact on those fisheries addressed in the Council's proposals and finding that adverse impacts will occur, the Council may file or present the Council's position to the Federal agency(s) responsible for the action which could (1) oppose the proposed action, (2) suggest project modifications or (3) seek full compensation for unavoidable fishery losses.

The Council may also recommend changes in the Federal statutes and their implementing regulations to protect marine fishery resources and their habitats in water development projects and policy.

GUIDELINES

The following guidelines could assist the Council in making its assessment of the proposed actions:

(1) The extent to which the activity would directly affect the production of fishery resources or their essential food base (e.g., as a result of dredging, filled marshland, pollution, reduced access, etc.);

(2) The extent to which precedent would be set in relation to existing or potential cumulative impacts of similar or other developments in the project area;

(3) The extent to which the activity would indirectly affect the production of fishery resources (e.g., alteration of circulation, salinity regimes, detrital export, etc.);

(4) The extent of any adverse impact that can be avoided through project modification or other safeguards (e.g., piers in lieu of channel dredging);

(5) The existence of alternative sites available to reduce unavoidable project impacts; and

(6) The extent to which the activity requires a waterfront location if dredging or filling wetlands is involved.

Project Review Process

(1) Significant projects shall be selected by the Council using the following criteria:

(a) Judgment that significant adverse effects may occur; or

(b) Notification by the Council or staff of significant projects that should be considered.

(2) NMFS shall forward copies of public notices of significant Federally authorized projects or policy immediately to Council staff followed by special briefings, as appropriate, or by NMFS position statements, as developed.

(3) Council staff, when appropriate, shall catalog notices and forward copies to the Council. The staff shall request state and other Federal assessments (position statements) of project impact and forward them to the Council.

(4) When appropriate, Council shall develop a Council position.

(a) The Council may file adverse comments or recommended project modifications to reduce environmental damage with the Federal construction or regulatory agency (COE, FERC, etc.).

(b) Council staff or members may testify at public hearings, as needed.

(c) Council may hold public hearings, as appropriate.

(5) The Council shall report on its actions at Council meetings as needed.

Criteria to Define Significant Projects

(1) Projects that may directly affect fisheries or habitat for which the Council has a management or research interest.

(2) Projects which significantly affect habitat important to species managed under the MFCMA or important to species upon which managed species are dependent for food.

(3) Projects that may be precedent setting or in unique or critical habitat areas.

(4) Projects having a substantial or significant indirect impact on surface water flow, detritus export, saltwater intrusion, isolating nursery areas, etc.

(5) Highly "controversial" projects, i.e., those which generate much publicity, strong opinions from user of the affected resource.

6.6. HABITAT PRESERVATION, PROTECTION AND RESTORATION RECOMMENDATIONS

Management of fisheries requires both control of fishing mortality (by the Councils) and preservation and restoration of habitat (by the States, EPA, and the Corps of Engineers). As noted above as a purpose for this action, the Council intends to work closely with these other agencies for habitat preservation.

As stated in section 4, scup are overexploited. Recognizing that scup are in poor shape, it is worthwhile to stress habitat conservation for increasing the survivability of juveniles, as well as management actions to control fishing mortality, which will strengthen the use of the habitat information in meeting the MAFMC mandates that "irreversible or long term adverse effects on fishery resources and the marine environment are avoided."

Scup are dependent on estuarine habitats for much of their life (section 6.1). It is precisely these habitats that are most vulnerable to anthropogenic impacts and loss. It is probable that fishing mortality rates on scup may be the primary reason for the declines noted. However, the critical habitat areas designated by the States (section 6.1.2) must be protected in order to allow scup populations to rebuild and be maintained when fishing mortality rates are reduced.

In order to resolve the above problems and prevent overfishing for this species, very significant reductions in fishing mortality will be required. The reductions in fishing mortality are needed to reduce the risk of stock failure. The Council has the ability to control fishing mortality and reduce that component of risk

through the Magnuson Act.

Equally important to reducing risk is the quality of the habitat. In this area the primary federal responsibility is that of EPA and the Corps of Engineers, since the Magnuson Act only allows the Council the right to comment on proposals. Spawning and nursery areas and migratory pathways must be protected and kept viable if the stringent fishing regulations are to succeed. Successful fishery management requires a partnership between the fishery managers and the habitat protection agencies for the programs to succeed. It would not be fair to place stringent regulations on the fishermen in order to solve the stock problems, only to lose any gains to pollution and habitat degradation. The recommendations that follow are made in keeping with this philosophy.

It is the policy of the Mid-Atlantic Fishery Management Council (section 6.5) to oppose any loss of aquatic habitat or wetlands which contributes to the conservation of fish stocks. Where loss of habitat is unavoidable locally, the Council endorses recreation of quantitatively and qualitatively equivalent habitat. The Council recognizes the multiple resource base of our coastal areas and recognizes the need to accommodate other natural resource management objectives with special sensitivity to goals that may be contrary to the objectives of fishery management. The intent of the Council is to support no net loss of fishery habitat while minimizing all detrimental alterations of these essential habitats.

This policy is intended to allow the MAFMC to optimize the management of fisheries in the mid-Atlantic EEZ through a concerted effort to establish a quality habitat and to seek to reverse the serious problems affecting the reproduction, size frequency and distribution of fish. The Council will accomplish this through participation in the review of private and government projects which would adversely affect fish production.

The Council is deeply concerned about the effects of marine and estuarine habitat degradation on fishery resources. They have a responsibility under the MFCMA to take into account the impact of habitat degradation on scup. The following recommendations are made in light of that responsibility and are in full accordance with the Council's Habitat Policy and Position Paper on Habitat and the Environment.

1. All available or potential natural habitat for migratory scup should be preserved by encouraging management of conflicting uses to assure access by the fish to essential habitat and maintenance of high water quality standards to protect scup migration, spawning, nursery, overwintering, and feeding areas.

2. Filling of wetlands should not be permitted in or near nursery summering areas. Mitigating or compensating measures should be employed where filling is unavoidable. Project proponents must demonstrate that project implementation will not negatively affect scup, their habitat, or their food sources.

3. Best engineering and management practices (e.g., seasonal restrictions, dredging methods, disposal options, etc.) should be employed for all dredging and in water construction projects. Such projects should be permitted only for water dependent purposes when no feasible alternatives are available. Mitigating or compensating measures should be employed where adverse impacts are unavoidable. Project proponents should demonstrate that project implementation will not negatively affect scup, their habitat, or their food sources.

4. The disposal of sewage sludge, industrial waste, and contaminated dredged material in scup habitat, including the New York Bight, should not be allowed. Advanced garbage, industrial waste, and sludge handling techniques are now available and must be encouraged. Specifically:

a. The Council opposes ocean dumping of industrial waste, sludge and other harmful materials.

b. The Council requests EPA require each permitted ocean dumping vessel be required to furnish detailed information concerning each trip to the dump site. This might be in the form of transponders; locked Loran C recorder plots of trip to and from the dump site; phone call to EPA when vessel leaves and returns to port; or other appropriate method to ascertain that vessels dump only in designated areas.

c. The Council requests fishermen and other members of the public to report to the EPA, Coast Guard and the Council any observance of vessels dumping other than in the approved dump sites. A list of permitted vessels would accompany this request with the additional request for reporting of any vessel not on the approved list. The report should include date, time, location (longitude, latitude, Loran bearings), vessel name of the dumping vessel, the nature of the material dumped, name of reporting individual and vessel. This would enable EPA or the Coast Guard to take appropriate action against illegal dumping.

d. The Council strongly urges state and federal environmental agencies to reduce the amount of industrial waste, sludge and other harmful materials discharged into rivers and the marine environment, and for these agencies to increase their surveillance monitoring and research of waste discharge. The Council requests that the Environmental Protection Agency implement and enforce all legislation, rules and regulations with emphasis on the best available technology requirements and pretreatment standards.

5. Ocean disposal of fish waste should not be allowed in any areas where environmental harm may occur. The burden of proof that no environmental harm exists should be on the entity proposing the disposal. An environmental monitoring program to characterize the proposed site prior to, during, and after disposal occurs must be undertaken and is the financial responsibility of the entity benefiting from the use of the ocean environment. As an example, the dumping of fish wastes in areas of surf clams or scallops could provide enrichment that could trigger undesirable organisms, such as paralytic shellfish poisoning (PSP).

6. The siting of industries requiring water diversion and large volume water withdrawals should be avoided in scup critical areas. Project proponents must demonstrate that project implementation will not negatively affect scup, their habitat, or their food supply. Where such facilities currently exist, best management practices must be employed to minimize adverse effects on the environment.

7. Dechlorination facilities should be used to destroy chlorine at sewage treatment plants and power plants.

8. No toxic substances in concentrations harmful (synergistically or otherwise) to humans, fish, wildlife, and aquatic life should be discharged. The EPA's Water Quality Criteria Series should be used as guidelines for determining harmful concentration levels. Use of the best available technology to control industrial waste water discharges must be required in areas critical to the survival of scup. Any new potential discharge into critical areas must be shown not to have a harmful effect on scup. In calculating potential impacts, the stratification affects of mixing zones should be carefully considered.

9. The EPA, for the EEZ, and states, for the Coastal Zone, should review their water quality standards and make changes as needed with respect to the habitat requirements of scup migratory passage and feeding and to maintain edible scup; that is, flesh and organ buildup of contaminants must be considered.

10. Water quality standards in nursery, spawning, feeding, and areas of migratory passage should be enforced rigidly by state or local water quality management agencies, whose actions should be carefully monitored by the EPA. Where state or local management efforts (standards/enforcement) are deemed inadequate, EPA should take steps to assure improvement; if these efforts continue to be inadequate, EPA should assume authority, as necessary.

11. Appropriate measures must be taken as soon as possible to reduce acid precipitation and runoff into estuaries and near shore waters.

12. EPA and appropriate agencies must establish and approve criteria for vegetated buffer strips in agricultural areas adjacent to scup nursery areas to minimize pesticide, fertilizer, and sediment loads to these areas critical for survival. The effective width of these vegetated buffer strips varies with slope of terrain and soil permeability. The Soil Conservation Service and other concerned Federal and State agencies should conduct programs and demonstration projects to educate farmers on improved agricultural practices that would minimize the wastage of pesticides, fertilizers, and top soil and reduce the adverse effects of these materials.

6.7. HABITAT RESEARCH NEEDS

The National Status and Trends Program of NOAA (USDC 1987 and 1989) should provide guidance in making intelligent decisions involving the use and allocation of resources in the nation's coastal and estuarine regions. These decisions require reliable and continuous information about the status and trends on environmental quality in the marine environment. Four general objectives have been established for the early years of the National Status and Trends Program (USDC 1987 and 1989). Those objectives are (1) to establish a national data base using state of the art sampling, preservation, and analysis methodologies; (2) to use the information in the data base to estimate environmental quality, to establish a statistical basis for detecting spatial and temporal change, and to identify areas of the nation that might benefit from more intensive study; (3) to seek and validate additional measurement techniques, especially those that describe a biological response to the presence of contaminants; and (4) to create a cryogenic, archival specimen bank containing environmental samples collected and preserved through techniques that will permit reliable analysis over a period of decades. While the Council concurs with these objectives, efforts by this program or other NMFS programs, as well as any capable scientists (universities, State agencies, environmental groups, etc.) also must look at specific issues which include:

1. It is necessary that scientific investigations be conducted on scup to emphasize the long term, synergistic effects of combinations of environmental variables on, for example, reproductive capability, genetic changes, and suitability for human consumption.

2. The Council recommends the following areas for future habitat directed investigations: field studies on the direct and indirect effects of contaminants on mortality of scup; studies on the interactive effects of pH, contaminants, and other environmental variables on survival of scup; and continued studies on the importance of factors controlling the production and distribution of food items that appear in the diet of young scup.

7. DESCRIPTION OF FISHING ACTIVITIES

7.1. Domestic Commercial Fishery

Scup have supported important commercial fisheries since colonial times (Neville and Talbot 1964). Prior to the 1930's, most scup were harvested by fixed gears such as pound nets and floating traps. Since then otter trawls have increased in importance and are now the predominant gear used to catch scup commercially. A more detailed description of the historic fisheries for scup can be found in Neville and Talbot (1964) and Morse (1978).

Commercial landings have steadily increased since the early 1900's to a peak of approximately 50 million pounds in 1960 (Figure 12). However, landings began to decline in the mid 1960's and reached a low of less than 8.2 million pounds in 1989. Since 1989, landings have increased to approximately 13 million pounds in 1992 and have since declined to under 10 million pounds in both 1993 and 1994.

Since 1983, commercial scup landings have averaged approximately 13 million pounds per year or 70% of the total landings, recreational and commercial landings combined (Table 11). In 1993, for example, fishermen landed approximately 12.3 million pounds of scup of which commercial landings accounted for approximately 9.1 million pounds. This represents a decline from 17.2 million pounds; the amount of scup landed by commercial fishermen in 1983.

Although scup were harvested in both state and federal waters by a variety of commercial gears, two gears accounted for the majority of the commercial landings from 1983 to 1992. Coastwide, the greatest proportion of scup, 74%, were landed by otter trawls (Table 12). The other predominant gear, shallow floating traps, accounted for 12% of the landings over this time period. Other important gears included paired trawls, pound nets, fish pots/traps, and hand lines.

Otter trawls were the dominant gear in most states in which scup were landed (Table 13). However,

pound nets accounted for most of the landings in Massachusetts (29%) and floating traps were important in Rhode Island, accounting for 31% of the landings in that state over a ten year period.

Coastwide, otter trawls were consistently the predominant gear from 1983 to 1992 accounting for 69 to 85% of the landings (Table 14). The percent of scup harvested by floating traps fluctuated over this time period with this gear accounting for only 5% of the landings in 1989 and almost 18% in 1988.

In 1992, approximately 70% of the commercial landings came from the EEZ (Table 15). Coastwide, from 1983 to 1992, an average of 69% of the scup landed commercially came from federal waters. By subregion, EEZ landings were predominant in the Mid-Atlantic area each year from 1983 to 1992 (Table 16). However, in New England the landings were almost equally divided between state and federal waters with a slight predominance in the EEZ in most years except 1983 and 1984. In 1992, EEZ landings accounted for 52 and 90% of the landings in the New England and Mid-Atlantic regions, respectively. Scup landed in North Carolina have been taken almost exclusively from the EEZ (Table 17).

Based on average monthly landings for the period 1983-1992, most scup were harvested in federal waters from November through April with peak landings in March and April (Table 18). In state waters, landings peaked in May. Coastwide, in state and EEZ waters combined, landings peaked in May with a ten-year average of 2.5 million pounds.

In 1992, almost 45% of the commercial landings came from one state, Rhode Island (Table 19). Scup landings from Rhode Island have fluctuated over the ten-year time period with 1992 landings of approximately 5.9 million pounds. More scup were harvested in Rhode Island than any other state in all years over the time period. In general, three states, Rhode Island, New York, and New Jersey, have accounted for more than 80% of the coastwide scup landings on average from 1983 to 1992 (Table 20).

7.2. Domestic Recreational Fishery

Saltwater angling surveys were conducted for the entire Atlantic coast in 1960 (Clark 1962) and 1965 (Deuel and Clark 1968) by the US Fish and Wildlife Service and in 1970 (Deuel 1973) by the National Marine Fisheries Service. Beginning in 1979 and continuing to present, the NMFS has conducted annual Marine Recreational Fishing Statistical Surveys (MRFSS). This survey is designed to expand interview data on catch and angler effort from both on site creel census and telephone surveys to state and regional levels. The MRFSS distinguishes between fish available for identification and measurement by the interviewers (Type A), fish used as bait, filleted, or discarded dead (Type B1), and fish released alive (Type B2). The sum of types A, B1, and B2 comprise the total recreational catch whereas types A and B1 constitute total recreational landings.

Recreational fishermen caught over 5.6 million scup in 1994; they landed approximately 4.3 million (Table 21). Both the recreational catch and landings were below the 1983-1994 average of 12 and 9.6 million scup, respectively.

In 1994, recreational landings were almost equally divided between the North Atlantic and Mid-Atlantic subregions (Table 22). The predominance of recreational landings by subregion varied from one year to the next with more scup landed by recreational fishermen in the North Atlantic states in most years. Few scup were landed by recreational fishermen in North Carolina.

Recreational fishermen landed (by number) more scup caught from state waters than in the EEZ in 1994, with 84% and 85% of all scup caught in the North Atlantic and the Mid-Atlantic areas, respectively (Table 23). State landings were predominant in all years from 1983 to 1994 at an average of 86% of the landings by number in the North Atlantic and 93% by number in the Mid-Atlantic. In 1994, most of the scup by weight were attributed to anglers fishing in state waters in both the North Atlantic and Mid-Atlantic.

Recreational fishermen using private/rental boats accounted for most of the scup catch and landings from 1983-1992 (Table 24). Conversely, anglers fishing from party/charter boats caught 12% of the total and

landed 14% by weight.

Anglers in New York landed the highest proportion of all scup landed along the Atlantic coast, accounting for 37% of the total scup landed by recreational fishermen from 1983 to 1992. Recreational landings from the states of Massachusetts, Rhode Island, Connecticut, and New York accounted for nearly all of the recreational landings from 1983-1992. Few if any scup were caught by anglers fishing in states north of Massachusetts or south of Delaware.

8. ECONOMIC CHARACTERISTICS OF THE FISHERY

Scup is an important component of the commercial and recreational fisheries from North Carolina through Massachusetts. The economic characteristics of the commercial and recreational scup fisheries are described in the following sections. Throughout this description, it is important to note the distinction between economic value and economic impact.

Economic value is a measure of willingness to pay for a good or service. Ex-vessel value in the commercial sector is thus a measure of processor and wholesaler willingness to pay for scup in the dockside market. Likewise, retail value is a measure of final consumer willingness to pay for scup at supermarkets, seafood shops and restaurants. Economic impact, on the other hand, is a measure of expenditures made by people engaged in a particular activity, and the employment, income, tax revenues, etc. which result from these expenditures. Often, it is said that recreational fishermen spend "x" dollars on gear, boats, travel, etc., and generate "y" amount of employment or "z" dollars in tax revenue.

Clearly, scup are valuable to both recreational anglers and seafood consumers who do not or cannot fish for themselves. Also, individuals and firms engaged in the commercial harvesting and marketing of scup make expenditures and generate employment in the course of business activities, just as participants in the recreational fishery do. Scup have economic value in both recreational and commercial uses and scup related activities have economic impact in each use.

When considering the relative benefits of scup to the two sectors, commercial values must be compared to recreational values and commercial impacts must be compared to recreational impacts. Unfortunately, recreational values are not easily measured and too often, economic impacts of recreational fishing are erroneously contrasted with ex-vessel value in the commercial sector. The reader is cautioned to avoid this confusion when impact and value estimates are presented in the following sections.

8.1. COMMERCIAL FISHERY

As a general rule, commercial fisheries are divided into three different components: harvesting, processing and marketing. Different degrees of specialization and integration within each of these components exists among different fisheries. That is, many individuals and firms specialize in a single sector, although some vertically integrated companies span all sectors, and diversified companies are often involved in food related industries besides seafood. The intent of the following section is to examine each component in order to better understand the scup fishery.

8.1.1. Harvesting Sector

8.1.1.1. Ex-vessel value and price

Commercial landings of scup decreased approximately 47% from 17.2 million pounds in 1983 to 9.1 million pounds in 1993 (Table 11). Commercial landings in 1993 were 31% below the 1992 level and 29% below the 1983-1993 mean. The value of commercial landings in 1993 indicated a 26% decrease from the 1992 level and a 25% decrease from the 1983-1992 mean (Table 26). The effects of decline in landings on ex-vessel value or revenues to harvesters have been mitigated by an increase in prices (constant 1993 dollars) from $0.55 per pound to $0.58 per pound from 1983 to 1993 (Table 26). Inflation adjusted average prices for scup have ranged from $0.53 per pound to $0.87 per pound for the 1983-

1992 period.
A record high average price (all sizes) for scup occurred in 1989 in both nominal and inflation adjusted (1993) dollars (Table 26). Price fluctuations were likely associated with supply responses; generally it was found that higher prices corresponded to significant decreases in landings. On a monthly basis, the supply-price relationship was also evident. As expected, an inverse relationship between landings and average ex-vessel prices was found with overall higher prices corresponding to months with lower landings (Table 27).

The value of scup landings relative to the value of total landings in 1993 varied for each state from less than 1% (New Hampshire, Massachusetts, Connecticut, Maryland, Virginia and North Carolina) to about 2.3% of the total value of landings in New Jersey (Table 28).

Prices received for scup harvested in state waters were generally higher than for scup harvested in EEZ waters throughout the year (Table 27). Prices received by fishermen tracked the seasonal supply relationship for scup caught in state waters as well as in EEZ waters. The 1993 coastwide average ex-vessel price per pound for jumbo scup was $1.33, $0.92 for large, $0.66 for large/mix, $0.54 for medium, $0.28 for small, $0.18 for pins, and $0.68 for unclassified (Table 30). Price differentials in 1993 indicate that the ex-vessel price per pound for large scup was 70% greater than for small and 80% greater than for pins.

8.1.1.2. Fishing Vessel Activity

At the present time there is no annual permit requirement for commercial fishing vessels taking scup within US waters. Without individual logbooks, information on the total number of vessels actually landing scup (or the extent of dependence on scup) is difficult to assemble. The NMFS weighout system records can be used to estimate the number of vessels landing scup in covered states (NC is not included). However, the data do not constitute a complete census. NMFS weighout files indicate that 498 vessels employing diverse types of gear landed scup in 1993. This statistic provides a lower boundary for the number of commercial vessels involved in the scup commercial fishery. In 1993, there were about 80-100 vessels that could have participated in the scup fishery in North Carolina (R. Monaghan pers. comm.). Thus, the number of vessels currently fishing for scup could range from 498 to 598 vessels. It is likely that most of the vessels that qualify for scup permits would apply for them in order to maintain flexibility of fishing operations pending the availability of species, or to maintain eligibility given concerns about a potential limited entry program. It is expected that about 700 vessels would qualify for scup permits (see section 9.2.2.2.1).

In 1992 and 1993, 394 and 427 otter trawl vessels, respectively, landed scup that were recorded in NMFS weighout records (Table 31). Scup represented 24% of the total pounds landed and 28% of the total ex-vessel value of all otter trawl trips harvesting 4,000 pounds or more of scup in 1992 (Table 32). The top ten species (by weight) contributed 93% of the total pounds and 92% of the total value of the harvest of otter trawl vessels landing 4,000 pounds or more of scup. When considering the value per pound of these species (obtained by dividing total value by total pounds) scup had the fifth largest ex-vessel value per pound.

Based on trips landing more than 4,000 pounds of scup (Table 32), the average ex-vessel scup value per trip was $9,415 in 1993 (obtained by dividing ex-vessel value in Table 32 by number of trips in Table 31). Otter trawl vessels which land scup also harvest other species throughout the year. This activity categorizes this type of fishery as a mixed fishery, where squid, summer flounder, Atlantic mackerel, silver hake and other species are harvested on the basis of local availability (opportunistic fishery), or land scup as a bycatch from the involvement in other directed fisheries.

In 1993, scup landings and value represented 0.5% and 0.6% of the Atlantic coast total commercial landings and value, respectively (Table 28). Scup ex-vessel value was highest in New Jersey ($2.2 million), followed by Rhode Island ($1.6 million) and New York ($1.1 million) (Table 33). When scup value is compared to the total value of all species landed in each state, scup was most important to fishermen in New Jersey, at 2.3% of the total commercial value, followed by New York (2.1%) and Rhode Island

(2.0%) (Table 28). Rhode Island, New Jersey and New York accounted for 82% of all scup harvested during the period 1983-1992 (Table 20).

Activities at the port level indicate that 78% of all scup commercial landings occurred in four ports: Point Judith, Rhode Island; Montauk, New York; Cape May, New Jersey; and Newport, Rhode Island (Finlayson and McCay 1994). The degree of reliance on scup for these ports is low. Scup landed value as a percent of total port landed value was: 5.43% for Point Judith, 6.41% for Montauk, and 13% for Cape May.

8.1.1.3. Fishing Costs

Vessel costs are composed of ownership costs and operating costs. Ownership costs are incurred once the durable goods are purchased. These are added costs whether or not the assets (equipment/materials) are used in the production process, that is they remain constant regardless of the output level. Ownership costs are frequently referred to as "fixed costs." They include depreciation, debt, insurance, routine maintenance, and insurance, among others. Operating costs are incurred when the production process occurs. These costs are commonly known as "variable costs." They include fuel, oil, maintenance, wages, food, sale and unloading fees, among others.

Vessel variable costs are proportionate to the hours traveling and fishing (operating maintenance, fuel, ice) and the quantity of fish landed (wages, sales and unloading fees, ice). Costs vary in different locations and the cost components have changed over the years. Due to the variation in vessels landing scup (home port, tonnage class, directed fishery, etc.), exact cost information is difficult to obtain and generally applicable only to a hypothetical "average" vessel. A general description based on unpublished NMFS data follows.

Wages are almost always in the form of a share or "lay" system. The captain, crew, and vessel owner split the net revenue based on a predetermined, set ratio. Ratios are in many instances set according to what is traditional in that port. The particular ratio of the lay system utilized varies between vessels. Often certain expenses such as fuel, ice and in some cases food are deducted from the gross revenues with the remainder divided about 60-40 between the vessel owner and the captain and crew (A. Kitts pers. comm.). When one or the other of the parties is responsible for additional costs, the share split normally reflects this.

Fuel costs vary among ports. As of May 1994, diesel fuel costs for selected ports in the Mid and North Atlantic ranged from about $.60 per gallon to $1.10 per gallon, with an average of $.75 per gallon (A. Kitts pers. comm.). Total vessel fuel costs are directly proportional to the amount of time spent steaming and fishing as well as the size and drag of the fishing gear used.

Ice costs also vary among ports. On a per-ton basis, ice costs $50 in Boston, MA; $35 in Gloucester, MA; $75 in Montauk, NY; and $40 in Cape May, NJ. Typically ice costs will range from $40 to $70 coastwide (A. Kitts pers. comm.). Ice costs are related to the amount of fish expected to be caught, the expected trip length, and the type and size of storage system utilized on board.

Variable maintenance costs are related to the number of hours the engines, fishing gear, etc. are used and the weather conditions. Much of the minor repair work is conducted by crew members and, on larger vessels, by an engineer. Since these crew members perform this labor as part of their normal responsibilities, there is no added labor cost (Crutchfield 1986). However, most major engine, electronics, and gear repairs are contracted to specialists.

Selling costs consist of lumpers (unloaders) fees, transportation costs, etc. Lumpers fees are variable among ports. In Point Judith, RI the cost is $6 per 1,000 lbs (J. McCauley pers. comm.), $3 per 1,000 in Cape May, NJ (C. Bergman pers. comm.) and $5 per 1,000 lbs in Newport, RI (A. Kitts pers. comm.). In Montauk (NY) lumpers fees are not applicable, since the fish are boxed at sea (A. Kitts pers. comm.). The market charges $.10 per pound for unloading and packaging in Cape May, with transportation charges between $.06 to $.07 per pound (C. Bergman pers. comm.). In Point Judith unloading charges will depend on the value of the fish unloaded. Costs associated with washing, sorting, and packing scup in a carton

with ice (including labor) are between $.08 to $.10 per pound. Transportation charges range from $.05 and $.07 per pound (J. McCauley pers. comm.).

The New England full-time otter trawl fleet increased 66% between 1976 and 1985, while per-vessel deflated gross revenue decreased 20% (Kurkul and Terrill 1986). This appears to be a result of decreased landings per vessel rather than increased expenses.

Fishing costs for pound nets, fish traps, and hand line operations are much less than costs for otter trawlers (Norton *et al.* 1984). There are no studies addressing scup fishing costs by type of gear. Fishing costs of commercial striped bass harvesters using fish traps and hook and line gear were developed by Norton *et al.* (1983). The design of floating traps allows for the harvesting of species such as scup, butterfish, squid and fluke. Fish trap fishermen typically use 70 ft vessels with major expenditures for wages (41%) followed by nets (15%) and taxes (14%). Hook and line fishermen typically use a small boat (17 ft average), have major expenses of wages (35%), fuel (16%), and tackle (16%) (Norton *et al.* 1983).

Estimates of vessel costs based on sea sampling data of otter trawl vessels landing mackerel from Maine to Virginia were developed by Walden (1993). In Walden's study, costs were broken down into trip costs or variable costs (fuel, ice and food, etc.) and yearly costs or fixed costs (insurance, engine and gear repair, electronic equipment expenses, etc.). Labor costs were not included in the analysis because labor is generally paid as a percentage of the total revenue after certain expenses are subtracted. Table 34 summarizes estimated average cost data for otter trawlers that operated in the mackerel fishery developed in Walden's study. Otter trawl vessels involved in the squid and scup fishery may generally have similar equipment to the otter trawl vessels in the mackerel fishery. The cost data results developed by Walden might be used to an extent when analyzing cost data for otter trawl vessels in the scup fishery. Vessels that participate in mixed fisheries have their fixed costs distributed over various activities. Utilization of such fixed costs to evaluate the financial performance of a vessel in only one fishery would yield inappropriate results.

An analysis by Buss and Kitts (1994) utilized three data sources (Capital Construction Fund Files, Northeast Fisheries Science Center Weighout Files and Northeast Fisheries Science Center Master Vessel Files) to compile a data base containing information regarding revenues, landings, and expenditures for vessels operating in the US Northeast Atlantic coast for the period 1983-1992. Preliminary results from Buss and Kitts' (1994) work indicated that costs as a percent of total gross revenues (from tax return files) for trawlers in the following categories were: trip costs (fuel, oil, ice, water, food, etc.) 18.3%; other variable operating expenses (gear, supplies, freight, payment to lumpers, auction fee, etc.) 5.9%; indivisible operating expenses (insurance, licenses and permits, office expenses, taxes (not income), utilities (telephone), etc.) 16.8%; insurance cost 7.7%; crew share 36.9%; salary (payment to officers) 6.2%; and employee benefits 6%. Since expenses are recorded by individuals differently in tax forms, missing information was treated as missing values, therefore the above percentages do not add up to 100. The economic interpretations of the data provided by Buss and Kitts have limitations. Two significant drawbacks are: 1) data are based on tax returns and techniques dealing with different aspects of the return can vary significantly from one return to the next and 2) the data set does not fully represent the population of Northeast fishing vessels and results in the analysis are probably more applicable to more profitable vessels or "highliners" (Buss and Kitts 1994).

8.1.2. Processing Sector, Marketing and Consumption

Most scup are sold fresh (C. Bergman and R. Ross pers. comm.). The catch is generally refrigerated or iced during long trips and might or might not be iced during short trips. When the catch arrives at the dock, it is sorted, washed, weighed, and boxed and iced for shipment. Scup might be frozen for future marketing when demand is low or when the market is glutted. When scup is frozen, processing is minimal, mainly consisting of handling and freezing. Boxes containing scup for shipment typically weigh 100 pounds, however, higher value scup may be boxed in 50 pound cartons (J. McCauley pers. comm.).

Scup are generally transported to market by truck. The Fulton Fish Market in New York City is the primary wholesale outlet for scup (Finlayson and McCay 1994). Marketing channels for scup appear to be well

established.

Scup is generally a low priced fish. The greatest proportion of small scup go to dealers in Philadelphia, Washington, Baltimore and points south (Finlayson and McCay 1994). Some of the large scup marketed from Point Judith, Rhode Island are shipped to the Boston area (J. McCauley pers. comm.).

8.1.3. Economic Impact of the Commercial Fishery

The economic impact of the commercial scup fishery as it relates to employment and wages is difficult to determine given the nature of the fishery. Since, most scup landings are bycatch or associated with opportunistic fisheries, and scup represents less than 1% of both the total landings and total value for all finfish and shellfish from North Carolina to Maine, it can be assumed that only a small amount of the region's fishing vessel employment, wages and sales is dependent on scup.

8.2. RECREATIONAL FISHERY

Recreational fishing contributes to the general well being of participants by affording them opportunities for relaxation, experiencing nature, and socializing with friends. The potential to catch and ultimately consume fish is an integral part of the recreational experience, though studies have shown that non-catch related aspects of the experience are often as highly regarded by anglers as the number and size of fish caught. Since equipment purchase and travel related expenditures by marine recreational anglers have a profound effect on local economies, the maintenance of healthy fish stocks and development of access sites is as important to fishery managers as the status of commercial fisheries.

8.2.1. Recreational Fishing Activity

The participation of scup anglers by region and mode indicates that from 1983 to 1992, 77% of scup (by number) were caught from private or rental vessels (Table 24). Ownership of a private vessel involves sizable investment and maintenance expenditures, thus contributing greatly to measures of economic impact. Private vessels are also used for non-fishing purposes, however, and are used to fish for many different species. Expenditure and cost data must be prorated for scup trips to account for multipurpose use.

In addition to private and rental boats, 11% of scup were caught from shore and 12% from party and charter boats (Table 24). At the present time, annual permit requirements for party and charter boats (vessels for hire) which take anglers to fish for scup within the US EEZ do not exist. Without individual logbooks, the total number of party and charter vessels actually directing trips on scup is difficult to determine.

In 1985, a total of 454 party and 1,626 charter boats operated out of Atlantic coast ports from Maine through North Carolina (Table 35). These vessels generated revenues of $101 million in 1985. Estimates of party and charter boat trips directed at scup are lacking for specific regions along the coast. In 1993, a random sample of 821 New Jersey marine recreational fishermen (regardless of mode) indicated that scup was targeted by less than 1% of the recreational fishermen (B. Brown pers. comm.).

The National Marine Fisheries Service estimated that in 1991, a total of 23,416,000 trips were taken by marine recreational anglers in the Mid-Atlantic and North Atlantic regions (USDC 1992). Intercept surveys show that 2.74% and 7.25% of the anglers interviewed indicated that they preferred or sought scup as the primary species targeted in the Mid-Atlantic and North Atlantic regions, respectively. That is, an estimated 2,339,250 angler trips (all modes) were nominally directed at scup in 1991. Over 72% of those directed scup trips were made in the North Atlantic region.

8.2.2. Economic Impact of the Recreational Fishery

In 1985, direct sales related to marine recreational fishing for all species from North Carolina to Maine amounted to over $1.8 billion. Angler purchases or expenditures generate and sustain employment and

personal income in the production and marketing of goods and services bought. These sales and services required an estimated 30 thousand person-years of labor and generated wages of $370 million (SFI 1988). These estimates correspond to all marine recreational fishing and help to illustrate the relative importance of the recreational fishery. Unfortunately, estimates of the economic activity specifically associated with scup were not provided separately, but were combined with other species. In the North and Middle Atlantic regions, scup impacts were not specifically enumerated due to the greater relative popularity and abundance of other species. Furthermore, the fact that fishermen may target more than one species or may incidentally encounter other fish creates difficulty when addressing the direct economic impact associated with a single species.

8.2.3. Value of Scup to Anglers

Estimates of aggregate economic value for scup are not currently available. The value that anglers place on the recreational fishing experience can be divided into actual expenditures and non-monetary benefits associated with satisfaction (consumer surplus). Anglers incur expenses for fish (purchase of gear, bait, boats, fuel, etc.), but do not pay for the fish they catch or retain nor for the enjoyment of many other attributes of the fishing experience (socializing with friends, contact with nature, etc.). Despite the obvious value of these fish and other attributes of the experience to anglers, no direct expenditures are made for them, hence the term "non-monetary" benefits.

A demand curve for recreational fishing trips for scup is not available. The demand for recreational fishing trips would be determined by travel expenditures, catch rates, costs of equipment and supplies, accessibility of fishing sites, social experience, weather and a variety of other factors affecting angler enjoyment. A decrease in the catch rate or retention rate, holding all other factors constant, e.g weather, travel costs, etc., would move the demand curve to the left. On the other hand, an increase in the catch or retention rate would shift the demand curve to the right. Each move will have an associated decrease, increase in angler expenditures and total benefits, respectively.

Economic estimates of total expenditures made for fishing are useful for economic impact analysis. In order to estimate the total value (willingness to pay) of scup, an estimate of the marginal value per trip would be required. However, as already mentioned above, in the case of scup, as with many recreational sought species, an aggregate demand curve is not available.

Estimates of the value of a recreational fishing day for salt water angling have been made in several studies. A recent study by Strand *et al.* (1991) provides information about marine recreational fishing in the Middle and South Atlantic. Table 36 presents estimated total cost (travel and services) or estimated value for a recreational fishing day for selected states. The range of average values were $43.35 to $69.69 for party vessels, $59.88 to $146.66 for charter vessels and $40.33 to $44.38 for private vessels. Travel cost tended to be higher in Delaware for all modes of fishing.

Other studies have estimated the value of a recreational fishing day for saltwater angling along the Atlantic coast. Value per trip for marine recreational fishing for nine sites in Delaware was estimated by Rockland (1983). The travel cost method with a variety of estimation approaches was employed. On average, the values for boat fishing sites ranged from $20.58 to $39.90 per day, while the range for shore fishing was $37.47 to $62.53 per day. Norton *et al.* (1983) estimated $39 to $169 per day in a study of the recreational striped bass fishery on the Atlantic coast. Bell *et al.* (1982) estimated values from $18.97 to $57.99 per day for all marine species in the state of Florida. It is important to note that the average cost of a scup trip or fishing day is not equivalent to the marginal value of a recreationally caught scup. Attributes of a recreational fishing day other than catching fish are valued by anglers, so all expenditures are not dependent on scup catch. The marginal value of scup catch must be estimated, and as with any normal good, marginal value declines with increasing quantity.

Addressing the economic value associated with marine recreational fishing when developing fishery management plans is important. Ideally the value that anglers are willing to pay for the recreational opportunity that they enjoy should be considered when evaluating plans that affect both the recreational and the commercial fishery.

An estimate of the total expenditures made fishing for scup can be made by multiplying the number of trips taken by an estimate of average cost per day. However, it is not possible to address the non-monetary benefit derived from fishing without more sophisticated statistical techniques enabling an estimate of the marginal value per trip.

The National Marine Fisheries Service recognizes the importance of the proper valuation of fish stock resources by commercial and recreational fisheries. Currently, a survey is being analyzed to assess socio-economic data on the people who participate in marine recreational fishing in the Northeast region. This data will be employed to estimate statistical models of the demand for marine recreational fishing for eight important recreational species (bluefish, striped bass, summer flounder, Atlantic cod, black sea bass, tautog, scup, and weakfish) (R. Roe pers. comm.).

8.2.4. 1990 Survey of Charter and Party Boats

The charter and party boat industry is important in several states in the management unit of this FMP. On average for the 1983-1992 period, 12% of the scup (in numbers) landed by anglers off the Atlantic coast were caught from party or charter boats (Table 24).

To provide additional information on this segment of the industry, the Council conducted a survey of charter and party boat owners in the summer of 1990 with the purpose of acquiring information in support of management efforts for the summer flounder, scup, and black sea bass fisheries. A mailing list was compiled from the NMFS vessel permit files, including all vessels which indicated they were involved in party and charter activities (permit Category 2). The list included 402 vessels.

Consultation with Council members yielded concerns that a number of vessels did not hold Federal permits, and would not be included in the survey. Representatives from New Jersey, New York, and Virginia supplied the Council with lists supplementing the NMFS permit files, and an additional 190 questionnaires were mailed.

A total of 592 surveys were sent out to 13 east coast states (Table 37). Massachusetts, New Jersey, New York, and Virginia were most heavily represented, together accounting for 80% of survey mailings.

A total of 202 surveys were returned to the Council, 172 of which were usable. The 30 returns which could not be used were inappropriate mailings that fell into the following general categories: did not charter/fish in 1989; private boat, not for hire; dive boat, primarily after lobsters; returned as undeliverable by Post Office; or sold boat. Usable returns equaled 29% of total mailings, with the percentage ranging from approximately 20% - 50% for individual states.

Some of the analyses conducted on the survey divided the responses into "Party boat" versus "Charter boat" categories. Typically, charter vessels are thought of as hiring out for a day's fishing to a small number of individuals at a cost of over $100 per person. They provide a high level of personal attention to the passengers and will make special efforts to find the particular species of interest to their clients.

"Party boats" are generally larger vessels which run on a fixed schedule and carry from 10 to 100 passengers, averaging around 20. They offer fewer options and less attention to passengers, yet charge much lower fares than charter boats (in the $20 - $40 range).

In order to have the ability to differentiate between these two groups, the data were partitioned based on the reported number of passengers each vessel could carry. Examination of the data showed a logical division between those vessels which reported carrying 8 or fewer passengers, and those able to carry more than 8. The average fee charged per person dropped significantly for those vessels carrying more than 8 passengers. For purposes of this analysis, then, "charter boats" are defined as those boats carrying 8 or fewer passengers, and "party boats" those which may carry 9 and above. It is recognized that charter boats are generally licensed for six passengers and, in fact, responses to another question indicated that the average charter boat carried 6 passengers (SD = 0.4), while the average party boat carried 53 (SD = 32), so it is quite likely that the respondents which indicated they owned a charter boat that carried eight

people were including the captain and mate whereas in the subsequent question they were referring to the six paying passengers.

The first question on the survey attempted to gauge the interest or demand which party and charter boat customers exhibited for common species (or species groups). Given a five point scale, owners were asked to rank each species as being: 1 = Low, 2 = Somewhat Low, 3 = Moderate, 4 = Somewhat High, or 5 = High in interest to their customers. Calculating mean values of responses allows comparison of the different species using a single number for each.

Spot ranked as the most desirable fish for party boats (mean interest = 4.7), illustrating its importance to the well-represented boats of Virginia (Table 38). It was followed by bluefish (4.6), then summer flounder (3.6), Atlantic Mackerel (3.5), and striped bass (3.5). Scup ranked as one of the least desirable fish for party boats (2.2). The top four fish which party boats reported catching were: bluefish (4.0), Atlantic mackerel (3.5), spot (3.4), and black sea bass (2.9).

For party boats, summer flounder ranked as the fish anglers were least successful in catching (mean success = 1.5). It was followed by weakfish and striped bass (1.7), sharks (other than dogfish) (1.9), and scup (2.0).

An additional perspective can be gained on the situation by creating what might be termed a "frustration index," or simply the difference between fishermen's interest in catching a particular species and their success in doing so. Summer flounder stands out by having the largest difference between interest and success values for party boat fishermen (2.1), followed by striped bass and weakfish. Scup showed one of the smallest differences between interest and success value for party boat fishermen (0.2), second to Atlantic mackerel.

Charter boat owners reported a preference ordering similar to that of party boats for their customers, with the exception that large pelagics took the second ranked spot along with bluefish (Table 38). The top five species were: spot (4.6), large pelagics (3.9), bluefish (3.9), striped bass (3.7), and summer flounder (3.2). The preference for scup for charter boat owners (1.4) was ranked as the least desirable species.

In 1989, the average party boat customer traveled 67 miles, with a standard deviation (SD) of 43 miles. The farthest party boat customer traveled 695 miles (SD = 1,125 mi.). In 1989, the average charter boat customer traveled 123 miles (SD = 194 mi.). The farthest charter boat customer traveled 727 miles (SD = 914 mi.).

Charter boat respondents indicated that 38% of their customers were more interested in a particular species, 15% were more interested in fishing enjoyment, and 46% were about equally interested in each. For party boats, the responses were 43% for a particular species, 12% for the fishing experience, and 45% equally for each.

For charter boats, 89% of the respondents were both owner and operator (7% just owner, 5% just captain). The party boat responses were 94% owner and captain, 2% just owner, and 4% just captain. Only 14% of the charter boats were used year round (86% seasonally), while 18% of the party boats were used year round (82% seasonally). The average charter boat carried 6 passengers (SD = 0.4), while the average party boat carried 53 (SD = 32).

Thirty six percent of the charter boat respondents indicated that they fished commercially in 1989, with 91% of those fishing commercially from the charter boat and 9% from another boat. For party boats, 26% of the respondents indicated they had fished commercially in 1989, with 69% of those fishing commercially from the party boat and 31% from another boat.

On a scale of 1 (almost none) to 5 (almost all), respondents were asked what part of their personal earnings in 1989 came from party and charter boat fishing, commercial fishing, or other sources. For charter boat respondents the mean answers were: charter or party boat fishing, 2.2; commercial fishing 1.5; and other sources, 4.0. For party boat respondents the mean answers were: charter or party boat

fishing, 3.2; commercial fishing 1.3; and other sources, 2.4.

Respondents were also asked what their perception of fishing success was for 1989 and what they thought their customers' perceptions of 1989 fishing success was. Ranking was on a scale of 1 (good) through 3 (bad). For charter boats, the operators reported a mean of 2.1 (SD = 0.7) for their own view and 1.9 (SD = 0.7) for their customers. For party boat operators, their own perception was 2.2 (SD = 0.6), while they thought their customers would rate the season at 2.0 (SD = 0.6).

The survey included a series of questions to determine how the respondents felt business was in 1989 compared to 1985. Both charter and party boats made slightly fewer trips in 1989 compared to 1985 (Table 39). The days per trip and/or trips per day were essentially unchanged. They operated fewer days per week, on average, and carried slightly fewer customers. The average price per trip increased from $121.80 to $149.50 for charter boats and $26.20 to $29.20 for party boats. The average number of fish taken per customer for charter boats fell from 10.9 to 8.3 for charter boats and from 15.2 to 9.9 for party boats between 1985 and 1989. The number of crew members stayed relatively constant. The average cost per trip rose from $96.10 to $131.10 for charter boats and from $113.30 to $146.60 for party boats during the period.

8.3. INTERNATIONAL TRADE

Scup occur primarily on the continental shelf of the northwest Atlantic, and there are no imports of this species into the US. International trade of scup appears to be very limited. In 1991 there were no scup exports and in 1992 about 93,000 pounds valued at $67,200 were exported to China (R. Ross pers. comm.). These figures minimum export values. Given the export classification codes employed by the NMFS, it is possible that some scup were exported under the "unclassified" species category.

9. FISHERY MANAGEMENT PROGRAM

9.1. MEASURES TO ATTAIN MANAGEMENT OBJECTIVES

9.1.1. Specification of OY, DAH, DAP, JVP, TALFF, Overfishing Definition, and Fishing Mortality Rate Reduction Strategy

Section 303(a)(3) of the MFCMA requires that FMPs assess and specify the OY from the fishery and include a summary of the information utilized in making such specification. OY is to be based on MSY, or on MSY as it may be adjusted for social, economic, or ecological reasons. The most important limitation on the specification of OY is that the choice of OY and the conservation and management measures proposed to achieve it must prevent overfishing.

OY is all scup harvested pursuant to this FMP. OY cannot be specified as a quantity because it will change as the fishing mortality rate target varies and is dependent on the level of recruitment.

The Council has concluded that US vessels have the capacity to, and will, harvest the OY on an annual basis, so DAH equals OY. The Council has also concluded that US fish processors, on an annual basis, will process that portion of the OY that will be harvested by US commercial fishing vessels, so DAP equals DAH and JVP equals zero. Since US fishing vessels have the capacity and intent to harvest the entire OY, there is no portion of the OY that can be made available for foreign fishing, so TALFF also equals zero.

Overfishing for scup is defined as fishing in excess of the F_{max} level. F_{max} is a biological reference point that corresponds to the level of fishing mortality (F) that produces the maximum yield per recruit. Based on current conditions in the fishery, F_{max} is 0.24.

Stock assessment information indicates that scup are overfished. Age based analyses indicate that current fishing mortality rates (F) are at least 1.3.

The Council and the ASMFC Management Board approved a recovery strategy that reduces overfishing on scup over a 7 year time frame. The recovery strategy calls for minimum fish sizes and commercial gear regulations in year 1. In years 2 through 4, target exploitation rates would be 47% for scup. In years 5 and 6, the target exploitation rates would be 33% and in year 7 and subsequent years, the target exploitation rate would be based on F_{max}. Based on current conditions in the fishery, F_{max} is 0.24 and the associated exploitation rate is 19%. This recovery schedule is:

	Exploitation Rates
Current	69%
Year 2	47%
Year 5	33%
Year 7	19%

9.1.2 Specification of Adopted Management Measures

9.1.2.1. Permits and fees

9.1.2.1.1. Vessel permits and fees

9.1.2.1.1.1. General

Any owner of a vessel desiring to fish for scup within the US EEZ for sale, or transport or deliver for sale, any scup taken within the EEZ, must obtain a moratorium permit from NMFS for that purpose. The vessel must meet the criteria set forth in 9.1.2.1.1.2 in order to qualify for the moratorium permit.

The owner of a party and charter boat (vessel for hire) must obtain a party or charter boat permit.

A recreational vessel, other than a party or charter boat (vessel for hire), is exempt from the permitting requirement if it catches no more than the recreational possession limit, multiplied by the number of persons on board, of scup per trip.

A party or charter boat may have both a party or charter boat permit and a commercial moratorium permit to catch and sell if the vessel meets the commercial vessel qualification requirements set forth in 9.1.2.1.1.2. However, such a vessel may not fish under the commercial rules if it is carrying passengers for a fee. When a party or charter boat is operating as a commercial vessel, the crew size must not be more than 5 when it is a party boat and not more than 3 when it is a charter boat.

9.1.2.1.1.2. Moratorium on entry to the commercial fishery

There will be a moratorium on entry of additional commercial vessels into the scup fishery in the EEZ. Each state is encouraged to adopt complementary moratorium measures for those participating in the commercial fishery. Vessels with documented landings of scup for sale between 26 January 1988 and 26 January 1993 qualify for a moratorium permit to land and sell scup under this moratorium program.

Under the moratorium, vessels and moratorium permits together may be bought and sold with the approval of the Regional Director. Vessels that involuntarily leave the fishery (for example, vessels that were sunk or burnt) may be replaced with vessels of the same or less Gross Registered Tonnage (GRT) and overall registered length as the vessel being replaced. Commercial vessels that are judged unseaworthy by the Coast Guard for reasons other than lack of maintenance may be replaced by a vessel with the same or less GRT and vessel registered length. Permits may not be combined to create larger replacement vessels. The moratorium may be terminated or replaced at any time by FMP amendment establishing an alternative limited entry system.

A vessel is eligible for a moratorium permit if it meets any of the following criteria:

1. The owner or operator of the vessel landed and sold scup in the management unit for scup between 26 January 1988 and 26 January 1993; or

2. The vessel was under construction for, or was being rerigged for, use in the directed fishery for scup on 26 January 1993 and provided the vessel has landed scup for sale prior to implementation of this FMP. For the purpose of this paragraph, "under construction" means that the keel had been laid or the vessel was under written agreement for construction or the vessel was under written contract for purchase. "Being rerigged" means physical alteration of the vessel or its gear had begun to transform the vessel into one capable of fishing commercially for scup; or

3. The vessel is replacing a vessel of substantially similar harvesting capacity which involuntarily left the scup fishery during the moratorium, and both the entering and replaced vessels are owned by the same person. "Substantially similar harvesting capacity" means the same or less GRT and vessel registered length for commercial vessels.

4. Vessels that are judged unseaworthy by the Coast Guard for reasons other than lack of maintenance may be replaced by a vessel with the same or less GRT and vessel registered length for commercial vessels.

Eligibility must be established during the first year of the FMP. In other words, the moratorium permit may not be applied for more than twelve months following the effective date of the final regulations or if a vessel is retired from the fishery. This does not affect annual permit renewals.

Vessel permits issued to vessels that involuntarily leave the fishery may not be combined to create larger replacement vessels.

Applicants for moratorium permits shall provide information with the application sufficient for the Regional Director to determine if the vessel meets the eligibility requirements. Sales receipts or dealer weighout forms signed by the dealer and, for condition 3, a notarized statement from marine architects or surveyors or shipyard officials will be considered acceptable forms of proof.

9.1.2.1.1.3. Permit application

The owner or operator of a qualified US vessel may obtain the appropriate Federal permit by furnishing on the form provided by NMFS at least the following information, and any other information required by the Regional Director: vessel name; owner name, mailing address, and telephone number; U.S. Coast Guard documentation number and a copy of the vessel's U.S. Coast Guard documentation or, if undocumented, the vessel's state registration number and a copy of the state registration; home port and principal port of landing; length; gross tonnage; net tonnage; engine horsepower; year the vessel was built; type of construction and type of propulsion; approximate fish hold capacity; type of fishing gear used by the vessel; number of crew; permit category; if owner is a corporation, a copy of the Certificate of Incorporation, and the names and addresses of all shareholders owning 25 percent or more of the corporation's shares; if the owner is a partnership, a copy of the Partnership Agreement and the names and addresses of all partners; if there is more than one owner, names of all owners having owned more than a 25-percent interest; the name and signature of the owner or the owner's authorized representative; permit number of any current or, if expired, previous Federal fishery permit issued to the vessel; and a copy of charter/party boat license and number of passengers the vessel is licensed to carry (charter and party boats). Operators of commercial vessels must also supply information required to establish that the vessels qualify for a permit pursuant to the moratorium. The Regional Director will notify the applicant of any deficiency in the application. If the applicant fails to correct the deficiency within 15 days following the date of notification, the application will be considered abandoned.

Applicants for a permit under this FMP must agree, as a condition of issuance of the permit, to fish in accordance with federal rules whether they are fishing in the EEZ or state waters.

Permits expire: (1) when the owner or operator retires the vessel from the fishery, or (2) on 31 December

of each year, or (3) when the ownership of the vessel changes; however, the Regional Director may authorize continuation of a vessel permit for the scup fishery if the new owner so requests. Applications for continuation of a permit must be addressed to the Regional Director.

The permit must be carried, at all times, on board the vessel for which it is issued, and must be maintained in legible condition. The permit, the vessel, its gear and catch shall be subject to inspection upon request by any authorized official.

The Federal costs of implementing an annual permit system for the sale of scup shall be charged to permit holders as authorized by section 303(b) (1) of the Magnuson Act. In establishing the annual fee, the Regional Director will ensure that the fee does not exceed the administrative costs incurred in issuing the permit, as required by section 304(d) of the Magnuson Act. Proper accounting for administrative costs may include labor costs (salary and benefits of permitting officers plus prorated share of secretarial support and supervision at both the NMFS regional and headquarters levels), computer costs for creating and maintaining permit files (prorated capital costs, time share and expendable supplies), cost of forms and mailers (purchase, preparation, printing and reproduction), and postage costs for application forms and permits.

9.1.2.1.2. Dealer permits and fees

Any dealer of scup must have a permit. A dealer of scup is defined as a person or firm that receives scup for a commercial purpose from the owner or operator of a vessel issued a moratorium permit pursuant to this FMP for other than transport.

An applicant must apply for a dealer permit in writing to the Regional Director. The application must be signed by the applicant and submitted to the Regional Director at least 30 days before the date upon which the applicant desires to have the permit made effective. Applications must contain the name, principal place of business, mailing address and telephone number of the applicant. The Regional Director will notify the applicant of any deficiency in the application. If the applicant fails to correct the deficiency within 15 days following the date of notification, the application will be considered abandoned. Except as provided in Subpart D of 15 CFR Part 904, the Regional Director will issue a permit within 30 days of the receipt of a completed application.

A permit expires on 31 December of each year or if the ownership or the dealer changes. Any permit issued under this section remains valid until it expires, is suspended, is revoked, or ownership changes. Any permit which is altered, erased, or mutilated is invalid. The Regional Director may issue replacement permits. Any application for a replacement permit shall be considered a new permit.

A permit is not transferable or assignable. It is valid only for the dealer to whom it is issued.

The permit must be displayed for inspection upon request by an authorized officer or any employee of NMFS designated by the Regional Director.

The Regional Director may suspend, revoke, or modify, any permit issued or sought under this section. Procedures governing permit sanctions or denials are found at Subpart D of 15 CFR Part 904. The Regional Director may, after publication of a notice in the *Federal Register*, charge a permit fee. Within 15 days after the change in the information contained in an application submitted under this section, the dealer issued the permit must report the change in writing to the Regional Director.

The Regional Director shall recognize state dealer permits in lieu of federal dealer permits if the permits contain the necessary information and are forwarded to the Regional Director by the appropriate state.

The states would recognize federal permit holders fishing in state waters. In addition, state permits would be required for persons harvesting or dealing in fish exclusively from state waters.

9.1.2.1.3. Operator permit and fees

An operator of a vessel with permit issued pursuant to this FMP (either a moratorium permit or a party/charter boat permit) must have an Operator's Permit issued by NMFS. Any vessel fishing commercially for scup under a moratorium permit or recreationally with a party/charter boat permit must have on board at least one operator who holds a permit. That operator may be held accountable for violations of the fishing regulations and may be subject to a permit sanction. During the permit sanction period, the individual operator may not work in any capacity aboard a federally permitted fishing vessel.

The permit program has the following requirements:

1. Any operator of a vessel fishing for scup must have an operator's permit issued by the NMFS Regional Director.

2. An operator is defined as the master or other individual on board a vessel who is in charge of that vessel (see 50 CFR 620.2).

3. The operator is required to submit an application, supplied by the Regional Director, for an operator's permit. The permit will be issued for a period of up to three years.

4. The applicant would provide his/her name, mailing address, telephone number, date of birth and physical characteristics (height, weight, hair and eye color, etc.) on the application, and would be requested to provide his/her social security number. In addition to this information, the applicant must provide two passport-size color photos.

5. The permit is not transferable.

6. Permit holders would be required to carry their permit aboard the fishing vessel during fishing and off-loading operations and must have it available for inspection upon request by an authorized officer.

7. The Regional Director may, after publication in the *Federal Register*, charge a permit fee.

9.1.2.2. Scup FMP Monitoring Committee

The Scup Monitoring Committee will be made up of staff representatives of the Mid-Atlantic, New England, and South Atlantic Fishery Management Councils, the Northeast Regional Office, the Northeast Fisheries Center, and ASMFC representatives. The MAFMC Executive Director or his designee will chair the Committee.

The Scup Monitoring Committee will annually review the best available data including, but not limited to, commercial and recreational catch/landing statistics, current estimates of fishing mortality, stock status, the most recent estimates of recruitment, VPA results, target mortality levels, beneficial impacts of size/mesh regulations, as well as the level of noncompliance by fishermen or states and recommend to the Council Committee and ASMFC Management Board commercial (annual quota, minimum fish size, and minimum mesh size) and recreational (possession and size limits and seasonal closures) measures designed to assure that the target mortality level on scup is not exceeded (as specified in section 9.1.1.). The Committee will also review state regulatory programs for consistency with the FMP. The Committee will also review the gear used to catch scup to determine whether additional gears need to be regulated to help assure attainment of the fishing mortality rate target and propose such regulations as appropriate.

The Council and ASMFC will receive the report of the Committee and make its recommendations to the Regional Director. The Regional Director will receive the report of the Council and ASMFC and publish his report in the *Federal Register* for public comment by the date specified in the regulations which provide states sufficient time to implement quotas and other management measures. Following the review period, the Regional Director will set the final quota and other management measure adjustments for the year.

In summary, the steps from the Monitoring Committee for action by the Regional Director are:

1. The Monitoring Committee reviews the data and makes its recommendations to the Demersal Species Committee and ASMFC Management Board.

2. The Demersal Species Committee and ASMFC Management Board consider the recommendations of the Monitoring Committee and makes their recommendations to the Council and ASMFC.

3. The Council and ASMFC consider the recommendations of the Demersal Species Committee and ASMFC Management Board and make their recommendations to the Regional Director.

4. The Regional Director considers the recommendations of the Council and ASMFC and publishes proposed measures in the *Federal Register*.

The Monitoring Committee, Demersal Species Committee, ASMFC Management Board, and Council meetings will all be open to the public and provide an opportunity for public comment. The publication of the Regional Director's proposed action in the *Federal Register* provides an opportunity for public comment at that level.

9.1.2.3. Commercial management measures

9.1.2.3.1. Commercial fish size limitations

It would be illegal for owners or operators of vessels issued moratorium permits, except party and charter boats carrying passengers for hire, to possess scup less than 9" total length (TL). It would also be illegal to possess parts of scup less than 9" to the point of landing. Scup less than 9" TL could not be sold.

Vessels with commercial moratorium permits issued pursuant to this FMP would be required to fish and land pursuant to the provisions of this FMP unless the vessels land in states with larger minimum fish sizes than those provided in the FMP, in which case the minimum fish size would be required to meet the state limits. States with minimum size larger than those in the FMP are encouraged to maintain them.

The minimum fish size may be changed annually, if appropriate, following the Scup FMP Monitoring Committee process set forth in 9.1.2.2.

9.1.2.3.2. Minimum mesh requirement

Owners or operators of otter trawl vessels possessing 4,000 lbs or more of scup, may fish only with nets that have a minimum mesh size of 4.0" diamond mesh, inside measure, applied throughout the cod end for at least 75 continuous meshes forward of the terminus of the net, or, if the net is not long enough for such a measurement, the terminal 1/3 of the net, measured from the terminus of the cod end to the head rope.

Mesh would be allowed to be larger than the minimum size, but it could be no smaller than the minimum size. If the fish were landed in a state that has a more stringent net mesh regulation, the state regulation would prevail. States with minimum mesh regulations larger than those established in this FMP would be encouraged to maintain them.

In addition, this alternative would require that owners or operators of otter trawl vessels possessing 4,000 lbs or more of scup not have available for immediate use any net, or any piece of net not meeting the minimum mesh size requirements, or mesh that is rigged in a manner that is inconsistent with the minimum mesh size. A net that conformed to one of the following specifications and that could be shown not to have been in recent use is considered to be not "available for immediate use":

(1) A net stowed below deck, provided:

(i) it is located below the main working deck from which the net is deployed and retrieved;

(ii) the towing wires, including the "leg" wires, are detached from the net; and

(iii) it is fan-folded (flaked) and bound around its circumference.

(2) A net stowed and lashed down on deck, provided:

(i) it is fan-folded (flaked) and bound around its circumference;

(ii) it is securely fastened to the deck or rail of the vessel; and

(iii) the towing wires, including the leg wires, are detached from the net.

(3) A net that is on a reel and is covered and secured, provided:

(i) the entire surface of the net is covered with canvas or other similar material that is securely bound;

(ii) the towing wires, including the leg wires, are detached from the net; and

(iii) the codend is removed from the net and stored below deck.

(4) Nets that are secured in a manner approved by the Regional Director, provided that the Regional Director has reviewed the alternative manner of securing nets and has published that alternative in the *Federal Register*.

Any combination of mesh or liners that effectively decreases the mesh below the minimum size would be prohibited.

This alternative would prohibit the owner or operator of a fishing vessel from using any device, gear, or material, including, but not limited to, nets, net strengtheners, ropes, lines, or chaffing gear, on the top of the regulated portion of a trawl net; except that, one splitting strap and one bull rope (if present), consisting of line or rope no more than 2" in diameter, may be used if such splitting strap and/or bull rope does not constrict in any manner the top of the regulated portion of the net; and one rope no greater than 0.75 inches in diameter extending the length of the net from the belly to the terminus of the cod end along each of the following: the top, bottom, and each side of the net. "Top of the regulated portion of the net" means the 50% of the entire regulated portion of the net which (in a hypothetical situation) would not be in contact with the ocean bottom during a tow if the regulated portion of the net were laid flat on the ocean floor. For the purpose of this paragraph, head ropes shall not be considered part of the top of the regulated portion of a trawl net.

The minimum net mesh size and threshold level could be changed annually, if appropriate, following the Scup FMP Monitoring Committee process set forth in 9.1.2.2. Based on the recommendations of the Scup Monitoring Committee and Council, the Regional Director, by regulatory amendment, shall implement regulations on gear other than otter trawls to achieve discards of scup equivalent to the discards with otter trawls given the minimum net mesh requirements. This provision is intended to address the problem that could develop if gear currently not in significant use in the scup fishery are developed as a way of avoiding the minimum otter trawl mesh rule.

9.1.2.3.3. Maximum roller diameter

It would be illegal for owners or operators of vessels issued moratorium permits to use roller rig trawl gear equipped with rollers greater than 18" in diameter.

The maximum roller diameter may be changed annually, if appropriate, following the Scup FMP Monitoring Committee process set forth in 9.1.2.2.

9.1.2.3.4. Minimum escape vent requirement

Scup pots and traps would be required to have a circular escape vent of with a minimum of 3.1" in diameter or a square escape vent with a minimum of 2.25" for each side or an equivalent rectangular escape vent. The escape vent provision would be implemented at the start of the first calendar year following FMP approval so that fishermen would not be required to pull their pots and add vents in the middle of the season.

A scup pot or trap would be defined by the state regulations that applied to a vessel's principal port of landing. The definition and the minimum escape vent requirement would apply to pots fished in both state and federal waters.

The escape vent requirement may be changed annually, if appropriate, following the Scup FMP Monitoring Committee process set forth in 9.1.2.2.

9.1.2.3.5. Degradable fasteners in traps and pots

Scup pots and traps would be required to have hinges and fasteners on one panel or door made of one of the following degradable materials:

a. untreated hemp, jute, or cotton string of 3/16" (4.8 mm) diameter or smaller;

b. magnesium alloy, timed float releases (pop-up devices) or similar magnesium alloy fasteners; or

c. ungalvanized or uncoated iron wire of 0.094" (2.4 mm) diameter or smaller.

A scup pot or trap would be defined by the state regulations that applied to a vessel's principal port of landing. The definition and the minimum escape vent requirement would apply to pots fished in both state and federal waters.

9.1.2.3.6. Seasonal and area closures

Gear-specific seasonal and area closures could be implemented to reduce discards in the commercial scup fishery and prevent quota overruns. Seasonal and area closures would be based on the recommendations of the Scup FMP Monitoring Committee to the Council and ASMFC Board. The Council and ASMFC would consider those recommendations and submit their recommendations to the Regional Director. The Regional Director would then set the season and area closures.

9.1.2.3.7. Commercial quota

Beginning in year 2, a quota would be allocated to the commercial fishery to reduce exploitation rates on the fully recruited age groups (i.e., fish larger than 9" TL). The commercial quota will be derived from a total allowable catch (TAC). The TAC will be calculated each year based on the target exploitation rate and the projected stock size estimates derived from annual stock assessment information.

The TAC will be allocated to the commercial and recreational fisheries based on the proportions of commercial and recreational catch (landings plus discards) for the years 1988-1992 (Table 40). Based on this data, 78% of the TAC would be allocated to the commercial fishery. An estimate of total coastwide discards would then be subtracted from the commercial TAC to derive the allowable level of harvest (commercial quota).

During the first year of the FMP, a system to distribute and manage the annual commercial quota will be developed by the Council and Commission. Coastwide, regional and state by state quotas will be considered in combination with different fractions of the fishing year, e.g., bimonthly quotas.

The annual commercial quota will be set at a range of between 0 and the commercial share of the

maximum allowed by the adopted fishing mortality rate reduction strategy. The commercial quota includes all landings for sale by *any* gear.

All landings by any vessel that has a commercial moratorium permit (permit to sell) counts against the quota, whether the scup are caught with an otter trawl, a scallop dredge, hook and line, or any other gear. If the vessel does not have a commercial moratorium permit, the fish may not be sold and the recreational rules on size, possession, and season apply.

The annual commercial quota would be based on the recommendations of the Scup FMP Monitoring Committee to the Council and ASMFC Board. The Council and ASMFC would consider those recommendations and submit their recommendations to the Regional Director. The Regional Director will set the commercial quota annually.

The quota would apply throughout the management unit, that is, in both state and federal waters. All commercial landings would count toward the quota. When the quota had been landed, fishing for and/or landing scup would be prohibited. The Regional Director shall close the EEZ to fishing for scup by commercial vessels when the quota has been landed.

Any landings in excess of the quota would be subtracted from the following year's quota. For example, if the quota was exceeded by 10,000 pounds in 1997, 10,000 pounds would be subtracted from the quota in 1998.

Using data collected through this FMP (section 9.1.3), NMFS will monitor the fishery to determine when a quota will be reached. It is expected that the states will assist NMFS with data collection.

9.1.2.4. Recreational Fishery Measures

9.1.2.4.1. Recreational Size, Possession, and Seasonal Limits

Beginning in year 1 of the management program, it would be illegal for recreational fishermen to possess whole scup or parts of scup less than 7" total length (TL).

Beginning in year 2, the recreational fishery throughout the management unit would be managed through an annual evaluation of a framework system (section 9.1.2.2) of possession limits, size limits, and seasonal closures. Beginning in year 2, recreational landings would be compared to annual target harvest levels established through the FMP Monitoring Committee process to determine if modifications to the recreational possession limit and size limit were required for the following year or if the fishery needed to be closed for certain periods.

The annual recreational possession limit, size limit, and season will be set at a range of between 0 and the maximum allowed by the recreational share of the adopted fishing mortality rate reduction strategy.

On vessels with several passengers, where catches are pooled in one or more containers, the number of scup contained on the vessel may not exceed the possession limit multiplied by the number of people aboard the vessel.

It is the responsibility of each state to assure that it implements measures equivalent with the Federal FMP. The Regional Director may prohibit landing scup from the EEZ by recreational vessels (party, charter, and private boats) of any state not in compliance with this FMP (possession limit, size limit, and season). If the inaction of one or more states leads the Regional Director to conclude that the FMP will be adversely affected, he may close the entire EEZ to scup fishing.

9.1.2.4.2. Recreational Harvest Limit

Beginning in year 2, a recreational harvest limit would be allocated to the recreational fishery to reduce exploitation rates on the fully recruited age groups. The recreational harvest limit will be derived from an

total allowable catch (TAC). The TAC will be calculated each year based on the target fishing mortality rate and the projected stock size estimates derived from annual stock assessment information.

The TAC will be allocated to the commercial and recreational fisheries based on the proportions of commercial and recreational catch for the years 1988-1992 (Table 40). Based on this data, 22% of the TAC would be allocated to the recreational fishery. An estimate of total coastwide discards would then be subtracted from the recreational TAC to derive the recreational harvest limit.

The annual recreational harvest limit will be set at a range of between 0 and the maximum allowed by the recreational share of the adopted fishing mortality rate reduction strategy.

Any landings in excess of the target harvest level would be subtracted from the following year's target level. For example, if the target was exceeded by 10,000 pounds in 1997, 10,000 pounds would be subtracted from the target harvest level in 1998.

9.1.2.5. Experimental Fishery

The Regional Director, in consultation with the Executive Director, may exempt any person or vessel from the requirements of this FMP for the conduct of experimental fishing beneficial to the management of the scup resource or fishery.

The Regional Director may not grant such exemption unless it is determined that the purpose, design, and administration of the exemption is consistent with the objectives of the FMP, the provisions of the Magnuson Act, and other applicable law, and that granting the exemption will not:

1. have a detrimental effect on the scup resource and fishery or cause any quota to be exceeded; or

2. create significant enforcement problems.

Each vessel participating in any exempted experimental fishing activity is subject to all provisions of this FMP except those necessarily relating to the purpose and nature of the exemption. The exemption will be specified in a letter issued by the Regional Director to each vessel participating in the exempted activity. This letter must be carried aboard the vessel seeking the benefit of such exemption.

All experimental activities must be consistent with the fishing mortality rate reduction schedule in the FMP.

It is the Council's intention that experimental fisheries are to be short-term fisheries to answer specific management questions and are not to be used to resolve short-comings in existing fishery management plans.

9.1.2.6. Enforcement recommendations

It is recommended that violators of the mesh regulations be severely punished. This is necessary to minimize abuses of the flexibility introduced into the management regime that allow for several meshes onboard. An example of a possible penalty would be a permit sanction.

9.1.2.7. Other measures

Only persons with a dealer permit may buy scup landed by a vessel that has a commercial moratorium permit issued pursuant to this FMP at the point of first sale.

Owners or operators of vessels with moratorium permits may sell scup at the point of first sale only to a dealer that has a dealer permit issued pursuant to this FMP.

Owners or operators of vessels with moratorium permits may not land scup during a period when the

Regional Director has determined that the commercial quota has been landed.

All scup on vessels fishing with a mesh smaller than the legal minimum size must have any scup on board boxed in a manner that will facilitate enforcement personnel knowing whether the vessel has 4000 lbs or more of scup on board to meet the minimum mesh size criterion. Any unboxed scup on board a vessel fishing with a net smaller than the legal minimum is considered a violation of this FMP. A standard 100 pound tote has a liquid capacity of 18.2 gallons (70 liters), or a volume of not more than 4,320 cubic inches (2.5 cubic feet).

The Regional Director may place sea samplers aboard vessels if he determines a voluntary sea sampling system is not giving a representative sample from the scup fishery.

No foreign fishing vessel shall conduct a fishery for or retain any scup. Foreign nations catching scup shall be subject to the incidental catch regulations set forth in 50 CFR 611.13, 611.14, and 611.50.

No vessel may use a net capable of catching scup in which the bars entering or exiting the knots twist around each other.

No person may assault, resist, oppose, impede, harass, intimidate, or interfere with either a NMFS-approved observer aboard a vessel, or an authorized officer conducting any search, inspection, investigation, or seizure in connection with enforcement of this FMP.

9.1.3. Specification and Sources of Pertinent Fishery Data

9.1.3.1. Domestic and foreign fishermen

Section 303(a)(5) of the MFCMA requires at least information regarding the type and quantity of fishing gear used, catch by species in numbers of fish or weight thereof, areas in which fishing was engaged in, time of fishing, and number of hauls must be submitted to the Secretary. In order to achieve the objectives of this FMP and to manage the fishery for the maximum benefit of the US, it is necessary that, at a minimum, the Secretary collect on a continuing basis and make available to the Councils: (1) scup catch, effort, and ex-vessel value and the catch and ex-vessel value of those species caught in conjunction with scup for the commercial fishery provided in a form that analysis can be performed at the trip, water area, gear, month, year, principal (normal) landing port, landing port for trip, and State levels of aggregation; (2) data on commercial fishery discards; (3) catch and effort for the recreational fishery; (4) biological (e.g., length, weight, age, and sex) samples from both the commercial and recreational fisheries; and (5) annual and fully comparable NMFS bottom trawl surveys for analyses of both CPUE and age/size frequency. The Secretary may implement necessary data collection procedures through amendments to the regulations. It is mandatory that these data be collected for the entire management unit, including North Carolina, on a compatible and comparable basis.

Commercial logbooks must be submitted on a monthly basis by federal moratorium permit holders in order to monitor the fishery.

Operators of party and charter boats with federal permits issued pursuant to this FMP must submit logbooks monthly showing at least name and permit number of the vessel; total numbers of each species taken; date(s) fished; number of trips; duration of trip; locality fished; crew size; landing port; number of anglers carried on each trip; and discard rate. A sample of party and charter boats may be required to report length frequencies of species caught for a sample of their trips.

States are encouraged to implement equivalent fishery data collection systems for the development of a coordinated statistics gathering effort.

It is intended that the reports required by this section are the same as the reports required by the Summer Flounder FMP, the Northeast Multispecies FMP, and the Atlantic Sea Scallop FMP. That is, fishermen need to submit one logbook report, not one report for each FMP.

Foreign fishermen are subject to the reporting and recordkeeping requirements in 50 CFR 611.

9.1.3.2. Dealers

In order to monitor the fishery and enable the Regional Director and the States to forecast when a closure will be needed, dealers with permits issued pursuant to this FMP must submit weekly reports showing at least the quantity of scup purchased (in pounds), and the name and permit number of the vessels from whom the scup was purchased.

Buyers that do not purchase directly from vessels are not required to submit reports under this provision. Dealers should report only those purchases from vessels (fishermen with commercial moratorium permits).

It is intended that the report required by this section is the same as the report required by the Summer Flounder FMP. That is, dealers need to submit one logbook report, not one report for each FMP.

9.1.3.3. Processors

Section 303(a)(5) of the MFCMA requires at least estimated processing capacity of, and the actual processing capacity utilized by US fish processors must be submitted to the Secretary. The Secretary may implement necessary data collection procedures through amendments to the regulations.

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

9.2.1. The FMP 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 pursuant to this title shall be consistent with the following national standards for fishery conservation and management." The following is a discussion of the standards and how this FMP meets them:

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

MSY (section 5.4) has not been specified for scup. OY is all scup harvested pursuant to this FMP.

Overfishing in the Scup FMP is defined as fishing in excess of the F_{max} level. F_{max} is a biological reference point that corresponds to the level of fishing mortality (F) that produces the maximum yield per recruit. The Council has adopted an overfishing definition for scup based on an estimate of F_{max}. F_{max} is a biological reference point derived from yield per recruit analysis and is defined as the fishing mortality rate that maximizes the yield per recruit. Best available information indicates that F_{max} is 0.24 for scup based on current conditions in the fishery.

Mortality rates on scup have increased substantially in recent years. Based on a review of coastwide data, mortality rates in the early 1980's were slightly greater than 0.3, the value derived by Mayo (1982) for scup caught in the late 1970's. Howell (1990) estimated that F increased from 0.4 in the early 1980's to over 1.0 in 1988 based on catch curve and length based analysis of scup taken in Connecticut and Massachusetts surveys. Current estimates of F are 1.3 or higher. This information would indicate that scup have been overexploited (F's in excess of F_{max}) since the early 1980's. Assuming a current fishing mortality rate of 1.3 for scup, exploitation rates would have to be reduced 72% to achieve an F_{max} of 0.24.

The Council has adopted a strategy that will reduce mortality to the F_{max} level by the seventh year following FMP implementation. The following recovery strategy will be implemented. In year 1, minimum fish sizes and commercial gear regulations will be imposed. In year 2 to 4, target exploitation rates will be 47% for scup. In years 5 and 6, the target exploitation rates will be 33% and in year 7 and subsequent years, the target exploitation rate will be the one associated with F_{max} which is currently an F of 0.24 or an exploitation rate of 19%.

This seven-year strategy reflects the pressure now being placed on fishermen by other FMPs. Although the scup resource should be rebuilt as quickly as possible, scup management measures can be implemented over an seven-year time frame to minimize the short term economic burden placed on fishermen and still reduce the overfished condition of the stocks.

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

This FMP is based on the best and most recent scientific information available. Future scup research should be devoted toward both data collection and analysis in order to evaluate the effectiveness of this FMP. This species should be reviewed annually by the NEFSC Stock Assessment Workshop process.

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

The FMP's management unit is scup throughout their range on the Atlantic coast from Maine through Cape Hatteras, North Carolina, including the EEZ, territorial sea, and internal waters. This specification is considered to be consistent with National Standard 3.

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

The FMP does not discriminate among residents of different states. It does not differentiate among US citizens, nationals, resident aliens, or corporations on the basis of their state of residence. It does not incorporate or rely on a state statute or regulation that discriminates against residents of another state. Commercial and recreational regulations would be applied coastwide.

This FMP would establish a commercial fishery quota system and recreational harvest limit for scup, based on historical landings data. This allocation, based on traditional landings patterns, would ensure that fishermen received a fair and equitable share of the resource.

The commercial minimum fish size, minimum net provisions, threshold, and commercial quota and the recreational size limits, possession limits, season, and recreational harvest limit are all specified so that they may be adjusted annually following procedures set forth in the FMP to assure that the fishing mortality reductions strategy is followed. These provisions are, therefore, "reasonably calculated to promote conservation."

The definition of a scup pot or trap in this FMP is used because the construction of scup pots/traps differs from state to state. As such, it would be impractical to develop a definition that included all the pots/traps that are used in the directed harvest of scup in the EEZ. A definition that is based on the vessel's principal port of landing is fair and equitable to the pot fishermen in the various states.

The moratorium is fair and equitable. The Council voted to establish 26 January 1990 as a control date for limiting entry into the fishery at its February 1990 meeting. The Federal Register notice of this date was published 7 June 1990. The moratorium was discussed at Council and Committee meetings, published in Council newsletters, and the moratorium was part of the preferred alternative in the public hearing draft of this FMP. Because of the delay in the development of this FMP, the time period for eligibility was extended three years from 1990 to 1993.

Vessels with any documented landings (i.e., greater than 0 lbs) of scup between 26 January 1988 and 26 January 1993 would qualify for a moratorium permit. Thus, any vessel which actively fished for and landed any amount of scup between these dates would be guaranteed access to the fishery.

The only vessels excluded by the moratorium provisions of the FMP would be those that landed scup prior to 1988 or after 26 January 1993. Unpublished NMFS weighout data (Maine-Virginia) indicates that between 1983 and 1987, 798 vessels landed 66.9 million pounds of scup. Forty-one percent of these vessels (326) landed 5.1 million pounds (7.6%) of the total scup landed commercially during the 1983-1987 period, but did not land scup during the moratorium period (1988-1992). These vessels may have switched to fishing for other species or discontinued fishing for scup due to retirement from the fishery.

In 1993, 9.2 million pounds of scup were landed by 498 vessels. Seventy-eight of these vessels landed 260 thousand pounds (2.8%) of the total scup commercially landed in 1993, but did not participate in the scup commercial fishery during the 1988-1992 period. Taking into consideration the limited degree of participation by these vessels in the scup fishery in 1993, and the fact that they did not land any scup between 1988-1992, it is likely that these vessels did not participate in a directed fishery for scup in 1993 but retained scup as a bycatch when fishing for other species. In addition, vessels entering the fishery after 26 January 1993 would have known that a control date for scup had been published on 26 January 1990. Thus, it is likely that few individuals would have made large investments to participate in a directed fishery for scup after this date.

Unpublished NMFS weighout data indicates that a total of 597 vessels participated in the fishery between 1988 and 1992. An additional 100 vessels from North Carolina could have participated in the scup fishery between 1988 and 1992 (R. Monaghan pers. comm.). Thus, it is likely that approximately 600-700 vessel owners would apply for commercial moratorium permits.

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

The management regime is intended to allow the fishery to operate at the lowest possible cost (e.g., fishing effort, administration, and enforcement) given the FMP's objectives. The objectives focus on the issue of administrative and enforcement costs by encouraging compatibility between federal and state regulations since a substantial portion of the fishery occurs in state waters. The FMP places no restrictions on processing, or marketing and no unnecessary restrictions on the use of efficient techniques of harvesting.

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

The management regime was developed to be compatible with and reinforce the management efforts of the states and the Commission. The minimum size regulations were developed with the recognition that the commercial and recreational fisheries have traditionally relied on different sizes of scup. In addition, reductions in stock size and specifically reductions in the availability of larger scup, have resulted in a situation such that most of the scup caught by recreational fishermen in recent years are 9" TL or less.

The commercial minimum size and mesh regulations were designed to reduce the discarding of small scup by otter trawl vessels, increase yields, and allow more scup to reach sexual maturity and spawn. The regulations differentiate between fishermen who encounter small amounts of legal-sized scup while fishing for other species and those fishermen targeting scup and exceeding the 4,000 threshold. Fishermen would be required to utilize a 4.0" mesh when a 4,000 lb threshold was reached. Vessels targeting scup now have an economic incentive to catch and discard large numbers of small scup using small mesh because they have the capability of sorting through large numbers of fish relatively quickly to cull the size of scup that can be sold at market. Discards would not be reduced without the mesh provision for these vessels.

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

The management regime was developed to be compatible with and reinforce the management efforts of the states and the Commission. The minimum size limits, quotas, possession limits, and, to some extent,

closed seasons, can be enforced on shore, thus eliminating the need for high cost at sea enforcement. The provisions of this FMP have already been adopted by the Commission.

9.2.2. Cost/Benefit Analysis

9.2.2.1. Implications of overfishing definitions and need to reduce fishing mortality rate

The cost/benefit analysis must be considered with regard to the guidelines established in 50 *CFR* 601, which require that a Council define overfishing for the managed species, determine whether the species is in an overfished condition, and, if it is, develop a strategy for ending the overfished condition. The Council has adopted an overfishing definition for scup. The Council has also determined that scup are currently overfished and has adopted a seven-year strategy to reduce fishing mortality to prescribed levels in order to end the overfished condition.

This seven-year strategy reflects the pressure now being placed on fishermen by other FMPs. Although the scup resource should be rebuilt as quickly as possible, scup management measures can be implemented over a seven-year time frame to minimize the short term economic burden placed on fishermen and still reduce the overfished condition of the stocks.

The excessive take of scup will cease when fishing mortality is at the F_{max} level, which current analyses indicate is F = 0.24. Current fishing mortality rates are at least 1.3. Thus, there is at least a five fold difference between the F_{max} and the current F. In order to achieve F_{max}, current exploitation rates would have to be reduced by 72%.

An immediate reduction to an F_{max} level was seen as having an unnecessarily negative impact on the industry, so the Council and ASMFC Board adopted the following strategy. In year 1, minimum fish sizes and commercial gear regulations will be imposed. In years 2 through 4, target exploitation rates will be 47% for scup. In years 5 and 6, the target exploitation rates will be 33% and in year 7 and subsequent years, the target exploitation rate would be based on the F_{max} level which is currently an F of 0.24 (an exploitation rate of 19%). This recovery schedule is:

	Exploitation Rates
Current	67%
Year 2	47%
Year 5	33%
Year 7	19%

9.2.2.2. Commercial Fishery

9.2.2.2.1. Moratorium on commercial vessels

The MFCMA allows the Council to limit entry into a fishery if the Council considers the factors set forth in section 303(b)(6) of the Act: "establish a system for limiting access to the fishery in order to achieve optimum yield if, in developing such system, the Council and the Secretary take into account (A) present participation in the fishery, (B) historical fishing practices in, and dependence on, the fishery, (C) the economics of the fishery, (D) the capability of fishing vessels used in the fishery to engage in other fisheries, (E) the cultural and social framework relevant to the fishery, and (F) any other relevant considerations;"

Participation in the scup commercial fishery between 1988 and 1992 was estimated to range between 600 and 700 vessels. In addition to scup, these vessels land *Loligo* squid, Atlantic mackerel, silver hake, summer flounder, black sea bass, and other species. Most of the marketable species caught in the mixed trawl fishery are depleted, if not technically overfished. A moratorium exists for vessels in the summer flounder fishery. The Mid-Atlantic Council has already determined that black sea bass are overfished, and has adopted a control date for limited entry. The New England Council has approved moratoria for the Northeast Multispecies FMP and the Scallop FMP.

The measures proposed in this Amendment will significantly impact fishermen. They are considered to be the most reasonable and fair given the need to dramatically reduce fishing mortality. The real issue is that, if the measures proposed in this Amendment are not implemented, the negative impact on the fishermen will be even greater.

Given the likely number of vessels operating in this fishery and the level of probable quotas beginning in year 2 of the management program, not controlling the number of vessels could lead to a significant waste of capital resources as the ever decreasing probability of profits are dissipated over more operating units.

The Amendment proposes a moratorium on new entrants to the commercial scup fishery. The main purpose of this provision is simply to cap entry so that any future gains in productivity and profitability which may occur in the fishery will not be dissipated by future entrants. In this way, the individuals who make sacrifices today will be able to share in the benefits of future stock recovery, rather than others who experienced none of the hardship.

The initial impacts of this provision are purely administrative. Vessel owners or operators will be asked to provide evidence that they harvested scup between 26 January 1988 and 26 January 1993.

There are a number of impacts which will occur in the short term. The very fact that entry into the industry has been curtailed will give vessels with moratorium permits a scarcity value that they would not otherwise possess. Experience in the surf clam fishery has shown that, over time, the value these moratorium permits can accrue is substantial, though the magnitude in the scup fishery will be reduced because a larger quantity of permits will be issued.

Fishermen will also be impacted by the provision controlling vessel replacement. This is intended as a means to reduce the number of vessels in the fishery slightly by attrition.

A final impact is the reduction in flexibility which fishermen with genuinely lost vessels will have in replacing them. The current specification of the preferred alternative requires that replacement vessels not have a larger tonnage or registered length than the original. On balance, this limitation is considered necessary to inhibit a large scale increase in the fishing power of the fleet through such replacements.

The MFCMA (Section 303(b)(6)) provides that a fishery management plan may establish a system for limiting access to a managed fishery in order to achieve Optimum Yield if, in developing such a system, the Council and the Secretary take into account six factors. A discussion of those factors and their application to the proposed limited entry program for the scup fishery follows:

A. Present participation in the fishery.

Present participation in the scup commercial fishery is estimated to range from 498 to 598 vessels. The proposed program of limited entry seeks to reduce the size of the fleet gradually through natural attrition. No vessel which actively fished for scup between 26 January 1988 and 26 January 1993 would be denied access to the fishery. Approximately 600 to 700 vessels would qualify for the moratorium permit.

B. Historical fishing practices in, and dependence on, the fishery.

Fishermen using otter trawls account for the majority of commercial landings; 74% based on 1983 to 1992 data (Table 12). Other important commercial gears include floating traps, paired trawls, pound nets, pots and traps, and hand lines. Many species are caught in conjunction with scup (Table 32). Economically, scup is an important species in the mixed trawl fishery (Table 32).

C. The economics of the fishery.

Scup are economically one of the most important species in the mixed trawl fishery. The provisions of this Amendment, in order to solve the overfishing problem, will impose restrictions on the industry. Limiting entry is the only tool available under the MFCMA to allow vessel owners and operators to recover, at least

in part, losses incurred during the rebuilding program. If entry remains open, profits will likely be dissipated among new entrants following recovery.

D. The capability of fishing vessels used in the fishery to engage in other fisheries.

Scup vessels traditionally harvest other species. However, a number of species in the mixed trawl fishery have also been determined to be overfished. The Mid-Atlantic Council has determined that summer flounder and black sea bass are overfished and is preparing an amendment to the Bluefish FMP to eliminate the overfished nature of that resource. The ASMFC has adopted an Amendment to their Weakfish FMP to eliminate an overfished situation. The Mid-Atlantic Council has also prepared an Amendment to the Atlantic Mackerel, Squid, and Butterfish FMP to limit entry into the squid and butterfish fisheries.

The proposed limited entry program will not force operators out of the fishery unless they clearly do not meet a minimum standard of involvement and activity in the fishery. The program is designed to continue over a period long enough to allow the number of operators to seek its own equilibrium level through natural attrition.

E. The cultural and social framework relevant to the fishery.

Many of the vessels in the fishery are owned and operated by independent, individual fishermen who have obtained their position of ownership through individual enterprise. There is a strong tradition of scup fishing within families. Many of the family operated businesses are the most vulnerable to an influx of additional vessels because they are not in a position to survive long periods without revenue, or to operate at significantly lower levels of gross revenue.

F. Any other relevant consideration.

The management program is designed to rebuild the stocks. However, the vessels currently in the fishery will have to sacrifice income opportunity as a part of the rebuilding program. While the net benefits to society from the management program are not in question, the benefits to individual operators who make the sacrifice could quickly be lost or eroded among new entrants. The length of the period of sacrifice is unknown. It would be unfair to dissipate the investment of these operators among a flood of opportunistic new entrants when it begins to appear that the stock is rebuilding. The proposed program of limited entry allows traditional operators to recoup at least a portion of their sacrifice. Such a program will promote resource stability and industry efficiency which is in the best interests of the fishing community and the nation.

9.2.2.2.2. Minimum fish size

Historic commercial length frequencies were used as an estimate of potential short-term impacts of length limits on the commercial scup fisheries (Tables 41 to 44). Specifically, commercial length frequencies from the NMFS Weighout Data and North Carolina DMF from 1982 to 1994 were used to determine potential size limit effects. In general, size frequency data indicated that potential size limit effects increased from north to south, were gear dependent, and varied from one year to the next.

Based on NMFS weighout data, approximately 19% of the measured scup were less than 9" TL for all otter trawl vessels with sampled landings (Table 44). This gear is associated with most of the commercial landings coastwide; otter trawl vessels accounted for over 74% of the coastwide landings based on 1983-1992 General Canvass data (Table 12).

A 9" TL minimum size regulation would have a slightly greater effect on landings from floating traps, the other predominant gear in the scup fishery. Based on NMFS weighout data, almost 26% of the measured fish were less than 9" TL for the 316 scup obtained from this gear from 1983 to 1991 combined (Table 44).

Size limit effects were more pronounced in North Carolina landings from the winter trawl fishery (Table

42). From 1982 to 1994, the amount of measured fish less than 9" TL ranged from 31.0% to 90.2%. However, North Carolina accounted for only 2% of the coastwide commercial landings on average from 1983-1992.

Combined, a coastwide commercial size limit of 9" TL would have affected approximately 10% to 39% of the scup landed by commercial fishermen for the years 1983-1993. Assuming that undersized fish are not caught and discarded, minimum size regulations have positive impacts on the stock. In general, because minimum sizes increase the size at full recruitment, yields are increased as fishermen catch larger, heavier fish. In addition, minimum size regulations can increase the resilience of the stock to overfishing, i.e., the biological reference points (F_{max}) can increase. Finally, minimum size regulations can increase spawning stock biomass by allowing more fish to spawn. Sexual maturity data for scup indicate that 50% of the scup are mature by a size of 6.8" TL and almost all are sexually mature by the time they reach a size of 10" TL.

A preliminary economic analysis of the impact of a reduction in discards was conducted by Mark Simonitsch (see comment letter in Appendix 2) and made available to Council staff during the hearing process. This analysis was modified slightly by Council staff and the results are as follows.

According to the Northeast Fishery Science Center (NEFSC), approximately 9.4, 9.2, and 13.9 million scup of age 0, 1, and 2, respectively, were discarded yearly on average from 1989 to 1993. If these scup had not been discarded but were allowed to survive to age 3 (average weight of 0.638 pounds), approximately 14.5 million additional pounds of scup would have been available for harvest over a three year period. Assuming an ex-vessel value of $0.54 per pound (Table 30), these discarded scup could have generated ex-vessel revenues of $7.8 million.

In addition to the reduction in discards, the implementation of a 9" TL minimum size limit will also have positive economic benefits. According to the NEFSC, on average (1989-1993), approximately 16 thousand pounds of age 0, 1.5 million pounds of age 1, and 8.1 million pounds of age 2 scup are landed yearly. Using the mean weight at age for commercial landings, and assuming that a 9" TL scup is a fish of age class 3 or less (Table 1), this would represent approximately 4.1 million pounds of scup measuring less than 9" TL. If these fish are assumed to be worth $0.18 per pound (Table 30), the potential forgone revenues from commercially landed scup measuring less than 9" TL would be $742,217 per year or approximately $2.2 million for a 3-year period.

However, this decrease in annual revenues are considered forgone earnings in one time period which may be realized later when the fish have grown to a larger size. If these scup were not landed but were allowed to survive to age 3, approximately 4.9 million additional pounds of scup would be available for harvest in the future. If these fish are assumed to be worth $0.54 per pound (Table 30), their potential ex-vessel value would be approximately $2.6 million. Thus the net benefit from delaying harvest until 9" TL would be at least $0.4 million for the three year period.

9.2.2.2.3. Minimum mesh size

Owners or operators of otter trawl vessels possessing 4,000 lbs or more of scup would only be allowed to fish with nets that have a minimum mesh size of 4.0" in the codend. During the development of this FMP, the Council and Commission were presented with data that indicated that the L_{50} (the length at which 50% of the scup are retained) is 8.3 inches for this mesh size (Table 45).

Retention lengths for scup were calculated by Mayo (1982) and are based on the relationship between length and body depth as derived by Smith and Norcross (1968). Although retention lengths were derived using body measurements, the results agree very well with selectivity experiments conducted by personnel at the University of Rhode Island (DeAlteris and Reifsteck 1990). Their results also indicated that the L_{50} for scup was 8.3" TL for a mesh size of 4.0" (Figure 14).

The results of the URI study indicate that approximately 80% of the 9" fish caught with a 4.0" mesh would be retained. These results suggest that a 9" minimum fish size combined with a 4.0" mesh may not

decrease discards, i.e., a 4.0" mesh would catch a large number of 8" and smaller fish that would be discarded dead.

In addition to theoretical and empirical selectivity data, at-sea observations of the size distribution of scup caught and discarded are available from the NEFSC Sea Sampling Program. Scup discard data by mesh size based on 1989-1993 NEFSC sea sampling of otter trawl tows which caught and measured scup are summarized in Table 46. It should be noted that this characterization of scup discards is based upon a limited number of sea sampled tows, especially for mesh sizes greater than 3.0 inches. Because of the limited nature of available data, all tows that caught scup which were subsequently measured were included in the analysis. As a result, the data set includes many tows where scup was not the target species.

In general, discarding of scup was high for the tows sampled, especially for mesh sizes less than 4.0 inches. This was due to the fact that the vast majority of scup caught in these mesh sizes were less than 9.0 inches (Table 46). The percent of scup discarded was highest for 3.0 inch mesh (93%), followed by liners (78%), 2.0 inch (74%), 4.5 inch (48%), and finally was lowest for 4.0 inch mesh (40%). The percent of scup retained that were less than 9.0 inches for the 4.0 and 4.5 inch meshes was considerably less compared to the smaller mesh sizes. From this perspective, the 4.0 inch mesh requirement should greatly reduce the proportion of scup below 9.0 inches that would have to be discarded relative to the status quo (i.e., the allowance of the use of smaller mesh sizes.) However, sea sampling data do suggest that some proportion of the scup less than 9" TL encountered would be retained by a 4.0 inch mesh.

During public testimony at Council and Commission meetings, commercial fishermen stated that a 4.0" mesh was the appropriate mesh for a 9" TL fish. They suggested that the results of the URI study were flawed because researchers had used a covered cod end technique to estimate selectivity and, in fact, based on their personal experience at sea, a significant portion of the 9" TL fish that would encounter a 4.0" mesh would escape. Furthermore, these fishermen suggested that because most fishermen knew that this mesh was the appropriate size, compliance would be higher with the 4.0" mesh than it would be with a larger mesh size. As such, a greater reduction in the discard of small scup would occur with this mesh size then it would with a larger mesh.

Landings of scup represent only a portion of the fishing mortality experienced by the stock. Undersized scup, those less than 9" TL, experience both discard mortality and deaths due to encounters with commercial gear. The amount of fish dying due to these causes can be high with the current mesh sizes now used in the fishery, that is, an effective mesh size of 2.0" or less. Sea sampling data indicate that the weight of the discarded fish may be almost equivalent to the weight of the landings in some years. Discard rates are higher in years of good recruitment, that is, years when more small fish were available.

Scup are a component of the mixed trawl fishery in Southern New England and the Mid-Atlantic. Although Sea Sampling data indicate that fishermen may differentiate between species on a per tow basis (i.e., target a single species on a tow), fishermen land many different species on a per trip basis. Based on NMFS weighout data, scup are most frequently landed with *Loligo* squid, Atlantic mackerel, and silver hake. In fact, for trips landing 4,000 or more pounds of scup per trip, more *Loligo* squid were landed than scup in 1992 (Table 32).

However, this predominance of *Loligo* may reflect reduced availability of scup in 1992. Based on 1983 to 1987 data, the landings of otter trawl vessels landings 1,000 lbs or more of scup were composed primarily of scup (41%) (Table 47). *Loligo* accounted for only 17% of the landings.

The 4000 pound threshold would not affect the majority of the vessels or trips that landed scup in 1992 or 1993. Based on NMFS weighout data, a threshold of 4000 lbs per trip would have affected approximately 27% of the vessels and 10% of the trips landing scup in 1992 and 1993 (Tables 48 and 49). However, these trips accounted for 80% of the scup landed by otter trawl vessel in 1992 and 1993. Also, regulations that allow multiple nets onboard would allow fishermen who traditionally targeted multi-species on a trip, to fish for and retain other species with small mesh until the 4,000 pound threshold of scup was reached. These fishermen would then have to use the 4.0" mesh if they decided to target more scup.

Once the threshold was reached fishermen would have to properly stow other cod ends for the remainder of the trip.

Fishermen using small mesh would be required to box their scup in 100 pound containers to facilitate enforcement of the mesh provisions. Potentially, a small mesh fisherman who wanted to retain his scup bycatch, would have up to 40 boxes onboard. However, the number of boxes would be limited by the size of the vessel. Directed fishermen using the 4.0" mesh would not have to box their scup.

Landings of scup by fishermen targeting *Loligo* squid on the same trip could be affected by these regulations. Based on 1992 NMFS weighout data, 45% of the vessels and 29% of the trips landing 2,500 pounds or more of *Loligo* squid, landed over 95% of *Loligo* landed by all *Loligo* otter trawl fishermen (Tables 50 and 51). Based on this 2,500 pound threshold, scup comprise slightly more than 6% of the total fish landed on these trips (Table 52). However, the total pounds is slightly more than 50% of all scup landed by otter trawl fishermen in 1992.

In general, these regulations would modify some traditional fishing practices. The fishermen most affected by these regulations would be those fishermen who targeted scup first on their trip and retained more than 4000 pounds of scup, before switching to other species for the remainder of their trip. Although, this group of fishermen is likely to be relatively small compared to total number of fishermen landing scup, landings of other species taken as bycatch by these fishermen could be affected.

Minimum mesh and fish size provisions will ensure that discards of sub-legal scup will be reduced. Greater gains will accrue to fishermen through protecting scup until they reach legal size. Discard mortality is extremely high for trawl caught fish and the problem is particularly acute when new year classes are abundant. The benefits of the proposed minimum fish size and mesh size regulations will be manifested through a more balanced age structure of the scup stock. Further, waste will be reduced due to (1) lower total discards and (2) lower mortality of net encounter.

The minimum net mesh size and threshold level could be changed annually, if appropriate, following the Scup FMP Monitoring Committee process set forth in 9.1.2.2.

9.2.2.2.4. Maximum roller diameter

It would be illegal for owners or operators of vessels issued moratorium permits to use roller rig trawl gear equipped with rollers greater than 18" in diameter. A 18" diameter corresponds to a maximum roller diameter used by some states to regulate this gear in state waters.

Roller diameter is correlated with vessel size and the ability of vessels to fish rough, hard bottom areas. Larger roller sizes require larger engine sizes to pull the net. An engine size with an associated horsepower of 800-900 hp is required to tow a net with 18" to 24" rollers whereas 10" to 12" rollers can be pulled by a boat using a-175-200 hp engine (D. Simpson pers. comm.).

Information is lacking as to the relationship between roller diameter and the size of obstruction that it can clear. In general, 10-12" diameter rollers can be used for fishing over rough bottom that can include ledges and cliffs. Limitations on roller size will make some areas of the ocean inaccessible to trawls by preventing fishermen from trawling in the harder, rough bottom areas. Thus scup associated with these areas would be protected from harvest allowing more fish to grow to maturity and spawn increasing stock biomass and yields.

9.2.2.2.5. Minimum escape vent requirement

Scup pots and traps would be required to have a circular escape vent of with a minimum of 3.1" in diameter or a square escape vent with a minimum of 2.25" for each side or an equivalent rectangular escape vent. The escape vent provision would be implemented at the start of the first calendar year following FMP approval so that fishermen would not be required to pull their pots and add vents in the middle of the season.

The body depth/length relationship derived by Smith and Norcross (1968) was used to derive the minimum sizes of scup that would be retained by fish traps fitted with escape vents (Table 53). An escape vent of 3.1" would allow scup less than approximately 9.0" TL to escape from the trap before it was brought to the surface.

Pots and traps accounted for approximately 2% of the total commercial landings for the period 1983-1992. Although only a small portion of scup are landed by fishermen using this gear, escape vents will allow for some undersized fish to escape alive increasing the amount of mature fish in the stock and increasing yields.

9.2.2.2.6. Degradable fasteners in traps

Scup pots would be required to have hinges and fasteners of one panel or door made of degradable materials. These materials would allow the door or panel of a trap to fall away from an unattended trap. This would prevent lost traps from "ghost fishing," i.e., continuing to catch and retain fish that could not be removed from the trap. Thus scup and other species of fish and invertebrates typically caught by these traps could escape preventing waste and lost yields in a number of fisheries.

9.2.2.2.7. Seasonal and area closures

Gear-specific seasonal and area closures could be implemented to control fishing mortality and reduce discards in the commercial scup fishery. Seasonal and area closures would be based on the recommendations of the Scup FMP Monitoring Committee to the Council and ASMFC Board. The Council and Commission would consider those recommendations and submit their recommendations to the Regional Director. The Regional Director would then set the season and area closures.

NMFS General Canvass Data from 1988 to 1992 were used to determine the potential impact of seasonal closures on commercial landings of scup. The ASMFC technical committee decided that these years would be most representative of current conditions in the fisheries.

The Committee decided that seasonal closures for scup fishermen be applied on a coastwide basis. Calculations restricted the smallest unit of closure to one week. Seasonal closures were derived assuming that fishermen would recoup 0% and 15% of their landings during the open season. The 15% level applied to all mobile gears, including hook and line. Because of the fixed nature of the pots and traps, only a 0% (no recoupment) level was used for these gears.

If a recoupment level was assumed, calculations were made using a simple algorithm that accounted for changes in landings per day (LPD) during the open and closed seasons. For example, for scup landed by otter trawl fishermen, the time period from November 15 to January 31 accounted for 28% of the landings during 1988-1992. A closed season during these months would result in a fishing season that would be open for 8 1/2 months (February through November 14) or approximately 288 days. The amount of discretionary time during this open period would be 43 days (15% x 288 days). Since 72% of the landings occurred during the open period, the LPD during the open period would be 72 divided by the days fished or 245 (288-43). This LPD multiplied times the discretionary time (43 days) would result in a recoupment of 13%. As a result, the realized reduction in landings for the closed period February through May would be 15% (28% - 13%).

Seasonal closures ranged from slightly more than one month to four months depending on location (north or south) and gear type (Table 54). Seasonal closures could achieve the desired reductions if the following criteria were met:

1. The level of discretionary time used to derive the reductions is realistic. The assumed value of 15% may be an underestimate for some mobile gears.

2. All gear capable of catching scup be removed from the water during the closed period. Without such a

provision, fishermen would continue to fish for other species during the closed period, catching and discarding scup in the process. For trawl fisheries, the technical committee recommended that mesh sizes of 5.5" diamond mesh or larger could continue to operate.

3. Landings patterns do not vary much from one year to the next, i.e., anticipated landings in year three of the management program are similar to the landings observed for 1988-1992.

Seasonal closures could be combined with area closures to reduce discards and prevent quota overruns. For example, based on 1989-1993 sea sampling and weighout data, statistical areas 537, 539, 616, and 622 (Figure 15), accounted for 75% of the landings (Table 55). Discard rates in these areas were approximately 40% or higher for these years (Table 56).

Any effective area/seasonal closure would require that NMFS be able to track commercial vessels on a real time basis to ensure compliance. Such a system could be comparable to the Vessel Monitoring System that will be implemented for groundfish and scallops by NMFS.

Seasonal and area closures would be designed to complement the quota based management system and reduce discards in the commercial fishery. However, it is important to note that seasonal and area closures would have to be designed such that fishermen would not negate seasonal and area closure effects by increasing effort or efficiency during the open season or area. In addition, the economic impact of the requirement that all gear capable of catching scup be removed from the water during a closure would have to be considered in regard to the catch of other important species that have been traditionally landed with scup on the same trip.

9.2.2.2.8. Commercial quota

Beginning in year 2, a quota would be allocated to the commercial fishery to reduce exploitation rates on the fully recruited age groups (i.e., fish larger than 9" TL). The commercial quota will be derived from a total allowable catch (TAC). The TAC will be calculated each year based on the target fishing mortality rate and the projected stock size estimates derived from annual stock assessment information.

The TAC will be allocated to the commercial and recreational fisheries based on the proportions of commercial and recreational catch for the years 1988-1992. Based on this data, 78% of the TAC would be allocated to the commercial fishery. An estimate of total coastwide discards would then be subtracted from the commercial TAC to derive the allowable level of harvest (commercial quota).

In determining how to allocate the TAC to the commercial and recreational fishermen, the Council and Commission examined several alternatives that allocated either catch or landings. They determined that allocating the TAC to the fisheries and then removing the discards to determine the annual harvest limits was fair and equitable to both the commercial and recreational fisheries.

A TAC has not yet been derived for 1997, the second year of the management program. As such, catch data for 1988-1992 were used to derive the average catch for those years to calculate a possible TAC for illustrative purposes. Based on these data, a 32% reduction in exploitation would equate to a TAC of 16.83 million pounds.

Based on a TAC of 16.83 million lbs, 13.13 million lbs would be allocated to the commercial fishery and 3.70 million lbs to the recreational fishery. Then, assuming an average discard rate based on 1988-1992 data for each fishery, and subtracting these discards from the catch, 5.64 million lbs would be allocated to the commercial fishery as a quota and 3.46 million lbs to the recreational fishery as a harvest limit (Table 57). If total discards (commercial and recreational) were removed from the TAC and then the landings allocated to each fishery (70% commercial and 30% recreational based on historic percentages), the commercial quota would have been slightly larger at 9.1 million lbs and the recreational harvest limit lower at 2.73 million lbs. Under this rejected alternative, the recreational fishery allocation would have been reduced because of high discards in the commercial fishery, i.e., the higher the commercial discards the lower the recreational harvest limit.

However, under the chosen allocation system, the commercial fishery has a direct incentive to reduce discards, i.e., the lower the discards the higher the quota for a given TAC. For example, if commercial discards were reduced by 30% to 5.24 million lbs and the TAC remained constant at 16.83 million lbs, the commercial quota would increase to 7.89 million lbs (Table 57). Conversely, if discards were to increase 30%, the commercial quota would be reduced to 3.39 million lbs. In both cases, the recreational harvest limit would remain the same at 3.46 million lbs. In addition to the direct benefit of an increase in quota, a reduction in discards will benefit both the commercial and recreational fisheries as fish survive to grow larger and spawn increasing the biomass available for harvest.

In summary, changes in the discard rate in the commercial fishery would affect the commercial quota when allocations are based on catches as well as landings. However, changes in the discard rate in the commercial fishery would only have a direct effect on the recreational harvest limit when allocations are based on landings. When allocations are based on catches, the commercial sector would receive the full effect of a change in the rate of discards, i.e., commercial quota would increase proportionally to the level of discard reduction. Under allocations based on catches, each fishery would be treated fairly with respect to their contribution to discards and the effect of those discards on their shares of TAC.

During the first year of the FMP, a system to distribute and manage the annual commercial quota will be developed by the Council and Commission. Coastwide, regional and state by state quotas will be considered in combination with different fractions of the fishing year, e.g., bimonthly quotas. The following is an analysis of two possible management systems; a state-by-state and a bimonthly, coastwide system.

In a state-by-state system, quotas would be distributed to the states based on their percentage share of commercial landings for the period 1988-1992. Assuming a coastwide quota of 5.64 million pounds, quotas would range from 7,890 lbs to 2.46 million lbs based on these percentages (Table 58).

A state-by-state quota system could allow for the most equitable distribution of the commercial quota to fishermen. Specifically, states under this alternative would have the responsibility of managing their quota for the greatest benefit of the commercial scup industry in their state. States could design allocation systems based on trip limits and seasons. States would also have the ability to transfer or combine quota increasing the flexibility of the system to respond to year to year variations in fishing practices or landings patterns.

However, state-by-state allocations would negatively affect fishermen who land in those states that do not have the capability of regulating a quota. Based on the quota system implemented for summer flounder, a few states have not been able to establish trip limit systems that ensure a continuous and steady supply of product over the season for producers and/or a fair an equitable distribution of flounder to all fishermen who have traditionally landed summer flounder in their state. In addition, some states have had problems coordinating their regulations with neighboring states to prevent large scale landings by fishermen in states with the most favorable trip limits. A similar situation could occur if a state-by-state system was implemented for scup.

As one alternative to a state-by-state system, the coastwide quota could be allocated on a bimonthly basis. The Regional Director would be required to prohibit landings by federally permitted vessels when any bimonthly quota had been reached.

The quota must apply throughout the management unit, that is, in both state and federal waters. All commercial landings during a bimonthly period would count toward the quota for that period. When the quota had been landed for a bimonthly period, fishing for and/or landing scup would be prohibited for the remainder of the period.

A bimonthly quota system could allow for an equitable allocation of the commercial quota to northern and southern participants as well as between the smaller day boats and larger offshore vessels. Due to the seasonal nature of the scup fishery, the quota would have to be divided into bimonthly units. To minimize effects on traditional landings patterns, the allocation to each period would be based on past landings

instead of a system that divided the quota equally over the six periods. Based on 1988-1992 data, 22.4% would be allocated to period 3 (May-June) and only 5.3% to period 4 (July-August) (Table 59). The bimonthly allocations would range from 298,638 lbs to 1,713,199 lbs based on a annual quota of pounds 5.63 million lbs (Table 59). Based on state data for those years, fishermen would be able to maintain traditional landings patterns in most states (Tables 60 and 61).

A coastwide system would allow fishermen to land in any port along the coast and all commercial landings during a bimonthly period would count toward that quota for that period. When the quota had been landed for a bimonthly period, fishing for and/or landing scup would be prohibited for the remainder of the period. Landings in excess of the allocation for the period would be subtracted from the following years's quota for the same period. Trip limits would have to be implemented. Bimonthly allocations without trip limits would encourage derby-style fishing practices that would allow the quota to be landed by larger, more mobile vessels at the beginning of each period. As a result, supplies of scup would be discontinuous and smaller boats would be disadvantaged.

Trip limits would be established and modified throughout the two-month period to allow for a continuous supply of product and equitable distribution of scup to fishermen using both small and large vessels. For example, almost all of the landings in period 1 are attributable to fishermen using otter trawl vessels. A 10,000 pound trip limit could be established for the beginning of period 1. The limit would decrease to 5000 lbs when 50% of the allocation was reached, 1000 lbs when 75% of the quota was taken, and 500 lbs when 90% of the landings were reached.

Different trip limit systems could be designed for each period to ensure equitable distribution over each two-month period. Unlike a system where states have the flexibility to design their own systems, NMFS would be responsible for implementing trip limits for each period.

An overall quota for the commercial fishery is important to control mortality on the scup population. The minimum size regulation may reduce discard and escape mortality of undersized scup. However, decreases in mortality would occur only with the smaller fish; reductions in mortality would not occur for scup once they reached the legal size of 9" TL. Essentially the fish that contribute the most to the spawning population, fish 9" TL and larger, would continue to experience high mortality rates; overfishing would not be reduced. The commercial quota will control mortality on fully recruited, older fish.

This management measure will result in a short term reduction in the marketable catch and long term benefits as more fish mature and increase the size of the spawning stock. In addition, a reduction in the mortality of small scup will allow for an increase in yield or harvest as small fish that were previously killed grow larger and add weight to the stock.

Combined, these management measures, the minimum mesh and size regulations and the commercial quota, will prevent overfishing and reduce waste. As the stock rebuilds and exploitation rates remain constant, commercial quotas would increase.

9.2.2.3. Recreational Fishery

9.2.2.3.1. Possession limits, minimum size limits, and seasonal closures

Based on 1983 to 1994 MRFSS data, only 14% and 7% of the scup caught by recreational fishermen in the North and Mid-Atlantic, respectively, were caught in the EEZ (Table 23). In 1994, 15% of the total scup caught by recreational fishermen in these subregions originated in the EEZ. Thus, the effect of a 7" TL minimum size in the EEZ would be inconsequential for both fishermen and the stock.

However, because most of the recreational landings are attributed to state waters, minimum size limits would effect state landings. Based on 1990-94 intercept data, almost 4% of the measured scup were less than 7" TL for scup landed along the coast (Table 62). Analysis of intercept data from the states from New Jersey through North Carolina indicated that anglers harvested smaller fish in these states. Assuming a post-release mortality of 15%, the percent reduction in the number of scup killed by anglers associated

with the minimum size limits would be 3.2% for the coast based on combined 1990-1994 data (Table 63).

The assumed level of post-release mortality (hooking and handling mortality) used in the above calculations is based on a study conducted in 1981. Howell and Simpson (1985) estimated hooking mortality for 360 scup caught by angling between July-September 1981. Scup were caught using No. 4 and No. 6 Mustad stainless steel hooks baited with squid or sandworms. Mortality estimates were derived by assuming that all fish hooked in the gills or esophagus were lethally injured (100% mortality) and all others would survive (0% mortality). Based on these assumptions, hooking mortality increased from 0% to 15% with increasing lengths of fish.

Based on the fishing mortality reduction schedule adopted by the Council and Commission, exploitation would have to be reduced 32% in year 2 to achieve the target F. MRFSS data for 1990-94 indicate that catch frequencies for scup ranged from 1 to 200 fish per day on a coastwide basis (Table 64). Based on these data, the reductions in exploitation associated with various possession limits for 1 to 50 scup per trip were calculated (Table 65). The coastwide possession limit associated with a 32% reduction in exploitation is 15 fish. The possession limit would increase when combined with size limits and/or seasons.

Analysis of scup recreational data indicated that nearly 90% of the annual landings occurred from July through October for the years 1990 to 1994 combined (Table 66). Seasons based on this MRFSS data could be established on a coastwide basis to reduce exploitation. A season could be combined with the size limit to allow for higher possession limits.

9.2.2.3.2. Evaluation of framework provisions

Based on a recommendation by the Council and the ASMFC Policy Board, the Regional Director and the states in their respective jurisdictions could modify the possession limit to between 0 and 50 scup per angler, the size limit from 7" TL to 10" TL, and open or close the fishing season for the entire year. Recreational limits would be revised according to specific criteria to account for changes in stock abundance and meet the time frame of the fishing mortality reduction strategy.

Short term impacts due to restrictive limits would be outweighed by the long term benefit of conserving the scup stock for future generations of recreational anglers. The possession limit could be as high as 50 scup, the size limit as low as 7" TL, and the season open throughout the year. However, decreases in restrictions would only occur under circumstances of increased scup abundance. Since the prevailing rate of fishing success would reflect increased stock abundance, the number of anglers catching their limit would be high for overly restrictive limits. Decreasing recreational restrictions by raising the possession limit, decreasing the size limit, or increasing the length of the fishing season would therefore decrease the number of affected anglers and have less adverse impact than the limit in force at the time.

If stock levels are allowed to continue to decline or the amount of effort by recreational anglers increases (more trips or more people) disproportionately to increases in stock size, landing rates for anglers would decline regardless of specific limits. Adverse impacts would therefore be measured against the prevailing rate of fishing success and would not be as great as when scup are abundant or angler effort is less. Although it is not possible to estimate exact impacts for hypothetical levels of scup abundance, it is clear that more restrictive limits than those proposed initially would have substantially less impact than a total fishery closure precipitated by stock collapse.

A zero possession limit or a season closed for the entire year would prohibit retention of scup by recreational fishermen and would have significant impacts, depending on the level of fishing success currently operative and the value anglers place on retention of catch. A 10" TL minimum size, the most restrictive minimum size limit proposed for this framework measure, would have had an associated percent reduction in exploitation of nearly 57% based on 1990-1994 coastwide MRFSS data (Table 63). These severe restrictions would only be implemented in the event that the stock continues to decline and stock collapse becomes imminent.

Reductions associated with these limits assume 100% compliance by recreational fishermen. Levels of

noncompliance will be considered in annual reviews when assessing the impact of bag/size limits on the recreational fishery and determining if modification to the possession/size/season limits are necessary. A thorough and consistent enforcement program is required for this or any other FMP to succeed.

9.2.2.3.3. Recreational Harvest Limits

Beginning in year 2, a recreational harvest limit would be allocated to the recreational fishery to control fishing mortality. The harvest limit would be based on stock assessment information on projected stock size estimates for that year. Estimates of stock size coupled with the target fishing mortality rate would allow for a calculation of total allowable catch (TAC). An estimate of discards would then be subtracted from the TAC to derive the allowed level of landings (harvest limit). Based on the historic proportions of commercial and recreational catch for 1988 to 1992, 22% of the total target would be allocated to the recreational fishery. An analysis of this system was presented in section 9.2.2.2.8 above (commercial quota).

Because stock size has not been projected for 1997, the second year of the management program, landings data were used from 1988-1992 to derive average landings for those years to assess the potential impacts of the harvest limit. Based on these data, a 32% reduction in exploitation would equate to a recreational harvest limit of 3.46 million lbs in the second year of the management program (Table 57). This harvest limit would be achieved on a coastwide basis through a system of possession limits, size limits, and/or season. Year end total recreational landings would be compared to the harvest limit to ensure that the landings target was not exceeded.

9.2.2.4. Administrative, enforcement, and information costs

Currently, a reporting system is being implemented by the NMFS. This system has been designed to collect information for various fisheries according to their respective FMP's.

The cost of enforcing the scup size limit equals the value of the additional capital and labor resources required to expand current enforcement efforts to encompass the new regulations. Minimum size regulations for scup are currently enforced in Rhode Island, Connecticut, New York and New Jersey. The additional cost to existing dockside enforcement in these states from the implementation of the minimum size limit alternative is expected to be minimal. In addition, in states with minimum size regulations for other species, additional reporting and enforcement from scup regulations should also be minimal.

It is assumed that most individuals that will potentially apply for scup operator permits already hold operator permits for summer flounder, multispecies, and/or scallops. It is also expected than since most of the vessel's operators already submit logbook reports under the Northeast Multispecies, Scallop, and Summer Flounder FMPs, the implementation of this plan would not affect the reporting process to any significant extent.

9.2.2.5. Prices to consumers

In recent years, the ex-vessel price per pound of scup caught commercially has shown a slight upward trend, indicating that supply and/or demand factors may be shifting. For the period between 1983 to 1992, the highest price for all size categories of scup occurred in 1989, at $.79 per pound. NMFS weighout data for 1993 indicate an average ex-vessel price of $.58 per pound coastwide, ranging from $0.18 per pound for pins to $1.33 per pound for jumbos. Continual increase in the demand of fish and shellfish in general (due to health awareness) could be the cause for increased ex-vessel revenue. However, the effects of this factor on ex-ex-vessel price can not be address quantitatively at the time.

Potential reduction in landings and value attributed to this plan in its early years are not expected to significantly increase overall ex-vessel scup price. Future increases in scup supply due to reduction in mortality, higher harvest weight, and stock stability, should maintain the consumer scup price level.

9.2.2.6. Redistribution of costs

The FMP is designed to give fishermen the greatest possible freedom of action in conducting business and pursuing recreational opportunities consistent with the objectives. It is not anticipated that the proposed management measures will redistribute costs between users or from one level of government to another.

9.2.2.7. Fishery impact statement

The impacts of the proposed actions on participants in the scup fisheries including analyses of biological, economic, and social impacts are described in section 9.2 (Analysis of Beneficial and Adverse Impacts of Adopted Management Measures), in Appendix 1 (Alternatives to the Amendment) and in Appendix 2 (Regulatory Impact Review) of the FMP. The Mid-Atlantic Fishery Management Council commissioned two reports to assess the probable socio-economic impacts of management options identified in the draft FMP. The first report titled "Part 2, Phase I, Fishery Impact Statement Project, Mid-Atlantic Fishery Management Council" by McCay *et al.* (1993), described the people and communities involved in the region's fisheries. The second report titled "Social and Economic Impacts of the Draft Management Plans for Black Sea Bass and Scup" by Finlayson and McCay (1994), assessed the probable socio-economic impacts of management options identified in the draft FMP. This section is intended to further describe the potential effects of the proposed FMP on the people and the communities involved in the scup fisheries throughout the region based on these reports.

The principal approaches employed to compile the information presented in the two reports mentioned above were open-ended phone interviews, port visits, data analysis, and interviews of people involved in different aspects of the fishing industry. It is important to note the potential biases in the comments provided by some of the individuals interviewed. In the second report, Finlayson and McCay (1994) stated that:

> "When assessing the claims and opinions of members of the fishing industry cited and quoted in this report, the reader should remain critically aware that in many if not all cases there is an element of self-interest at work. This is particularly true where there is a real or perceived conflict between gear sectors and/or regions in competition for a limited, and declining, resource, and where they fear that draft regulations will result in an unequal, and hence unfair, distribution of economic impacts among the user groups."

The first report (McCay *et al.* 1993), identified ports that appeared in the top 10, in terms of landed value, for any of the species that the Mid-Atlantic Fishery Management Council has full or shared responsibility for the preparation of Fishery Management Plans (tilefish, scup, black sea bass, summer flounder, dogfish, Atlantic mackerel, *Loligo* squid, *Illex* squid, butterfish, weakfish, bluefish, and angler or monkfish). The ports identified as relevant in the first report covered ports from Chatham, Massachusetts, to Wanchese, North Carolina. The second report (Finlayson and McCay 1994), identified ports that met one or both of the following criteria: the port or closely related port group accounted for more than 1 percent by landed value of the total landings of black sea bass or scup, or the landings of black sea bass or scup accounted for more than 1 percent of all commercial landings in that port or port group (Finlayson and McCay 1994). The ports identified as relevant on the second report covered ports from Gloucester, Massachusetts, to Hampton Roads, Virginia.

Landing statistics and values are from the National Marine Fisheries Service weighout data. Information about the ports is from interviews with key informants and from earlier studies conducted by McCay's research team (McCay *et al.* 1993).

In this section, both reports will be used to assess the socio-economic implications of the proposed FMP at the individual and aggregate level as permitted by the available information. For a more through review of the potential socio-economic implications of the FMP, refer to these reports.

Table 67 shows port groups ranked by landed value of scup as a percentage of the value of port landings for all species. In 1992, scup accounted for approximately 10% of the value of total port landings in Freeport/Brooklyn; 6% in Montauk; 5% in Point Judith; 3% in Cape May; 2% in Stonington; and less than 2% for the rest of the ports. Three ports accounted for 65% of all scup landed value in 1992: Point Judith, Montauk, and Cape May (Table 68). Newport is an important component of the two sets of ports ranked above. However, due to the confidentiality of data it was not ranked (see footnotes in Tables 67 and 68). Point Judith accounted for approximately 26% of the total scup landed value; Montauk 23%; Cape May 15%; Freeport/Brooklyn 6%; and less than 4% for the rest of the ports. Scup landings and values are higher for ports located in the northern part of the region (Tables 67 and 68).

The degree of reliance on scup for selected ports from Gloucester, Massachusetts, to Hampton Roads, Virginia, is low . One port represented more than 10% of the total landed value of scup (Freeport/Brooklyn), with the rest of the ports having a value somewhere between 0 to 6% (Table 67).

9.2.2.7.1. Port level - Commercial Fishery

The port discussion includes a description of the fleet (number of vessels and type of gear employed), a description of the landings (species and value) and a general description of the community and port characteristics as permitted by the available information. The discussion provided in the port description is based on findings by McCay *et al.* (1993). The overall description may vary from port to port due to the confidentiality of data.

9.2.2.7.1.1. Freeport/Brooklyn Area, New York

According to McCay *et al.* (1993), there is a total of 71 permitted commercial fishing vessels in Freeport and 33 in Brooklyn. The average length, gross tonnage and horse power are slightly larger in the Brooklyn vessels than in the Freeport vessels.

The total value of all species landed in the area was about $4 million in 1992. Surf calms represented the most important fisheries in terms of landed value (45%), followed by *Loligo* (13%), summer flounder (11%), scup (10%), and lobster (6%). In 1992, the majority of the landed value by gear type corresponded to bottom otter trawls with 48%, and surf clam dredges with 45%. The four major species targeted by otter trawlers in the Freeport area are whiting, winter flounder, summer flounder and squid.

There are three lobster boats working out of Freeport. Some fishermen have unsuccessfully tried potting for scup and black sea bass, and according to some Freeport fishermen, no one in Nassau County fishes with traps (McCay *et al.* 1993). Inshore and offshore lobster potting accounted for about 6% of the total landed value by gear in the area in 1992.

The otter trawl boats pay on the share system, and most boats use a captain and a crew member. The dredgers are all owner operated and mostly day boats.

The level of tourism in the Freeport area is substantial. Freeport is located near Jones Beach and has a number of charter boats.

9.2.2.7.1.2. Montauk Area, New York

The Montauk area ports (Montauk, Shinnecock/Hampton Bay, and Greenport) had a total of $28 million in landings of fish and shellfish in 1992. Scup accounted for about 6% of the total landed value in the area in 1992, ranking sixth, after *Loligo* squid, tilefish, lobster, silver hake, and big eye tuna. The Montauk area is characterized by a high diversity of species and gear types, reflecting the coexistence of estuarine, inshore, and offshore fisheries. An interesting fishing innovation called "double crewing" has developed in Montauk and other ports. The double crew strategy provides the boats and the crew with a greater degree of operational flexibility. According to McCay *et al.* (1993):

> "Boats that double crew have two sets of captains and crews. In a double crewing

situation one set of captain and crew comes in and unloads the boat and then the other captain and crew comes on board and takes the boat out for another trip. "They are willing to spend money, they are making money, and they are doing it by making the boat work harder," said one informant regarding double crewing. This same person commented that one of the reasons they are working the boats harder today in 1993 than fifteen years ago are the large mortgages that are on these vessels that they did not have before."

There are between 20 and 35 draggers in Montauk. The major gear types, in terms of percentage of landed value in 1992 were: bottom dragging (finfish) 40%, tilefish longlining (25%), and pelagic longlining (swordfish and tuna) 18%. Handlining (scup, black sea bass, and Atlantic mackerel) accounts for 6% of the total landed value.

Loligo squid is the main target of the Montauk fishing fleet. Scup contributes 7% of the total landed value per species for bottom draggers. The typical dragger in Montauk is owner operated, and vessels might have a second captain and a double crew.

There are approximately fifty-five commercial fishing boats operating in the Shinnecock/Hampton Bays area. Most of these boats are draggers. Otter trawlers and dredgers (scallop/ocean quahog) accounted for 66% and 24% of the total landed value for all species in these ports in 1992, respectively.

The top four species in landed value in 1992 in this area were: *Loligo* squid, silver hake, ocean quahog, and surf clam. They contributed for about 68% of the total landed value. *Loligo* accounted for 27% of the total landed value (97% caught by trawlers). Scup ranked sixth, with 6% of the total landed value for the same period.

Loligo squid and whiting are the major targeted species for draggers from the Shinnecock/Hampton Bays area, representing 66% of the total landed value for all species in 1992. Scup ranked third with 8% of the total landed value. *Loligo* squid and whiting are both targeted all year round. Scup is targeted for about three to four weeks as they migrate through the Hampton area.

Sink gill netting and inshore lobster potting were the third and fifth fisheries in terms of total landed value in 1992, (5% and 1%, respectively). However, they do not target scup.

Pound nets represented 0.13% of the total value for all species in 1992. *Loligo* squid accounted for approximately 34% of the total landed value for pound nets in 1992, scup for 16%, winter flounder for 14% and butterfish for 10%.

Based on McCay *et al.* (1993), fishery trends and changes in Shinnecock indicate that:

> "Whiting has always been targeted but more so in the last six months (July-December 1993) because of a new market for juvenile whiting. Within the last year (1993), very small whiting has become a big export item to Spain. The Spanish want the really small whiting; it is prepared by putting the tail in the mouth like a donut and frying it. There are about a half a dozen boats targeting small whiting as of December 1993. There is an export operation in Greenport for these small whiting."
>
> "According to informants, whiting and squid are plentiful right now, (December 1993). Scup are becoming harder and harder to get every year. The species caught by Shinnecock boats depends on availability and the market. If whiting is in big demand, the fishermen go for that."

Ninety-five percent of the fish (except squid, swordfish, and tuna) in Shinnecock goes to Fulton Market in New York. Swordfish and tuna are sold by the vessel owner. Squid is usually sent to New Jersey for

processing.

The social nature of the Shinnecock fishing community indicates that most boats are owner operated. Many fishermen in Shinnecock have families in the commercial fishing industry. It is also evident that father-son operations are more common in this community than in Montauk.
The crews are mostly integrated by local men that are not usually family members. Crews are paid using the share system. Most crew members in Shinnecock are white males with about 60-70% of them having a high school education.

At the present time, there are no women fishing in Shinnecock. However, fishermen's wives have been very active in pushing for the maintenance of the Shinnecock Inlet.

In addition to a stable year-round population, Hampton Bays has a large tourist community. Numerous businesses such as bars, banks, liquor stores and restaurants cater to the tourist. The growth of the service industry in the area provides additional opportunities of summer employment in the community. Overall, construction, fishing and tourism are the largest sources of employment.

In Shinnecock a small number of support businesses to the fishing industry exist. There is one craftsman who does boat work exclusively. Welders and wood workers can do wood work as well as other types of work. Their electronic repairmen in the community are very specialized in marine electronics.

Three principal types of fishing are done by Greenport vessels: bottom dragging, offshore and inshore potting, pound netting and gillnetting. Between ten and twenty otter trawlers are home ported in Greenport. These bring about 60% of the total landed fish value. Offshore and inshore potting accounted for more than 25% of the landed value by gear in 1992. There are ten boats in the pound net fishery, which account for about 6% of the total landed value by gear in 1992. The four major species caught as a percent of the total landed value by all gear in 1992 were: lobster (28%), *Loligo* squid (13%), silver hake (12%), and scup (9%).

Loligo squid, whiting, scup, winter flounder, and summer flounder were the top five species by landed value for Greenport otter trawlers in 1992, with 21%, 20%, 14%, 10%, and 10% of the total landed value of otter trawlers, respectively. Scup is typically targeted in the late fall and early winter. *Loligo* squid is targeted in the spring and fall and it is also a bycatch with whiting. Summer flounder are targeted during the summer and through the fall.

Lobster potting is the second most important fishery in Greenport in terms of landed value. Scup is not an important bycatch of the inshore lobster fishing.

Pound-net fishing accounts for a small percentage of the total landed value in Greenport. In 1992, scup accounted for about 16% of the total landed value for pound-netters.

The number of boats engaged in fishing activities in Greenport has been increasing in the last two to six years. This has created an upward trend in the importance of ancillary services such as ice and fuel. Other support businesses include a local welding business and Greenport Yacht and Shipping. These last two businesses are diversified and serve both commercial and recreational boats.

There are three packing facilities in Greenport. Most of the fish either go to Fulton market in New York or are exported (juvenile whiting).

To an extent, family is important in commercial fishing in Greenport. About half of the boats may have a family member (primarily a son) working on the boats. During the summer a number of high school students may work aboard a relative's boat.

The crews are full-time, local men. Most fishermen are high school or college graduates. The average age of the crew members and captains is between 25 and 35, and 40 to 60 years of age, respectively. The crews are typically paid using the share system.

There are no women working as part of the crews or the packing staff. However, some wives may be involved in other support aspects of the fishing operations.

The ethnic background of the fishing community in Greenport is quite diverse. There are African-Americans, Puerto Ricans, Russians and Poles working either as crews or as packing staff.

9.2.2.7.1.3. Point Judith, Rhode Island

Point Judith has a large fishing fleet of trawlers, gillnetters and lobster boats. Estimates on the number of boats in the area vary. However, about 200 commercial boats dock in Point Judith, including 80 trawlers, 30 gillnetters, and approximately 100 lobster boats. Otter trawls accounted for 67% of the total landed value of all gear, while lobster pot fishing accounted for 28% of the total landed value in 1992. Of the total landed value by species caught with otter trawlers, *Loligo* squid was first with 23% of the total, scup ranked fifth with 7% of the total.

The total value of fish landed in Point Judith in 1992 was $37 million. The top 10 species by percent landed value in 1992 were: lobster (28%), *Loligo* squid (15%), silver hake (10%), angler (10%), summer flounder (8%), scup (5%), butterfish (4%), winter flounder (4%), yellowtail flounder (2%), and cod (2%). Point Judith boats mainly target whiting, fluke, and monkfish. The commercial importance of monkfish is increasing. It is the second most available finfish after fluke. In 1992, six million dollars worth of monkfish was caught. Squid is also increasing in economic importance in the area.

Point Judith's boats are described by an informant McCay *et al.* (1993), as being diverse in their approach to the fisheries. This allows commercial fishermen to target different species year round even if they have to switch boats during the year.

Fishermen target *Loligo* throughout the year. In the summer, some butterfish is caught inshore, by fall good catches occur when the butterfish moves offshore. Scup, fluke, and black sea bass are caught inshore during the summer, and offshore during the winter. The majority of the scup landings occur in the spring and summer.

Some minor fisheries occur in Point Judith. Pot fisheries, besides lobster, accounted for 0.48% of the total landed value for all gear in 1992. Pot fisheries are heavily dependent on scup. In 1992, scup contributed about 89-96% of the total landed value.

Overall, the role of other types of gear in Point Judith is minor in all cases. Among these the highest levels are: fish pots which caught approximately 8% of the value of scup and 3.5% of the value of black sea bass. Gill-nets contributed with 7% of the value of anglers and 3% of the value of bluefish.

McCay *et al.* (1993) described Point Judith as follows:

> "Point Judith, which is part of the Narragansett, is almost exclusively a fishing community, having a core group of fishermen who fish full-time. During the summers the streets are filled with tourists coming or going on the Block Island ferry. Yet there is little for tourists to do in Point Judith. The town does not have the condominiums, shops, and hotels that other ports such as Chatham, Newport, and Montauk have. Only one hotel stands out in Point Judith, the Dutch Inn, which is circa 1960. The few restaurants, shops, and tourist venues, such as fudge shops, are enough to take care of the summer onslaught of ferry passengers and the year round working population centered around commercial fishing."

9.2.2.7.1.4. Newport, Rhode Island

There are three commercial fishing packaging and distributing businesses in Newport. One primarily deals with draggers, gillnetters, and some scallopers, and brings in a large amount of groundfish. Another is a

lobster house, which also handle trappers. There is also a trap company located in Newport.

The total landed value for all species in Newport in 1992 was $14.5 million. Lobster ranked first accounting for 44% of the total landed value. Scup ranked fifth. In 1992, lobster pots accounted for about 50% of the landings in Newport. About 33% of the landings were associated with otter trawls.

The dragger fishery mainly targets northeastern groundfish, as well as *Loligo* squid. Scup is a minor component of this fishery. In the summer time there is a scup pot fishery in Newport. The future of this fishery is in question given declines in scup landings. Scup is one of the half dozen or so species targeted by the floating trap fishery. Scup is also important to the small handline fishery in the area.

The people who make up the crews in Newport are not necessarily fishermen from the area. Some crew members come from Point Judith, New Jersey, New York, and New Bedford. The owners of the boats do not typically work the boats.

Newport is a reasonably large coastal community. The town is known for its colonial history. The town's water front is mainly occupied by various marinas, hotels, shops, and condominiums.

9.2.2.7.1.5. Cape May, New Jersey

There are about 33 local draggers operating from Cape May docks, most of which are wet boats. There are some equipped with refrigerated sea water (RSW) capacity and seven boats are wet boats. Many transit boats (57 in 1992) land in the Cape May/Wildwood area from places like Point Pleasant, and Point Judith, mainly to take advantage of winter stocks of *Loligo* squid and to find safe harbor during storms.

The total landed value of all species for the Cape May/Wildwood area was approximately $37 million in 1992. Cape May alone landed about $30.4 million, Wildwood landed $4.5 million, and other ports in the Cape May area landed $2.3 million. The landed value of the major species landed in 1992 included sea scallops (28%), ocean quahog (11%), *Illex* squid (10%), *Loligo* squid (9%), and surf clams (8%). Scup contributed 3% of the total landed value of all species. Other ports in this area and the statistics that follow include Cold Spring Harbor, near Cape May, and Sea Isle City, located to the north. There are now two tilefish boats, two fish trap (pot) boats and one dragger working out of Sea Isle City. Tilefish and black sea bass are species targeted.

The general outline of Cape May/Wildwood fisheries is described by McCay *et al.* (1993) at continuation:

> "Tilefish are not landed in the Cape May/Wildwood area, except in Sea Isle City. Scup are targeted by draggers. Black sea bass are caught by pot boats and some draggers. Fluke are targeted by draggers. Dogfish are caught by gillnetters in November, December and in the spring at which time they switch from the spiny dogfish to the smooth dogfish. Draggers target dogfish in the early winter months. Some draggers may just catch them if they happen to run into them. Atlantic mackerel are targeted by draggers in the winter. Loligo squid is almost a year round fishery for draggers. But they may be going for either squid on a trip. Illex squid is caught by draggers from May to October. Butterfish are a bycatch of squid and are rarely targeted. Gillnetters catch weakfish but there aren't many doing this any more because of state regulations. So there is a drop in these landings. Draggers also target weakfish. Bluefish are caught by gillnetters and they are a bycatch for draggers."

Bottom fish otter trawling, along with bottom sea scallop trawling accounted for 39% of the total landed value by gear in the Cape May/Wildwood area in 1992. The major species caught by value by bottom fish otter trawl in 1992 were: *Illex* squid (27%), *Loligo* squid (25%), and summer flounder (20%). Scup ranked fourth with 8%.

Different species may be targeted at different times of the year by different types of boats or gear. *Loligo* squid is targeted during the winter by freezer trawlers. Once aboard the boat the squid is flash frozen into blocks of ice and kept in cold storage until the boat reaches port. The demand for *Loligo* squid is mostly for an export market in flash frozen squid. To a lesser extent, squid is marketed domestically in the fresh fish markets in New York and Philadelphia. Both the domestic and foreign markets are slowly growing.

Illex squid is the largest summer fishery for freezer trawlers. It is a relatively new fishery because *Illex* is very susceptible to higher temperatures. Recirculating sea water technology is required to handle large volumes of *Illex*. However, flash freezers are desirable in order to ensure a better product. *Illex* is mainly marketed as a flash frozen product in Europe.

Butterfish sometimes is a bycatch of the squid fishery. When butterfish is caught with large amounts of squid, it is unmarketable (sometimes it is consumed by the captain and crew of the vessel). However, if landed in considerably large quantities it can be marketed.

During the winter, scup sometimes is targeted by RSW and normal trawlers. Mixed trawl and porgy nets are employed to fish for scup. The product is marketed in the fresh fish markets.

Cape May is the most southerly town in New Jersey. Cape May has a vibrant tourist and beach economy during the summer. The commercial docks are located along one stretch of the road separated from the rest of the community.

9.2.2.7.2. Individual level - Commercial fishery

The possibility of significant impacts of the management actions may be expected to be quite different at the individual level than at the "global" or "port level." That is, the proposed management actions may significantly affect a specific group of fishermen employing specific gear types that depend or mainly target the species being managed. The purpose of this section is to address the potential effects at the individual level of the proposed management actions.

Table 69 shows the degree of specialization in the scup fishery by gear type for selected ports from Gloucester, Massachusetts, to Hampton Roads, Virginia. The pot fishery in Point Judith, Rhode Island is an example of specialization or "reliance" on the fishery. Even though only 2% of the value of scup throughout the region caught with pot gear was landed in Point Judith, scup represented about 95% of the landed value of fish caught with fish pots in this port.

The scale of the pot fishery is relatively small. It is expected that the two management alternatives most relevant to this fishery (escapement and minimum size limit) will have little negative impact. This fishery is conducted inshore in relatively shallow waters and the state. It is expected that if fish are handle with care and quickly returned to the water discard survival would be high.

Table 13 indicates that, on average, scup was predominantly targeted by pots and traps in Connecticut, Massachusetts and Rhode Island for the 1983-1992 period. In Massachusetts and in both Connecticut and Rhode Island a 9" and a 8" total length recreational and commercial size limit has been established by state laws, respectively. Furthermore, Rhode Island has established minimum vent size regulations, and Massachusetts is thinking about establishing it. The existence of the minimum size limit mentioned above, in addition to the fact that fishermen in the pot fishery mainly target large fish indicates that the minimum size limit alternative addressed in the FMP would likely have minimum consequences on the fishery.

The hook and line fishery does not appear to be a strong component of the scup fishery (Table 12). Hook and line fishermen typically target large fish and the minimum size limit addressed in the FMP is not expected to substantially affect this fishery. Finlayson and McCay (1994) reported that a substantial undocumented hook and line scup fishery may be operating in western Long Island (the Freeport/Brooklyn port group). In addition to this, "weekend warriors" may also participate in the scup fishery. The degree to which this type of activity extends is not known. "Weekend warriors" are described by Finlayson and McCay (1994) as follows:

"...people who may have full-time jobs during the week but who have developed private unregulated and unreported markets for the fish they catch on the weekends. They may sell to restaurants or to retail fish markets. They may have very sophisticated electronics and fish-finding gear including color side-scan sonar. They may be using multiple rods with motorized reels. It is impossible to estimate with any useful precision how many of these people are out there or what their impact is on the stocks. But most commercial fishermen are in agreement that their numbers are large and that their aggregate catch is significant."

Scup does not appear to be targeted with gill nets from Gloucester, Massachusetts to Hampton Roads, Virginia (Table 60).

9.2.2.7.3. Recreational fishery

Section 9.2.2.3 of the FMP, and section 2.3.4 of the RIR provide detailed discussions of the potential effects of the proposed management plan on the recreational fishery. As it was indicated in section 2.3.4 of the RIR, the group of individuals that could be most likely affected by the possession and minimum size limits are fishermen that are largely interested in obtaining very large catches per fishing trip. Such as fishermen that participate in the "party" or "head boats" fishery.

"Party" or "head" boats are described by Finlayson and McCay (1994) as follows:

"...boats which take large numbers of people out for a day or half-day fishing for a fee. From the point of view of the owners, skippers, and crew of these boats, this is a business and is therefore, in a sense, a commercial fishery. A significant portion of the "party" or "head" boat business from Massachusetts to Virginia is now comprised of organized bus tours from remote urban centers whose subscribers are fishing for personal and family sustenance and/or monetary gain, and seek, and sometimes find, very large catches. The demographics of this sub-set of the recreational fishery should be the subject of further detailed study. The fishers are best characterized as "ethnic" with Spanish, Italian, Greek, and Portuguese-speaking people appearing to predominate in the northern Scup fishery while African Americans from urban centers such as Philadelphia and Washington predominate in the ports from Cape May south. Anecdotal evidence suggests that many of these recreational fishers see the $30-50 fee for a day's fishing as money well-spent if they can return with 100 lbs. or more of fish in their cooler. Whether these fish are primarily destined for personal or family consumption or for sale is not known although many commercial fishers believe that the latter is true. Certainly, some of the practices used by the operators of these boats such as cash pools for "high hook"--the person who catches the greatest number or weight of fish-- should receive critical attention from management."

Table 36 indicates that the average total cost for a party boat day trip for selected states ranges from $43 to $70. It is likely that the implementation of size and bag limits would mostly have some impact on the number of individuals that are willing to pay between that range for a fishing day.

The degree of the impact derived from different management actions would depend on the experience and expectations of what constitutes a "good fishing trip" and the degree to which these boats have become dependent upon people fishing for subsistence or sale.

A survey of charter and party boats conducted in 1990, indicates that for "party boats", the relative customer interest for scup ranked as the second lowest (Table 38). Overall, the proposed management alternatives in the FMP are likely to have minimal impacts on the recreational fishery.

9.2.2.7.4. Summary

According to the 1992 landings statistics, scup is not of critical importance to the commercial fishery industry in the ports addressed above. Given the degree of port reliance on scup, it can be expected that the proposed regulatory measures will have a minimal effect on the communities and local economies of these ports. The effects of proposed regulations on individual commercial fishermen and recreational fishermen are also expected to be minimal.

The adopted management measures are considered the most reasonable to achieve the fishing mortality rate reduction target available at this time. The moratorium is included to increase probability of compliance with the management program in the near term. It will also provide a mechanism for participants to share in the recovery of the resource rather than having the dividend of recovery dissipated over additional vessels that could enter the fishery as soon as the resource has recovered. This technique was used to great success with the surf clam fishery.

In terms of the consultative requirement of this provision of the Magnuson Act, since the management unit of the FMP is scup in US waters in the western Atlantic Ocean from Cape Hatteras, North Carolina northward to the US - Canadian border, the South Atlantic and New England Councils were invited and did designate members of their Councils to the Mid-Atlantic Council's Demersal Species Committee, the oversight committee for this FMP. Additionally, both Councils were invited to appoint industry advisors to the Mid-Atlantic Council Scup Advisory Panel.

9.3. RELATION OF RECOMMENDED MEASURES TO EXISTING APPLICABLE LAWS AND POLICIES

9.3.1. FMPs

This FMP 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 can cause significant nontarget species fishing mortality on other stocks. In addition, scup are food items for many commercially and recreationally important fish species, as well as themselves utilizing many finfish and invertebrate species as food items.

9.3.2. Treaties or international agreements

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

9.3.3. Federal law and policies

9.3.3.1. Marine Mammals and Endangered Species

Numerous species of marine mammals and sea turtles occur in the northwest Atlantic Ocean. The most recent comprehensive survey in this region was done from 1979-1982 by the Cetacean and Turtle Assessment Program (CETAP), at the University of Rhode Island (University of Rhode Island 1982), under contract to the Minerals Management Service (MMS), Department of the Interior. The following is a summary of the information gathered in that study, which covered the area from Cape Sable, Nova Scotia, to Cape Hatteras, North Carolina, from the coastline to 5 nautical miles seaward of the 1,000 fathom isobath.

Four hundred and seventy one large whale sightings, 1,547 small whale sightings and 1,172 sea turtles were encountered in the surveys. The "estimated minimum population number" for each mammal and turtle in the area, as well as those species currently included under the Endangered Species Act, were also tabulated (Table 70).

CETAP concluded that both large and small cetaceans were widely distributed throughout the study area in

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

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

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

The ESA Section 7 Consultation on the summer flounder fishery was reinitiated to include the black sea bass and scup fisheries. The resulting Biological Opinion was signed on February 19, 1996, and concluded that the effects of these fisheries, along with the associated management actions, may adversely affect listed or proposed species, but are not likely to jeopardize their continued existence.

The reasonable and prudent measures contained in the August 10, 1992, Biological Opinion for Amendment 2 to the summer flounder FMP established measures to be implemented to reduce adverse impacts to endangered and threatened sea turtles and are hereby incorporated by reference. In order to be exempt from the prohibitions of section 9 of the ESA, NMFS must comply with the following terms and conditions, which implement the reasonable and prudent measures. These terms and conditions are non-discretionary and must be implemented for the summer flounder, scup and black sea bass fisheries.

The following measures are in addition to the terms and conditions in the August 10, 1992 opinion, and reflect the findings in this biological opinion and current TED regulations:

(1) The use of a NMFS certified turtle excluder device (TED) is required by any vessels engaged in summer flounder, scup and black sea bass fishing operations utilizing trawl gear in the summer flounder sea turtle protection area, Cape Charles, VA southward to the North Carolina/South Carolina border. Trawlers will be exempt from the TED requirement in the northern portion of the TED-use area south to Oregon Inlet, NC annually from January 15 through March 15.

(2) NMFS must investigate the extent of take in flynet gear and if deemed appropriate develop and certify a TED for flynet gear that will retain fish by size classes acceptable to fishery conservation plans while excluding sea turtles.

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

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

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

9.3.3.2. Marine Sanctuaries

National marine sanctuaries are allowed to be established under the National Marine Sanctuaries Act of 1973. Currently there are 11 designated marine sanctuaries (Figure 13) that creates a system that protects over 14,000 square miles (National Marine Sanctuary Program 1993).

There are two designated national marine sanctuaries in the area covered by the FMP: the *Monitor* National Marine Sanctuary off North Carolina, and the Stellwagen Bank National Marine Sanctuary off Massachusetts. There are currently five additional proposed sanctuaries, but only one, the Norfolk Canyon is on the east coast.

The *Monitor* National Marine Sanctuary was designated on 30 January 1975, under Title III of the Marine Protection, Research and Sanctuaries Act of 1972 (MPRSA). Implementing regulations (15 CFR 924) 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 is clearly designated on all National Ocean Service (NOS) charts by the caption "protected area." This minimizes the potential for damage to the Sanctuary by fishing operations. Correspondence for this sanctuary should be addressed to: *Monitor* NMS, NOAA, Building 1519, Fort Ousts, VA 23604.

NOAA/NOS issued a proposed rule on 8 February 1991 (56 FR 5282) proposing designation under MPRSA of the Stellwagen Bank National Marine Sanctuary, in federal waters between Cape Cod and Cape May, Massachusetts. On 4 November 1992, the Sanctuary was Congressionally designated. Implementing regulations (15 CFR 940) became effective March 1994. Commercial fishing is not specifically regulated by Stellwagen Bank regulations. The regulations do however call for consultation between Federal agencies and the Secretary of Commerce on proposed agency actions in the vicinity of the Sanctuary that "may affect" sanctuary resources. The process for consultation is currently (late 1995) being worked out between the Regional office of NMFS, the Sanctuary, and NEFMC for Amendment 7 to groundfish. Correspondence for this sanctuary should be addressed to: Stellwagen Bank NMS, 14 Union Street, Plymouth, MA. 02360.

Details on sanctuary regulations may be obtained from the Chief, Sanctuaries and Reserves Division (SSMC4) Office of Ocean and Coastal Resource Management, NOAA, 1305 East-West Highway, Silver Spring, MD 20910.

9.3.3.3. Indian treaty fishing rights

No Indian treaty fishing rights are known to exist in the fishery.

9.3.3.4. 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 Councils, through involvement in the Intergovernmental Planning Program of the MMS, monitor OCS activities and have opportunity to comment and to advise MMS of the Councils' 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 Councils are unaware of pending deep water port plans which would directly impact offshore fishery management goals in the areas under consideration, and are unaware of potential effects of offshore FMPs upon future development of deep water port facilities.

9.3.3.5. Vessel Safety

Section 303(a)(6) of the MFCMA requires that FMPs consider access to the fishery for vessels otherwise prevented from harvesting because of weather or other ocean conditions affecting the safety of vessels. The proposed management measures of this FMP do not limit the times or places when or where vessels may fish. Therefore, the Council has concluded that the proposed FMP will not impact or affect the safety of vessels fishing in this fishery.

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

9.3.4.1. State management activities

State regulations for scup are summarized in Table 71.

Several states have minimum size limits pertaining to the possession of scup. Massachusetts has the largest size limit (9" TL), which applies to both the commercial and recreational fisheries. Rhode Island and Connecticut have 8" TL minimum size limits which also apply to all fisheries. New York and New Jersey have 7" TL minimum size limits for scup which apply to the commercial fisheries only. None of the remaining states in the management unit (ME, NH, DE, MD, VA, and NC) regulate the minimum size of scup. Some states have minimum mesh size requirements, but none pertain directly to scup. Minimum mesh requirements vary by state, area, and season. In addition, many of the states have season, area, and gear restrictions which may affect fishing for scup. No state has a recreational possession limit pertaining to scup.

9.3.4.2. Impact of federal regulations on state management activities

The management measures of this FMP complement or are identical to those proposed by ASMFC for the coastal states.

9.3.4.3. Coastal Zone Management Program Consistency

The CZM Act of 1972, as amended, provides measures for ensuring stability of productive fishery habitat while striving to balance development pressures with social, economic, cultural, and other impacts on the coastal zone. It is recognized that responsible management of both coastal zones and fish stocks must involve mutually supportive goals.

The Council must determine whether the FMP will affect a state's coastal zone. If it will, the FMP must be evaluated relative to the state's approved CZM program to determine whether it is consistent to the maximum extent practicable. The states have 45 days in which to agree or disagree with the Councils' evaluation. If a state fails to respond within 45 days, the state's agreement may be presumed. If a state disagrees, the issue may be resolved through negotiation or, if that fails, by the Secretary.

The FMP was reviewed relative to CZM programs of Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, and North Carolina. Letters were sent to all of the states listed along with a hearing draft of the FMP. The letters to all of the states stated that the Council concluded that the FMP would not affect the state's coastal zone and was consistent to the maximum extent practicable with the state's CZM program as understood by the Council. New Hampshire, Massachusetts, Rhode Island, Connecticut, New Jersey, Delaware, and North Carolina

have concurred with the Council's opinion.

9.4. COUNCIL REVIEW AND MONITORING OF THE FMP

9.4.1. Monitoring

The Councils and ASMFC will monitor the fishery using the best available data, including that specified in section 9.1.3. The commercial, recreational, biological, and survey data specified in section 9.1.3 are critical to the evaluation of the management measures adjustment mechanism. It is necessary that NMFS incorporate all of the above data types from North Carolina scup fisheries into the overall NEFSC data bases. Additionally, improved stock assessments are necessary for FMP monitoring. As a result of that monitoring, the Councils and ASMFC will determine whether it is necessary to amend the FMP.

The primary organization in the review and monitoring process will be the Scup FMP Monitoring Committee (section 9.1.2.2).

9.4.2. Research and Data Needs [pursuant to MFCMA 303(a)(8)]

Estimates of discarded scup will be very important, especially from freezer trawlers, for adjusting the overall quota in order to meet the target mortality levels. It is, therefore, important that levels of sea sampling effort be sufficient and representative of the fisheries that contribute to scup fishing mortality to accurately describe the level of discard. It must be recognized that this sea sampling will likely involve some vessels not in the directed scup fishery, but vessels in the squid and groundfish fisheries, for example, where large quantities of scup are caught and possibly discarded.

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Table 1. Estimates of annual recruitment, spawning stock biomass (SSB) and fishing mortality (F) for scup based on VPA results (from NEFSC 1995).

Year	Recruits (millions of age 0)	SSB (m lbs)	F (ages 2 - 5)
1984	137.7	20.1	1.18
1985	141.3	19.8	1.18
1986	70.1	26.0	1.20
1987	80.7	18.4	1.43
1988	112.1	13.4	2.13
1989	60.2	14.2	1.60
1990	113.0	21.0	0.96
1991	66.6	18.8	1.29
1992	71.7	14.5	1.31
1993	92.2	10.2	1.32

Table 2. The mean back-calculated lengths (inches TL) of scup ages 1 to 10 from various studies. The number in parenthesis is sample size.

	Age (Years)									
	1	2	3	4	5	6	7	8	9	10
Sisson 1974 (250)	2.9	6.2	8.5	10.2	11.4	12.3	12.9	13.3	13.6	13.8
Hamer 1979 (1429)	5.6	8.6	10.1	11.2	11.8	12.5	13.3	14.1	14.8	15.4
Pierce 1980 (230)	4.6	7.5	9.7	11.4	12.7	13.7	14.5	15.2	15.7	16.1
Crecco *et al.* 1981										
research trawl (697)	4.4	7.4	9.3	10.6	11.9	12.8	13.6	14.1	14.5	14.8
commercial trawl (543)	4.8	7.9	9.7	11.0	11.9	12.7	13.3	14.1	14.6	16.0
Howell/Simpson 1984 (5999)	4.0	7.7	9.6	11.0	12.2	13.1	13.7	14.3	14.7	15.3
Campbell *et al.* (unpub.) (2170)	4.3	6.6	8.6	10.2	11.6	12.8	13.7	14.5	15.3	15.8

Note: FL in millimeters converted to TL in inches.

Table 3. Theoretical growth parameters for scup collected in various studies.

	L-inf			
	FL (mm)	TL (in)	k	t_o
Sisson 1975	324	(14.4)	0.34	-0.31
Hamer 1979	341	(15.1)	0.29	-0.80
Pierce 1980	396	(17.6)	0.24	-0.35
Finkelstein 1969				
male	343	(15.2)	0.27	-0.41
female	374	(16.6)	0.22	-0.47
Crecco *et al.* 1981	366	(16.3)	0.25	-0.35
Howell/Simpson 1984	389	(17.3)	0.22	-0.35
Campbell *et al.* (unpub.)	422	(18.8)	0.18	-0.51

Table 4. Spatial distribution and relative abundance of scup in the North Atlantic Estuaries.

	North Atlantic Estuaries																	
	Passama-quoddy Bay			Englishman Machias Bays			Narra-guagus Bay			Blue Hill Bay			Penobscot Bay			Muscongus Bay		
Species/Life Stage	T	M	S	T	M	S	T	M	S	T	M	S	T	M	S	T	M	S
Scup *Stenotomus chrysops* A																		
S																		
J																		
L																		
E																		

	Damari-scotta River			Sheepscot River			Kennebec/ Andro-scoggin Rivers			Casco Bay			Saco Bay			Wells Harbor		
Species/Life Stage	T	M	S	T	M	S	T	M	S	T	M	S	T	M	S	•	M	S
Scup *Stenotomus chrysops* A												√			√			
S																		
J												√			√			
L																		
E																		

	Great Bay			Merrimack River			Massa-chusetts Bay			Boston Harbor			Cape Cod Bay		
Species/Life Stage	T	M	S	T	M	•	•	•	S	•	M	S	•	M	S
Scup *Stenotomus chrysops* A									√			√			O
S															
J									O		√	√		O	O
L									√			√			√
E															

Relative Abundance

- ● Highly Abundant
- ● Abundant
- O Common
- √ Rare
- Blank Not Present

Salinity Zone

- T - Tidal Fresh
- M - Mixing
- S - Seawater
- • - Salinity zone not present

Life Stage

- A - Adults
- S - Spawning adults
- J - Juveniles
- L - Larvae
- E - Eggs

Source: USDC 1994a

Table 5. Spatial distribution and relative abundance of scup in the Mid-Atlantic Estuaries.

		Mid-Atlantic Estuaries																	
		Waquoit Bay			Buzzards Bay			Narragansett Bay			Long Island Sound			Connecticut River			Gardiners Bay		
Species/Life Stage		*	M	S	*	M	S	T	M	S	T	M	S	T	M	*	*	M	S
Scup *Stenotomus chrysops*	A		√	○		√	●		◉	○		√	●		√			√	◉
	S			○			◉			○			◉						◉
	J		√	○		√	●		●	◉		√	●		√			√	◉
	L		√	◉		√	◉		√	○		√	◉		√			√	◉
	E		√	◉		○	◉		√	○		√	◉		√			√	◉

		Great South Bay			Hudson R./ Raritan B.			Barnegat Bay			New Jersey Inland Bays			Delaware Bay			Delaware Inland Bays		
Species/Life Stage		*	M	S	T	M	S	T	M	S	T	M	S	T	M	S	*	M	S
Scup *Stenotomus chrysops*	A			○		√	○		√	√		√	√		√	○			○
	S						○												
	J			○		√	◉		√	○		√	○		○	○			○
	L					√	○												
	E					√	○												

		Chinco-teague Bay			Chesapeake Bay Mainstem			Chester River			Choptank River			Patuxent River			Potomac River		
Species/Life Stage		*	*	S	T	M	S	T	M	*	T	M	*	T	M	*	T	M	*
Scup *Stenotomus chrysops*	A					○	○												
	S																		
	J			√		○	◉												
	L																		
	E																		

		Tangier / Pocomoke Sound			Rappa-hannock River			York River			James River		
Species/Life Stage		*	M	*	T	M	*	T	M	*	T	M	*
Scup *Stenotomus chrysops*	A		√									√	
	S												
	J		√						√			√	
	L												
	E												

Relative Abundance

- ● Highly Abundant
- ◉ Abundant
- ○ Common
- √ Rare
- Blank Not Present

Salinity Zone

- T - Tidal Fresh
- M - Mixing
- S - Seawater
- * - Salinity zone not present

Life Stage

- A - Adults
- S - Spawning adults
- J - Juveniles
- L - Larvae
- E - Eggs

Source: USDC 1994b

Table 6. Temporal distribution and relative abundance of scup in the Northern Maine Estuaries.

	North Atlantic Estuaries		
Estuary / Month	Passamaquoddy Bay	Englishman/Machias Bays	Narraguagus Bay
Species / Life Stage	J F M A M J J A S O N D	J F M A M J J A S O N D	J F M A M J J A S O N D
Scup *Stenotomus chrysops* A			
S			
J			
L			
E			

Estuary / Month	Blue Hill Bay	Penobscot Bay	Muscongus Bay
Species / Life Stage	J F M A M J J A S O N D	J F M A M J J A S O N D	J F M A M J J A S O N D
Scup *Stenotomus chrysops* A			
S			
J			
L			
E			

Estuary / Month	Damariscotta River	Sheepscot River	Kennebec/Andro-scoggin Rivers
Species / Life Stage	J F M A M J J A S O N D	J F M A M J J A S O N D	J F M A M J J A S O N D
Scup *Stenotomus chrysops* A			
S			
J			
L			
E			

Relative Abundance

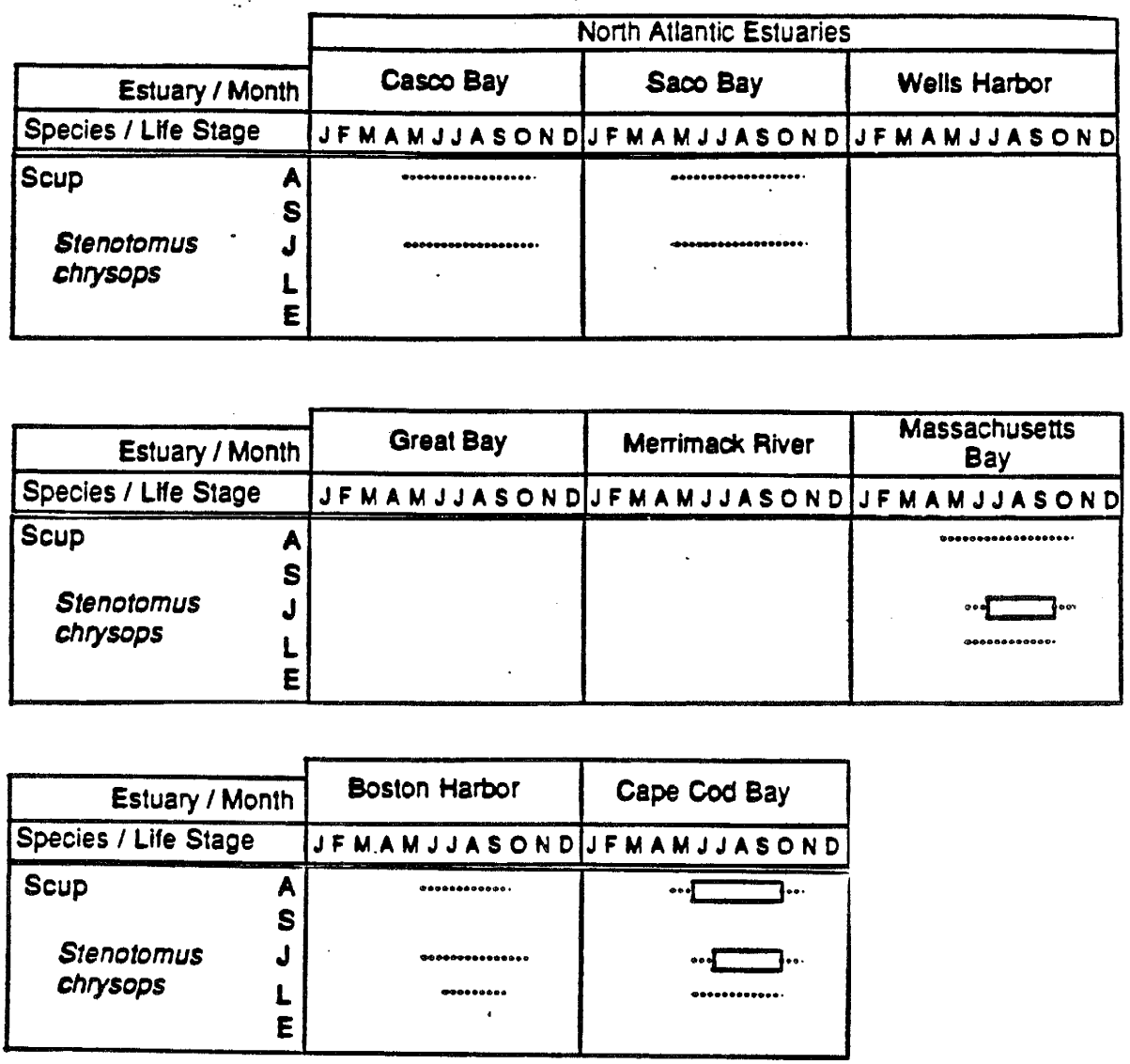
- Highly Abundant
- Abundant
- Common
- Rare
- Blank — Not Present
- na — No data available

Life Stage

A - Adults
S - Spawning adults
J - Juveniles
L - Larvae
E - Eggs

Source: USDC 1994a

Table 7. Temporal distribution and relative abundance of Scup in Southern Maine through Cape Cod Bay.



Relative Abundance

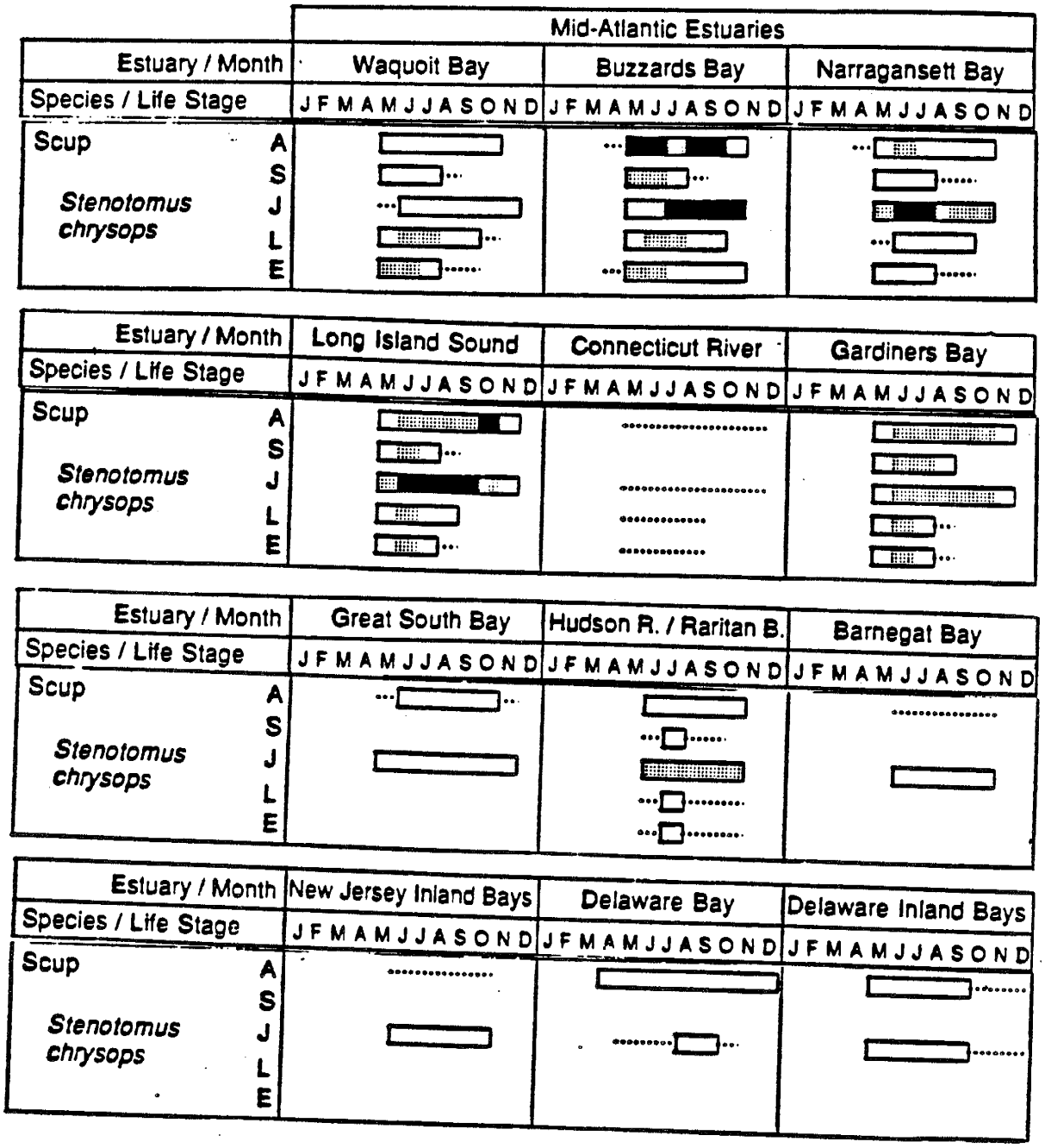
- Highly Abundant
- Abundant
- Common
- Rare
- Blank — Not Present

Life Stage

- A - Adults
- S - Spawning adults
- J - Juveniles
- L - Larvae
- E - Eggs

Source: USDC 1994a

Table 8. Temporal distribution of scup in Cape Cod through Delaware Inland Bays.



Relative Abundance

- Highly Abundant
- Abundant
- Common
- Rare
- Blank — Not Present
- na — No Data Available

Life Stage

- A - Adults
- S - Spawning adults
- J - Juveniles
- L - Larvae
- E - Eggs

Source: USDC 1994b

Table 9. Temporal distribution of scup in Maryland and Virginia Estuaries.

	Mid-Atlantic Estuaries		
Estuary / Month	Chincoteague Bay	Chesapeake B. mainstem	Chester River
Species / Life Stage	J F M A M J J A S O N D	J F M A M J J A S O N D	J F M A M J J A S O N D
Scup *Stenotomus chrysops* A			
S			
J	.....	▭ ▩ ...	
L			
E			

Estuary / Month	Choptank River	Patuxent River	Potomac River
Species / Life Stage	J F M A M J J A S O N D	J F M A M J J A S O N D	J F M A M J J A S O N D
Scup *Stenotomus chrysops* A			
S			
J			
L			
E			

Estuary / Month	Tangier/Pocomoke Sd.	Rappahannock River
Species / Life Stage	J F M A M J J A S O N D	J F M A M J J A S O N D
Scup *Stenotomus chrysops* A	.....	
S		
J	.....	
L		
E		

Estuary / Month	York River	James River
Species / Life Stage	J F M A M J J A S O N D	J F M A M J J A S O N D
Scup *Stenotomus chrysops* A		.....
S		
J	.....	.....
L		
E		

Relative Abundance

- ■ Highly Abundant
- ▩ Abundant
- ▭ Common
- ..... Rare
- Blank Not Present

Life Stage

- A - Adults
- S - Spawning adults
- J - Juveniles
- L - Larvae
- E - Eggs

Source: USDC 1994b

Table 10. Preliminary ranking of major threats to living marine resources and habitats in the Northeast.

1. Urban and port development *
2. Ocean Disposal #
3. Dams
4. Agricultural Practices ●
5. Industrial Waste Discharges @
6. Domestic Waste Discharges @
7. OCS Oil and Gas Development
8. Insect Control
9. Water Division
10. Sand and Gravel Mining
11. Power Generation

* Includes dredge and fill and construction activities covered by Section 10/104 permits, as well as point source pollution covered by NPDES permits and nonpoint source pollution.

\# Includes dredged material disposal in State waters, as well as actual ocean dumping of dredged material, sewage sludge, etc., covered by Section 103 permits.

● Includes nonpoint source pollution (fertilizers, animal wastes, biocides, sediments, heavy metals, etc.) that affects coastal aquatic areas.

@ Point source pollution covered by NPDES permits.

Source: USDC 1985.

Table 11. Commercial and recreational landings (thousands of pounds) of scup, 1983-1994.

Year	Comm	Rec	Total	% Comm	% Rec
1983	17,183	6,252	23,435	73	27
1984	17,128	2,416	19,544	88	12
1985	14,828	6,093	20,921	71	29
1986	15,252	11,605	26,857	57	43
1987	13,380	6,197	19,577	68	32
1988	12,628	4,267	16,895	75	25
1989	8,192	5,557	13,749	60	40
1990	9,518	4,140	13,658	70	30
1991	15,140	8,087	23,227	65	35
1992	13,184	4,412	17,596	75	25
1993	9,147	3,197	12,344	74	26
1994	9,861*	2,628	12,489	79	21
Avg	12,953	5,404	18,358		

* Preliminary

Source: NMFS General Canvass and MRFSS data.

Table 12. Scup commercial landings, by gear, Maine to Cape Hatteras, NC, 1983-1992 combined.

Gear	1,000 Lbs	Percent
Haul Seines, Beach	123	*
Haul Seines, Long(Danish)	0	*
Stop Nets	4	*
Purse Seines, Menhaden	0	*
Otter Trawl Bottom, Fish	101,330	74
Otter Trawl Bottom, Lobster	0	*
Otter Trawl Bottom, Scallop	22	*
Otter Trawl Bottom, Shrimp	16	*
Otter Trawl Midwater	70	*
Trawl Midwater, Paired	4,334	3
Trawl Bottom, Paired	1,290	*
Scottish Seine	0	*
Pound Nets, Fish	3,456	2
Pound Nets, Other	366	*
Floating Traps (Shallow)	17,706	12
Fyke And Hoop Nets, Fish	3	*
Pots And Traps, Crab, Blue	1	*
Pots And Traps, Fish	2,739	2
Pots And Traps, Lobster Inshore	506	*
Pots And Traps, Lobster Offshore	0	*
Pots And Traps, Other	37	*
Gill Nets, Other	103	*
Gill Nets, Sink, Other	0	*
Gill Nets, Drift, Other	14	*
Gill Nets, Drift, Runaround	22	*
Gill Nets, Stake	0	*
Trammel Nets	0	*
Lines Hand, Other	3,998	2
Lines Troll, Other	268	*
Lines Long Set With Hooks	9	*
Dredges Scallop, Sea	5	*
All Gear	136,438	100

* = less than 1%

Source: Unpublished NMFS General Canvass data.

Table 13. Scup commercial landings, by State and gear type, 1983-1992 combined.

Gear	ME % of Total	MA % of Total	RI % of Total	CT % of Total	NY % of Total	NJ % of Total	MD % of Total	VA % of Total	NC % of Total
	State								
Haul Seines, Beach	.	.	0.0	0.0	0.6	.	.	0.1	.
Haul Seines, Long(Danish)	.	0.0	.	.	.	.	.	.	.
Stop Nets	.	0.0	0.0	.	.	.	.	.	.
Purse Seines, Menhaden	.	.	.	.	.	0.0	.	.	.
Otter Trawl Bottom, Fish	99.9	21.0	60.7	64.1	82.8	99.7	95.4	99.3	100.0
Otter Trawl Bottom, Lobster	.	.	.	.	.	.	.	0.0	.
Otter Trawl Bottom, Scallop	.	.	.	.	.	0.0	0.2	0.1	.
Otter Trawl Bottom, Shrimp	0.1	0.0	0.0	.	.	.	.	.	.
Otter Trawl Midwater	.	.	0.1	.	.	.	.	.	.
Trawl Midwater, Paired	.	25.1	3.2	.	.	.	.	.	.
Trawl Bottom, Paired	.	.	2.2	.	0.1	.	.	.	.
Scottish Seine	.	0.0	.	.	.	.	.	.	.
Pound Nets, Fish	.	29.0	.	0.0	2.6	0.1	.	0.1	.
Pound Nets, Other	.	3.6	.	.	.	.	.	.	.
Floating Traps (Shallow)	.	.	31.1	.	.	.	.	.	.
Fyke And Hoop Nets, Fish	.	0.0	0.0	0.0	.	.	.	.	.
Pots And Traps, Crab, Blue	.	.	.	.	.	0.0	.	0.0	.
Pots And Traps, Fish	.	11.4	1.6	18.7	0.1	0.1	0.4	0.0	.
Pots And Traps, Lobster Inshore	.	1.0	0.0	10.6	0.1	0.0	.	.	.
Pots And Traps, Lobster Offshore	.	.	.	.	0.0	0.0	0.1	.	.
Pots And Traps, Other	.	.	0.1	.	.	.	.	.	.
Gill Nets, Other	0.1	0.1	0.1	0.0	0.1	0.0	0.5	0.1	.
Gill Nets, Sink, Other	.	0.0	.	.	.	.	.	.	.
Gill Nets, Drift, Other	.	0.0	.	0.0	.	0.0	2.5	0.2	.
Gill Nets, Drift, Runaround	.	0.0	.	.	0.0	0.1	.	.	.
Gill Nets, Stake	.	.	.	0.0	.	.	.	.	.
Trammel Nets	.	.	.	.	.	0.0	.	.	.
Lines Hand, Other	.	8.1	0.5	6.5	13.6	0.0	1.0	0.0	.
Lines Troll, Other	.	0.5	0.4	.	.	.	.	.	.
Lines Long Set With Hooks	.	0.1	0.0	.	.	0.0	.	.	.
Dredges Scallop, Sea	.	0.0	0.0	.	.	0.0	.	0.0	.
All Gear	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Unpublished NMFS General Canvass data.

Table 14. Scup commercial landings, landings by year and gear type, Maine to Cape Hatteras, NC, 1983-1992.

Gear	83 % of Total	84 % of Total	85 % of Total	86 % of Total	87 % of Total	88 % of Total	89 % of Total	90 % of Total	91 % of Total	92 % of Total
	Year									
Haul Seines, Beach	0.2	0.2	0.2	0.1	.	0.0	.	0.0	0.0	0.0
Haul Seines, Long(Danish)	.	0.0	.	0.0	0.0	.	.	.	.	.
Stop Nets	.	.	.	.	.	.	0.0	.	0.0	.
Purse Seines, Menhaden	.	.	.	.	.	.	.	.	.	0.0
Otter Trawl Bottom, Fish	75.2	72.3	72.2	74.7	75.7	72.2	85.4	74.2	75.9	69.3
Otter Trawl Bottom, Lobster	.	0.0	.	.	.	.	.	.	.	.
Otter Trawl Bottom, Scallop	.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Otter Trawl Bottom, Shrimp	.	.	0.0	.	.	0.1	.	.	.	0.0
Otter Trawl Midwater	.	.	.	0.3	0.2	.	.	.	0.0	.
Trawl Midwater, Paired	5.1	1.7	4.6	3.4	3.8	2.3	2.4	4.6	2.2	1.6
Trawl Bottom, Paired	.	1.8	1.6	4.4	0.0	0.6	.	.	0.0	0.1
Scottish Seine	0.0	.	.	.	.	.	.	.	.	0.0
Pound Nets, Fish	5.0	3.8	3.4	4.8	3.2	0.9	0.1	0.6	0.5	0.3
Pound Nets, Other	.	.	.	.	.	.	1.9	0.8	0.1	0.8
Floating Traps (Shallow)	10.9	16.3	15.2	9.1	9.7	18.4	5.2	11.7	14.4	15.6
Fyke And Hoop Nets, Fish	.	0.0	0.0	0.0	.	.	.	0.0	0.0	.
Pots And Traps, Crab, Blue	.	.	.	.	.	0.0	0.0	0.0	0.0	.
Pots And Traps, Fish	0.1	0.1	0.0	0.1	3.8	2.0	2.7	5.5	3.6	4.8
Pots And Traps, Lobster Inshore	0.0	0.0	0.0	0.0	0.1	.	0.1	0.0	0.1	3.5
Pots And Traps, Lobster Offshore	.	.	0.0	.	0.0	.	.	.	.	0.0
Pots And Traps, Other	.	.	.	.	.	.	.	.	0.1	0.2
Gill Nets, Other	0.0	0.0	0.0	0.0	0.2	0.1	0.1	0.0	0.1	0.1
Gill Nets, Sink, Other	.	.	.	.	.	.	.	.	.	0.0
Gill Nets, Drift, Other	0.0	.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gill Nets, Drift, Runaround	0.0	.	.	.	.	0.0	0.0	0.1	0.1	0.0
Gill Nets, Stake	.	.	.	.	.	.	.	0.0	.	.
Trammel Nets	.	.	.	.	.	.	.	.	0.0	.
Lines Hand, Other	3.4	3.7	2.7	3.0	3.1	2.7	1.8	2.0	2.7	3.2
Lines Troll, Other	0.0	.	.	0.2	0.3	0.6	0.3	0.3	0.1	0.4
Lines Long Set With Hooks	.	0.0	0.0	.	.	0.0	.	0.0	0.0	0.1
Dredges Scallop, Sea	0.0	0.0	.	.	.	.	.	0.0	0.0	0.0
All Gear	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Unpublished NMFS General Canvass data.

Table 15. Scup commercial landings by year and water area, Maine to Cape Hatteras, NC, all gears combined.

	State <3 mi		EEZ >3mi		Total	
YEAR	1,000 Lbs	% of Total	1,000 Lbs	% of Total	1,000 Lbs	% of Total
83	5,342	31	11,840	68	17,183	100
84	6,147	35	10,981	64	17,128	100
85	4,034	27	10,793	72	14,828	100
86	4,628	30	10,624	69	15,252	100
87	3,764	28	9,616	71	13,380	100
88	3,868	30	8,759	69	12,628	100
89	1,751	21	6,441	78	8,192	100
90	3,029	31	6,489	68	9,518	100
91	4,417	29	10,722	70	15,140	100
92	3,954	29	9,230	70	13,184	100
MEAN	4,093	30	9,550	69	13,643	100

Source: Unpublished NMFS General Canvass data.

Table 16. Scup commercial landings by region and year, 1983-1992.

REGION/AREA		Year 83	84	85	86	87	88	89	90	91	92
NEW ENGLAND											
State	1000 Lbs	3,988	4,847	3,337	3,776	3,160	3,540	1,405	2,618	3,735	3,439
(<3 mi)	% REG	54	62	37	46	47	45	34	49	47	47
EEZ	1000 Lbs	3,295	2,850	5,506	4,320	3,445	4,222	2,637	2,667	4,077	3,764
(>3 mi)	% REG	45	37	62	53	52	54	65	50	52	52
All	1000 Lbs	7,283	7,698	8,843	8,096	6,605	7,762	4,042	5,286	7,813	7,204
	% REG	100	100	100	100	100	100	100	100	100	100
	% CST	42	44	59	53	49	61	49	55	51	54
MID-ATLANTIC											
State	1000 Lbs	1,354	1,300	697	852	604	328	346	392	673	514
(<3 mi)	% REG	14	15	12	12	9	6	8	9	9	9
EEZ	1000 Lbs	7,880	7,076	4,690	5,925	5,922	4,409	3,771	3,660	6,500	5,186
(>3 mi)	% REG	85	84	87	87	90	93	91	90	90	90
All	1000 Lbs	9,234	8,376	5,388	6,777	6,526	4,737	4,117	4,052	7,174	5,701
	% REG	100	100	100	100	100	100	100	100	100	100
	% CST	53	48	36	44	48	37	50	42	47	43
SOUTH ATLANTIC											
State	1000 Lbs	0	.	.	0	.	0	0	18	8	.
(<3 mi)	% REG	*	.	.	*	.	*	*	10	5	.
EEZ	1000 Lbs	665	1,054	596	378	248	128	32	161	144	279
(>3 mi)	% REG	99	100	100	99	100	99	99	89	94	100
All	1000 Lbs	665	1,054	596	378	248	128	32	179	152	279
	% REG	100	100	100	100	100	100	100	100	100	100
	% CST	3	6	4	2	1	1	*	1	1	2
ALL											
State	1000 Lbs	5,342	6,147	4,034	4,628	3,764	3,868	1,751	3,029	4,417	3,954
(<3 mi)	% REG	31	35	27	30	28	30	21	31	29	29
EEZ	1000 Lbs	11,840	10,981	10,793	10,624	9,616	8,759	6,441	6,489	10,722	9,230
(>3 mi)	% REG	68	64	72	69	71	69	78	68	70	70
All	1000 Lbs	17,183	17,128	14,828	15,252	13,380	12,628	8,192	9,518	15,140	13,184
	% REG	100	100	100	100	100	100	100	100	100	100
	% CST	100	100	100	100	100	100	100	100	100	100

% REG = area % of regional total, % CST = area % of coastwide area total
0 = less than 1000 lbs
* = less than 1%
. = none

Source: Unpublished NMFS General Canvass data.

Table 17. Scup commercial landings by year, state and area, 1983-1992.

YEAR	DIST	ME	MA	RI	CT	NY	NJ	MD	VA	NC	All
		State									
83											
State	1000 Lbs	.	1,370	2,517	100	1,348	2	.	3	0	5,342
(<3 mi)	%	.	92	44	92	55	*	.	*	*	31
EEZ (>3	1000 Lbs	0	109	3,176	8	1,083	5,589	28	1,179	665	11,840
mi)	%	100	7	55	7	44	99	100	99	99	68
All	1000 Lbs	0	1,480	5,693	108	2,431	5,591	28	1,182	665	17,183
	%	100	100	100	100	100	100	100	100	100	100
84											
State	1000 Lbs	.	1,134	3,643	70	1,292	7	.	0	.	6,147
(<3 mi)	%	.	95	56	99	64	*	.	*	.	35
EEZ (>3	1000 Lbs	.	57	2,792	0	700	4,879	12	1,484	1,054	10,981
mi)	%	.	4	43	0	35	99	100	99	100	64
All	1000 Lbs	.	1,191	6,435	70	1,992	4,886	12	1,484	1,054	17,128
	%	.	100	100	100	100	100	100	100	100	100
85											
State	1000 Lbs	.	642	2,604	90	690	6	.	0	.	4,034
(<3 mi)	%	.	75	32	100	36	*	.	*	.	27
EEZ (>3	1000 Lbs	0	211	5,295	.	1,207	3,283	36	163	596	10,793
mi)	%	100	24	67	.	63	99	100	99	100	72
All	1000 Lbs	0	853	7,899	90	1,897	3,290	36	163	596	14,828
	%	100	100	100	100	100	100	100	100	100	100
86											
State	1000 Lbs	.	1,117	2,511	146	847	3	.	1	0	4,628
(<3 mi)	%	.	81	38	100	43	*	.	*	*	30
EEZ (>3	1000 Lbs	0	246	4,073	.	1,122	4,173	30	599	378	10,624
mi)	%	100	18	61	.	56	99	100	99	99	69
All	1000 Lbs	0	1,364	6,585	146	1,969	4,176	30	600	378	15,252
	%	100	100	100	100	100	100	100	100	100	100
87											
State	1000 Lbs	.	997	1,641	521	601	2	.	0	.	3,764
(<3 mi)	%	.	85	34	78	29	*	.	*	.	28
EEZ (>3	1000 Lbs	10	167	3,125	142	1,406	4,002	0	512	248	9,616
mi)	%	100	14	65	21	70	99	100	99	100	71
All	1000 Lbs	10	1,165	4,766	663	2,008	4,004	0	512	248	13,380
	%	100	100	100	100	100	100	100	100	100	100
88											
State	1000 Lbs	.	617	2,572	350	315	5	1	6	0	3,868
(<3 mi)	%	.	87	41	44	20	*	48	2	*	30
EEZ (>3	1000 Lbs	19	89	3,671	440	1,198	2,935	1	274	128	8,759
mi)	%	100	12	58	55	79	99	51	97	99	69
All	1000 Lbs	19	706	6,244	791	1,514	2,940	2	280	128	12,628
	%	100	100	100	100	100	100	100	100	100	100
89											
State	1000 Lbs	0	610	751	43	326	15	0	4	0	1,751
(<3 mi)	%	*	88	24	22	24	0	5	4	*	21
EEZ (>3	1000 Lbs	69	75	2,339	153	1,002	2,672	1	94	32	6,441
mi)	%	99	11	75	77	75	99	95	95	99	78
All	1000 Lbs	69	685	3,090	196	1,328	2,687	2	98	32	8,192
	%	100	100	100	100	100	100	100	100	100	100

Table 17 (continued). Scup commercial landings by year, state and area, 1983-1992.

		State									
YEAR	DIST	ME	MA	RI	CT	NY	NJ	MD	VA	NC	All
90											
State	1000 Lbs	.	911	1,533	174	361	26	0	3	18	3,029
(<3 mi)	%	.	93	38	47	21	1	6	2	10	31
EEZ (>3	1000 Lbs	8	64	2,404	190	1,302	2,187	8	161	161	6,489
mi)	%	100	6	61	52	78	98	93	97	89	68
All	1000 Lbs	8	975	3,937	364	1,663	2,214	9	164	179	9,518
	%	100	100	100	100	100	100	100	100	100	100
91											
State	1000 Lbs	.	680	2,622	432	571	97	1	3	8	4,417
(<3 mi)	%	.	90	40	68	21	2	4	2	5	29
EEZ (>3	1000 Lbs	34	69	3,774	200	2,124	4,222	32	120	144	10,722
mi)	%	100	9	59	31	78	97	95	97	94	70
All	1000 Lbs	34	749	6,397	632	2,696	4,320	34	123	152	15,140
	%	100	100	100	100	100	100	100	100	100	100
92											
State	1000 Lbs	.	739	2,548	151	473	34	2	4	.	3,954
(<3 mi)	%	.	84	43	35	21	1	5	2	.	29
EEZ (>3	1000 Lbs	.	137	3,351	274	1,777	3,216	34	157	279	9,230
mi)	%	.	15	56	64	78	98	94	97	100	70
All	1000 Lbs	.	877	5,900	426	2,251	3,251	36	161	279	13,184
	%	.	100	100	100	100	100	100	100	100	100

0 = less than 1000 lbs
* = less than 1%
. = none

Source: Unpublished NMFS General Canvass data.

Table 18. Average ex-vessel commercial landings of Scup by month, Maine to Cape Hatteras, NC, 1983-1992.

	Water Area		
	State (<3 mi) 1,000 Lbs	EEZ (>3 mi) 1,000 Lbs	All 1,000 Lbs
MONTH			
JAN	5	1,165	1,171
FEB	4	1,168	1,172
MAR	2	1,749	1,752
APR	200	1,699	1,899
MAY	1,922	589	2,512
JUN	460	294	755
JUL	298	110	408
AUG	271	72	343
SEP	263	106	370
OCT	212	455	668
NOV	66	938	1,004
DEC	13	1,022	1,035
All	3,722	9,372	13,095

Source: Unpublished NMFS General Canvass data.

Table 19. Scup commercial landings by year and state.

	Year										
	83 1,000 Lbs	84 1,000 Lbs	85 1,000 Lbs	86 1,000 Lbs	87 1,000 Lbs	88 1,000 Lbs	89 1,000 Lbs	90 1,000 Lbs	91 1,000 Lbs	92 1,000 Lbs	93 1,000 Lbs
State											
ME	0	.	0	0	10	19	69	8	34	.	.
MA	1,480	1,191	853	1,364	1,165	706	685	975	749	877	653
RI	5,693	6,435	7,899	6,585	4,766	6,244	3,090	3,937	6,397	5,900	2,937
CT	108	70	90	146	663	791	196	364	632	426	326
NY	2,431	1,992	1,897	1,969	2,008	1,514	1,328	1,663	2,696	2,251	1,607
NJ	5,591	4,886	3,290	4,176	4,004	2,940	2,687	2,214	4,320	3,251	4,016
MD	28	12	36	30	0	2	2	9	34	36	23
VA	1,182	1,484	163	600	512	280	98	164	123	161	160
NC	665	1,054	596	378	248	128	32	179	152	279	116

0 = less than 1,000
. = none reported

Source: Unpublished NMFS General Canvass data.

Table 20. Average annual commercial landings of Scup by state, 1983-1992.

State	10 Year Average Landings 1,000 Lbs	Percent
ME	14	*
MA	1,005	7
RI	5,695	41
CT	349	2
NY	1,975	14
NJ	3,736	27
MD	19	*
VA	477	3
NC	371	2
All States	13,643	100

Source: Unpublished NMFS General Canvass data.

Table 21. The number ('000) of scup caught and landed by recreational anglers each year 1983-1994.

	Catch	Landings	% Catch released
1983	10,155	8,837	13
1984	7,775	6,057	22
1985	13,861	10,810	22
1986	30,872	24,823	20
1987	12,377	9,916	20
1988	7,539	6,062	20
1989	11,394	9,176	19
1990	10,172	8,043	21
1991	16,852	13,279	21
1992	10,077	7,764	23
1993	7,076	5,663	20
1994	5,650	4,270	24
Avg	11,983	9,558	

Source: Unpublished MRFSS data.

Table 22. Recreational landings ('000 lbs) of scup by year and region, Maine to North Carolina.

	Number			Weight		
	NA	MA	SA	NA	MA	SA
1983	3,465	5,372	0	2,502	3,750	0
1984	2,199	3,859	0	1,185	1,230	0
1985	5,655	5,155	0	3,243	2,850	0
1986	14,890	9,933	0	7,525	4,080	0
1987	7,512	2,402	2	4,854	1,343	1
1988	4,525	1,536	1	3,383	883	1
1989	5,259	3,909	9	3,564	1,990	3
1990	3,209	4,833	1	1,746	2,394	1
1991	7,823	5,449	7	5,003	3,082	2
1992	3,923	3,804	37	2,300	2,102	10
1993	3,702	1,946	16	2,275	920	3
1994	2,011	2,233	26	1,542	1,076	9
Avg	5,348	4,203	8	3,260	2,124	3

Source: Unpublished MRFSS data.

Table 23. The percent of total number and total weight of scup landed by marine recreational fishermen from state waters and the EEZ in each Atlantic coast subregion, 1983-1994.

		% of Total Number		% of Total Weight	
Subregion	Year	State	EEZ	State	EEZ
NA	1983	77	23	73	27
	1984	76	24	77	23
	1985	95	5	97	3
	1986	87	13	82	18
	1987	69	31	64	36
	1988	92	8	88	12
	1989	96	4	96	4
	1990	90	10	91	9
	1991	95	5	94	6
	1992	97	3	98	2
	1993	75	25	68	32
	1994	84	15	88	12
	Avg	86	14	85	15
MA	1983	58	41	48	51
	1984	100	0	100	0
	1985	98	2	100	0
	1986	97	3	96	4
	1987	98	2	98	2
	1988	97	3	96	4
	1989	93	7	95	5
	1990	93	7	94	6
	1991	94	6	94	7
	1992	99	1	99	1
	1993	98	2	98	2
	1994	85	15	85	15
	Avg	93	7	91	8

Source: Unpublished MRFSS data.

Table 24. The proportion (%) of scup caught and landed by recreational fishermen for each mode, 1983-1992 combined.

Mode	Catch (Number)	Landing (Number)	Landing (Weight)
Shore	11	11	6
Party/Charter	12	13	14
Private/Rental	77	75	80

Source: Unpublished MRFSS data.

Table 25. The average annual recreational landings of scup by state, 1983-1992.

State	1,000 lbs	%
ME	-	-
NH	-	-
MA	1,989	33.70
RI	429	7.27
CT	1,112	18.84
NY	2,204	37.35
NJ	130	2.21
DE	16	0.28
MD	3	0.04
VA	17	0.28
NC	2	0.03

Source: Unpublished MRFSS data.

Table 26. Ex-vessel value of scup commercial landings by year, Maine to Cape Hatteras, NC.

Year	Nominal Value 1,000 $	Nominal Price Mean	Mean Price in constant 1993 $
83	7,695	0.45	0.55
84	7,754	0.45	0.54
85	8,401	0.57	0.68
86	8,471	0.56	0.68
87	8,896	0.66	0.78
88	8,306	0.66	0.76
89	6,447	0.79	0.87
90	6,552	0.69	0.72
91	7,850	0.52	0.53
92	7,688	0.58	0.59
93	5,707	0.58	0.58
Avg	7,615	0.57	

Prices adjusted with PPI (1982=100)

Source: Unpublished NMFS General Canvass data.

Table 27. Average ex-vessel commercial landings of scup, value and price by month, Maine to Cape Hatteras, NC, 1983-1992.

	Water Area								
	State(<3mi)			EEZ(>3mi)			All		
MONTH	1000 Lbs	Value in constant 1992 $ ('000)	Mean price in constant 1992 $	1000 Lbs	Value in constant 1992 $ ('000)	Mean price in constant 1992 $	1000 Lbs	Value in constant 1992 $ ('000)	Mean price in constant 1992 $
JAN	5	7	1.24	1,165	791	0.68	1,171	798	0.68
FEB	4	3	0.87	1,168	743	0.64	1,172	747	0.64
MAR	2	1	0.72	1,749	1,100	0.63	1,752	1,102	0.63
APR	200	129	0.64	1,699	962	0.57	1,899	1,091	0.57
MAY	1,922	883	0.46	589	250	0.43	2,512	1,134	0.45
JUN	460	307	0.67	294	190	0.64	755	497	0.66
JUL	298	256	0.86	110	101	0.92	408	358	0.88
AUG	271	231	0.85	72	65	0.90	343	296	0.86
SEP	263	243	0.92	106	98	0.93	370	342	0.92
OCT	212	180	0.85	455	344	0.76	668	524	0.79
NOV	66	50	0.77	938	606	0.65	1,004	657	0.65
DEC	13	15	1.12	1,022	595	0.58	1,035	610	0.59
All	3,722	2,312	0.62	9,372	5,850	0.62	13,095	8,163	0.62

Prices adjusted with PPI (1982=100)

Source: Unpublished NMFS General Canvass data.

Table 28. Total landings and ex-vessel value for all finfish and shellfish, total landings and value for scup, and scup percent of total landings and value by state, 1993.

	All fish and finfish		Scup		Scup %	
	Total Landings (1,000 lbs)	Total Value ($1,000)	Total Landings (1,000 lbs)	Total Value ($1,000)	Total Landings	Total Value
ME	236,406	181,136	0	0	0.0	0.0
NH	10,971	11,836	a	a	b	b
MA	219,166	232,103	653	501	0.3	0.2
RI	120,756	76,320	2,937	1,558	2.4	2.0
CT	17,398	50,885	326	147	1.9	0.3
NY	54,340	54,163	1,607	1,115	3.0	2.1
NJ	196,101	96,288	4,016	2,233	2.0	2.3
DE	7,191	4,628	0	0	0.0	0.0
MD	84,938	53,399	23	10	b	b
VA	728,345	108,117	160	90	b	0.1
NC	164,883	57,890	116	54	0.1	0.1
Total	1,840,495	926,765	9,838	5,708	0.5	0.6

[a] less than 1,000

[b] less than 0.1%

Source: USDC 1995.
Unpublished NMFS General Canvass data.

Table 29. Ex-vessel value of scup commercial landings by year and water area, Maine to Cape Hatteras, NC, all gears combined.

	State <3 mi		EEZ >3mi		Total	
YEAR	1,000 $	% of Total	1,000 $	% of Total	1,000 $	% of Total
83	2,867	37	4,827	62	7,695	100
84	2,527	32	5,227	67	7,754	100
85	2,389	28	6,012	71	8,401	100
86	2,776	32	5,695	67	8,471	100
87	2,381	26	6,514	73	8,896	100
88	2,549	30	5,757	69	8,306	100
89	1,592	24	4,854	75	6,447	100
90	1,859	28	4,692	71	6,552	100
91	2,323	29	5,527	70	7,850	100
92	2,133	27	5,555	72	7,688	100
AVG	2,340	29	5,466	70	7,806	100

Source: Unpublished NMFS General Canvass data.

Table 30. Landings, ex-vessel value and price of scup by size category for 1993, all states and gears combined.

Size Category[1]	Landings (1,000 lbs)	Value ($ 1,000)	Price ($ /lb)
Jumbo	24	32	1.33
Large	1,189	1,099	0.92
Large/Mix	2,337	1,544	0.66
Medium	1,930	1,047	0.54
Small	2,184	617	0.28
Pins	141	25	0.18
Unclassified	1,818	1,245	0.68

[1] Parameters associated with size categories are determined by dealers and vary among ports. For example, in Cape May (NJ), the primary sizes ranges are: small 9" to .75 lb and large/mix >.75 lb. In Cape May, scup sometimes may be graded as follows: pins <9"; small 9" to .75 lb; medium .75 lb to 1.25 lbs; and large 1.25 lbs to 2 lbs (W. Makowski pers. comm.). In Point Judith (RI), scup is classified as follows: pins <.40 lb; small .40 lb to .49 lb; medium .50 lb to .74 lb; large .75 lb to 1.99 lbs; and jumbo >2 lbs (E. Hutchins pers. comm.).

Source: Unpublished NMFS Weighout data.

Table 31. The number of otter trawl vessels, trips, and associated pounds for a given threshold (pounds) of scup landings, 1992 and 1993.

1992

Threshold	Vessel	Trips	Pounds
>= 1	394	4,135	9,220,675
>= 200	287	1,961	9,120,186
>= 400	255	1,607	9,018,579
>= 600	230	1,408	8,922,550
>= 800	217	1,262	8,822,145
>= 1000	203	1,155	8,726,706
>= 4000	115	488	7,364,205
>= 5000	99	401	6,976,707
>= 10000	60	213	5,648,598

1993

Threshold	Vessel	Trips	Pounds
>= 1	427	4,802	8,260,554
>= 200	278	1,745	8,132,544
>= 400	245	1,412	8,038,801
>= 600	229	1,258	7,964,578
>= 800	211	1,117	7,867,326
>= 1000	197	1,015	7,776,723
>= 4000	117	462	6,649,490
>= 5000	105	388	6,319,130
>= 10000	68	206	5,000,346

Source: NMFS Weighout data.

Table 32. Scup - Otter Trawl Trips harvesting 1,000 pounds or more

Common Name	Pounds*	Species % of Total Pounds	Value	Species % of Total Value
SQUID (LOLIGO)	13,018,782	29.350%	7,284,066	30.199%
SCUP	8,726,706	19.674%	5,359,489	22.220%
MACKEREL, ATLANTIC	6,154,322	13.874%	937,815	3.888%
HAKE, SILVER	6,005,925	13.540%	2,621,675	10.869%
FLOUNDER, SUMMER	1,756,288	3.959%	2,893,398	11.996%
BUTTERFISH	1,327,231	2.992%	735,860	3.051%
ANGLER	1,072,460	2.418%	786,734	3.262%
BLUEFISH	1,057,301	2.384%	265,791	1.102%
FLOUNDER, WINTER	1,028,547	2.319%	989,719	4.103%
HAKE, RED	818,438	1.845%	215,078	0.892%
SKATES UNC	707,300	1.595%	70,080	0.291%
SEA BASS, BLACK	527,857	1.190%	485,966	2.015%
HERRING, ATLANTIC	394,617	0.890%	27,616	0.114%
FLOUNDER, YELLOWTAIL	283,940	0.640%	282,531	1.171%
COD	214,515	0.484%	190,671	0.791%
SQUID (ILLEX)	165,623	0.373%	42,347	0.176%
WEAKFISH, SQUETEAGUE	159,393	0.359%	122,011	0.506%
TAUTOG	153,497	0.346%	87,188	0.361%
DOGFISH (NK)	101,820	0.230%	17,607	0.073%
DOGFISH SPINY	99,379	0.224%	10,701	0.044%
LOBSTER	86,447	0.195%	313,335	1.299%
TILEFISH	63,173	0.142%	43,101	0.179%
EEL, CONGER	58,399	0.132%	15,301	0.063%
FLOUNDER, WITCH	54,691	0.123%	63,336	0.263%
FLOUNDER, SAND-DAB	47,298	0.107%	13,090	0.054%
SEA ROBINS	40,407	0.091%	9,945	0.041%
POUT, OCEAN	34,588	0.078%	5,396	0.022%
SCALLOP, SEA	32,234	0.073%	152,331	0.632%
HAKE, WHITE	30,625	0.069%	11,346	0.047%
OTHER FISH	20,590	0.046%	824	0.003%
CRAB, HORSESHOE	16,420	0.037%	1,675	0.007%
OTHER FISH	12,539	0.028%	8,407	0.035%
STURGEONS	9,249	0.021%	10,213	0.042%
CONCHS	8,872	0.020%	14,242	0.059%
SQUIDS (NS)	8,833	0.020%	4,459	0.018%
MENHADEN	8,545	0.019%	541	0.002%
CRAB, JONAH	8,151	0.018%	3,575	0.015%
FLOUNDERS (NK)	6,510	0.015%	4,235	0.018%
SHAD, AMERICAN	6,473	0.015%	2,304	0.010%
POLLOCK	4,540	0.010%	2,709	0.011%
MACKEREL, SPAN	4,211	0.009%	2,764	0.011%
BONITO	3,570	0.008%	1,219	0.005%
WHELK, KNOBBED	2,511	0.006%	1,365	0.006%
PUFFER, NORTHERN	2,313	0.005%	1,222	0.005%
SHARK, NK	1,785	0.004%	1,092	0.005%
WHELK, CHANNELED	1,193	0.003%	777	0.003%
JOHN DORY	1,026	0.002%	472	0.002%
BASS, STRIPED	940	0.002%	1,603	0.007%

Table 32 Continued. Scup - Otter Trawl Trips harvesting 1,000 pounds or more

Common Name	Pounds*	Species % of Total Pounds	Value	Species % of Total Value
FLOUNDER, AM. PLAICE	850	0.002%	554	0.002%
CUNNER	757	0.002%	66	0.000%
HERRING (NK)	706	0.002%	101	0.000%
WHITING, KING	699	0.002%	180	0.001%
SHARK, PORBEAGLE	687	0.002%	195	0.001%
SHARK, SANDBAR	556	0.001%	200	0.001%
WHITING, BLACK	515	0.001%	155	0.001%
SHARK, THRESHER	365	0.001%	102	0.000%
WOLFFISHES	340	0.001%	217	0.001%
SHARK, TIGER	321	0.001%	69	0.000%
CRAB, ROCK	227	0.001%	225	0.001%
CROAKER, ATLANTIC	171	0.000%	40	0.000%
REDFISH	165	0.000%	84	0.000%
PERCH, WHITE	160	0.000%	42	0.000%
TRIGGERFISH	145	0.000%	68	0.000%
HADDOCK	137	0.000%	122	0.001%
SWORDFISH	72	0.000%	243	0.001%
AMBER JACK	38	0.000%	24	0.000%
ALEWIFE	31	0.000%	2	0.000%
SPOT	20	0.000%	5	0.000%
DOGFISH SMOOTH	18	0.000%	8	0.000%
COBIA	15	0.000%	15	0.000%
SHARK, DUSKY	14	0.000%	4	0.000%
HAKE MIX RED & WHITE	5	0.000%	2	0.000%
CRAB, BLUE	5	0.000%	2	0.000%
TOTAL	44,357,093	100.000%	24,119,947	100.000%

Note: Records with Vessel identity unknown were excluded.
Number of Trips = 1,155.

Table 33. Scup commercial landings, value and price by state, 1993.

State	Landings 1,000'S	Ex-vessel Value 1,000'S	Price $/lb
NH	0	0	1.06
MA	653	501	0.77
RI	2,937	1,558	0.53
CT	326	147	0.45
NY	1,607	1,115	0.69
NJ	4,016	2,233	0.56
MD	23	10	0.44
VA	160	90	0.56
NC	116	54	0.46

0= less than 1,000

Source: Unpublished NMFS General Canvass data.

Table 34. Estimated cost data for otter trawlers that operated in the US mackerel fishery from 1989-1991 by gross tonnage.

Item	Vessel Size 5-50 $	GRT %	51-150 $	GRT %	>150 $	GRT %
Fixed Costs						
Gear	8,902	22.43	14,095	15.12	33,407	19.46
Electronics	3,509	8.84	3,385	3.62	8,352	4.87
Engine	3,123	7.87	9,216	9.88	26,951	15.70
Other hull costs	4,038	10.17	5,090	5.46	6,170	3.59
Insurance	7,800	19.65	21,095	22.63	34,256	19.95
Subtotal	27,372	68.95	52,881	56.72	109,146	63.57
Variable costs						
Fuel	6,371	16.05	26,624	28.56	42,656	24.84
Ice	3,534	8.90	7,584	8.13	11,160	6.50
Food	2,418	6.09	6,144	6.59	8,730	5.08
Subtotal	12,323	31.04	40,352	43.28	62,546	36.43
Total	39,695	100	93,233	100	171,692	100

[1] All values are in 1987 dollars.
[2] GRT=gross registered tonnage.

Source: Adapted from Walden 1993.

Table 35. Estimated number of party and charter boats operating along the Atlantic Coast and associated revenues by state, 1985.

State	Charter	Party	Revenues ('000 1985 $)
Maine	35	10	2,696
New Hampshire	19	21	3,226
Massachusetts	136	41	10,717
Rhode Island	78	6	4,164
Connecticut	46	15	3,753
New York	300	100	24,723
New Jersey	375	100	28,074
Delaware	80	12	2,511
Maryland	221	109	11,307
Virginia	200	30	5,196
North Carolina	136	10	4,376
Total	1,626	454	100,723

Source: Sport Fishing Institute 1988.

Table 36. Average total cost [a] for a day trip, by mode for selected states (1980-1989).

State	Pier	Beach	Mode Party	Charter	Rental	Private
New York	$16.09	$13.77	$43.35	$59.88	$78.19	$44.38
New Jersey	21.10	16.32	45.36	146.66	92.41	40.93
Delaware	34.15	44.44	69.69	73.66	b	40.33

[a] Travel and services (services might be composed of a combination of the following: costs for bait, tackle, cleaning, fuel, pier fees, and boat fees).
[b] Not enough observations for precise estimates.

Source: Adapted from Strand *et al.* 1991.

Table 37. Charter and party boat survey distribution and returns, 1990.

State	Number sent	Usable returns	Non-usable returns
ME	24	5	1
NH	21	5	-
MA	80	17	9
RI	15	7	2
CT	17	4	2
NY	92	24	3
NJ	159	51	6
PA	16	7	1
DE	14	3	-
MD	4	2	-
VA	143	44	5
NC	1	1	-
FL	6	2	1
Total	592	172	30

Table 38. Relative customer interest and success in catching selected species in 1989. (1 = Low, 2 = Somewhat Low, 3 = Moderate, 4 = Somewhat High, and 5 = High).

	Charter boats		Party boats	
Species	Interest (mean)	Success (mean)	Interest (mean)	Success (mean)
Large pelagics (marlin, tunas)	3.9	2.4	3.1	2.8
Sharks (other than dogfish)	3.2	2.4	2.1	1.9
Bluefish	3.9	3.9	4.6	4.0
Atlantic mackerel	2.4	3.0	3.5	3.5
Summer flounder	3.2	1.9	3.6	1.5
Scup	1.4	1.7	2.2	2.0
Black sea bass	2.1	2.6	3.2	2.9
Hakes	1.4	1.6	2.3	2.5
Groundfish (cod, haddock, yellowtail)	3.0	2.6	3.0	2.4
Weakfish	3.1	1.7	3.3	1.7
Striped bass	3.7	2.5	3.5	1.7
Other: spot	4.6	3.9	4.7	3.4

Table 39. Party and charter boat operating experience in 1985 and 1989.

	Charter 1985 (mean)	Charter 1989 (mean)	Party 1985 (mean)	Party 1989 (mean)
Ave. number of trips per year	57.0	50.0	142.0	130.0
Ave. number of trips per day OR	1.0	1.0	1.3	1.4
Ave. number of days per trip	1.1	1.1	1.2	1.3
Ave. number days fishing per week	3.2	3.1	5.0	4.6
Ave. number of anglers per trip	5.2	5.1	20.9	19.5
Ave. trip price per customer ($)	121.8	149.5	26.2	29.2
Ave. number of fish Taken per customer	10.9	8.3	15.2	9.9
Ave. number of crew members	1.4	1.4	2.1	2.0
Ave. cost of fuel & supplies ($)	96.1	131.1	113.3	146.6

Table 40. Commercial and recreational catch, landings, and discards ('000 lbs), 1983-1994.

	Commercial		Recreational		Total
Year	Landings	Disard	Landings	Discard	Catch
83	17,183	-	6,252	124	-
84	17,128	4,744	2,417	88	24,377
85	14,828	9,233	6,145	140	30,346
86	15,252	4,418	11,605	103	31,378
87	13,380	5,598	6,198	260	25,436
88	12,628	3,662	4,267	424	20,981
89	8,192	4,791	5,557	231	18,771
90	9,518	8,547	4,140	156	22,361
91	15,140	7,793	8,088	201	31,222
92	13,184	12,674	4,412	164	30,435
93	9,147	3,161	3,203	326	15,837
94	9,861	-	2,628	197	-
Avg 88-92	11,732	7,494	5,293	235	24,754

- = no estimates available

Source: NMFS weighout and MRFSS data and NEFSC (1995)

Table 41. The percent of measured scup (TL) less than a given size based on 1983-1993 NEFSC weighout data.

Year	< 7.0	< 8.0	< 9.0	< 10.0	N
1983	1.5	10.2	28.9	53.2	7,860
1984	1.4	11.4	32.1	53.1	6,303
1985	6.0	20.4	36.5	56.7	3,058
1986	0.3	3.1	9.9	48.7	5,467
1987	1.8	8.4	34.6	65.2	6,491
1988	0.9	7.1	32.3	64.0	8,691
1989	0.3	9.8	29.9	55.3	4,806
1990	1.4	11.4	38.7	72.4	4,736
1991	0.1	7.6	38.3	69.9	3,150
1992	1.6	33.1	58.1	82.7	3,260
1993	0.9	28.3	57.3	81.0	2,287

Table 42. The percent of measured scup (TL) less than a given size based on 1982-1994 North Carolina winter trawl data.

Fishing Season	< 7.0	< 8.0	< 9.0	< 10.0	N
1982-1983	1.1	16.7	43.4	67.0	280,569
1983-1984	1.7	20.5	44.8	65.7	316,294
1984-1985	5.1	49.1	83.8	92.2	209,902
1985-1986	1.6	10.9	31.0	50.8	113,944
1986-1987	17.1	20.2	34.2	52.4	152,994
1987-1988	16.9	21.4	46.2	78.0	96,060
1988-1989	57.0	74.4	90.2	97.1	38,826
1989-1990	4.5	13.3	33.3	67.7	87,877
1990-1991	3.0	25.2	58.8	82.9	224,146
1991-1992	6.7	37.2	80.2	89.8	130,715
1992-1993	15.9	42.8	66.8	81.9	223,642
1993-1994	4.8	24.3	65.9	88.1	389,097

Table 43. The percent of measured scup (TL) less than a given size based on 1983-1991 NEFSC weighout data for each state.

State	< 7.0	< 8.0	< 9.0	< 10.0	N
MA	0.4	6.0	22.4	81.8	1,010
RI	0.2	5.8	13.3	48.9	17,436
CT	-	-	-	-	-
NY	1.6	8.9	29.7	59.1	2,438
NJ	1.7	10.4	37.3	67.1	23,533
DE	-	-	-	-	-
MD	2.0	41.0	92.0	100.0	100
VA	3.2	16.0	24.8	54.8	6,045

Table 44. The percent of measured scup (TL) less than a given size based on 1983-1991 NEFSC weighout data for each major gear type.

Gear	< 7.0	< 8.0	< 9.0	< 10.0	N
Handline	0.0	1.0	13.2	43.2	486
Otter Trawl, Bottom	1.4	9.5	19.3	59.1	48,077
Float Traps	0.0	13.6	25.9	59.2	316
Pound Nets	0.6	8.4	30.8	97.7	704
Otter Trawl, Mid-Water	0.4	0.6	8.7	37.5	472
Pot/Traps	0.0	6.3	19.3	66.9	507

Table 45. The average length (L_{50}) at which scup are first fully recruited to the trawl fishery by mesh size. Estimates are based on retention lengths as derived by Mayo (1982).

Mesh Size	Total Length
1.5	3.9
2.0	4.8
2.5	5.7
3.0	6.5
3.5	7.4
4.0	8.3
4.5	9.1
5.0	10.1
5.5	10.9

Note: Mesh sizes are inside stretch measurements.

Note: Total lengths were derived from fork lengths using the following relationship (Hamer 1979): TL = 1.14(FL)-0.44.

Table 46. Summary of scup discards by mesh size based on 1989-1993 NEFSC Sea Sampling data.

Mesh (In)	No. of Tows	Total No. Scup	% scup < 9"	% scup Discarded
liner*	97	8,025	78	78
2	25	2,023	72	74
3	34	3,305	93	93
4	10	818	47	40
4.5	2	196	65	48

*liner sizes ranged from 1.0 - 2.0 inches

Table 47. Catch composition (%) for scup otter trawl trips, 1983-1987 average.

Species	>0 Lbs/Trip	>100 Lbs/Trip	>250 Lbs/Trip	>500 Lbs/Trip	>1,000 Lbs/Trip
Black sea bass	1	1	1	1	1
Scup	17	26	31	36	41
Bluefish	2	2	2	2	2
Butterfish	7	8	8	8	8
Croaker	*	*	*	*	*
Winter flounder	6	4	3	3	2
Summer flounder	20	16	13	11	9
Mackerel	4	6	7	8	9
Weakfish	*	*	*	*	*
Tautog	*	*	*	*	*
Whiting	12	10	9	8	7
Lobster	*	*	*	*	*
Sea scallop	*	*	*	*	*
Loligo	17	18	18	18	17
Other	12	8	7	5	4
Trips	13,183	6,459	4,959	3,881	2,911

* = less than 0.5%.

Source: NMFS NEFC Weighout data.

Table 48. The number of otter trawl vessels, trips, and associated pounds for a given threshold (pounds) of scup landings, 1992 and 1993.

1992

Threshold	Vessel	Trips	Pounds
> = 1	394	4,135	9,220,675
> = 200	287	1,961	9,120,186
> = 400	255	1,607	9,018,579
> = 600	230	1,408	8,922,550
> = 800	217	1,262	8,822,145
> = 1000	203	1,155	8,726,706
> = 4000	115	488	7,364,205
> = 5000	99	401	6,976,707
> = 10000	60	213	5,648,598

1993

Threshold	Vessel	Trips	Pounds
> = 1	427	4,802	8,260,554
> = 200	278	1,745	8,132,544
> = 400	245	1,412	8,038,801
> = 600	229	1,258	7,964,578
> = 800	211	1,117	7,867,326
> = 1000	197	1,015	7,776,723
> = 4000	117	462	6,649,490
> = 5000	105	388	6,319,130
> = 10000	68	206	5,000,346

Source: NMFS Weighout data.

Table 49. The percent of otter trawl vessels, trips, and associated pounds for a given threshold (pounds) of scup landings, 1992 and 1993.

1992

Threshold	Vessel	Trips	Pounds
> = 1	100	100	100
> = 200	73	47	99
> = 400	65	39	98
> = 600	58	34	97
> = 800	55	31	96
> = 1000	52	28	95
> = 4000	29	12	80
> = 5000	25	10	76
> = 10000	15	5	61

1993

Threshold	Vessel	Trips	Pounds
> = 1	100	100	100
> = 200	65	36	98
> = 400	57	29	97
> = 600	54	26	96
> = 800	49	23	95
> = 1000	46	21	94
> = 4000	27	10	80
> = 5000	25	8	76
> = 10000	16	4	61

Source: NMFS Weighout data

Table 50. The number of otter trawl vessels, trips, and associated pounds for a given threshold (pounds) of *Loligo* landings, 1992 and 1993.

1992

Threshold	Vessel	Trips	Pounds
> = 1	383	5,608	39,548,368
> = 200	313	3,794	39,426,206
> = 400	283	3,187	39,252,701
> = 600	260	2,806	39,066,885
> = 800	245	2,529	38,875,824
> = 1000	229	2,352	38,716,974
> = 2500	172	1,644	37,605,209
> = 5000	139	1,159	35,857,109
> = 10000	110	719	32,697,193

1993

Threshold	Vessel	Trips	Pounds
> = 1	430	7,400	48,305,947
> = 200	370	5,015	48,156,477
> = 400	328	4,260	47,938,730
> = 600	308	3,790	47,708,294
> = 800	295	3,844	47,500,127
> = 1000	285	3,223	47,265,249
> = 2500	234	2,226	45,671,028
> = 5000	197	1,494	43,069,430
> = 10000	153	921	39,002,004

Source: NMFS Weighout data.

Table 51. The percent of otter trawl vessels, trips, and associated pounds for a given threshold (pounds) of *Loligo* landings, 1992 and 1993.

1992

Threshold	Vessel	Trips	Pounds
> = 1	100	100	100
> = 200	82	68	100
> = 400	74	57	99
> = 600	68	50	99
> = 800	64	45	98
> = 1000	60	42	98
> = 2500	45	29	95
> = 5000	36	21	91
> = 10000	29	13	83

1993

Threshold	Vessel	Trips	Pounds
> = 1	100	100	100
> = 200	86	68	100
> = 400	76	58	99
> = 600	72	51	99
> = 800	69	52	98
> = 1000	66	44	98
> = 2500	54	30	95
> = 5000	46	20	89
> = 10000	36	12	81

Source: NMFS Weighout data.

Table 52. Landings by species for all otter trawl trips harvesting 2,500 pounds or more of *Loligo*, 1992.

Common Name	Pounds*	Species % of Total Pounds	Value	Species % of Total Value
SQUID (*LOLIGO*)	37,605,209	48.861%	21,946,834	51.956%
HAKE, SILVER	9,431,248	12.254%	4,082,811	9.665%
MACKEREL, ATLANTIC	7,063,093	9.177%	1,214,848	2.876%
SCUP	4,685,335	6.088%	3,186,156	7.543%
BUTTERFISH	3,983,006	5.175%	2,510,065	5.942%
SQUID (*ILLEX*)	3,963,974	5.150%	1,137,752	2.693%
FLOUNDER, SUMMER	2,195,269	2.852%	3,595,796	8.513%
ANGLER	1,379,661	1.793%	922,119	2.183%
BLUEFISH	1,150,885	1.495%	287,213	0.680%
HAKE, RED	1,114,031	1.447%	303,351	0.718%
FLOUNDER, WINTER	1,008,942	1.311%	969,747	2.296%
SKATES UNC	641,492	0.834%	64,277	0.152%
SEA BASS, BLACK	502,602	0.653%	456,282	1.080%
HERRING, ATLANTIC	428,410	0.557%	38,235	0.091%
FLOUNDER, YELLOWTAIL	393,679	0.512%	405,059	0.959%
COD	218,049	0.283%	204,273	0.484%
DOGFISH (NK)	190,695	0.248%	25,416	0.060%
TILEFISH	175,398	0.228%	97,953	0.232%
WEAKFISH, SQUETEAGUE	96,904	0.126%	92,866	0.220%
EEL, CONGER	93,578	0.122%	19,914	0.047%
TAUTOG	93,516	0.122%	59,635	0.141%
FLOUNDER, WITCH	89,113	0.116%	109,019	0.258%
LOBSTER	72,531	0.094%	277,736	0.657%
HAKE, WHITE	65,306	0.085%	23,264	0.055%
POUT, OCEAN	51,657	0.067%	8,548	0.020%
WHITING, BLACK	40,206	0.052%	10,258	0.024%
SEA ROBINS	39,423	0.051%	10,135	0.024%
FLOUNDER, SAND-DAB	21,551	0.028%	6,172	0.015%
OTHER FISH	20,590	0.027%	824	0.002%
SCAllOP, SEA	19,941	0.026%	101,002	0.239%
DOGFISH SPINY	16,350	0.021%	1,512	0.004%
OTHER FISH	10,387	0.013%	4,746	0.011%
POLLOCK	10,066	0.013%	5,266	0.012%
CONCHS	9,005	0.012%	11,410	0.027%
CROAKER, ATLANTIC	6,844	0.009%	1,383	0.003%
STURGEONS	6,338	0.008%	7,469	0.018%
FLOUNDER, AM. PLAICE	5,954	0.008%	7,768	0.018%
SHAD, AMERICAN	5,762	0.007%	2,398	0.006%
DOGFISH SMOOTH	5,349	0.007%	1,782	0.004%
SHARK, SANDBAR	5,225	0.007%	1,859	0.004%
SQUIDS (NS)	5,209	0.007%	2,738	0.006%
MENHADEN	4,900	0.006%	294	0.001%
JOHN DORY	4,490	0.006%	2,502	0.006%
MACKEREL, SPAN	4,141	0.005%	2,730	0.006%
WHITING, KING	4,102	0.005%	811	0.002%
WOLFFISHES	3,802	0.005%	2,304	0.005%

Table 52 (continued). Landings by species for all otter trawl trips harvesting 2,500 pounds or more of *Loligo*, 1992.

Common Name	Pounds*	Species % of Total Pounds	Value	Species % of Total Value
HADDOCK	3,335	0.004%	747	0.002%
SWORDFISH	2,829	0.004%	8,022	0.019%
PUFFER, NORTHERN	2,313	0.003%	1,237	0.003%
BONITO	1,946	0.003%	623	0.001%
HERRING (NK)	1,506	0.002%	240	0.001%
SHARK, NK	1,460	0.002%	1,664	0.004%
SHARK, THRESHER	1,400	0.002%	1,076	0.003%
REDFISH	869	0.001%	523	0.001%
BASS, STRIPED	698	0.001%	1,214	0.003%
SHARK, BLACK TIP	666	0.001%	120	0.000%
CUNNER	598	0.001%	51	0.000%
SHARK, DUSKY	582	0.001%	91	0.000%
CRAB, JONAH	425	0.001%	309	0.001%
COBIA	207	0.000%	267	0.001%
CRAB, ROCK	172	0.000%	170	0.000%
SPOT	170	0.000%	42	0.000%
TRIGGERFISH	145	0.000%	68	0.000%
FLOUNDER, FOURSPOT	102	0.000%	19	0.000%
SHARK, PORBEAGLE	97	0.000%	52	0.000%
FLOUNDERS (NK)	59	0.000%	60	0.000%
CRAB, HORSESHOE	40	0.000%	4	0.000%
ALEWIFE	31	0.000%	2	0.000%
HALIBUT, ATLANTIC	29	0.000%	40	0.000%
SHARK, MAKO SHORTFIN	15	0.000%	46	0.000%
MACKEREL, KING	10	0.000%	9	0.000%
TUNA, ALBACORE	9	0.000%	4	0.000%
CUSK	6	0.000%	2	0.000%
WHELK, CHANNELED	6	0.000%	5	0.000%
WHELK, KNOBBED	6	0.000%	4	0.000%
Total	76,962,949	100.000%	42,241,243	100.000%

Note: Records with unknown vessel identity were excluded.
Number of Trips = 1,644.

Source: NMFS Weighout data.

Table 53. The minimum theoretical size of scup (TL inches) that would be retained by a fish trap fitted with circular or square escape vents (inches). The derived lengths are based on the body depth/total length relationship for scup derived by Smith and Norcross (1968).

Scup Size	Circular Vent Diameter	Square Vent Sides
8	2.7	2.0
9	3.1	2.25

Table 54. Closed seasons necessary to achieve the third year reduction in exploitation for scup.

Gear	Closed Season	% Reduction 0% Rec	% Reduction 15% Rec
Otter Trawl	Nov 15 - Jan 31	28	15
	Oct 15 - Feb 7	38	28
Float Traps	Apr 1 - May 7	34	-
Pair trawls	Mar 1 - May 31	28	15
	Mar 1 - Jun 15	39	28
Pots/Traps	Jun 1 - Jul 31	29	-
Pound Nets	Jun 1 - Jul 21	30	-
Hand Lines	May 1 - Jul 31	32	20
	May 1 - Aug 7	38	27

Table 55. Scup landings (lbs), 5 year average by 3-digit statistical area and month, 1989-1993 combined[1], all gears.

AREA	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct
511	0	0	0	8	0	0	0	0	0	0
513	0	0	0	0	0	0	0	0	0	29
514	44.6	0	7	148.4	145.6	89.8	225.8	0	45.2	1292.4
515	0	0	0	0	0	0	0	0	50	0
521	21	0.2	0	364.8	3365.2	1983	253.8	314.2	552	423.2
522	0	0	0	0	28	0	0.2	347.8	105	2
525	13	0.8	44.2	22.4	4915	132.2	0.4	0	2	1
526	1318.6	871.6	19670.6	20771.6	5921.6	552	1.8	19.4	45.2	478.4
533	0	0	0	1366.6	0	0	0	0	0	0
537	111272.2	38821	49957.4	224882.2	144395.6	33633.6	18960.4	26696	37139.4	162868.2
538	0	0	0	32976.8	372337.8	174723	81955.2	72576	78039.4	110121.2
539	6500	4930.4	1574.4	222991.8	1031981	91734.2	100660.8	92690.6	88524.8	119665.8
562	0	0	0	0	365.6	0.6	0	0	8	1.6
611	2900	2060	5275	10003.2	29083	50841	43046.4	43059.4	43262.6	30837.2
612	1884.4	1299.6	7	13472.6	4009	996.8	364	5069.4	4960.6	22442.6
613	42803	18995.4	19765	111771.2	52949.6	46063.8	30746.4	19597	19255.2	69248.2
614	0	67	0	0	42.6	12	3	5	603.2	14711.8
615	3474.8	41666.8	29706	4767.6	6	12.8	0	0	7.6	1612
616	335374.6	262188.6	519090	588786	87218.6	14176	21250.2	0	223.2	16597.2
621	1657.6	3821	7783.2	8674	67.4	481.2	55.2	59.2	4813	12900.8
622	439379.8	466022.2	668078	356914.2	9842.4	0	0	0	0	338
623	14149.2	14118.6	3827	308	0	0	0	0	0	0
625	27	0	0	169	24.6	10.2	192.6	1100.6	559.8	2441.8
626	10243.6	16942	67470.4	25550	844.2	0	0	0	0	55
627	0	0	460	0	0	0	0	0	0	0
631	259.6	106.8	157.4	0	0	0	0.2	2	31	244.2
632	2443.8	762.2	5858.2	234.8	0	0	0	0	0	0
635	141.6	1.6	0	0	0	0	0	0	0	0
ALL	973908.4	872675.8	1398731	1624183	1747543	415442.2	297716.4	261536.6	278227.2	566311.6
PERCENT	9.4%	8.4%	13.5%	15.7%	16.9%	4.0%	2.9%	2.5%	2.7%	5.5%

[1]Excludes landings for unknown area and/or month. This figure represents 93.9% of the total scup landings between 1989-1993.

Source: NMFS Unpublished Weighout data.

Table 56. Scup harvests and discards (lbs) by 3-digit area, 1989 - 1993 combined, All Gears.

	Sea Sampling data					Weighout data	
Area	Number Of Tows	5-year Total Catch	Percent Of Catch	5-year Total Discards	Percent Discarded	5-year Total Landings[1]	Percent Of Landings
511	0	0	0.0%	0	-	40	0.0%
513	17	25	0.0%	19	76.0%	379	0.0%
514	33	672	0.1%	46	6.8%	33,037	0.1%
515	1	678	0.1%	0	0.0%	250	0.0%
521	11	27	0.0%	27	100.0%	40,590	0.1%
522	2	3	0.0%	0	0.0%	2,415	0.0%
525	1	1	0.0%	0	0.0%	25,680	0.0%
526	40	2,217	0.3%	1,531	69.1%	266,241	0.5%
533	0	0	0.0%	0	-	6,833	0.0%
537	400	104,937	16.3%	41,342	39.4%	6,483,160	12.5%
538	109	34,017	5.3%	22,547	66.3%	4,749,370	9.2%
539	225	15,920	2.5%	6,586	41.4%	10,262,073	19.9%
562	0	0	0.0%	0	-	1,894	0.0%
611	22	2,817	0.4%	2,162	76.7%	1,404,701	2.7%
612	11	124	0.0%	102	82.3%	618,588	1.2%
613	352	183,822	28.5%	91,831	50.0%	4,023,524	7.8%
614	31	1,462	0.2%	932	63.7%	83,162	0.2%
615	9	32,657	5.1%	1,816	5.6%	610,589	1.2%
616	339	167,461	25.9%	82,599	49.3%	11,586,987	22.4%
621	247	12,526	1.9%	11,806	94.3%	272,263	0.5%
622	201	67,843	10.5%	26,927	39.7%	10,311,362	20.0%
623	13	16,406	2.5%	15,145	92.3%	163,088	0.3%
625	21	96	0.0%	77	80.2%	25,727	0.0%
626	43	1,863	0.3%	1,094	58.7%	628,449	1.2%
627	0	0	0.0%	0	-	2,300	0.0%
631	17	39	0.0%	13	33.3%	5,476	0.0%
632	9	20	0.0%	9	45.0%	57,280	0.1%
635	8	71	0.0%	66	93.0%	742	0.0%
ALL	**2,162**	**645,704**	**100.0%**	**306,677**	**47.5%**	**51,666,200**	**100.0%**

Source: NMFS Unpublished Sea Sampling and Weighout Data.

[1] Excludes landings for unknown area and/or month. This figure represents 93.9% of the total scup landings between 1989-1993.

Table 57. Hypothetical scenario developed to assess the impacts of a change in the commercial discard rate on the commercial quota and recreational harvest limit from allocations based on catch or landings.

Allocations based on catches

Comm. Discards	TAC	Comm. TAC	Comm. Discards	Comm. Quota	Rec. TAC	Rec. Discards	Rec. Harvest Limit
Average	16.83	13.13	7.49	5.64	3.70	0.24	3.46
+30%	16.83	13.13	9.74	3.39	3.70	0.24	3.46
- 30%	16.83	13.13	5.24	7.89	3.70	0.24	3.46

Allocations based on landings

Comm. Discards	TAC	Discards	Total Harvest Limit	Comm. Quota	Rec. Harvest Limit
Average	16.83	7.73	9.10	6.37	2.73
+30%	16.83	9.98	6.85	4.80	2.06
-30%	16.83	5.48	11.35	7.95	3.41

Table 58. State shares of a coastwide quota of 5.64 million pounds. Shares are based on five years of landings data, 1988-1992.

State	%	lbs
ME	0.22	12,398
MA	6.81	383,779
RI	43.60	2,457,088
CT	4.11	231,620
NY	16.12	908,446
NJ	26.28	1,481,015
MD	0.14	7,890
VA	1.41	79,461
NC	1.31	73,825
Total	100.00	5,635,522

Table 59. Bimonthly allocations based on a coastwide quota of 5.64 million pounds. Shares are based on ten years of bimonthly landings data, 1988-1992.

Bimonthly Period	%	lbs
Jan - Feb	18.0	1,014,394
Mar - Apr	30.4	1,713,199
May - June	22.4	1,262,357
Jul - Aug	5.3	298,683
Sep - Oct	7.3	411,393
Nov - Dec	16.6	935,497
Total	100.0	5,635,522

Table 60. Average Bimonthly Landings by State, Maine to Cape Hatteras, NC. Percentage of Total Scup Landings by Period, 1988-1992.

State	Jan - Feb	Mar - Apr	May - Jun	Jul - Aug	Sep - Oct	Nov - Dec
ME	0.1%	0.3%	0.5%	0.0%	0.0%	0.3%
NH	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
MA	0.0%	1.1%	9.2%	22.9%	15.9%	0.6%
RI	22.4%	34.7%	80.6%	38.4%	49.3%	51.0%
NY	14.0%	13.2%	8.1%	38.4%	29.1%	24.8%
NJ	58.2%	44.5%	1.6%	0.3%	5.2%	22.5%
MD	0.2%	0.3%	0.0%	0.0%	0.1%	0.1%
VA	3.7%	2.4%	0.0%	0.0%	0.5%	0.3%
NC	1.4%	3.6%	0.0%	0.0%	0.0%	0.5%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Source: Unpublished NMFS General Canvass data.

Table 61. Average Bimonthly Landings of Scup, Maine - Cape Hatteras, NC. Percentage of Total Landings by State, 1988-1992.

	Jan - Feb	Mar - Apr	May - Jun	Jul - Aug	Sep - Oct	Nov - Dec	Total
ME	3.9%	33.5%	43.8%	0.0%	0.0%	18.7%	100.0%
NH	0.0%	0.0%	11.8%	0.0%	88.2%	0.0%	100.0%
MA	0.0%	7.1%	42.1%	24.9%	23.8%	2.1%	100.0%
RI	8.6%	22.6%	38.6%	4.4%	7.7%	18.1%	100.0%
NY	15.1%	24.1%	10.9%	12.2%	12.8%	24.8%	100.0%
NJ	36.7%	47.5%	1.3%	0.0%	1.3%	13.1%	100.0%
MD	23.0%	66.8%	0.1%	0.2%	2.9%	7.1%	100.0%
VA	45.2%	48.1%	0.2%	0.1%	2.5%	3.8%	100.0%
NC	18.1%	76.4%	0.0%	0.1%	0.0%	5.3%	100.0%

Source: Unpublished NMFS General Canvass data.

Table 62. The percent of measured scup (TL) less than a given size based on 1990-1994 MRFSS intercept data for each state.

State	< 7.0	< 8.0	< 9.0	< 10.0	N
ME	-	-	-	-	-
NH	-	-	-	-	-
MA	0.9	5.9	27.2	57.8	3,184
RI	4.3	13.7	33.6	63.0	3,418
CT	0.8	4.1	22.9	56.3	1,358
NY	4.1	16.3	38.9	67.8	5,171
NJ	5.7	35.1	82.9	94.8	995
DE	5.7	53.9	85.5	97.5	401
MD	0.0	27.8	88.9	100.0	18
VA	24.7	51.0	84.5	100.0	239
NC	21.6	57.6	79.2	91.2	125
Coast	3.8	15.6	39.1	66.9	14,909

Table 63. The percent reduction in exploitation associated with various size limits for scup, 1990-1994. The reductions are based on measured fish from the MRFSS survey and assume a post-release mortality of 15%. The number in parentheses is the sample size.

Size (TL)	Coast (14,909)
7	3.2
8	13.2
9	33.2
10	56.9

Table 64. The percent of successful anglers landing 1 to 200 scup (MRFSS A fish) per day, coastwide, 1990-1994.

Catch Per Trip	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	1,138	23.6	1,138	23.6
2	549	11.4	1,687	35.1
3	453	9.4	2,140	44.5
4	262	5.4	2,402	49.9
5	277	5.8	2,679	55.7
6	203	4.2	2,882	59.9
7	119	2.5	3,001	62.4
8	172	3.6	3,173	65.9
9	80	1.7	3,253	67.6
10	167	3.5	3,420	71.1
11	59	1.2	3,479	72.3
12	102	2.1	3,581	74.4
13	61	1.3	3,642	75.7
14	47	1.0	3,689	76.7
15	176	3.7	3,865	80.3
16	50	1.0	3,915	81.4
17	43	0.9	3,958	82.3
18	43	0.9	4,001	83.1
19	24	0.5	4,025	83.6
20	73	1.5	4,098	85.2
21	16	0.3	4,114	85.5
22	16	0.3	4,130	85.8
23	28	0.6	4,158	86.4
24	45	0.9	4,203	87.3
25	46	1.0	4,249	88.3
26	31	0.6	4,280	88.9
27	29	0.6	4,309	89.5
28	18	0.4	4,327	89.9
29	9	0.2	4,336	90.1
30	84	1.7	4,420	91.9
31	17	0.4	4,437	92.2
32	12	0.2	4,449	92.5
33	15	0.3	4,464	92.8
34	8	0.2	4,472	92.9
35	12	0.2	4,484	93.2
36	24	0.5	4,508	93.7
37	7	0.1	4,515	93.8
38	8	0.2	4,523	94.0

Table 64 (continued). The percent of successful anglers landing 1 to 200 scup (MRFSS A fish) per day, coastwide, 1990 - 1994.

Catch per Trip	Frequency	Percent	Cumulative Frequency	Cumulative Percent
39	9	0.2	4,532	94.2
40	29	0.6	4,561	94.8
41	12	0.2	4,573	95.0
42	10	0.2	4,583	95.2
43	4	0.1	4,587	95.3
44	10	0.2	4,597	95.5
45	16	0.3	4,613	95.9
46	1	0.0	4,614	95.9
47	4	0.1	4,618	96.0
48	6	0.1	4,624	96.1
49	2	0.0	4,626	96.1
50	47	1.0	4,673	97.1
51	4	0.1	4,677	97.2
52	4	0.1	4,681	97.3
53	4	0.1	4,685	97.4
54	11	0.2	4,696	97.6
55	10	0.2	4,706	97.8
56-200	106	2.2	4,812	100.0

Table 65. The percent reduction in exploitation associated with various possession limits for scup, 1990-1992. The reductions assume a post-release mortality of 15%.

Bag	Coast
1	76.9
2	70.8
3	65.6
4	61.2
5	57.2
6	53.6
7	50.4
8	47.4
9	44.7
10	42.1
11	39.7
12	37.5
13	35.5
14	33.5
15	31.7
16	30.1
17	28.6
18	27.2
19	25.8
20	24.5
21	23.3
22	22.2
23	21.0
24	19.9
25	18.9
26	18.0
27	17.1
28	16.3
29	15.5
30	14.7
31	14.0
32	13.4
33	12.8
34	12.2
35	11.6
36	11.1
37	10.6
38	10.1
39	9.6
40	9.1
41	8.7
42	8.3
43	7.9
44	7.6
45	7.2
46	6.9
47	6.5
48	6.2
49	5.9
50	5.6

Table 66. Scup recreational landings number by wave, 1990-1994 combined.

	% of Total
J - F	*
M - A	0
M - J	9.8
J - A	45.7
S - O	43.0
N - D	1.6

* = None landed
0 = less than 1%

Table 67. Estimated commercial scup landed value as a percentage of the total port landings for all species for selected ports from Gloucester, Massachusetts, to Hampton Roads, Virginia, all gears combined, 1992.

Port Group	Scup % of Port Value[a]
Freeport/Brooklyn	10.46
Montauk	6.41
Point Judith	5.43
Cape May	3.13
Stonington	2.25
Monmouth	1.79
Other Wash.	1.28
Barnstable	0.80
Pt. Pleasant	.56
Hampton Roads	.28
Ocean City	.22
New Bedford	.01
Barnegat Light	.01
Gloucester	.00

[a] Ports for which there is confidential data have been removed, including Newport.

Source: Adapted from Finlayson and McCay 1994.

Table 68. Estimated commercial scup landed value as a percentage of the of total port landed value of scup for selected ports from Gloucester, Massachusetts, to Hampton Roads, Virginia, all gears combined, 1992.

	Scup
Port Group	% of Port Value*
Point Judith	26.16
Montuak	23.18
Cape May	15.35
Freeport/Brooklyn	5.74
Barnstable	3.50
Other Wash.	3.46
Stonington	2.18
Monmouth	2.30
Hampton Roads	1.22
Pt. Pleasant	1.21
Ocean City	.24
New Bedford	.18
Barnegat Light	.01
Gloucester	.00

*Ports for which there is confidential data have been removed, including Newport.

Source: Adapted from Finlayson and McCay 1994.

Table 69. Estimated percentage of commercial landings of scup by port and gear for selected ports, 1992[a].

Port	Gear[b]	Port/Gear	All Scup
Pt. Judith	OT	7.25%	23.47%
	Pots	95.12%	2.48%
	FT/PN	65.02%	.15%
Other Wash./RI	Pots	93.16%	.71%
Montauk	H&L	5.39%	3.56%
	OT	10.35%	19.12%
	FT/PN	15.28%	.47%
Freeport/Brooklyn	OT	21.89%	5.74%
Monmouth	OT	9.28%	2.29%
Cape May	OT	7.94%	15.35%

Source: Adapted from Finlayson and McCay 1994.

[a]Criteria for port selection (ports considered ranged from Gloucester, MA to Hampton Roads, VA): Percent landed value of all fish caught per gear type, per Port (>5%); percent landed value of all scup caught in the region (>5%), 1992.

[b]Legend: H&L = hook and line; OT = otter trawls; Pots = pots, fish pots, lobster pots, FT/PN = fish traps, pond nets.

Note: An example of how to read this table: Scup represented 7.25% of the landed value of fish caught with otter trawls in Port Judith, RI and Point Judith otter trawls caught 23.47% of the landed value of scup throughout the region.

Table 70. Cetaceans and Turtles found in Survey Area.

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

Source: University of Rhode Island 1982.

Table 71. Overview of State laws for scup, Maine to North Carolina. (Note that this table is only a summary of State regulations. Fishermen should contact State agencies to obtain a complete copy of regulations applicable to scup in their State.)

Maine

Size limits	None.
Gear restrictions	5.5" minimum mesh size for trawls, scottish seines, bottom-tending gillnets and bottom-tending seines. Regulations exist regarding the placement of stop seines and fish weirs. Additional gear/season restrictions for specific locations are detailed in Department regulations.
Area closures	Groundfish spawning closure in Booth Bay and Sheepscot Bay from May 1 to June 30.
Seasons	See above.
Licenses	A commercial license is required for the harvest, transport, and sale of fish that are not for personal use: $33 for individual, resident operators; $89 for resident operator with crew; $334 for nonresident operator and crew. No license is required for fish taken with hook and line for personal use. There is no recreational license, except for Atlantic Salmon.
Other	Nonresidents are required by law to report all groundfish catches.

New Hampshire

Size limits	None.
Gear restrictions	Mobile fishing gear may not be used in state waters between April 16 and Dec 14. Use of trawls and drag seines are prohibited in Piscataqua River or its tributaries north of the Portsmouth Memorial Bridge.
Area closures	See above
Seasons	None.
Licenses	Resident commercial saltwater fishing license: $26; no sport fishing license. Residents are not required to have a license to sell fish caught by hook and line, but a $200 minimum license fee is required for nonresidents.

Massachusetts

Size limits	As of January 1, 1995: 9" recreational and commercial; (All are possession restrictions; total length measurements.)
Gear restrictions	Minimum mesh sizes for mobile trawl gear: * North of Cape Cod: - 6" required year-round. Permitted small mesh exemptions are allowed for underutilized species (e.g. dogfish, ocean pout) with no bycatch of regulated species. * South of Cape Cod: - 5.5" required Nov. 1 - April 23. - 4.5" required June 1 - Oct. 31. - No minimum required April 23 - June 1 (squid season). * East of Cape Cod:

- 6" required year round.

Gillnets may not exceed 2,400 feet; mesh size of gillnets must be greater than 6" stretched measure.

Area closures	Buzzards Bay is closed to trawling year-round. State waters from Nauset Light around Monomoy west to Succonessett Point, Mashpee are closed to trawling from May 1 - Oct. 31. All waters south of Cape Cod banned to gillnetting April 1 - Nov. 15. (See Mass. regulations for additional closures.)
Seasons	See above.
Licenses	Commercial fishing licenses: Vessel license ranges from $130 to $260, depending on length; license for individuals = $65 each. There is no sport license for fish caught for personal use. A license to sell fish caught with hook and line is $35, and applies to any individual selling fish.
Other	Night trawling prohibited 1/2 hour after sunset to 1/2 hour before sunrise from March 1- Oct. 31 and from 6 am- 6 pm from Nov. 1- Feb. 28. Also, the bycatch of finfish in the lobster fishery may not exceed the catch of lobster (by weight).

Rhode Island

Size limits	8" total length measurement which applies to both commercial and recreational fishermen.
Gear restrictions	Trawling is prohibited in the upper portion of Narragansett Bay from Nov 1 - July 1; 5" cod end minimum mesh size in a portion of central Narragansett Bay from Nov 1 - Feb 28. Numerous specific gillnet regulations by geographic location and season; trap and fyke net regulations regarding leaders, distance from shore, distance between traps, etc. Each person utilizing traps or pots in the fishery for scup are limited to no more than 50 pots, and each vessel is limited to 50 pots regardless of the number of license holders on board. In addition, scup traps (pots) must be constructed with escape openings which may be circular (minimum 2 3/8" diameter), rectangular (1 7/8" X 5 3/4" minimum) or of square mesh wire at least 2 1/4" X 2 1/4".
Area closures	Numerous restrictions on the location of traps off the Island of Rhode Island, the Sakonnet River, and in Narragansett Bay. Cannot set, haul, and/or maintain a seine within 0.5 mile of the seaward entrance of several ponds/rivers; significant portion of the state is closed to various forms of netting.
Seasons	Fish traps must be out of the water Jan 1 - end of Feb.
Licenses	Multipurpose commercial licenses allow for harvest and sale of fish: $150, with additional fees for specific gear types. There is no sport license to fish for personal use.

Connecticut

Size limits	8" total length measurement which applies to both commercial and recreational fishermen.
Gear restrictions	Cod end minimum mesh size of 5.5" (6" square) in trawls from Nov 15 - June 30 and 4"(4.5" square) from July 1 - Nov 14. May 15- July 31 vessels fishing for squid may use mesh of any size. Gillnet minimum mesh size 3"; Pound, trap, fyke, and weir minimum mesh: 2".

Area closures	Fish traps and pound nets may not be set in an area off the mouth of the Connecticut River; pound nets must be set at least one mile apart; trawling is prohibited in rivers, coves and harbors as well as in portions of Long Island Sound (LIS). Night trawling prohibited in the western two-thirds of LIS. Vessels greater than 44 ft prohibited in western one-third of LIS unless owner fished there in 1982.
Seasons	None except as noted above.
Licenses	A variety of commercial resident and non-resident licenses are available allowing for the harvest and sale of fish. Fees range from $50- $225. No marine recreational fishing license required but commercial sale of fish taken by hook and line requires a commercial license ($50) and the fee is doubled for species regulated by recreational creel limit. Personal use fishing with trawls and other specific gear requires a commercial license.

New York

Size limits	7" total length measurement which applies to commercial fishermen only.
Gear restrictions	No minimum mesh size for trawls at the present time.
Area closures	There are numerous specific locations where trawl and/or other net gear are restricted.
Seasons	None.
Licenses	A commercial license is required for the harvest and sale of fish: Resident: $100, Non-resident: $1,000. (The non-resident harvest license may only be purchased in January.) A non-resident license which allows landing only: $250. There is no sport license for fish caught for personal use.

New Jersey

Size limits	7" total length measurement which applies to commercial fishermen only.
Gear restrictions	None pertaining to scup. Gillnets may not exceed 2,400 ft in length from Feb 1 - May 15, and may not exceed 1,200 ft from May 15 - Dec 15.
Area closures	Trawling and purse seining (for food fish) are prohibited within two miles of the coast; gillnetting is limited to the Atlantic Ocean and Delaware Bay.
Seasons	Gillnets cannot be fished from Dec 16 - Feb 1.
Licenses	Commercial gears are licensed, with fees dependent on the gear type. There is no sport fishing license for hook and line gear, and no license is required to sell hook and line caught fish. Limited entry for gill net licenses in Delaware Bay only.

Delaware

Size limits	None.
Gear restrictions	Trawls, purse seines, power-operated seines, and run-around gillnets are prohibited. A single gillnet cannot exceed 200 yards in length; a series of connected gillnets cannot exceed 500 yards; a fyke net cannot exceed 72" in diameter; fish traps may not exceed 125 cubic ft and must have an escape panel. There is a moratorium on issuance of new commercial (> 200 ft) gillnet permits until the number of fishermen falls below 30.
Area closures	Areas within a 0.5 mile sector at the mouths of all major tributaries to the Delaware River and Bay are closed to all fixed gears; numerous specific areas closed to commercial fishing.

Seasons	From April 1 - May 10, commercial fishermen cannot set over 1,000 yards of fixed gillnet from one vessel; from May 10 to Sept 30, commercial fishermen cannot set over 1,000 yards of drifting gillnet from one vessel; drift gillnets cannot be set from 2,400 hrs Friday - 1,600 hrs Sunday during this period; specific seasonal closures for gillnets in certain areas.
Licenses	Commercial food fishing license is required for the harvest and sale of fish: Residents: $150; Non-residents: $1,500. Additional fees are levied for the use of specific gear types. There is no sport license for fish caught for personal use.

Maryland

Size limits	None.
Gear restrictions	Trawls prohibited within one mile of the coastline, and in Chesapeake Bay. Use of monofilament gillnets prohibited, except in coastal bays and the Atlantic Ocean; several specific gillnet restrictions exist for Chesapeake Bay; minimum mesh sizes for pound nets, haul seines, and fyke nets are 1.5"; purse seines prohibited.
Area closures	There are numerous specific locations where trawl, gill, seine and/or other net gear are restricted.
Seasons	None.
Licenses	An appropriate commercial fishing or license or a fish dealers license is required to catch, buy, sell, process, export, transport, or otherwise deal in fish that were caught in the tidal waters of Maryland. License fees vary from $37.50 to $300.00 depending on license type. Chesapeake sportfishing license: resident - $7.00, non-resident $12.00.

Virginia

Size limits	None.
Gear restrictions	Trawls and encircling gillnets are prohibited in Virginia waters. Minimum mesh sizes: pound nets = 2"; haul seines over 200 yards = 3"; Various gill net mesh restrictions in various areas at different times of the year.
Area closures	Fish trot lines cannot be set on the sea side of the eastern shore. Various area gill net closures at different times of the year.
Seasons	None.
Licenses	Commercial licenses are required for specific fishing gears, with the fee dependent on the gear type. There is sport fishing license (Atlantic Ocean exempt) with variable fees and a $25 license is required to sell hook and line caught fish. All fishermen must register ($150 fee) before they can purchase individual gear licenses. There also is a two year waiting period for commercial registration.
Other	Virginia required mandatory reporting for all species caught in commercial gear in Virginia waters beginning in 1993.

North Carolina

Size limits	None.
Gear restrictions	No net may be towed by more than one vessel except in long-haul (seine) fishing operations. Flynet codends must be at least 15 ft. in length and have a minimum mesh

of 3" square or 3.5 "diamond. In addition, flynets must have an extension a minimum of 20 ft. in length constructed of 3" square mesh. All trawls fished in the Atlantic Ocean (except flynets) required to have a minimum codend mesh of 5.5". Additional exceptions include vessels possessing State Atlantic mackerel and/or squid permits and crab trawls.

Area closures	Numerous specific gear restrictions by geographic area. Trawls are prohibited within one-half mile of the beach between the Virginia line and Oregon Inlet. No flynet fishing in Atlantic Ocean south of Cape Hatteras.
Seasons	Several specific seasonal restrictions pertaining to gillnets.
Licenses	A commercial license is required for vessels, with fees dependent on vessel length (non-residents have an additional $200 surcharge). An endorsement on the vessel license or a non-vessel endorsement to sell fish is required to sell fish products.
Other	There is a two-year moratorium on any new vessel, shellfish or crab license.

Table 72. Landings by species for all scup - otter trawl trips harvesting 1,000 pounds or more of scup, 1992.

Common Name	Pounds*	Species % of Total Pounds	Value	Species % of Total Value
SQUID (*LOLIGO*)	13,018,782	29.350%	7,284,066	30.199%
SCUP	8,726,706	19.674%	5,359,489	22.220%
MACKEREL, ATLANTIC	6,154,322	13.874%	937,815	3.888%
HAKE, SILVER	6,005,925	13.540%	2,621,675	10.869%
FLOUNDER, SUMMER	1,756,288	3.959%	2,893,398	11.996%
BUTTERFISH	1,327,231	2.992%	735,860	3.051%
ANGLER	1,072,460	2.418%	786,734	3.262%
BLUEFISH	1,057,301	2.384%	265,791	1.102%
FLOUNDER, WINTER	1,028,547	2.319%	989,719	4.103%
HAKE, RED	818,438	1.845%	215,078	0.892%
SKATES UNC	707,300	1.595%	70,080	0.291%
SEA BASS, BLACK	527,857	1.190%	485,966	2.015%
HERRING, ATLANTIC	394,617	0.890%	27,616	0.114%
FLOUNDER, YELLOWTAIL	283,940	0.640%	282,531	1.171%
COD	214,515	0.484%	190,671	0.791%
SQUID *(ILLEX)*	165,623	0.373%	42,347	0.176%
WEAKFISH, SQUETEAGUE	159,393	0.359%	122,011	0.506%
TAUTOG	153,497	0.346%	87,188	0.361%
DOGFISH (NK)	101,820	0.230%	17,607	0.073%
DOGFISH SPINY	99,379	0.224%	10,701	0.044%
LOBSTER	86,447	0.195%	313,335	1.299%
TILEFISH	63,173	0.142%	43,101	0.179%
EEL, CONGER	58,399	0.132%	15,301	0.063%
FLOUNDER, WITCH	54,691	0.123%	63,336	0.263%
FLOUNDER, SAND-DAB	47,298	0.107%	13,090	0.054%
SEA ROBINS	40,407	0.091%	9,945	0.041%
POUT, OCEAN	34,588	0.078%	5,396	0.022%
SCALLOP, SEA	32,234	0.073%	152,331	0.632%
HAKE, WHITE	30,625	0.069%	11,346	0.047%
OTHER FISH	20,590	0.046%	824	0.003%
CRAB, HORSESHOE	16,420	0.037%	1,675	0.007%
OTHER FISH	12,539	0.028%	8,407	0.035%
STURGEONS	9,249	0.021%	10,213	0.042%
CONCHS	8,872	0.020%	14,242	0.059%
SQUIDS (NS)	8,833	0.020%	4,459	0.018%
MENHADEN	8,545	0.019%	541	0.002%
CRAB, JONAH	8,151	0.018%	3,575	0.015%
FLOUNDERS (NK)	6,510	0.015%	4,235	0.018%
SHAD, AMERICAN	6,473	0.015%	2,304	0.010%
POLLOCK	4,540	0.010%	2,709	0.011%
MACKEREL, SPAN	4,211	0.009%	2,764	0.011%
BONITO	3,570	0.008%	1,219	0.005%
WHELK, KNOBBED	2,511	0.006%	1,365	0.006%
PUFFER, NORTHERN	2,313	0.005%	1,222	0.005%
SHARK, NK	1,785	0.004%	1,092	0.005%
WHELK, CHANNELED	1,193	0.003%	777	0.003%

Table 72 (continued). Landings by species for all scup - otter trawl trips harvesting 1,000 pounds or more of scup, 1992.

Common Name	Pounds*	Species % of Total Pounds	Value	Species % of Total Value
JOHN DORY	1,026	0.002%	472	0.002%
BASS, STRIPED	940	0.002%	1,603	0.007%
FLOUNDER, AM. PLAICE	850	0.002%	554	0.002%
CUNNER	757	0.002%	66	0.000%
HERRING (NK)	706	0.002%	101	0.000%
WHITING, KING	699	0.002%	180	0.001%
SHARK, PORBEAGLE	687	0.002%	195	0.001%
SHARK, SANDBAR	556	0.001%	200	0.001%
WHITING, BLACK	515	0.001%	155	0.001%
SHARK, THRESHER	365	0.001%	102	0.000%
WOLFFISHES	340	0.001%	217	0.001%
SHARK, TIGER	321	0.001%	69	0.000%
CRAB, ROCK	227	0.001%	225	0.001%
CROAKER, ATLANTIC	171	0.000%	40	0.000%
REDFISH	165	0.000%	84	0.000%
PERCH, WHITE	160	0.000%	42	0.000%
TRIGGERFISH	145	0.000%	68	0.000%
HADDOCK	137	0.000%	122	0.001%
SWORDFISH	72	0.000%	243	0.001%
AMBER JACK	38	0.000%	24	0.000%
ALEWIFE	31	0.000%	2	0.000%
SPOT	20	0.000%	5	0.000%
DOGFISH SMOOTH	18	0.000%	8	0.000%
COBIA	15	0.000%	15	0.000%
SHARK, DUSKY	14	0.000%	4	0.000%
HAKE MIX RED & WHITE	5	0.000%	2	0.000%
CRAB, BLUE	5	0.000%	2	0.000%
Total	44,357,093	100.000%	24,119,947	100.000%

Note: Records with Vessel identity unknown were excluded.
Number of Trips = 1,155.

Table 73. State shares of a coastwide quota of 8.5 million pounds. Shares are based on five years of landings data, 1988-1992.

State	%	lbs
ME	0.22	18,843
MA	6.81	578,630
RI	43.60	3,706,013
CT	4.11	349,178
NY	16.12	1,370,042
NJ	26.28	2,233,928
MD	0.14	12,030
VA	1.41	119,726
NC	1.31	111,609
Total	100.00	8,500,000

Table 74. Bimonthly allocations based on a coastwide quota of 8.5 million pounds. Shares are based on ten years of bimonthly landings data, 1988-1992.

Bimonthly Period	%	lbs
Jan - Feb	18.0	1,530,000
Mar - Apr	30.4	2,584,000
May - June	22.4	1,904,000
Jul - Aug	5.3	450,500
Sep - Oct	7.3	620,500
Nov - Dec	16.6	1,411,000
Total	100.0	8,500,000

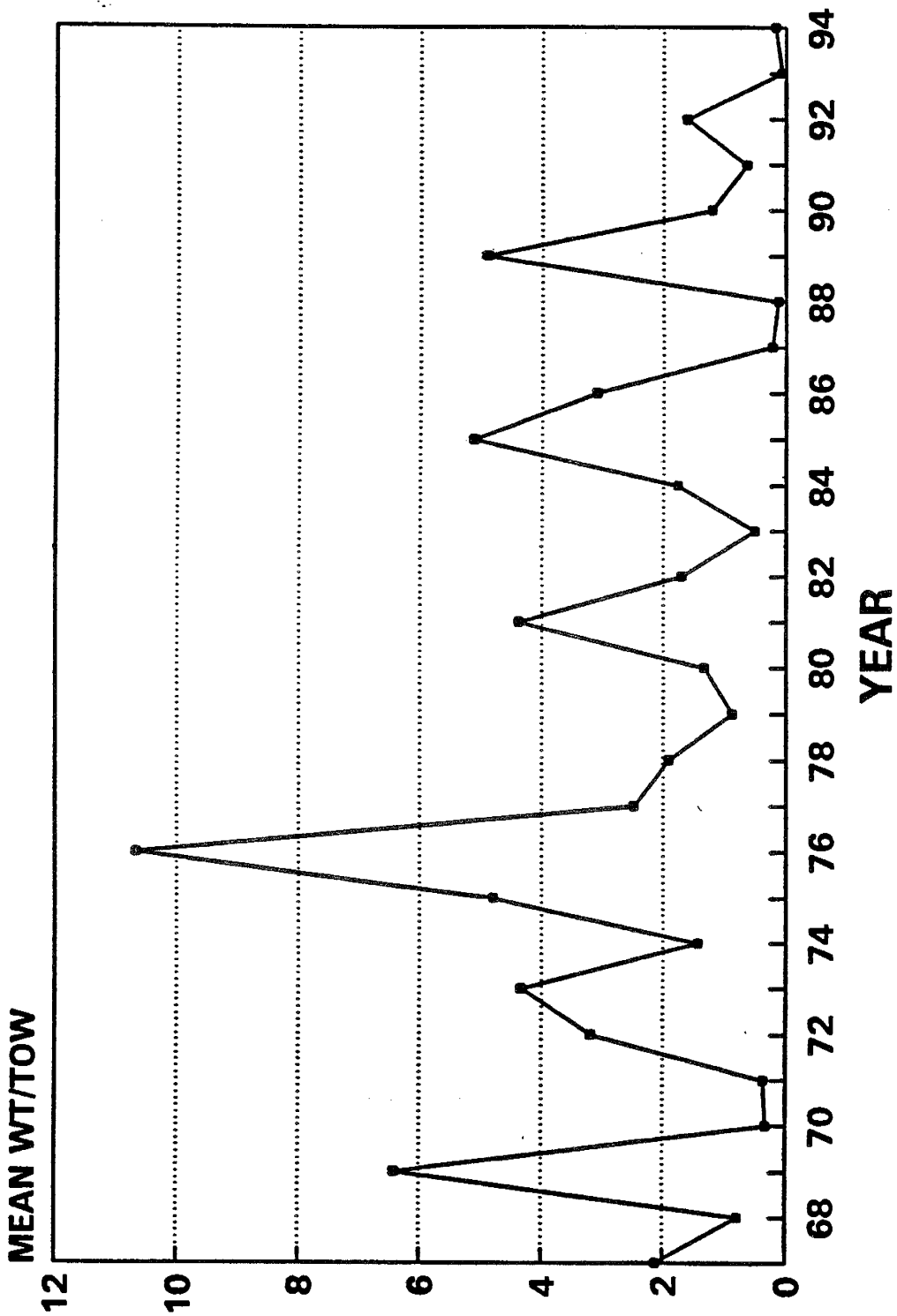


Figure 1. NEFSC Autumn Offshore Survey

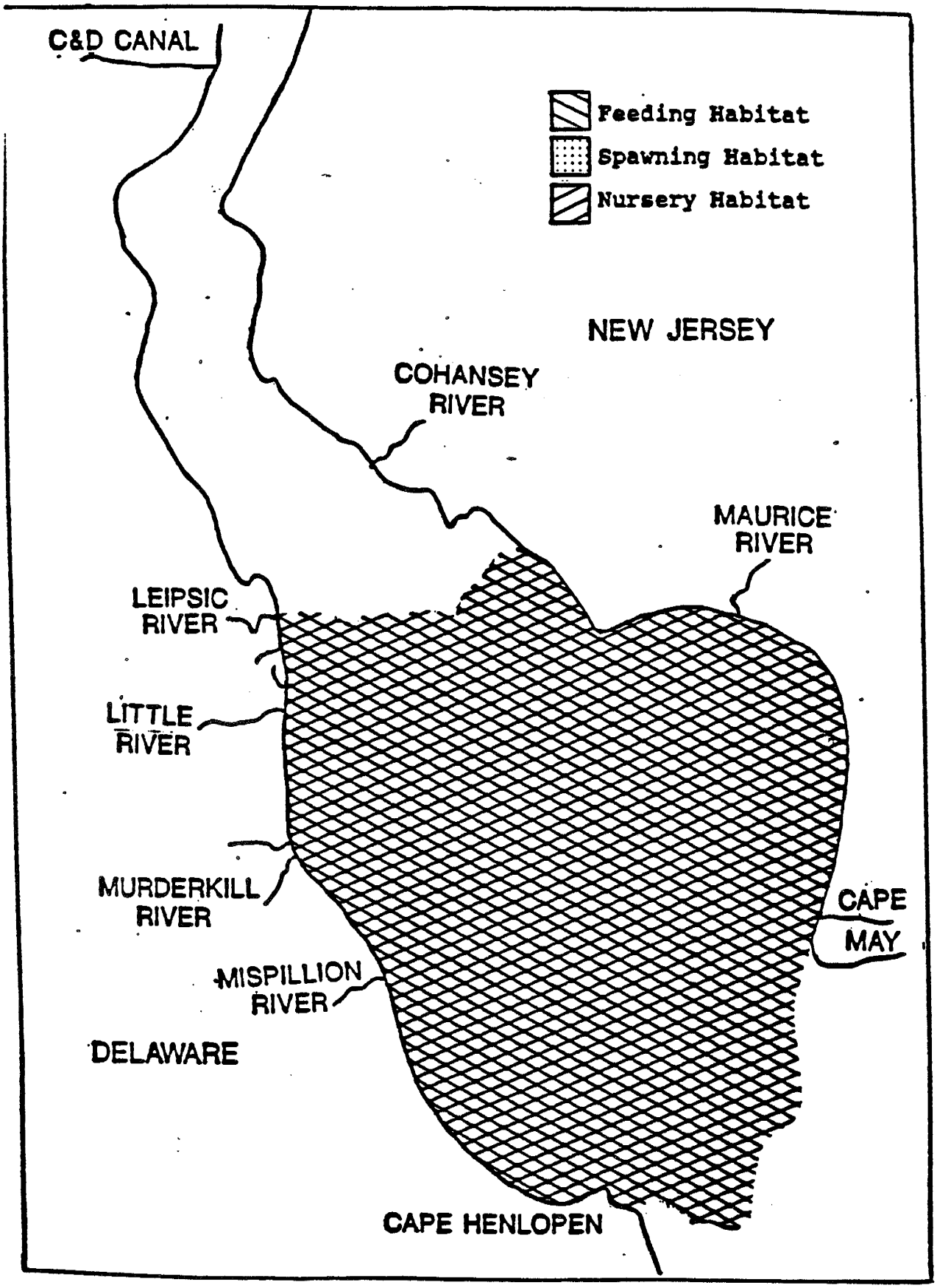
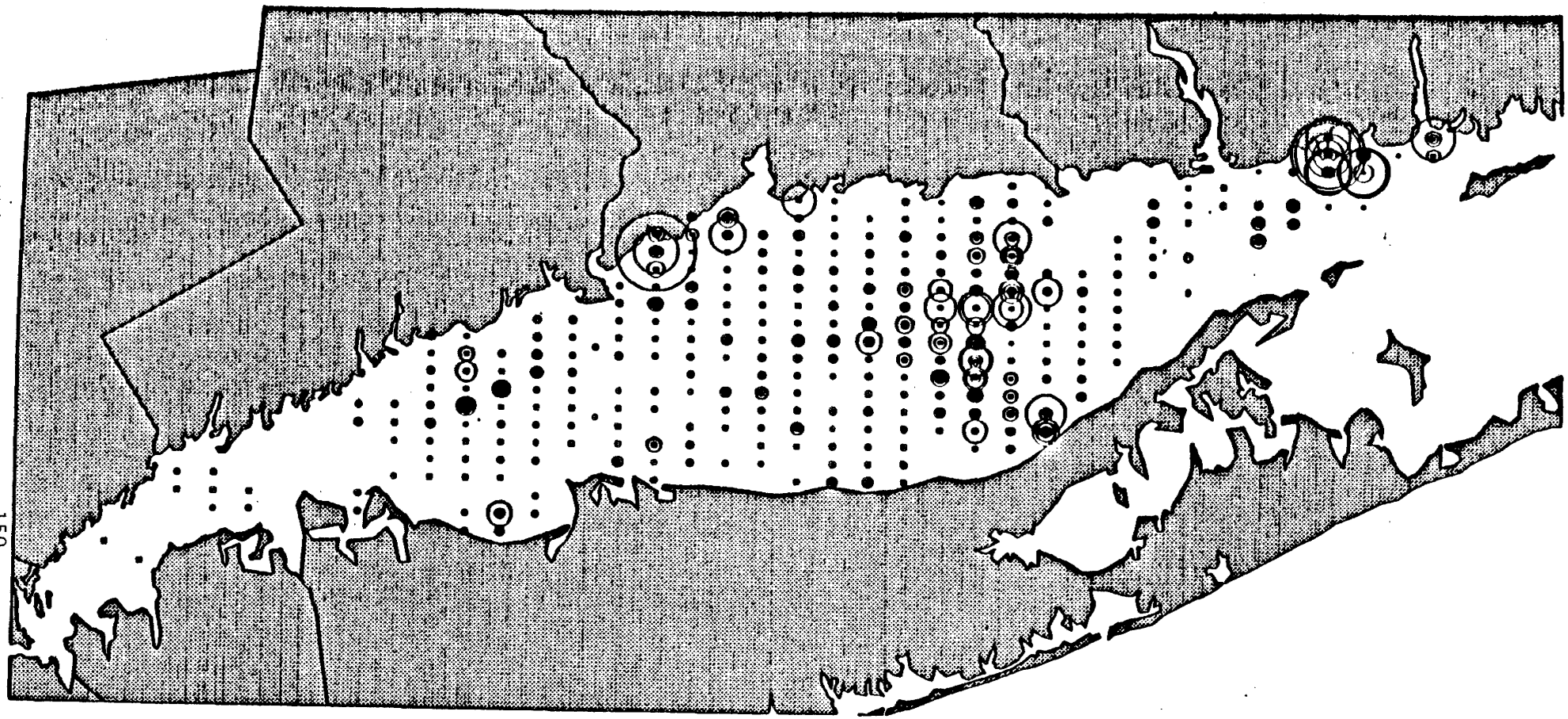


Figure 2. Scup nursery/feeding habitat distribution in Delaware Bay.

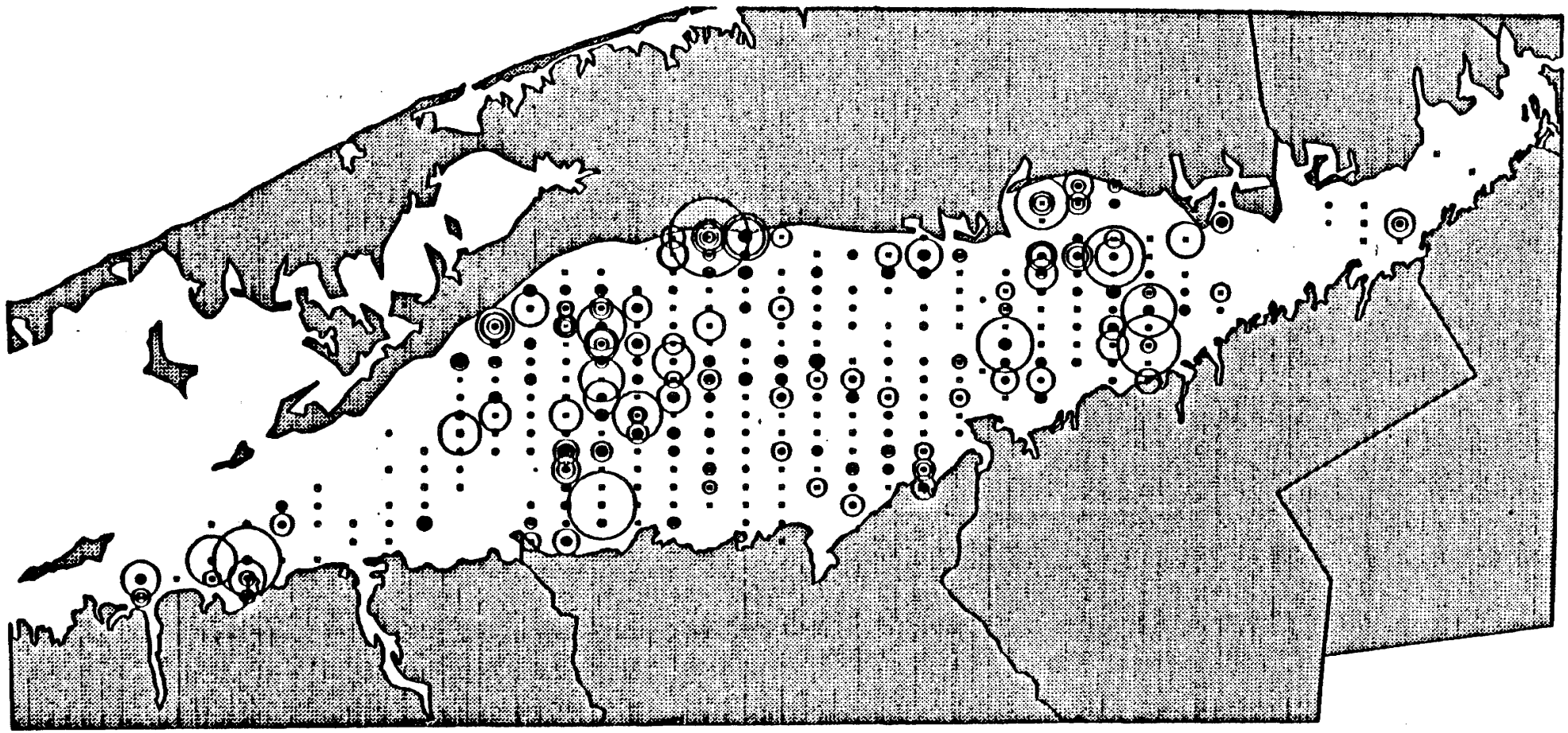
Source: Cole pers. comm.



Largest circle represents 1842 fish
Smallest circle represents 1 fish
Zero catches = X

Figure 3. Connecticut Trawl Survey 1984-93. Catch of age 1 + scup.

Source: Simpson pers. comm.



Largest circle represents 2327 fish
Smallest circle represents 1 fish
Zero catches = X

Figure 4. Connecticut Trawl Survey 1984-93. Catch of age 0 scup.

Source: Simpson pers. comm.

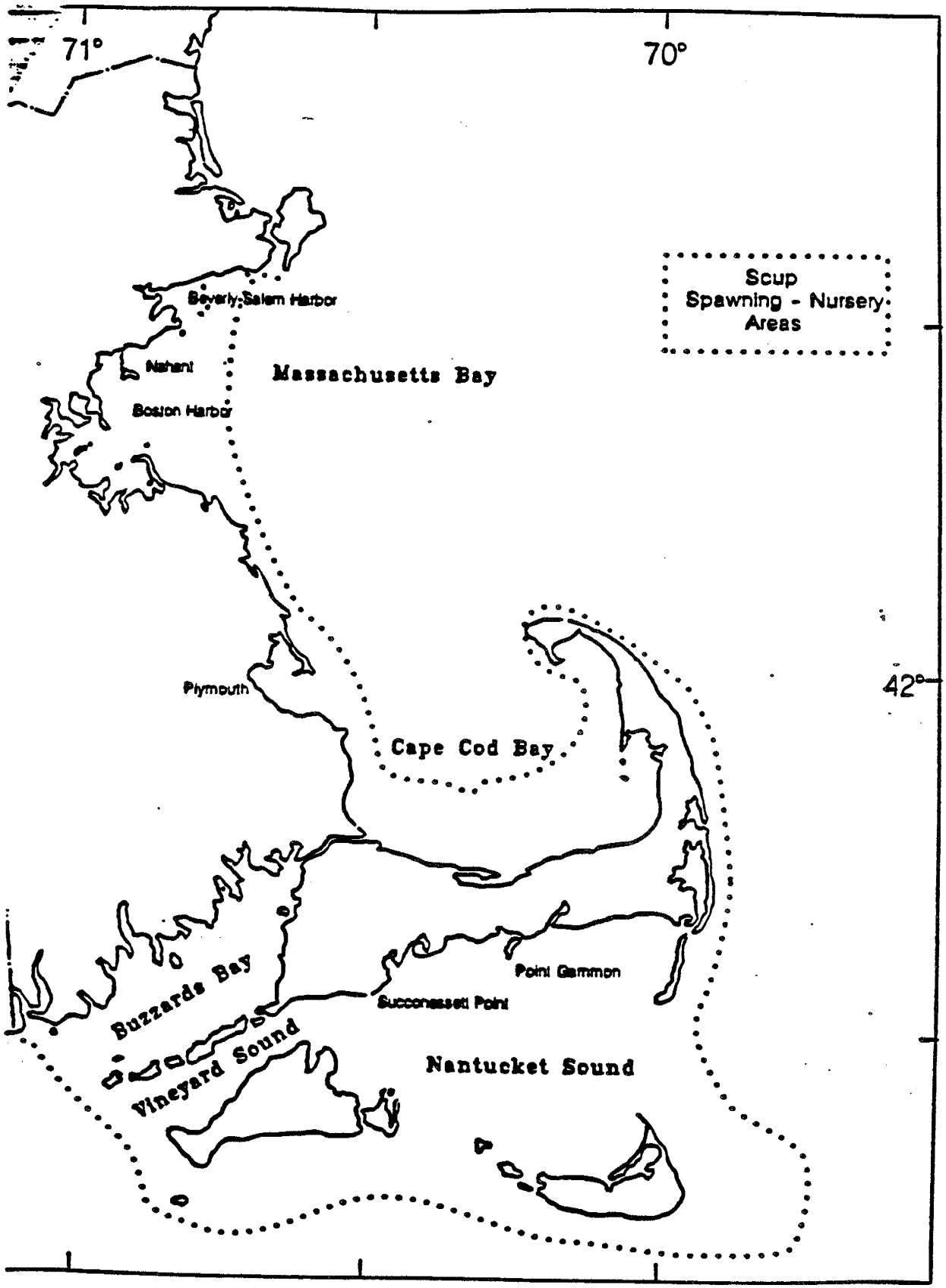
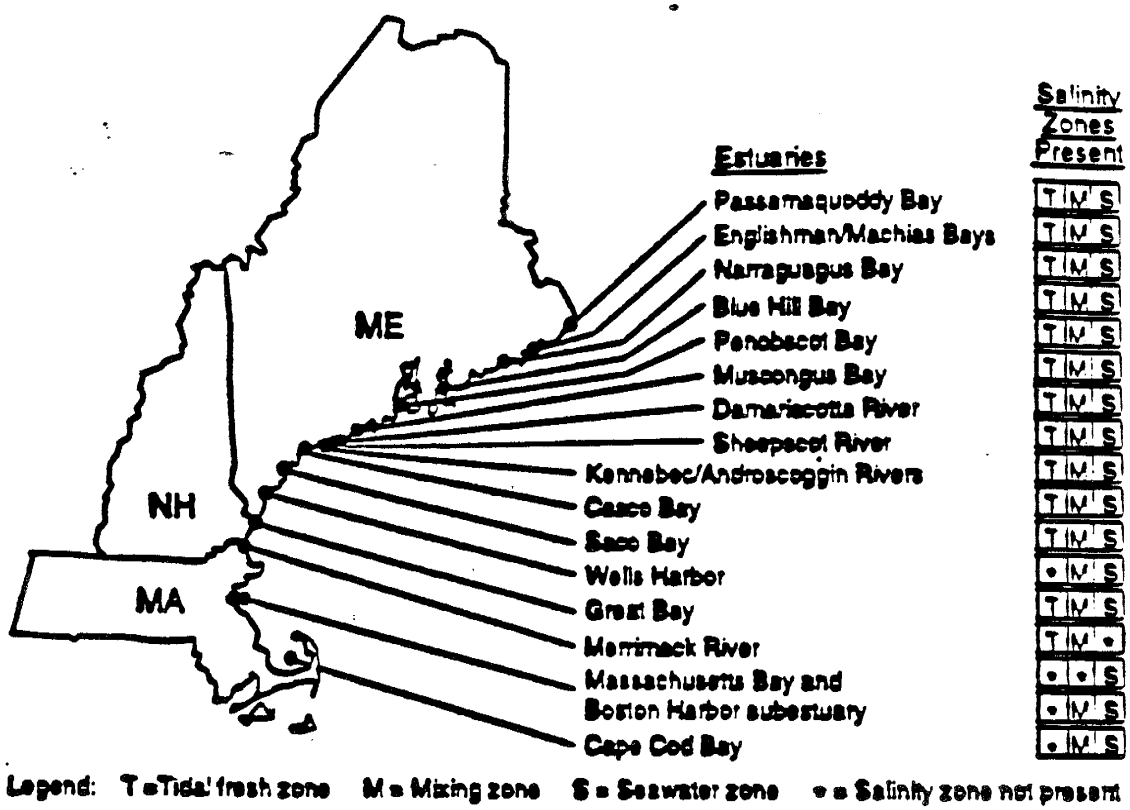


Figure 5. Scup habitat in Massachusetts waters.

Source: Currier pers. comm.

(a)



(b)

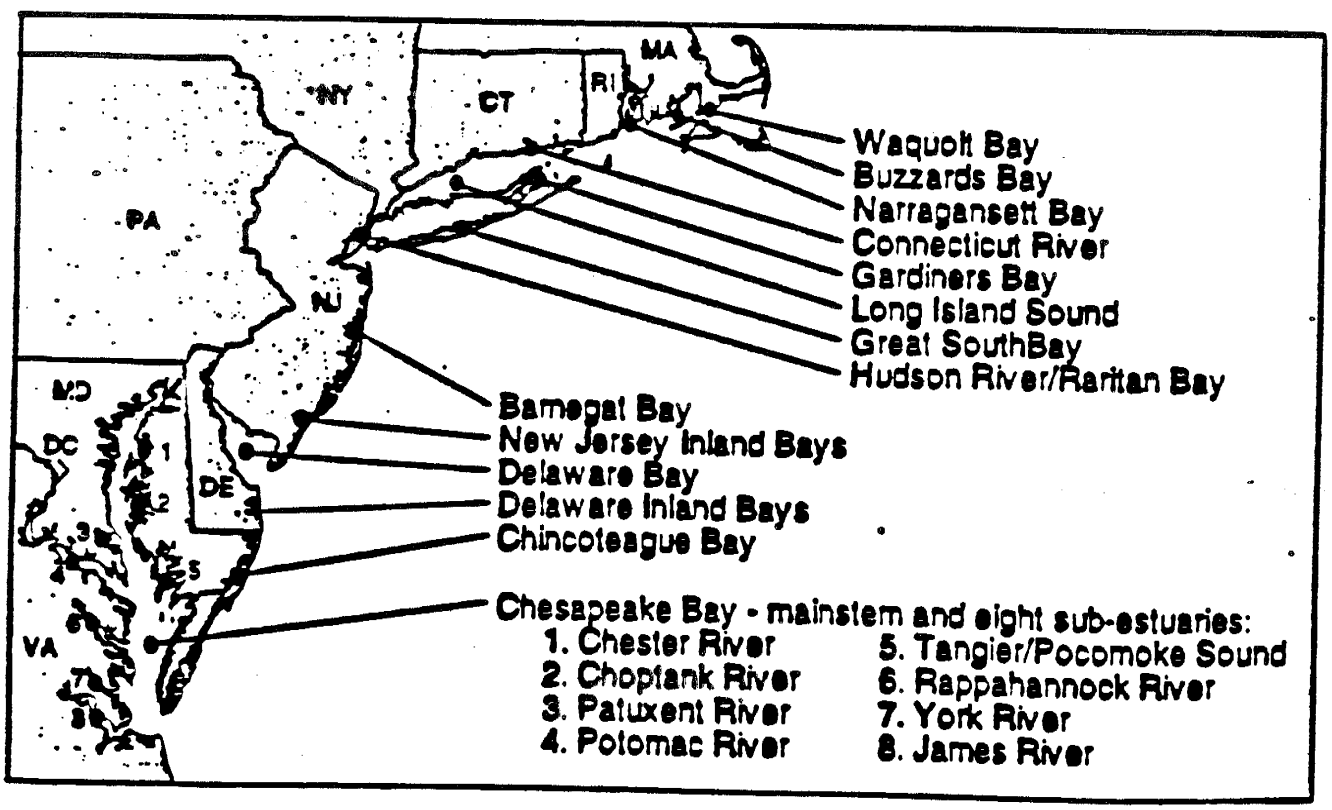


Figure 6. Location of estuaries in NOAA's Estuarine Living Marine Resources Program (a) North Atlantic and (b) Mid-Atlantic.

Source: USDC 1994(a) and (b).

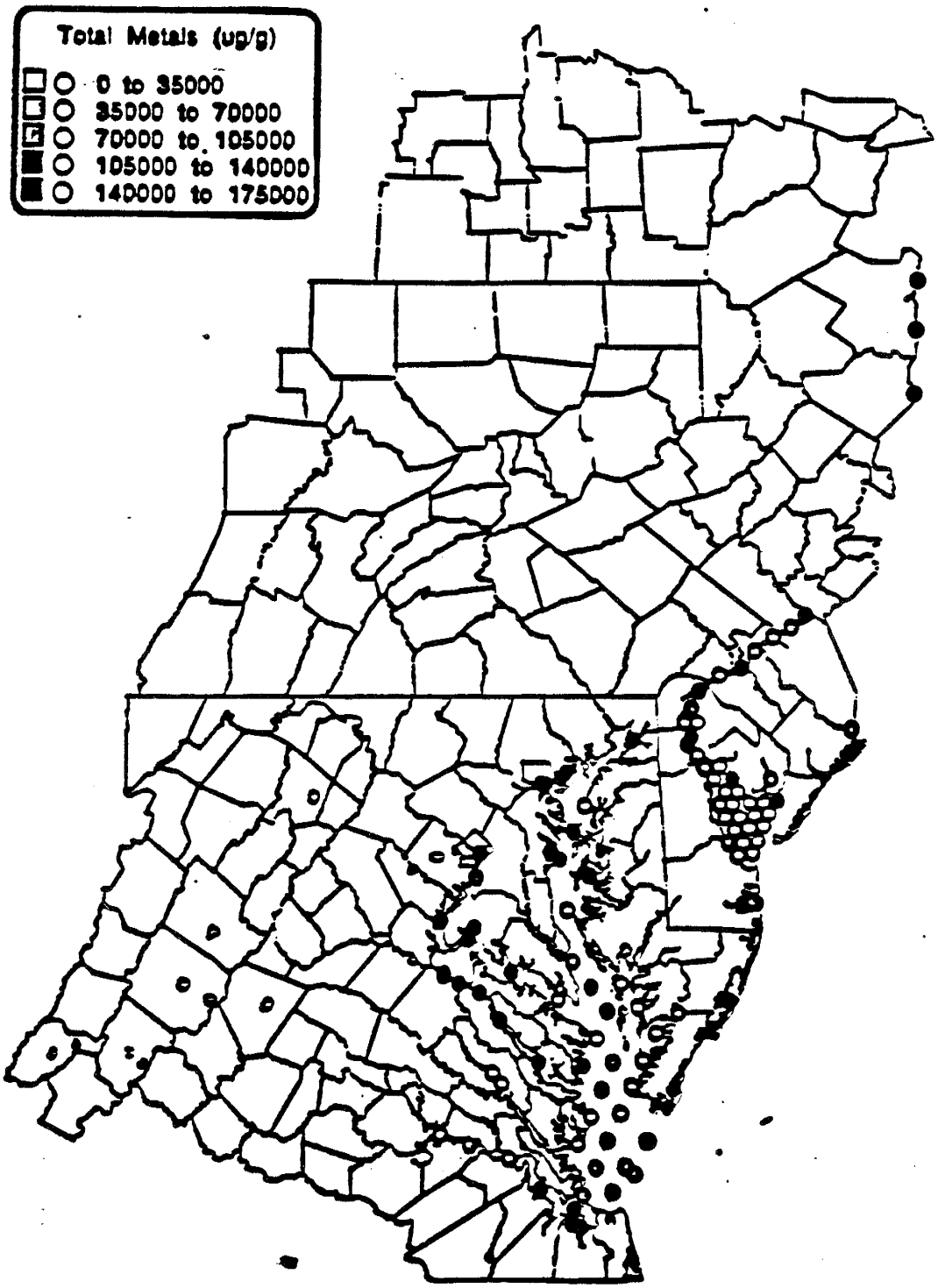


Figure 7. Total metals reported per gram sediment for Chesapeake Bay, Delaware Bay and DE & MD coastal bays by E-Map data (provided by NOAA/ORCA/SEA).

Source: MARMRP 1994.

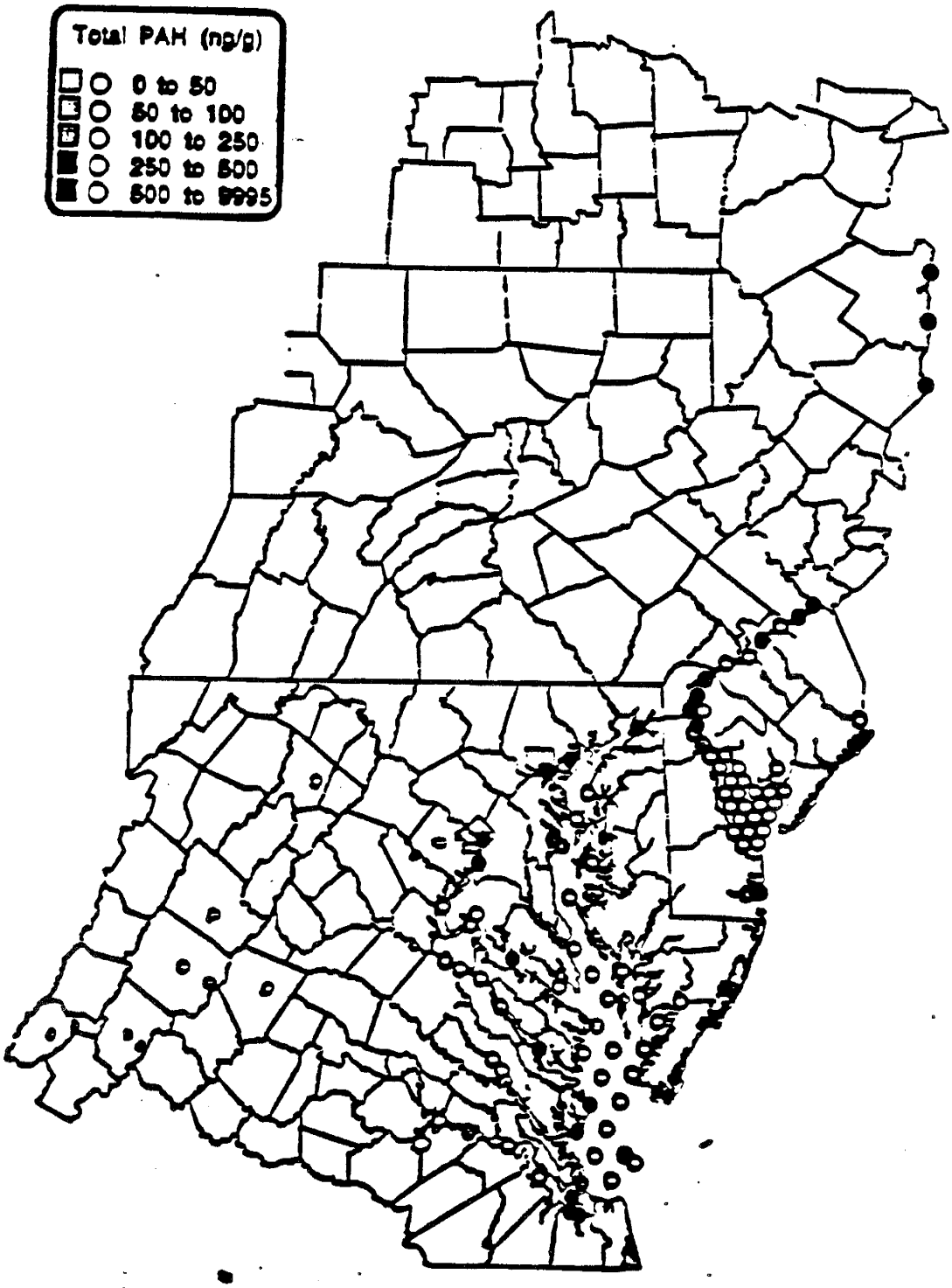


Figure 8. Total polycyclic aromatic hydrocarbons (PAHs) reported per gram sediment for Chesapeake Bay, Delaware Bay and DE & MD coastal bays by E-map data (provided by NOAA/ORCA/SEA).

Source: MARMRP 1994.

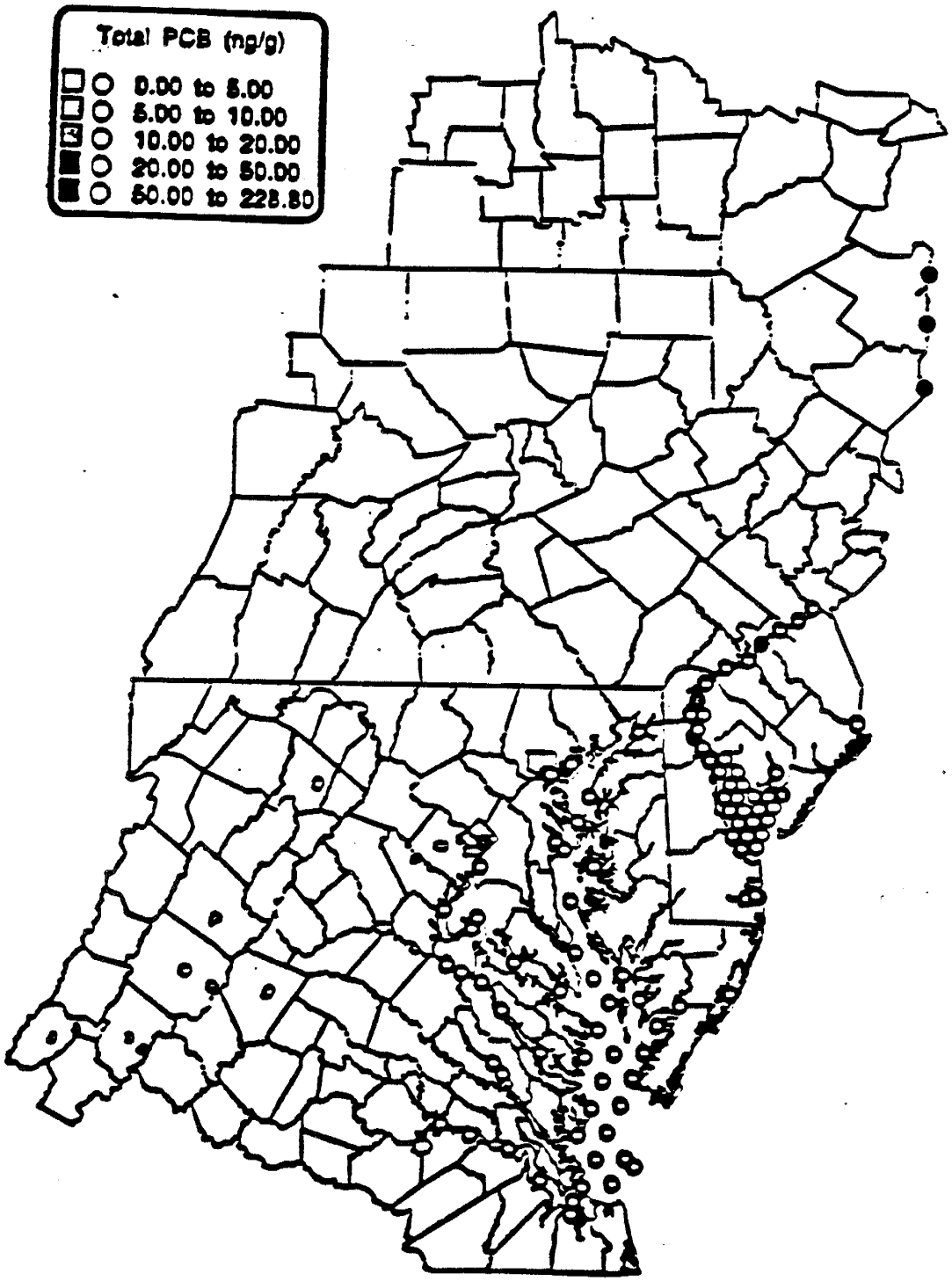


Figure 9. Total polychlorinated biphenyls (PCBs) per gram sediment reported for Chesapeake Bay, Delaware Bay and DE & MD coastal bays by E-map data (provided by NOAA/ORCA/SEA).

Source: MARMRP 1994.

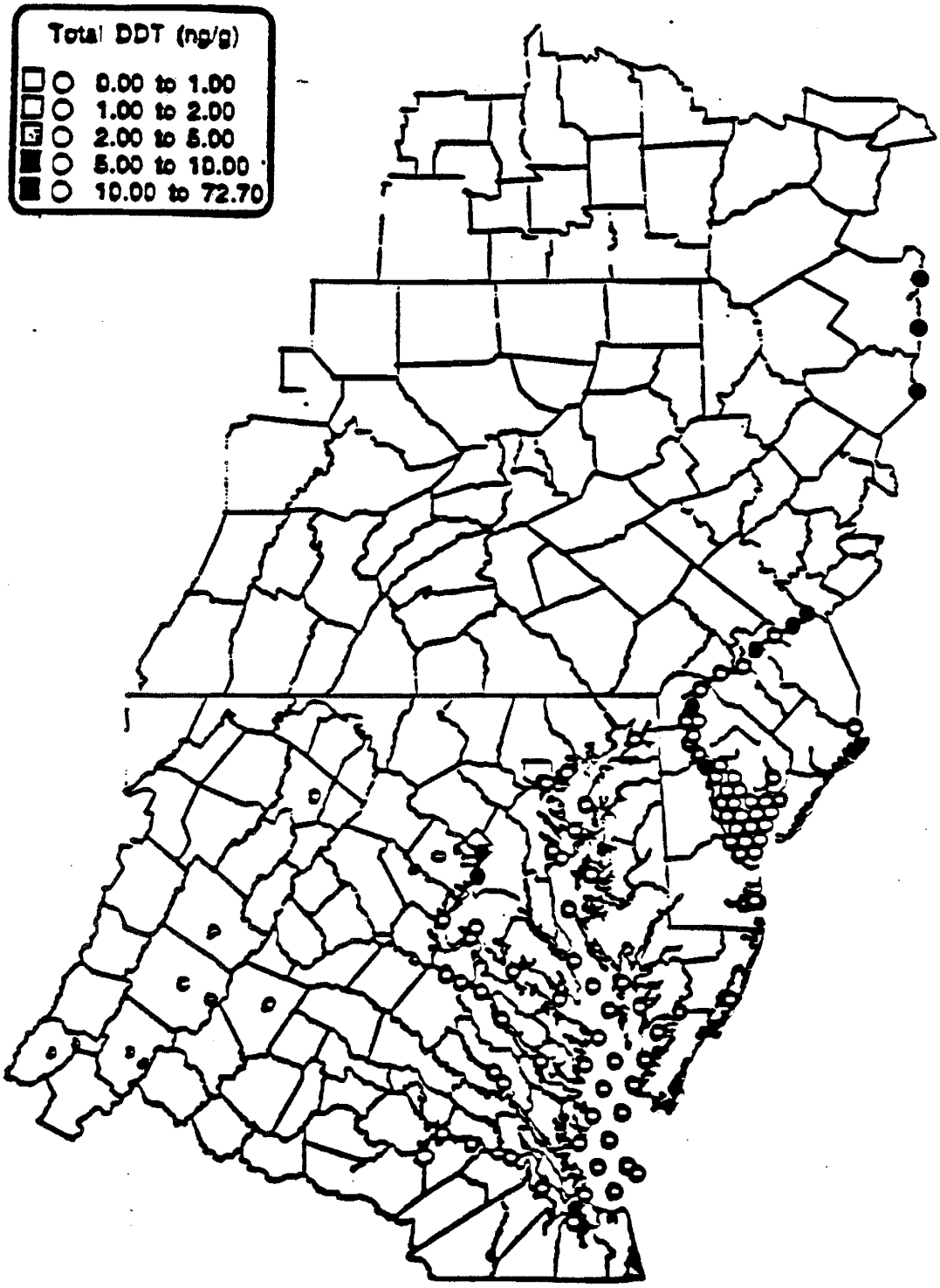


Figure 10.
Total DDT (dichloro-diphenyl-trichloroethane) and its metabolites per gram sediment for Chesapeake Bay, Delaware Bay and DE & MD coastal bays by E-map data (provided by NOAA/ORCA/SEA).

Source: MARMRP 1994.

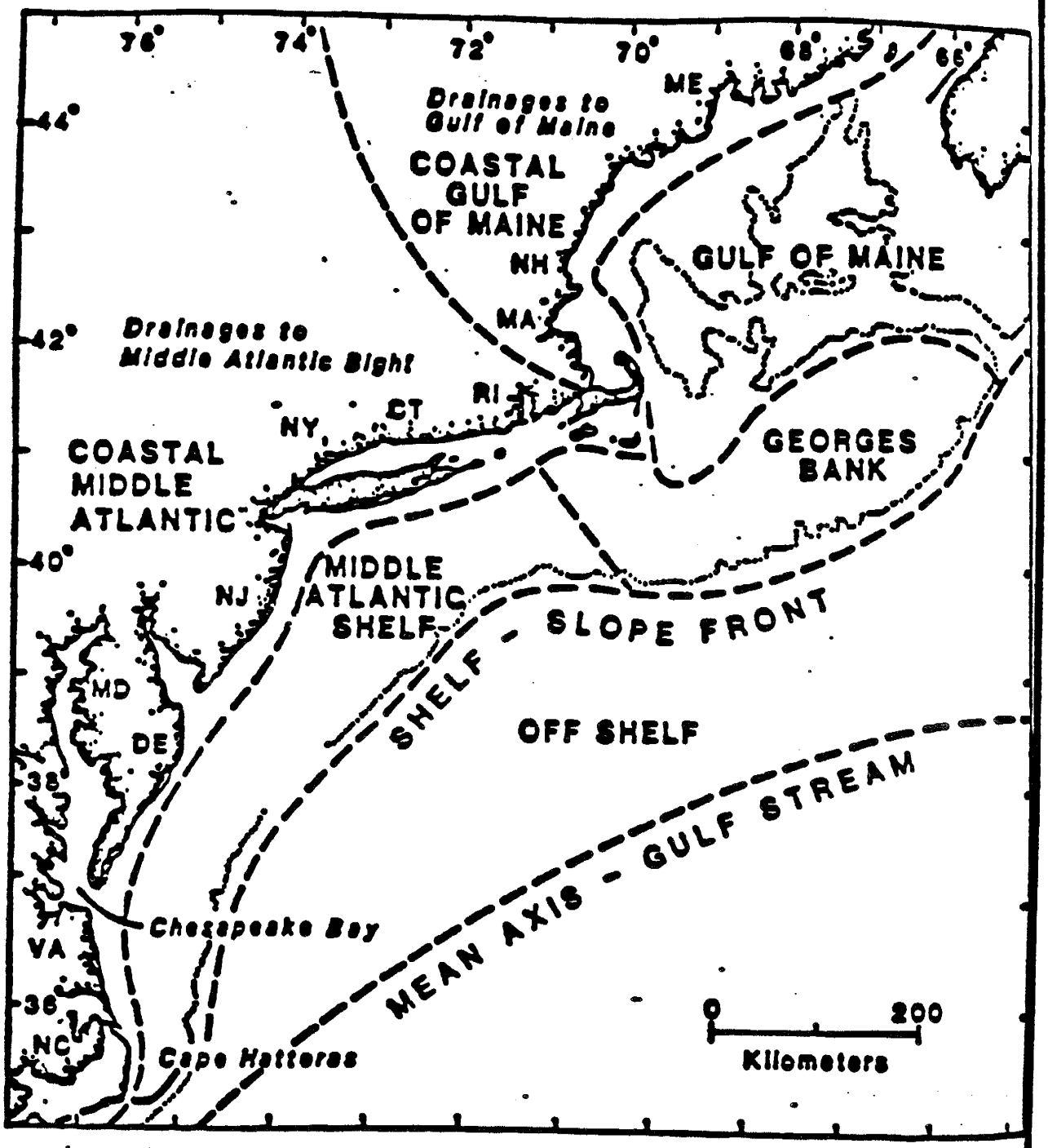


Figure 11. Northeast Regional Action Plan (RAP) Water Management Units.

Source: USDC 1985

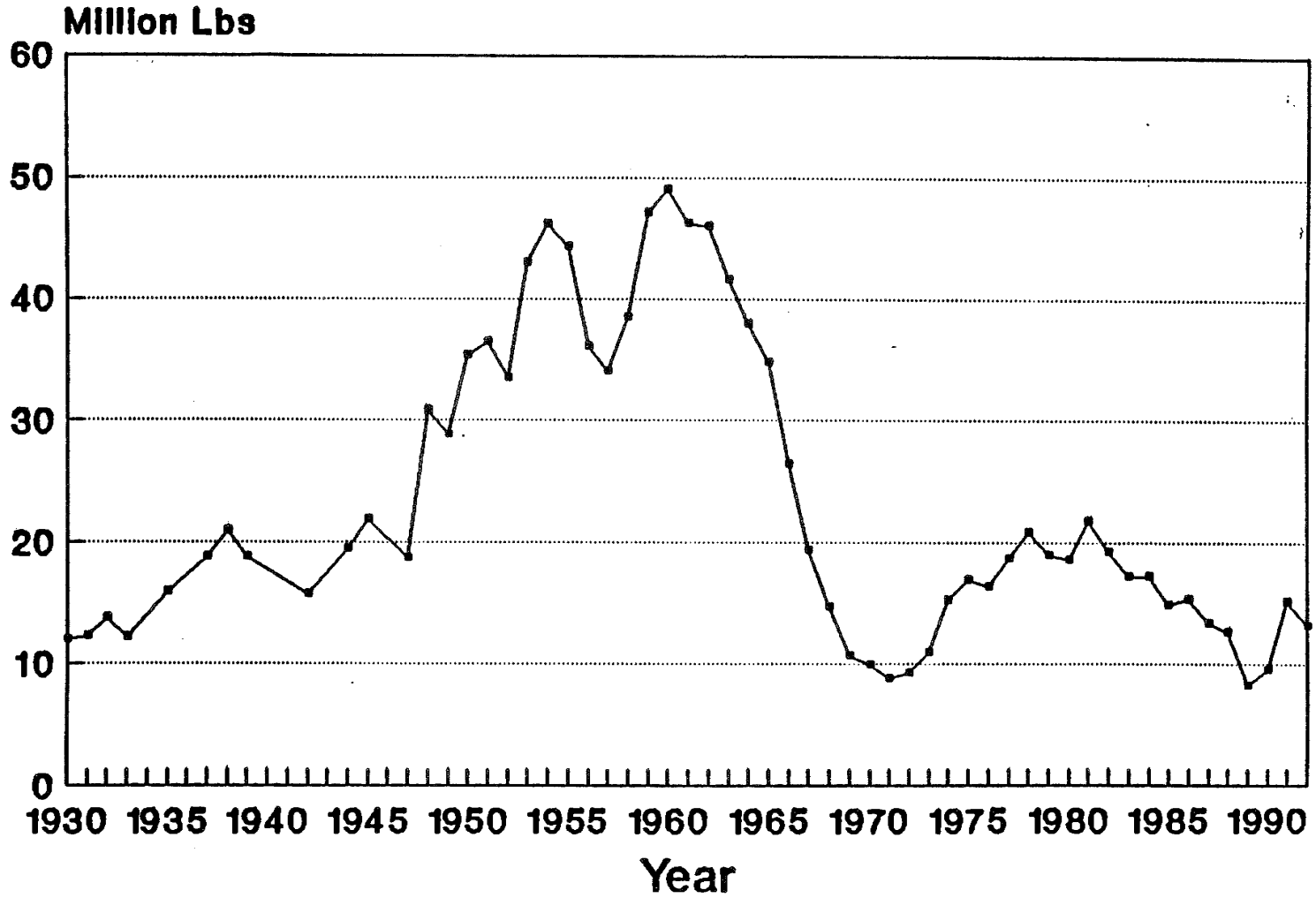


Figure 12. **Scup commercial landings.**

National Marine Sanctuary Program

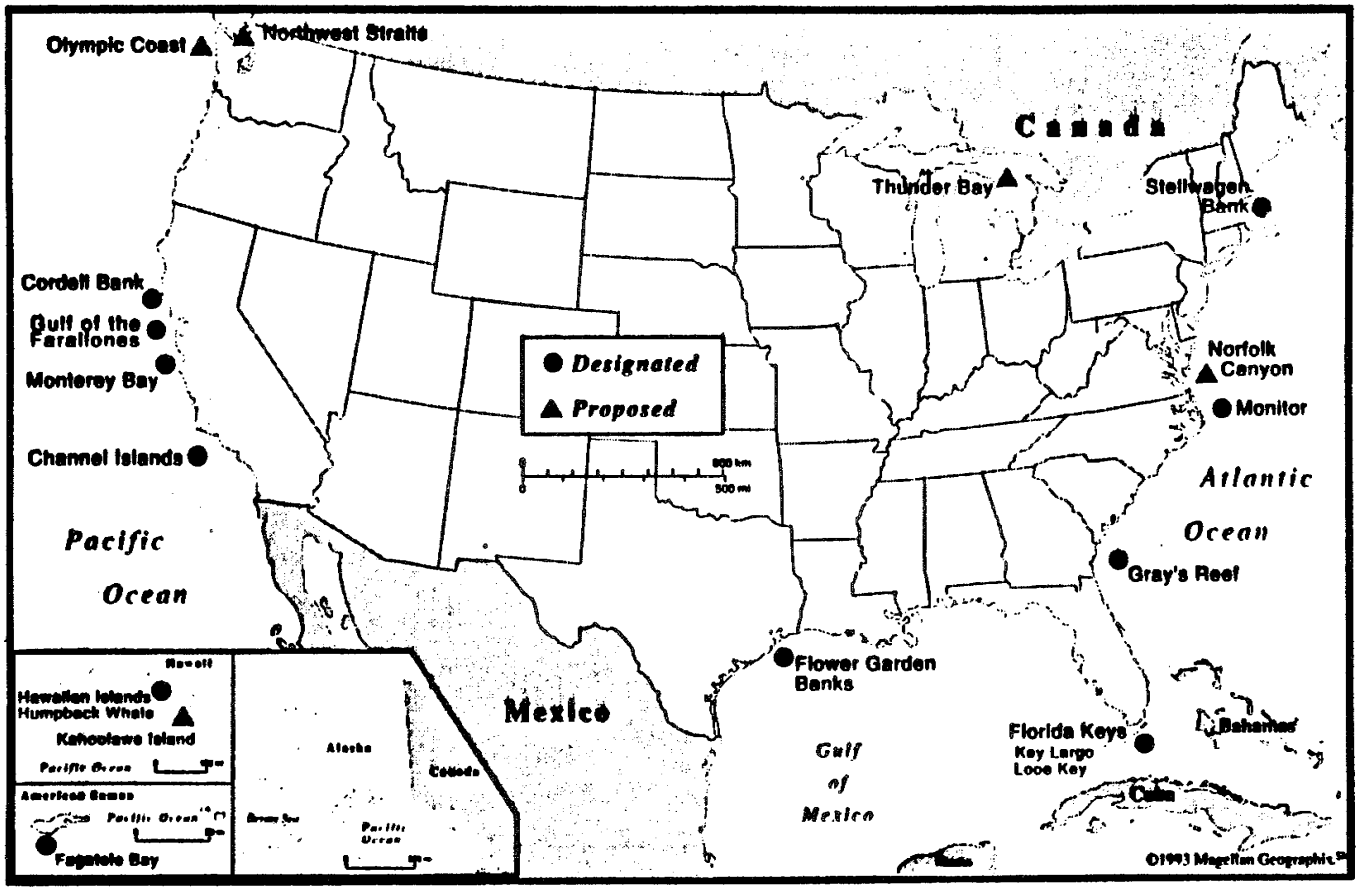


Figure 13. Designated and Proposed National Marine Sanctuaries.

Source: National Marine Sanctuary Program 1993.

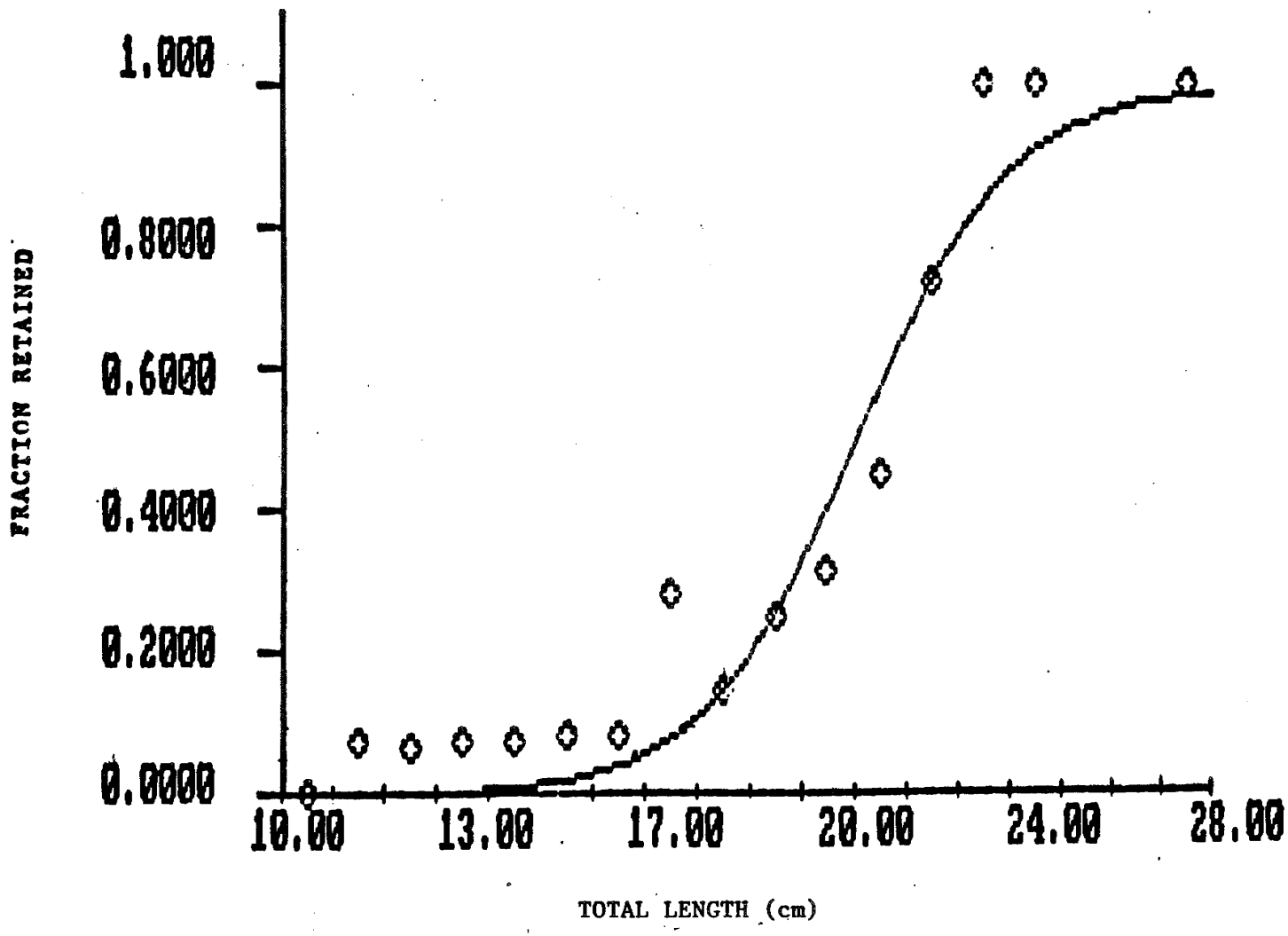


Figure 14. Selection curve for scup retained by 4" diamond mesh.

Source: DeAlteris and Reifsteck 1990.

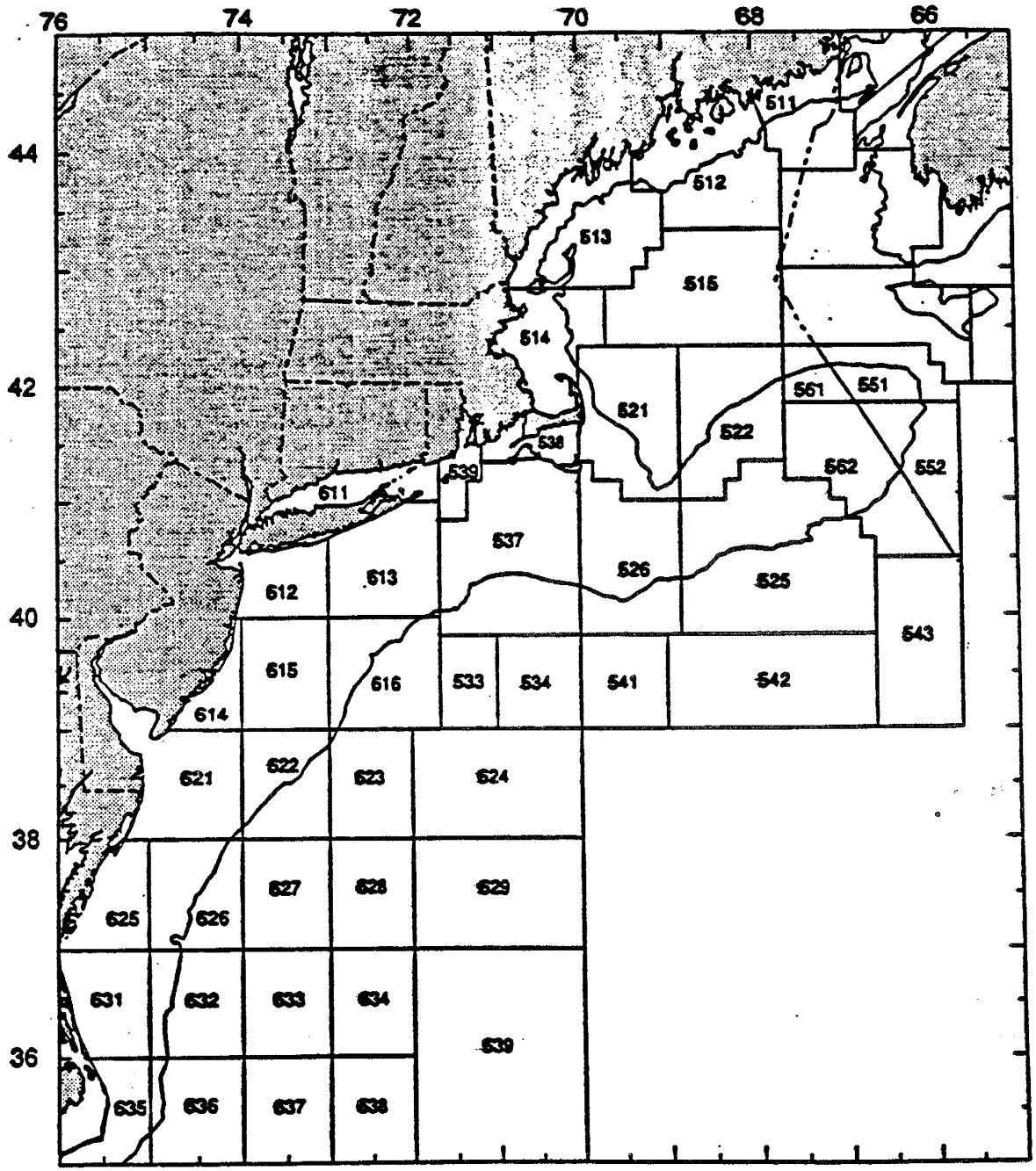


Figure 15. **Statistical areas used for catch monitoring in offshore fisheries in the northeast United States**

APPENDIX 1. ALTERNATIVES TO THE FMP

1. TAKE NO ACTION AT THIS TIME

1.1. Description

No action would mean that the scup fishery would not be managed under the Magnuson Act. The resource would continue to be overfished.

1.2. Evaluation

The "No Action" alternative would not solve the problems identified in section 4.

2. A 9 " TL MINIMUM FISH SIZE AND A 4.5" MINIMUM MESH SIZE IN THE OTTER TRAWL FISHERY WHEN A VESSEL HAS 1,000 POUNDS OR MORE OF SCUP ON BOARD

2.1 Description

This alternative would allow fishermen to use only nets that have a minimum mesh size of 4.5" diamond mesh or 4.0" square mesh when they had 1000 pounds or more of scup on board. In addition to the minimum mesh provisions, this alternative would require that fishermen not land for sale any scup smaller than the 9" TL minimum size limit. A maximum of a 5% tolerance by weight of undersized scup would be allowed on commercial vessels. Scup less than 9" TL could not be sold. This alternative would be used in conjunction with other alternatives such as the quota or closed seasons.

This alternative would require that owners or operators of otter trawl vessels possessing 1000 lbs or more of scup, fish only with nets that have a minimum mesh size of 4.5" diamond mesh (4.0" square), inside measure, applied throughout the cod end for at least 75 continuous meshes forward of the terminus of the net, or, if the net is not long enough for such a measurement, the terminal 1/3 of the net, measured from the terminus of the cod end to the head rope. Mesh would be allowed to be larger than the minimum size, but it could be no smaller than the minimum size. If the fish are landed in a state that has a more stringent net mesh regulation, the state regulation would prevail. States with minimum mesh regulations larger than those established by this alternative would be encouraged to maintain them.

In addition, this alternative would require that owners or operators of otter trawl vessels possessing 1000 lbs or more of scup not have available for immediate use any net, or any piece of net not meeting the minimum mesh size requirements, or mesh that is rigged in a manner that is inconsistent with the minimum mesh size. A net that conformed to one of the following specifications and that could be shown not to have been in recent use is considered to be not "available for immediate use":

(1) A net stowed below deck, provided:

(i) it is located below the main working deck from which the net is deployed and retrieved;

(ii) the towing wires, including the "leg" wires, are detached from the net; and

(iii) it is fan-folded (flaked) and bound around its circumference.

(2) A net stowed and lashed down on deck, provided:

(i) it is fan-folded (flaked) and bound around its circumference;

(ii) it is securely fastened to the deck or rail of the vessel; and

(iii) the towing wires, including the leg wires, are detached from the net.

(3) A net that is on a reel and is covered and secured, provided:

(i) the entire surface of the net is covered with canvas or other similar material that is securely bound;

(ii) the towing wires, including the leg wires, are detached from the net; and

(iii) the codend is removed from the net and stored below deck.

(4) Nets that are secured in a manner approved by the Regional Director, provided that the Regional Director has reviewed the alternative manner of securing nets and has published that alternative in the *Federal Register*.

Any combination of mesh or liners that effectively decreases the mesh below the minimum size would be prohibited.

This alternative would prohibit the owner or operator of a fishing vessel from using any device, gear, or material, including, but not limited to, nets, net strengtheners, ropes, lines, or chaffing gear, on the top of the regulated portion of a trawl net; except that, one splitting strap and one bull rope (if present), consisting of line or rope no more than 2" in diameter, may be used if such splitting strap and/or bull rope does not constrict in any manner the top of the regulated portion of the net; and one rope no greater than 0.75 inches in diameter extending the length of the net from the belly to the terminus of the cod end along each of the following: the top, bottom, and each side of the net. "Top of the regulated portion of the net" means the 50% of the entire regulated portion of the net which (in a hypothetical situation) would not be in contact with the ocean bottom during a tow if the regulated portion of the net were laid flat on the ocean floor. For the purpose of this paragraph, head ropes shall not be considered part of the top of the regulated portion of a trawl net.

The minimum net mesh size could be changed annually, if appropriate, following the Scup FMP Monitoring Committee process set forth in 9.1.2.2. Based on the recommendations of the Scup Monitoring Committee and Council, the Regional Director, by regulatory amendment, shall implement regulations on gear other than otter trawls to achieve discards of scup equivalent to the discards with otter trawls given the minimum net mesh requirements. This provision is intended to address the problem that could develop if gears currently not in significant use in the scup fishery are developed as a way of avoiding the minimum otter trawl mesh rule.

2.2. Evaluation

If implemented, owners or operators of otter trawl vessels possessing 1000 lbs or more of scup would only be allowed to fish with nets that have a minimum mesh size of 4.5" diamond (4.0" square) in the codend. The L_{50} (the length at which 50% of the scup are retained) is 9.1 inches for this mesh size (Table 45).

Landings of scup represent only a portion of the fishing mortality experienced by the stock. Undersized scup, those less than 9" TL, experience both discard mortality and deaths due to encounters with commercial gear. The amount of fish dying due to these causes can be high with the current mesh sizes now used in the fishery, that is, an effective mesh size of 2.0" or less. Sea sampling data indicate that the weight of the discarded fish are almost equivalent to the weight of the landings in some years. Discard rates are higher in years of good recruitment, that is, years when more small fish were available.

During the development of this FMP, fishermen stated that a minimum mesh regulation would not be necessary if a minimum size regulation was implemented. They based their statements on the argument that it would be economically inefficient to catch large amounts of small scup that would then have to be sorted to retain only the legal sized fish. As a result, they indicated that they would modify their fishing practices to avoid small scup. In addition, they indicated that their traditional fishing practices would be disrupted by a minimum mesh provision.

Scup are a component of the mixed trawl fishery in Southern New England and the Mid-Atlantic. Although Sea Sampling data indicate that fishermen may differentiate between species on a per tow basis (i.e., target a single species on a tow), fishermen land many different species on a per trip basis. Based on NMFS weighout data, scup are most frequently landed with *Loligo* squid, Atlantic mackerel, and silver hake. In fact, for trips landing a 1000 or more pounds of scup per trip, more *Loligo* squid were landed than scup (Table 72).

The 1000 pound threshold would not effect the majority of the vessels or trips that landed scup in 1992. Based on NMFS weighout data, a threshold of 1000 lbs per trip would have affected approximately 52% of the vessels and 28% of the trips landing scup in 1992 (Tables 48 and 49). However, these trips accounted for over 95% of the scup landed by otter trawl vessel in 1992. Also, regulations that allow multiple nets on board would allow fishermen who traditionally targeted multi-species on a trip, to fish for and retain other species with small mesh until the 1000 pound threshold of scup was reached. These fishermen would then have to use the 4.5" mesh if they decided to target more scup. Once the threshold was reached fishermen would have to properly stow other cod ends for the remainder of the trip.

Landings of scup by fishermen targeting *Loligo* squid on the same trip could be effected by these regulations. Based on 1992 NMFS weighout data, 45% of the vessels and 29% of the trips landing 2500 pounds or more of *Loligo* squid, landed over 95% of *Loligo* landed by all *Loligo* otter trawl fishermen (Tables 50 and 51). Based on this 2500 pound threshold, scup comprise slightly more than 6% of the total fish landed on these trips (Table 52). However, the total pounds is slightly more than 50% of all scup landed by otter trawl fishermen in 1992.

In general, these regulations would modify some traditional fishing practices. The fishermen effected by these regulations would be those fishermen who targeted scup first on their trip and retained more than 1000 pounds of scup, before switching to other species for the remainder of their trip. Landings of other species taken as bycatch by these fishermen could be affected. Alternatively, if a fishermen had 1000 lbs of scup on board, and desired to continue fishing with a small mesh net, he would be required to discard any scup caught in tows directed to other species. Thus, it is possible that discards would not be reduced and the benefits to the fishery, both the fishermen and the stock, would be minimal.

3. AN 8 " TL MINIMUM FISH SIZE AND A 4" MINIMUM MESH SIZE IN THE OTTER TRAWL FISHERY WHEN A VESSEL HAS 1,000 POUNDS OR MORE OF SCUP ON BOARD

3.1. Description

This alternative would allow fishermen to use only nets that have a minimum mesh size of 4.0" diamond mesh or 3.5" square mesh when they had 1000 pounds or more of scup on board. In addition to the minimum mesh provisions, this alternative would require that fishermen not land for sale any scup smaller than the 8" TL minimum size limit. A maximum of a 5% tolerance by weight of undersized scup would be allowed on commercial vessels. This alternative would be used in conjunction with other alternatives such as the quota or closed seasons.

This alternative would require that owners or operators of otter trawl vessels possessing 1000 lbs or more of scup, fish only with nets that have a minimum mesh size of 4.0" diamond mesh (3.5" square), inside measure, applied throughout the cod end for at least 75 continuous meshes forward of the terminus of the net, or, if the net is not long enough for such a measurement, the terminal 1/3 of the net, measured from the terminus of the cod end to the head rope. Mesh would be allowed to be larger than the minimum size, but it could be no smaller than the minimum size. If the fish are landed in a state that has a more stringent net mesh regulation, the state regulation would prevail. States with minimum mesh regulations larger than those established by this alternative would be encouraged to maintain them.

In addition, this alternative would require that owners or operators of otter trawl vessels possessing 1000 lbs or more of scup not have available for immediate use any net, or any piece of net not meeting the minimum mesh size requirements, or mesh that is rigged in a manner that is inconsistent with the minimum mesh size. A net that conformed to one of the following specifications and that could be shown not to

have been in recent use is considered to be not "available for immediate use":

(1) A net stowed below deck, provided:

(i) it is located below the main working deck from which the net is deployed and retrieved;

(ii) the towing wires, including the "leg" wires, are detached from the net; and

(iii) it is fan-folded (flaked) and bound around its circumference.

(2) A net stowed and lashed down on deck, provided:

(i) it is fan-folded (flaked) and bound around its circumference;

(ii) it is securely fastened to the deck or rail of the vessel; and

(iii) the towing wires, including the leg wires, are detached from the net.

(3) A net that is on a reel and is covered and secured, provided:

(i) the entire surface of the net is covered with canvas or other similar material that is securely bound;

(ii) the towing wires, including the leg wires, are detached from the net; and

(iii) the codend is removed from the net and stored below deck.

(4) Nets that are secured in a manner approved by the Regional Director, provided that the Regional Director has reviewed the alternative manner of securing nets and has published that alternative in the *Federal Register*.

Any combination of mesh or liners that effectively decreases the mesh below the minimum size would be prohibited.

This alternative would prohibit the owner or operator of a fishing vessel from using any device, gear, or material, including, but not limited to, nets, net strengtheners, ropes, lines, or chaffing gear, on the top of the regulated portion of a trawl net; except that, one splitting strap and one bull rope (if present), consisting of line or rope no more than 2" in diameter, may be used if such splitting strap and/or bull rope does not constrict in any manner the top of the regulated portion of the net; and one rope no greater than 0.75 inches in diameter extending the length of the net from the belly to the terminus of the cod end along each of the following: the top, bottom, and each side of the net. "Top of the regulated portion of the net" means the 50% of the entire regulated portion of the net which (in a hypothetical situation) would not be in contact with the ocean bottom during a tow if the regulated portion of the net were laid flat on the ocean floor. For the purpose of this paragraph, head ropes shall not be considered part of the top of the regulated portion of a trawl net.

The minimum net mesh size could be changed annually, if appropriate, following the Scup FMP Monitoring Committee process set forth in 9.1.2.2. Based on the recommendations of the Scup Monitoring Committee and Council, the Regional Director, by regulatory amendment, shall implement regulations on gear other than otter trawls to achieve discards of scup equivalent to the discards with otter trawls given the minimum net mesh requirements. This provision is intended to address the problem that could develop if gear currently not in significant use in the scup fishery are developed as a way of avoiding the minimum otter trawl mesh rule.

3.2. Evaluation

If implemented, owners or operators of otter trawl vessels possessing 1000 lbs or more of scup would only be allowed to fish with nets that have a minimum mesh size of 4.0" diamond (3.5" square) in the codend. The L_{50} (the length at which 50% of the scup are retained) is 8.3 inches for this mesh size (Table 45).

Landings of scup represent only a portion of the fishing mortality experienced by the stock. Undersized scup, those less than 9" TL, experience both discard mortality and deaths due to encounters with commercial gear. The amount of fish dying due to these causes can be high with the current mesh sizes now used in the fishery, that is, an effective mesh size of 2.0" or less. Sea sampling data indicate that the weight of the discarded fish are almost equivalent to the weight of the landings in some years. Discard rates are higher in years of good recruitment, that is, years when more small fish were available.

During the development of this FMP, fishermen stated that a minimum mesh regulation would not be necessary if a minimum size regulation was implemented. They based their statements on the argument that it would be economically inefficient to catch large amounts of small scup that would then have to be sorted to retain only the legal sized fish. As a result, they indicated that they would modify their fishing practices to avoid small scup. In addition, they indicated that their traditional fishing practices would be disrupted by a minimum mesh provision.

Scup are a component of the mixed trawl fishery in Southern New England and the Mid-Atlantic. Although Sea Sampling data indicate that fishermen may differentiate between species on a per tow basis (i.e., target a single species on a tow), fishermen land many different species on a per trip basis. Based on NMFS weighout data, scup are most frequently landed with *Loligo* squid, Atlantic mackerel, and silver hake. In fact, for trips landing a 1000 or more pounds of scup per trip, more *Loligo* squid were landed than scup (Table 72).

The 1000 pound threshold would not effect the majority of the vessels or trips that landed scup in 1992. Based on NMFS weighout data, a threshold of 1000 lbs per trip would have affected approximately 52% of the vessels and 28% of the trips landing scup in 1992 (Tables 48 and 49). However, these trips accounted for over 95% of the scup landed by otter trawl vessel in 1992. Also, regulations that allow multiple nets on board would allow fishermen who traditionally targeted multi-species on a trip, to fish for and retain other species with small mesh until the 1000 pound threshold of scup was reached. These fishermen would then have to use the 4.0" mesh if they decided to target more scup. Once the threshold was reached fishermen would have to properly stow other cod ends for the remainder of the trip.

Landings of scup by fishermen targeting *Loligo* squid on the same trip could be effected by these regulations. Based on 1992 NMFS weighout data, 45% of the vessels and 29% of the trips landing 2500 pounds or more of *Loligo* squid, landed over 95% of *Loligo* landed by all *Loligo* otter trawl fishermen (Tables 50 and 51). Based on this 2500 pound threshold, scup comprise slightly more than 6% of the total fish landed on these trips (Table 52). However, the total pounds is slightly more than 50% of all scup landed by otter trawl fishermen in 1992.

In general, these regulations would modify some traditional fishing practices. The fishermen effected by these regulations would be those fishermen who targeted scup first on their trip and retained more than 1000 pounds of scup, before switching to other species for the remainder of their trip. Landings of other species taken as bycatch by these fishermen could be affected. Alternatively, if a fishermen had 1000 lbs of scup on board, and desired to continue fishing with a small mesh net, he would be required to discard any scup caught in tows directed to other species. Thus, it is possible that discards would not be reduced and the benefits to the fishery, both the fishermen and the stock, would be minimal.

4. NO MINIMUM FISH SIZE AND A 4.5" MINIMUM MESH SIZE IN THE OTTER TRAWL FISHERY WHEN A VESSEL HAS 1,000 POUNDS OR MORE OF SCUP ON BOARD

4.1. Description

This alternative would allow fishermen to use only nets that have a minimum mesh size of 4.5" diamond (4.0" square) mesh, inside measure, applied throughout the cod end. Fishermen could land for sale scup of any size. This alternative would be used in conjunction with other alternatives such as the quota or closed seasons.

This alternative would require that owners or operators of otter trawl vessels possessing 1000 lbs or more of scup, fish only with nets that have a minimum mesh size of 4.5" diamond mesh (4.0" square), inside measure, applied throughout the cod end for at least 75 continuous meshes forward of the terminus of the net, or, if the net is not long enough for such a measurement, the terminal 1/3 of the net, measured from the terminus of the cod end to the head rope. Mesh would be allowed to be larger than the minimum size, but it could be no smaller than the minimum size. If the fish are landed in a state that has a more stringent net mesh regulation, the state regulation would prevail. States with minimum mesh regulations larger than those established by this alternative would be encouraged to maintain them.

In addition, this alternative would require that owners or operators of otter trawl vessels possessing 1000 lbs or more of scup not have available for immediate use any net, or any piece of net not meeting the minimum mesh size requirements, or mesh that is rigged in a manner that is inconsistent with the minimum mesh size. A net that conformed to one of the following specifications and that could be shown not to have been in recent use is considered to be not "available for immediate use":

(1) A net stowed below deck, provided:

(i) it is located below the main working deck from which the net is deployed and retrieved;

(ii) the towing wires, including the "leg" wires, are detached from the net; and

(iii) it is fan-folded (flaked) and bound around its circumference.

(2) A net stowed and lashed down on deck, provided:

(i) it is fan-folded (flaked) and bound around its circumference;

(ii) it is securely fastened to the deck or rail of the vessel; and

(iii) the towing wires, including the leg wires, are detached from the net.

(3) A net that is on a reel and is covered and secured, provided:

(i) the entire surface of the net is covered with canvas or other similar material that is securely bound;

(ii) the towing wires, including the leg wires, are detached from the net; and

(iii) the codend is removed from the net and stored below deck.

(4) Nets that are secured in a manner approved by the Regional Director, provided that the Regional Director has reviewed the alternative manner of securing nets and has published that alternative in the *Federal Register*.

Any combination of mesh or liners that effectively decreases the mesh below the minimum size would be prohibited.

This alternative would prohibit the owner or operator of a fishing vessel from using any device, gear, or material, including, but not limited to, nets, net strengtheners, ropes, lines, or chaffing gear, on the top of the regulated portion of a trawl net; except that, one splitting strap and one bull rope (if present), consisting of line or rope no more than 2" in diameter, may be used if such splitting strap and/or bull rope does not constrict in any manner the top of the regulated portion of the net; and one rope no greater than 0.75 inches in diameter extending the length of the net from the belly to the terminus of the cod end along each of the following: the top, bottom, and each side of the net. "Top of the regulated portion of the net" means the 50% of the entire regulated portion of the net which (in a hypothetical situation) would not be in contact with the ocean bottom during a tow if the regulated portion of the net were laid flat on the ocean floor. For the purpose of this paragraph, head ropes shall not be considered part of the top of the regulated portion of a trawl net.

The minimum net mesh size could be changed annually, if appropriate, following the Scup FMP Monitoring Committee process set forth in 9.1.2.2. Based on the recommendations of the Scup Monitoring Committee and Council, the Regional Director, by regulatory amendment, shall implement regulations on gear other than otter trawls to achieve discards of scup equivalent to the discards with otter trawls given the minimum net mesh requirements. This provision is intended to address the problem that could develop if gear currently not in significant use in the scup fishery are developed as a way of avoiding the minimum otter trawl mesh rule.

4.2. Evaluation

This alternative would allow the market to control the minimum size of fish landed by commercial fishermen. Based on industry comment, most marketable fish are generally 9" TL or larger at the present time although the market will accept fish as small as 7" TL.

A 4.5" mesh would catch and retain smaller fish that would then be marketed. Without the additional incentive offered by a minimum size regulation, it is possible that fishermen would use smaller mesh not only to target smaller fish but also insure that more of the 9" TL fish were caught and retained, i.e., 50% of the 9.1" TL fish are retained by a 4.5" mesh.

Fishermen using other gears also catch and land scup. Because the minimum mesh provision would not apply to these fishermen, they would continue to fish for and retain small scup.

In general, this alternative would result in continued discarding and landings of small scup by commercial fishermen. The benefits to the fishery, both the fishermen and the stock, would be minimal.

5. STATE BY STATE COMMERCIAL QUOTAS

5.1. Description

This alternative would allocate the commercial quota on a state by state basis. States would have the responsibility for closures in their state and the Regional Director would be required to prohibit landings by Federally permitted vessels in any state that had reached its quota. States would be allowed to trade or combine quotas and the states could impose trip limits or other measures to manage their quotas. The system would be the same as that operating under the Summer Flounder FMP.

5.2. Evaluation

The quota setting process is specified in 9.1.2.2. Beginning in year 3, a quota would be allocated to the commercial fishery to control fishing mortality. The quota would be based on stock assessment information on projected stock size estimates for that year. Estimates of stock size coupled with the target fishing mortality rate would allow for a calculation of total allowable landings. Based on the historic proportions of commercial and recreational landings, 70% of the total target would be allocated to the commercial fishery.

To assess potential impacts of the quota, landings data were used from 1988-1992 to derive average landings for those years (11.732 million lbs). Based on these data, a 28% reduction in exploitation would equate to a commercial quota of 8.5 million lbs (72% x 11.732).

Quotas would be distributed to the states based on their percentage share of commercial landings for the period 1983-1992. Quotas would range from 12,030 lbs to 3.7 million lbs based on these percentages (Table 73).

A state-by-state quota system could allow for the most equitable distribution of the commercial quota to fishermen. Specifically, states under this alternative would have the responsibility of managing their quota for the greatest benefit of the commercial scup industry in their state. States could design allocation systems based on trip limits and seasons. States would also have the ability to transfer or combine quota increasing the flexibility of the system to respond to year to year variations in fishing practices or landings patterns.

However, state-by-state allocations would negatively affect fishermen who land in those states that do not have the capability of regulating a quota. Based on the quota system implemented for summer flounder, a few states have not been able to establish trip limit systems that ensure a continuous and steady supply of product over the season for producers and/or a fair an equitable distribution of flounder to all fishermen who have traditionally landed summer flounder in their state. In addition, some states have had problems coordinating their regulations with neighboring states to prevent large scale landings by fishermen in states with the most favorable trip limits. A similar situation could occur if a state-by-state system was implemented for scup.

6. COASTWIDE BIMONTHLY COMMERCIAL QUOTAS

6.1. Description

This alternative would allocate the annual coastwide quota on a bimonthly basis. The Regional Director would be required to prohibit landings by federally permitted vessels when any bimonthly quota had been reached.

The quota setting process is specified in 9.1.2.2. Beginning in year 3, a quota would be allocated to the commercial fishery to control fishing mortality. The quota would be based on projected stock size estimates derived from stock assessment information for that year. Estimates of stock size coupled with the target fishing mortality rate would allow for a calculation of total allowable landings. Based on the historic proportions of commercial and recreational landings, 70% of the total target would be allocated to the commercial fishery (Table 11).

The annual commercial quota will be set at a range of between 0 and the commercial share of the maximum allowed by the adopted fishing mortality rate reduction strategy. The commercial quota includes all landings for sale by *any* gear.

All landings by any vessel that has a commercial moratorium permit (permit to sell) counts against the quota, whether the scup are caught with an otter trawl, a scallop dredge, hook and line, or any other gear. If the vessel does not have a commercial moratorium permit, the fish may not be sold and the recreational rules on size, possession, and season apply.

The annual commercial quota would be based on the recommendations of the Scup FMP Monitoring Committee to the Council and ASMFC Board. The Council and ASMFC would consider those recommendations and submit their recommendations to the Regional Director. The Regional Director will set the commercial quota annually.

The quota must apply throughout the management unit, that is, in both state and federal waters. All commercial landings during a bimonthly period would count toward the quota for that period. When the quota had been landed for a bimonthly period, fishing for and/or landing scup would be prohibited for the

remainder of the period.

Any landings in excess of the bimonthly quota would be subtracted from the following year's quota for the same period. For example, if the period 1 (January-February) quota was exceeded by 10,000 pounds, 10,000 pounds would be subtracted from the period 1 allocation the following year.

Using data collected through this FMP (section 9.1.3), NMFS will monitor the fishery to determine when a bimonthly quota will be reached. It is expected that the States will assist NMFS with data collection.

The Regional Director shall close the EEZ to fishing for scup by commercial vessels when the bimonthly allocation has been landed.

The Regional Director may establish a system of trip limits to ensure an equitable distribution of the quota over the bimonthly period.

Annual quotas would be allocated on a bimonthly basis based on commercial landings for the period 1988-92 (Table 74).

6.2. Evaluation

Beginning in year 3 a quota would be allocated to the commercial fishery to control fishing mortality. The quota would be based on stock assessment information on projected stock size estimates for that year. Estimates of stock size coupled with the target fishing mortality rate would allow for a calculation of total allowable landings. Based on the historic proportions of commercial and recreational landings for 1983 to 1992, 67% of the total target would be allocated to the commercial fishery (Table 11).

To assess potential impacts of the quota, landings data were used from 1988-1992 to derive average landings for those years (11.732 million lbs). Based on these data, a 28% reduction in exploitation would equate to a commercial quota of 8.5 million lbs (72% x 11.732).

A bimonthly quota system could allow for an equitable allocation of the commercial quota to northern and southern participants as well as between the smaller day boats and larger offshore vessels. Due to the seasonal nature of the scup fishery, the quota would have to be divided into bimonthly units. To minimize effects on traditional landings patterns, the allocation to each period would be based on past landings instead of a system that divided the quota equally over the six periods. Based on 1988-1992 data, 22.4% would be allocated to period 3 (May-June) and only 5.3% to period 4 (July-August) (Table 74). The bimonthly allocations would range from 450,000 lbs to 2,584,000 lbs based on a annual quota of pounds 8.5 million lbs (Table 74). Based on state data for those years, fishermen would be able to maintain traditional landings patterns in most states.

A coastwide system would allow fishermen to land in any port along the coast and all commercial landings during a bimonthly period would count toward that quota for that period. When the quota had been landed for a bimonthly period, fishing for and/or landing scup would be prohibited for the remainder of the period. Landings in excess of the allocation for the period would be subtracted from the following years's quota for the same period. Trip limits would have to be implemented. Bimonthly allocations without trip limits would encourage derby-style fishing practices that would allow the quota to be landed by larger, more mobile vessels at the beginning of each period. As a result, supplies of scup would be discontinuous and smaller boats would be disadvantaged.

Trip limits would be established and modified throughout the two-month period to allow for a continuous supply of product and equitable distribution of scup to fishermen using both small and large vessels. For example, almost all of the landings in period 1 are attributable to fishermen using otter trawl vessels. A 10,000 pound trip limit could be established for the beginning of period 1. The limit would decrease to 5000 lbs when 50% of the allocation was reached, 1000 lbs when 75% of the quota was taken, and 500 lbs when 90% of the landings were reached.

Different trip limit systems could be designed for each period to ensure equitable distribution over each two-month period. Unlike a system where states have the flexibility to design their own systems, NMFS would be responsible for implementing trip limits for each period. However, such a system would place a large administrative burden on NMFS at a time when additional resources are not available.

7. SEASONAL CLOSURES IN THE COMMERCIAL FISHERY FOR YEARS 3 AND BEYOND

7.1. Description

This alternative would achieve the fishing mortality rate reduction target in years three and beyond through a seasonal closure in conjunction with a minimum fish size and/or minimum mesh size.

The Monitoring Committee would annually estimate a mortality target from the fishing mortality rate reduction schedule. From this, a seasonal closure would be specified to assure that the mortality target was not exceeded. This would go through a review, comment, and approval process involving the Council, ASMFC Management Board, and NMFS Northeast Regional Director.

Gear-specific seasonal closures would be implemented to control fishing mortality in the commercial scup fishery (Table 54). During a seasonal closure all gear capable of catching scup be removed from the water. In addition, vessels would be required to carry and operate an electronic vessel tracking device that met NMFS specifications.

7.2. Evaluation

NMFS General Canvass Data from 1988 to 1992 were used to determine the potential impact of seasonal closures on commercial landings of scup. The ASMFC technical committee decided that these years would be most representative of current conditions in the fisheries.

The Committee decided that seasonal closures for scup fishermen be applied on a coastwide basis. Calculations restricted the smallest unit of closure to one week. Calculated reductions were as close to 28% (the target reduction in the third year of the management program) as could be derived based on average monthly data from 1988-92 and the criteria decided on by the committee. In addition, seasonal closures were derived assuming that fishermen would recoup 0% and 15% of their landings during the open season. The 15% level applied to all mobile gears, including hook and line. Because of the fixed nature of the pots and traps, only a 0% (no recoupment) level was used for these gears.

If a recoupment level was assumed, calculations were made using a simple algorithm that accounted for changes in landings per day (LPD) during the open and closed seasons. For example, for scup landed by otter trawl fishermen, the time period from November 15 to January 31 accounted for 28% of the landings during 1988-1992. A closed season during these months would result in a fishing season that would be open for 8 1/2 months (February through November 14) or approximately 288 days. The amount of discretionary time during this open period would be 43 days (15% x 288 days). Since 72% of the landings occurred during the open period, the LPD during the open period would be 72 divided by the days fished or 245 (288-43). This LPD multiplied times the discretionary time (43 days) would result in a recoupment of 13%. As a result, the realized reduction in landings for the closed period February through May would be 15% (28% - 13%).

Seasonal closures ranged from slightly more than one month to four months depending on location (north or south) and gear type (Table 54). Note that because otter trawls are the only gear that land significant amounts of scup in the south, all gear specific seasonal closures for scup would be coastwide. Seasonal closures could achieve the desired reductions if the following criteria were met:

1. The level of discretionary time used to derive the reductions is realistic. The assumed value of 15% may be an underestimate for some mobile gears.

2. All gear capable of catching scup be removed from the water during the closed period. Without such a

provision, fishermen would continue to fish for other species during the closed period, catching and discarding scup in the process. For trawl fisheries, the technical committee recommended that mesh sizes of 5.5" diamond mesh or larger could continue to operate.

3. Landings patterns do not vary much from one year to the next, i.e., anticipated landings in year three of the management program are similar to the landings observed for 1988-1992.

Finally, any effective area/seasonal closure would require that NMFS be able to track commercial vessels on a real time basis to ensure a high level of compliance. Such a system could be comparable to the Vessel Monitoring System that will be implemented for groundfish and scallops by NMFS.

It is also important to note that fishermen could negate seasonal closure effects by increasing effort or efficiency during the open season. These increases could produce conditions in the stock that were equivalent to or worse than those before regulations.

In addition, the requirement that all gear capable of catching scup be removed from the water during a closure would have major impacts on the catch of other economically important species that have been traditionally landed with scup on the same trip.

8. SEASONAL DEPENDENT MINIMUM SIZES IN THE COMMERCIAL FISHERY: A 10" TL MINIMUM SIZE FROM OCT. 1 - APRIL 30 AND A 9" TL MINIMUM SIZE FOR THE REST OF THE YEAR

8.1. Description

This alternative would allow commercial fishermen to use any size cod end so long as they did not land for sale any scup smaller than the 9" TL minimum size limit from May through September 30 and a 10" TL minimum size limit from October 1 through April 30. A maximum of a 5% tolerance by weight of undersized scup would be allowed on commercial vessels. Scup less than the minimum size limit could not be sold. This alternative would be used in conjunction with other alternatives such as the quota or closed seasons beginning in year 3 of the management program.

The minimum fish size may be changed annually, if appropriate, following the Scup FMP Monitoring Committee process set forth in 9.1.2.2.

8.2. Evaluation

This alternative recognizes the seasonal nature of the commercial scup fisheries. Based on 1983 to 1992 monthly data, most scup are harvested from state waters from May through September and from EEZ waters from October through April (Table 18). In addition, fixed gears such as floating traps, pound nets, and pots/traps as well as hook and line account for the majority of the landings from May through September and otter trawls are the predominant gear from October through April. Otter trawls and floating traps accounted for over 74% and 12% of the coastwide landings, respectively based 1983-1992 General Canvass data (Table 12).

Historic commercial length frequencies were used as an estimate of potential short-term impacts of length limits on the commercial scup fisheries (Tables 41 to 44). Specifically, commercial length frequencies from the NMFS Weighout Data and North Carolina DMF from 1982 to 1994 were used to determine potential size limit effects. In general, size frequency data indicated that potential size limit effects increased from north to south, were gear dependent, and varied from one year to the next.

Based on NMFS weighout data, approximately 19% of the measured scup were less than 9" TL for all otter trawl vessel with sampled landings (Table 44). A 9" TL minimum size regulation would have a slightly greater effect on landings from floating traps, the other predominant gear in the scup fishery. Based on NMFS weighout data, almost 26% of the measured fish were less than 9" TL for the 316 obtained from this gear from 1983 to 1991 combined.

A 10" TL minimum size limit would have a significantly greater effect on otter trawl landings. Based on 1983 to 1991 NMFS weighout data, over 59% of the fish measured from otter trawl landings were less than 10" TL. The proportion was even greater for scup measured from the North Carolina winter trawl fishery; almost 88% of the scup were less than 10" TL in 1991-1992 (Table 42). The effect of these minimum size regulations on fishermen using fixed gear would be the same as those identified in the preferred alternative.

However, a 10" TL minimum size in the otter trawl fishery could significantly reduce landings by these vessels in the short term. A large reduction in landings could have large negative economic consequences to fishermen, processors, and the consuming public. In addition, if these vessels continued to catch and discard smaller scup in the process, the benefits to the stock would be minimal.

Assuming that undersized fish are not caught and discarded, minimum size regulations have positive impacts on the stock. In general, because minimum sizes increase the size at full recruitment, yields are increased as fishermen catch larger, heavier fish. In addition, minimum size regulations can increase the resilience of the stock to overfishing, i.e., the biological reference points (F_{max}) can increase. Finally, minimum size regulations can increase spawning stock biomass by allowing more fish to spawn. Sexual maturity data for scup indicate that 50% of the scup are mature by a size of 6.8" TL. A total of a 100% would be mature by the time they reached a size of 10" TL.

9. INDIVIDUAL TRANSFERRABLE QUOTAS

9.1. Description

An individual transferrable quota (ITQ) program would assign annual quotas to individual vessels. Qualifications to participate could be the same as participation under the vessel moratorium. Initial allocations could be made based on sales receipts for the most recent five years, but no vessel could be allocated more than some maximum percentage. Fishermen would be prohibited from fishing for or landing scup after their annual allocations had been taken.

9.2. Evaluation

ITQs are a relatively new management technique where a total quota is divided into small parts and allocated to individual participants. Individual quotas or shares could be bought, sold or leased so that harvesters have flexibility in planning their fishing activities. Potential advantages of ITQs include increased profits, greater economic stability, improved product quality, improved safety, reduced gear conflicts and losses, elimination of derby-type fisheries, bycatch reduction, an improved investment climate, reduction of market gluts, and reduction in post-harvest waste (Anderson 1992). Potential disadvantages of ITQs include increased high-grading, under-reporting of catch, enforcement costs and problems, creation of a "rich mans club", changes in the makeup of the fishing fleet, and potential inequities of the initial allocation of quota shares due to lack of information (Anderson 1992).

An ITQ program could allow individual fishermen greater flexibility than any of the quota or seasonal closure based systems. That is, they could fish for scup when they wanted to, rather than being controlled by quota or seasonal closures.

As with the other alternatives, fishermen could not fish for (catch and discard as well as catch and land) scup after their allocations had been taken. This would require careful management of their allocations to assure that their participation in other small mesh fisheries did not violate their ITQ allocations.

An initial problem is associated with the initial allocation process. A great deal of time would be required to obtain and validate sales records to determine initial allocations. NMFS weighout data indicate that approximately 600 to 700 vessels could be eligible for allocations. Since not all vessels are captured in the weighout data base, the number could be considerably larger. It might be preferable to initiate management of the scup resource without ITQs to protect the resource and introduce an ITQ system subsequently.

10. AN 8" TL MINIMUM FISH SIZE LIMIT IN THE RECREATIONAL FISHERY COASTWIDE IN YEARS ONE AND TWO OF THE MANAGEMENT PROGRAM

10.1. Description

This alternative would make it illegal for recreational fishermen to possess whole scup or parts of scup less than 8" TL in areas from Maine through Cape Hatteras, North Carolina.

10.2. Evaluation

Based on 1983 to 1994 MRFSS data, only 14% and 7% of the scup caught by recreational fishermen in the North and Mid-Atlantic, respectively, were caught in the EEZ (Table 23). In 1994, 15% of the total scup caught by recreational fishermen in these subregions originated in the EEZ. Thus the effect of a 8" TL minimum size in the EEZ would be inconsequential for both fishermen and the stock.

However, minimum size limits would effect state landings. Based on 1990-94 intercept data, 4-16% of the measured scup were less than 8" TL for scup landed in states from Maine to New York (Table 62). On average, these states accounted for over 97% of the recreational landings on a coastwide basis (Table 25).

Analysis of intercept data for the states from New Jersey through North Carolina indicated that anglers harvested smaller fish in these states. Based on 1990-94 data, 28-58% of the measured scup were less than 8" TL (Table 62).

Thus, the associated reduction in landings resulting from the implementation of an 8" TL would have a larger consequence for southern states (NJ-NC) than northern (ME-NY). Assuming a post-release mortality of 15%, the percent reduction in the number of scup killed by anglers associated with the minimum size limits would be 13.2% based on combined 1990-1994 data (Table 63).

11. AN 8" TL MINIMUM FISH SIZE LIMIT IN THE RECREATIONAL FISHERY IN THE EEZ WITH A 7" TL MINIMUM FISH SIZE LIMIT IN THE STATES OF NEW YORK THROUGH NORTH CAROLINA AND AN 8" TL MINIMUM FISH SIZE LIMIT IN THE STATES OF CONNECTICUT THROUGH MAINE IN STATE WATERS IN YEARS ONE AND TWO OF THE MANAGEMENT PROGRAM

11.1. Description

This alternative differs from the preferred alternative in that the minimum size limit would be 8" TL in the EEZ coastwide and the 7" TL minimum size limit would include the state of New York. That is, this alternative would make it illegal for recreational fishermen to possess whole scup or parts of scup less than 8" TL in state waters from Maine through Connecticut. In state waters from New York through Cape Hatteras, North Carolina, this alternative would make it illegal for recreational fishermen to possess whole scup or parts of scup less than 7" TL.

11.2. Evaluation

Based on 1983 to 1994 MRFSS data, only 14% and 7% of the scup caught by recreational fishermen in the North and Mid-Atlantic, respectively, were caught in the EEZ (Table 23). In 1994, 15% of the total scup caught by recreational fishermen in these subregions originated in the EEZ. Thus the effect of a 8" TL minimum size in the EEZ would be inconsequential for both fishermen and the stock.

However, minimum size limits would effect state landings. Based on 1990-94 intercept data, 4-16% of the measured scup were less than 8" TL for scup landed in states from Maine to New York (Table 62). On average, these states accounted for over 97% of the recreational landings on a coastwide basis (Table 25).

Analysis of intercept data for the states from New Jersey through North Carolina indicated that anglers harvested smaller fish in these states. Based on 1990-94 data, 28-58% of the measured scup were less than 8" TL (Table 62). However, the percent of measured fish less than 7" TL ranged from 6-25%.

On average, the state of New York accounted for the majority of scup landed by recreational anglers from 1983-1992 (37%). In addition, only 4.1% of the scup measured by MRFSS field interviewers in New York were less than 7" TL. Thus the effect of a 7" TL minimum size in the state of New York would be inconsequential for both fishermen and the stock. In addition, relative to the preferred alternative, a 7" TL size limit in New York would reduce the effectiveness of a recreational size limit on a coastwide basis.

12. A THRESHOLD REQUIREMENT TO QUALIFY FOR A MORATORIUM PERMIT

12.1. Description

This alternative would require that a vessel have documented landings of scup equal to, or in excess of, some minimum threshold amount in order to qualify for a moratorium permit to land and sell scup under the moratorium program. The qualification period, 26 January 1988 to 26 January 1993, would remain identical to that proposed in the preferred alternative. However, this alternative differs from the preferred alternative in that the preferred alternative would require that any amount of scup (i.e., greater than 0 pounds) be documented for sale between those dates to qualify for the permit.

12.2. Evaluation

The percent of otter trawl vessels, trips, and associated pounds for a given threshold (pounds) of scup landings was derived using 1992 and 1993 NMFS weighout data. These data indicate that the number of vessels landing scup decrease as the threshold amount increases. As an example, at a 5000 pound threshold, only 25% of the vessels would qualify for the permit yet these vessels accounted for over 75% of the landings in the weighout data base (Table 49).

13. SEPARATE MANAGEMENT MEASURES FOR PARTY/CHARTER BOAT FISHERMEN

13.1. Description

This alternative would recognize that anglers fishing from party/charter boats form a distinct user group that is separate from other recreational or commercial fishermen. As such, beginning in year 3 of the fishery management program, management measures would be developed that were applicable only to this user group. These could include a coastwide harvest limit, minimum size limit, possession limit, and season.

13.2 Evaluation

Based on 1983 to 1992 MRFSS data, anglers fishing from party/charter boats accounted for 12% of the recreational landings on a coastwide basis. Based on this data, 12% of the coastwide recreational harvest limit would be allocated to this user group. A combination of size and possession limits with seasons could then be used to achieve the allocation on an annual basis.

APPENDIX 2. PUBLIC HEARING SUMMARIES

July 18, 1995, New Bedford, Massachusetts

The hearing was opened at 7:05 pm by hearing officer Dave Pierce, Massachusetts Div. of Marine Fisheries. Also in attendance was Dave Borden, RI Div. of Fish and Wildlife and 45 members of the public.

Mr. Seagraves presented the hearing draft of the Scup Fishery Management Plan.

Frank Cyganowski was opposed to mesh sizes and size limits. He feels that fisheries should be limited to an overall quota and the fishermen should be allowed to keep everything they catch. He stated that the minimum size limit will cause a major discard problem. He cited the cod/haddock mesh requirements as an example of the failure of mesh size requirements.

Alfred Pauline questioned why there were different size limits between different states and between commercial and recreational fisheries. He supported a uniform size limit for scup. He was concerned about the inshore fisheries if a coastwide quota approach was adopted. He favors some sort of measure to protect the inshore trap fishermen. He feels that there is no such thing as a recreational fishermen, claiming that 99% of the scup caught on hook and line go to market.

Ray Nazarchyk, commercial hook and line fishermen, was concerned that the Plan did not address the commercial rod and reel fishery directly. He favored a closure during the spawning season.

Gene Bothelo suggested specifying a date during the season when you can begin fishing for scup. He favored an open season from June 15 onward. He wants to protect the fish during the spawning season. He feels that the Council takes too long to develop fishery management plans.

Keith Baker, Neatlady Inc., stated that he has been fishing for scup for 18 years in Buzzard's Bay. He owns a party boat and stated that the scup just aren't there like they used to be. He is very concerned that the Scup Plan will be too little, too late. He favors a spawning closure to July 1. He stated that over the past three years his scup catch has declined 100%. He feels the timetable to reduce fishing mortality is too lenient. He wants fishing stopped completely if necessary, especially during the spawning season.

James Tietje, Patriot Party Boats, stated that he has experienced the same decline as the previous speaker in Vineyard Sound. He takes tourists fishing and now has to fish for sea robins since there are no scup. He favors limits on fishing including bag limits, size limits, and closure of the spawning and nursery area during spring and early summer. He is very concerned that the Council take immediate action to conserve the scup resource.

Richard Rauenelle was concerned about the limited access provisions of the Plan. He feels the Council should allow the free market to determine the course of the fishery.

David Pierce presented the position of the Massachusetts Division of Marine Fisheries. The Division feels that the Scup Plan is one a of series of plans that the Council has recently developed which attempts to manage a mixed species fishery complex. This problem is a significant one and they hope the Council will work with the States to solve this problem. They feel that the Scup Plan does not acknowledge the multi-species problem and that this needs to be dealt with. They are very concerned with what they perceive to be a very large discard problem in the offshore small mesh fisheries. They feel the offshore otter trawl fishery for *Loligo* squid is causing most of the discard problem. It is difficult for the States to accept a quota which may be exceeded by the discards. They would like the Council to come up with some creative solutions to this problem. They favor a faster recovery schedule than the one currently proposed. They want the Council to deal with the discard problem now but don't favor a mesh size as the sole solution. They feel that quotas will be problematic. They feel that allocation, monitoring, and enforcement problems would be significant amongst gears. They suggest the Council focus on the offshore fishery. The Council should consider large, long offshore area closures similar to the old foreign fishing windows. They feel this would help alleviate some of the

discard problem and at the same time benefit other species as well (*Loligo* and butterfish). He stated that if an adequate sea sampling program was carried out then a large discard problem would be discovered.

Paul Girard, had questions concerning the size of hog rings required as degradable fastenings. He stated that the size of degradable hog rings specified in the Plan came from the South Atlantic Black Sea Bass Plan is inappropriate for scup pot fishery in New England waters. He stated that the resource seems to be in trouble. He feels that the fishery management process takes up too much of his time.

Dan Dwyer, scup potter, depends on the spring fishery, so he is opposed to a spring closure.

Wayne Hayes, fish potter, stated that his fishery has done a lot to alleviate the discard problem. He stated that few, if any, fish die when discarded from pots. He feels the pot fishery has already done its share to conserve the scup resource. He stated that the fish pots are only 6% of the fishery and feels that the biggest part of the problem is in the offshore fishery. He feels that the State of MA has bent over backwards to conserve the fisheries. He feels that unless the offshore fishery is regulated, problems with the resource will not be solved. He stated that if you kill all the fish at 3 and 4 inches offshore then an 8 inch minimum size limit is meaningless.

Jim Bounakes stated that biggest killer of small scup are the fish traps operated to the west of southern New England and that something should be done to stop this.

Mark Simonitsch, Fish Weirs Inc., operates a fish trap in Nantucket Sound. He agrees that the discard problem with scup is primarily offshore. He feels the Plan basically postpones any meaningful restrictions. He feels the problem here lies with the commercial fishery offshore. While the Plan recognizes theses problems, it does not confront them until year three of the management program. He favors a restriction which requires culling at the site. The Plan should require that undersize fish be returned to the water immediately. He cited the 1995 NEFSC SAW document which highlighted the truncated age distribution of the scup stock. He feels that F must be reduced immediately. The Council should not be able to hide behind the best scientific data available. Funding for NOAA is adequate. The agency should be held accountable, the Council is indulging in self-destructive behavior. He feels the Plan should contain a minimum mesh requirement and that not to require one is a joke. He highlighted the connection between the *Loligo* and scup fishery. He questioned what the commercial quota would be based on. He feels that basing the quota on the last 10 years would be unfair. The Council would be rewarding the perpetrators of overfishing if they did that. He feels that the plan is shameful, unacceptable, and does not address the real problems of the fishery.

Daniel Lucas favors a uniform size limit for scup.

Chuck Diaz favors uniform recreational limits for scup. He stated that 1995 was a very poor year for scup.

Henry Leverge asked if there are any scientific estimates available concerning the effects of the removal of scup during the spawning season.

July 17, 1995, Newport, Rhode Island

The hearing was opened at 7:15 pm by hearing officer Dave Borden (Rhode Island Division of fish and Wildlife). Also attending was Dick Sisson (RI Div F&W) and 11 members of the public.

Mr. Seagraves presented the hearing draft of the Scup Fishery Management Plan.

James O'Malley asked when the definition of "sale" becomes complete. The hearing draft allows a 5% tolerance of undersized fish to be landed but not sold. Are the dealers or second order wholesalers also to be held responsible for buying or selling undersized scup? He suggested that the Plan should require vessels that retain scup carry at least 4.5" mesh on board. He was opposed to the NMFS asking for a fishermen's Social Security Number when applying for a permit. He stated that the industry was

concerned with the deck loading of small scup and the ensuing discard problem. He said that the most important thing for the Plan to do is to prevent bad fishing practices. He agreed strongly with the approach the Plan takes for the first two years. He wants to see the poundage threshold which would trigger mesh requirements increased. He also submitted written comments (see attachment 1).

Harold Loftes, F/V Mary Elena, was opposed to the differential size limit between commercial and recreational fisheries. He supported a coast wide uniform size limit for both commercial and recreational fishermen. He stated that boats must be made responsible for harvesting undersized fish. He stated that the 4.5" mesh size would put him out of business since he catches scup in the winter in the mixed trawl fishery. He currently uses 4" codends when targeting scup but he also carries smaller mesh to take butterfish, squid, and whiting on the same trip. On a normal winter trip he changes the codend half a dozen times to match the target species and the size of fish present. He suggested that the Plan make it mandatory to carry multiple mesh on board. He opposed a quota system like the current system for fluke. He feels that the New England region was not adequately represented in the development of the Scup Plan. He thinks it is unfair that the MAFMC developed the Plan since about half the catch comes from New England States. He felt that the 1 lb criteria to obtain a moratorium permit was low, but the Council needs to consider the small vessels. He felt the roller rig measure was unnecessary. He suggested that the Council require fishermen to separate scup from the rest of their catch.

Joel Hovanesian, F/V Excalibur, agreed with a coastwide uniform minimum size limit for all fisheries. He suggested raising the tolerance of undersized fish to 10% since scup are taken in a "volume" fishery. If the fish are boxed at sea, the burden of who is responsible for the sale of undersized fish is placed on the vessel and not the dealer. He is very concerned with the current practice of landing undersized scup and culling them at the dock. He suggested that this was a big problem in NJ since it is legal there to land but not sell undersize scup. He suggested that the Council raise the threshold to 10,000 lbs before the 4.5" mesh be required. He catches scup and Loligo on the same trip, the mesh requirement will cause him a lot of problems. He can't make a trip with the current mesh threshold. He felt that 4" or 4.5" mesh were the correct sizes for scup. He favored a mechanism in the Plan which allowed for rapid action on changes to framework measures. He objects to the length of time it took New England to implement framework adjustments in the Groundfish Plan. He favored rasing the threshold for obtaining a moratorium permit. He opposed the roller rig provision; he opposes any management measure which restricts only certain gear types. He was concerned that discards in the scup fishery are not currently accounted for accurately. Will this be accounted for in the updated assessment and fishing mortality estimates?

George Mendosa, Tallman and Mack Trap Co., supported a uniform coastwide size limit of 8" for all fisheries. He stated that trap fishermen can't control the size of scup which enter their trap. He may catch up to 100,000 pounds of fish in his trap. A trap costs from $50,000-$75,000 to construct and he can not easily change the mesh size of the trap during the scup season. During May, the 4.5" mesh would cause a major gilling problem with Atlantic mackerel. He would also lose most of his *Loligo* catch with 4.5" mesh. The current mesh in the parlor (where escapement occurs) is 2.75" (to prevent gilling of mackerel and to retain *Loligo* squid). Under calm conditions with no major tides, it is possible to operate a "sifter" which culls the catch. He felt that 4.5" would be the appropriate mesh for a sifter device.

Peter Barbera, Town Dock Inc., had a problem with the no sale provision of the 5% undersize scup retained. He explained that this is a volume fishery and frequently the fish are pumped out of the hold. It would be difficult to cull the small fish out under these conditions. He suggests that the tolerance be on the sale of the undersize fish as well as possession. He was strongly opposed to a quota system which would operate like the fluke quota system. He wants the Council to consider a moratorium on dealers permits as well as the proposed vessel moratorium. He supports a uniform data collection program.

Dick Sisson gave the position of the Rhode Island Division of Fish And Wildlife. They are concerned about the different size limits in the Plan and supports a uniform coastwide size limit. They were critical of the definition of overfishing (F_{max}). They suggested that the level of F which should not be exceeded be either F0.1, F=M, or F_{30}. They also felt that the rebuilding schedule was too long; they

recommended a six year recovery schedule. They will also submit written comments.

Mike Panascandola favored the 4.5" mesh size for scup (to help reduce the level of discard).

July 19, 1995, Riverhead , NY

Hearing officer Robert Hamilton opened the hearing at 7:35 pm. Also in attendance was John Mason of the NYDEC and seven members of the public.

Mr. Seagraves presented the hearing draft of the Scup Fishery Management Plan.

Mark Phillips, F/V Illusion, stated that East Coast Fisheries is in agreement with the preferred alternative of the Scup Plan. He supports the 9" minimum size limit and if it doesn't work he would support an increase in the mesh size. He opposed state by state quota allocations since he feels that they reward states with the smallest size limits. He would support a bi-monthly quota. Since scup are inshore during the summer, the bi-monthly quota would protect the inshore fisheries. He feels that an 8" size limit is too small and would do nothing to conserve the resource. He is concerned that a 2.75" diameter escape vents in traps is way too small to allow escapement of 9" scup. If the stock does not improve then he would consider a mesh size and/or a larger minimum size in the EEZ.

David Brennan, party boat Capt. representing the North Fork Capt. Association and the Montauk Boatmen's Association, was opposed to the different minimum fish sizes in the plan. He feels that his industry has already been given a disadvantage in many other plans. He favors a uniform 7 inch minimum size limit along the coast. He feels that the current proposal will have severe negative economic impacts on his business and others in the New York party boat industry. He stated that pot fishing does not appear to be regulated in state waters.

Brad Lowoen, representing East Hampton Baymen's Association and trap fishermen from Rhode Island to Massachusetts, stated that the Scup Plan is too complicated. He feels the Plan does not consider fishermen who work strictly in State waters. He feels that the 9" minimum size will destroy his business. He feels that something must be done immediately to address the discard problem offshore. He supports no quota and size limits tailored to individual fisheries. If a quota was necessary, he favors an inshore/offshore allocation scheme. He feels the inshore state fisheries should be insured some quota, otherwise he supports non-preferred alternative 5. He feels the Plan must not exclude the inshore fishery. His fishery takes 9'' scup only in the early spring and fall for a couple of weeks, but otherwise they are dependent on scup smaller than that size. Overall, the trappers catch is about 10-15% scup greater than or equal to 9". He would also support non-preferred alternative #8 with an 8" minimum size during the summer fishery. He is highly opposed to a coastwide quota system. He questioned why there is no possibility of a mesh requirement until year three? He stated that his landings have recently declined from 30,000 lbs of scup per year to 500 lbs per year.

July 24, 1995, Manhattan Beach, NY

A public hearing on the Scup FMP was held on 24 July 1995 at Kingsborough Community College, Manhattan Beach, New York. Hearing moderator and Mid-Atlantic Council member Tony DiLernia opened the hearing at 8:15 pm. Tom Hoff, Mid-Atlantic Council staff was also present. There were twenty-one members of the public present.

Dr. Hoff reviewed the provisions of the Scup Plan.

Mr. Thomas Marconi, United Boatmen of NY, supported the Council preferred alternative in general. He advocated that since New York and New Jersey were similar that they should have a similar 7" size limit. He also wanted more regulations on commercial fishermen.

Mr. Marc Hoffman, Atlantis Anglers, and NY Marine Resources Advisory Council, advocated that the proposed NY waters size limit of 8" does not solve the problem. He spoke against over-zealous

commercial fishermen and felt that pots and roller rigs should be banned.

Mr. Edward Moraski, *FV Seawolf*, advocated a 7" fish size for NY waters and south.

Mr. Richard Johnson, *The Fishing Line,* supported a 7" fish for NY waters, and that 8" was ok for Connecticut and north.

Mr. James Schneider, *FV James Huntington,* supported 7" fish size which should take pressure off of other species like summer flounder. He called for implementation of immediate mesh restrictions. Scup are caught with *Loligo* and butterfish in January through March where as many as 90% of the small scup are discarded.

Mr. Albert Lindroth supported the 7" minimum fish size since NY and NJ are similar. He stated that the Point Judith boats fished out the year class of 3 years ago.

Mr. Walter Specht, *FV Miss Point Lookout II*, agreed with the 7" size and stated that good fishermen discard 3 times the number of fish they catch. Scup take pressure off of other species like summer flounder.

Mr. James D'Ambrosio wanted a smaller size than the 7" minimum, especially in Jamaica Bay.

Mr. Jerry Maio, *FV Miss Freeport III*, wants a 7" minimum fish size.

Mr. John McCormick, *FV Starstream II and Capt. Lou Fleet*, wants a 7" minimum and stated that the commercial fishermen are the problem.

Mr. Tony Greco, *FV Dolphin*, wants a 7" fish size.

Mr. Mike Barnett, Codfather Charters, stated that in the winter the draggers should be regulated when the scup are along the Shelf.

After everyone, that had signed up to speak, had spoken, there was an open general discussion. The major additional theme during the open discussion was that they all advocated that the measures that are possible for implementation in year 3 of the FMP, should be implemented now, because of the resource condition.

July 18, 1995, Toms River, NJ

A public hearing on the Scup FMP was held on 18 July 1995 at the Holiday Inn in Toms River, New Jersey. Hearing moderator and Mid-Atlantic Council member Rob Winkel opened the hearing at 7:15 pm. Tom Hoff, Mid-Atlantic Council staff was also present. There were three members of the public (Charlie Bergman, Ray Bogan, and Willie Eggeter present. Two additional New Jersey State employees (Pete Himchak and Tom McCloy) were also present.

Dr. Hoff reviewed the provisions of the Scup Plan.

Mr. Bogan favors the 7" minimum fish size and was thankful for the Council's consideration of the New Jersey's recreational industry's request. He is concerned that New York has an 8" size and he proposed a dividing line around Moriches Bay rather than between the two States. For the record, he wanted it known that the scup fishery decline occurred during the past several decades. In the 1930's and 1940's, New Jersey had a significant party fleet. In the 1950's and 1960's there were 25 - 30 boats in New Jersey targeting scup. Now there are only 2 full-time party boats.

Mr. Bogan also expressed concern over the permitting provisions because of his association of them with a salt-water license. He wants to coordinate reporting with Council staff and wants the result to be "good" data. He also suggested that the changes in year 3 of the FMP should be worded with

"may" rather than "would". He also was supportive of the scup pots and traps provision.

Mr. Bergman advocated that the 5% tolerance that is afforded the fishing vessel for under-sized fish, should also apply to dealers -- or there should be no tolerance for either group.

The hearing closed at 7:40 pm.

July 10, 1995, Salisbury, MD

The hearing was called to order at 7:10 p.m. by hearing officer Bill Outten. Staff in attendance were Chris Moore and Kathy Collins. One member of the public, David Martin, was present.

Chris Moore reviewed the provisions of the Scup Plan.

Mr. Martin questioned why in year one and two it is only 9" total length then what good is it when you go to year three before the mesh size? He stated that he has no problem with the 9" total length.

Dr. Moore explained that the industry convinced the Council that the minimum size alone was adequate and they would avoid small scup.

Mr. Martin suggested starting off with some minimum mesh size. He explained that you need a mesh size, even if it was 4" because many people do not like the 4.5". He added that you should be able to save all the undersized fish you can and the 4" allows for more escapement. He stated that a no sale provision should make people more honest, but they will still pull fish in and kill them. He said that he has no problem with the no sale provision because this should help guys to <u>not</u> catch small fish because they couldn't sell them.

Dr. Moore said that he felt a no sale provision was appropriate.

The hearing was adjourned at 7:20 p.m.

July 17, 1995, Virginia Beach, VA

A public hearing on the Scup FMP was held on the 17 July 1995 in Virginia Beach, Virginia. Jim Douglas, Mid-Atlantic Council member, was the hearing officer. Lt. Commander Reb Bryant USCG, a non-voting member of the Mid-Atlantic Council, and Chris Moore, Mid-Atlantic Council staff were also present.

No members of the public attended.

July 18, 1995, Manteo, NC.

A public hearing on the Scup FMP was held on 18 July 1995 in Manteo, North Carolina. Hearing moderator and South Atlantic Council member Jerry Schill opened the hearing at approximately 7:10 pm. Chris Moore, Mid-Atlantic Council staff was also present. There was one member of the public present.

Chris Moore reviewed the provisions of the Scup Plan.

James Fletcher, Wanchese Fish Company, stated his opposition to any new regulations that would increase the paperwork burden on commercial fishermen. He stated that permits and logbooks required for scup should be combined with those required for other species and that fishermen should have the ability to submit data electronically.

Mr. Fletcher was opposed to the 9" TL minimum fish size for the commercial fishery and indicated that

a 7" TL minimum size for both commercial and recreational scup fisheries should be implemented. He indicated that regulations should remain unchanged for a period of 5 to 7 years to see if they had an effect before additional measures were implemented.

Mr. Fletcher was concerned about VPA calculations and how they were effected if the industry shifted effort and landings were reduced. He was also concerned that regulations that were implemented for one species (e.g. flounder) would effect landings of another species (e.g. weakfish) and that this effect should be considered when developing management plans.

Mr. Fletcher indicated that stock enhancement programs should be established that would raise fish in hatcheries and release them into the wild to increase stock size. He indicated that these programs should be established before any additional regulations were passed.

The hearing closed at 7:30 pm.

ADDENDUM: APPENDIX 3. COMMENT LETTERS AND COUNCIL RESPONSE

Fifteen comment letters were received on the Draft Scup FMP. Four were from government agencies: the Northeast Regional Office of NMFS, the Rhode Island Department of Environmental Management, the Massachusetts Division of Marine Fisheries, and the Connecticut Department of Environmental Protection. The remaining letters were from fishermen (including three letters from one fisherman and one letter with eighteen signatures). All of the letters are reproduced in this Appendix.

There were a total of 19 substantively different comments on the proposed regulations in the draft FMP. These comments and the Council's responses are listed below.

Comment 1: Three commenters indicated that the eight-year fishing mortality rate reduction strategy proposed in the draft FMP was extended over too long a period considering the overfished condition of the resource.

Response 1: The Council and Commission agree and adopted a fishing mortality rate reduction strategy that will reduce rates over a seven-year period. Minimum fish size and gear regulations will be implemented in year 1 of the FMP. Beginning in year 2, rates will be reduced until F_{max} is reached in year 7.

All available information indicates that scup are overexploited. The current condition of the resource is such that immediate action is required to reduce fishing mortality. As such, the Council and Commission requested emergency implementation of the minimum fish sizes as the FMP was reviewed by NMFS.

Although immediate action is necessary, it will take time to rebuild the stock. The reduction in fishing mortality was accelerated by one year to allow for a more rapid reduction in mortality on the fully recruited fish which in turn will allow for greater increases in yield and spawning stock biomass.

This seven-year strategy reflects the pressure now being placed on fishermen by other FMPs. Although the scup resource should be rebuilt as quickly as possible, scup management measures can be implemented over an seven-year time frame to minimize the short term economic burden placed on fishermen and still reduce the overfished condition of the stocks.

Comment 2: A total of 2 comment letters suggested that there should be no minimum fish sizes for the commercial fishery offshore.

Response 2: Based on 1983 to 1992 data, approximately 70% of the commercial landings come from the EEZ (offshore). Without a minimum size regulation, fishermen would have no incentive to reduce their catch of small fish offshore. As such, no minimum fish size in the commercial fishery offshore would exacerbate the discard problem in the commercial fishery. The commercial minimum size in conjunction with the mesh regulations were designed to reduce the discarding of small scup by otter trawl vessels, increase yields, and allow more scup to reach sexual maturity and spawn.

Comment 3: Seven commenters felt the minimum commercial fish size without a minimum mesh size would not benefit the resource.

Response 3: The Council and Commission agree that discards would not be reduced without the mesh provision. In the final version of the FMP, fishermen would be required to utilize a 4.0" mesh when a 4,000 lb threshold was reached.

Comment 4: Two commenters felt the minimum recreational fish size should be uniform coastwide.

Response 4: The Council and Commission agree. In the final version of the FMP, the Council and Commission adopted a 7" TL minimum fish size in the recreational fishery in both state and federal

waters that would apply in the first and all subsequent years.

Comment 5: Two comment letters indicated that the size limit should be the same for both commercial and recreational fishermen.

Response 5: The Council and Commission considered a number of alternative size limits in the development of the FMP. The adopted size limits reflect the differential distribution of scup that generally results in larger scup being more available to commercial fishermen who fish further offshore. As such, the minimum size regulations were developed with the recognition that the commercial and recreational fisheries have traditionally relied on different sizes of scup.

Comment 6: Three comment letters indicated that either the commercial and/or the recreational size limit should be larger than those proposed.

Response 6: The Council and Commission considered a number of alternative size limits in the development of the FMP. In their deliberations, they considered the potential short-term impacts of length limits on the commercial and recreational fisheries and determined that the 9" TL commercial and 7" TL recreational size limits were appropriate for the first year of the management program. In addition, the minimum size limit is a framework management measure such that the minimum size limit can be increased in subsequent years if necessary.

Comment 7: One commenter indicated that the biodegradable panels and vent sizes recommended for scup pots were in conflict with regulations currently in place for lobster pots.

Response 7: The Council and Commission modified the language on the degradable materials to make the size of the uncoated iron wire in scup pots identical to that required for lobster pots in the lobster plan, i.e., 2.4 mm. However, the Lobster FMP implemented regulations that require a rectangular escape vent of 1 7/8" x 5 3/4" or two circular escape vents that are 2 3/8" in diameter. The Scup FMP would require a larger circular escape vent of 3.1" in diameter or a square escape vent with a minimum of 2.25" for each side. Based on body depth/length relationships, these vent sizes would allow scup less than approximately 9" TL, the minimum fish size in the commercial fishery, to escape from the trap before it was brought to the surface.

Comment 8: One commenter suggested that it would be difficult for fishermen using floating traps to comply with the minimum mesh size.

Response 8: The mesh regulations would only apply to the cod end mesh of trawls and do not apply to the mesh in floating traps. The Council and Commission did not consider having the minimum mesh size apply to any other gear except trawls.

Comment 9: There were three comment letters that suggested that the tolerance of undersized fish in the commercial fishery should be changed. One commenter felt the tolerance for undersized fish in the commercial fishery was unenforceable, one commenter indicated that the tolerance should be increased to 10%, and another to 15%.

Response 9: Based on the comments of the NMFS and law enforcement personnel, which indicated that the tolerance would prove difficult to enforce, the Council and Commission decided to eliminate the tolerance in the final version of the FMP.

Comment 10: A total of five commenters felt there should be provision for season or area closures to reduce discards and protect spawning adults.

Response 10: The Council and Commission agree and adopted a framework provision in the FMP for gear-specific season and area closures to reduce discards and control fishing mortality in the commercial scup fishery . During an annual review process, season and area closures would be based on the recommendations of the Scup Monitoring Committee to the Council and Commission.

Comment 11, 12 and 13: There were a total of three comments regarding the commercial moratorium permit including comments on public notice, qualification criteria, and lack of justification.

Response 11, 12 and 13: The Council voted to establish 26 January 1990 as a control date for limiting entry into the fishery at its February 1990 meeting. The Federal Register notice of this date was published 7 June 1990. The moratorium was discussed at Council and Committee meetings, published in Council newsletters, and the moratorium was part of the preferred alternative in the public hearing draft of this FMP. Because of the delay in the development of this FMP, the time period for eligibility was extended three years from 1990 to 1993.

Vessels with any documented landings (i.e., greater than 0 lbs) of scup between 26 January 1988 and 26 January 1993 would qualify for a moratorium permit. Thus, any vessel which actively fished for and landed any amount of scup between these dates would be guaranteed access to the fishery. The only vessels excluded by the moratorium provisions of the FMP would be those that landed scup prior to 1988 or after 26 January 1993.

The management program is designed to rebuild the stocks. However, the vessels currently in the fishery will have to sacrifice income opportunity as a part of the rebuilding program. While the net benefits to society from the management program are not in question, the benefits to individual operators who make the sacrifice could quickly be lost or eroded among new entrants. The length of the period of sacrifice is unknown. It would be unfair to dissipate the investment of these operators among a flood of opportunistic new entrants when it begins to appear that the stock is rebuilding. The proposed program of limited entry allows traditional operators to recoup at least a portion of their sacrifice. Such a program will promote resource stability and industry efficiency which is in the best interests of the fishing community and the nation.

Comments 14, 15 and 16: One comment letter suggested that there be a ban on sorting machines at sea and a limit on the number of scup pots per vessel. Another commenter suggested that fishing for scup at night should be banned.

Response 14, 15, and 16: Consideration of these options by the Council and Commission would have required additional public hearings. In consideration of the overfished nature of the scup resource and the need for immediate action, the Council and Commission decided to save these issues for future consideration in possible plan amendments.

Comment 17: One comment letter indicated that scup should only be harvested by commercial fishermen using rod and reel.

Response 17: Commercial landings by fishermen using rod and reel (hook and line) accounted for only 2% of the commercial landings from 1983-1992. Such a measure would discriminate against commercial fishermen who have traditionally harvested scup using other gear and have accounted for a more significant portion of the harvest over the same time period.

Comment 18 and 19: Two comment letters suggested that quotas should not be used to control fishing mortality on scup. Another comment letter indicated that the quota should only apply to the offshore fishery.

Response 18 and 19: Beginning in year 2, a quota will be allocated to the commercial fishery to reduce exploitation rates on the fully recruited age groups (i.e., fish larger than 9" TL). The quota will

be based on the target fishing mortality rates and the projected stock size estimates derived from annual stock assessment information.

An overall quota for the commercial fishery that applies to all commercial landings is important to control mortality on the scup population. The minimum size and mesh regulations may reduce discard and escape mortality of undersized scup. However, decreases in mortality would occur only with the smaller fish; reductions in mortality would not occur for scup once they reached the legal size of 9" TL. Essentially the fish that contribute the most to the spawning population, fish 9" TL and larger, would continue to experience high mortality rates; overfishing would not be reduced. The commercial quota will control mortality on fully recruited, older fish.

Inshore commercial landings account for a significant portion of the landings, approximately 30% of the total commercial landings on average from 1983 to 1992. If the quota only applied to the offshore fishery, inshore commercial landings would be regulated only by minimum size and gear regulations. Landings of larger fish would be uncontrolled and any potential gains in stock biomass and spawning potential resulting from an offshore quota would be reduced or eliminated by increased harvest in inshore waters.

KC

133 North Street
Mattapoisett, MA 02739
July 12, 1995

Mr. David Keifer
Mid-Atlantic Fishery Management Council
Room 2115 Federal Building
300 South New Street
Dover, DE 19904-6790

Dear Mr. Kiefer:

I have read the summary of the proposed Fishery Management Plan for Scup and do not feel it will be effective in restoring the scup population.

As a commercial hook fishermen in Massachusetts I have lived with a nine inch minimum size limit for several years and would like to see it implemented coastwide. In my fishery as well as the pot fishery this is an effective management measure as the bycatch mortality on undersize fish is close to zero. The fish we throw back have the opportunity to spawn and grow to legal size. We are already meeting objective number 2 of the plan, "reduce fishing mortality on immature scup to increase spawning stock biomass."

In the dragger fishery with its high mortality on undersize fish, the nine inch limit will do nothing toward rebuilding the scup population unless an appropriate mesh size is also implemented. Under the proposed plan, instead of taking the small scup to market the draggers will shovel ten dead scup the over the side for every legal fish they keep.

Since the draggers take 75% of the commercial catch the nine inch minimum size will do very little to restore the scup population unless their bycatch mortality is reduced. If you truly want to meet the objectives of the plan then the 4.5" minimum mesh size must be implemented during the first year.

Sincerely,

Drew Kolek

Drew Kolek

Comments KC

RECEIVED
JUL 21 1995
MID-ATLANTIC FISHERY COUNCIL

July 19, 1995

TO DAVID R. KEIFER

After attending the Public Hearing on the Fishery Management Plan I felt that I would like to offer a few suggestions.

A conservation plan should be put into effect immediately if the scup are to survive. It might be too late already considering this years catch.

1. A closure plan for all off shore fishing of scup.
2. Eliminate the size limit (TL) on scup for off shore fishing. 75% of all fish caught are thrown back into the water dead.
3. Set quotas for scup during spawning season. Especially Buzzard Bay. There are way too many traps being used in the Bay during the spawning season. It cannot sustain the 50 to 80 thousand lbs per day being taken by trappers plus the amount being caught by the hand-liners. I am suggesting Quota instead of closure during the spawning season because it would put the commercial fishermen out of business.

Regulations must be passed for off shore fishing as soon as possible. Regulations for in-shore including Buzzard Bay must take place by next spring if the scup are going to survive. There are very very few scup out there right now. I know you have ~~some~~ a tough decision to make, Please consider any suggestions seriously. Thank you

Albert E. Hett
22 Briggs Ln
Marion, Ma 02738

KC

July 20, 1995

RECEIVED
JUL 24 1995
MID-ATLANTIC FISHERY COUNCIL

Mid-Atlantic Fishery
300 South New St.
Dover, Delaware 19904
RE: Scup Fishing:

To Whom it may concern:

On July 18, 1995 I attended an open meeting at Days Inn of New Bedford, MA. The meeting was to discuss scup fishing and the serious problems facing this species of fish in addition to others.

Based on information provided by the Council and the verbal expressions of the public in attendance I would like to bring some of my concerns to your attention.

Many issues and suggestions were discussed but the one and probably the single most important issue is to close the spawning grounds during the spring season. Each year the fishing has become less and less. Size what is a jumbo scup or even a large scup. These days you are very lucky to meet the required

9" size limit. If we don't allow the scup to spawn we will be facing complete extinction and not in 1 yr or 5 yrs. we are facing this very serious problem now!!

Scientifically speaking if we catch one pregnant scup we are technically killing off 100,000 plus one fish to keep one adult scup. If we allow her to lay her eggs maybe 50% or even 25% will live to legal size which is far better than just one fish anyday. This issue cannot be expressed enough and we urge you to truly consider this closing for the 1996 season while there is some hope for re-covery.

A second important issue brought up was the mesh size. If the offshore fishing vessels are given a quota instead of a size limit this would certainly help to eliminate the massive shovelling of small fish back to the sea dead. This doesn't do anyone any good to have this continue. It may be wise to set a quota for offshore and a size limit for recreational and in-shore fishermen.

The third issue is out of state fishermen. They come from as far as Pennsylvania, New Jersey New York and Connecticut to fish in Hyannis and take all they can back to their state and sell it at a higher rate. They are not only taking all our fish they are getting a larger profit from it. In addition they are fishing as recreational fishermen so the state doesn't even get a license amount from these boats. Our suggestion on this issue is to set a bag limit for out of state fishermen to discourage them from fishing especially in the spawning grounds.

In summary we need four facts looked at with a clear eye and a very open frame of mind.

1) Close the spawning grounds
2) Eliminate size offshore & set quotas
3) Put some tougher regulations on out of state fishermen
4) Monitor, enforce the laws regulations. I have yet to see a game warden at the piers or even at the fish markets. We need to get tougher

in order gain some control and replenish our fishing grounds. Lets start to punish the offenders, publicize that we are taking a stand and this in itself will make the average offender think twice about breaking the rules and every little bit helps.

In closing my only hope is that you have received many more letters from those who share the same concerns.

Sincerely

Amelia Cabral 137 COUNTY ST. Fall River, Ma. 02723

Henry J. LaBerge 137 County St. Fall River, Ma. 02723

George H Conroy 195 Doyle ST. Fall River Ma. 02723

Bill Terpen 146 PITMAN ST FALL RIVER 02723

Wayne Conroy 1122 Pleasant st Fall River mass 02723

Wayne Kelly 88 HARRISON ST FALL RIVER MASS 44430

Jim Conroy 4150 MEADOWBROOK DR. LEAVITTSBURG OHIO 02723

Barbara Conroy 195 Doyle St. F.R. Ma.

[illegible] 1161 PLEASANT ST FALL RIVER MA. 02723

Everett Tove 380 London St Fall River Mass

RAYMOND CODERRE 462 SECOND ST FALL RIVER MA
(BUCKO BROS BAIT SHOP)

ALAN L. CONFOEY 363 ROBERT STREET WESTPORT MA.

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Bridge Bait & Tackle
263 Lindsey Street
Fall River, MA 02720
Joseph Souza

David J. Gray 1428 County St. Fall River, MA.
PATRICIA A. GRAY " " "
Roy LaGorge 29 Massasoit St. Fall River Ma.

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

Department of Environmental Management
ASSOCIATE DIRECTOR FOR NATURAL RESOURCES MANAGEMENT
22 Hayes Street
Providence, R.I. 02908
277-6605

RECEIVED
JUL 28 1995
MID-ATLANTIC FISHERY COUNCIL

KC

July 20,1995

David R. Keifer, Executive Director
Mid-Atlantic Fishery Management Council
Federal Building, Room 2115,
South New Street,
Dover, Delaware 19904

Dear David:

I offer the following comments on the draft fishery management plan for scup (DEIS) dated May 1995. The Department commends the Mid-Atlantic for it's efforts in this regard, and urges you to implement a version of the plan as soon as possible. We offer the following specific comments:

1. The Department totally endorses your efforts to reduce mortality and lower discard rates in the fishery. The estimated number of fish being discarded in the offshore fishery(31 million fish per year between 1984-1993) is nothing short of scandalous, as it is approximately equal to the total number of fish landed by the commercial and recreation fishery (28 million fish per year 1984-1993. Although adoption of a minimum size will reduce the incentive to continue this practice, it will not altogether terminate this wasteful situation. The Council should more directly address this issue in the original submission. I suggest the staff precisely identify the area in which the majority of the discards take place and identify alternative strategies for Council and Commission consideration. One strategy you may wish to consider would be to create a winter discard quota. The quota could be phased down, consistent with the mortality reduction schedule. Obviously this would require some degree of mandatory sea sampling in the area during the winter months in order to reliably predict discard rates. Attaining the discard quota should result in immediate action by the Regional Director to implement further regulations in the problem area i.e., close the area, require large mesh etc. Adoption of this type of system would provide a powerful inducement for the industry to be creative and voluntarily reduce discards. If you think the concept has application, I

would be happy to develop the proposal further.

2. All States along the coast should have the same recreational and commercial minimum size. There is no genetic, environmental, or biological justification in the plan which documents a need for differential sizes, or separate management units. I totally concur that states should have the option to adopt smaller sizes than specified by federal regulations, but this should only be allowed if they achieve the same conservation equivalency. This is the procedure in the striped bass plan, and it provides individual states with flexibility, while achieving the same conservation standard.

3. The plan should initially contain an annual target quota, which should include discards. The target quota should be separated into a inshore (territorial waters) and offshore component based on the distribution of catch over at least a ten to fifteen year period of time. Inclusion of a annual target quota will facilitate management decisions pertaining to the effectiveness of the regulations. If this is unacceptable, I suggest adoption of the state quota proposal as drafted. Either one of these proposals should be crafted in such a manner so as to maintain the historic inshore fishery(based on a long time series of data). Given cutbacks in the groundfish fishery, you should anticipate a dramatic increase in the amount of effort in the offshore scup fishery, either as targeted effort, by-catch, or discards. Failure to address this problem in the initial plan creates the real possibility that the fishery will develop into an exclusive offshore industry. This would be extremely undesirable from the States perspective.

4. Regarding the minimum size, we concur with the 9 inch minimum size and also suggest that the tolerance level be placed in a range (5-15%), with a framework mechanism to allow quick changes dependent upon stock and environmental conditions. It is quite conceivable that the strength of incoming year classes, in combination with growth rates, will largely determine industry compliance and the ultimate success of this measure. The Council should have some flexibility to change this measure in response to changes in stock size.

5. Compliance with the minimum size and associated tolerance should be the responsibility of the vessel. This will encourage sorting at sea and the use of selective gear. Processors have little control over the size of the fish when they pump the catch at the dock or when purchasing scup boxed at sea.

6. Ban the possession of sorting machines at sea while in possession of scup. As I understand it, they are not

currently in use, and this would encourage the use of size selective gear.

7. Limit the number of scup pot to 50 per vessel. There is no need to utilize more than that number. The easiest way to deal with effort levels in the scup pot sector of the fishery is to cap the amount of gear a vessel can fish. If you cap the amount of pots fished per vessel , you ultimately eliminate the need to manage a host of other variables i.e. vessel size, crew size, hauling capacity, etc. R.I. implemented this restriction in 1994 in order to cap the fishery, reduce gear conflicts, and prevent over-capitalization. You would be well advised to do the same prior to the development of an extensive pot fishery.

8. The escape vent size is in conflict with the lobster vent size. Scup potters in N.E. frequently catch lobster as a valuable by-catch, and there is no justification to terminate this practice. This could also be addressed by prescribing the correct rectangular dimension (to release undersize scup), while maintaining the requirement that the pot also contain a circular lobster escape vent of the legal size. The hog ring size should also be of the same dimension as the biodegradable hog ring in the lobster plan. Little positive benefit will be gained by prescribing a different size.

9. The rebuilding period should be shortened by at least two years. The major problem in the fishery relates to discarding of age zero and one year old fish. If you successfully resolve this problem, you will rebuild at a much more rapid rate with far less economic dislocation and pain.

10. The inshore floating trap fishery will find it totally impossible to comply with the mesh requirement due to the well documented mixed nature of the catch. Floating fish traps should be exempt from the proposed mesh requirement, but be required to possess a 4.5 inch stretched mesh sifter. The trap industry in R.I. has used a large mesh sifter for a number of years, with great success.

Please call if you have comments or questions in regard to these recommendations.

Sincerely:

David V.D. Borden
Assistant Director
R.I. Department of
Environmental Management

NANTUCKET SOUND
FISH WEIRS, INC.
TRAP FISH

July 22, 1995

DR. Lee Anderson, Chairman
Mid-Atlantic Fish Management Council
Room 2115 Federal Building
3090 South New Street
Dover, Delaware 19904-6790

Re: Fish management Plan for the Scup Fishery

1. The strength of this plan is twofold: first, the phased recovery for reducing mortality rates to reach a 20% exploitation by year eight. Second: a framework for avoiding time consuming amendments in the future. The weakness of the FMP is the failure to effectively address Scup discards in the EEZ mixed species otter trawl fishery in the plan's first year.

2. A very serious obstacle for the MAFMC (and all Councils) in developing this management plan is the lack of data collection and the slow processing of that information. Until regular sea sampling occurs the extent of our resource problems will remain poorly defined. Management of fisheries data is antiquated. Within the private sector a verified landing of fish allows for payment via electronic deposit to the vessel's bank account within minutes of completing the NOAA form. The same landing figure requires at least 12 to 24 months to reach resource managers. Electronic bank deposits, credit card validations, live images from downtown Bagdad, and fisheries statistics are merely data in an electronic world that views one second as a long period of time.

The foundation of fisheries management is data. Inability to afford, collect and process this vital information cripples the Council's principal mission. "Using the best scientific information available," is simply regurgitating a worn out 1976 legislative phrase that is no longer a satisfactory explanation for failure to have current statistics. This is an administrative problem in which the fishermen have little responsibility. Councils, NMFS, NOAA, and Commerce must correct this situation. How can we manage what we do not know.

3. Eligibility conditions for a moratorium permit are too lenient and will permit a sufficient number of harvestors to fish and collapse the stock. Section 9.2.1.4 of the FMP reads that the goal of the eligibility criteria "assures the highest possible number of fishermen can qualify." This is counterproductive to achieving the FMP objectives. A management objective should be to immediately reduce the number of harvestors.

4. This plan should include a specific requirement for fish traps, pounds, and pot fishermen to return undersized scup into the water at the capture site in an expeditious manner. Piling small fish on deck, that could be released alive, should no longer be acceptable.

5. Information in the Scup FMP and the report of the 19th Stock Assessment Workshop (SAW) contradicts the FMP rationale for not implementing a minimum mesh requirement or any other suitable measure in year one. Section 9.2.1.6 of the plan states that a minimum mesh requirement "would negatively impact their ability to catch and retain other species of fish on a per trip basis. Furthermore these fishermen indicated they could avoid small scup and only target larger legal size fish." Appendix 2.2 continues with "traditional fishing practices would be disrupted by a minimum mesh provision."

Allow me to evaluate these statements more carefully with facts extracted from the Scup FMP and the 19th Stock Assessment Workshop Plenary. In the FMP, Appendix 1, section 2.2, is clear in stating: "Sea Sampling data indicate that the weight of the discarded fish (Scup, from otter trawls) are almost equivalent to the weight of the landings in some years. Discard rates are higher in years of

MARK SIMONITSCH

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good recruitment, that is, years when more small fish are available." Section 2.2 of Appendix 1, further declares: from the trips that " landed over 95% of Loligo...., the total pounds (of Scup) landed is slightly more than 50% of all Scup landed by all otter trawl fishermen." Therefore, Loligo otter trawl vessels discarded a Scup weight equal to the Scup weight they landed, which is 50% of 4,684,335 lb. (Table 56, FMP).

Page 33, paragraph 1 of the 19th SAW Plenary concludes "only 6.5% of the (Scup) stock in 1992-93 was age 3 and older,"..., "about 87% of the total catch in numbers during 1992-93 consisted of largely immature age 0-2 (<7") fish." The Plenary further declares on page 33, "Recruitment failure in a single year could result in a collapse of the fishery."

Page 10 of the FMP, section 5.2. reports that " recent landings have been composed primarily of age 2 and 3 year old scup with a general absence of larger older fish in the landed catch"..., "In fact the maximum length observed in NEFSC autumn surveys dropped from a mean of 14.0 inches between 1982 and 1986 to 9.5 inches for the years 1987 to 1992 (NEFSC 1993)."

One of the reasons given in the FMP for not taking immediate steps to correct the discard situation is the promise of the fishermen that, in some unspecified manner, "the boats will be able to target schools of larger Scup," (section 9.2.2.3.2 FMP). No action is being taken in years one and two despite the existence of data indicating there are very few numbers of scup larger than 7 inches - thirteen percent, and that the mean maximum length exceeds the proposed FMP legal minimum total length by only 0.5 inches. The logical questions to arise at this point are..., If the boats can target larger scup in the future, why haven't they done so in the past. And..., how can fishing be restricted to schools of large Scup when so few large Scup exist.

An additional consideration offered in the plan for not placing net restrictions on the otter traw gear is revealed in Appendix 1, Section 2.2 where "they (the fishermen) indicated that their traditional fishing practices would be disrupted by a minimum mesh provision." One can only conclude that large discards is one of the "traditional fishing practices" the otter trawl fishermen resist changing.

The FMP further states(9.2.2.3.2) in justification of no minimum mesh that fishermen would find it "economically inefficient to catch large amounts of small scup that would have to be sorted." The obvious rebuttal to that position is that present discards of fifty percent of weight or discards of eighty seven percent of numbers of Scup are presently being tolerated. Apparently these amounts of discards have not reached the threshold of inefficiencies. Hopefully, discards of this significance surpass the tolerance level of resource managers.

6. Managing by mesh size appears to have many shortcomings. I recommend time /area closures, in concert with seasonal quotas, to achieve lower exploitation rates and reduce discards. Considering the approved 1 7/8" minimum mesh in Amendment V for Mackeral, Squid and Butterfish, and the frequent Scup encounters during Loligo otter trawl trips, area closures would be be a practical method to achieve the management objectives. Failure to address mixed species small mesh proplems only exacerbates the situation this plan attempts to correct. It is time to understand that the MAFMC's continued postponement in dealing directly with the small mesh discard problem is fundamentally self destructive.

7. The MAFMC should experiment with video- conferencing selected committee meetings. Increased involvement will improve the council process.

Sincerely,

CAPTREE BOATMEN

Open and Charter Boats

CAPTREE STATE PARK
P. O. BOX 347, BABYLON, N.Y.

CODE 516 669-0449

Fax to:
302-674-539

July 24, 1995

Dr. Lee G. Anderson, Chairman
Mid Atlantic Fishery Management Council
300 South New Street
Dover, Delaware, 19904-6790

Subject: Scup FMP Hearing, 7/24/95, Manhattan Beach NY

Dear Dr. Anderson:

Please be advised the Captree Boatmen, a port of some 35 open and charter party fishing boats at Fire Island Inlet, providing some 300,000 patrons yearly a party boat fishing experience in the ocean and bay locations, cannot support a size limit for scup of greater than 7 inches when neighboring states to the south have a 7 inch limit. Very simply, as experienced in other fisheries, our New York patrons, venture to the Southern states, particularly New Jersey, as we fish in the same ocean locations.

Please provide New York with a 7 inch limit equivalent to New Jersey to maintain economic viability and compatibility with New Jersey for our fleets.

Very truly yours
Capt Ed Doske, Secty
for Capt Ralph Green,
President

P.S. Sorry for the handwritten letter, but time and computers are presently shot.

The Commonwealth of Massachusetts

Division of Marine Fisheries
Leverett Saltonstall State Office Building
100 Cambridge Street
Boston, Massachusetts 02202

PHILIP G. COATES
DIRECTOR

727-3193

July 24, 1995

Mr. David Kiefer
Executive Director
Mid-Atlantic Fishery Management Council
Room 2115 Federal Bldg.
Dover, Delaware 19904-6790

Dear David:

We offer the following comments on the Council's Scup Fishery FMP, the next installment in your Council's series of plans with the commonality of a mixed-species fishery "problem for resolution." As with squid, butterfish, and fluke, scup (and sea bass too) pose mixed-species (multispecies) management dilemmas that the New England Council has long labored to resolve for groundfish. Figuratively and literally, we're all in the same "kettles of fish" — a management bouillabaisse to be sure. So is ASMFC since this is a plan being developed "in cooperation" with the Commission.

Please take these comments as constructive criticism from a state that continues to have an abiding interest in the suite of species for which the Council has primary management responsibility in the EEZ. We focus on the mixed-species fishery problem, discards, overfishing and SAW advice, quotas, and the timetable for reducing exploitation. We suggest an approach that offers the greatest potential for the Council's dealing with its Gordian knot of offshore fishing on the mix. It's an alternative strategy — a corollary to your Alternative #7.

Mixed-species fishery problem

While we recognize the extent of this problem for your Council, working closely with ASMFC to create effective management for this species, we still are disappointed that the plan does little more than briefly describe the nature of the mixed species fishery, acknowledge that identification of "appropriate and effective management strategies" is complicated, and admit that the plan has no measures to "specifically address the mixed trawl fishery problem." We are heartened to read that the Council is working to develop a strategy and that framework measures could be used to implement the measures. However, the plan neither adequately describes the sorts of measures that could be implemented for the commercial fishery nor details how the Council actually "considered the implications of the mixed trawl fishery when developing the proposed measures."

We hold that while framework measures have good use to adjust existing measures to make them more restrictive, if need be (e.g., increasing mesh size or fish size or by expanding closed areas), for mixed-species fisheries with their host of complicated and perplexing management problems, it is best to initially describe in the plan itself how those problems are going to be resolved. Relying on framework measures potentially can be a serious pitfall since they can be used to postpone until tomorrow concepts and strategies that should be identified today.

The importance of these mixed-species fisheries implications should obligate the Council to detail those considerations for the benefit of its constituents and its own membership especially in this plan for scup — a species that clearly will be difficult to effectively manage. As the plan notes, notwithstanding the large recreational fishery, scup are taken by otter trawls, midwater trawls, pots and traps, pound nets (weirs), and handlines, all posing their own special brand of management challenges, particularly how to deal with discards. For example, in 1992 more Loligo squid and just somewhat less silver hake were landed than scup for otter trawls trips landing 1,000 pounds or more of scup per trip. Assuming these scup were taken as by-catch in small-mesh fisheries for squid and hake, one has to wonder about the amount of scup discard.

Discards

What are the implications of this presumably horrendous amount of discard estimated at the 19th SARC/SAW. In the Report of the SARC Pelagic/Coastal Subcommittee (CRD95-04), the Subcommittee estimated huge numbers of discards especially of juvenile fish (ages 0 and 1). In 1985 and 1992, discards exceeded 73 million fish each year, and landings were about 15-20 million fish. Discard of age 0 fish were over 50% of total discard.

Please examine the "Report of the 19th SAW Scup Advisory Report" and accompanying working papers to appreciate the amount of discard estimated from 1985-1993. In 1993, about 14 million fish were discarded; 16 million were landed. In terms of weight, in 1992 the amount discarded (extrapolated with assumed 100% mortality) almost equalled commercial landings. In 1993 commercial discards were about one-third commercial landings — landings that almost equalled the spawning stock biomass by weight! This highlights the dependency of the fishery on juveniles, a fact emphasized in the 19th SAW Report: "About 87% of total catch in numbers during 1992-1993 consisted of largely immature age 0-2 (less 7" fish)." From 1985-1991 the percentage was about 74%.

We grant you that these discard estimates are tenuous, and sea sampling is inadequate to reliably estimate quantity and age composition of commercial discards. Nevertheless, it appears there is an incredible waste of recruits and spawning potential. Of special note to us, the amount discarded in 1993 far exceeded the Plan proposed 6.81% Massachusetts' share of a possible coastwide commercial quota of 8.5 million pounds (3,086,000 pounds discarded versus 578,630-pound share). And let's not forget the 1992 estimate of 12,563,000 pounds discarded versus 578,630-pound share. Massachusetts' 10-year average of 1983-1992 landings (according to the plan) was 1,005,000 pounds. The minimum estimate of coastwide discard for the commercial fishery from 1984-1993 was about 3,086,000 pounds (according to 19th SAW). These numbers are quite enlightening and highlight the question of whether it is appropriate to manage this resource with quotas when so much of the resource is never landed — just wasted.

This question is especially relevant for Massachusetts where discarding of scup by trawlers in Massachusetts commercial fisheries is minuscule compared to discarding elsewhere. We have our night closure to mobile gear fishing, area closures to mobile gear fishing from May 1 through October 31, and a 4 1/2" minimum mesh size for trawls from June 1 through October 31. [Note the attached March 1992 "Notice to Fishermen and Dealers" that describes how the night closure and 4½" mesh pertains to state conservation efforts for scup and other species.] During the squid season from late April through May, no minimum mesh is required (unless more than 100 pounds of flounder are in possession). However, DMF sea sampling clearly has shown that May discards of scup taken in the squid fishery generally is low. For example, in 1993 during May for all vessels landing squid from Nantucket and Vineyard Sounds (Area 538) we estimated a total scup discard of 13,500 pounds with most discard being attributed to vessels greater than 50 GRT. Now, with our 1995 72' length overall limit, many larger vessels greater than this tonnage no longer can fish the sounds for scup or any other species.

Our sea sampling also indicates that the fluke fishery in the sounds presents no discard problem. During 11 fluke trips in the sounds from 1994-95 only 100 pounds was discarded. A minimum mesh of 6" (diamond or square) is required if fishermen have in possession more than 100 pounds of flounder including fluke.

Discards in other Massachusetts fisheries have low mortality. Massachusetts weirman dipnet their fish at weirs in less than 30 feet of water and release sublegal (less than 9" total length) scup in excellent condition. We presume the impact of commercial hook-and-line fishermen is also minimal if scup catch-and-release mortality in the sounds is about equal to mortality documented by DMF/NEFSC 1988/89 research for black sea bass (about 5%). Finally, pot fishermen tend to fish in relatively shoal Massachusetts waters. Pots are tended on the same day since pots must be baited, and sublegal fish generally are returned to the water soon after hauling.

Overfishing and SAW advice

Considering our state waters restrictions and low by-catch and high survival of scup discards in our state water's fisheries, we look elsewhere for the source of the discard problem that has contributed to the 19th SARC conclusion that scup are overfished. There is an 80% probability that F was between 0.80 and 2.40 in 1993 (57-83% exploitation rate). This compares to the target of 0.24 (19% exploitation). There is a 50% probability that F is greater than 1.3 (73% exploitation). Combine these annual removals due to fishing with natural mortality, and total mortality ranges from 64% to 96%. With a mid-range of about 80%, not much is left.

Spawning stock biomass decreased to about 10,138,000 pounds in 1993 from a 1992 SSB of about 14,546,000. The SAW predicted that in 1994, SSB dropped again to an estimated 7,934,000 pounds. If these estimates are to be believed, SSB for the last two years is considerably below the 1985-1992 average (about 18,238,000 pounds). SSB is far below the biomass required to support a long-term potential catch of 22-33,000,000 pounds.

Even though the SAW didn't provide a specific 1995 forecast, SAW management advice provided to the Council and ASMFC should be remembered and dealt with in the plan. That advice was:

• Fishing mortality on fully-recruited fish has been far in excess of all biological reference points and should be substantially reduced immediately.

• High exploitation rates on age 0-2 (<7" fish) must be decreased to allow these fish to mature and contribute to future SSB.

• Recruitment failure in a single year could result in a collapse of the fishery.

We dwell on these "stock status" issues because the plan does not adequately reflect the urgency of 1995 scientific advice provided at the January Plenary of the 19th SAW held in Ocean City.

Scup & small-mesh fisheries

After review of SAW advice and the proposed plan, we conclude a 9" total length minimum size for the commercial fishery in years 1 and 2 is a step in right direction, but too few fish will reach this size due to high discards of immature fish. Take note of page App 1-3 where the Council states:

> "Scup are a component of the mixed trawl fishery in Southern New England and the Mid-Atlantic...Based on NMFS weighout data, scup are most frequently landed with Loligo squid, Atlantic mackerel, and silver hake. In fact, for trips landing a 1,000 or more pounds of scup per trip, more Loligo squid were landed than scup...Based on 1992 NMFS weighout data, 45% of the vessels and 29% of the trips landing 2,500 pounds or more of Loligo squid, landed over 95% of Loligo landed by all Loligo otter trawl fishermen. Based on this 2,500 pound threshold, scup comprise slightly more than 6% of the total fish landed on these trips. However, the total pounds is slightly more than 50% of all scup landed (emphasis added) by otter trawl fishermen in 1992."

Here is the crux of the problem. Scup are caught in small-mesh (e.g., 2" and smaller) fisheries for squid and other species, hence the huge discard problem negating potential benefits of any measures (such as quotas) restricting a directed fishery for scup with a minimum mesh such as 4½", or larger. Finagling with mesh and triggers for use of specific mesh sizes (e.g., 1,000 pounds of scup on board) will be for naught. We appreciate some fishermen's assurances (page App 1-2) that it would be "economically inefficient to catch large amounts of small scup that would then have to be sorted to retain only legal sized fish," hence fishermen should not be constrained by a minimum mesh regulation since they will supposedly "modify their fishing practices to avoid small scup." Nevertheless, small scup still will be taken and discarded in small-mesh fisheries targeting squid, whiting, and mackerel. The Council and ASMFC cannot ignore this fact.

Furthermore, we ask: Can fishermen really avoid 7" and 8" total length scup and target 9" and larger? Are fish of these sizes separated especially when offshore during the winter? We suspect not. Also, considering mesh selectivity is not sharp for scup, we feel reliance on mesh size as a primary management measure to achieve your objective of "reducing fishing mortality on immature scup to increase spawning stock biomass and improving yield for the fisheries," is ill-advised. For example, based on what little mesh selectivity information exists for scup, with

a 4½" mesh net, about 30% of all 7" scup entering the cod end are retained. About 15% of all 6" fish are retained. Of course, these percentages are obtained from a smoothed curve drawn through scattered somewhat crude mesh selectivity data, and we all know there are many factors affecting mesh selectivity — factors collapsing the curve so that small fish don't escape in sufficient numbers. Nevertheless, many commercial tows with 4½" mesh nets (which may measure 4" after use), that are not very selective for scup, eventually will produce very high discards of smaller fish.

Fishing on the mix

The mixed-species/discard problem is probably near impossible to resolve with fish and mesh minimum size requirements, or even with quotas, unless they are combined with some means to stop fishing on the mix at key times of the year. For this reason, we reiterate comments made to you in a December 18, 1994 letter regarding Amendment #5 to the Squid, Mackerel, and Butterfish Management Plan.

Large season/area closures should be considered for offshore fisheries from fall though spring. Offshore, small-mesh fishing for squid is prevalent from October through April (71% of all 1992 Loligo landings). Offshore winter/early spring landings of scup are high. From your Table 18, average 1983-1992 December-April commercial landings (Maine to NC) from the EEZ were about 52% of total landings (73% of all EEZ landings). Note the attached figures that, if overlaid, show the concentration of landings (not catch) of scup, squid, sea bass, and fluke on the edge of the shelf. We suspect one could overlay the landings patterns of butterfish and other species on these distributions and find a similar clustering of landings per 10-minute squares along the shelf edge.

The Council has recognized commercial fishery closed seasons as an alternative in the amendment. The Regulatory Impact Review (RIR-16&17) indicates that for years 3 and beyond, in conjunction with a minimum fish size and/or minimum mesh size, gear-specific seasonal closures could be implemented to control fishing mortality. However, in your evaluation you make convincing arguments that this alternative presents too many problems. We agree with your assessment on page RIR-32 that all gear capable of catching scup would have to be removed from the water during a closed period otherwise scup would be caught and discarded as fishermen pursue other species, and fishermen could negate seasonal closure effects by increasing effort or efficiency during the open period. Still, we suggest there is a somewhat less restrictive measure that potentially would greatly reduce the amount of discards of juvenile and sublegal fish without a total reliance on difficult-to-enforce mesh regulations. This measure likely would have the added benefit of reducing catch and discards of juvenile and/or sublegal fish of such species as sea bass, butterfish, and Loligo. The magnitude of the discard problem is so severe and the mixed-species fishery consideration is so overarching that area closures, perhaps seasonal in nature, should be adopted.

Instead of closing entire commercial scup fisheries everywhere for prolonged periods of time thereby worsening discards as fishermen pursue other species in the same areas, prohibit all commercial fishing in selected widespread areas along the shelf during times when species of greatest concern to the Council, and ASMFC, overlap in distribution, notably scup, sea bass, fluke, and Loligo. We suggest this strategy has more merit than reliance on fish and mesh

minimum sizes because discarding will still occur especially during small-mesh (less than 2") fishing for squid.

While these same scup (and other species) will be vulnerable during spring movements to inshore waters where they will spawn, fishermen will have a greater opportunity to successfully target separate species by using different mesh sizes because these species tend to disperse during inshore movements.

The New England Council already has large areas closed to groundfishing. More and larger areas are now being considered as alternatives to the Multispecies Plan Amendment #7. We suggest it's time for the Mid-Atlantic Council to consider this type of measure before the Council is faced with collapsed stocks and the need to slash fishing mortality rates with all that portends, e.g., very low commercial quotas, but unlike for fluke, the Herculean task of allocating the quota between all the different gear types — a task the states will have to shoulder more so than the Council since inshore fisheries are pursued by numerous gear types.

Quotas

We suggest you rethink your position that application of commercial quotas in conjunction with minimum mesh and fish sizes will provide the way for you to achieve scup target fishing mortality rates. We make the following six points:

(1) State quota shares are being based on 1988-1992 data. In 1992 DMF implemented a night closure to mobile gear fishing that caused 1992 scup landings to be far less than they otherwise would have been. Much of the trawler catch in our waters was taken at night. By including 1992, we are penalized for our conservation efforts aimed at scup and other species. Furthermore, early in 1992 we implemented a 9" TL scup minimum size for the commercial fishery — a 2" increase from our 7" minimum size adopted for commercial and recreational fisheries in 1985. [Note: 9" TL minimum size for the scup recreational fishery was implemented in January, 1995].

(2) We argue that states having landed more scup than Massachusetts from 1983-1992 (years for determining the state quota shares) also have been responsible for the lion's share of discard; therefore, why should those states be rewarded now with a larger share of future landings than states with a minor impact on discard such as Massachusetts. For example, commercial fishermen's landings in New Jersey, with most being by draggermen (Table 13), occurred almost entirely from the EEZ (97-99%)(Table 17). Almost all of New Jersey's landings occurred from November through April (97.3%)(Table 66). A similar argument can be made for Rhode Island with 61% of commercial landings being attributable to draggers with the majority of scup landings originating from the EEZ (43-75%, average 60%). A sizable amount (49%) is taken from November through April. Massachusetts landings originate primarily state waters from May through October.

The argument also can be made that states landing the preponderance of Loligo probably were responsible for the majority of scup discards in the squid fishery. Why should these states be rewarded with a larger share of the scup commercial quota when these states' fishermen have been wasting scup and contributing to the overfishing problem? Since Loligo is a major

component of New Jersey landings, and Cape May has begun to rely more heavily on squid in recent years, we argue that a 26.3% share is inappropriate. A similar argument can be made about Rhode Island's 43.6% share. In 1992 New Jersey and Rhode Island accounted for 75% of total Loligo landings.

(3) To reiterate an earlier important point, quotas cannot be considered a sensible approach as long as discards are so high (e.g., about 3,086,000 pounds in 1993). Moreover, discards far exceed the proposed 8.5 million pound quota individual state shares for Maine, Massachusetts, Connecticut, New York, New Jersey, Maryland, Virginia, and North Carolina (and almost equal Rhode Island's share). How can states support administratively burdensome and contentious scup quotas, that will have to be allocated between many competing gear types, when offshore discarding plays so dominant a role? How can we defend quotas to commercial fishermen who will quickly recognize the unfairness and unreasonableness of the situation? Furthermore, can we convince recreational fishermen to accept bag limits and other controls when discarding in the commercial fishery is so extreme?

(4) Bimonthly quotas are still a problem due to discards. For example, why should inshore fishermen dependent on a May-June bimonthly quota, settle for a 22.4% share, when discarding in the offshore fishery is so significant. A combined offshore share of about 65% (November-April) will rub salt in this wound since the share doesn't include discards.

Furthermore, according to the proposed plan, almost 50% of Massachusetts commercial landings occur from July-October. Only 12.6% of a coastwide quota would be set aside for this period. Again, why should commercial fishermen landing scup in Massachusetts (and in other states) during this 4-month period be limited to 12.6% (about 1.1 million pounds) when the annual amount discarded was about 3,086,000 pounds for 1985-1993 and possibly as high as 12,563,000 pounds in 1992. Any quota scheme, bimonthly or otherwise, unravels due to discards.

(5) We suspect the record of hook-and-line commercial landings is erroneous for Massachusetts. Consider the following logic and calculations based on observations of DMF staff who followed the spring commercial and recreational fisheries south of Cape Cod during the last 3-4 years.

The hook and line scup season within Nantucket Sound is approximately 6 weeks: May 15 through the end of June/early July. If we use the reasonable assumption of one lost fishing day per week due to poor weather, then the 6 weeks drops to about 36 fishing days. Based on our observations of fish being landed by hook-and-line fishermen, approximately 1/2 of these days represents non-peak productivity with an estimated average catch per vessel of 150 pounds. The other 1/2 of the time period is characterized by increased production rates estimated at 600 pounds per vessel. Again, based on our observations, average numbers of vessels per day in this fishery is about 80 vessels based on estimates of 50 vessels per day Mondays through Thursdays, 70 vessels on Fridays, and 150 vessels per day on weekends. These numbers result in scup landings of 1,080,000 pounds for this fishery. This estimate is conservative because it pertains to observations just for a portion of Nantucket Sound. Other scup hook-and-line fisheries take place in Buzzards Bay (spring - fall), Vineyard Sound (summer - fall) and Noman's Island area (summer - fall). A large proportion of these landings are unaccounted for in the NMFS port survey and general canvass data base along with a proportion of the "recreational" catch that is discretely marketed both within and out of state.

Our point is: Because Massachusetts has and will continue to aggressively account for all commercial landings tallied against Council/ASMFC quotas (e.g., fluke, bluefish, and striped bass), once scup is plugged into our Statistics Program and our automated reporting system, scup commercial landings that heretofore have been unrecorded will suddenly be accounted for. Our commercial quota (if a state share) will be taken much faster than anticipated and our commercial fishery will be jeopardized. And, in the meantime, offshore discards will continue — even with 4 1/2" mesh nets.

(6) Please take note of the following 19th SAW Plenary Scup Advisory Report conclusions:

> "A quantitative forecast of catch and SSB for 1995 is not provided due to the imprecision of the discard estimates and uncertain future recruitment...Due to the limitations in the sea sampling data used to estimate and characterize commercial discards [pause], age compositions of total catch and the estimates of fishing mortality and stock size derived from them, are uncertain."

An annual VPA will not be available for determination of quotas under different assumptions of recruitment. The Council will be forced to employ the approach it suggests it will use for determining the 1998 year-3 11,732,000 pound quota: average landings (not catch) data from 1988-1992 times 28% (difference between current exploitation of 65% and year 3's 47% target) with the product being subtracted from 11,732,000 resulting in 8,500,000 pounds. But this approach does not account for changes in spawning stock biomass, which in 1993 and 1994 dropped substantially from previous years. Recruitment isn't considered either. What will be the scientific basis for setting annual quotas? Shouldn't your year-3 quota calculation be based on total catch, not landings?

Furthermore, your method for equating a quota to the 47% exploitation rate in year 3 is a guessing game. It needs further explanation. A cut in 1988-1992 average commercial landings by 28% doesn't mean that exploitation will decrease from status quo of 65% to the year-3 47% (about F=0.64). Since exploitation is a function of stock size and catch, the quota for year-3 set without reference to stock size will not correspond to the 47% target exploitation.

F-reduction timetable

Setting all our concerns about quotas aside for the moment, let's debate the recovery schedule itself. Eight years to reach a 20% target?! Six years to reach a 33% target?! Scup are now overfished. One of the plan objectives is to "assure that overfishing does not occur." We suggest this objective be changed to "reduce fishing mortality to the level corresponding to the overfishing definition (F=0.25)." Fortunately, this F, that is F_{max}, will increase as age-at-entry increases, as the plan notes. On p. 54, F_{max} increases to 0.38 with 9" total length for the commercial fishery and 7-8" for recreational fisheries.

An outcry heard at the New Bedford public hearing was that managers shouldn't postpone meaningful action until three years from now. Party boat fishermen and weir fishermen have seen scup of commercial size in the last years, and especially this year, diminish to levels that make them fear for their livelihoods. If it would do any good for the resource, some fishermen even were willing to accept further state waters restrictions to curtail fishing that occurs when fish

arrive in the spring.

We recommend the Council, and ASMFC, adhere to 19th SAW advice: dramatically accelerate the F-reduction timetable, or as succinctly stated at the SAW, "Immediately and substantially reduce the exploitation rate." We suggest this can be accomplished by closing important offshore fishing grounds during the winter to protect overwintering scup (and other species).

Alternative #8

We also recommend adoption of alternative 8: a 10" TL minimum size from October 1 through April 30 and a 9" TL minimum size for the rest of the year.

The biggest challenge will be to prevent catch and discard of scup less than 10" from October through April and to convince commercial fishermen to forego the smaller fish in exchange for the major benefits as noted on p. App 1-12 of the plan:

- yields are increased as fishermen catch larger, more heavier fish
- the stock is more resilient to overfishing
- F_{max} will increase even further
- SSB will increase by allowing more fish to spawn (100% would be mature at 10" TL).

The Plan makes the point that for the 1991-1992 North Carolina winter trawl fishery, 90% of the scup were less than 10" TL (age 3). True, but there were years when the percentage was around 50% (Table 46). Larger fish can make up a large proportion of the landings, provided the fish are allowed to grow to larger sizes. Scup are overfished, so abundance of larger fish is bound to be down. Stop overfishing, and larger fish will reappear.

The plan also indicates (Table 45) that from 1983 through 1991, 10" and larger scup made up 40-50% of the NMFS weighout, until the 1990's when the percentage dropped to about 30%. Our point is that fishermen not too long ago could find, target, and land larger scup. Now, the commercial fishery is targeting immature fish with ages 0-2 making up 87% in 1992-1993. Who knows what the percentage was in 1993-1994 and 1994-1995? As noted in the Plenary document:

> "...SSB has declined steadily since 1990 to a record low of 4,600 mt in 1993 [predicted 3,600 mt in 1994]...Although the assessment covered a relatively short time period (1984-1993), NEFSC survey data indicate that much higher levels of stock biomass occurred during the 1970's."

Moratorium on new entrants

Your addendum to the FMP and DEIS describes a moratorium on entry of additional commercial vessels into the scup fishery. While we agree in principle, that effort should be limited, we argue it is inappropriate at this time to limit entry into the EEZ scup fishery. Because commercial discard estimates averaged about 7,494,000 pounds each year from 1989-1993, limiting entry cannot be justified especially since the fishery appears to have shifted to

immature scup (87% of catch in numbers during 1992-1993 largely of age 0-2 fish). When the discard problem is effectively addressed (e.g., reducing scup discard in the squid and hake fisheries), then limiting entry would be defensible.

Conclusion

We hope the Council, and ASMFC, will agree that newest assessment information, especially estimates of discards and dependence of the commercial fishery on age 0-2 fish, makes a very compelling case for a rethinking of the long-term strategy to reduce overfishing and deal with mixed species fishery problems. We recognize that fishermen are being pressured by other FMP's, and short-term economic burdens on fishermen are hard to ignore. These considerations are used by the Council to justify the eight-year strategy (see pp. 50 and 52 of the FMP/DEIS). Nevertheless, since the plan relies on data only through 1992 and the basic elements of the plan (such as the rebuilding schedule) were developed in 1992, with 1996 now being the first year of the plan, the 3-year interlude and worsening stock condition (e.g., SSB declines in 1993, 1994, and maybe 1995) force a reconsideration of plan strategies.

We don't suggest a "back-to-the-drawing-board" approach. With a concerted effort by the Council and staff, and with serious and quick attention being given to the mixed species fishery problem (before the Sea Bass Plan is aired at public hearings), an improved plan more attentive to critical issues described in this letter should be possible. Unfortunately, another offshore winter fishery might come and go before revisions are possible. We don't view the delay as too significant because, as it stands, the plan won't do much for 1996 anyway. We know our assessment seems harsh. We suppose it is. Our experience with groundfish makes us wary of postponing until tomorrow, what we all know must be done today.

Sincerely yours,

Philip G. Coates
Director

cc.
Jack Dunnigan
Douglas Marshall
Andrew Rosenberg
Allen E. Peterson, Jr.
Mass. Marine Fisheries Commission
David Borden

STATE OF CONNECTICUT
DEPARTMENT OF ENVIRONMENTAL PROTECTION
FISHERIES DIVISION
79 ELM STREET
HARTFORD, CT 06106

July 24, 1995

Mr. David R. Keifer, Executive Director
Mid-Atlantic Fishery Management Council
Room 2115 Federal Building
300 South New Street
Dover, DE 19904-6790

Dear David:

I am writing to comment on the Scup Fishery Management Plan now under development. There are four issues of great importance to us.

First, we are very concerned about the continued absence of older fish in Long Island Sound. Less than 20 years ago, a substantial fishery existed in the Sound on 7-11" fish. That fishery is virtually gone. Even though recruitment in the intervening years has been acceptable, the growth overfishing which has occurred has greatly diminished the fishery in state waters.

Second, relative to management measures, we can support the uniform 9" minimum length. We have difficulty supporting an increase from our current 8" length (sport and commercial) without a concomitant increase in both the commercial and sport fishery minimum lengths along the entire coast. A 7" length in the sport fishery seems to do nothing more than undercut the conservation initiative that will be borne on the backs of commercial fishermen.

Third, something must be done to minimize discard mortality but we see nothing in the public hearing document about a minimum trawl net mesh size in the commercial fishery. Some minimum mesh size consistent with a 9" fish must be established for the directed scup fishery in the EEZ so that fish now wasted as discards can be left in the resource to enter the harvestable biomass as older, larger fish.

Finally, we are very concerned about the implications of a quota management system for scup in Year Three of the plan. While the summer flounder resource may be responding well to imposition of an absolute quota, we do not believe the state-specific system is an acceptable method of allocation. Until this strategy is supplanted by a better one, anything that moves us in the direction of quota management for scup is of concern to us. In our view, a reduction in discard mortality is the best thing we can do for the scup resource at this time, and this means large mesh. Moreover, we believe the door should be left open for consideration of an array of alternatives to accomplish the eventual goal of F_{max}.

Thank you for the opportunity to comment.

Sincerely,

Ernie

Ernest E. Beckwith, Jr.
Director

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UNITED BOATMAN ASSOCIATION
217 KENSINGTON ROAD
LYNBROOK, NEW YORK 11563
516-599-0700

Date: July 25, 1995

To: Mid Atlantic Council

From: Capt Tom Marconi
United Boatman Association

Re: Scub

We the United Organization of Party & Charter boat fisherman of New York State request the line of demarcation on the size limit of scub be revoked

The seven (7) inch size limit should be from New York State South, not from New Jersey South. Our porgie industry highly depends on porgie seven (7) inch in size. If you were to pass an eight (8) inch size limit in New York will undoubtly send all our economy south.

During the Stripe Bass issue in New York involving size limits, New York State realized the Party and Charter Boat bass industry left to go to other states with a smaller size limit. There by bring that economy to another State. In order to rectify this situation, New York DEC lower the size limit so our Party & Charter boats could be competitive

Many areas of New York State doesn't and will not have a larger porgies like Connecticut and Massachusetts we need seven (7) inch to survive.

Another example, when New York State DEC passed the Blackfish size and bag limit, for example my business to largest carrier of the Blackfish trade on the East Coast, was so divesting that we were forced to leave that fishery and fish for other species. My economy trade left us to go to New Jersey with no bag limit and as one (1) inch smaller fish. We are a perfect example of what radical law making can do

New York and New Jersey thrive on the same size fish. New Jersey cannot have a larger porgie and neither can New York State.

Please draw the line of demarcation North of New York, or you will be the eliminating cause of the porgie economy to leave New York State. There by also placing many industries in jeopardy

We the owners of New York State appreciate your time and hope that you will consider our pleas. We need seven (7) inch porgie.

We the United Boatman proposed a seven (7) inch size limit for New York State and Federal Waters.

The above comments represent the North, South, Eastern and Western Long Island, West Chester and Brooklyn Party and Charter Boat Fisherman of New York.

Thank You.

KC

June 28, 1995

Dear David Kiefer
Mid-Atlantic Fishery Management Council

I am writing to you in reference to the Scup Plan, here are my suggestions.

Recreational

1) 10 inch size limit
2) Limit 30 per angler

Commercial

1) No netting
2) 10 inch size limit.
3) Rod and Reel only.
4) No limit by Rod and Reel
5) No Pots or Traps

By getting right to the point, you can protect the fish. They are so easy to catch as well, in all, take the bull by the horns.

Thank you,

Steve Palmer
2647 Haddonfield Rd.
Pennsauken, NJ 08110
(609) 665-3669
(609) 486-4303

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
NORTHEAST REGION
One Blackburn Drive
Gloucester, MA 01930

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OCT 10 1995
MID-ATLANTIC FISHERY COUNCIL

OCT 4 1995

David R. Keifer
Executive Director
Mid-Atlantic Fishery Management Council
Federal Building, 300 South New Street
Dover, Delaware 19901-6790

Dear Dave,

The hearing draft of the proposed Scup FMP has been circulated among my staff for in-house review and comment. I would like to forward the following comments to you.

- The 19th SAW advised that fishing mortality should be substantially reduced immediately, and that recruitment failure in a single year could collapse the fishery. I have serious concerns that the proposed actions do not fully implement this most recent assessment advice. If the Council is still determined to propose an 8-year rebuilding schedule to minimize the short term economic burden on the industry, the need for this schedule must be more fully analyzed in the document.

- The document should provide economic and social impact examinations of alternatives other than the preferred. The analysis of the impacts of minimum mesh size regulations would benefit from additional quantitative and qualitative analysis.

- The justification for implementing a commercial minimum fish size without accompanying mesh restrictions in years 1 and 2 is not sufficient. The discussion of this proposal is also internally inconsistent within the document. On p. 55, the document explains that industry believes the minimum fish size will be effective in reducing mortality without minimum mesh restriction because it would become uneconomical to catch small scup which would have to be sorted from the rest of the catch. However, the Council proposes to allow a tolerance for possession of small fish which eliminates this disincentive. The document also states on this page that discard is presently high in the fishery, with current mesh sizes used of 2" or less. There is no explanation in the document for the Council's apparent conclusion that a minimum fish size requirement will alter current industry mesh use or discard practices.

On p. 57 of the document, the Council explains that it proposes to implement a commercial quota in year 3 of the FMP because the minimum size alone will not reduce overfishing. There is no explanation as to why, despite the fact that the Council is aware of this, it proposes inadequate measures for years 1 and 2.

Additionally, the effectiveness of implementing minimum fish size regulations in the commercial fishery (without accompanying mesh size regulations) is not clearly demonstrated. According to the testimony of fishermen, mesh size regulations are unnecessary given the ability of the commercial fishery to target on larger fish. Yet in 1992, according to the FMP, about one third of the commercial landings of scup were obtained from trips landings over 2,500 pounds of *Loligo*. The FMP further notes that in some years the amount of scup discarded has exceeded that landed. There are at least two possible explanations for this apparent discrepancy: Either (1) the current commercial fishery does not or cannot target marketable-sized scup; or (2) scup are unavoidably retained in small mesh fisheries (e.g. fisheries targeting *Loligo*). In either case, increasing the minimum fish size would likely increase discards, and, without direct controls, would not decrease fishing mortality.

- The stated equivalence of OY and the yield obtained under the fishing mortality rate corresponding (or tending toward) the overfishing definition is troubling. Essentially, the FMP equates overfishing with attainment of the OY: The plan target is overfishing. A framework should be implemented to develop a definition of OY consistent with the MFCMA once an appropriate definition of yield or catch potential has been specified.

- The Council should re-analyze the recreational fishery using recreational statistics calculated through the revised MRFSS methodology. The FMP includes data from 1990 and 1992. Revised MRFSS data are available through 1994. Also, an extensive qualitative analysis of the further restrictions in year 3 should be undertaken to identify effects of the alternatives. As the justification of the proposed rebuilding schedule may be modified by the current assessment, NMFS recommends that the Council update the assessment information. F_{max} has been revised from 0.25 to 0.24 (19% exploitation rate). The mean fishing mortality rate for the period 1984 through 1993 is 1.36, above the higher estimate of 1.2 mentioned in the FMP. These data indicate a higher exploitation rate and a lower reference point, and thus the biological and economic impacts of the preferred alternative are understated.

- The document does not adequately explain why the Council has chosen different regional minimum fish sizes for the recreational fishery. The justification for imposing two sets of minimum fish sizes in the recreational fishery (ME-NY: 8"; NJ-NC: 7") during the first two years of the FMP may be an artifact of the different historical minimum fish sizes by state. A higher percentage of fish less than 8" has probably been characteristic of the landings taken from New Jersey to North Carolina simply because no minimum fish sizes for recreational landings of scup have existed in these states. There is no information presented in the sections on habitat to indicate that large fish are not available to the recreational fishery south of New York.

- There are several problems with implementation of the Council's proposed commercial quota in year 3 of the FMP. First, the document states that the Regional Director may impose trip limits in order to extend the fishing year. The document presents no criteria for my use in taking action and there is no mention of this in the draft regulations. If the Council wishes this to be a management measure, it must completely describe the measure in the document. Second, if the Council continues to support its proposal to allow vessels to land, but not sell, undersized scup, the document must specify how these landings will be counted toward the quota. As stated previously, NMFS advises eliminating the undersized fish tolerance. Third, the document does not properly describe the quota monitoring or closures which would be required under quota management. Paragraphs 3 and 8 in Section 9.1.2.3.1 should be deleted.

  In Section 9.2.1.4 the document states that the commercial quota would be allocated based on traditional landings patterns and, therefore, would be distributed equitably to harvesters in each state. This statement implies that the quota would be allocated on a state-by-state basis and should be revised if that is not the case.

- The notice establishing January 26, 1990, as the control date for the fishery was published on June 7, 1990. The Council proposes to base moratorium permit eligibility on proof of landings made between January 26, 1988 and January 26, 1993. I am concerned about the possibility that entrants to this fishery since 1990 may not have been aware of the control date. The Council should address this issue by describing the manner in which the public was notified of the likelihood of limited entry in the intervening time (eg. meetings and hearings held, newsletter articles, etc.).

- The Council proposes to confer moratorium permit eligibility upon vessels which were re-rigging on January 26, 1993 and land scup prior to the implementation of the FMP. The Council may wish to reconsider the length of time it is allowing for such vessels to establish eligibility. The Council should also consider revising this provision to include "vessels under written agreement for construction" (as was done in the summer flounder FMP) and "vessels under written contract for purchase" (as was done in the lobster FMP). In section 9.1.2.1.1.2 (p. 42), vessel replacement restrictions should read "same or less" to parallel the summer flounder plan and the language in the DPR-2, §635.2. In §635.4(b)(1)(iv) remove "...for reasons other than lack of maintenance..."

- NMFS Law Enforcement identified the language in §635.9(a)91) that would make it unlawful to "...possess at sea any scup, or parts thereof, in excess of the 5% tolerance that fail to meet the minimum fish size specified in §635.23." as unenforceable. Instead, Law Enforcement recommends a prohibition on the possession of undersized fish, and language in §635.23(b) should reflect that prohibition. Enforcement stresses that percentage tolerance of undersized fish is completely unenforceable at sea, as such percentages vary on any given day, and even within the same day. Law Enforcement also suggests the Council should prohibit the filleting of scup prior to the completion of a fishing trip, as identifying fish fillets and parts by species is virtually impossible without laboratory analyses.

- The statement in section 9.1.2.1.2 that state dealer permits will be accepted in lieu of Federal dealer permits must be deleted. This provision was proposed in Amendment 2 to the summer flounder FMP, but was found to be impossible to administer.

- As in past amendments, I am requesting that the Council add a summary section to the Introduction giving a summary of the Management Strategy presented in the FMP.

Sincerely,

Dr. Andrew A. Rosenberg
Regional Director

Mr. E. Wayne Halbruner
715 Shunpike Road
Cape May, New Jersey 08204

October 12, 1995

Mr. Dave Keifer
Mid-Atlantic Fishery Management Council
Room 2115 Federal Building
300 South New Street
Dover, Delaware 19901-6790

Re: Scup Fisheries

Dear Mr. Keifer:

I am and have been a Commercial Fisherman for forty years and have owned my own vessel for thirty five years. Ninety percent of my stock is from scup fisheries.

I am very concerned about the scup laws. I sat in on a meeting in the Cape May Court House extension office last night and was told about the meeting today in Philadelphia.

It was discussed about the 9" scup size and that was a good idea with all fisherman at the meeting, but, that isn't going to solve the small scup problem which is very important.

We have to come up with a mesh size not two or three years from now, but, NOW.

At the meeting last night, that appeared to be the biggest problem. The 4 1/2" mesh size was mentioned and everyone felt that was too big for us to make a living. I'm not sure, but, I believe possibly a 4" mesh would do the trick.

Mr. Kiefer, as a scup fisherman who is looking for scup sometimes you go two, three, four days before finding any scup, so you need the smaller mesh in order to catch the smaller fish, such as whiting, butterfish, bass, squid, to make the trip pay. These fish you would not catch with 4" or 4 1/2" bag.

I have been using a 3" bag for the last five years scratch fishing and then when we find schools of scup we put 4" bag on. The 4" bag helps to save small scup if you do not tow too long and clog the mesh.

My feelings are, 1) mesh size of 4" for scup. 2) Instead of closures, ban all scup fishing at night. Give the scup a chance.

What has happened in New England is all their boats fish 24hrs a day 7 days a week with no let up. For 25 years we never fished at night for scup until it was introduced to us by the New England fisherman.

If all boats were to take off conveyors in scup fisheries they would not put 30,000 or 40,000 pounds of scup on deck and have to pick through all those small fish to get 3,000 or 4,000 pounds of usable fish.

I believe they would be glad to put a big mess bag on and let little fish go. Conveyors in my opinion are SMALL fish killers.

Sincerely,

E. Wayne Halbruner,
Owner F/V Elisa G
Cape May, NJ

9

NANTUCKET SOUND

FISH WEIRS, INC.

October 14,1995

TRAP FISH

Mid-Atlantic Fishery Management Council
Room 2115, Frear Federal Building
300 South New Street
Dover, Delaware 19904-6790

RECEIVED
OCT 19 1995
NEW ENGLAND FISHERY MANAGEMENT COUNCIL

Re: Scup Fish Management Plan

Gentlemen and Ladies;

The purpose of this letter is to provide a justification, other than biological, for taking firm action in the first year of the Scup FMP to reduce discards. **Lost revenue to the industry from Scup discards is staggering.** The FMP presently provides for an increase in minimum mesh size in year three. However creditable managing by mesh size appears, the reality is different. A more practicable solution is seasonal area closure considering the frequent encounters of small Scup when fishing for Loligo squid with 1 7/8" mesh.

Using Scup discard data from the Northeast Fishery Science Center (NFSC) for the five years between 1989 and including 1994, a very revealing case can be made by calculating the annual lost dollar value of the discards ex-vessel. Please follow how an estimated 22,744,000 of annually discarded Scup in number would be 14,487,928 pounds if they survived to be age 3, and at an estimated value of 0.51 cents a pound returned to the vessel, the total annual lost value would be @ 7.2 million dollars to fishermen.

For the five years (1989-1994) the New England Fisheries Science Center (NFSC) data reveals the estimated annual average Scup discards, based on sea sampling, were 32,560,000 numbers of fish for ages 0, 1, and 2. (1995 assessment of Scup; 1994, Report of Pelagic/Coastal Subcommittee NEFC, CRD 95-04, in press)

Continuing to use the NEFC,CRD 95-04 report which details discards by year and age group: if the average number of the 0 age fish discarded each year suffered only natural mortality (M=0.2), and were caught and landed instead at age 3, they would decline from 9,439,000 fish to 5,180,000. If the average number of age 1 annually discarded fish had only natural mortality, those 9,203,000 Scup would be reduced to 6,169,000 fish by age 3. And finally if the average number of age 2 fish annually discarded survived, those 13,918,000 discards would be 11,395,000 fish when they reached age 3. The total average annual number of surviving fish for the three ages, at age three, would be 22,744,000. The NFSC average weight for a 3 year old commercial Scup is 0.637 pounds per fish for the years in question. **Thus, 0.637 lb. x 22,744,000 fish = 14,487,928 pounds of annual lost potential if the Scup had survived to age 3.** If the fish survive to an older age the weights would increase.

7.2 million dollars of potential income to fishermen is lost at the present annual average rate of discards, (Scup FMP, May 1995, Table 30, medium Scup, $0.51 lb). The 1992 total landings of Scup were 13,181,000 lb, with a total ex-vessel value of 7.5 million dollars, (Scup FMP, pg 101, Table 28).

Generally the argument for protecting the resource is to insure sufficient biomass. Demonstrating the annual potential value of discarded Scup is not a wasted exercise if it falls on ears receptive to making money. Who could that possibly be?

Sincerely,

MARK SIMONITSCH

84 Deane Road, Chatham, Massachusetts 02633

(9)

NANTUCKET SOUND
FISH WEIRS, INC.
TRAP FISH

November, 4, 1995

RECEIVED
NOV 15 1995
NEW ENGLAND FISHERY MANAGEMENT COUNCIL

Mid Atlantic Fishery Management Council
Room 2115 Federal Building
3090 South New Street
Dover, Delaware 19904-6790

Re: Scup Fish Management Plan (FMP)

The following statements apply to this discussion:

Scup resources are at an extremely low level. "Recruitment failure in a single year could result in a collapse of the fishery," NEFSC, 19th SAW Plenary.

Significant Scup discards occur in the small mesh, mixed species otter trawl fisheries conducted on the edge of the continental shelf. "87% of the total catch in numbers during 1992-93 consisted of largely immature age 0-2 (<7") fish," NEFSC, 19th SAW Plenary.

It is impossible to confine harvesting efforts to a single species where Loligo squid, butterfish, scup, and seabass are found in the EEZ.

One and 7/8 inch bag mesh, with strengthener, will be the minimum size permitted for Loligo squid under the new Amendment V. There is presently no minimum mesh size.

Currently fifty percent of the annual Scup landings are caught on trips directed for Loligo squid, Scup FMP, Appendix 1.

A fair question to the Council is: how can the proposed Scup FMP successfully correct the discard problem when an important percent of the devastation occurs in pursuit of other species, and when the new Amendment V, for Mackerel, Squid and Butterfish, will not prevent the major Scup discards experienced in those fisheries.

My recommendations:

1. Seasonal closures in the EEZ sectors identified as high discard areas.

2. No quotas. States with the largest Scup landings also have heavy discards, why reward such a record. States with a history of strong conservation restrictions would be penalized. States with the highest Loligo landings probably have the most Scup discards. The Scup biomass was in decline for the suggested base years of 1988-92. Solomon could not devise a fair quota system.

3. An absolute minimum of 4.5 inch mesh when there is more than 1000 lb of scup aboard; small mesh bags to be lashed and stowed appropriately.

4. Size limits: Commercial -9 inch TL minimum; Recreational -8 inch year 1, 9 inch in year 2.

5. Ten percent tolerance for undersized fish.

Sincerely,

MARK SIMONITSCH

84 Doane Road, Chatham, Massachusetts 02633
Wharf: 508-945-1791 • Fax: 508-945-9730 • Residence: 508-945-2496

F/V Illusion

217 4th Street
Greenport, New York 11944

Mark S. Phillips
CAPTAIN/OWNER

Phone: 516-477-2940
Fax: 516-477-8583

To the Mid Atlantic Council:

Every year I come to the council and ask you to implement a 9" scup size. I am asking again. A 9" possession limit with a 5% tolerance by weight will do more for this fishery than anything else. It is a physical impossibility to cull thru large volumes of fish on the boats. This bit of taking large volumes of small scup to the dock must be stopped.

The fluke plan has just made the scup problem worse. As soon as New Jersey shuts their fluke fishery down some of those boats go scupping. Because of the warm winter the whiting boats out of New York and Rhode Island have been catching small scup. It would be okay if one boat got a hit. But as soon as one boat gets a hit 20 boats are now targeting on small 7" scup with whiting bags.

I don't believe anything but a fish size will help the stock and still allow scup to be caught. The bag size just forces incidental catches of saleable fish to be discarded. A closed season penalizes the boats that target scup primarily. Trip limits will penalize the boats that target scup primarily Just like the fluke plan has done to the fluke boats out of NY, RI, Conn, Mass.

If the scup resource collapses this council is responsible exclusively. There have been a number of fishermen asking for many years for a size limit that would preserve the stock. The longer you delay the harder a larger size limit becomes. I do not want to see this fishery go the way the fluke fishery has gone in NY, RI, Conn, Mass of eliminating directed fluke trips. These requests have been going on for 5 or 6 years or longer.

Thank you,

Mark S. Phillips

UNITED STATES DEPARTMENT OF COMMERCE
Office of the Under Secretary for
Oceans and Atmosphere
Washington, D.C. 20230

MAY 30 1996

To All Interested Government Agencies and Public Groups:

Pursuant to the National Environmental Policy Act, an environmental review has been performed on the following action.

TITLE: Final Environmental Impact Statement (FEIS) for Amendment 8 to the Fishery Management Plan for the Summer Flounder and Scup Fisheries (FMP)

LOCATION: The exclusive economic zone (EEZ) off the New England and Mid-Atlantic coasts

SUMMARY: Amendment 8 to the FMP would revise the Summer Flounder FMP to institute management of the scup fisheries in the EEZ. Proposed management measures for scup in Year 1 include: Dealer, charter/party vessel, and operator permits; moratorium on vessel permits for the directed commercial fishery; a requirement that permitted vessels may sell only to permitted dealers; mandatory reporting for permitted vessels and dealers; escape vents on scup pots or traps, degradable hinges and fasteners in scup pots or traps, and maximum size for rollers used in roller rig trawl gear; minimum fish sizes for the commercial and recreational fisheries; and minimum codend mesh requirements when possessing more than a threshold level of scup on board. For scup in Year 2 and beyond, the proposed measures include a coastwide quota with Federal commercial permit holders being prohibited from landing after the quota has been attained, as well as several framework measures. The intended effect of this rule is to prevent overfishing and allow the resource to rebuild.

NMFS disapproved six measures in Amendment 8 during the preliminary evaluation before publishing the notice of availability in the Federal Register. The disapproved measures would: (1) Confer moratorium permit eligibility upon vessels that were re-rigging on January 26, 1993, and land scup prior to the implementation of the FMP; (2) require vessels to keep scup catches of less than 4,000 lb in 100-lb boxes to enhance enforcement; (3) accept state dealer permits in lieu of the required Federal permit; (4) deny access to the exclusive economic zone to vessels from states that do not implement

recreational measures equivalent to those specified in the Federal plan; (5) use state regulations to define scup pots for the residents of that state; and (6) establish annual recreational harvest limits and deduct catches in excess of those limits from the limits for the following year.

RESPONSIBLE OFFICIAL: Regina L. Spallone
Fishery Policy Analyst
Northeast Region
One Blackburn Drive
Gloucester, MA 01930-2298
Phone: 508-281-9315

Copies of the FEIS/Amendment 8 are enclosed for your information. Also enclosed is an addendum to *APPENDIX 3. COMMENT LETTERS* that contains responses to the content of the Draft Environmental Impact Statement for Amendment 8. Upon request, an unabridged version of the comments is available from the Mid-Atlantic Fishery Management Council, Room 2115 Federal Building, 300 S. New Street, Dover, DE 19904-6790 (302) 674-2331. Please send one copy of your comments on the FEIS/Amendment 8 to me in Room 5805, OPSP, U.S. Department of Commerce, Washington, D.C. 20230.

Sincerely,

Donna Wieting
Acting Director, Office of
Ecology and Conservation

Enclosures

APPENDIX 4. FINAL ENVIRONMENTAL IMPACT STATEMENT (FEIS)

1. COVER SHEET

Responsible Agency
Mid-Atlantic Fishery Management Council

Cooperating Agencies
Atlantic States Marine Fisheries Commission
New England Fishery Management Council
South Atlantic Fishery Management Council
National Marine Fisheries Service/National Oceanic and Atmospheric Administration

Title of Action
Fishery Management Plan for the Scup Fishery

Contact Person
David R. Keifer, Executive Director
Mid-Atlantic Fishery Management Council
Room 2115 Federal Building
300 South New Street
Dover, Delaware 19904-6790
302-674-2331

Designation of the Statement
Final Environmental Impact Statement

Abstract
The proposed action, authorized under the Magnuson Fishery Conservation and Management Act of 1976, as amended (Magnuson Act), will institute management of the scup fisheries in the US Exclusive Economic Zone (EEZ). The action will, among other things, prevent overfishing and allow the resource to rebuild. It will provide a data collection and reporting system and a procedure for adjusting management measures annually. The proposed action will have no adverse impact on the physical environment and will strengthen efforts to work with other Federal and State agencies to conserve and manage scup and their habitats. There may be temporary losses to the human environment because of the requisite reduced harvest levels. However, the proposed restrictions will produce long-term benefits, allowing the fishery to rebuild and to continue indefinitely in a controlled manner.

Comment Due Date
Comments on the statement were required by 24 July 1995.

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C. SUMMARY

C.1. BACKGROUND.

This Fishery Management Plan for the Scup Fishery (FMP), prepared by the Mid-Atlantic Fishery Management Council (Council), is intended to manage the scup (*Stenotomus chrysops*) fishery pursuant to the Magnuson Fishery Conservation and Management Act of 1976, as amended (MFCMA). The management unit is scup (*Stenotomus chrysops*) in US waters in the western Atlantic Ocean from Cape Hatteras northward. The objectives of the FMP are to:

1. Reduce fishing mortality in the scup fishery to assure that overfishing does not occur.

2. Reduce fishing mortality on immature scup to increase spawning stock biomass.

3. Improve the yield from the fisheries.

4. Promote compatible management regulations between State and Federal jurisdictions.

5. Promote uniform and effective enforcement of regulations.

6. Minimize regulations to achieve the management objectives stated above.

Overfishing for scup is defined as fishing in excess of F_{max}. The Council and the Atlantic States Marine Fisheries Commission (Commission) have adopted a fishing mortality rate reduction strategy that will implement minimum fish sizes and commercial gear regulations in year 1 (1996) of the FMP. Beginning in year 2 (1997), exploitation rates will be reduced until a level of 19% (the exploitation rate associated with the current estimate of F_{max}) is reached in year 7.

The Council has adopted the following management measures for this FMP for purposes of public hearings. Beginning in year 1 of the management program, the following management measures would be implemented:

1. Operator permits for commercial and party and charter boats.

2. Vessel permits for party and charter boats.

3. Vessel permits for commercial vessels (permits to sell) under a moratorium on entry. Vessels with documented landings of scup for sale between 26 January 1988 and 26 January 1993 qualify for a moratorium permit to land and sell scup under this moratorium program.

4. Dealer permits (permits to purchase).

5. Permitted vessels may only sell to permitted dealers and permitted dealers may only buy from permitted vessels.

6. Party and charter boat, commercial vessel, and dealer reports.

7. Scup pots or traps are defined by the state regulations that apply to a vessel's principal port of landing.

8. Scup pots or traps are required to have an escape vent of 2.25" square, 3.1" diameter circular, or the equivalent.

9. The hinges and fasteners of one panel or door in scup pots or traps must be made of one of the following degradable materials:

a. untreated hemp, jute, or cotton string of 3/16" (4.8 mm) diameter of smaller;

b. magnesium alloy, timed float releases (pop-up devices) or similar magnesium alloy fasteners; or

c. ungalvanized or uncoated iron wire of 0.094" (2.4 mm) diameter or smaller.

10. A maximum size of 18" in diameter for rollers used in roller rig trawl gear.

The Council has adopted the following management measures for years 1 and 2 of the management program:

1. A 9" total length (TL) minimum fish size in the commercial fishery in federal and state waters. Scup less than 9" TL could not be sold.

2. A 4.0" minimum mesh size for vessels retaining more than 4,000 pounds of scup.

3. A 7" total length (TL) minimum fish size in the recreational fishery in both state and federal waters. States having larger minimum size limits would be encouraged to keep them.

The Council has adopted the following management measures for year 2 and subsequent years of the management program:

Prior to year two and annually thereafter, the Council, working through a Monitoring Committee, would evaluate the success of the FMP relative to the overfishing reduction goal and propose adjustments to the management system. Beginning with year two, management measures would include:

For the commercial fishery:

1. A 9" TL minimum fish size which may be adjusted annually through framework action. Scup less than the size limit could not be sold.

2. A 4.0" minimum mesh size for vessels retaining more than 4,000 pounds of scup. The mesh size and the threshold may be adjusted annually through framework action

3. A coastwide quota with federal permit holders being prohibited from landing (selling) after the quota had been landed. Quota overruns would be deducted from the quota for the subsequent year. All states would need to prohibit scup sales following Federal sales prohibition.

4. A framework for time/area closures to reduce bycatch and prevent quota overruns.

For the recreational fishery:

1. A 7" TL minimum fish size, which may be adjusted annually through framework action.

2. A possession limit, which may be adjusted annually through framework action.

3. An open season in the recreational fishery, which may be adjusted annually through framework action.

4. A coastwide recreational harvest limit. Landings in excess of the limit would be deducted from the harvest limit for the subsequent year.

Alternatives Considered but not Adopted

The Council considered a number of other alternatives during the development of this FMP that were not adopted for public hearing purposes.

1. Take no action at this time. This would mean that scup would not be managed pursuant to the MFCMA.

2. A 9" TL minimum size with a 4.5" mesh when a vessel has 1,000 lb. of scup on board.

3. An 8" TL minimum fish size with a 4" mesh when a vessel has 1,000 lb. of scup on board.

4. A 4.5" minimum mesh with no minimum fish size.

5. State by state commercial quotas, with possible trip limits established by the States to reduce the length of closures.

6. Bimonthly commercial quotas, with possible trip limits established by the NMFS Regional Director to reduce the length of closures.

7. Seasonal closures.

8. Seasonal dependent minimum sizes in the commercial fishery: a 10" TL minimum size from Oct 1-April 30 and a 9" TL minimum size for the rest of the year.

9. Individual transferable quotas.

10. An 8" TL size limit in the recreational fishery coastwide, state and EEZ waters combined.

11. An 8" TL size limit for the recreational fishery in the EEZ with a 7" TL size limit in state waters from New York to North Carolina and an 8" TL size limit in state waters from Connecticut to Maine.

12. A threshold requirement to qualify for a moratorium permit.

13. Separate management measures for party/charter boat fishermen.

C.2. MAJOR CONCLUSIONS.

C.2.1. Implications of Overfishing Definitions and Need to Reduce Fishing Mortality Rate.

The cost/benefit analysis must be considered with regard to the guidelines established in 50 *CFR* 601, which require that a Council define overfishing for the managed species, determine whether the species is in an overfished condition, and, if it is, develop a strategy for ending the overfished condition. The Council has adopted an overfishing definition for scup. The Council has also determined that scup are currently overfished and has adopted a seven-year strategy to reduce fishing mortality to prescribed levels in order to end the overfished condition.

This seven-year strategy reflects the pressure now being placed on fishermen by other FMPs. Although the scup resource should be rebuilt as quickly as possible, scup management measures can be implemented over a seven-year time frame to minimize the short-term economic burden placed on fishermen and still reduce the overfished condition of the stocks.

The excessive take of scup will cease when fishing mortality is at the F_{max} level, which current analyses indicate is F = 0.24. Current fishing mortality rates are at least 1.3. Thus, there is at least a five fold difference between the F_{max} and the current F. In order to achieve F_{max}, current exploitation rates would have to be reduced by 72%.

An immediate reduction to an F_{max} level was seen as having an unnecessarily negative impact on the industry, so the Council and ASMFC Board adopted the following strategy. In year 1, minimum fish sizes and commercial gear regulations will be imposed. In years 2 through 4, target exploitation rates will be 47% for scup. In years 5 and 6, the target exploitation rates will be 33% and in year 7 and subsequent years, the target exploitation rate would be based on the F_{max} level which is currently an F of 0.24 (an exploitation rate of 19%). This recovery schedule is:

	Exploitation Rates
Current	67%
Year 3	47%
Year 6	33%
Year 8	19%

C.2.2. Commercial Fishery Constraints.

C.2.2.1. Moratorium on Commercial Vessels.

The MFCMA (Section 303(b)(6)) provides that a fishery management plan may establish a system for limiting access to a managed fishery in order to achieve Optimum Yield if, in developing such a system, the Council and the Secretary take into account six factors.

A. Present participation in the fishery.

B. Historical fishing practices in, and dependence on, the fishery.

C. The economics of the fishery.

D. The capability of fishing vessels used in the fishery to engage in other fisheries.

E. The cultural and social framework relevant to the fishery.

F. Any other relevant considerations.

These six factors are fully addressed in section 9.2 of this FMP.

C.2.2.2. Minimum fish size.

Historic commercial length frequencies were used as an estimate of potential short-term impacts of length limits on the commercial scup fisheries (Tables 41 to 44). Specifically, commercial length frequencies from the NMFS Weighout Data and North Carolina DMF from 1982 to 1994 were used to determine potential size limit effects. In general, size frequency data indicated that potential size limit effects increased from north to south, were gear dependent, and varied from one year to the next.

Based on NMFS weighout data, approximately 19% of the measured scup were less than 9" TL for all otter trawl vessels with sampled landings (Table 44). This gear is associated with most of the commercial landings coastwide; otter trawl vessels accounted for over 74% of the coastwide landings based on 1983-1992 General Canvass data (Table 12).

A 9" TL minimum size regulation would have a slightly greater effect on landings from floating traps, the other predominant gear in the scup fishery. Based on NMFS weighout data, almost 26% of the measured fish were less than 9" TL for the 316 scup obtained from this gear from 1983 to 1991 combined (Table 44).

Size limit effects were more pronounced in North Carolina landings from the winter trawl fishery (Table 42). From 1982 to 1994, the amount of measured fish less than 9" TL ranged from 31.0% to 90.2%. However, North Carolina accounted for only 2% of the coastwide commercial landings on average from 1983-1992.

Combined, a coastwide commercial size limit of 9" TL would have affected approximately 10% to 39% of the scup landed by commercial fishermen for the years 1983-1993. Assuming that undersized fish are not caught and discarded, minimum size regulations have positive impacts on the stock. In general, because minimum sizes increase the size at full recruitment, yields are increased as fishermen catch larger, heavier fish. In addition, minimum size regulations can increase the resilience of the stock to overfishing, i.e., the biological reference points (F_{max}) can increase. Finally, minimum size regulations can increase spawning stock biomass by allowing more fish to spawn. Sexual maturity data for scup indicate that 50% of the scup are mature by a size of 6.8" TL and almost all are sexually mature by the time they reach a size of 10" TL.

A preliminary economic analysis of the impact of a reduction in discards was conducted by Mark Simonitsch (see comment letter in Appendix 2) and made available to Council staff during the hearing process. This analysis was modified slightly by Council staff and the results are as follows.

According to the Northeast Fishery Science Center (NEFSC), approximately 9.4, 9.2, and 13.9 million scup of age 0, 1, and 2, respectively, were discarded yearly on average from 1989 to 1993. If these scup had not been discarded but were allowed to survive to age 3 (average weight of 0.638 pounds), approximately 14.5 million additional pounds of scup would have been available for harvest over a three year period. Assuming an ex-vessel value of $0.54 per pound (Table 30), these discarded scup could have generated ex-vessel revenues of $7.8 million.

In addition to the reduction in discards, the implementation of a 9" TL minimum size limit will also have positive economic benefits. According to the NEFSC, on average (1989-1993), approximately 16 thousand pounds of age 0, 1.5 million pounds of age 1, and 8.1 million pounds of age 2 scup are landed yearly. Using the mean weight at age for commercial landings, and assuming that a 9" TL scup is a fish of age class 3 or less (Table 1), this would represent approximately 4.1 million pounds of scup measuring less than 9" TL. If these fish are assumed to be worth $0.18 per pound (Table 30), the potential foregone revenues from commercially landed scup measuring less than 9" TL would be $742,217 per year or approximately $2.2 million for a 3-year period.

However, this decrease in annual revenues are considered foregone earnings in one time period which may be realized later when the fish have grown to a larger size. If these scup were not landed but were allowed to survive to age 3, approximately 4.9 million additional pounds of scup would be available for harvest in the future. If these fish are assumed to be worth $0.54 per pound (Table 30), their potential ex-vessel value would be approximately $2.6 million. Thus the net benefit from delaying harvest until 9" TL would be at least $0.4 million for the three year period.

C.2.2.3. Minimum mesh size.

Owners or operators of otter trawl vessels possessing 4,000 lbs or more of scup would only be allowed to fish with nets that have a minimum mesh size of 4.0" in the codend. During the development of this FMP, the Council and Commission were presented with data that indicated that the L_{50} (the length at which 50% of the scup are retained) is 8.3 inches for this mesh size (Table 45).

Retention lengths for scup were calculated by Mayo (1982) and are based on the relationship between length and body depth as derived by Smith and Norcross (1968). Although retention lengths were derived using body measurements, the results agree very well with selectivity experiments conducted by personnel at the University of Rhode Island (DeAlteris and Reifsteck 1990). Their results also indicated that the L_{50} for scup was 8.3" TL for a mesh size of 4.0" (Figure 14).

The results of the URI study indicate that approximately 80% of the 9" fish caught with a 4.0" mesh would be retained. These results suggest that a 9" minimum fish size combined with a 4.0" mesh may not decrease discards, i.e., a 4.0" mesh would catch a large number of 8" and smaller fish that would be discarded dead.

In addition to theoretical and empirical selectivity data, at-sea observations of the size distribution of scup caught and discarded are available from the NEFSC Sea Sampling Program. Scup discard data by mesh size based on 1989-1993 NEFSC sea sampling of otter trawl tows which caught and measured scup are summarized in Table 46. It should be noted that this characterization of scup discards is based upon a limited number of sea sampled tows, especially for mesh sizes greater than 3.0 inches. Because of the limited nature of available data, all tows that caught scup which were subsequently measured were included in the analysis. As a result, the data set includes many tows where scup was not the target species.

In general, discarding of scup was high for the tows sampled, especially for mesh sizes less than 4.0 inches. This was due to the fact that the vast majority of scup caught in these mesh sizes were less than 9.0 inches (Table 46). The percent of scup discarded was highest for 3.0 inch mesh (93%), followed by liners (78%), 2.0 inch (74%), 4.5 inch (48%), and finally was lowest for 4.0 inch mesh (40%). The percent of scup retained that were less than 9.0 inches for the 4.0 and 4.5 inch meshes was considerably less compared to the smaller mesh sizes. From this perspective, the 4.0 inch mesh requirement should greatly reduce the proportion of scup below 9.0 inches that would have to be discarded relative to the status quo (i.e., the allowance of the use of smaller mesh sizes.) However, sea sampling data do suggest that some proportion of the scup less than 9" TL encountered would be retained by a 4.0 inch mesh.

During public testimony at Council and Commission meetings, commercial fishermen stated that a 4.0" mesh was the appropriate mesh for a 9" TL fish. They suggested that the results of the URI study were flawed because researchers had used a covered cod end technique to estimate selectivity and, in fact, based on their personal experience at sea, a significant portion of the 9" TL fish that would encounter a 4.0" mesh would escape. Furthermore, these fishermen suggested that because most fishermen knew that this mesh was the appropriate size, compliance would be higher with the 4.0" mesh than it would be with a larger mesh size. As such, a greater reduction in the discard of small scup would occur with this mesh size then it would with a larger mesh.

Landings of scup represent only a portion of the fishing mortality experienced by the stock. Undersized scup, those less than 9" TL, experience both discard mortality and deaths due to encounters with commercial gear. The amount of fish dying due to these causes can be high with the current mesh sizes now used in the fishery, that is, an effective mesh size of 2.0" or less. Sea sampling data indicate that the weight of the discarded fish may be almost equivalent to the weight of the landings in some years. Discard rates are higher in years of good recruitment, that is, years when more small fish were available.

Minimum mesh provisions will ensure that discards of sub-legal scup will be reduced if the minimum size regulations alone do not have the desired effect. Greater gains will accrue to fishermen through protecting scup until they reach legal size. Discard mortality is extremely high for trawl caught fish and the problem is particularly acute when new year classes are abundant. The benefits of the proposed minimum fish size and mesh size regulations will be manifested through a more balanced age structure of the scup stock. Further, waste will be reduced due to (1) lower total discards and (2) lower mortality of net encounter.

C.2.2.4. Maximum roller diameter.

It would be illegal for owners or operators of vessels issued moratorium permits to use roller rig trawl gear equipped with rollers greater than 18" in diameter. A 18" diameter corresponds to a maximum roller diameter used by some states to regulate this gear in state waters.

Roller diameter is correlated with vessel size and the ability of vessels to fish rough, hard bottom areas. Larger roller sizes require larger engine sizes to pull the net. An engine size with an associated horsepower

of 800-900 hp is required to tow a net with 18" to 24" rollers whereas 10" to 12" rollers can be pulled by a boat using a-175-200 hp engine (D. Simpson pers. comm.).

Information is lacking as to the relationship between roller diameter and the size of obstruction that it can clear. In general, 10-12" diameter rollers can be used for fishing over rough bottom that can include ledges and cliffs. Limitations on roller size will make some areas of the ocean inaccessible to trawls by preventing fishermen from trawling in the harder, rough bottom areas. Thus scup associated with these areas would be protected from harvest allowing more fish to grow to maturity and spawn increasing stock biomass and yields.

C.2.2.5. Minimum escape vent requirement.

Scup pots and traps would be required to have a circular escape vent of with a minimum of 3.1" in diameter or a square escape vent with a minimum of 2.25" for each side or an equivalent rectangular escape vent. The escape vent provision would be implemented at the start of the first calendar year following FMP approval so that fishermen would not be required to pull their pots and add vents in the middle of the season.

The body depth/length relationship derived by Smith and Norcross (1968) was used to derive the minimum sizes of scup that would be retained by fish traps fitted with escape vents (Table 53). An escape vent of 3.1" would allow scup less than approximately 9.0" TL to escape from the trap before it was brought to the surface.

Pots and traps accounted for approximately 2% of the total commercial landings for the period 1983-1992. Although only a small portion of scup are landed by fishermen using this gear, escape vents will allow for some undersized fish to escape alive increasing the amount of mature fish in the stock and increasing yields.

C.2.2.6. Degradable fasteners in traps.

Scup pots would be required to have hinges and fasteners of one panel or door made of degradable materials. These materials would allow the door or panel of a trap to fall away from an unattended trap. This would prevent lost traps from "ghost fishing," i.e., continuing to catch and retain fish that could not be removed from the trap. Thus scup and other species of fish and invertebrates typically caught by these traps could escape preventing waste and lost yields in a number of fisheries.

C.2.2.7. Seasonal and area closures.

Gear-specific seasonal and area closures could be implemented to control fishing mortality and reduce discards in the commercial scup fishery. Seasonal and area closures would be based on the recommendations of the Scup FMP Monitoring Committee to the Council and ASMFC Board. The Council and Commission would consider those recommendations and submit their recommendations to the Regional Director. The Regional Director would then set the season and area closures.

NMFS General Canvass Data from 1988 to 1992 were used to determine the potential impact of seasonal closures on commercial landings of scup. The ASMFC technical committee decided that these years would be most representative of current conditions in the fisheries.

The Committee decided that seasonal closures for scup fishermen be applied on a coastwide basis. Calculations restricted the smallest unit of closure to one week. Seasonal closures were derived assuming that fishermen would recoup 0% and 15% of their landings during the open season. The 15% level applied to all mobile gears, including hook and line. Because of the fixed nature of the pots and traps, only a 0% (no recoupment) level was used for these gears.

If a recoupment level was assumed, calculations were made using a simple algorithm that accounted for changes in landings per day (LPD) during the open and closed seasons. For example, for scup landed by otter trawl fishermen, the time period from November 15 to January 31 accounted for 28% of the landings during 1988-1992. A closed season during these months would result in a fishing season that would be open for 8 1/2 months (February through November 14) or approximately 288 days. The amount of discretionary time during this open period would be 43 days (15% x 288 days). Since 72% of the landings occurred during the open period, the LPD during the open period would be 72 divided by the days fished or 245 (288-43). This LPD multiplied times the discretionary time (43 days) would result in a recoupment of 13%. As a result, the realized reduction in landings for the closed period February through May would be 15% (28% - 13%).

Seasonal closures ranged from slightly more than one month to four months depending on location (north or south) and gear type (Table 54). Seasonal closures could achieve the desired reductions if the following criteria were met:

1. The level of discretionary time used to derive the reductions is realistic. The assumed value of 15% may be an underestimate for some mobile gears.

2. All gear capable of catching scup be removed from the water during the closed period. Without such a provision, fishermen would continue to fish for other species during the closed period, catching and discarding scup in the process. For trawl fisheries, the technical committee recommended that mesh sizes of 5.5" diamond mesh or larger could continue to operate.

3. Landings patterns do not vary much from one year to the next, i.e., anticipated landings in year three of the management program are similar to the landings observed for 1988-1992.

Seasonal closures could be combined with area closures to reduce discards and prevent quota overruns. For example, based on 1989-1993 sea sampling and weighout data, statistical areas 537, 539, 616, and 622 (Figure 15), accounted for 75% of the landings (Table 55). Discard rates in these areas were approximately 40% or higher for these years (Table 56).

Any effective area/seasonal closure would require that NMFS be able to track commercial vessels on a real time basis to ensure compliance. Such a system could be comparable to the Vessel Monitoring System that will be implemented for groundfish and scallops by NMFS.

Seasonal and area closures would be designed to complement the quota based management system and reduce discards in the commercial fishery. However, it is important to note that seasonal and area closures would have to be designed such that fishermen would not negate seasonal and area closure effects by increasing effort or efficiency during the open season or area. In addition, the economic impact of the requirement that all gear capable of catching scup be removed from the water during a closure would have to be considered in regard to the catch of other important species that have been traditionally landed with scup on the same trip.

C.2.2.8. Commercial quota.

Beginning in year 2, a quota would be allocated to the commercial fishery to reduce exploitation rates on the fully recruited age groups (i.e., fish larger than 9" TL). The commercial quota will be derived from a total allowable catch (TAC). The TAC will be calculated each year based on the target fishing mortality rate and the projected stock size estimates derived from annual stock assessment information.

The TAC will be allocated to the commercial and recreational fisheries based on the proportions of commercial and recreational catch for the years 1988-1992. Based on this data, 78% of the TAC would be allocated to the commercial fishery. An estimate of total coastwide discards would then be subtracted from the commercial TAC to derive the allowable level of harvest (commercial quota).

In determining how to allocate the TAC to the commercial and recreational fishermen, the Council and Commission examined several alternatives that allocated either catch or landings. They determined that allocating the TAC to the fisheries and then removing the discards to determine the annual harvest limits was fair and equitable to both the commercial and recreational fisheries.

A TAC has not yet been derived for 1997, the second year of the management program. As such, catch data for 1988-1992 were used to derive the average catch for those years to calculate a possible TAC for illustrative purposes. Based on these data, a 32% reduction in exploitation would equate to a TAC of 16.83 million pounds.

Based on a TAC of 16.83 million lbs, 13.13 million lbs would be allocated to the commercial fishery and 3.70 million lbs to the recreational fishery. Then, assuming an average discard rate based on 1988-1992 data for each fishery, and subtracting these discards from the catch, 5.64 million lbs would be allocated to the commercial fishery as a quota and 3.46 million lbs to the recreational fishery as a harvest limit (Table 57). If total discards (commercial and recreational) were removed from the TAC and then the landings allocated to each fishery (70% commercial and 30% recreational based on historic percentages), the commercial quota would have been slightly larger at 9.1 million lbs and the recreational harvest limit lower at 2.73 million lbs. Under this rejected alternative, the recreational fishery allocation would have been reduced because of high discards in the commercial fishery, i.e., the higher the commercial discards the lower the recreational harvest limit.

However, under the chosen allocation system, the commercial fishery has a direct incentive to reduce discards, i.e., the lower the discards the higher the quota for a given TAC. For example, if commercial discards were reduced by 30% to 5.24 million lbs and the TAC remained constant at 16.83 million lbs, the commercial quota would increase to 7.89 million lbs (Table 57). Conversely, if discards were to increase 30%, the commercial quota would be reduced to 3.39 million lbs. In both cases, the recreational harvest limit would remain the same at 3.46 million lbs. In addition to the direct benefit of an increase in quota, a reduction in discards will benefit both the commercial and recreational fisheries as fish survive to grow larger and spawn increasing the biomass available for harvest.

In summary, changes in the discard rate in the commercial fishery would affect the commercial quota when allocations are based on catches as well as landings. However, changes in the discard rate in the commercial fishery would only have a direct effect on the recreational harvest limit when allocations are based on landings. When allocations are based on catches, the commercial sector would receive the full effect of a change in the rate of discards, i.e., commercial quota would increase proportionally to the level of discard reduction. Under allocations based on catches, each fishery would be treated fairly with respect to their contribution to discards and the effect of those discards on their shares of TAC.

During the first year of the FMP, a system to distribute and manage the annual commercial quota will be developed by the Council and Commission. Coastwide, regional and state by state quotas will be considered in combination with different fractions of the fishing year, e.g., bimonthly quotas. The following is an analysis of two possible management systems; a state-by-state and a bimonthly, coastwide system.

In a state-by-state system, quotas would be distributed to the states based on their percentage share of commercial landings for the period 1988-1992. Assuming a coastwide quota of 5.64 million pounds, quotas would range from 7,890 lbs to 2.46 million lbs based on these percentages (Table 58).

A state-by-state quota system could allow for the most equitable distribution of the commercial quota to fishermen. Specifically, states under this alternative would have the responsibility of managing their quota for the greatest benefit of the commercial scup industry in their state. States could design allocation systems based on trip limits and seasons. States would also have the ability to transfer or combine quota increasing the flexibility of the system to respond to year to year variations in fishing practices or landings patterns.

However, state-by-state allocations would negatively affect fishermen who land in those states that do not have the capability of regulating a quota. Based on the quota system implemented for summer flounder, a few states have not been able to establish trip limit systems that ensure a continuous and steady supply of product over the season for producers and/or a fair an equitable distribution of flounder to all fishermen who have traditionally landed summer flounder in their state. In addition, some states have had problems coordinating their regulations with neighboring states to prevent large scale landings by fishermen in states with the most favorable trip limits. A similar situation could occur if a state-by-state system was implemented for scup.

As one alternative to a state-by-state system, the coastwide quota could be allocated on a bimonthly basis. The Regional Director would be required to prohibit landings by federally permitted vessels when any bimonthly quota had been reached.

The quota must apply throughout the management unit, that is, in both state and federal waters. All commercial landings during a bimonthly period would count toward the quota for that period. When the quota had been landed for a bimonthly period, fishing for and/or landing scup would be prohibited for the remainder of the period.

A bimonthly quota system could allow for an equitable allocation of the commercial quota to northern and southern participants as well as between the smaller day boats and larger offshore vessels. Due to the seasonal nature of the scup fishery, the quota would have to be divided into bimonthly units. To minimize effects on traditional landings patterns, the allocation to each period would be based on past landings instead of a system that divided the quota equally over the six periods. Based on 1988-1992 data, 22.4% would be allocated to period 3 (May-June) and only 5.3% to period 4 (July-August) (Table 59). The bimonthly allocations would range from 298,638 lbs to 1,713,199 lbs based on a annual quota of pounds 5.63 million lbs (Table 59). Based on state data for those years, fishermen would be able to maintain traditional landings patterns in most states (Tables 60 and 61).

A coastwide system would allow fishermen to land in any port along the coast and all commercial landings during a bimonthly period would count toward that quota for that period. When the quota had been landed for a bimonthly period, fishing for and/or landing scup would be prohibited for the remainder of the period. Landings in excess of the allocation for the period would be subtracted from the following years's quota for the same period. Trip limits would have to be implemented. Bimonthly allocations without trip limits would encourage derby-style fishing practices that would allow the quota to be landed by larger, more mobile vessels at the beginning of each period. As a result, supplies of scup would be discontinuous and smaller boats would be disadvantaged.

Trip limits would be established and modified throughout the two-month period to allow for a continuous supply of product and equitable distribution of scup to fishermen using both small and large vessels. For example, almost all of the landings in period 1 are attributable to fishermen using otter trawl vessels. A 10,000 pound trip limit could be established for the beginning of period 1. The limit would decrease to 5,000 lbs when 50% of the allocation was reached, 1,000 lbs when 75% of the quota was taken, and 500 lbs when 90% of the landings were reached.

Different trip limit systems could be designed for each period to ensure equitable distribution over each two-month period. Unlike a system where states have the flexibility to design their own systems, NMFS would be responsible for implementing trip limits for each period.

An overall quota for the commercial fishery is important to control mortality on the scup population. The minimum size regulation may reduce discard and escape mortality of undersized scup. However, decreases in mortality would occur only with the smaller fish; reductions in mortality would not occur for scup once they reached the legal size of 9" TL. Essentially the fish that contribute the most to the spawning population, fish 9" TL and larger, would continue to experience high mortality rates; overfishing would not be reduced. The commercial quota will control mortality on fully recruited, older fish.

This management measure will result in a short-term reduction in the marketable catch and long-term benefits as more fish mature and increase the size of the spawning stock. In addition, a reduction in the mortality of small scup will allow for an increase in yield or harvest as small fish that were previously killed grow larger and add weight to the stock.

Combined, these management measures, the minimum mesh and size regulations and the commercial quota, will prevent overfishing and reduce waste. As the stock rebuilds and exploitation rates remain constant, commercial quotas would increase.

C.2.3. Recreational Fishery Constraints.

Based on 1983 to 1994 MRFSS data, only 14% and 7% of the scup caught by recreational fishermen in the North and Mid-Atlantic, respectively, were caught in the EEZ (Table 23). In 1994, 15% of the total scup caught by recreational fishermen in these subregions originated in the EEZ. Thus, the effect of a 7" TL minimum size in the EEZ would be inconsequential for both fishermen and the stock.

However, because most of the recreational landings are attributed to state waters, minimum size limits would effect state landings. Based on 1990-94 intercept data, almost 4% of the measured scup were less than 7" TL for scup landed along the coast (Table 62). Analysis of intercept data from the states from New Jersey through North Carolina indicated that anglers harvested smaller fish in these states. Assuming a post-release mortality of 15%, the percent reduction in the number of scup killed by anglers associated with the minimum size limits would be 3.2% for the coast based on combined 1990-1994 data (Table 63).

The assumed level of post-release mortality (hooking and handling mortality) used in the above calculations is based on a study conducted in 1981. Howell and Simpson (1985) estimated hooking mortality for 360 scup caught by angling between July-September 1981. Scup were caught using No. 4 and No. 6 Mustad stainless steel hooks baited with squid or sandworms. Mortality estimates were derived by assuming that all fish hooked in the gills or esophagus were lethally injured (100% mortality) and all others would survive (0% mortality). Based on these assumptions, hooking mortality increased from 0% to 15% with increasing lengths of fish.

Based on the fishing mortality reduction schedule adopted by the Council and Commission, exploitation would have to be reduced 32% in year 2 to achieve the target F. MRFSS data for 1990-94 indicate that catch frequencies for scup ranged from 1 to 200 fish per day on a coastwide basis (Table 64). Based on these data, the reductions in exploitation associated with various possession limits for 1 to 50 scup per trip were calculated (Table 65). The coastwide possession limit associated with a 32% reduction in exploitation is 15 fish. The possession limit would increase when combined with size limits and/or seasons.

Analysis of scup recreational data indicated that nearly 90% of the annual landings occurred from July through October for the years 1990 to 1994 combined (Table 66). Seasons based on this MRFSS data could be established on a coastwide basis to reduce exploitation. A season could be combined with the size limit to allow for higher possession limits.

C.2.4. Fishery Impact Statement.

Clearly, there will be impacts from the adopted plan. However, if overfishing is to be eliminated, fishing mortality must be reduced (section 9.2.2.1 of the FMP). The real test of impacts is whether the fishing mortality reduction period adopted by the Council represents the best compromise between the probability that the stock will recover and the minimization of costs to the fishing industry. Achieving the fishing mortality reduction target in the first year would probably require closure of the fishery, thus maximizing costs to the fishermen.

The adopted management measures are considered the most reasonable to achieve the fishing mortality rate reduction target available at this time. The moratorium is included to increase probability of compliance with the management program in the near-term. It will also provide a mechanism for

participants to share in the recovery of the resource rather than having the dividend of recovery dissipated over additional vessels that could enter the fishery as soon as the resource has recovered. This technique was used to great success with the surf clam fishery.

In terms of the consultative requirement of this provision of the Magnuson Act, since the management unit of the FMP is scup in US waters in the western Atlantic Ocean from Cape Hatteras, North Carolina northward to the US - Canadian border, the South Atlantic and New England Councils were invited and did designate members of their Councils to the Mid-Atlantic Council's Demersal Species Committee, the oversight committee for this FMP. Additionally, both Councils were invited to appoint industry advisors to the Mid-Atlantic Council Scup Advisory Panel.

C.2.5. Summary.

The above items are the major measures for this FMP. This resource has become over-exploited and over-capitalized. This FMP is intended to reduce exploitation and to make certain that the resource is there on a long-term basis to provide high, long-term yields. If no management is undertaken and the fishery continues to be overfished, catch per effort will continue to decline, the resource biomass will continue to decline, and the potential for stock collapse will be higher. The lack of effective management could drive the fishery to the brink of commercial extinction, as has happened with New England groundfish.

C.3. AREAS OF CONTROVERSY.

There were a number of controversial issues associated with this FMP during its development. The preferred alternative includes an immediate moratorium. The commercial quota and minimum mesh regulations were also controversial on the commercial side while the minimum fish size has generated a lot of discussion from recreational fishermen. It is believed that additional areas of controversy can be resolved by the Council following the public hearing process. The Hearings will be summarized and included with the final FMP when it is submitted.

C.4. ISSUES TO BE RESOLVED.

Given the condition of the resource, the Council knew when it began work on the FMP that stringent management measures would be required to address overfishing. The alternatives were developed after extensive public discussion and debate, and all parties acknowledge that the adoption of these management measures would have significant impact on the fisheries and the associated human environment. Several proposed management measures were revised in response to impacts identified during the course of the public discussion of the proposed management measures. If the proposed management scheme is adopted and reveals unforeseen negative impacts, these will be evaluated and responded to in future amendments.

C.5. MITIGATION.

There are no issues in the proposed management measures for this FMP that require mitigation at this time. The NMFS was asked in the spring of 1994 to initiate the Endangered Species Act Section 7 consultation for this FMP and they responded that they needed to review the drafted FMP first. Both NMFS (marine mammals, sea turtles, and shortnose sturgeon) and Fish and Wildlife Service (birds) were asked to initiate the Endangered Species Act Section 7 consultation process as soon as the FMP is available for public hearings. The Fish and Wildlife Service has responded that the FMP will not affect listed seabirds.

D. PURPOSE AND NEED

D.1. SCUP ARE OVEREXPLOITED.

Commercial scup landings have declined substantially since peak landings in the 1960's. In fact, in 1989, commercial landings decreased to 8.2 million pounds, the lowest value recorded during the ten-year period 1983 to 1992 and only about 17% of the 49 million pounds landed in 1960. Landings increased to approximately 15 million pounds in 1991 and then declined to 9.1 million pounds in 1993. Recreational landings in 1993 of 3.2 million pounds were below the ten year average of 5.4 million pounds. In addition, preliminary data indicate low landings in 1994 with commercial and recreational landings of 9.9 and 2.6 million pounds, respectively.

Abundance indices from NMFS trawl surveys and surveys conducted by the states of Massachusetts, Rhode Island, and Connecticut indicate recent adult biomass at low levels. For example, the NEFSC autumn offshore survey indices of scup (age 1+) abundance have declined dramatically in recent years. The 1993 index was the third lowest value observed in the time series and the 1994 index was the all-time lowest value observed since the survey began in 1967.

Reduced abundance is also evident in data collected for US commercial otter trawl vessels. Standardized catch per unit effort (CPUE) of these vessels peaked in 1978 at greater than 2.5 mt/day and have since trended downward to about 1.0 mt/day in recent years. Based on the trawl survey and the CPUE indices, the NEFSC concluded that "the overall declining trend in survey indices suggest that recent exploitation has reduced stock abundance substantially" (NEFSC 1993).

In addition, length frequency distributions of scup in commercial landings have shifted to smaller, younger fish including young-of-year. Although scup may attain ages of 20 years, recent landings have been composed primarily of age 2 and 3 year old scup with a general absence of larger, older fish in the landed catch (NEFSC 1993). This truncated age distribution also suggests a reduced population level.

Overfishing for scup is defined as fishing in excess of the F_{max} level. Based on current conditions in the fishery, yield per recruit analysis indicates that F_{max} for scup is 0.24 (19% annual exploitation rate). Current estimates of fishing mortality indicate that the current mortality rate is 1.3 (67% annual exploitation rate). This, coupled with the above information, that is, the decrease in landings, reduced CPUE, and low survey indices, as well as the truncated age distributions, indicate that scup are overexploited.

D.2. MIXED SPECIES FISHERY.

The Mid-Atlantic mixed species trawl fishery relies principally on summer flounder, scup, and black sea bass, but also harvests significant quantities of *Loligo* squid, winter flounder, witch flounder, yellowtail flounder, and other species either as bycatch or in directed fisheries. Many of these species are also principal components of the southern New England trawl fisheries since stock migrations occur between the Mid-Atlantic Bight and this area.

Generally, fishing activity follows these species as they make annual migrations from south to north and from offshore to inshore waters. Fishing effort is concentrated northerly and inshore in summer when a wide range of vessels have access to the stocks. In winter, effort is concentrated southerly and offshore, primarily by larger vessels. Although the majority of landings are taken by otter trawls, scup are landed by many other types of fishing gear: midwater trawls, pots and traps, pound nets and hand lines. At any particular time, fishermen may target a single species with certain gear, but significant bycatch of other species usually occurs in conjunction with the targeted species, depending on the fishing technique.

The occurrence of scup and other species in commercial catches of the Mid-Atlantic and southern New England regions complicates the identification of appropriate and effective management strategies. Close coordination of regulatory measures is therefore necessary to properly manage this species assemblage.

The Council has included no measures in this FMP at this time to specifically address the mixed trawl fishery problem, although the Council considered the implications of the mixed trawl fishery when developing the proposed measures. The Council is working to develop a mixed trawl fishery management strategy and the framework management measures put in place through this FMP could be used to implement the measures developed through this process.

D.3. INCREASED FISHING PRESSURE.

Nearly all the major groundfish fisheries in New England (haddock, yellowtail flounder, redfish, cod, etc.) have had their stocks severely depleted or have current catch levels which exceed long-term potential catch (NEFSC 1993). There have also been declines in South Atlantic and Gulf of Mexico fishery resources. Consequently, it is probable that more effort will be directed towards the southern New England/Mid-Atlantic scup, exacerbating current problems of high exploitation rates. Because of the potential for an increased number of entrants into the fisheries, increases in effort by present participants, as well as technological advances that have increased the efficiency of gear, there is a need to limit and reduce effort in the scup fishery.

D.4. LACK OF UNIFORM MANAGEMENT.

The highly migratory nature of scup complicate the development of management strategies since fishing activities in the EEZ or waters of a few States could adversely impact the stocks. For example, the Atlantic coastal States have different size regulations pertaining to the harvest of scup.

D.5. INCONSISTENT AND INADEQUATE ENFORCEMENT.

There is a lack of uniform regulations affecting the scup fishery which is partly due to the inconsistent regulations among States and between States and Federal jurisdictions. FMP advisors report a lack of consistency in enforcement between States, the EEZ, and/or parts thereof, due to various interpretations of the rules by enforcement officers, which leads to confusion and resulted in fishermen seeking ways to avoid the rules. Adequate funding at the State and Federal level for enforcement personnel, training, and equipment is problematic. In addition, sanctions resulting from noncompliance with regulations are insufficient to encourage conformity to State and Federal laws. Permit sanctions combined with fines are likely to be a more effective deterrent than fines alone.

Effective enforcement requires that fishery participants perceive both the likelihood of enforcement contact and the application of standards to be uniform throughout the management unit. The perception of fairness is essential in the promotion of voluntary compliance. Proper training of fishery enforcement officers is important in this regard.

D.6. LACK OF DATA.

National Standard 2 states that "measures shall be based upon the best scientific information available". Although recreational and commercial catch data for scup are adequate to formulate and implement management measures, data collection should be improved. An improved data base will allow the Council to more finely tune the management system to the needs of the fishery. These data are necessary to assess the impact and effectiveness of management measures, as well as monitor reductions in fishing mortality and increases in stock size to determine if additional amendments to the FMP will be necessary. For example, the absence of a permit to sell requirement in some States, which allows direct sale of catch to retail establishments by fishermen, may result in under reporting of commercial landings that complicates the development, implementation, and enforcement of fishery management strategies.

D.7. HABITAT DEGRADATION.

Scup are a continental shelf species that spend significant portions of their lives in coastal waters. Scup make inshore and northern migrations during warm months and are found in tidal bays and sounds as well

as the ocean environment. Those same areas are known to be increasingly affected by coastal development (e.g., dredging, marinas, docks, etc.) and the related declines in habitat quality and quantity. This increase in habitat degradation plays an important role in scup population health.

E. ALTERNATIVES INCLUDING THE PROPOSED ACTION

E.1. DESCRIPTION OF PROPOSED MANAGEMENT MEASURES.

The Council has adopted the following management measures for this FMP for purposes of public hearings. Beginning in year 1 of the management program, the following management measures would be implemented:

1. Operator permits for commercial and party and charter boats.

2. Vessel permits for party and charter boats.

3. Vessel permits for commercial vessels (permits to sell) under a moratorium on entry. Vessels with documented landings of scup for sale between 26 January 1988 and 26 January 1993 qualify for a moratorium permit to land and sell scup under this moratorium program.

4. Dealer permits (permits to purchase).

5. Permitted vessels may only sell to permitted dealers and permitted dealers may only buy from permitted vessels.

6. Party and charter boat, commercial vessel, and dealer reports.

7. Scup pots or traps are defined by the state regulations that apply to a vessel's principal port of landing.

8. Scup pots or traps are required to have an escape vent of 2.25" square, 3.1" diameter circular, or the equivalent.

9. The hinges and fasteners of one panel or door in scup pots or traps must be made of one of the following degradable materials:

   a. untreated hemp, jute, or cotton string of 3/16" (4.8 mm) diameter of smaller;

   b. magnesium alloy, timed float releases (pop-up devices) or similar magnesium alloy fasteners; or

   c. ungalvanized or uncoated iron wire of 0.094" (2.4 mm) diameter or smaller.

10. A maximum size of 18" in diameter for rollers used in roller rig trawl gear.

The Council has adopted the following management measures for years 1 and 2 of the management program:

1. A 9" total length (TL) minimum fish size in the commercial fishery in federal and state waters. Scup less than 9" TL could not be sold.

2. A 4.0" minimum mesh size for vessels retaining more than 4,000 pounds of scup.

3. A 7" total length (TL) minimum fish size in the recreational fishery in both state and federal waters. States having larger minimum size limits would be encouraged to keep them.

The Council has adopted the following management measures for year 2 and subsequent years of the management program:

Prior to year two and annually thereafter, the Council, working through a Monitoring Committee, would evaluate the success of the FMP relative to the overfishing reduction goal and propose adjustments to the management system. Beginning with year two, management measures would include:

For the commercial fishery:

1. A 9" TL minimum fish size which may be adjusted annually through framework action. Scup less than the size limit could not be sold.

2. A 4.0" minimum mesh size for vessels retaining more than 4,000 pounds of scup. The mesh size and the threshold may be adjusted annually through framework action

3. A coastwide quota with federal permit holders being prohibited from landing (selling) after the quota had been landed. Quota overruns would be deducted from the quota for the subsequent year. All states would need to prohibit scup sales following Federal sales prohibition.

4. A framework for time/area closures to reduce bycatch and prevent quota overruns.

For the recreational fishery:

1. A 7" TL minimum fish size, which may be adjusted annually through framework action.

2. A possession limit, which may be adjusted annually through framework action.

3. An open season in the recreational fishery, which may be adjusted annually through framework action.

4. A coastwide recreational harvest limit. Landings in excess of the limit would be deducted from the harvest limit for the subsequent year.

E.1.1. General Management Measures Applicable to All Alternatives.

Included in this section, are the general management measures that are applicable to all the alternatives. These include descriptions of the specification of OY, overfishing definition, fishing mortality rate reduction strategy, permits and fees, the Scup FMP Monitoring Committee, experimental fishing, enforcement recommendations, and specification and sources of pertinent fishery data. These are described in 9.1 of the FMP.

E.1.2. Commercial Fishery Measures.

The preferred alternative includes a combination of commercial quotas, minimum fish sizes, minimum mesh sizes, maximum diameter for rollers on roller rig gear, minimum escape vent requirements, degradable fasteners in traps and a moratorium on new entrants. Many of these measures are frameworked and can be adjusted annually based upon the target fishing mortality reduction schedules. The preferred alternatives are described in section 9.1.2 of the FMP.

E.1.3. Recreational Fishery Measures.

Recreational fishery constraints include the possibility of minimum fish size, bag limits and seasonal restrictions, all of which can be adjusted annually to achieve the target fishing mortalities.

The recreational fishery throughout the management unit would be managed through an annual evaluation of a framework system (section 9.1.2.2 of the FMP) of possession limits, size limits, and seasonal

closures. Beginning in year 2, recreational landings would be compared to annual target harvest levels established through the FMP Monitoring Committee process to determine if modifications to the recreational possession limit and size limit were required for the following year or if the fishery needed to be closed for certain periods.

E.1.4. Non-preferred alternatives to the proposed management measures.

There are currently 13 alternatives that differ from the preferred action alternative described in section E.1.2 and E.1.3. These alternatives are described and evaluated in Appendix 1 of the FMP. Some of these 13 alternatives are single item specific while others combine multiple management measures. There are 13 specific alternative because the Council has considered them as separate entities over time. There is no belief that all of the alternatives will have the same reduction in fishing mortality, or that some of these may not become part of the final preferred combination of alternatives. The Council is soliciting public comments on all of the non-preferred alternatives. Of course, the overall sociological characterization of the various ports and fisheries that are described in the Fishery Impact Statement of the FMP are applicable to these non-preferred alternatives. The public hearing process will also provide significant input as to the sociological impacts of the various alternatives.

E.2. EVALUATION OF THE PROPOSED ACTION.

The preferred management measures are evaluated in section 9.2 of the FMP.

E.3. ALTERNATIVES TO THE PROPOSED ACTION.

The non-preferred management measures are evaluated in Appendix 1 of the FMP.

F. AFFECTED ENVIRONMENT

The distribution and habitat requirements of scup are described in section 6 of the FMP. The description of the fishery can be found in section 7 of the FMP. The economics of the scup fisheries are described in section 8 of the FMP. The social characterization of the scup fisheries can be found in the Fishery Impact Statement of the FMP which is section 9.2.2.7.

G. ENVIRONMENTAL CONSEQUENCES

The analysis of impacts is conducted with specific reference to the guidance presented in NOAA Manual 216-6 regarding the determination of environmental significance. Section 13(b) presents 5 criteria against which the proposed action and any alternatives should be evaluated.

G.1. WILL THE ALTERNATIVES BE REASONABLY EXPECTED TO JEOPARDIZE THE LONG-TERM PRODUCTIVE CAPABILITY OF ANY STOCKS THAT MAY BE AFFECTED BY THE ACTION?

G.1.1. Proposed Action (moratorium on commercial vessels, reduction in overfishing, recreational constraints frameworked to allow for minimum fish sizes, seasonal restrictions and bag limits, as well as, commercial constraints frameworked to allow for minimum fish sizes, minimum mesh sizes, maximum roller diameters, minimum escape vents, degradable fasteners for traps, and a commercial quotas).

Scup are significantly overfished and have an extremely truncated age distribution. The reduction in fishing mortality that will occur during the next seven years of proposed management measures will be highly beneficial to this resource.

The age/size structure of the current stocks and fisheries is poorly understood. The longevity of scup is as much as 20 years but the current age distribution has the vast majority of the catches being composed of scup less than two years. Minimum mesh size and minimum fish size will encourage fishermen from targeting on schools of small individuals that would need to be discarded. Minimum size and mesh size requirements should generally increase yields and spawning stock biomass.

The proposed actions of this FMP will place the scup resource under management. Overfishing will be reduced and the fisheries will eventually be maintained at maximum sustainable yield levels. Other proposed actions provide for the acquisition of critical data and information to improve future management. A framework adjustment procedure is incorporated in the FMP to allow changes to be made in the management measures as new and better information is acquired. The Monitoring Committee will meet annually to recommend measures that are frameworked which will allow the target fishing levels to be attained. It is important to note that the cooperation of state governments is essential if scup are to be successfully managed throughout their range.

Historic commercial length frequencies were used as an estimate of potential short-term impacts of length limits on the commercial scup fisheries (Tables 41 to 44). Specifically, commercial length frequencies from the NMFS Weighout Data and North Carolina DMF from 1982 to 1994 were used to determine potential size limit effects. In general, size frequency data indicated that potential size limit effects increased from north to south, were gear dependent, and varied from one year to the next.

Based on NMFS weighout data, approximately 19% of the measured scup were less than 9" TL for all otter trawl vessels with sampled landings (Table 44). This gear is associated with most of the commercial landings coastwide; otter trawl vessels accounted for over 74% of the coastwide landings based on 1983-1992 General Canvass data (Table 12).

A 9" TL minimum size regulation would have a slightly greater effect on landings from floating traps, the other predominant gear in the scup fishery. Based on NMFS weighout data, almost 26% of the measured fish were less than 9" TL for the 316 scup obtained from this gear from 1983 to 1991 combined (Table 44).

Size limit effects were more pronounced in North Carolina landings from the winter trawl fishery (Table 42). From 1982 to 1994, the amount of measured fish less than 9" TL ranged from 31.0% to 90.2%. However, North Carolina accounted for only 2% of the coastwide commercial landings on average from 1983-1992.

Combined, a coastwide commercial size limit of 9" TL would have affected approximately 10% to 39% of the scup landed by commercial fishermen for the years 1983-1993. Assuming that undersized fish are not caught and discarded, minimum size regulations have positive impacts on the stock. In general, because minimum sizes increase the size at full recruitment, yields are increased as fishermen catch larger, heavier fish. In addition, minimum size regulations can increase the resilience of the stock to overfishing, i.e., the biological reference points (F_{max}) can increase. Finally, minimum size regulations can increase spawning stock biomass by allowing more fish to spawn. Sexual maturity data for scup indicate that 50% of the scup are mature by a size of 6.8" TL and almost all are sexually mature by the time they reach a size of 10" TL.

Owners or operators of otter trawl vessels possessing 4,000 lbs or more of scup would only be allowed to fish with nets that have a minimum mesh size of 4.0" in the codend. During the development of this FMP, the Council and Commission were presented with data that indicated that the L_{50} (the length at which 50% of the scup are retained) is 8.3 inches for this mesh size (Table 45).

In addition to theoretical and empirical selectivity data, at-sea observations of the size distribution of scup caught and discarded are available from the NEFSC Sea Sampling Program. Scup discard data by mesh size based on 1989-1993 NEFSC sea sampling of otter trawl tows which caught and measured scup are summarized in Table 46. It should be noted that this characterization of scup discards is based upon a

limited number of sea sampled tows, especially for mesh sizes greater than 3.0 inches. Because of the limited nature of available data, all tows that caught scup which were subsequently measured were included in the analysis. As a result, the data set includes many tows where scup was not the target species.

In general, discarding of scup was high for the tows sampled, especially for mesh sizes less than 4.0 inches. This was due to the fact that the vast majority of scup caught in these mesh sizes were less than 9.0 inches (Table 46). The percent of scup discarded was highest for 3.0 inch mesh (93%), followed by liners (78%), 2.0 inch (74%), 4.5 inch (48%), and finally was lowest for 4.0 inch mesh (40%). The percent of scup retained that were less than 9.0 inches for the 4.0 and 4.5 inch meshes was considerably less compared to the smaller mesh sizes. From this perspective, the 4.0 inch mesh requirement should greatly reduce the proportion of scup below 9.0 inches that would have to be discarded relative to the status quo (i.e., the allowance of the use of smaller mesh sizes.) However, sea sampling data do suggest that some proportion of the scup less than 9" TL encountered would be retained by a 4.0 inch mesh.

During public testimony at Council and Commission meetings, commercial fishermen stated that a 4.0" mesh was the appropriate mesh for a 9" TL fish. They suggested that the results of the URI study were flawed because researchers had used a covered cod end technique to estimate selectivity and, in fact, based on their personal experience at sea, a significant portion of the 9" TL fish that would encounter a 4.0" mesh would escape. Furthermore, these fishermen suggested that because most fishermen knew that this mesh was the appropriate size, compliance would be higher with the 4.0" mesh than it would be with a larger mesh size. As such, a greater reduction in the discard of small scup would occur with this mesh size then it would with a larger mesh.

Landings of scup represent only a portion of the fishing mortality experienced by the stock. Undersized scup, those less than 9" TL, experience both discard mortality and deaths due to encounters with commercial gear. The amount of fish dying due to these causes can be high with the current mesh sizes now used in the fishery, that is, an effective mesh size of 2.0" or less. Sea sampling data indicate that the weight of the discarded fish may be almost equivalent to the weight of the landings in some years. Discard rates are higher in years of good recruitment, that is, years when more small fish were available.

These measures may force some commercial fishermen to divert their activities to other fisheries. Which fisheries may be switched to is very uncertain but a knowledge of the directed fisheries and the species composition of the catch, as well as, the predator prey interaction would all be germane to any speculation. The following material is condensed from the FMP.

Based on trips landing more than 4,000 pounds of scup (Table 32), the average ex-vessel scup value per trip was $9,415 in 1993 (obtained by dividing ex-vessel value in Table 32 by number of trips in Table 31). Otter trawl vessels which land scup also harvest other species throughout the year. This activity categorizes this type of fishery as a mixed fishery, where squid, summer flounder, Atlantic mackerel, silver hake and other species are harvested on the basis of local availability (opportunistic fishery), or land scup as a bycatch from the involvement in other directed fisheries.

In 1993, scup landings and value represented 0.5% and 0.6% of the Atlantic coast total commercial landings and value, respectively (Table 28).

Scup are a component of the mixed trawl fishery in Southern New England and the Mid-Atlantic. Although Sea Sampling data indicate that fishermen may differentiate between species on a per tow basis (i.e., target a single species on a tow), fishermen land many different species on a per trip basis. Based on NMFS weighout data, scup are most frequently landed with *Loligo* squid, Atlantic mackerel, and silver hake. In fact, for trips landing 4,000 or more pounds of scup per trip, more *Loligo* squid were landed than scup in 1992 (Table 32).

However, this predominance of *Loligo* may reflect reduced availability of scup in 1992. Based on 1983 to 1987 data, the landings of otter trawl vessels landings 1,000 lbs or more of scup were composed primarily

of scup (41%) (Table 47). *Loligo* accounted for only 17% of the landings. No other species accounted for more than 10% of the trip landings, but six (bluefish, butterfish, winter flounder, summer flounder, mackerel, and whiting) species accounted for at lest 2% of the catch composition and the "other" category in Table 47 is probably comprised of many of the same species identified in Table 52.

The 4,000 pound threshold would not affect the majority of the vessels or trips that landed scup in 1992 or 1993. Based on NMFS weighout data, a threshold of 4,000 lbs per trip would have affected approximately 27% of the vessels and 10% of the trips landing scup in 1992 and 1993 (Tables 48 and 49). However, these trips accounted for 80% of the scup landed by otter trawl vessel in 1992 and 1993. Also, regulations that allow multiple nets onboard would allow fishermen who traditionally targeted multi-species on a trip, to fish for and retain other species with small mesh until the 4,000 pound threshold of scup was reached. These fishermen would then have to use the 4.0" mesh if they decided to target more scup. Once the threshold was reached fishermen would have to properly stow other cod ends for the remainder of the trip.

Landings of scup by fishermen targeting *Loligo* squid on the same trip could be affected by these regulations. Based on 1992 NMFS weighout data, 45% of the vessels and 29% of the trips landing 2,500 pounds or more of *Loligo* squid, landed over 95% of *Loligo* landed by all *Loligo* otter trawl fishermen (Tables 50 and 51). Based on this 2,500 pound threshold, scup comprise slightly more than 6% of the total fish landed on these trips (Table 52). However, the total pounds is slightly more than 50% of all scup landed by otter trawl fishermen in 1992.

In general, these regulations would modify some traditional fishing practices. The fishermen most affected by these regulations would be those fishermen who targeted scup first on their trip and retained more than 4,000 pounds of scup, before switching to other species for the remainder of their trip. Although, this group of fishermen is likely to be relatively small compared to total number of fishermen landing scup, landings of other species taken as bycatch by these fishermen could be affected.

Minimum mesh and fish size provisions will ensure that discards of sub-legal scup will be reduced. Greater gains will accrue to fishermen through protecting scup until they reach legal size. Discard mortality is extremely high for trawl caught fish and the problem is particularly acute when new year classes are abundant. The benefits of the proposed minimum fish size and mesh size regulations will be manifested through a more balanced age structure of the scup stock. Further, waste will be reduced due to (1) lower total discards and (2) lower mortality of net encounter.

The minimum net mesh size and threshold level could be changed annually, if appropriate, following the Scup FMP Monitoring Committee process set forth in 9.1.2.2.

Generally, sorting of otter trawl caught fish is begun immediately after redeployment of the net. Marketable species are sorted by size category and placed on ice as rapidly as possible. Once the valuable catch is stored, undersized fish and non-marketable bycatch are generally shoveled or picked overboard. Several hours may lapse before discarded fish are returned to the sea, resulting in high discard mortality rates.

The NMFS contracted with the Manomet Bird Observatory to place observers on US boats beginning in 1989 to collect a variety of data on the vessels, personnel, and catch. Unfortunately sea sampling data on these fisheries are limited. There are no observer data available for the catch and discard from the large freezer-trawlers.

In general, the species that coexist with scup were also the species that commonly appeared in the directed fisheries. The landings data that are summarized above reflect market value and not necessarily the actual catch from a specific trawl. The ecological niche that scup inhabit includes their prey and predators.

Scup are bottom or near bottom feeders (Morse 1978) that eat a wide variety of food including small crustacea, worms, mollusks, squid, vegetable debris, hydroids, and sand dollars (Goode 1884, Nichols and Breder 1927, Bigelow and Schroeder 1953). Maurer and Bowman (1975) found that scup fed principally on polychaetes and coelenterates based on the stomach contents of 346 scup collected in southern New England and the Mid-Atlantic from 1969 to 1972. Scup may abstain from feeding during spawning (Morse 1978).

Scup are preyed upon by a wide variety of piscivorous fish including striped bass, weakfish, and bluefish (Morse 1978). Scup share common food resources with a number of species including a number of northwest Atlantic finfish (Langton 1982).

The proposed action will also address problems of species diversity and abundance that have been increasing over the past decade. The proposed action will enable scup to maintain themselves, and will hopefully prevent the type of species replacement (by less desirable species like skates and rays) that has occurred on Georges Bank and elsewhere after major targeted species have been cropped by fishing pressure. The problem of species replacement is becoming a great concern. The 1994 autumn bottom trawl survey conducted by NEFC showed a continuing dominance of cartilaginous fish (dogfish, skates, and rays). Nearly three fourths of the survey's total weight was of cartilaginous species whereas catches of the three "traditional" groundfish species (cod, haddock, and yellowtail flounder) comprised only 3% of the total (USDC 1994a).

The importance of biological diversity cannot be understated. The synergistic effects of the sum of the world's biota is directly responsible for maintaining the gaseous composition of the atmosphere, regulating the world's hydrology, generating and maintaining soils and nutrients, detoxifying wastes, driving biogeochemical cycles, controlling pest epidemics, and providing plant pollination, thus making human life on Earth possible. In addition, select species are used by humans to enhance the quality of life. For example, many plants contain active ingredients which are used in pharmaceuticals. Humans also use species for food and shelter. Almost all of these "ecosystem services" are at present irreplaceable by technology. Technologies to replace lost elements of biological diversity are extremely limited if not non-existent (Atlantic Biodiversity Center 1994).

At this moment, human activities are inadvertently forcing species and populations into extinction at an unprecedented rate. How fast is this diversity disappearing? Harvard's Cradoord Laureate ecologist E. O. Wilson, conservatively estimated that the annual extinction rate in 1990 was 4,000 to 6,000 species per year. To put this into perspective, this rate of extinction is 10,000 times faster than the "background" or normal rate of extinction. Moreover, this may even be faster than the rate of extinction that occurred during the Cretaceous-Triassic extinctions (i.e. the dinosaur extinctions) over 65 million years ago. Biodiversity is in a constant state of being created and destroyed through the process of extinction and speciation. But speciation, a process which takes thousands of years, is not keeping pace with extinction. The result is our present stat of increasing global biotic impoverishment (Atlantic Biodiversity Center 1994).

The issue of biological diversity, or biodiversity, is a general term referring to an extremely complex ecological issue. It is often defined simply as "the variety and variability of life" or "the diversity of genes, species, and ecosystems" (Council on Environmental Quality 1993). In fact, biodiversity does comprise the variation between and among major ecological elements, but the significance of that diversity is not communicated by these definitions.

Biodiversity is a new and more explicit expression of one of the fundamental concepts of ecology, popularly stated as "everything is connected to everything else." Emerging concern about biodiversity reflects an empirically based recognition of the fundamental interconnections within and among various levels of ecological organization. Ecological organization, and therefore biodiversity, is a hierarchically arranged continuum, and reduction of diversity at any level will have effects at the other levels (CEQ 1993).

Fundamental to our understanding of biodiversity is the recognition that the biological world is not a series of unconnected elements, and that the richness of the mix of elements and the connections between those elements are what sustains the system as a whole (CEQ 1993).

In the past, biologists relied upon measurements of species diversity or species richness -- simple measures of the number or distribution of species in a given area -- to describe biodiversity. However, these measures do not consider the issues of ecosystem and genetic diversity and typically treat all species alike, whether native or introduced, common or rare (CEQ 1993).

Concern for biodiversity is often misinterpreted as a desire to maximize the diversity (usually species diversity) of every area. In fact, managing for maximum diversity might actually impoverish natural biodiversity. For example, introducing small-scale habitat disturbances might increase local biodiversity by favoring the spread of opportunistic, "weedy" species. However, the same activity may decrease the available habitat for species at risk regionally, and regional or global biodiversity may be diminished (CEQ 1993).

The CEQ (1993) report list six main factors the contribute to the decline of biodiversity. These six main factors are: physical alteration, pollution, overharvesting, introduction of exotic species, disruption of natural processes, and global climate change. Of course, these six factors all have the overpopulation problem (section F.3) at their root.

This FMP is designed to prevent the overharvesting of scup. The prevention of overfishing is the requirement of the first National Standard of the MFCMA and the only real factor that affects biodiversity that the Fishery Management Councils can control. The Councils make recommendations to the Secretary of Commerce in the FMPs (section 6.6) for ways to minimize or stop the effects of pollution on the species managed. However at this time these are only recommendations. It is hoped that with reauthorization of the MFCMA in 1995, that Congress will give more authority to the Councils and NMFS for ways to conserve fishery habitats and reduce the impacts of pollution. The other four factors are really out of the purview of the fishery management process.

G.1.2. No Action.

The no action alternative will jeopardize the long-term productive capability of scup. The NMFS estimates that the long-term potential yield to be 32 million pounds (USDC 1993) with an ex-vessel commercial value of $20 million in 1992 dollars. Scup need to be rebuilt, in that they are heavily over-exploited. Commercial scup landings have declined substantially since peak landings in the 1960's. In fact, in 1989, commercial landings decreased to 8.2 million pounds, the lowest value recorded during the ten-year period 1983 to 1992 and only about 17% of the 49 million pounds landed in 1960. Landings increased to approximately 15 million pounds in 1991 and then declined to 9.1 million pounds in 1993. Recreational landings in 1993 of 3.2 million pounds were below the ten year average of 5.4 million pounds. In addition, preliminary data indicate low landings in 1994 with commercial and recreational landings of 9.9 and 2.6 million pounds, respectively.

Abundance indices from NMFS trawl surveys and surveys conducted by the states of Massachusetts, Rhode Island, and Connecticut indicate recent adult biomass at low levels. For example, the NEFSC autumn offshore survey indices of scup (age 1 +) abundance have declined dramatically in recent years. The 1993 index was the third lowest value observed in the time series and the 1994 index was the all-time lowest value observed since the survey began in 1967.

Reduced abundance is also evident in data collected for US commercial otter trawl vessels. Standardized catch per unit effort (CPUE) of these vessels peaked in 1978 at greater than 2.5 mt/day and have since trended downward to about 1.0 mt/day in recent years. Based on the trawl survey and the CPUE indices, the NEFSC concluded that "the overall declining trend in survey indices suggest that recent exploitation has reduced stock abundance substantially" (NEFSC 1993).

In addition, length frequency distributions of scup in commercial landings have shifted to smaller, younger fish including young-of-year. Although scup may attain ages of 20 years, recent landings have been composed primarily of age 2 and 3 year old scup with a general absence of larger, older fish in the landed catch (NEFSC 1993). This truncated age distribution also suggests a reduced population level.

Overfishing for scup is defined as fishing in excess of the F_{max} level. Based on current conditions in the fishery, yield per recruit analysis indicates that F_{max} for scup is 0.24 (19% annual exploitation rate). Current estimates of fishing mortality indicate that the current mortality rate is 1.3 (67% annual exploitation rate). This, coupled with the above information, that is, the decrease in landings, reduced CPUE, and low survey indices, as well as the truncated age distributions, indicate that scup are overexploited.

The no action alternative will also have negative impacts on other species and habitat. The purpose and need section (D) of this EIS identifies problems of the mixed species fishery, the increasing fishing pressure, and habitat degradation, all problems that will be beneficially helped by implementation of management measures for scup.

G.1.3. Other Alternatives.

Adoption of the alternatives other than the proposed action may increase the likelihood that management measures may jeopardize the long-term productive capability of this resource and reduce biodiversity. In general, the other alternatives could be combined in order to meet the FMP objectives, especially the overfishing objective (objective 1), the reduction of fishing mortality on immature scup objective (objective 2), and the improvement of yield objective (objective 3), but it is not a requirement since most of the alternatives being considered are perceived as "stand-alone" alternatives. From the commercial fishing segment, it is possible that a restrictive quota, or specific mesh or specific fish size measures could each be used to meet the objectives but it is the Councils belief that the specific combination of commercial measures adopted as the preferred alternative will do the least environmental harm. For example, if only a quota was imposed, it is highly likely that there would be a rush to harvest, with more small fish and more of other species bycatch occurring. All the preferred management measures identified for years three and after are frameworked so that the specific target exploitation rates can be achieved. The commercial fishery has a minimum fish size, a minimum mesh size and a coastwide quota, all of which are frameworked, in the preferred alternative. The recreational fishery has a minimum fish size, a possession limit, a season, and a coastwide recreational harvest limit combination in the preferred alternative. Annually a Monitoring Committee will evaluate the fishery relative to the target exploitation rates (47% in year two, 33% in year five, and 19% in year seven and thereafter) and make recommendations for the frameworked management measures. The frameworked management measures are the key to successful exploitation rate reductions and are the items that will protect the long-term productive capability of the scup stock.

It is anticipated that improved data collection, including the permitting and reporting requirements of the FMP, will allow such a study to be conducted in future amendments. It must also be recognized that all alternatives (including most particularly, the no action alternative) may have negative economic impacts. However, it is believed that the preferred frameworked alternatives will have the least negative impacts in the short-term and the greatest benefits (in the form of the rebuilt resource) in the long-term in a reasonable time frame (10 years).

G.1.3.1. List of Non-Preferred Alternatives.

1. Take no action at this time.

2. A 9" TL minimum size with a 4.5" mesh when a vessel has 1,000 lb. of scup on board.

3. An 8" TL minimum fish size with a 4" mesh when a vessel has 1,000 lb. of scup on board.

4. A 4.5" minimum mesh with no minimum fish size.

5. State by state commercial quotas, with possible trip limits established by the states to reduce the length of closures.

6. Bimonthly commercial quotas, with possible trip limits established by the NMFS Regional Director to reduce the length of closures.

7. Seasonal closures.

8. Seasonal dependent minimum sizes in the commercial fishery: a 10" TL minimum size from Oct 1-April 30 and a 9" TL minimum size for the rest of the year.

9. Individual transferable quotas.

10. An 8" TL size limit in the recreational fishery coastwide, state and EEZ waters combined.

11. An 8" TL size limit for the recreational fishery in the EEZ with a 7" TL size limit in state waters from New York to North Carolina and an 8" TL size limit in state waters from Connecticut to Maine.

12. A threshold requirement to qualify for a moratorium permit.

13. Separate management measures for party/charter boat fishermen.

G.2. WILL THE ALTERNATIVES BE REASONABLY EXPECTED TO ALLOW SUBSTANTIAL DAMAGE TO THE OCEAN AND COASTAL HABITATS?

The proposed action includes numerous references to the importance of suitable habitats for healthy stocks of scup. While there is no information proving that harvest does affect habitats, there is ample evidence that other human activities affect scup and their essential habitats. On that basis, this EIS and the FMP anticipates a closer working relationship with state and federal agencies empowered to make decisions that could affect the habitat of scup. That Council and NMFS responsibility is especially important in nearshore waters. Scup are dependent on estuaries and coastal bays, which are often the same waters affected by dredging, discharges, run-off, water diversions, and other permitted and unpermitted actions by the 60 million people living in the Atlantic coastal region.

There is considerable awareness of the potential impact of otter trawling on the ocean bottom habitat. However, quantification of specific gear types on various bottom types is poorly understood. The South Atlantic Council (1988) in its Amendment 1 for the snapper/grouper fishery prohibited the use of trawl gear to harvest snapper/grouper in the directed fishery south of Cape Hatteras and north of Cape Canaveral. That Council based the trawl prohibition on habitat destruction and the desire to prevent overfishing of vermillion snapper. Their main concern was the destruction of sponge-coral habitat and did not address the effect of trawling on other types of ocean environment.

There are no known coral-sponge habitats north of Cape Hatteras which is where these fisheries are prosecuted. The issue of ocean bottom habitat degradation caused by trawling is largely an unknown at this time. The very few published papers that do exist deal with specific habitats. It is important to note that when habitat damage is described it is often from as little as one tow of trawl gear through the study area (NRC 1994 a). Under commercial fishing conditions, the bottom would be fished over and over until the catches from such an area become unprofitable. Under such conditions, habitat damage could be expected to be much greater than would occur with towing through the area once. Obviously, more research efforts are likely to be directed towards this issue in the future.

National marine sanctuaries are allowed to be established under the National Marine Sanctuaries Act of 1973. Currently there are 11 designated marine sanctuaries (Figure 13) that creates a system that protects over 14,000 square miles (National Marine Sanctuary Program 1993).

There are two designated national marine sanctuaries in the area covered by the FMP: the *Monitor* National Marine Sanctuary off North Carolina, and the Stellwagen Bank National Marine Sanctuary off Massachusetts. There are currently five additional proposed sanctuaries, but only one, the Norfolk Canyon is on the east coast.

The *Monitor* National Marine Sanctuary was designated on 30 January 1975, under Title III of the Marine Protection, Research and Sanctuaries Act of 1972 (MPRSA). Implementing regulations (15 CFR 924) 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 is clearly designated on all National Ocean Service (NOS) charts by the caption "protected area." This minimizes the potential for damage to the Sanctuary by fishing operations. Correspondence for this sanctuary should be addressed to: *Monitor* NMS, NOAA, Building 1519, Fort Eustis, VA 23604.

NOAA/NOS issued a proposed rule on 8 February 1991 (56 FR 5282) proposing designation under MPRSA of the Stellwagen Bank National Marine Sanctuary, in Federal waters between Cape Cod and Cape Ann, Massachusetts. On 4 November 1992, the Sanctuary was Congressionally designated. Implementing regulations (15 CFR 940) will become effective following Congressional review. Commercial fishing is not specifically regulated by Stellwagen Bank regulations. Correspondence for this sanctuary should be addressed to: Stellwagen Bank NMS, 14 Union Street, Plymouth, MA. 02360.

Details on sanctuary regulations may be obtained from the Chief, Sanctuaries and Reserves Division (SSMC4) Office of Ocean and Coastal Resource Management, NOAA, 1305 East-West Highway, Silver Spring, MD 20910.

In summary, habitat alteration by the fishing activities themselves is perhaps the least understood of the important environmental effects of fishing (National Research Council 1994b). Alterations to resource habitats due to fishing may result from the loss of habitats of non-target species, such as species encrusting cobbles, or of other epibenthic habitats, which may be important nursery areas for juvenile fish; from the alteration of nutrient levels and bottom sediment, including destruction of habitat by bottom trawling, dredging, and other fishing and processing operations; and from the generation of suspended debris that can have lethal effects long after fishing activities have ceased.

G.2.2. No Action.

The no action alternative will allow larger roller gear to be introduced into the fishery and thus will have more damage to the ocean and coastal habitat because the gear can fish bigger rock piles and will do more environmental damage. The no action alternative will not require scup pots and traps to have degradable materials.

Roller diameter is correlated with vessel size and the ability of vessels to fish rough, hard bottom areas. Larger roller sizes require larger engine sizes to pull the net. An engine size with an associated horsepower of 800-900 hp is required to tow a net with 18" to 24" rollers whereas 10" to 12" rollers can be pulled by a boat using a 175-200 hp engine (D. Simpson pers. comm.).

Information is lacking as to the relationship between roller diameter and the size of obstruction that it can clear. In general, 10-12" diameter rollers can be used for fishing over rough bottom that can include ledges and cliffs. Limitations on roller size will make some areas of the ocean inaccessible to trawls by preventing fishermen from trawling in the harder, rough bottom areas. Thus, scup associated with these areas would be protected from harvest allowing more fish to grow to maturity and spawn increasing stock biomass and yields.

Scup pots would be required to have hinges and fasteners of one panel or door made of degradable materials. These materials would allow the door or panel of a trap to fall away from an unattended trap. This would prevent lost traps from "ghost fishing", i.e., continuing to catch and retain fish that could not be removed from the trap. Thus scup and other species of fish and invertebrates typically caught by these traps could escape, preventing waste and lost yields in a number of fisheries.

G.2.3. Other Alternatives.

None of the other alternatives are expected to allow substantial damage to the ocean and coastal habitats. The preferred alternative is the most desirable because of the frameworked measures designed to achieve the target exploitation rates. Most of the preferred and non-preferred management measures (i.e. permitting, reporting, fish size, possession limit, season and harvest limits) simply do not affect ocean and coastal habitats.

G.3. WILL THE ALTERNATIVES BE REASONABLY EXPECTED TO HAVE A SUBSTANTIAL ADVERSE IMPACT ON PUBLIC HEALTH AND SAFETY?

None of the alternatives are expected to have an adverse impact on public health or safety. Obviously, scup are afflicted with various parasites and disease. Fin rot disease may be the most common among fish and is most often associated with stressful environmental conditions. Fish from polluted waters are subject to increased prevalence of disease. Scup are exposed to the full range of human activities during their lifetime. They are exposed to extensive, detrimental amounts of toxic organic and inorganic contaminants, such as heavy metals, PCBs, and petroleum hydrocarbons in the various physical compartments of the marine ecosystem (FMP section 6.2). Most research on the toxicological effects of various contaminants in fish in general, and scup, in particular is recent and ongoing. While more research is certainly necessary on toxicological effects associated with these species (EIS section F.4.2.) none of the alternatives are expected to have a differential adverse impact on public health or safety. In fact, heightened awareness and improved data collection will occur with the implementation of this FMP. The alternatives will not create situations that would have an adverse impact on public health and safety.

G.4. WILL THE ALTERNATIVES BE REASONABLY EXPECTED TO ADVERSELY AFFECT AN ENDANGERED OR THREATENED SPECIES OR MARINE MAMMAL POPULATION?

G.4.1. Proposed Action.

The proposed action, because of the control placed on continued unrestricted growth of fishing activity will tend to reduce contacts with endangered and threatened sea turtle species, shortnose sturgeon, and marine mammals. Activities conducted under this Fishery Management Plan have not yet been considered for their impacts on endangered species in order to do a Section 7 of the Endangered Species Act, as amended, consultation. The NMFS will be performing a Section 7 consultation while the FMP is out for public review during the next few months. They were requested to perform a consultation last spring, but felt they could not until the fisheries were adequately described. We will request that Fish and Wildlife Service also perform a Section 7 consultation on any seabirds that may be impacted by this FMP. The Fish and Wildlife Service has responded that the FMP will not affect any listed seabirds.

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

Four hundred and seventy one large whale sightings, 1547 small whale sightings and 1172 sea turtles were encountered in the surveys. The "estimated minimum population number" for each mammal and

turtle in the area, as well as those species currently included under the Endangered Species Act, were also tabulated (Table 70).

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

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

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

The ESA Section 7 Consultation on the summer flounder fishery was reinitiated to include the black sea bass and scup fisheries. The resulting Biological Opinion was signed on February 19, 1996, and concluded that the effects of these fisheries, along with the associated management actions, may adversely affect listed or proposed species, but are not likely to jeopardize their continued existence.

The reasonable and prudent measures contained in the August 10, 1992, Biological Opinion for Amendment 2 to the summer flounder FMP established measures to be implemented to reduce adverse impacts to endangered and threatened sea turtles and are hereby incorporated by reference. In order to be exempt from the prohibitions of section 9 of the ESA, NMFS must comply with the following terms and conditions, which implement the reasonable and prudent measures. These terms and conditions are non-discretionary and must be implemented for the summer flounder, scup and black sea bass fisheries.

The following measures are in addition to the terms and conditions in the August 10, 1992 opinion, and reflect the findings in this biological opinion and current TED regulations:

(1) The use of a NMFS certified turtle excluder device (TED) is required by any vessels engaged in summer flounder, scup and black sea bass fishing operations utilizing trawl gear in the summer flounder sea turtle protection area, Cape Charles, VA southward to the North Carolina/South Carolina border. Trawlers will be exempt from the TED requirement in the northern portion of the TED-use area south to Oregon Inlet, NC annually from January 15 through March 15.

(2) NMFS must investigate the extent of take in flynet gear and if deemed appropriate develop and certify a TED for flynet gear that will retain fish by size classes acceptable to fishery conservation plans while excluding sea turtles.

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

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

G.4.1.1. Sea Turtles.

Attempts were made to put these fisheries/sea turtle interaction into perspective of other sources of mortality for these endangered turtle species. The Congressionally mandated report *Decline of the Sea Turtles: Causes and Prevention* (NRC 1990) states that "Of all the known factors, by far the most important source of deaths was the incidental capture of turtles (especially loggerheads and Kemp's ridleys) in shrimp trawling. This factor acts on the life stages with the greatest reproductive value for the recovery of sea turtle populations."

Mortality associated with other fisheries and with lost or discarded fishing gear is much more difficult to estimate than that associated with shrimp trawling, and there is a need to improve these estimates (NRC 1990). This report identified possible turtle losses from the winter trawl fishery north of Cape Hatteras (about 50-200 turtles per year); the historical Atlantic sturgeon fishery, now closed, off the Carolinas (about 200 to 800 turtles per year); and the Chesapeake Bay passive-gear fisheries (about 25 turtles per year). Considering the large numbers of fisheries from Maine to Texas that have not been evaluated and the problems of estimating the numbers of turtles entangled in the 135,000 metric tons of plastic nets, lines, and buoys lost or discarded annually, it seems likely that more than 500 loggerheads and 50 Kemp's ridleys are killed annually by nonshrimp fisheries (NRC 1990). These other fishery operations, lost fishing gear, and marine debris are known to kill sea turtles, but the reported deaths are only about 10% of those caused by shrimp trawling. Dredging, entrainment in power-plants intake pipes, collisions with boats, and the effects of petroleum-platform removal all are potentially and locally serious causes of sea turtle deaths. However these collectively amount to less than 5% of the mortality caused by shrimp trawling (NRC 1990).

The NRC report (1990) concludes that all species of marine turtles need increased protection under the Endangered Species Act and other relevant legislation. While the report does not recommend specific conservation measures for these fisheries, the recommendations for the shrimp trawling are germane. The NRC report (1990) recommended TEDs, 60 minute winter tow-time limits, and limited time/area closure for turtle "hot spots". Currently, there are 5 sea turtle recovery plans in place, these include plans for the loggerhead (1991), the green sea turtle (1991), the leatherback (1992), the Kemp's ridley sea turtle (1992), and the hawksbill sea turtle (1993). Of the six "Actions Needed" that are identified by the Recovery Plan to achieve recovery of loggerheads is item 5: "minimize mortality from commercial fisheries."

G.4.1.2. Shortnose Sturgeon.

Shortnose sturgeon (*Acipenser brevirostrum*) is an additional endangered species that may be caught incidentally in the trawl fisheries. Sturgeon will be included in the Incidental Take Statement of the pending Biological Opinion. As shortnose sturgeon are generally associated with the estuarine environment, rather than the truly marine environment, it is anticipated that the gear and fishing locations of these scup fisheries will rarely encounter shortnose sturgeon.

G.4.1.3. Marine Mammals.

Marine mammals are managed under the Marine Mammal Protection Act of 1972 and the Endangered Species Act of 1973. Marine mammals have been historically important in the US both as targets for commercial harvests and in ecological interactions with commercial fisheries. Some scientific attention was given to marine mammals as early as 1851 when Matthew F. Maury of the US Navy's Depot of Charts and Instruments published his whale charts based upon whaler's logs and records of sightings. The US Fish Commission, after its creation in 1871, gave more attention to marine mammals, commissioning, for example, Starbuck's 1878 (as cited in USDC 1993) "History of the American Whale Fishery". The omnibus series entitled "The Fisheries and Fishery Industries of the United States" by G. B. Goode in 1884 described fisheries for the great whales as well as smaller whales (e.g. pilot whales, bottlenose dolphins and bottlenose whales) in the North Atlantic (USDC 1993).

In addition to these direct fisheries, there was also interest in the indirect effects of marine mammals on other fisheries. Goode also described the destructiveness of marine mammals to fisheries, a theme the US Commissioner of Fisheries used in 1889 in supporting a fish meal factory to be built in Woods Hole. The commissioner speculated that the 20 tons of predators such as porpoises, skates, and dogfish that the proposed factory would process annually "should present a marked influence upon the supply of edible fishes." The interest of the US Fish Commission was primarily in terms of fisheries, and little biological study appears to have been done of marine mammals in this region beyond the taxonomic studies of Frederick True starting in the 1880's. For example, he provided written instructions to the lighthouse keepers on "the best means of collecting and preserving specimens of whales and porpoises" (USDC 1993).

With the declining importance of the US harvests of east coast species of marine mammals in the late 1800's and early 1900's, the incentive for systematic scientific study of the species inhabiting northeastern US waters declined. In the 1930's and 1940's, Remington Kellogg at the Smithsonian and William Schevill at Harvard undertook taxonomic studies, but it was not until the late 1940's that cetacean biology began to be investigated more systematically. Then Schevill began a series of investigations at the Woods Hole Oceanographic Institution of cetacean acoustics that are still continuing. In the early 1970's, several other researchers began studying marine mammals in this region. The results of this earlier work was addressed in 1979 when the US Marine Mammal Commission sponsored a workshop to help define research needed for the study of marine mammals on the US east and Gulf coasts and in 1989 at a NMFS-sponsored workshop on Gulf of Mexico marine mammal research needs (USDC 1993).

These workshops set a research agenda that was immediately addressed by agencies such as the Minerals Management Service and the NMFS. During the 1980's, several institutions in the northeast developed active research programs which have resulted in a body of knowledge that is being drawn upon in developing management approaches for several critical marine mammal issues in the region. In the 1990's, increased attention has been focused on the characterization of marine mammal fauna of the US Gulf of Mexico and the Mid-Atlantic Bight (USDC 1993).

Thirty-five species of marine mammals range the US Atlantic and Gulf of Mexico waters (32 whales, dolphins and porpoises, two seal species and one manatee). Their status is poorly known, but some, like the right whale, Mid-Atlantic coastal bottlenose dolphin, and harbor porpoise, are under stresses that may affect their survival (USDC 1993). Brief summaries below for selected species give data on distribution, current and historical abundance and population trends.

Bottlenose Dolphin.

The number of discrete stocks of bottlenose dolphins is unknown, although there appear to be offshore and coastal types, possibly forming two distinct populations. There are no comprehensive population estimates, but abundance in the Gulf of Mexico is 35,000 - 40,000 in waters of 100 fathoms or less. Nearshore aerial surveys between Cape Hatteras and Nova Scotia in 1979 -82 suggest a northeast US total of 10,000 - 13,000 individuals. However, a large die-off of bottlenose dolphins in 1987 - 88 may have resulted in a 50% or greater decline in the nearshore and offshore types. An offshore survey from New

Jersey to Cape Hatteras in 1987 found about 1,050 - 7,500 which were assumed to be of the coastal type (USDC 1993).

Pilot Whale.

Two species of pilot whales occur in the North Atlantic, the shortfin pilot whale in the south and the longfin in the north. The range of the two species overlaps seasonally in the Mid-Atlantic region of the western North Atlantic. The longfin pilot whale occurs northward into Canadian and the Greenland waters and eastward to Europe: it is subject to an ongoing harvest around the Faroe Islands and incidental capture in several fisheries in the US and Canadian waters. The shortfin pilot whale may be subject to a low level of bycatch in several US fisheries. Population structure and general life history of both species is very poorly known. Abundance has been estimated for the longfin pilot whale in the eastern North Atlantic (750,000) and for the continental shelf region of the western North Atlantic (roughly 11,000; USDC 1993).

Fin Whale.

Fin whales, listed as endangered under the ESA, are probably the most numerous large cetaceans in temperate waters of the western North Atlantic Ocean. They range widely throughout the continental shelf in all seasons, but most sightings occur from the Great South Channel on Cape Cod, north throughout the southwest Gulf of Maine. Stock structure and total abundance are unknown. An estimate of abundance off the northeast coast in 1979 - 82 was 5,200 in spring and 1,500 in winter. Important research and management questions are whether separate stocks exist, the location of calving grounds and annual calf production, and the location of the wintering grounds for the northwest Atlantic population.

Humpback Whale.

The humpback whale is listed as endangered. Reasonably discrete summer stocks occur in the Gulf of Maine, Gulf of St. Lawrence, and the waters of Newfoundland-Labrador, west Greenland, Iceland, and Norway. The estimated population is about 5,100 whales. Along the northeast coast, humpbacks frequent the Great South Channel, Georges Bank, Stellwagon Bank, and Jeffreys Ledge during summer. A minimum estimate of the population prior to commercial whaling (about 1865) was 4,400 - 4,700 humpbacks. Entanglement with fishing gear and sporadic toxin-induced die-offs are problems for the species. In recent years the number of sightings of young humpbacks in the Mid-Atlantic region has increased, generally in the areas of the Chesapeake and Delaware Bays (USDC 1993). There is a recovery plan for this species.

Right Whale.

Northern right whales occur on the continental shelf from Florida to Nova Scotia. The endangered western Northern Atlantic stock is the only northern hemisphere right whale population with a significant number of individuals (300 - 350) -- the other stocks being virtually extinct. The pre-eighteenth century population may have been as high as 10,000, and, if so, the current population is more than 95% depleted. Individual identification, satellite tagging, genetic analysis, and the use of video cameras to document behavior are new research methods that have been applied in recent years. Many questions, however, remain. Among them are the location of the summering grounds for 30% of the population and wintering grounds for 80% of the population. Human impacts (net entanglements and ship strikes) are affecting some 60% of the population and may be inhibiting recovery. Two areas important to the northern right whale, the summer feeding grounds off the New England coast and the winter calving area along the Georgia and northern Florida coast, have been proposed as critical habitat (USDC 1993). There is a recovery plan for this species. A final rule was published in June 1994, designating right whale critical habitat for summer feeding grounds in New England and winter calving grounds off the Georgia and Florida coasts.

Harbor Porpoise.

The northwestern Atlantic harbor porpoise is found from Newfoundland, Canada, to Florida. It is hypothesized that there are three populations: Newfoundland, Gulf of St. Lawrence, and Gulf of Maine-Bay of Fundy. However, there is not enough evidence to test this hypothesis against the alternative of a single population. Summer aggregations occur in the Gulf of Maine, Gulf of St. Lawrence, and the east coast of Newfoundland. The winter distribution is poorly understood. The 1991 - 92 population estimate of the Gulf of Maine population is 47,200 (95% CI 32,800 - 68,000). No useful estimates of abundance for the other populations exist. The average estimate of annual mortality by the US Gulf of Maine sink gillnet fishery from 1990 and 1992 is about 1,700 (range 900 - 2,400). These estimates do not include bycatch from fisheries south of Cape Cod or north of the US border. The estimated bycatch of the other two populations is largely unknown, though some new data do exist for the Bay of Fundy, which are currently being analyzed (USDC 1993).

Harbor Seal.

Harbor seals, year-round residents of Maine and eastern Canada, are seasonal-winter residents in southern New England. Harbor seal numbers have apparently increased in recent years, due primarily to protection under the MMPA. Recent surveys suggest that 26,000 harbor seals occur in the Gulf of Maine, and they are increasing. Bycatch levels are relatively low, and major concerns are competition with fisheries and periodic disease outbreaks (USDC 1993).

Beaked Whales.

There are four species of beaked whales in the northwest Atlantic, however little is known on their distribution, biology, and population structure. Based on cetacean surveys conducted during the early 1980's and 1990's, these species are distributed along the shelf edge (2,000 m), principally along the southern edge of Georges Bank and associated with oceanographic fronts and Gulf Stream meanders. Population estimates for this species are not available. Determination of minimum abundance estimates will require substantial survey effort in shelf-edge waters and waters seaward to at least the Gulf Stream off the northeast US and eastern Canada coasts (USDC 1993).

The gears managed under this FMP are all in the third category or not listed at all for the final List of Fisheries for 1994 for the taking of marine mammals by commercial fishing operations under section 114 of the Marine Mammal Protection Act (MMPA) of 1972 (*Federal Register* 43818-43826). Section 114 of the MMPA establishes an interim exemption for the taking of marine mammals incidental to commercial fishing operations and requires NMFS to publish and annually update the List of Fisheries, along with the marine mammals and the number of vessels or persons involved in each fishery, arranging them according to categories, as follows:

1. A fishery that has a frequent incidental taking of marine mammals;

2. A fishery that has an occasional incidental taking of marine mammals; or

3. A fishery that has a remote likelihood, or no known incidental taking, of marine mammals.

In Category I there is documented information indicating a "frequent" incidental taking of marine mammals in the fishery. "Frequent" means that it is highly likely that more than one marine mammal will be incidentally taken by a randomly selected vessel in the fishery during a 20-day period. No scup fisheries are in this category.

In Category II there is documented information indicating an "occasional" incidental taking of marine mammals in the fishery, or in the absence of information indicating the frequency of incidental taking of marine mammals, other factors such as fishing techniques, gear used, methods used to deter marine mammals, target species, seasons and areas fished, and species and distribution of marine mammals in the area suggest there is a likelihood of at least an "occasional" incidental taking in the fishery. "Occasional"

means that there is some likelihood that one marine mammal will be incidentally taken by a randomly selected vessel in the fishery during a 20-day period, but that there is little likelihood that more than one marine mammal will be incidentally taken. No scup fisheries are in this category.

In Category III there is information indicating no more than a "remote likelihood" of an incidental taking of a marine mammal in the fishery or in the absence of information indicating the frequency of incidental taking of marine mammals, other factors such as fishing techniques, gear used, methods used to deter marine mammals, target species, seasons and areas fished, and species and distribution of marine mammals in the area suggest there is no more than a remote likelihood of an incidental take in the fishery. "Remote likelihood" means that it is highly unlikely that any marine mammal will be incidentally taken by a randomly selected vessel in the fishery during a 20-day period. The mixed species trawl fishery (where most scup are caught) is considered a Category III fishery. This fishery has greater than 1,000 vessels. This fishery had no documented marine mammal species involved, according to the *Federal Register* notice. With the limitations on new vessel entry into the scup fisheries in the preferred alternative, there should be a beneficial impact of the preferred alternative management on the marine mammal populations of the east coast.

This final list will remain in effect until the interim exemption established under section 114 of the MMPA becomes obsolete. The MMPA was amended on 30 April 1994 and section 118 was created to govern the taking of marine mammals incidental to commercial fishing operations. The provisions of section 118 will replace the current interim exemption system (section 114), when regulations are put into effect, no later than 1 September 1995. Included in the implementation will be a revised List of Fisheries, a revised set of classification criteria, and new implementing regulations, based on the provisions of section 118, to replace those provisions currently in effect.

G.4.1.4. Seabirds.

Pelagic seabirds may also come into contact with scup fisheries. Most of the following information is taken from the Mid-Atlantic Research Program (1994) and Peterson (1963). Fulmars occur as far south as Virginia in late winter and early spring. Shearwaters, storm petrels (both Leach's and Wilson's), jaegers, skuas and some terns pass through this region in their annual migrations. Gannets and phalaropes occur in the Mid-Atlantic during winter months. Eight gulls breed in eastern North America and occur in shelf waters off the northeastern US. These gulls include: glaucous, Iceland, great black-backed, herring, laughing, ring-billed, Bonaparte's and Sabine's gulls and black-legged caduceus. Royal and sandwich terns are coastal inhabitants from Chesapeake Bay south to the Gulf of Mexico. The Roseate tern is listed as endangered under the ESA, while the Least tern is considered threatened (Safina pers. comm.). Of course, our national symbol, the bald eagle is listed as endangered under the ESA, and is a bird of aquatic ecosystems. Literally translated, its Latin name, *Haliaeetus leucocephalus*, means white-headed sea eagle (*Federal Register* 1994, 35584). Prey of esturine inhabiting bald eagles is likely to include scup (D'Amico pers. comm.).

Scup are important prey for the Common and Roseate terns (Safina *et al.* 1988, and Safina *et al.* 1990). Safina *et al.* (1988) note that few other seabird studies have measured ambient food levels among foraging birds, but many studies which have examined food provisioning to chicks and reproductive performance in seabirds have found results similar to theirs. Laying dates, clutch sizes, growth, and fledgling success of seabirds have been linked to food availability by a number of workers. Safina *et al.* (1988) recorded that prey fish were more abundant in 1984 than it was in 1985 and noted that reproductive productivity of terns was greater in 1984 for most parameters measured. Although they studied productivity for only two seasons, the results suggest that prey population fluctuations may limit reproductive success in the terns they studied.

Safina *et al.* (1990) noted that observing prey deliveries at nests cannot address the question of how foraging birds select prey or foraging habitat from the range of possibilities. However, the variability they found show that either prey availability or birds' selection criteria changes, and that prey availability or selection varies differently between the two tern species, Common and Roseate, they studied. Some prey

species may have their own consistent internal rhythms (or influencing factors) which make them differentially susceptible to tern predation on a daily time scale.

A definitive analyses of the importance of scup for the diets of pelagic seabirds and marine mammals has not yet been conducted. Alaska Sea Grant (1993) sponsored a workshop in 1993 entitled *Is It Food* which addressed the importance of Alaskan fish prey for marine mammal and seabird declines. A similar workshop for Northwest Atlantic interactions would be quite germane.

G.4.2. No Action.

No action may jeopardize the continued existence of the threatened or endangered species mentioned above because there will be uncontrolled, unlimited fishing pressures on the species managed by the FMP. As noted earlier, scup are very important in the diets of some seabirds, marine mammals, and various fishes. Since the resource is currently overfished and the biomass is greatly reduced, the availability of scup for food for these other populations is also greatly reduced. Preventing overfishing of scup thus will be beneficial to some seabirds and certain species of marine mammals.

G.4.3. Other Alternatives.

It is likely that none of the non-preferred alternatives will pose a direct substantial damage to threatened or endangered species. Adoption of some of the non-preferred alternatives other than the proposed action could possibly inhibit the continued existence of any of the threatened or endangered species mentioned above because there will be uncontrolled, unlimited fishing pressures on scup. Only the preferred alternative has all the various commercial and recreational measures frameworked to allow the achievement of the target exploitation rates. More fishermen (i.e. without the moratorium) rushing for limited resources may definitely have negative impacts on threatened and endangered marine life. The scup resource needs significant conservation which in turn will be beneficial to seabirds, marine turtles, and marine mammals in general.

G.5. WILL THE ALTERNATIVES BE REASONABLY EXPECTED TO RESULT IN CUMULATIVE ADVERSE EFFECTS THAT COULD HAVE A SUBSTANTIAL EFFECT ON THE TARGET RESOURCE SPECIES OR ANY RELATED STOCKS THAT MAY BE AFFECTED BY THE ACTION?

G.5.1. Proposed Action

The proposed action will be expected to result in cumulative beneficial effects on the target resource and other associated non targeted species that are greatly overfished. Given the Congressional mandate (National Standard 1 of the MFCMA) to prevent overfishing, the conservation and management of this resource must occur. The increasing level of fishing mortality that has been occurring during the past decade, and which could greatly increase with the addition of numerous New England groundfish boats could drive this resource to a level where the spawning stock biomass is reduced so low, that a stock collapse could occur. The maximum sustainable yield would then not be achievable. Unquestionably, the human impacts may be significant in the short-term, if the resource is not used for short-term economic gain. However, with the population rebuilt, and harvesting occurring around MSY, the maximum long-term economic gains to the Nation, will be achieved.

As stated above, some switching of target species may occur and the prediction of the fishermen's behavior is very difficult. However, species of fish which are truly caught as a bycatch with scup may also sustain a decrease in fishing effort as effort is stabilized at the effort level associated with MSY. Very few trawl-targeted species in the Northwest Atlantic are underfished, but it is the underfished species like Atlantic mackerel, skates, and dogfish which may be targeted by fishermen as efforts increase to reduce overfishing on many presently targeted species.

The proposed action has been selected to reduce short and long-term impacts on the resource. The management measures will prevent excessive mortality and improve stock health. Related activities directed to State and Federal regulatory agencies may offer indirect benefits to essential habitats for scup.

G.5.2. No Action.

No action would allow the overfishing of scup to continue. The overfished condition of the resource requires management. Reductions in fishing mortality will benefit the resource and the entire ecosystem (especially species that prey on scup, section G.4) that scup are a part of, as well as the human environment that would be more profitable under effective fishery management.

G.5.3. Other Alternatives.

The critical aspect of the preferred management measure is the frameworked nature of the commercial and recreational measures that allow the achievement of the target exploitation rates. The cumulative adverse effects for the scup resource and other related species that may be affected by the proposed management will be minimized with the preferred alternative. Obviously, the scup resource is rebuilt the fastest, and thus the beneficial aspects of abundant scup (i.e. prey) for other species is greatest with the frameworked preferred measures. Most of the non-preferred alternatives will not allow direct substantial damage to occur to the environment on a cumulative basis.

G.6. ADDITIONAL ENVIRONMENTAL CONSEQUENCES OF MANAGEMENT ALTERNATIVES.

There are six objectives for this FMP:

1. Reduce fishing mortality in the scup fishery to assure that overfishing does not occur.

2. Reduce fishing mortality on immature scup to increase spawning stock biomass.

3. Improve the yield from the fisheries.

4. Promote compatible management regulations between state and federal jurisdictions.

5. Promote uniform and effective enforcement of regulations.

6. Minimize regulations to achieve the management objectives stated above.

All six of these objectives will contribute to positive environmental benefits, in that they will contribute towards a rebuilding of the scup resource which will also contribute towards a well-balanced, healthy ecosystem.

Overfishing for scup is defined as fishing in excess of F_{max}. The Council and the Atlantic States Marine Fisheries Commission (Commission) have adopted a fishing mortality rate reduction strategy that will implement minimum fish sizes and commercial gear regulations in year 1 (1996) of the FMP. Beginning in year 2 (1997), exploitation rates will be reduced until a level of 19% (the exploitation rate associated with the current estimate of F_{max}) is reached in year 7.

The Council has adopted the following management measures for this FMP for purposes of public hearings. Beginning in year 1 of the management program nine management measures would be implemented as described is section E.1.

Permitting (items 1, 2, 4 and 5 above) and reporting (item 6) should have no environmental consequences. The moratorium on entry of new commercial vessels (item 3) will have only beneficial environmental consequences. The minimum escape vent size (measure 8) will contribute towards objectives 1, 2, and 3, and will have beneficial environmental consequences for the scup resource and other species that may

prey on scup. The implementation of management measures 9 (degradable material for traps and pots) and 10 (regulating a maximum roller rig size) will definitely have beneficial environmental consequences in that they will reduce ghost fishing of lost gear and provide refugia for natural resources from currently developing fishing gear.

Beginning in year 1, the Council adopted a 9" total length (TL) minimum fish size in the commercial fishery in federal and state waters and a 7" total length (TL) minimum fish size in the recreational fishery in federal and state waters. These two minimum fish sizes will have some conservation and environmental benefits.

Prior to year two and annually thereafter, the Council, working through a Monitoring Committee, would evaluate the success of the FMP relative to the overfishing reduction goal and propose adjustments to the management system. Beginning with year three, additional measures would be implemented by the Regional Director based on the recommendations of the Council as described in section E.1.

Beginning in year 1 of the management program, a minimum commercial mesh size could be implemented which would have major beneficial environmental consequences. Many more small scup will escape with a minimum mesh than are currently being caught and discarded with the 2 inch mesh nets currently in use. Increased survival of small scup will not only contribute to objectives 1 through 3 of the FMP that will be directly benefitting scup but will also be quite advantageous to the overall ecosystem to which scup are often an important prey item. Fishermen have indicated that they will use larger mesh to harvest scup. Other species that are part of the mixed trawl catch that are discarded dead also will benefit as the mesh is increased from the current size of 2 inches.

The commercial quota, as well as the recreational measures all will contribute to the mortality reduction schedule but should have little positive or negative direct environmental consequences.

Of the thirteen non-preferred alternatives identified in FMP Appendix section 1, only the no action alternative and the individual transferable quota would have significantly different environmental consequences to those measures in the preferred alternative package.

Clearly the no action alternative is indefensible from a biological or environmental point of view. The scup resource would continue greatly overfished with negative ecosystem consequences. The environment would also be further harmed through increased ghost fishing from pots and traps. Structured habitat that is currently difficult to fish would also become more vulnerable to larger roller rigs.

The ITQ alternative would have significant positive environmental consequences. Paramount among these benefits is the incentive to conserve and shepherd a natural resource because an individual has a stake in its future. The importance of this motivation cannot be overemphasized given the depleted condition in which so many of our living marine resources exist. Incentives under most existing management systems are simply to harvest as much as possible today, for tomorrow the resource may be gone, or harvested by someone else. Issuing harvest rights which last indefinitely engenders a corresponding concern among users that the health of the fishery resource be maintained indefinitely.

G.7. ECONOMIC EFFECTS OF THE ALTERNATIVES.

G.7.1. Proposed Action.

The economic characteristics of the fishery are presented in section 8 of the FMP. The benefits and costs of the proposed actions addressed in this FMP and DEIS are evaluated in section 9.2 (Analysis of Beneficial and Adverse Impacts of Adopted Management Measures), in Appendix 1 (Alternatives to the Amendment), and in Appendix 4 (Regulatory Impact Review).

G.8. FEDERAL AGENCIES THAT MAY BE AFFECTED.

The Federal Agencies that may be affected by this proposed Amendment include:

Dept. of Army Civil Works: scheduling of dredging projects, discharge of dredged materials, identification of aquatic borrow sites.

Dept. of Army Regulatory 1404 Program: issuing of permits for water development projects (e.g. dredging, filling, bulkheading, construction of piers, and installation of piles).

Environmental Protection Agency: Section 401 -- individual state review of 404 discharges, Section 402 -- point source discharges, Section 404 -- discharge of dredge or fill into waters of the U.S., Section 208 -- nonpoint source pollution control. Marine Protection, Research, and Sanctuaries Act. Ocean Dumping, RCA, Superfund.

Minerals Management Service: Outer Continental Shelf Land Act, Hydrocarbon Exploration and Development, Hard Mineral Mining.

Dept. of Commerce: Endangered Species Act, Marine Mammals Protection Act, Coastal Zone Management Act.

H. LIST OF PREPARERS

The FMP was prepared by a team of fishery managers and scientists with special expertise in the scup resource including:

Mid-Atlantic Council Demersal Committee - Mid-Atlantic Council members: Rick Cole (Chair, DE), Dr. Brian Rothschild (Vice Chair, MD), Dr. James Gilford (MD), Pete Jensen (MD), Jack Travelstead (VA), Bruce Freeman (NJ), Gordon Colvin (NY), Alan Weiss (PA), Bob Hamilton (NY), Jack Dunnigan (ASMFC), South Atlantic Council members Dennis Spitsbergen and Gerald Schill, and New England Council member James McCauley.

Mid-Atlantic Council Scup Industry Advisory Committee - Peter Wadelton (NY), Thomas Marconi (NY), Charlie Johnson (NY), Doug Wilson (NJ), William Egerter (NJ), Lars Axelsson (NJ), Albert Adams (DE), David Martin (MD), Jim Swagler (MD), Charles Amory (VA) and New England representative Robert Smith (RI).

MAFMC staff - David R. Keifer, Dr. Christopher M. Moore, Dr. Thomas B. Hoff, Clayton E. Heaton, Richard J. Seagraves, and José L. Montañez-Lanza.

I. REFERENCES, TABLES, AND FIGURES ARE ALL FROM THE FMP.

J. AGENCIES, ORGANIZATIONS, AND PERSONS TO WHOM COPIES OF THE EIS WERE SENT.

Appendix A lists the agencies, organizations, and persons to whom copies of the EIS were sent.

Last Name	First Name	Address 1	Address 2	City	State	Zip
& Johnson, Inc.	Axelsson	P.O. Box 180		Cape May	NJ	08204
& P.Barbera	N.Clark	Town Dock, Inc.	P.O. Box 608	Narragansett	RI	02882
(011)5th C.G. Dis	Cmdr.,	Federal Bldg. Room 401	431 Crawford St.	Portsmouth	VA	23705
Abrams	Robert	520 Davie St.		Westbury	NY	11590-5908
Ackert	Jim	577 Washington St		Gloucester	MA	01930-1743
Adams	Albert	RD 1 Box 406		Milford	DE	19963
Affairs Library	Marine	Washburn Hall	Univ. of RI	Kingston	RI	02881
Agnello	Richard	Economics Dept.	Univ. of Delaware	Newark	DE	19711
Agric. Counselor		Embassy German Fed. Rep.	4645 Reservoir Rd.,NW	Washington	DC	20007-1998
Allen	Kenneth	448 N. Connecticut Ave.		Atlantic City	NJ	08401
Allen	Richard	35 Bliss Rd.		Wakefield	RI	02879
Allen	Rick	Borden Clam Products	Box 994 Ocean Drive	Cape May	NJ	08204
Alley	Dick	The Fisherman	121 So. Compo Rd	Westport	CT	06880
Alspach	Thomas	295 Bay St., Suite One	PO Box 1358	Easton	MD	21601
Ambrico	Donald	3030 Emmons Ave.		Brooklyn	NY	11235
Amory	Charles	L.D. Amory Seafood Co.	101 South King Street	Hampton	VA	23669
Anderson	Eric	Dept. of Economics	Old Dominion Univ.	Norfolk	VA	23529
Anderson	Lee	College of Marine Studies	University of Delaware	Newark	DE	19716
Anderson	Tom	705 Tall Oaks Dr		Brick	NJ	08724
Andrae	John	PO Box 358		Port Republic	NJ	08241
Ardolino	Fred	2345 Knapp St.		Brooklyn	NY	11229
Armani	Jerry	393 Stanhope St.		Brooklyn	NY	11237
Asbury Park Press		703 Mill Creek Rd		Manahawkin	NJ	08050
Asbury Park Press		John Geiser, Out. Writer	Box 1550	Neptune	NJ	07754
Ascoli	Capt. Fred	3 Rabbit Run		Cape May	NJ	08204
Atl.Fish.Mgt.Coun	South	Southpark Bldg.,Suite 306	1 Southpark Circle	Charleston	SC	29407
Auld	Don	MD Sportfish Advisory Com	11501 Crows Nest Road	Clarksville	MD	21019
Auletta	Thomas	43 Idolstone Ln		Matawan	NJ	07747
Axelsson	Harry	738 Shunpike Road		Cape May	NJ	08204
Axelsson	Lars	705 Hughes Ave		N. Cape May	NJ	08204
Aza de Martinez	Carmen	Int. Trading & Shipping	1382 Thrid Ave #365	New York	NY	10021
Bacek	Tracy	PO Box 202		Barnegat Light	NJ	08006
Bader	D.	1442 East 13th St		Brooklyn	NY	11230
Bain III	Claude M	Suite 102 Hauser Bldg.	968 Oriole Dr. South	Virginia Beach	VA	23451
Baird	Charles	RD 2 Box 321		Milton	DE	19968
Baker, Town Mngr.	Stewart	Town Office	4026 Main St.	Chincoteague	VA	23336
Balcom	Nancy	Sea Grant Marine Adv. Prg	1084 Shennecossett Rd	Groton	CT	06340-6097
Bandes	Bruce	Bandes & Byrnes	Main Street	Oakdale	NY	11769
Bannick	Bruce	7 Galley Street		Jamestown	RI	02835
Barnes	John	Ampro Fisheries Company	PO Box 319	Reedville	VA	22539
Barr	Capt. E.W.	PO Box 866		Urbanna	VA	23175
Basmajian	Don	228 St. John Ave.		Erma	NJ	08204
Bates	Robert G.	Seafood Industrial Park	34 Jefferson Ave.	Newport News	VA	23607

Last Name	First Name	Address 1	Address 2	City	State	Zip
Beal	Kenneth	NOAA Fisheries - F/NER5	One Blackburn Drive	Gloucester	MA	01930
Beckwith, Jr.	Ernest E.	Dept of Env. Protection	State Office Bldg, Rm 255	Hartford	CT	06115
Behlmen	Wade	59 Audreys Lane		Marstons Mills	MA	02648
Beideman	Terri L.	PO Box 579		Barnegat Light	NJ	08006
Beideman	Nelson R	10th St. & Bay Ave.		Barnegat Light	NJ	08006
Bennett	Al	Bridgeport Post	341 Fairland Dr.	Fairfield	CT	06430
Bennett	Scott	Box AX		Amagansett	NY	11930
Berens	Raymond	Philadelphia Press	One East Penn Sq., Ste813	Philadelphia	PA	19107-2708
Berg	Erling	1235 Lafayette		Cape May	NJ	08204
Bergmann	Charlie	969 Shirley Ave.		Cape May	NJ	08204
Bermudez	Linda	1415 East 16th Street		Brooklyn	NY	11230
Bezanson	Scott	152 Indian Trail		Wakefield	RI	02879
Birke	R.	216 E. Shore Drive		Massapequa	NY	11758
Blakeslee	Jerry	117 Morris Ave.		Milton	DE	19968
Blount	Willis	F/V Ruthie B	56 Vesper Lane	Nantucket	MA	02554
Bochenek, PhD	Eleanor	Sea Grant Marine Adv Serv	1623 Whitesville Rd	Toms River	NJ	08755
Bogan	Howard	7 Kings Path		Brielle	NJ	08730
Bogan	Raymond	605 Beacon Blvd.		Sea Girt	NJ	08750
Borden	David	Div. of Fish & Wildlife	Government Center	Wakefield	RI	02879
Bovykin	Yu.	Fisheries Attache	1609 Decatur St., NW	Washington	DC	20011
Boyce	Leo	108 Moriches Ave		Mastic	NY	11950
Boyd	David M	Commonwealth of VA	PO Box 756	Newport News	VA	23607
Boyle	Paul	Deputy Director	Aquarium for Wildlife Con	Brooklyn	NY	11224
Bozek	Robert	Atl Pro Boatmans Assn.	154 Hendrickson Ave.	Rockville Centre	NY	11570
Brame	Dick	ACCA	1994 Eastwood Road	Wilmington	NC	28403
Bramhall	David	106 Chicago Blvd.		Sea Girt	NJ	08750
Brancaleone	Joseph	4 Flume Rd		Magnolia	MA	01930
Branin	Joseph	172 Linden Ave	P.O. Box 53	Highlands	NJ	07732
Branstetter	Steve	1957 Arvis Circle		Clearwater	FL	34624
Branstetter, Ph.D	Steve	2816 Eagle Run Circle		Clearwater	FL	34620
Braun	Erik	National Marine Fish Serv	62 Newtown Ln, Room 203	E.Hampton	NY	11937
Breitweiser	Charles	677 Snow Drop Ct.		Morgansville	NJ	07751
Brennan	William	Dept of Marine Resources	State House Station 21	Augusta	ME	04333-0021
Bright	William	615 Goshen Rd.		Cape May Crthse	NJ	08210-1501
Brindley	Jim	PO Box 52		West Creek	NJ	08092
Brodziak	Dr. John	NMFS/NEFC	166 Water Street	Woods Hole	MA	02543
Brooks	Priscilla	Cons. Law Foundation	62 Summer St.	Boston	MA	02110-1008
Brown	Jed	MSRC SUNY Stony Brook		Stony Brook	NY	11794-5000
Brown, Director	Dr. Brad	Southeast Fisheries Cntr.	75 Virginia Beach Dr	Miami	FL	33141
Brunisholz	Robert	PO Box 441		Califon	NJ	07830
Bryant	LtCMDR Ross	US Coast Guard 5th Dist.	431 Crawford St.	Portsmouth	VA	23704-5004
Bryson	John	40 McBry Dr.		Dover	DE	19901
Buck	Eugene	Cong. Resrch Service-ENR	Library of Congress	Washington	DC	20540-7450

Last Name	First Name	Address 1	Address 2	City	State	Zip
Buckmaster	Linda	National Fisherman	PO Box 908	Rockland	ME	04841
Bullard	Buddy	805 West Fifth St.		Hampton	SC	29924
Bunting	David	307 Dorchester St.		Ocean City	MD	21842
Burger	John	PO Box 428		Dover	DE	19901
Burgess	Robert D.	Snow's Doxsee Inc.	994 Ocean Drive	Cape May	NJ	08204
Burkland	Richard	Montauk Fish Dock	PO Box 2048	Montauk	NY	11954
Burnett-Kurie	Karen	IPSSR, UNH	Hood House, 89 Main St	Durham	NH	03824-3577
Burnley	Eric	2408 Hayloff Lane		Virginia Beach	VA	23456
Butowski	Nancy	MD DNR	Tawes State Ofc. Bldg C2	Annapolis	MD	21401
Calos, PAF	Angela	Public Affairs Officer	1335 East-West Highway	Silver Spring	MD	20910
Cangialosi	Carl	28 Lawrence Ave		Holbrook	NY	11741
Cantwell	Maria	1520 Longworth HOB	ATTN: Amy Robins	Washington	DC	20515
Cape Fisheries	Atlantic	P.O. Box 555		Cape May	NJ	08204
Caputi	Gary	118 Harding Drive		Bricktown	NJ	08724
Carlson	Sten	Box 445		Wellfleet	MA	02667
Carmines	George S	103 Rens Road		Poquoson	VA	23662-1611
Carpenter	Steve	Burlington Co. Times	Route 130	Willingboro	NJ	08046
Carr	Sam	50 Broadview Drive		Tiverton	RI	02878
Carrington	Floyd	20 Ocean Ave.	PO Box 3016	East Quogue	NY	11942
Carroll	Bill	Seafood Processing Co, RI	55 State Street	Narragansett	RI	02882
Carvalho	Tony	8 East Lake Side Ave		N. Dartmouth	MA	02747
Casey	Jack	120 Knowles Way Ext	Suite 101	Narragansett	RI	02882
Cassell	Jodi	World Wildlife Fund	1250 24th Street, NW	Washington	DC	20037
Castoro	Nicholas	Cerullo Brothers Fishing	Bay Avenue	East Moriches	NY	11940
Castro	Kathy	URI Fisheries Center	East Farm	Kingston	RI	02881
Cerbone	Dominick	168 Fordham St		City Island	NY	10464
Champlin	Timothy	61 South Ferry Rd		Saund	RI	02874
Chandler	LeeAnne	300D Robinson Hall	University of Delaware	Newark	DE	19716
Chiles	David	128 East North st		Bethlehem	PA	18018
Chincoteague		Chamber of Commerce	MADDOX Blvd	Chincoteague	VA	23336
Clairmont	Robert	U.S. Small Business Adm.	409 3rd St., Suite 7800	Washington	DC	20416-3110
Clam Co.	Eastern	Sam Barrington	255 MacArthur Drive	New Bedford	MA	02740
Coastal Law Cntr.	Ocean &	School of Law-Librarian	Univ. of Oregon	Eugene	OR	97403-1221
Coates	Philip	Div. of Marine Fisheries	100 Cambridge St.	Boston	MA	02202
Coble	Howard	403 Cannon Building	ATTN: Ed Lee	Washington	DC	20515
Coble	Capt. Larry	1231 Cherry Hill Rd		Mocksville	NC	27028
Cocoros	Raymond	2127 35th St.		Long Isl. City	NY	11105-2101
Coffman	Danny G	RT #1 Box 2	Chapel View	Lewes	DE	19958
Cohen	Daniel	PO Box 555		Cape May	NJ	08204
Cohen	Max	21 Locust Lane		Cape May Crthse	NJ	08210
Colabella	Joe	602 Green Ave.		Bielle	NJ	08730
Cole	John	Fishermen's Co-op Dock	P.O. Box 1314	Pt.Pleasnt Bch	NJ	08742
Cole	Richard	Dept Nat'l Res.&Env.Cont.	PO Box 1401	Dover	DE	19903

Last Name	First Name	Address 1	Address 2	City	State	Zip
Cole	Willard	US Fish & Wildlife	PO Box 972	Morehead City	NC	28557
Collins & Sons	Jack	37 Hawley Ave		West Islip	NY	11795
Colvin	Gordon	Dept. of Env. Cons.	SUNY Bldg. #40	Stony Brook	NY	11790
Connelly	John	25 Jacksonville Rd		Towaco	NJ	07082
Conner	Charles	MA Div. of Marine Fish.	790 Fisher Rd.	N. Dartmouth	MA	02749
Connolly	Jerry	PO Box 1932		Gloucester	MA	01930
Conover	Dr. David	Marine Science Res. Cntr.	State Univ. of NY	Stony Brook	NY	11790-5000
Conti	Carmen	216 43rd St.		Sea Isle City	NJ	08243
Cookingham	Russell	P.O. Box 1037		Monument Beach	MA	02553
Cooney	John T.	Admiral Abatement Inc	60 Gansevoort St	New York	NY	10014
Cooper	Robert	9 Osprey Nest Rd.	P.O. Box 131	Greenport	NY	11944
Coppa	Michael	600 Millman Blvd.		Del Haven	NJ	08251
Cordes	Albert	1036 Idaho Ave		Cape May	NJ	08204
Corey	Roger	Agri.;Div.	US Int'l Trade Comm.	Washington	DC	20436
Corp of Engineers	US Army	Reg. Branch, Norfolk Dist	803 Front St	Norfolk	VA	23510-1096
Corps of Engineer	US Army	Wanamaker Building	100 Penn Square East	Philadelphia	PA	19107-3390
Creed	Carolyn	220 Burlington Court		Flemington	NJ	08822
Crossman	Ken	USDC/NOAA Enforcement	1 Blackburn Drive, Rm.206	Gloucester	MA	01930
Crowell	Peter F.	P.O. Box 362		Scituate	MA	02066
Csulak	Frank	NMFS, Sandy Hook Lab	74 McGruder Rd.	Highlands	NJ	07732
D'Amico	Mike	PO Box 160		Nassau	DE	19969
D'Anna	S.A.	9 Nightingale Way		Lutherville	MD	21095
D.B.W.A.		28 S Market St.	PO Box 527	Port Norris	NJ	08349-0527
Daily Press		Skip Miller	7505 Warwick Blvd.	Newport News	VA	23607
Daniels	Joey	PO Box 369		Wanchese	NC	27981
Davis	Tom	2 Avon Ct		Dix Hills	NY	11746
Dawson	James	3008 Haucks Mill Rd		Monkton	MD	21111
DeMaula, Jr.	Anthony	22600 Main Rd		Cutchogue	NY	11935-1265
DeVito	Larry	Caleb & Haley	#14 Futon Fish Market	New York	NY	10038
Deem	Jeff	Po Box 6274		Springfield	VA	22150
Degener	Richard	The Press & Sunday Press	1 South Main Street	Cape May Crthse	NJ	08210
Delanoy	Neil	90 Cedar Point Dr.		West Islip	NY	11795
Denney	John P.	5 Blackhawk Rd.		Billerica	MA	01821
Desfosse	Joseph	VA Inst. of Marine Scienc	PO Box 1346	Gloucester Pt.	VA	23062
Devnew	Jack	Flagship Group Ltd	PO Box 3670	Norfolk	VA	23514
Di Vincenzo	Mark	Daily Press, Inc.	PO Box 746	Newport News	VA	23607
DiCosimo	Jane	North Pacific Fish Coucil	PO Box 103136	Anchorage	AK	99510
DiDanielle	Danny	P.O. Box 787		Montauk	NY	11954
DiLernia, Prof.	Anthony	Ofce of Marine Education	Kingsborough College	Manhattan Bch	NY	11235
Dickel	Barry	Bahia Marina, Inc.	2107 Herring Way	Ocean City	MD	21842
Dickerson	Gary	446 Crestview Terrace		Brick	NJ	0872
Dickson	Gary	4 Bergen Ave		Hampton Bays	NY	11946
Dodson	Donald K	National Westminster Bank	1 N. Main Street	Cape May Crthse	NJ	08210

Last Name	First Name	Address 1	Address 2	City	State	Zip
Doernte	Harry	5 Saunders Dr		Poquoson	VA	23662
Dominion Lobster	Old	c/o Carl Meixner	3166 S. Main Street	Chincoteague	VA	23336
Dorman	Robert	Rt. 3, Box 258		Lewes	DE	19958
Dorsey	Ellie	Conservation Law Found.	62 Summer St.	Boston	MA	02110
Doss	Ken M.	211 Choctaw Rd.		Brunswick	GA	31525-9265
Douglas	Jim	Marine Resource Comm	PO Box 756	Newport News	VA	23607
Doxsee, Jr.	Robert L	Doxsee Sea Clam Co.	50 Bayside Dr.	Point Lookout	NY	11569
Drew	Steve	Fisheries Observer Prog.	Manomet Bird Ob. Box 1770	Manomet	MA	02345
Drewer, Jr.	Vernon			Saxis	VA	23427
Drury	Lt. C.L.	New York State DEC	Region 2-Law Enf. Box 251	E.Nassau	NY	12062
DuPaul	William	Dept. of Advisory Serv.	VIMS	Gloucester Pt.	VA	23062
Duke	Emmett	521 Washington Ave		Chestertown	MD	21620
Dulemba	John	Seafood Network Inc.	94 Heritage Lane	Chatham	MA	02633
Dunlop	Bob	59 Lincoln Rd		Montauk	NY	11954-5007
Dunnigan	Jack	ASMFC	1776 Mass. Ave, NW, #600	Washington	DC	20036
Durkas	Susan	131 East Prospect Ave.		Woodbridge	NJ	07095
Dyer	Larry	PO Box 2407		Amagansett	NY	11930
Dykstra	Jacob	1001 Nicholwood Dr.	Apt. 205	Raleigh	NC	27605-3220
Eakes	Bob	PO Box 98		Buxton	NC	27920
East Hampton Star		153 Main St		East Hampton	NY	11937
Eastlake	Gordon	P.O. Box 197		Wachapreague	VA	23480
Eckhardt	Dr. Ronald	Brooklyn College	2900 Bedford Ave	Brooklyn	NY	11210
Egerter	Bill	1107 St. Louis Ave.		Pt. Pleasant	NJ	08742
Egerter	William	208 Harvard Ave		Pt.Pleasant Bch	NJ	08742
Eldredge	Ernest	Chatham Fisheries	PO Box 1407	West Chatham	MA	02669
Ellen W. Corp.		Eastern Shore Seafood Pr.	P.O. Box 38	Mappsville	VA	23407
Ellenton	Dave	World Wide Trading	26 Locust St., Suite 2	Danvers	MA	01923
Ellis	Steven	National Marine Fish Serv	PO Box 436	Hampton	VA	23669
England	Marilyn	Scully Science Center	306 South Bay Ave	Islip	NY	11751
Enners	Peter	19 Long Lane		Hampton Bays	NY	11946
Epstein	Jan	204 Lee's Lane		Mays Landing	NJ	08330
Escher	Diane	Envit. Review Coordinator	841 Chestnut St	Philadelphia	PA	19107
Ethridge	Capt. Rex	PO Box 91		Wanchese	NC	27981
Eutsler	Jeffrey	PO Box 51		Ocean City	MD	21842
Evans	Amos F	Old Inlet Bait and Tackle	P.O. Box 129	Rehoboth	DE	19971
Ewing	R.C.	Baader North America	PO Box 9504	Ft. Meyers	FL	33906
Fagin	Dan	Newsday, Environ. Writer	235 Pinelawn Rd.	Mellville	NY	11747
Falk	James M.	College of Marine Studies	Univ. of Delaware	Lewes	DE	19958
Fant	Stephen	40 Walsh Ave.		Auburn	MA	01501
Farley	Sen. Hugh T	NY State Senate	412 Leg. Off. Bldg.	Albany	NY	12247
Farnham	Paul	Montauk Fish Dock	PO Box 2048	Montauk	NY	11954
Farnham	Dan	Box 2242		Montauk	NY	11954
Fee	Russ	66 Douglas Street	Sugarmill Woods	Homosassa	FL	34446

Last Name	First Name	Address 1	Address 2	City	State	Zip
Feinberg	William	Feinberg Dee, & Feinberg	554 Broadway	Bayonne	NJ	07002
Feller	Fred	417 Croatan Hills Rd.		Virginia Beach	VA	23451-3684
Ferrera	Jack	356 Arthur St.		Freeport	NY	11520
Fields	Jack	Merchant Marine & Fisher.	2228 Rayburn HOB	Washington	DC	20515
Figurski	Robert	The Trust Company of NJ	35 Journal Square	Jersey City	NJ	07306
Finke	Joe	29 July Ave.		Bayville	NY	11709
Fish & Game Assn	NASSAU Co.	P.O. Box 245		Rockville Centre	NY	11570
Fish Mgmt. Co.	Pacific	Metro Center, Suite 420	2000 SW First Ave.	Portland	OR	97201
Fish Mgmt. Co.	W. Pac.	1164 Bishop ST.	Room 1405	Honolulu	HI	96813
Fish. Mgmt. Co.	N.Pacif.	PO Box 103136		Anchorage	AK	99510
Fish. Mgt. Co.	Carib.	268 Ave Munoz Rivera 1108		San Juan	PR	00918
Fish. Mgt. Co.	Gulf	5401 W. Kennedy Blvd.		Tampa	FL	33607
Fisher	Wayne	11940 Old Buckingham Rd		Midlothian	VA	23113
Fisheries Coord.	Virginia	US Fish & Wildlife	P.O. Box 480	White Marsh	VA	23183
Fisheries Instit.	National	1525 Wilson Boulevard	Suite 500	Arlington	VA	22209
Fisherman's Dock		Coop	P.O. Box 1314	Pt. Pleasant Bch	NJ	08742
Fishery Mngmt Cou	New Engl	Suntaug Office Park	5 Broadway (Route 1)	Saugus	MA	01906
Fitzpatrick	James	Cape May Star and Wave	513 Washington Mall	Cape May	NJ	08204
Flannigan	Pat	P.O. Box 32	Mid-Atl. Fisheries Inc.	Swarthmore	PA	19081
Fletcher	James	123 Apple Road		Mans Harbor	NC	27953-9617
Flimlin, Jr.	Gef E.	Ocean Co. Ext. Serv.	Rt. 527 Agr. Cntr.	Toms River	NJ	08753
Fordham	Sonja	Center for Marine Conserv	1725 DeSales St NW Su 500	Washington	DC	20036
Foster	Bill	PO Box 212		Hatteras	NC	27943
Foster	William	PO Box 212		Hatteras	NC	27943
Foster, III	John W S	Tidewater Adm	Tawes State Off Bldg.	Annapolis	MD	21401
Fote	Thomas P	22 Cruiser Ct.		Toms River	NJ	08753
Francis	Woody	Baltimore Army Corps	10 S. Howard St., 8th Fl	Baltimore	MD	21201
Frangipane	Philip	78 Lawrence Ave		Brooklyn	NY	11230
Fredericksen	Pete	34 Stockton Lake Blvd		Manasquan	NJ	08736
Fricke, F/CM1	Peter	NMFS	1335 East-West Highway	Silver Spring	MD	20910
Fulcher	Mitchell	11 Delavan St		East Hampton	NY	11937
Fullilove	James	National Fisherman	PO Box 908	Rockland	ME	04841-0908
G-OLE-2, Fish Enf	Comandant	U.S. Coast Guard HQ	2100 2nd St., SW	Washington	DC	20593-0001
Gabriel	Wendy	NMFS/NEFC	166 Water Street	Woods Hole	MA	02543
Gallagher	William	508 Carroll Fox Rd		Brick	NJ	08724
Gallimore	Richard	P.O. Box 350		Beach Haven	NJ	08008
Gallo	Richard	23 The Keel		East Islip	NY	11730
Gant	Randy	10 Artic Ocean Drive		Brick	NJ	08723
Garnache	Charles	PO Box 353		Biddleford	ME	04006
Garrell	Martin	Dept of Physics, Box 701	Adelphi Univ. Garden City	Long Island	NY	11530
Garvey	Chris	15 Trail Road		Hampton Bays	NY	11946
Garvilla	Joseph	PO Box 53		Powellville	MD	21852
Gavin	Arthur J	1022 Crew Lane		Manahawkin	NJ	08050

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Gaw	Edward	Merritt	PO Box 5225	Lighthouse Pt	FL	33064
Gehan	Shaun	Seafares Int.	5201 Auth Way	Camp Springs	MD	20746
Geiser	John	1863 Barbee Lane		Wall	NJ	07719
Geld	Gene	793 Pinewood Drive		Elkins	PA	19027
Getz	Tim	1508 Stage Coach Rd		Seavill	NJ	
Ghigliotty	David J.	804 Bayview Ave.		Barnegat Light	NJ	08006
Giaramita, Jr.	Joseph	28 Bay 41 St #1		Brooklyn	NY	11214
Gibson	Barry	4 Puritan Road		Beverly	MA	01915
Gifford Marine		18 N. Franklin Blvd.		Pleasantville	NJ	08232
Gilford	Dr.James	7003 Glen Court		Frederick	MD	21701
Gillelan	M.Elizabeth	NOAA Chesapeake Bay Ofc.	410 Severn Ave , Ste 107A	Annapolis	MD	21403
Gillen	Patrick	25 Ryder Ave		Dix Hills	NY	11746
Gilzinger	Robert H.	The Gorton Group	128 Rogers Street	Gloucester	MA	01930
Giunta	Dennis	3 Browning Drive		Greenlawn	NY	11740
Glas	George	Nat'l Party Boat Owners	All. 181 Thames St.	Groton	CT	06340
Glickberg	Howard	2127 Broadway		New York	NY	10023
Gloege	Wayne	151 Ocean. Tch. Bldg.	Univ. of Washington	Seattle	WA	98195
Glowka	Arthur	60 Round Hill Drive		Stanford	CT	06903
Gocial	Morris	Certified Public Accnt's	Fox Pavilion-Suite 529	Jenkintown	PA	19046
Goell	Nancy K.	P.O. Box 1493		East Hampton	NY	11937
Goetze	Albert	5830 Hopkins Neck Rd		Easton	MD	21601
Golden, Jr.	Robert	Ebasco Environmental	160 Chubb Avenue	Lyndhurst	NJ	07071
Goldfinger	Bud	PO Box 2284		E. Hampton	NY	11937
Goldsborough	Bill	Ches. Bay Foundation	162 Prince George St.	Annapolis	MD	21401
Good	Keith	New York Post	210 S. St.	New York	NY	10002
Goodale	Hannah	Fisheries Mgt., NMFS/NOAA	One Blackburn Drive	Gloucester	MA	01930-2298
Goodger	Tim	NMFS Oxford Lab.	Railroad Ave.	Oxford	MD	21654
Gordon	Cindy	Issues Management	105 Campus Drive	Princeton	NJ	08540
Gordon	Wally	Mid-Atlantic Foods	PO Box 367	Pocomoke City	MD	21851
Gordon	William	Sandy Hook Field Station	Bldg. #22	Fort Hancock	NJ	07732
Goyeneche	Fernando	712W 175 St. Apt 2C		New York	NY	10033
Grabowski	Stephen	NMFS Northwest Fish. Cnt	2725 Montlake Blvd.E.	Seattle	WA	98112
Graham	Bruce	256 Louvick St		Norfolk	VA	23503
Greenling	William	10 Crane Fly Circle		Cape May	NJ	08204
Greenling	Bill	10 Crane Fly Circle		Cape May	NJ	08204
Greenly	David	RD 2 Box 447		Lincoln	DE	19960
Grice	Frank	84 Ring Rd		Plympton	MA	02367
Grimes	Churchil	NMFS SE Fish. Ctr.	3500 Delwood Beach Rd.	Panama City	FL	32407
Griswold	Whit	Salt Water Sportsman	77 Franlin St.	Boston	MA	02110
Grosse	Daniel	10480 Little Pawtuxet	Duite 725	Columbia	MD	21044
Guinn	Sonny	10448 Azeala Rd		Berlin	MD	21811
Haas	John	PO Box 270		Seaside Park	NJ	08752
Habron	Geoffrey	907 Washington Blvd	2nd Floor	Oak Park	IL	60302

Last Name	First Name	Address 1	Address 2	City	State	Zip
Haines	Marty	1450 Church St.		Rahway	NJ	07065
Halavik	Tom	US Fish & Wildlife Serv.	P.O. Box 307	Charlestown	RI	02813
Halbrunner	Wayne	713 Shunpike Rd		Cape May	NJ	08204
Hallock	Lance	P.O. Box 358		Stonington	ME	04681
Halperin	Laurie	Center for Marine Cons.	306A Buckroe Ave	Hampton	VA	23664
Hamburg	Dan	114 Cannon HOB	ATTN: Kate Anderton	Washington	DC	20515
Hamer	Paul	611 Chelsa Road		Absecon	NJ	08201
Hamilton, Jr.	Robert	527 Main St.		Greenport	NY	11944
Hanna	Susan	Dept. Resource Economics	Oregon State Univ.	Corvallis	OR	97331-3601
Hanrahan	Brian	269 Howard Ave		Rochelle Park	NJ	07662
Harrell	Samuel	RR 2 Box 215-K		Georgetown	DE	19947
Harrell	Lucielle	PO Box 329		Edenton	NC	27932
Harrington	Kerry	PO Box 224		Berlin	MD	21811
Harris	Jim	338 Lakeview Lane		Cape May	NJ	08204
Hasbrouck	Emerson	Suffolk Coop Marine Prog	39 South Avenue	Riverhead	NY	11901
Hastings	Jay	1111 3rd Ave. Bldg.	Suite 3305	Seattle	WA	98101
Haven Fish Co.Inc	New	34 Saginaw Trail		Guilford	CT	06437
Havens, Jr.	William	PO Box 1992		East Hampton	NY	11937
Hawkins	Jeff	Div. of Marine Fisheries	PO Box 1507	Washington	NC	27889
Hayes	Wayne	37 Anthony Dr		Hyannis	MA	02601
Haynie	Allen W.	Zapata-Haynie Corp.	P.O. Box 175	Reedville	VA	22539
Helm	Ray	18203 Hermitage Rd		Onancock	VA	23417
Henry	James	PO Box 37		Hampton Bays	NY	11946
Hickman	David	940 Shirley Avenue		Cape May	NJ	08204
Higgins	Besty	Envit. Rev. Coordinator	Rm 2203, JFK Federal Bldg	Boston	MA	02203
Hill	Tom	Atl.& Pacific Marine Cons	27 Ferry Street	Gloucester	MA	01930
Hillhouse	Roger	1222 80th St. South		St. Petersburg	FL	33707
Hinman	Ken	Nat's Coal. Marine Cons.	3 West Market Street	Leesburg	VA	22075
Hoffman	Larry	PA Fish&Boat Comm	PO Box 67000	Harrisburg	PA	17106
Hogan, Jr.	Philip	1299 Globe Ave.		New York	NY	11003
Hogarth	Wm. P.	NOAA/NMFS/F CM3	1315 East West Highway	Silver Spring	MD	20910
Hoheland	Porter	Marine Policy Center	WHOI	Woods Hole	MA	02543-1138
Holder	Mark	8021 Ocean Pines		Berlin	MD	21811
Holliday F/SR1	Dr. Mark	Resource Stat. Div. NMFS	1335 East-West Highway	Silver Spring	MD	20910
Hopkins	Terry	554 Blackstrap Rd.		Falmouth	ME	04105
Hopkins	D.Douglas	EDF	257 Park Ave South	New York	NY	10010
Houde	Edward D	Ches. Bio. Lab Univ of MD	P.O. Box 38	Solomons	MD	20688
Houston	Len	Army Corp of Eng, Env. Br	26 Federal Plaza	New York	NY	10278-0090
Howey	Ronald	US Fish & Wildlife Serv.	300 Westgate Center Dr	Hadley	MA	01035-8613
Huba	Greg	30 Eagle Nest Terrace		S.Kingston	RI	02879
Hughes	William	241 Cannon HOB	ATTN: Ashley Evans	Washington	DC	20515
Humphreys, Jr.	H.R.			Weems	VA	22576
Hutchins	Eric	702 South Rd		Wakefield	RI	02879

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Hutchinson	Robert	The Virginian Pilot	150 W. Brambleton Ave.	Norfolk	VA	23510
Hutto	Earl	2435 Rayburn HOB	ATTN: Delisa Harmon	Washington	DC	20515
Isaacson	Dean	800 B 13th St		Virginia Beach	VA	23451
Island Fisherman	Long	14 Ramsey Rd		Shirley	NY	11967
Island Sportsman	Long	Mr. Bill Shaber	Box 242	Patchogue	NY	11722
Jacangelo	Dominic	Senator Owen Johnson	23-24 Argyle Square	Babylon	NY	11702
Jackson	Patricia	Lower James River Assoc.	PO Box 110	Richmond	VA	23201
Jackson	Robert	6074 Worcester Hwy		Snow Hill	MD	21863
Jacobs	John	410 Severn Ave	Suite 107A	Annapolis	MD	21403
Jasuta	Jim	108 N. Grenich St.		Montauk	NY	11954
Jensen	Arne	512 Shun Pike Rd.		Cape May	NJ	08204
Jensen	W. Peter	Tawes State Office Bldg.	580 Taylor Ave.	Annapolis	MD	21401
Johnson	Charles	194 Connetquot Dr.		Oakdale	NY	11769
Johnson	Tom	Greenpeace	1436 U Street	Washington	DC	20009
Johnson	Gail	RFD #1, Box 321		South Harpswell	ME	04079
Johnston	W. Scott	3544 Falstone Rd		Richmond	VA	23234
Jones	Susan	Commercial Fisheries News	PO Box 37	Stonington	ME	04681
Jones	Andrew	PO Box 2088		Montauk	NY	11954
Jones	Dr. Cynthia	Old Dominion University	AMRL	Norfolk	VA	23529
Julian	Joseph P	Julian's Bait Shop	PO Box 302	Atl. Highlands	NJ	07716
Kaiser	Dana	499 Main St		Metuchen	NJ	08840
Kamienski	Don	10 McCay Drive		Roebling	NJ	08554
Kaminsky	James	75 Woodcliff Dr.		Mattituck	NY	11952
Kanopka	John	3622 Princeton Dr. N.		Wantagh	NY	11793
Kanyuk	Dennis	593 Maude St		S. Hempstead	NY	11550
Kaplan	Eugene	148 Waterview St		Northport	NY	11768
Karanozinski	Andrew	7713 Central Ave		Sea Isle City	NJ	08243
Kavanagh	Pat	39 Burnham Dr		Falmouth	MA	02540
Kearney, Jr.	Steve	79 Laurel Dr.		Massapequa Park	NY	11762
Keene	Harry M.	28256 Widgeon Terrace		Easton	MD	21601
Kelleher	John	14 Brookridge Rd		Cape May Crthse	NJ	08210
Kennedy	John	135 Cedar Island Rd		Narragansett	RI	02882
Kennerly, Jr.	Harold B	1115 Woodland Rd.		Salisbury	MD	21801
Kenney	Heidi	Warwick Cove Marine	2 Seminole	Warwick	RI	02886
Kensler	Mike	Chesapeake Bay Found.	100 W. Plume Ctr, #701	Norfolk	VA	23510
Keros	Caranean	5622 Ravens Crest Dr		Plainsboro	NJ	08536
Kessinger	R.	926 Hayes St		Boldwin	NY	11510
Kieser	Fred	209 Bellevue Rd		Oakdale	NY	11769
Kim Bay Co., Inc		P.O. Box 51		Ocean City	MD	21842
King	Jim	220 East Mill Rd.		Mattituck	NY	11952
Kingston	Jack	1229 Longworth HOB	ATTN: Triece Ziblut	Washington	DC	20515
Kircher	Peggy	LGL Alaska Rsrch Assoc	4175 Tudor Centre Dr, 101	Anchorage	AK	99508
Kirkeberg	Eirik	Tacony Rd.		Wildwood	NJ	08260

Last Name	First Name	Address 1	Address 2	City	State	Zip
Kislowski	Sigmund	2607 Felter Lane		Bowie	MD	20715
Kisseli	Kenneth	103 Cartagena Dr		Brick	NJ	08723
Klinefelter	G.R.	21 West Main St.		Ephrata	PA	17522
Knisell	Ralph	100 W. Mantua Avenue		Wenonah	NJ	08090
Koehn	John	104 Campus Dr.		Princeton	NJ	08540
Kopel	Ty	Borden, Inc.	180 E. Broad St, 23rd Fl	Columbus	OH	43215
Kornahrens	Richard	14 Holly Tree Lane		East Islip	NY	11730
Koury	Peter	18 North Main St.	P.O. Box 778	Cape May Crthse	NJ	08210
Kozak	Linda	Access Unlimited, Inc	326 Center Ave, Suite 202	Kodiak	AK	99615
Kozofsky	Eric	31 Washington Heights		Hampton Bays	NY	11946
Krusa	David	Rt 2	Box 234	Montauk	NY	11954
Kuhnle	Alfred	117-26 228th Street		Cambria Heights	NY	11411
Kunz	Nancy	Dept of State CZMP	162 Washington Ave	Albany	NY	12231
Kurkul	Pat	NOAA Fisheries - F/NER72	One Blackburn Drive	Gloucester	MA	01930
LaMonica	Peter A.	Cape May Canners, Inc.	PO Box 158, Indian Trl.	Cape May	NJ	08204
LaRosa	Leo	19 Arcadia Ave.		Reading	MA	01867
Laaksonen	Will	VA Charterboat Assoc.	RT 2, Box 3D	Onancock	VA	23417
Lagace	Louis	3567 Main Rd.		Tiverton	RI	02878
Lambie	James T.	6 Ripley Lane		South Belmar	NJ	07719
Lancaster	H. Martin	2436 Rayburn HOB	ATTN: Skip Smith	Washington	DC	20515
Landau	Marc	696 Allwyn St.		Baldwin	NY	11510
Langreney	Fabrice	NACLS	9200 Basil Crt Suite 306	Landover	MD	20785
Lantz	Bryan	Cape Cod Times	#19 Cove Rd	New Orleans	MA	02653
Larson	Kirk	East 13th Street		Barnegat Light	NJ	08006
Laske	Ed	20 Iroquois Place		Massapequa	NY	11758
Lasprogata	Joe	2413 Whitby Rd		Havertown	PA	19803
Latannio, Jr.	John	50 Palmer Ave.		Staten Island	NY	10302
Laudeman	Keith	Cold Spring Fish & Sup.Co		Cape May	NJ	08204
Laudeman	Wally	Cold Spring Fish	& Supply Co.	Cape May	NJ	08204
Law Enforcement	NMFS	PO Box 4304		Salisbury	MD	21803-4304
Law Enforcement	NMFS	PO Box 277		Newport News	VA	23607
Law Enforcement	NMFS	PO Box 1869		Elizabeth City	NC	27906-1869
Lawrence	Geoffrey	Community Media, Inc.	25 W. Central Ave., Box93	Pearl River	NY	10965
Lazar	Naji	Coastal Fisheries Lab	1231 2nd Succotash	Wakefield	RI	02879
LeCates	John	222 Ann Ave.		Rehoboth Beach	DE	19971
LeCates	Harry L	222 Ann Ave		Rehoboth Bch	DE	19971
Legislative Comm.	NY State	on Water Resoure Needs-LI	11 Middleneck Rd. Sul.213	Great Neck	NY	11021
Leo	Arnold	E. Hampton Town Baymen' s	130 Gerard St.	E.Hampton	NY	11937
Leonard	Donald	PO Box 378		Chincoteague	VA	23336
Leonard	Thomas	Cape May County Library	30 West Mechanic St.	Cape May Crthse	NJ	08210
Lerman	Matthew	454 Beach 143rd St		Neponsit	NY	11694
Levin	Fred	Levin Marine Supply	PO Box 44	Fairhaven	MA	02719
Library		Rosenstiel School	4600 Rickenbacker Causewy	Miami	FL	33149

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Library	NMFS	Panama City Lab	3500 Delwood Beach Rd	Panama City	FL	32408
Library	Regional	Dept of Fish. & Oceans	Box 5667, St. Johns, Nfld	Canada A1C 5X1		
Licate	Jeff	Top Catch Seafood	87 Sackett	Brooklyn	NY	11231
Lick	Bob	831 State Rd		West Grove	PA	19390
Lighthouse Marina		P.O. Box 705		Barnegat Lt	NJ	08006
Lind	William	1974 East 37th St		Brooklyn	NY	11234
Lipcius	Dr. Rom	VIMS College of Wm & Mary	School of Marine Science	Gloucester Point	VA	23062
Livernois	Raymond	277 Yawgoo Valley Rd		Exeter	RI	02822
Livingston	Dick	NOAA/NMFS Law Enforcement	617 Hwy 71 Bldg 2	Brielle	NJ	08730
Livingston	Laura	Envit. Review Coordinator	26 Federal Plaza	New York	NY	10278
LoPerfido	Tony	911 83rd Street		Brooklyn	NY	11228
LoVerde	Eugene A	NMFS, Statistics	PO Box 143	Toms River	NJ	08753
Locandro	Dr.Roger	26 Grafton Rd	Frog Hollow Hog Farm	Stockton	NJ	08559
Loe	Roy	PO Box 76		Gwynn	VA	23066
Lofstad, Jr.	Rick	c/o Inlet Seafood	PO Box 2148	Montauk	NY	11954
Loftes, Jr.	Harold	271 Congdon Dr		Wakefield	RI	02879
Looft	Edward	20 Tracy Lane		East Islip	NY	11730
Lore	Joseph C	Box 21		Ridge	MD	20680
Loret	John	Science Museum of LI	1526 North Plandome Rd	Manhasset	NY	11030
Lucy	John	Marine Adv. Serv.	VIMS	Gloucester Pt.	VA	23062
Lund	Warren O	997 Ocean Drive		N. Cape May	NJ	08204
MacDonald	Joel	NOAA Fisheries - GCNE	One Blackburn Drive	Gloucester	MA	01930
MacKeil	Louis	PO Box 702		W. Hyannisport	MA	02672
MacLean	Malcolm O.	240 Causeway		Lawrence	NY	11559
MacMillan	Joseph	60 Atlantic Ave.		W. Sayville	NY	11796
Madsen	Stephanie	Aleutian Seafood Proc. As	Box 701	Unalaska	AK	99685
Malchoff	Mark H.	Cornell University Lab	39 Sound Ave.	Riverhead	NY	11901
Maliszewski	Ed	214 Emston Rd.		Parlin	NJ	08859
Mallari	Ana	123 Edgewood Ave.		San Francisco	CA	94117
Manchester	Francis	Point Trap Co.	1728 Main Rd	Tiverton	RI	02878
Mangano	James	Box 140		Amagansett	NY	11930
Manning	Richard	Staten Is.Fed.of Sprtsmen	263 Lincoln Ave.	Staten Island	NY	10306
Manzari	Nicholas	60 Bandolier Ln		West Bayshore	NY	11706
Marconi	Capt.Thomas	219 Kensington Rd.		Lynbrook	NY	11563
Maresca	Joe	1 Wellington Rd		Merrick	NY	11566
Marine Laboratory	Mote	Davis Library	1600 Thompson Parkway	Sarasota	FL	34236-1096
Marine Product Bd	Virginia	554 Denbigh Blvd, Suite B		Newport News	VA	23602-4240
Marion	Ron	Basic American Foods	309 Battles Street	Brockton	MA	02401
Marks	Rick	National Fisheries Instit	1525 Wilson Blvd. Ste.500	Arlington	VA	22209
Marks	Peter	8 Doxee Place		Islip	NY	11751
Martin	David	Martin Fish Co.	Box 51	Ocean City	MD	21842
Martin	James	National Westminster Bank	450 Tilton Rd	Northfield	NJ	08225
Martin	Robert L	Lock Drawer 179		Bellefonte	PA	16823

Last Name	First Name	Address 1	Address 2	City	State	Zip
Masin	William	Flamingo Rd.		Montauk	NY	11954
Mason	John	Dept. of Env. Cons.	SUNY Bldg. #40	Stony Brook	NY	11790
Mattera	Fred	28 Knowles Lane		West Kingston	RI	02892-1119
Matthews	Howard	616 Seashore Road		Cape May	NJ	08204
Mayflower Int.		P.O. Box 324		Wenham	MA	01984-0624
Maynard	Al	East Coast Fish. Ass'n	192 Ballard Ct. Suite 202	Virginia Beach	VA	23462
Mazurie	John	121-50th st.		Sea Isle City	NJ	08243
Mazza	John	Continental Capri Inc.	250 Jackson Street	Englewood	NJ	07631
McBride	Capt. Joe	PO Box 1908		East Hampton	NY	11937
McCauley	Jim	30 Woodman's Trail		Wakefield	RI	02879
McCay	Bonnie J	Dept. of Human Ecology	Cook College, PO Box 231	New Brunswick	NJ	08903
McCloy	Thomas W.	Div Fish, Game, Wildlife	CN 400	Trenton	NJ	08625
McCullough	Charles	PO Box 351022		Palm Coast	FL	32135-1022
McDaniels	Donald	1052 Shunpike Rd.		Cape May	NJ	08204
McElroy	Paul	Charter Ind. Magazine	PO Box 375	Stuart	FL	34995
McGarrigle, Jr.	Harry	2401 W. Brigantine Ave.		Brigantine	NJ	08203
McGuigan	Bruce	Box 157B, Route 3		Selbyville	DE	19975
McHugh	Dr. J.L.	c/o Vinson Hall	6251 Old Dominion Drive	McLean	VA	22101
McKeen	Michael	Box 184		Crosswicks	NJ	08515
McKernan	Dave	National Marine Fisheries	Box 606	Patchouge	NY	11772
McKown	Kim	NY State Env. Conservat.	SUNY Bld #40	Stony Brook	NY	11790-2356
McQuillan	Dan	PO Box 854		Mattapoisett	MA	02739
McSweeney	Philip	118 Old Stone Highway		East Hampton	NY	11937
McVey	Thomas	813 Seashore Rd		Cape May	NJ	08204
McWeeney	Leo	174 Bellvue Ave		Newport	RI	02840
Meadows	Wm. R.	Nanticoke Seafood Co.	PO Box 70	Nanticoke	MD	21840
Mears	Harold	NOAA Fisheries - F/NE04	One Blackburn Drive	Gloucester	MA	01930
Meberg	Dave	403 Anchorage Way		Freeport	NY	11520
Medeiros	Arthur	CT Comm Fishermen	236 N Water St	Stonington	CT	06378
Medved, PhD	Dr. R.J.	Great Circle Fisheries	78-A Park Place	East Hampton	NY	11937
Meier	Mike	VA Marine Resource Comm	PO Box 756	Newport News	VA	23607
Melius	Tom	US Senate Comm. of Commer	RM 428 Hart Bldg	Washington	DC	20510
Mendonsa	George	Tallman & Mack Trap Co.	Spring Wharf, PO Box 88	Newport	RI	02840
Meny	Thomas	PO Box 791		Pt. Lookout	NY	11569
Meredith	Russell	NMFS/NOAA	201 Varick St. Rm. 731	New York	NY	10014
Merrill	Jeff	918 Houston St		South Plainfield	NJ	07080-2109
Metzner	Rebecca	125 C. Street SE	Apt. 3	Washington	DC	20003
Middleton	Mark	PO Box 192		East Marion	NY	11939
Middleton	Robert	Minerals Mgmt Serv - 644	Pkwy Atrium Bdg 381 Elden	Herndon	VA	22070-4817
Midgette	Donald	Marine Safety Ofc.Hampton	200 Granby Mall	Norfolk	VA	23510
Miguell	Celerina	229 Cannon Building		Washington	DC	20575
Mihale	John	153 California Place N.		Island Park	NY	11558
Miles	John R.	J.H. Miles & Co., Inc.	Box 178	Norfolk	VA	23501

Last Name	First Name	Address 1	Address 2	City	State	Zip
Miller	Dr. Gary	Advanced Aquacultural Tec	PO Box 426	Syracuse	IN	46567
Miller	Mort	NMFS- Univ. S.Bldg.	1335 East-West Highway	Silver Spring	MD	20910
Miller	Richard	PO Box 816		East Quogue	NY	11942
Miller	Brian	Foot Brown Ave	PO Box 2180	Norfolk	VA	23501
Millikin	Mark	NMFS, F/CM2	1335 East West Highway	Silver Spring	MD	20910
Miranda	J.L.	Embassy of Spain/Agricult	2375 Pennsylvania Ave.,NW	Washington	DC	20037
Mirkovich	Nick	PO Box 168		Aransas Pass	TX	78335
Mitchell	Ed	67 Hillcrest Ave.		Wethersfield	CT	06423
Mizzele	Joe	1409 Gabriele Dr		Norfolk	VA	23502
Moffa	Michael	M. Moffa & Son Seafood	Box 748 Coles Mill Rd.	Franklinville	NJ	08322
Mombelardi	Ray	401 Valley Way		Bricktown	NJ	08723
Monaghan	Rick	NC Div. Marine Fisheries	PO Box 769	Morehead City	NC	28557
Montfort	John	Box 358	207 Sunset Blvd.	Barnegat Light	NJ	08006
Montgomery	Joe	Office of Fed Activities	401 M st SW, MC 2252	Washington	DC	20460
Moore	Niels	National Fisheries Instit	1525 Wilson Blvd, Ste 500	Arlington	VA	22209
Moran	Bob	NFI Suite 500	1525 Wilson Boulevard	Arlington	VA	22209
Morse	Peter	62 Tuttle Lane		Greenland	NH	03840
Mortensen	Kaj F.	EC Delegation	2100 M St.,NW, Suite 707	Washington	DC	20037
Mott	Bill	Marine Fish Conserv. Net.	1725 Desales NW	Washington	DC	20036
Muhlbaier	Craig	c/o Farm Credit S.Jersey	PO Box 188	Bridgeton	NJ	08302
Muller	Dr. Wm.	37 West 10th Ave.		Deer Park	NY	11729
Muller	Heinz	Envit. Review Coordinator	EPA Reg 4, 345 Cortland	Atlanta	GA	30365
Murawski	Steve	NEFC/NMFS	Water Street	Woods Hole	MA	02543
Murchelano	Robert	Northeast Fisheries Cntr	166 Water Street	Woods Hole	MA	02543
Murray, Jr.	John	PO Box 387		Brielle	NJ	08730
Musick	Dr. Jack	VIMS		Gloucester Pt.	VA	23062
Muzio, Director	Joseph	Kinsborough Comm College	2001 Oriental Blvd	Brooklyn	NY	11235
Myers	Richard	Eastern Shore Seaf. Prod.		Mappsville	VA	23407
NAFO		PO Box 638	Dartmouth, N.S.	Canada B2Y 3Y9		
NMFS		Statistics Investigations	P.O. Box 125	Greenbackville	VA	23356
Nardi	George	25 Adams St		Holbrook	MA	02343
Nash	James	19 Priest Blvd.		Rio Grande	NJ	08242
Newman	Kenneth	150 Lexington Ave		New York	NY	10016
Newman	Vivian	Sierra Club	11194 Douglas Ave	Marriottsville	MD	21104
Nicholls	Bruce	Wadland & Nicholls	265 Franklin Street	Boston	MA	02110-3109
Nickerson	Howard	Offshore Mariner's Assoc.	114 MacArthur Dr.	New Bedford	MA	02740
Nielsen	John	National Public Radio	635 Mass. Ave., N.W.	Washington	DC	20001
Nolan	John&Laurie	Box 2124		Montauk	NY	11954
O'Connell	Tory	Marine Fisheries Sect/AFS	304 Lake St., Room 103	Sitka	AK	99835
O'Connor	Michael	Boston Herald, Outdoor Ed	1 Herald Square	Boston	MA	02106
O'Hara	Joe	1919 Marlin Dr.		Ocean City	MD	21842
O'Hara and Sons	F.J.	145 Northern Ave		Boston	MA	02210
O'Malley	Jim	East Coast Fisheries	PO Box 649	Naragansett	RI	02882

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O'keefe	Jim	563 Sunny Ave.		Sommers Point	NJ	08244
Ocean, Inc.	Scan	33 Crafts Rd.		Gloucester	MA	01930
Oches	Arthur	1 Muriel Place		Manasquan	NJ	08736
Odierno	Linda	NJ Dept of Agriculture	CN 330, Rm. 200	Trenton	NJ	08625
Odlin	Arthur	210 A Pine St.		S. Portland	ME	04106
Odlin	Jim	PO Box 288		Portland	ME	04112
Office	Comm.	College of Wm. & Mary	VIMS	Gloucester Pt.	VA	23062
Offshore Fish Asn	Atl.	P.O. Box 3001		Newport	RI	02840
Ofiara	Douglas	Inst. of Marine & Coastal	Cook College, PO Box 231	New Brunswick	NJ	08903-0231
Olsen	Rolf	2042 Marshland Dr.		Charleston	SC	29414
Osmundsen	Sig	Sig's Dock, Inc.	704 W. Montgomery Ave.	Wildwood	NJ	08260
Ottmann	Barry	7017 Sandringham Ct.		Raleigh	NC	27613
Ouellette , CGLO	LCDR D.	National Marine Fisheries	8484 Georgia Ave., Ste415	Silver Spring	MD	20910
Outten	Bill	Tawes State Office Bldg.	580 Taylor Ave.	Annapolis	MD	21401
Overton	Ellen	1825 Connecticut Ave., NW	Rm 627 Universal South	Washington	DC	20235
Paladino	Thomas	2332 Royce St		Brooklyn	NY	11234
Pallone	Frank	241 Cannon HOB	ATTN: Jed Brown	Washington	DC	20515
Palmer	Steve	2647 Haddonfield Rd.		Pennsauken	NJ	08110
Parker, Esq.	Barry T.	3 Greentree Ctr Suite 401	Rt. 73 & Greentree Rd.	Marlton	NJ	08053
Parsons	H. Dale	7 Vermont Ave		Lewes	DE	19958
Paschall	Allan	2137 E. Admiral Drive		Virginia Beach	VA	23451
Patterson, Jr.	Jack	Patterson, Jrs., Inc.	PO Box 332	Barnegat Light	NJ	08006
Penello	Julian	2928 Replica Lane		Portsmouth	VA	23703
Pennypacker	Norman	Sea Watch	242 S Rehoboth Blvd	Milford	DE	19963
Peterson	Allen	NOAA Fisheries	NEFC Water Street	Woods Hole	MA	02543
Peterson	Ralph	Squid Mack Freezers	6 North Industrial Blvd	Bridgeton	NJ	08302
Petronio, Jr.	Everett	1239 Hartford Ave		Johnston	RI	02920
Phanz	Allen	Box 212		East Hampton	NY	11937
Phillips	Mark S.	F/V Illusion	217 4th St.	Greenport Village	NY	11944
Phillips	James H.	1021 Cedar Ridge Ct.		Annapolis	MD	21403
Pierce	David	Div. of Marine Fisheries	100 Cambridge St.	Boston	MA	02202
Plante	Janice M.	Commercial Fisheries News	1183 Taughannock Blvd.	Ithaca	NY	14850
Pleickhardt	John	15 Leach St.		Lyn	NY	11563
Poffenberger	Brian	Senator B. Mikulski	709 Hart Office Bldg. NE	Washington	DC	20510
Pollock	Susan	National Fisherman	65 Langdon St.	Cambridge	MA	02138
Pollum	Michael	217 N Princeton Ave.		Swarthmore	PA	19081
Power	Greg	NMFS, Woods Hole Lab	166 Water Street	Woods Hole	MA	02543
Powers	Collin	PO Box 10009	629 East Main St., 6th fl	Richmond	VA	23240
Pride	Bob	Fisheries Mngmt Committee	2105 Turnberry Cove	Virginia Beach	VA	23454
Pruitt	William	Marine Res. Comm.	P.O. Box 756	Newport News	VA	23607
Pt. Judith Fishmn		Cooperative Assoc., Inc.	P.O. Box 730	Narragansett	RI	02882
Puskas	Frances	1202 Central Ave.	PO Box 191	Barnegat Light	NJ	08006
Puskas, Jr.	Louis	PO Box 191		Barnegat Light	NJ	08006

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Quinby	Bill	Mayglower Int'l	PO Box 234	Wenham	MA	01984
Quinn	Adeline	1 Ocean Blvd		Lido Beach	NY	11561
RCG Fisheries		5 Beach Road East		Old Saybrook	CT	06475
RI Seafd. Council		212 Main St #3		Wakefield	RI	02879
Radio	WWQQ	News Director	721 Market St., Suite 101	Wilmington	NC	28401
Radonski	Gilbert	51 Pepper Tree Ct		Warrenton	VA	22186-3002
Ralyee	David	Frank Flower & Son	Ludlan Ave	Bayville	NY	11709
Randolph	Jack	304 Nottingham Dr.		Colonial Heights	VA	23834
Ratti	Bryan	6851 Imperial Dr		West Palm Beach	FL	33411
Ravenel, Jr.	Arthur	231 Cannon HOB	ATTN: Thomas Henderson	Washington	DC	20515
Raymond	Fran	Rockeseller Bros Fund	1290 6th Ave	New York	NY	10104-0233
Redmayne	Peter	Seafood Leader	1115 N.W. 46th Street	Seattle	WA	98107
Rees	Jeff	Borden, Inc	180 East Broad Street	Columbus	OH	43215
Reeve	Ian	3235 Emmons Ave		Brooklyn	NY	11235
Regenstein	Dr. J.M.	112 Rice Hall	Cornell Univ.	Ithaca	NY	14853-5601
Regional Director		NOAA Fisheries - F/NER	One Blackburn Drive	Gloucester	MA	01930
Reichle	Jeff	Lund's Fisheries	977 Ocean Drive	Cape May	NJ	08204
Reitz	Capt Doug	62 Laurel Lane		West Kingston	RI	02892
Reporting Spec.	Fishery	NMFS-Statistics Branch	PO Box 547	Narragansett	RI	02882
Reporting Spec.	Fishery	NMFS-Statistics Branch	PO Box 624	Cape May	NJ	08204
Reporting Spec.	Fishery	NMFS, Statistics Inv.	U.S. Custom House	New Bedford	MA	02740
Reporting Spec.	Fishery	NMFS, Rm 217 Fed. Bldg.	P.O. Box 708	Rockland	ME	04841
Reporting Spec.	Fishery	NMFS-Statistics Branch	PO Bldg. Thames St.	Newport	RI	02840
Reporting Spec.	Fishery	NMFS-Statistics Branch	29C Stage Harbor Rd	Chatham	MA	02633
Rhodes	Dusty	2361 Fire Lane North		Southampton	NJ	08088
Richard	G.	Dep. Min. of Fisheries	P.O. Box 2223	Halifax, N.S.		B3J 3C4
Richardson	George	Blount Seafood Corp.	Box 327	Warren	RI	02885
Richford	George	2150 Hendrickson St		Brooklyn	NY	11234
Ridge	Duncan	38 Shore Rd		E. Setauket	NY	11733
Riffe	Donald E	Old Salt Seafood	8978 Glebe Park Dr	Easton	MD	21601
Rins	Burton	Ruggiero Seafood	1137 Dickinson Ave	Yardley	PA	19067
Risdon	Frank	The Gorton Group	Gorton Rd, PO Box 309	Millville	NJ	08332
Ristori	Allan	1552 Osprey Court		Manasquan Park	NJ	08736
Robbins	Neil	7711 Roberts Ave		Sea Isle City	NJ	08243
Roberts	Fred	Deep Water Fleet, Inc.	376 Vanderbilt Blvd.	Oakdale	NY	11769-2038
Roberts	Mark	PO Box 99		Jonesport	ME	04649
Robinson F/NW02	William	NMFS	Bin C15700	Seattle	WA	98115
Robson	Ron	1447 Rt. 83		Cape May CourtHse	NJ	08210
Rodia, Jr.	Louis A.	6 N Main St		Cape May Crthse	NJ	08210
Rodrigues	Kathi L.	NOAA Fisheries - F/NER72	One Blackburn Drive	Gloucester	MA	01930
Roman	Gordon	Captree Boatmens Assoc.	17 Laurel Road	Freeport	NY	11520
Rose	Benny	712 Pilgrim Plaza		N. Cape May	NJ	08204
Rose	Arthur	4 Francis St		Westport	MA	02790

Last Name	First Name	Address 1	Address 2	City	State	Zip
Rosenman	Richard	Dept of State Room 5806	2205 C Street NW	Washington	DC	20520
Ross	Bob	8 Janes Road		Boxford	MA	01921
Rothschild	Dr. Brian	Chesapeake Bio Lab	Univ. of MD	Solomons	MD	20688-0038
Ruais	Rich	PO Box 447		Salem	NH	03079
Rubin	Bernie	Chincoteague Seafood	PO Box 21	Chincoteague	VA	23336
Rubins	Jonathan	2671 Village Blvd	Apt 302	West Palm Beach	FL	33409-6927
Rucky	Robert	15 Hunting Lane		East Islip	NY	11730
Ruggiero	Sal	96 Fairmont Ave		Chester	NJ	07930
Rugolo	Dr. Louis	MD Dept Nat. Res.	B-3 Tawes State Ofc. Bldg	Annapolic	MD	21401
Ruhle	James	PO Box 302		Wanchese	NC	27981
Ryan	Patrick	Micro Systems Integration	97 Stony Brook Rd	Stonington	CT	06378-1623
Ryder	Richard	14 Teal Rd.		Rio Grande	NJ	08242
Safina	Carl	National Audobon Society	306 S Bay Ave	Islip	NY	11751
Sampson	Mark	10418 Exeter Rd.		Ocean City	MD	21842-9792
Santich	Matthew	CR 112	PO Box 657	Greenwood	DE	19950
Santos, Jr.	Antone	77 Chancery St.		New Bedford	MA	02740
Sapp, Sr.	Robert L	Box D-14 River Village		Millsboro	DE	19966
Savadove	Larry	Jersey Shore Newsmagazine	1816 Long Beach Blvd	Surf City	NJ	08008
Savage	Ricks E.	11824 Parfin Drive		Berlin	MD	21811
Sawyer, III	Henry B	Kiawah-Seabrook Seafood	3966 Bohicket Road	Charleston	SC	29455
Schaefer F/CM	Richard	NMFS, SSMC Bldg 1	1335 East-West Highway	Silver Spring	MD	20910
Scheible	Capt. Bruce	23 Wynne Rd.		Ridge	MD	20680
Schick	Francis	7147 Marsden St		Philadelphia	PA	19135
Schill, Exec.Dir.	Jerry	NC Fisheries Assoc.	PO Box 12303	New Bern	NC	28561
Schmidt	Ray	185 Blue Point Rd.		Oakdale	NY	11769
Schumann	Chris	1 Bow Oarsmans Rd		East Hampton	NY	11937
Schwab	Fred	87 Old Farm Road		Levittown	NY	11756
Sciabarra	Joseph	31 Ross Lane		Sinai	NY	11766
Scott	Karl	312 Oxford Dr.		Savannah	GA	31405
Sea Grant Legal	Louisiana	170 Law Center	LSU	Baton Rouge	LA	70803-1018
Sea Watch Int'l.	M. Burns	8978 Glebe Park Drive		Easton	MD	21601
SeaCove, Inc.	Atlantic	402 "C" Street		Boston	MA	02210
Seafood, Inc.	Phillips	Saul Phillips	PO Box 817	Barnegat Light	NJ	08006
Seawave Corp.		PO Box 400		Rio Grande	NJ	08242
Seminara, Esq.	Joseph F	Wolff, Seminara & Mitberg	230 Park Ave.,Suite	New York	NY	10017
Serrone	Nat	881 Annette Dr.		Wantagh	NY	11793
Shackelford, Jr.	L.K.	PO Box 422		Hampton	VA	23669
Shepherd	Gary	NMFS/NEFC	166 Water Street	Woods Hole	MA	02543
Sherba, Jr.	John S	F/V Shearwater	16 Susan Lane	Green Creek	NJ	08219
Shinnecock Fish		Dock Inc	PO Box 728	Hampton Bays	NY	11946
Shoemaker	Dale E.	145 Winter Street		Bridgewater	MA	02324
Siegel	Al	41 Millbrook Drive		Stony Brook	NY	11790
Siegel	Lou	Shore Environmental Assc.	P.O. Box 202	Massapequa	NY	11758

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Siegel	Melvyn	American Swordfish Assoc.	7908 Bayshore Dr.	Margate	NJ	08402
Simmons	George	F/V Shearwater	814 Weekslanding Rd	Cape May	NJ	08204
Simmons	Marion R.	PO Box 10		Walterboro	SC	29488
Simonitsch	Mark	Nantucket Sound Fish Pier	84 Doane Rd.	Chatham	MA	02633
Sinning	John	PO Box 724		Southold	NY	11971
Skjevelano	Jorgen	U.S. Fish & Wildlife	1825 Virginia St.	Annapolis	MD	21401
Slikas	Vincent	87-34 95 st.		Woodhaven	NY	11421
Sloan	Stephen	Confed Atl Charter Boats	230 Park Av, Suite 1221	New York	NY	10169
Sminkey	Tom	DNR, Div. of Marine Res.	100 8th Ave., SE	St. Petersburg	FL	33701
Smith	Art	PO Box 399		Wanchese	NC	27981
Smith	Eric	Dept of Env. Protection	Marine Fisheries, Box 719	Old Lyme	CT	06371
Smith	Robert D	46 Woodcock Trail		Charlestown	RI	02813
Smith	Ronal	460 Gills Neck Rd.		Lewes	DE	19958
Smith	Terry	Northeast Fisheries Centr	166 Water Street	Woods Hole	MA	02543
Smith	Tom	7605 Worcester Hwy		Newark	MD	21841
Smith	LeAnn	88 Amityville St.		Islip Terrace	NY	11752
Smith	Bruce	416 Hulse Ave		Brick	NJ	08724
Smith	Mrs. Edward	7605 Worcester Highway		Newark	MD	21841
Solberg	Rob	3601 Somerset Dr.		Seaford	NY	11783
Spingler	Kevin	The Stony Brook School	Route 25A	Stony Brook	NY	11790
Spitsbergen	Dennis	NC Div of Marine Fish	PO Box 769	Morehead City	NC	28557
St John	Dr. R.Bruce	Caterpillar Inc.	PO Box 610	Mossville	IL	61552
Stallings	Jack	611 Goldsboro ave		Virginia Beach	VA	23451
State Univ.	Oregon	Library-Serials		Corvallis	OR	97331
Stavis	Fred	Stavis Seafoods, Inc.	148 Northern Ave.	Boston	MA	02210
Stavis	Norman	North Coast Seafoods	12-14 Fargo St	Boston	MA	02210
Steimle	Clair	US Dept of Commerce NOAA	Sandy Hook Lab	Higlands	NJ	07732
Stelle	William	Merchant Marine & Fisher.	1334 Longworth HOB	Washington	DC	20515
Stensland	John	Fisherman's Supply		Pt. Pleasant	NJ	08742
Stephens	Harry C.	237 Cabots Creek Drive		Myrtle Beach	SC	29577
Stevens	Lorelei	PO Box 655		West Harwich	MA	02671
Stevenson	Barbara	Suite 313	Two Portland Fish Pier	Portland	ME	04101
Stevenson	Douglas	Cntr for Seafarers Rights	241 Water St.	New York	NY	10038
Steves	Gale	Home Magazine	1633 Broadway, 41st floor	New York	NY	10019
Stolpe Exec. Dir.	Nils E.	3840 Terwood Dr.		Doylestown	PA	18901
Stone F/CM3	Dick	NMFS/NOAA	1335 East West Highway	Silve Spring	MD	20910
Stott III	Charles	1406 Bayvine Ave	Box 23	Barnegat Light	NJ	08006
Stotz	Richard	East St. & Mass. Ave.		Cape May	NJ	08204
Strand	Dr. Ivar	Univ of MD Ag & Res. Dept	2200 Symons Hall	College Park	MD	20742
Strattman	Steve	72 N. Lakeshore Drive		Manahawkin	NJ	08050
Stray	Bill	107-10 Shore Front Pkwy	Apt 8K	Rockaway Pt.	NY	11694
Street	Michael W.	NC Div. Marine Fisheries	PO Box 769	Morehead City	NC	28557-0769
Strombom	Dan B.	Rutgers Cooperative Ext.	4 Moore Road	Cape May Crthse	NJ	08210

Last Name	First Name	Address 1	Address 2	City	State	Zip
Studds	Gerry E.	Merchant Marine & Fish.	1334 Longworth HOB	Washington	DC	20515
Suisan Kaisha Ltd	Nippon	Bank of CA Center	900 Fourth Ave., 30F	Seattle	WA	98164
Sullivan	Michael	Westminister Press	1280 Ritchie Rd.	Capital Hghts	MD	20743
Sullivan	Patrick	PO Box 1028		East Hampton	NY	11937
Sullivan	John	245 E. Main St.		Gloucester	MA	01930
Sutton	Alex	IOLAR Enterprises	PO Box 919	Remsenburg	NY	11960
Swagler	Jim	1662 Yakana Rd		Towsown	MD	21204
Sweeney	Brian A.	Seafreeze Ltd.	100 Davisville Pier	N. Kingstown	RI	02852
Swenson	Carl	1201 Ocean Ave.	Apt. 78	Sea Bright	NJ	07760
Tadick	Vincent	Josh H. Carter Co.	33-34 Fulton Fish Market	New York	NY	10038
Tamimie	David	USCGR	245 Hampton Rd.	King of Prussia	PA	19406
Taormina	Anthony	7090 SE Lillian Crt.		Stuart	FL	34997
Tarasevich	Chris	Chipper Seafood	43 Celestial Dr	Sounderstown	RI	02874
Targett	Nancy	College of Marine Studies	University of DE	Lewes	DE	19958
Tatem	Damon	PO Drawer 429		Nags Head	NC	27959
Taylor	Gene	215 Longworth HOB	ATTN: Stephen Peranich	Washington	DC	20515
Taylor	Shirley	1414 Hilltop Drive		Tallahassee	FL	32303
Terceiro	Mark	NMFS/NEFC	166 Water Street	Woods Hole	MA	02543
Testaverde	Sal	11 Lakeridge Drive		Georgetown	MA	01833
Tharp	Robert	283 North St		West Creek	NJ	08092
Thomas	Randi	US Tuna Foundation	1101 17th St.N.W.Suite609	Washington	DC	20036
Thompson	Capt. Paul	95 Acorn Lane		Cape May Court Hse	NJ	08210
Tillett	Billy	PO Box 383		Wanchese	NC	27981
Tillett	Kevin	PO Box 159		Manteo	NC	27954
Times	Sakonnet	East Bay Window Section	1 Bradford St	Bristol	RI	02809
Timmons, Editor	Dale	Coastal Fisherman	9747 Golf Course Rd.	Ocean City	MD	21842
Tomorowiez	Dr Jacek	Polish Embassy, Econ. Co.	1503 21st St. N.W	Washington	DC	20036
Touris	Arthur	Touris Products Inc	34 Fifth St.	Pelham	NY	10803
Townsend	Chester	Sandy Landing		Dagsboro	DE	19939
Traber, Jr.	Frederic	300 E. Myrtle Rd.		Wildwood Crest	NJ	08260
Travelstead	Jack	Marine Res. Comm.	PO Box 756	Newport News	VA	23607
Tribbitt, Sr.	Robert L.	RD 2, Box 5		Frankford	DE	19945
Truex	Leroy	P.O. Box 727		Manahawkin	NJ	08050
Tully	William	39 Canoe Place Rd.		Hampton Bays	NY	11946
Tweedy, Jr.	Groege	168 Sumpwams Ave		Babylon	NY	11702
Ulanski	Prof. Stan	Dept of Geology	James Madison Univ.	Harrisonburg	VA	22807
Ulsh	Stephen	PA Fish & boat Commission	PO Box 67000	Harrisburg	PA	17106-7000
Unlimited, Inc.	Access	PO Box 2436		Port Angels	WA	98362
Unsoeld	Jolene	1527 Longworth HOB	ATTN: Jim Hoff	Washington	DC	20515
Valliere	April	Division of Fish & Wldlif	Succotash Rd	Wakefield	RI	02879
Vansant	Ron	8 E. Sunrise Rd		Petersburg	NJ	08270
Verbanas	Capt. Bill	2614 Whittier Dr		Wilmington	DE	19808
Vessels, Inc.	Atlantic	P.O. Box 178		Norfolk	VA	23501

Last Name	First Name	Address 1	Address 2	City	State	Zip
Village Dock	Viking	19th Street	Box 458	Barnegat Lt	NJ	08006
Vincent	Raoul	18 Argyle Drive		Northport, LI	NY	11768
Voss, Jr.	Leonard	210 N. Street		Smyrna	DE	19977
Wadelton	Peter	PO Box 1174		Mattituck	NY	11952
Wadsworth	John	15 First St.		Waterford	CT	06385
Wagner	Eric	AT & T Communication	340 Mt. Kemble Ave. S200	Morristown	NJ	07960
Wagner	Joe	10 Woodbine-Ocean View Rd		Ocean View	NJ	08230
Waidman	Alan	611 Roosevelt Blvd		Marmora	NJ	08223
Waldman	Cheryl	Cong. Info. Serv.	4520 East West Hwy.	Bethesda	MD	20814-3389
Walker, III	Wm E	57 Eastwood Rd		Media	PA	19063
Wall	Fred	68 Bay Breeze Dr.		Toms River	NJ	08753
Wallace	David	P.O. Box 1895		Salisbury	MD	21801
Wallo	Ron	RR2 Box 86 D		Dagsboro	DE	19939
Walsh	Laurence	P.O. Box 199		Barnegat Light	NJ	08006
Waltz	Bob	345 Rimson Rd.		Wading River	NY	11792
Wanchese Fish Co.		Box 369		Wanchese	NC	27981
Wang	Stanley	NOAA Fisheries - F/NER51	One Blackburn Drive	Gloucester	MA	01930
Ward	Charles	2332 Bayville Road		Virginia Beach	VA	23455
Ward	Lester	9308 Eclipse Drive		Suffolk	VA	23433
Wark	Kevin	1508 Bayview Ave		Barnegat Light	NJ	08006
Warny	Mrs. R.R.	Bridle Parh Jrbpr Acr		Prt Washington	NY	11050
Water Seafoods	Deep	Box 144A East Lake Dr.		Montauk	NY	11954
Watson	A. Wayne	10222 Golf Course Rd.		Ocean City	MD	21842
Watson	Edward	420 Fidler Rd		Woodbine	NJ	08270
Weber	Rick	C/O South Jersey Marina	PO Box 641	Cape May	NJ	08204
Weeks	Stevensn	410 Front Street	PO Drawer 360	Beaufort	NC	28516
Weeks	Theodore	6 Irongate Lane		Medford	NJ	08055
Wehner	Diane E.	c/o USEPA, Rm 3137-C	26 Federal Plaza	New York	NY	10278
Weis	Nancy B.	4002 Golfview Dr.		Newark	DE	19702
Weisberg	Richard	509 Nassau Ave		Freeport	NY	11520
Weiss	Alan	Blue Water Fishing Tackle	211 Boro Line Rd.	King of Prussia	PA	19406
Weiss	Peter	GCTA	304 Newbury St, Box 343	Boston	MA	02115
Weiss	Richard	167 Reid Ave		Rockaway Pt.	NY	11697
Welch	Ed	12501 Cassondra Ct.		Woodbridge	VA	22192
Wells	William	PO Box 600		Seaford	VA	23696
Wertz	Charles	160 Gordon Plance		Freeport	NY	11520
West	Susan	North Carolina Fisheries	PO Box 183	Buxton	NC	27920
West	Katy	NCDMF	1424 Carolina Ave	Washington	NC	27889
Wheat	Max	NY Marine Ed. Assn.	333 Bedell St.	Freeport	NY	11520
Whitted F/CM2	Shirley	NOAA/NMFS Room 8237	1335 East West Highway	Silver Spring	MD	20910
Wiegand	Robert	2034 East 73rd St		Brooklyn	NY	11234
Wilkings	Prof. Bruce	Cornell Coop DNR	112 Fernow Hall	Ithaca	NY	14853
William	Roy	41 River Edge Rd.		River Edge	NJ	07661

Last Name	First Name	Address 1	Address 2	City	State	Zip
Williams	Chris	11 Canal Way		Hampton Bays	NY	11946
Williams	James	PO Box 1308		Hampton Bays	NY	11946
Williams	John	2 Seminole St		Warwick	RI	02886
Williams	Roy	Marine Fisheries Comm.	2540 Exec Cntr West , 106	Tallahassee	FL	32301
Williams, F/CM1	Loretta	NMFS/NOAA, Rm. 8490	1335 East-West Highway	Silver Spring	MD	20910
Wilson	Doug	Axelsson & Johnson	993 Ocean Drive	Cape May	NJ	08204
Wilson	Jennifer	428 Monticello Blvd		Alexandria	VA	22305
Winkel	Rob	State of NJ, DEP	CN400 5 Station Plaza	Trenton	NJ	08625
Wise	William	Marine Science Res. Cntr.	Discovery Hall, Room 155	Stony Brook	NY	11794
Witek	Charles	1075 Tooker Ave		W.Babylon	NY	11704
Woodley-Miller	Cheryl	NMFS, Charleston Lab	PO Box 12607	Charleston	SC	29412
Wright	Dr. Jim	1120 1st Colonial Rd.		Virginia Beach	VA	23454
Wurster	Richard	245 Fifth Ave		West Cape May	NJ	08204
Wyatt	Joseph R.	JRW Associates	1904 Severn Grove Rd	Annapolis	MD	21401
Wypyszinskl	Alex	PO Box 231 Cook College	Rutgers Univ.	New Brunswick	NJ	08903
Young	Don	Fisheris Mngmt Subcommitt	2331 Rayburn HOB	Washington	DC	20515
Young	Ayanna	Greenpeace USA	1436 U Street, N.W.	Washington	DC	20009

APPENDIX 5. REGULATORY IMPACT REVIEW

1. INTRODUCTION

1.1. Purpose

Executive Order 12866, "Regulatory Planning and Review," was signed on September 30, 1993, and established guidelines for promulgating new regulations and reviewing existing regulations. While the executive order covers a variety of regulatory policy considerations, the benefits and costs of regulatory actions are a prominent concern. Section 1 of the order deals with the regulatory philosophy and principles that are to guide agency development of regulations. The regulatory philosophy stresses that, in deciding whether and how to regulate, agencies should assess all costs and benefits of all regulatory alternatives. In choosing among regulatory approaches, the philosophy is to choose those approaches that maximize net benefits to society.

The regulatory principles in E.O. 12866 emphasize careful identification of the problem to be addressed. The agency is to identify and assess alternatives to direct regulation, including economic incentives, such as user fees or marketable permits, to encourage the desired behavior. When an agency determines that a regulation is the best available method of achieving the regulatory objective, it shall design its regulations in the most cost-effective manner to achieve the regulatory objective. Each agency shall assess both the costs and the benefits of the intended regulation and, recognizing that some costs and benefits are difficult to quantify, propose or adopt a regulation only upon a reasoned determination that the benefits of the intended regulation justify its costs. Each agency shall base its decisions on the best reasonably obtainable scientific, technical, economic, and other information concerning the need for, and consequences of, the intended regulation.

The National Marine Fisheries Service (NMFS) requires the preparation of a Regulatory Impact Review (RIR) for all regulatory actions that either implement a new Fishery Management Plan (FMP) or significantly amend an existing plan. The RIR is part of the process of preparing and reviewing FMPs and provides a comprehensive review of the changes in net economic benefits to society associated with proposed regulatory actions. The analysis also provides a review of the problems and policy objectives prompting the regulatory proposals and an evaluation of the major alternatives that could be used to solve the problems. The purpose of the analysis is to ensure that the regulatory agency systematically and comprehensively considers all available alternatives so that the public welfare can be enhanced in the most efficient and cost-effective way. The RIR addresses many of the items in the regulatory philosophy and principles of E.O. 12866.

Executive Order 12866 requires that the Office of Management and Budget review proposed regulatory programs that are considered to be "significant." A "significant regulatory action" is one that is likely to:

> (1) Have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities;
>
> (2) Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;
>
> (3) Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or
>
> (4) Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in this Executive Order.

A regulatory program is "economically significant" if it is likely to result in the effects described in item (1) above.

The RIR is designed to provide information to determine whether the proposed regulation is likely to be "economically significant."

The document also contains an analysis of the impacts of the Plan relative to the Regulatory Flexibility Act and the Paperwork Reduction Act of 1980.

1.2. Description of User Groups

The fishery is described in sections 7 and 8 of this FMP.

1.3. Problems Addressed by the FMP

The problems to be addressed are discussed in section 4.2 of this FMP.

1.4. Management Objectives

The objectives of the FMP are to:

1. Reduce fishing mortality in the scup fishery to assure that overfishing does not occur.

2. Reduce fishing mortality on immature scup to increase spawning stock biomass.

3. Improve the yield from the fisheries.

4. Promote compatible management regulations between state and federal jurisdictions.

5. Promote uniform and effective enforcement of regulations.

6. Minimize regulations to achieve the management objectives stated above.

1.5. Provisions of the FMP

The management measures are presented below.

1.5.1. MEASURES TO ATTAIN MANAGEMENT OBJECTIVES

1.5.1.1. Specification of OY, DAH, DAP, JVP, TALFF, Overfishing Definition, and Fishing Mortality Rate Reduction Strategy

Section 303(a)(3) of the MFCMA requires that FMPs assess and specify the OY from the fishery and include a summary of the information utilized in making such specification. OY is to be based on MSY, or on MSY as it may be adjusted for social, economic, or ecological reasons. The most important limitation on the specification of OY is that the choice of OY and the conservation and management measures proposed to achieve it must prevent overfishing.

OY is all scup harvested pursuant to this FMP. OY cannot be specified as a quantity because it will change as the fishing mortality rate target varies and is dependent on the level of recruitment.

The Council has concluded that US vessels have the capacity to, and will, harvest the OY on an annual basis, so DAH equals OY. The Council has also concluded that US fish processors, on an annual basis, will process that portion of the OY that will be harvested by US commercial fishing vessels, so DAP equals DAH and JVP equals zero. Since US fishing vessels have the capacity and intent to harvest the entire OY, there is no portion of the OY that can be made available for foreign fishing, so TALFF also equals zero.

Overfishing for scup is defined as fishing in excess of the F_{max} level. F_{max} is a biological reference point that corresponds to the level of fishing mortality (F) that produces the maximum yield per recruit. Based on current conditions in the fishery, F_{max} is 0.24.

Stock assessment information indicates that scup are overfished. Age based analyses indicate that current fishing mortality rates (F) are at least 1.3.

The Council and the ASMFC Management Board approved a recovery strategy that reduces overfishing on scup over a 7 year time frame. The recovery strategy calls for minimum fish sizes and commercial gear regulations in year 1. In years 2 through 4, target exploitation rates would be 47% for scup. In years 5 and 6, the target exploitation rates would be 33% and in year 7 and subsequent years, the target exploitation rate would be based on F_{max}. Based on current conditions in the fishery, F_{max} is 0.24 and the associated exploitation rate is 19%. This recovery schedule is:

	Exploitation Rates
Current	69%
Year 2	47%
Year 5	33%
Year 7	19%

1.5.1.2 Specification of Adopted Management Measures

1.5.1.2.1. Permits and fees

1.5.1.2.1.1. Vessel permits and fees

1.5.1.2.1.1.1. General

Any owner of a vessel desiring to fish for scup within the US EEZ for sale, or transport or deliver for sale, any scup taken within the EEZ, must obtain a moratorium permit from NMFS for that purpose. The vessel must meet the criteria set forth in 1.5.1.2.1.1.2 in order to qualify for the moratorium permit.

The owner of a party and charter boat (vessel for hire) must obtain a party or charter boat permit.

A recreational vessel, other than a party or charter boat (vessel for hire), is exempt from the permitting requirement if it catches no more than the recreational possession limit, multiplied by the number of persons on board, of scup per trip.

A party or charter boat may have both a party or charter boat permit and a commercial moratorium permit to catch and sell if the vessel meets the commercial vessel qualification requirements set forth in 1.5.1.2.1.1.2. However, such a vessel may not fish under the commercial rules if it is carrying passengers for a fee. When a party or charter boat is operating as a commercial vessel, the crew size must not be more than 5 when it is operating as a party boat and not more than 3 when it is operating as a charter boat.

1.5.1.2.1.1.2. Moratorium on entry to the commercial fishery

There will be a moratorium on entry of additional commercial vessels into the scup fishery in the EEZ. Each state is encouraged to adopt complementary moratorium measures for those participating in the commercial fishery. Vessels with documented landings of scup for sale between 26 January 1988 and 26 January 1993 qualify for a moratorium permit to land and sell scup under this moratorium program.

Under the moratorium, vessels and moratorium permits together may be bought and sold with the approval of the Regional Director. Vessels that involuntarily leave the fishery (for example, vessels that were sunk or burnt) may be replaced with vessels of the same or less Gross Registered Tonnage (GRT) and overall

registered length as the vessel being replaced. Commercial vessels that are judged unseaworthy by the Coast Guard for reasons other than lack of maintenance may be replaced by a vessel with the same or less GRT and vessel registered length. Permits may not be combined to create larger replacement vessels. The moratorium may be terminated or replaced at any time by FMP amendment establishing an alternative limited entry system.

A vessel is eligible for a moratorium permit if it meets any of the following criteria:

1. The owner or operator of the vessel landed and sold scup in the management unit for scup between 26 January 1988 and 26 January 1993; or

2. The vessel was under construction for, or was being rerigged for, use in the directed fishery for scup on 26 January 1993 and provided the vessel has landed scup for sale prior to implementation of this Amendment. For the purpose of this paragraph, "under construction" means that the keel has been laid, the vessel is under written agreement for construction, or the vessel is under written contract for purchase. "Being rerigged" means physical alteration of the vessel or its gear had begun to transform the vessel into one capable of fishing commercially for scup; or

3. The vessel is replacing a vessel of substantially similar harvesting capacity which involuntarily left the scup fishery during the moratorium, and both the entering and replaced vessels are owned by the same person. "Substantially similar harvesting capacity" means the same or less GRT and vessel registered length for commercial vessels.

4. Vessels that are judged unseaworthy by the Coast Guard for reasons other than lack of maintenance may be replaced by a vessel with the same or less GRT and vessel registered length for commercial vessels.

Eligibility must be established during the first year of the FMP. In other words, the moratorium permit may not be applied for more than twelve months following the effective date of the final regulations or if a vessel is retired from the fishery. This does not affect annual permit renewals.

Vessel permits issued to vessels that involuntarily leave the fishery may not be combined to create larger replacement vessels.

Applicants for moratorium permits shall provide information with the application sufficient for the Regional Director to determine if the vessel meets the eligibility requirements. Sales receipts or dealer weighout forms signed by the dealer and, for condition 3, a notarized statement from marine architects or surveyors or shipyard officials will be considered acceptable forms of proof.

1.5.1.2.1.1.3. Permit application

The owner or operator of a qualified US vessel may obtain the appropriate Federal permit by furnishing on the form provided by NMFS at least the following information, and any other information required by the Regional Director: vessel name; owner name, mailing address, and telephone number; U.S. Coast Guard documentation number and a copy of the vessel's U.S. Coast Guard documentation or, if undocumented, the vessel's state registration number and a copy of the state registration; home port and principal port of landing; length; gross tonnage; net tonnage; engine horsepower; year the vessel was built; type of construction and type of propulsion; approximate fish hold capacity; type of fishing gear used by the vessel; number of crew; permit category; if owner is a corporation, a copy of the Certificate of Incorporation, and the names and addresses of all shareholders owning 25 percent or more of the corporation's shares; if the owner is a partnership, a copy of the Partnership Agreement and the names and addresses of all partners; if there is more than one owner, names of all owners having owned more than a 25-percent interest; the name and signature of the owner or the owner's authorized representative; permit number of any current or, if expired, previous Federal fishery permit issued to the vessel; and a copy of charter/party boat license and number of passengers the vessel is licensed to carry (charter and party boats). Operators of commercial vessels must also supply information required to establish that the vessels qualify for a

permit pursuant to the moratorium. The Regional Director will notify the applicant of any deficiency in the application. If the applicant fails to correct the deficiency within 15 days following the date of notification, the application will be considered abandoned.

Applicants for a permit under this FMP must agree, as a condition of issuance of the permit, to fish in accordance with federal rules whether they are fishing in the EEZ or state waters.

Permits expire: (1) when the owner or operator retires the vessel from the fishery, or (2) on 31 December of each year, or (3) when the ownership of the vessel changes; however, the Regional Director may authorize continuation of a vessel permit for the scup fishery if the new owner so requests. Applications for continuation of a permit must be addressed to the Regional Director.

The permit must be carried, at all times, on board the vessel for which it is issued, and must be maintained in legible condition. The permit, the vessel, its gear and catch shall be subject to inspection upon request by any authorized official.

The Federal costs of implementing an annual permit system for the sale of scup shall be charged to permit holders as authorized by section 303(b) (1) of the Magnuson Act. In establishing the annual fee, the Regional Director will ensure that the fee does not exceed the administrative costs incurred in issuing the permit, as required by section 304(d) of the Magnuson Act. Proper accounting for administrative costs may include labor costs (salary and benefits of permitting officers plus prorated share of secretarial support and supervision at both the NMFS regional and headquarters levels), computer costs for creating and maintaining permit files (prorated capital costs, time share and expendable supplies), cost of forms and mailers (purchase, preparation, printing and reproduction), and postage costs for application forms and permits.

1.5.1.2.1.2. Dealer permits and fees

Any dealer of scup must have a permit. A dealer of scup is defined as a person or firm that receives scup for a commercial purpose from the owner or operator of a vessel issued a moratorium permit pursuant to this FMP for other than transport.

An applicant must apply for a dealer permit in writing to the Regional Director. The application must be signed by the applicant and submitted to the Regional Director at least 30 days before the date upon which the applicant desires to have the permit made effective. Applications must contain the name, principal place of business, mailing address and telephone number of the applicant. The Regional Director will notify the applicant of any deficiency in the application. If the applicant fails to correct the deficiency within 15 days following the date of notification, the application will be considered abandoned. Except as provided in Subpart D of 15 CFR Part 904, the Regional Director will issue a permit within 30 days of the receipt of a completed application.

A permit expires on 31 December of each year or if the ownership or the dealer changes. Any permit issued under this section remains valid until it expires, is suspended, is revoked, or ownership changes. Any permit which is altered, erased, or mutilated is invalid. The Regional Director may issue replacement permits. Any application for a replacement permit shall be considered a new permit.

A permit is not transferable or assignable. It is valid only for the dealer to whom it is issued.

The permit must be displayed for inspection upon request by an authorized officer or any employee of NMFS designated by the Regional Director.

The Regional Director may suspend, revoke, or modify, any permit issued or sought under this section. Procedures governing permit sanctions or denials are found at Subpart D of 15 CFR Part 904. The Regional Director may, after publication of a notice in the *Federal Register*, charge a permit fee. Within 15 days after the change in the information contained in an application submitted under this section, the dealer issued the permit must report the change in writing to the Regional Director.

The Regional Director shall recognize state dealer permits in lieu of federal dealer permits if the permits contain the necessary information and are forwarded to the Regional Director by the appropriate state.

The states would recognize federal permit holders fishing in state waters. In addition, state permits would be required for persons harvesting or dealing in fish exclusively from state waters.

1.5.1.2.1.3. Operator permit and fees

An operator of a vessel with permit issued pursuant to this FMP (either a moratorium permit or a party/charter boat permit) must have an Operator's Permit issued by NMFS. Any vessel fishing commercially for scup under a moratorium permit or recreationally with a party/charter boat permit must have on board at least one operator who holds a permit. That operator may be held accountable for violations of the fishing regulations and may be subject to a permit sanction. During the permit sanction period, the individual operator may not work in any capacity aboard a federally permitted fishing vessel.

The permit program has the following requirements:

1. Any operator of a vessel fishing for scup must have an operator's permit issued by the NMFS Regional Director.

2. An operator is defined as the master or other individual on board a vessel who is in charge of that vessel (see 50 CFR 620.2).

3. The operator is required to submit an application, supplied by the Regional Director, for an operator's permit. The permit will be issued for a period of up to three years.

4. The applicant would provide his/her name, mailing address, telephone number, date of birth and physical characteristics (height, weight, hair and eye color, etc.) on the application, and would be requested to provide his/her social security number. In addition to this information, the applicant must provide two passport-size color photos.

5. The permit is not transferable.

6. Permit holders would be required to carry their permit aboard the fishing vessel during fishing and off-loading operations and must have it available for inspection upon request by an authorized officer.

7. The Regional Director may, after publication in the *Federal Register*, charge a permit fee.

1.5.1.2.2. Scup FMP Monitoring Committee

The Scup Monitoring Committee will be made up of staff representatives of the Mid-Atlantic, New England, and South Atlantic Fishery Management Councils, the Northeast Regional Office, the Northeast Fisheries Center, and ASMFC representatives. The MAFMC Executive Director or his designee will chair the Committee.

The Scup Monitoring Committee will annually review the best available data including, but not limited to, commercial and recreational catch/landing statistics, current estimates of fishing mortality, stock status, the most recent estimates of recruitment, VPA results, target mortality levels, beneficial impacts of size/mesh regulations, as well as the level of noncompliance by fishermen or states and recommend to the Council Committee and ASMFC Management Board commercial (annual quota, minimum fish size, and minimum mesh size) and recreational (possession and size limits and seasonal closures) measures designed to assure that the target mortality level on scup is not exceeded (as specified in section 1.5.1.1). The Committee will also review state regulatory programs for consistency with the FMP. The Committee will also review the gear used to catch scup to determine whether additional gears need to be regulated to help assure attainment of the fishing mortality rate target and propose such regulations as appropriate.

The Council and ASMFC will receive the report of the Committee and make its recommendations to the Regional Director. The Regional Director will receive the report of the Council and ASMFC and publish his report in the *Federal Register* for public comment by the date specified in the regulations which provide states sufficient time to implement quotas and other management measures. Following the review period, the Regional Director will set the final quota and other management measure adjustments for the year.

In summary, the steps from the Monitoring Committee for action by the Regional Director are:

1. The Monitoring Committee reviews the data and makes its recommendations to the Demersal Species Committee and ASMFC Management Board.

2. The Demersal Species Committee and ASMFC Management Board consider the recommendations of the Monitoring Committee and makes their recommendations to the Council and ASMFC.

3. The Council and ASMFC consider the recommendations of the Demersal Species Committee and ASMFC Management Board and make their recommendations to the Regional Director.

4. The Regional Director considers the recommendations of the Council and ASMFC and publishes proposed measures in the *Federal Register*.

The Monitoring Committee, Demersal Species Committee, ASMFC Management Board, and Council meetings will all be open to the public and provide an opportunity for public comment. The publication of the Regional Director's proposed action in the *Federal Register* provides an opportunity for public comment at that level.

1.5.1.2.3. Commercial Management Measures

1.5.1.2.3.1. Commercial fish size limitations

It would be illegal for owners or operators of vessels issued moratorium permits, except party and charter boats carrying passengers for hire, to possess scup less than 9" total length (TL). It would also be illegal to possess parts of scup less than 9" to the point of landing. Scup less than 9" TL could not be sold.

Vessels with commercial moratorium permits issued pursuant to this FMP would be required to fish and land pursuant to the provisions of this FMP unless the vessels land in states with larger minimum fish sizes than those provided in the FMP, in which case the minimum fish size would be required to meet the state limits. States with minimum size larger than those in the FMP are encouraged to maintain them.

The minimum fish size may be changed annually, if appropriate, following the Scup FMP Monitoring Committee process set forth in 1.5.1.2.2.

1.5.1.2.3.2. Minimum mesh requirement

Owners or operators of otter trawl vessels possessing 4,000 lbs or more of scup, may fish only with nets that have a minimum mesh size of 4.0" diamond mesh, inside measure, applied throughout the codend for at least 75 continuous meshes forward of the terminus of the net, or, if the net is not long enough for such a measurement, the terminal 1/3 of the net, measured from the terminus of the codend to the head rope.

Mesh would be allowed to be larger than the minimum size, but it could be no smaller than the minimum size. If the fish were landed in a state that has a more stringent net mesh regulation, the state regulation would prevail. States with minimum mesh regulations larger than those established in this FMP would be encouraged to maintain them.

In addition, this alternative would require that owners or operators of otter trawl vessels possessing 4,000 lbs or more of scup not have available for immediate use any net, or any piece of net not meeting the

minimum mesh size requirements, or mesh that is rigged in a manner that is inconsistent with the minimum mesh size. A net that conformed to one of the following specifications and that could be shown not to have been in recent use is considered to be not "available for immediate use:"

(1) A net stowed below deck, provided:

(i) it is located below the main working deck from which the net is deployed and retrieved;

(ii) the towing wires, including the "leg" wires, are detached from the net; and

(iii) it is fan-folded (flaked) and bound around its circumference.

(2) A net stowed and lashed down on deck, provided:

(i) it is fan-folded (flaked) and bound around its circumference;

(ii) it is securely fastened to the deck or rail of the vessel; and

(iii) the towing wires, including the leg wires, are detached from the net.

(3) A net that is on a reel and is covered and secured, provided:

(i) the entire surface of the net is covered with canvas or other similar material that is securely bound;

(ii) the towing wires, including the leg wires, are detached from the net; and

(iii) the codend is removed from the net and stored below deck.

(4) Nets that are secured in a manner approved by the Regional Director, provided that the Regional Director has reviewed the alternative manner of securing nets and has published that alternative in the *Federal Register*.

Any combination of mesh or liners that effectively decreases the mesh below the minimum size would be prohibited.

This alternative would prohibit the owner or operator of a fishing vessel from using any device, gear, or material, including, but not limited to, nets, net strengtheners, ropes, lines, or chaffing gear, on the top of the regulated portion of a trawl net; except that, one splitting strap and one bull rope (if present), consisting of line or rope no more than 2" in diameter, may be used if such splitting strap and/or bull rope does not constrict in any manner the top of the regulated portion of the net; and one rope no greater than 0.75 inches in diameter extending the length of the net from the belly to the terminus of the codend along each of the following: the top, bottom, and each side of the net. "Top of the regulated portion of the net" means the 50% of the entire regulated portion of the net which (in a hypothetical situation) would not be in contact with the ocean bottom during a tow if the regulated portion of the net were laid flat on the ocean floor. For the purpose of this paragraph, head ropes shall not be considered part of the top of the regulated portion of a trawl net.

The minimum net mesh size and threshold level could be changed annually, if appropriate, following the Scup FMP Monitoring Committee process set forth in 1.5.1.2.2. Based on the recommendations of the Scup Monitoring Committee and Council, the Regional Director, by regulatory amendment, shall implement regulations on gear other than otter trawls to achieve discards of scup equivalent to the discards with otter trawls given the minimum net mesh requirements. This provision is intended to address the problem that could develop if gear currently not in significant use in the scup fishery are developed as a way of avoiding the minimum otter trawl mesh rule.

1.5.1.2.3.3. Maximum roller diameter

It would be illegal for owners or operators of vessels issued moratorium permits to use roller rig trawl gear equipped with rollers greater than 18" in diameter.

The maximum roller diameter may be changed annually, if appropriate, following the Scup FMP Monitoring Committee process set forth in 1.5.1.2.2.

1.5.1.2.3.4. Minimum escape vent requirement

Scup pots and traps would be required to have a circular escape vent of with a minimum of 3.1" in diameter or a square escape vent with a minimum of 2.25" for each side or an equivalent rectangular escape vent. The escape vent provision would be implemented at the start of the first calendar year following FMP approval so that fishermen would not be required to pull their pots and add vents in the middle of the season.

A scup pot or trap would be defined by the state regulations that applied to a vessel's principal port of landing. The definition and the minimum escape vent requirement would apply to pots fished in both state and federal waters.

The escape vent requirement may be changed annually, if appropriate, following the Scup FMP Monitoring Committee process set forth in 1.5.1.2.2.

1.5.1.2.3.5. Degradable fasteners in traps and pots

Scup pots and traps would be required to have hinges and fasteners on one panel or door made of one of the following degradable materials:

a. untreated hemp, jute, or cotton string of 3/16" (4.8 mm) diameter or smaller;

b. magnesium alloy, timed float releases (pop-up devices) or similar magnesium alloy fasteners; or

c. ungalvanized or uncoated iron wire of 0.094" (2.4 mm) diameter or smaller.

A scup pot or trap would be defined by the state regulations that applied to a vessel's principal port of landing. The definition and the minimum escape vent requirement would apply to pots fished in both state and federal waters.

1.5.1.2.3.6. Seasonal and area closures

Gear-specific seasonal and area closures could be implemented to reduce discards in the commercial scup fishery and prevent quota overruns. Seasonal and area closures would be based on the recommendations of the Scup FMP Monitoring Committee to the Council and ASMFC Board. The Council and ASMFC would consider those recommendations and submit their recommendations to the Regional Director. The Regional Director would then set the season and area closures.

1.5.1.2.3.7. Commercial quota

Beginning in year 2, a quota would be allocated to the commercial fishery to reduce exploitation rates on the fully recruited age groups (i.e., fish larger than 9" TL). The commercial quota will be derived from a total allowable catch (TAC). The TAC will be calculated each year based on the target exploitation rate and the projected stock size estimates derived from annual stock assessment information.

The TAC will be allocated to the commercial and recreational fisheries based on the proportions of commercial and recreational catch (landings plus discards) for the years 1988-1992 (Table 40). Based on this data, 78% of the TAC would be allocated to the commercial fishery. An estimate of total coastwide

discards would then be subtracted from the commercial TAC to derive the allowable level of harvest (commercial quota).

During the first year of the FMP, a system to distribute and manage the annual commercial quota will be developed by the Council and Commission. Coastwide, regional and state by state quotas will be considered in combination with different fractions of the fishing year, e.g., bimonthly quotas.

The annual commercial quota will be set at a range of between 0 and the commercial share of the maximum allowed by the adopted fishing mortality rate reduction strategy. The commercial quota includes all landings for sale by *any* gear.

All landings by any vessel that has a commercial moratorium permit (permit to sell) counts against the quota, whether the scup are caught with an otter trawl, a scallop dredge, hook and line, or any other gear. If the vessel does not have a commercial moratorium permit, the fish may not be sold and the recreational rules on size, possession, and season apply.

The annual commercial quota would be based on the recommendations of the Scup FMP Monitoring Committee to the Council and ASMFC Board. The Council and ASMFC would consider those recommendations and submit their recommendations to the Regional Director. The Regional Director will set the commercial quota annually.

The quota will apply throughout the management unit, that is, in both state and federal waters. All commercial landings would count toward the quota. When the quota had been landed, fishing for and/or landing scup would be prohibited. The Regional Director shall close the EEZ to fishing for scup by commercial vessels when the quota has been landed.

Any landings in excess of the quota would be subtracted from the following year's quota. For example, if the quota was exceeded by 10,000 pounds in 1997, 10,000 pounds would be subtracted from the quota in 1998.

Using data collected through this FMP (section 1.5.1.3), NMFS will monitor the fishery to determine when a quota will be reached. It is expected that the states will assist NMFS with data collection.

1.5.1.2.4. Recreational Fishery Measures

1.5.1.2.4.1. Recreational Size, Possession, and Seasonal Limits

Beginning in year 1 of the management program, it would be illegal for recreational fishermen to possess whole scup or parts of scup less than 7" total length (TL).

Beginning in year 2, the recreational fishery throughout the management unit would be managed through an annual evaluation of a framework system (section 1.5.1.2.2) of possession limits, size limits, and seasonal closures. Beginning in year 2, recreational landings would be compared to annual target harvest levels established through the FMP Monitoring Committee process to determine if modifications to the recreational possession limit and size limit were required for the following year or if the fishery needed to be closed for certain periods.

The annual recreational possession limit, size limit, and season will be set at a range of between 0 and the maximum allowed by the recreational share of the adopted fishing mortality rate reduction strategy.

On vessels with several passengers, where catches are pooled in one or more containers, the number of scup contained on the vessel may not exceed the possession limit multiplied by the number of people aboard the vessel.

It is the responsibility of each state to assure that it implements measures equivalent with the Federal FMP. The Regional Director may prohibit landing scup from the EEZ by recreational vessels (party, charter, and

private boats) of any state not in compliance with this FMP (possession limit, size limit, and season). If the inaction of one or more states leads the Regional Director to conclude that the FMP will be adversely affected, he may close the entire EEZ to scup fishing.

1.5.1.2.4.2. Recreational Harvest Limit

Beginning in year 2, a recreational harvest limit would be allocated to the recreational fishery to reduce exploitation rates on the fully recruited age groups. The recreational harvest limit will be derived from an total allowable catch (TAC). The TAC will be calculated each year based on the target fishing mortality rate and the projected stock size estimates derived from annual stock assessment information.

The TAC will be allocated to the commercial and recreational fisheries based on the proportions of commercial and recreational catch for the years 1988-1992 (Table 40). Based on this data, 22% of the TAC would be allocated to the recreational fishery. An estimate of total coastwide discards would then be subtracted from the recreational TAC to derive the recreational harvest limit.

The annual recreational harvest limit will be set at a range of between 0 and the maximum allowed by the recreational share of the adopted fishing mortality rate reduction strategy.

Any landings in excess of the target harvest level would be subtracted from the following year's target level. For example, if the target was exceeded by 10,000 pounds in 1997, 10,000 pounds would be subtracted from the target harvest level in 1998.

1.5.1.2.5. Experimental Fishery

The Regional Director, in consultation with the Executive Director, may exempt any person or vessel from the requirements of this FMP for the conduct of experimental fishing beneficial to the management of the scup resource or fishery.

The Regional Director may not grant such exemption unless it is determined that the purpose, design, and administration of the exemption is consistent with the objectives of the FMP, the provisions of the Magnuson Act, and other applicable law, and that granting the exemption will not:

1. have a detrimental effect on the scup resource and fishery or cause any quota to be exceeded; or

2. create significant enforcement problems.

Each vessel participating in any exempted experimental fishing activity is subject to all provisions of this FMP except those necessarily relating to the purpose and nature of the exemption. The exemption will be specified in a letter issued by the Regional Director to each vessel participating in the exempted activity. This letter must be carried aboard the vessel seeking the benefit of such exemption.

All experimental activities must be consistent with the fishing mortality rate reduction schedule in the FMP.

It is the Council's intention that experimental fisheries are short-term fisheries to answer specific management questions and are not used to resolve short-comings in existing fishery management plans.

1.5.1.2.6. Enforcement recommendations

It is recommended that violators of the mesh regulations be severely punished. This is necessary to minimize abuses of the flexibility introduced into the management regime that allow for several meshes onboard. An example of a possible penalty would be a permit sanction.

1.5.1.2.7. Other measures

Only persons with a dealer permit may buy scup landed by a vessel that has a commercial moratorium permit issued pursuant to this FMP at the point of first sale.

Owners or operators of vessels with moratorium permits may sell scup at the point of first sale only to a dealer that has a dealer permit issued pursuant to this FMP.

Owners or operators of vessels with moratorium permits may not land scup during a period when the Regional Director has determined that the commercial quota has been landed.

All scup on vessels fishing with a mesh smaller than the legal minimum size must have any scup on board boxed in a manner that will facilitate enforcement personnel knowing whether the vessel has 4,000 lbs or more of scup on board to meet the minimum mesh size criterion. Any unboxed scup on board a vessel fishing with a net smaller than the legal minimum is considered a violation of this FMP. A standard 100 pound tote has a liquid capacity of 18.2 gallons (70 liters), or a volume of not more than 4,320 cubic inches (2.5 cubic feet).

The Regional Director may place sea samplers aboard vessels if he determines a voluntary sea sampling system is not giving a representative sample from the scup fishery.

No foreign fishing vessel shall conduct a fishery for or retain any scup. Foreign nations catching scup shall be subject to the incidental catch regulations set forth in 50 CFR 611.13, 611.14, and 611.50.

No vessel may use a net capable of catching scup in which the bars entering or exiting the knots twist around each other.

No person may assault, resist, oppose, impede, harass, intimidate, or interfere with either a NMFS-approved observer aboard a vessel, or an authorized officer conducting any search, inspection, investigation, or seizure in connection with enforcement of this FMP.

1.5.1.3. Specification and Sources of Pertinent Fishery Data

1.5.1.3.1. Domestic and foreign fishermen

Section 303(a)(5) of the MFCMA requires at least information regarding the type and quantity of fishing gear used, catch by species in numbers of fish or weight thereof, areas in which fishing was engaged in, time of fishing, and number of hauls must be submitted to the Secretary. In order to achieve the objectives of this FMP and to manage the fishery for the maximum benefit of the US, it is necessary that, at a minimum, the Secretary collect on a continuing basis and make available to the Councils: (1) scup catch, effort, and ex-vessel value and the catch and ex-vessel value of those species caught in conjunction with scup for the commercial fishery provided in a form that analysis can be performed at the trip, water area, gear, month, year, principal (normal) landing port, landing port for trip, and state levels of aggregation; (2) data on commercial fishery discards; (3) catch and effort for the recreational fishery; (4) biological (e.g., length, weight, age, and sex) samples from both the commercial and recreational fisheries; and (5) annual and fully comparable NMFS bottom trawl surveys for analyses of both CPUE and age/size frequency. The Secretary may implement necessary data collection procedures through amendments to the regulations. It is mandatory that these data be collected for the entire management unit, including North Carolina, on a compatible and comparable basis.

Commercial logbooks must be submitted on a monthly basis by federal moratorium permit holders in order to monitor the fishery.

Operators of party and charter boats with federal permits issued pursuant to this FMP must submit logbooks monthly showing at least name and permit number of the vessel; total numbers of each species taken; date(s) fished; number of trips; duration of trip; locality fished; crew size; landing port; number of anglers carried on each trip; and discard rate. A sample of party and charter boats may be required to report length frequencies of species caught for a sample of their trips.

States are encouraged to implement equivalent fishery data collection systems for the development of a coordinated statistics gathering effort.

It is intended that the reports required by this section are the same as the reports required by the Summer Flounder FMP, the Northeast Multispecies FMP, and the Atlantic Sea Scallop FMP. That is, fishermen need to submit one logbook report, not one report for each FMP.

Foreign fishermen are subject to the reporting and recordkeeping requirements in 50 CFR 611.

1.5.1.3.2. Dealers

In order to monitor the fishery and enable the Regional Director and the States to forecast when a closure will be needed, dealers with permits issued pursuant to this FMP must submit weekly reports showing at least the quantity of scup purchased (in pounds), and the name and permit number of the vessels from whom the scup was purchased.

Buyers that do not purchase directly from vessels are not required to submit reports under this provision. Dealers should report only those purchases from vessels (fishermen with commercial moratorium permits).

It is intended that the report required by this section is the same as the report required by the Summer Flounder FMP. That is, fishermen need to submit one logbook report, not one report for each FMP.

1.5.1.3.3. Processors

Section 303(a)(5) of the MFCMA requires at least estimated processing capacity of, and the actual processing capacity utilized by US fish processors must be submitted to the Secretary. The Secretary may implement necessary data collection procedures through amendments to the regulations.

1.5.2. ALTERNATIVES TO THE AMENDMENT

1.5.2.1. Take no action at this time

1.5.2.1.1. Description

No action would mean that the scup fishery would not be managed under the Magnuson Act. The resource would continue to be overfished.

1.5.2.2. A 9" TL minimum fish size and a 4.5" minimum mesh size in the otter trawl fishery when a vessel has 1,000 pounds or more of scup on board

1.5.2.2.1. Description

This alternative would allow fishermen to use only nets that have a minimum mesh size of 4.5" diamond mesh or 4.0" square mesh when they had 1,000 pounds or more of scup on board. In addition to the minimum mesh provisions, this alternative would require that fishermen not land for sale any scup smaller than the 9" TL minimum size limit. A maximum of a 5% tolerance by weight of undersized scup would be allowed on commercial vessels. Scup less than 9" TL could not be sold. This alternative would be used in conjunction with other alternatives such as the quota or closed seasons.

This alternative would require that owners or operators of otter trawl vessels possessing 1,000 lbs or more of scup, fish only with nets that have a minimum mesh size of 4.5" diamond mesh (4.0" square), inside measure, applied throughout the codend for at least 75 continuous meshes forward of the terminus of the net, or, if the net is not long enough for such a measurement, the terminal 1/3 of the net, measured from the terminus of the codend to the head rope. Mesh would be allowed to be larger than the minimum size, but it could be no smaller than the minimum size. If the fish are landed in a state that has a more stringent

net mesh regulation, the state regulation would prevail. States with minimum mesh regulations larger than those established by this alternative would be encouraged to maintain them.

In addition, this alternative would require that owners or operators of otter trawl vessels possessing 1,000 lbs or more of scup not have available for immediate use any net, or any piece of net not meeting the minimum mesh size requirements, or mesh that is rigged in a manner that is inconsistent with the minimum mesh size. A net that conformed to one of the following specifications and that could be shown not to have been in recent use is considered to be not "available for immediate use:"

(1) A net stowed below deck, provided:

(i) it is located below the main working deck from which the net is deployed and retrieved;

(ii) the towing wires, including the "leg" wires, are detached from the net; and

(iii) it is fan-folded (flaked) and bound around its circumference.

(2) A net stowed and lashed down on deck, provided:

(i) it is fan-folded (flaked) and bound around its circumference;

(ii) it is securely fastened to the deck or rail of the vessel; and

(iii) the towing wires, including the leg wires, are detached from the net.

(3) A net that is on a reel and is covered and secured, provided:

(i) the entire surface of the net is covered with canvas or other similar material that is securely bound;

(ii) the towing wires, including the leg wires, are detached from the net; and

(iii) the codend is removed from the net and stored below deck.

(4) Nets that are secured in a manner approved by the Regional Director, provided that the Regional Director has reviewed the alternative manner of securing nets and has published that alternative in the *Federal Register*.

Any combination of mesh or liners that effectively decreases the mesh below the minimum size would be prohibited.

This alternative would prohibit the owner or operator of a fishing vessel from using any device, gear, or material, including, but not limited to, nets, net strengtheners, ropes, lines, or chaffing gear, on the top of the regulated portion of a trawl net; except that, one splitting strap and one bull rope (if present), consisting of line or rope no more than 2" in diameter, may be used if such splitting strap and/or bull rope does not constrict in any manner the top of the regulated portion of the net; and one rope no greater than 0.75 inches in diameter extending the length of the net from the belly to the terminus of the codend along each of the following: the top, bottom, and each side of the net. "Top of the regulated portion of the net" means the 50% of the entire regulated portion of the net which (in a hypothetical situation) would not be in contact with the ocean bottom during a tow if the regulated portion of the net were laid flat on the ocean floor. For the purpose of this paragraph, head ropes shall not be considered part of the top of the regulated portion of a trawl net.

The minimum net mesh size could be changed annually, if appropriate, following the Scup FMP Monitoring Committee process set forth in 1.5.1.2.2 of the FMP. Based on the recommendations of the Scup Monitoring Committee and Council, the Regional Director, by regulatory amendment, shall implement

regulations on gear other than otter trawls to achieve discards of scup equivalent to the discards with otter trawls given the minimum net mesh requirements. This provision is intended to address the problem that could develop if gears currently not in significant use in the scup fishery are developed as a way of avoiding the minimum otter trawl mesh rule.

1.5.2.3. An 8" TL minimum fish size and a 4" mesh size in the otter trawl fishery when a vessel has 1,000 pounds or more of scup on board

1.5.2.3.1. Description

This alternative would allow fishermen to use only nets that have a minimum mesh size of 4.0" diamond mesh or 3.5" square mesh when they had 1,000 pounds or more of scup on board. In addition to the minimum mesh provisions, this alternative would require that fishermen not land for sale any scup smaller than the 8" TL minimum size limit. A maximum of a 5% tolerance by weight of undersized scup would be allowed on commercial vessels. This alternative would be used in conjunction with other alternatives such as the quota or closed seasons.

This alternative would require that owners or operators of otter trawl vessels possessing 1,000 lbs or more of scup, fish only with nets that have a minimum mesh size of 4.0" diamond mesh (3.5" square), inside measure, applied throughout the codend for at least 75 continuous meshes forward of the terminus of the net, or, if the net is not long enough for such a measurement, the terminal 1/3 of the net, measured from the terminus of the codend to the head rope. Mesh would be allowed to be larger than the minimum size, but it could be no smaller than the minimum size. If the fish are landed in a state that has a more stringent net mesh regulation, the State regulation would prevail. States with minimum mesh regulations larger than those established by this alternative would be encouraged to maintain them.

In addition, this alternative would require that owners or operators of otter trawl vessels possessing 1,000 lbs or more of scup not have available for immediate use any net, or any piece of net not meeting the minimum mesh size requirements, or mesh that is rigged in a manner that is inconsistent with the minimum mesh size. A net that conformed to one of the following specifications and that could be shown not to have been in recent use is considered to be not "available for immediate use:"

(1) A net stowed below deck, provided:

(i) it is located below the main working deck from which the net is deployed and retrieved;

(ii) the towing wires, including the "leg" wires, are detached from the net; and

(iii) it is fan-folded (flaked) and bound around its circumference.

(2) A net stowed and lashed down on deck, provided:

(i) it is fan-folded (flaked) and bound around its circumference;

(ii) it is securely fastened to the deck or rail of the vessel; and

(iii) the towing wires, including the leg wires, are detached from the net.

(3) A net that is on a reel and is covered and secured, provided:

(i) the entire surface of the net is covered with canvas or other similar material that is securely bound;

(ii) the towing wires, including the leg wires, are detached from the net; and

(iii) the codend is removed from the net and stored below deck.

(4) Nets that are secured in a manner approved by the Regional Director, provided that the Regional Director has reviewed the alternative manner of securing nets and has published that alternative in the *Federal Register*.

Any combination of mesh or liners that effectively decreases the mesh below the minimum size would be prohibited.

This alternative would prohibit the owner or operator of a fishing vessel from using any device, gear, or material, including, but not limited to, nets, net strengtheners, ropes, lines, or chaffing gear, on the top of the regulated portion of a trawl net; except that, one splitting strap and one bull rope (if present), consisting of line or rope no more than 2" in diameter, may be used if such splitting strap and/or bull rope does not constrict in any manner the top of the regulated portion of the net; and one rope no greater than 0.75 inches in diameter extending the length of the net from the belly to the terminus of the codend along each of the following: the top, bottom, and each side of the net. "Top of the regulated portion of the net" means the 50% of the entire regulated portion of the net which (in a hypothetical situation) would not be in contact with the ocean bottom during a tow if the regulated portion of the net were laid flat on the ocean floor. For the purpose of this paragraph, head ropes shall not be considered part of the top of the regulated portion of a trawl net.

The minimum net mesh size could be changed annually, if appropriate, following the Scup FMP Monitoring Committee process set forth in 1.5.1.2.2. Based on the recommendations of the Scup Monitoring Committee and Council, the Regional Director, by regulatory amendment, shall implement regulations on gear other than otter trawls to achieve discards of scup equivalent to the discards with otter trawls given the minimum net mesh requirements. This provision is intended to address the problem that could develop if gear currently not in significant use in the scup fishery are developed as a way of avoiding the minimum otter trawl mesh rule.

1.5.2.4. No minimum fish side and a 4.5" minimum mesh size in the otter trawl fishery when a vessel has 1,000 or more of scup on board

1.5.2.4.1. Description

This alternative would allow fishermen to use only nets that have a minimum mesh size of 4.5" diamond (4.0" square) mesh, inside measure, applied throughout the codend. Fishermen could land for sale scup of any size. This alternative would be used in conjunction with other alternatives such as the quota or closed seasons.

This alternative would require that owners or operators of otter trawl vessels possessing 1,000 lbs or more of scup, fish only with nets that have a minimum mesh size of 4.5" diamond mesh (4.0" square), inside measure, applied throughout the codend for at least 75 continuous meshes forward of the terminus of the net, or, if the net is not long enough for such a measurement, the terminal 1/3 of the net, measured from the terminus of the codend to the head rope. Mesh would be allowed to be larger than the minimum size, but it could be no smaller than the minimum size. If the fish are landed in a state that has a more stringent net mesh regulation, the state regulation would prevail. States with minimum mesh regulations larger than those established by this alternative would be encouraged to maintain them.

In addition, this alternative would require that owners or operators of otter trawl vessels possessing 1,000 lbs or more of scup not have available for immediate use any net, or any piece of net not meeting the minimum mesh size requirements, or mesh that is rigged in a manner that is inconsistent with the minimum mesh size. A net that conformed to one of the following specifications and that could be shown not to have been in recent use is considered to be not "available for immediate use:"

(1) A net stowed below deck, provided:

(i) it is located below the main working deck from which the net is deployed and retrieved;

(ii) the towing wires, including the "leg" wires, are detached from the net; and

(iii) it is fan-folded (flaked) and bound around its circumference.

(2) A net stowed and lashed down on deck, provided:

(i) it is fan-folded (flaked) and bound around its circumference;

(ii) it is securely fastened to the deck or rail of the vessel; and

(iii) the towing wires, including the leg wires, are detached from the net.

(3) A net that is on a reel and is covered and secured, provided:

(i) the entire surface of the net is covered with canvas or other similar material that is securely bound;

(ii) the towing wires, including the leg wires, are detached from the net; and

(iii) the codend is removed from the net and stored below deck.

(4) Nets that are secured in a manner approved by the Regional Director, provided that the Regional Director has reviewed the alternative manner of securing nets and has published that alternative in the *Federal Register*.

Any combination of mesh or liners that effectively decreases the mesh below the minimum size would be prohibited.

This alternative would prohibit the owner or operator of a fishing vessel from using any device, gear, or material, including, but not limited to, nets, net strengtheners, ropes, lines, or chaffing gear, on the top of the regulated portion of a trawl net; except that, one splitting strap and one bull rope (if present), consisting of line or rope no more than 2" in diameter, may be used if such splitting strap and/or bull rope does not constrict in any manner the top of the regulated portion of the net; and one rope no greater than 0.75 inches in diameter extending the length of the net from the belly to the terminus of the codend along each of the following: the top, bottom, and each side of the net. "Top of the regulated portion of the net" means the 50% of the entire regulated portion of the net which (in a hypothetical situation) would not be in contact with the ocean bottom during a tow if the regulated portion of the net were laid flat on the ocean floor. For the purpose of this paragraph, head ropes shall not be considered part of the top of the regulated portion of a trawl net.

The minimum net mesh size could be changed annually, if appropriate, following the Scup FMP Monitoring Committee process set forth in 1.5.1.2.2. Based on the recommendations of the Scup Monitoring Committee and Council, the Regional Director, by regulatory amendment, shall implement regulations on gear other than otter trawls to achieve discards of scup equivalent to the discards with otter trawls given the minimum net mesh requirements. This provision is intended to address the problem that could develop if gear currently not in significant use in the scup fishery are developed as a way of avoiding the minimum otter trawl mesh rule.

1.5.2.5. State by state commercial quotas

1.5.2.5.1. Description

This alternative would allocate the commercial quota on a state by state basis. States would have the responsibility for closures in their state and the Regional Director would be required to prohibit landings by Federally permitted vessels in any state that had reached its quota. States would be allowed to trade or

combine quotas and the states could impose trip limits or other measures to manage their quotas. The system would be the same as that operating under the Summer Flounder FMP.

1.5.2.6. Coastwide bimonthly commercial quotas

1.5.2.6.1. Description

This alternative would allocate the annual coastwide quota on a bimonthly basis. The Regional Director would be required to prohibit landings by federally permitted vessels when any bimonthly quota had been reached.

The quota setting process is specified in 1.5.1.2.2. Beginning in year 3, a quota would be allocated to the commercial fishery to control fishing mortality. The quota would be based on projected stock size estimates derived from stock assessment information for that year. Estimates of stock size coupled with the target fishing mortality rate would allow for a calculation of total allowable landings. Based on the historic proportions of commercial and recreational landings, 70% of the total target would be allocated to the commercial fishery (Table 11).

The annual commercial quota will be set at a range of between 0 and the commercial share of the maximum allowed by the adopted fishing mortality rate reduction strategy. The commercial quota includes all landings for sale by *any* gear.

All landings by any vessel that has a commercial moratorium permit (permit to sell) counts against the quota, whether the scup are caught with an otter trawl, a scallop dredge, hook and line, or any other gear. If the vessel does not have a commercial moratorium permit, the fish may not be sold and the recreational rules on size, possession, and season apply.

The annual commercial quota would be based on the recommendations of the Scup FMP Monitoring Committee to the Council and ASMFC Board. The Council and ASMFC would consider those recommendations and submit their recommendations to the Regional Director. The Regional Director will set the commercial quota annually.

The quota must apply throughout the management unit, that is, in both state and federal waters. All commercial landings during a bimonthly period would count toward the quota for that period. When the quota had been landed for a bimonthly period, fishing for and/or landing scup would be prohibited for the remainder of the period.

Any landings in excess of the bimonthly quota would be subtracted from the following year's quota for the same period. For example, if the period 1 (January-February) quota was exceeded by 10,000 pounds, 10,000 pounds would be subtracted from the period 1 allocation the following year.

Using data collected through this FMP (section 1.5.1.3), NMFS will monitor the fishery to determine when a bimonthly quota will be reached. It is expected that the States will assist NMFS with data collection.

The Regional Director shall close the EEZ to fishing for scup by commercial vessels when the bimonthly allocation has been landed.

The Regional Director may establish a system of trip limits to ensure an equitable distribution of the quota over the bimonthly period.

Annual quotas would be allocated on a bimonthly basis based on commercial landings for the period 1988-92 (Table 74).

1.5.2.7. Seasonal closures in the commercial fishery for years 3 and beyond

1.5.2.7.1. Description

This alternative would achieve the fishing mortality rate reduction target in years three and beyond through a seasonal closure in conjunction with a minimum fish size and/or minimum mesh size.

The Monitoring Committee would annually estimate a mortality target from the fishing mortality rate reduction schedule. From this, a seasonal closure would be specified to assure that the mortality target was not exceeded. This would go through a review, comment, and approval process involving the Council, ASMFC Management Board, and NMFS Northeast Regional Director.

Gear-specific seasonal closures would be implemented to control fishing mortality in the commercial scup fishery (Table 54). During a seasonal closure all gear capable of catching scup be removed from the water. In addition, vessels would be required to carry and operate an electronic vessel tracking device that met NMFS specifications.

1.5.2.8. Seasonal dependent minimum sizes in the commercial fishery: a 10" TL minimum size from October 1 - April 30 and a 9" TL minimum size for the rest of the year

1.5.2.8.1. Description

This alternative would allow commercial fishermen to use any size codend so long as they did not land for sale any scup smaller than the 9" TL minimum size limit from May through September 30 and a 10" TL minimum size limit from October 1 through April 30. A maximum of a 5% tolerance by weight of undersized scup would be allowed on commercial vessels. Scup less than the minimum size limit could not be sold. This alternative would be used in conjunction with other alternatives such as the quota or closed seasons beginning in year 3 of the management program.

The minimum fish size may be changed annually, if appropriate, following the Scup FMP Monitoring Committee process set forth in 1.5.1.2.2.

1.5.2.9. Individual transferrable quotas

1.5.2.9.1. Description

An individual transferrable quota (ITQ) program would assign annual quotas to individual vessels. Qualifications to participate could be the same as participation under the vessel moratorium. Initial allocations could be made based on sales receipts for the most recent five years, but no vessel could be allocated more than some maximum percentage. Fishermen would be prohibited from fishing for or landing scup after their annual allocations had been taken.

1.5.2.10. An 8" TL minimum fish size limit in the recreational fishery coastwide in years one and two of the management program

1.5.2.10.1. Description

This alternative would make it illegal for recreational fishermen to possess whole scup or parts of scup less than 8" TL in areas from Maine through Cape Hatteras, North Carolina.

1.5.2.11. An 8" TL minimum fish size limit in the recreational fishery in the EEZ with a 7" TL minimum fish size limit in the states of New York through North Carolina and an 8" TL minimum fish size limit in the states of Connecticut through Maine in state waters in years one and two of the management program

1.5.2.11.1. Description

This alternative differs from the preferred alternative in that the minimum size limit would be 8" TL in the EEZ coastwide and the 7" TL minimum size limit would include the state of New York. That is, this alternative would make it illegal for recreational fishermen to possess whole scup or parts of scup less than 8" TL in state waters from Maine through Connecticut. In state waters from New York through Cape Hatteras, North Carolina, this alternative would make it illegal for recreational fishermen to possess whole scup or parts of scup less than 7" TL.

1.5.2.12. A threshold requirement to qualify for a moratorium permit

1.5.2.12.1. Description

This alternative would require that a vessel have documented landings of scup equal to, or in excess of, some minimum threshold amount in order to qualify for a moratorium permit to land and sell scup under the moratorium program. The qualification period, 26 January 1988 to 26 January 1993, would remain identical to that proposed in the preferred alternative. However, this alternative differs from the preferred alternative in that the preferred alternative would require that any amount of scup (i.e., greater than 0 pounds) be documented for sale between those dates to qualify for the permit.

1.5.2.13. Separate management measures for party/charter boat fishermen

1.5.2.13.1. Description

This alternative would recognize that anglers fishing from party/charter boats form a distinct user group that is separate from other recreational or commercial fishermen. As such, beginning in year 3 of the fishery management program, management measures would be developed that were applicable only to this user group. These could include a coastwide harvest limit, minimum size limit, possession limit, and season.

2. REGULATORY IMPACT ANALYSIS

The impacts of the management measures are presented at continuation.

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

2.1.1. The FMP 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 pursuant to this title shall be consistent with the following national standards for fishery conservation and management." The following is a discussion of the standards and how this FMP meets them:

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

MSY (section 5.4 of the FMP) has not been specified for scup. OY is all scup harvested pursuant to this FMP.

Overfishing in the Scup FMP is defined as fishing in excess of the F_{max} level. F_{max} is a biological reference point that corresponds to the level of fishing mortality (F) that produces the maximum yield per recruit. The Council has adopted an overfishing definition for scup based on an estimate of F_{max}. F_{max} is a biological reference point derived from yield per recruit analysis and is defined as the fishing mortality rate that maximizes the yield per recruit. Best available information indicates that F_{max} is 0.24 for scup based on current conditions in the fishery.

Mortality rates on scup have increased substantially in recent years. Based on a review of coastwide data, mortality rates in the early 1980's were slightly greater than 0.3, the value derived by Mayo (1982)

for scup caught in the late 1970's. Howell (1990) estimated that F increased from 0.4 in the early 1980's to over 1.0 in 1988 based on catch curve and length based analysis of scup taken in Connecticut and Massachusetts surveys. Current estimates of F are 1.3 or higher. This information would indicate that scup have been overexploited (F's in excess of F_{max}) since the early 1980's. Assuming a current fishing mortality rate of 1.3 for scup, exploitation rates would have to be reduced 72% to achieve an F_{max} of 0.24.

The Council has adopted a strategy that will reduce mortality to the F_{max} level by the seventh year following FMP implementation. The following recovery strategy will be implemented. In year 1, minimum fish sizes and commercial gear regulations will be imposed. In year 2 to 4, target exploitation rates will be 47% for scup. In years 5 and 6, the target exploitation rates will be 33% and in year 7 and subsequent years, the target exploitation rate will be the one associated with F_{max} which is currently an F of 0.24 or an exploitation rate of 19%.

This seven-year strategy reflects the pressure now being placed on fishermen by other FMPs. Although the scup resource should be rebuilt as quickly as possible, scup management measures can be implemented over an seven-year time frame to minimize the short term economic burden placed on fishermen and still reduce the overfished condition of the stocks.

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

This FMP is based on the best and most recent scientific information available. Future scup research should be devoted toward both data collection and analysis in order to evaluate the effectiveness of this FMP. This species should be reviewed annually by the NEFSC Stock Assessment Workshop process.

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

The FMP's management unit is scup throughout their range on the Atlantic coast from Maine through Cape Hatteras, North Carolina, including the EEZ, territorial sea, and internal waters. This specification is considered to be consistent with National Standard 3.

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

The FMP does not discriminate among residents of different states. It does not differentiate among US citizens, nationals, resident aliens, or corporations on the basis of their state of residence. It does not incorporate or rely on a state statute or regulation that discriminates against residents of another state. Commercial and recreational regulations would be applied coastwide.

This FMP would establish a commercial fishery quota system and recreational harvest limit for scup, based on historical landings data. This allocation, based on traditional landings patterns, would ensure that fishermen received a fair and equitable share of the resource.

The commercial minimum fish size, minimum net provisions, threshold, and commercial quota and the recreational size limits, possession limits, season, and recreational harvest limit are all specified so that they may be adjusted annually following procedures set forth in the FMP to assure that the fishing mortality reductions strategy is followed. These provisions are, therefore, "reasonably calculated to promote conservation."

The definition of a scup pot or trap in this FMP is used because the construction of scup pots/traps differs from state to state. As such, it would be impractical to develop a definition that included all the pots/traps

that are used in the directed harvest of scup in the EEZ. A definition that is based on the vessel's principal port of landing is fair and equitable to the pot fishermen in the various states.

The moratorium is fair and equitable. The Council voted to establish 26 January 1990 as a control date for limiting entry into the fishery at its February 1990 meeting. The Federal Register notice of this date was published 7 June 1990. The moratorium was discussed at Council and Committee meetings, published in Council newsletters, and the moratorium was part of the preferred alternative in the public hearing draft of this FMP. Because of the delay in the development of this FMP, the time period for eligibility was extended three years from 1990 to 1993.

Vessels with any documented landings (i.e., greater than 0 lbs) of scup between 26 January 1988 and 26 January 1993 would qualify for a moratorium permit. Thus, any vessel which actively fished for and landed any amount of scup between these dates would be guaranteed access to the fishery.

The only vessels excluded by the moratorium provisions of the FMP would be those that landed scup prior to 1988 or after 26 January 1993. Unpublished NMFS weighout data (Maine-Virginia) indicates that between 1983 and 1987, 798 vessels landed 66.9 million pounds of scup. Forty-one percent of these vessels (326) landed 5.1 million pounds (7.6%) of the total scup landed commercially during the 1983-1987 period, but did not land scup during the moratorium period (1988-1992). These vessels may have switched to fishing for other species or discontinued fishing for scup due to retirement from the fishery.

In 1993, 9.2 million pounds of scup were landed by 498 vessels. Seventy-eight of these vessels landed 260 thousand pounds (2.8%) of the total scup commercially landed in 1993, but did not participate in the scup commercial fishery during the 1988-1992 period. Taking into consideration the limited degree of participation by these vessels in the scup fishery in 1993, and the fact that they did not land any scup between 1988-1992, it is likely that these vessels did not participate in a directed fishery for scup in 1993 but retained scup as a bycatch when fishing for other species. In addition, vessels entering the fishery after 26 January 1993 would have known that a control date for scup had been published on 26 January 1990. Thus, it is likely that few individuals would have made large investments to participate in a directed fishery for scup after this date.

Unpublished NMFS weighout data indicates that a total of 597 vessels participated in the fishery between 1988 and 1992. An additional 100 vessels from North Carolina could have participated in the scup fishery between 1988 and 1992 (R. Monaghan pers. comm.). Thus, it is likely that approximately 600-700 vessel owners would apply for commercial moratorium permits.

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

The management regime is intended to allow the fishery to operate at the lowest possible cost (e.g., fishing effort, administration, and enforcement) given the FMP's objectives. The objectives focus on the issue of administrative and enforcement costs by encouraging compatibility between federal and state regulations since a substantial portion of the fishery occurs in state waters. The FMP places no restrictions on processing, or marketing and no unnecessary restrictions on the use of efficient techniques of harvesting.

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

The management regime was developed to be compatible with and reinforce the management efforts of the states and the Commission. The minimum size regulations were developed with the recognition that the commercial and recreational fisheries have traditionally relied on different sizes of scup. In addition, reductions in stock size and specifically reductions in the availability of larger scup, have resulted in a situation such that most of the scup caught by recreational fishermen in recent years are 9" TL or less.

The commercial minimum size and mesh regulations were designed to reduce the discarding of small scup by otter trawl vessels, increase yields, and allow more scup to reach sexual maturity and spawn. The regulations differentiate between fishermen who encounter small amounts of legal-sized scup while fishing for other species and those fishermen targeting scup and exceeding the 4,000 threshold. Fishermen would be required to utilize a 4.0" mesh when a 4,000 lb threshold was reached. Vessels targeting scup now have an economic incentive to catch and discard large numbers of small scup using small mesh because they have the capability of sorting through large numbers of fish relatively quickly to cull the size of scup that can be sold at market. Discards would not be reduced without the mesh provision for these vessels.

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

The management regime was developed to be compatible with and reinforce the management efforts of the states and the Commission. The minimum size limits, quotas, possession limits, and, to some extent, closed seasons, can be enforced on shore, thus eliminating the need for high cost at sea enforcement. The provisions of this FMP have already been adopted by the Commission.

2.2. METHODOLOGY AND FRAMEWORK FOR ANALYSIS

For the alternatives considered in the plan, an analysis of expected benefits was conducted. In an ideal situation, as data permit, discounting can be employed to transform future benefits and costs into present values. The net yield steam over time associated with different alternatives would then be employed to evaluate and compare impacts. The benefits or value of the change in output are interpreted as the change in the consumers' and producers' surplus in the commercial sector. For recreational fisheries, consumer surplus can be estimated by the travel cost, contingent valuation, or other method. Unfortunately, the issues addressed in this Amendment cannot be quantified due to the lack of data. The analysis employed in the document is for the most part qualitative in nature, however, it is intended to analyze the directional effect of the course of actions and the effects on the fishing industry. A summary of the incremental benefits and costs of all major alternatives is presented at the end of the document.

2.3. PREFERRED ALTERNATIVES

2.3.1. Commercial Fishery

2.3.1.1. Moratorium on commercial vessels

The MFCMA allows the Council to limit entry into a fishery if the Council considers the factors set forth in section 303(b)(6) of the Act: "establish a system for limiting access to the fishery in order to achieve optimum yield if, in developing such system, the Council and the Secretary take into account (A) present participation in the fishery, (B) historical fishing practices in, and dependence on, the fishery, (C) the economics of the fishery, (D) the capability of fishing vessels used in the fishery to engage in other fisheries, (E) the cultural and social framework relevant to the fishery, and (F) any other relevant considerations;"

Participation in the scup commercial fishery between 1988 and 1992 was estimated to range between 600 and 700 vessels. In addition to scup, these vessels land *Loligo* squid, Atlantic mackerel, silver hake, summer flounder, black sea bass, and other species. Most of the marketable species caught in the mixed trawl fishery are depleted, if not technically overfished. A moratorium exists for vessels in the summer flounder fishery. The Mid-Atlantic Council has already determined that black sea bass are overfished, and has adopted a control date for limited entry. The New England Council has approved moratoria for the Northeast Multispecies FMP and the Scallop FMP.

The measures proposed in this Amendment will significantly impact fishermen. They are considered to be the most reasonable and fair given the need to dramatically reduce fishing mortality. The real issue is that, if the measures proposed in this Amendment are not implemented, the negative impact on the fishermen will be even greater.

Given the likely number of vessels operating in this fishery and the level of probable quotas beginning in year 2 of the management program, not controlling the number of vessels could lead to a significant waste of capital resources as the ever decreasing probability of profits are dissipated over more operating units.

The Amendment proposes a moratorium on new entrants to the commercial scup fishery. The main purpose of this provision is simply to cap entry so that any future gains in productivity and profitability which may occur in the fishery will not be dissipated by future entrants. In this way, the individuals who make sacrifices today will be able to share in the benefits of future stock recovery, rather than others who experienced none of the hardship.

The initial impacts of this provision are purely administrative. Vessel owners or operators will be asked to provide evidence that they harvested scup between 26 January 1988 and 26 January 1993.

There are a number of impacts which will occur in the short term. The very fact that entry into the industry has been curtailed will give vessels with moratorium permits a scarcity value that they would not otherwise possess. Experience in the surf clam fishery has shown that, over time, the value these moratorium permits can accrue is substantial, though the magnitude in the scup fishery will be reduced because a larger quantity of permits will be issued.

Fishermen will also be impacted by the provision controlling vessel replacement. This is intended as a means to reduce the number of vessels in the fishery slightly by attrition.

A final impact is the reduction in flexibility which fishermen with genuinely lost vessels will have in replacing them. The current specification of the preferred alternative requires that replacement vessels not have a larger tonnage or registered length than the original. On balance, this limitation is considered necessary to inhibit a large scale increase in the fishing power of the fleet through such replacements.

The MFCMA (section 303(b)(6)) provides that a fishery management plan may establish a system for limiting access to a managed fishery in order to achieve Optimum Yield if, in developing such a system, the Council and the Secretary take into account six factors. A discussion of those factors and their application to the proposed limited entry program for the scup fishery follows:

A. Present participation in the fishery.

Present participation in the scup commercial fishery is estimated to range from 498 to 598 vessels. The proposed program of limited entry seeks to reduce the size of the fleet gradually through natural attrition. No vessel which actively fished for scup between 26 January 1988 and 26 January 1993 would be denied access to the fishery. Approximately 600 to 700 vessels would qualify for the moratorium permit.

B. Historical fishing practices in, and dependence on, the fishery.

Fishermen using otter trawls account for the majority of commercial landings; 74% based on 1983 to 1992 data (Table 12). Other important commercial gears include floating traps, paired trawls, pound nets, pots and traps, and hand lines. Many species are caught in conjunction with scup (Table 32). Economically, scup is an important species in the mixed trawl fishery (Table 32).

C. The economics of the fishery.

Scup are economically one of the most important species in the mixed trawl fishery. The provisions of this Amendment, in order to solve the overfishing problem, will impose restrictions on the industry. Limiting entry is the only tool available under the MFCMA to allow vessel owners and operators to recover, at least in part, losses incurred during the rebuilding program. If entry remains open, profits will likely be dissipated among new entrants following recovery.

D. The capability of fishing vessels used in the fishery to engage in other fisheries.

Scup vessels traditionally harvest other species. However, a number of species in the mixed trawl fishery have also been determined to be overfished. The Mid-Atlantic Council has determined that summer flounder and black sea bass are overfished and is preparing an amendment to the Bluefish FMP to eliminate the overfished nature of that resource. The ASMFC has adopted an Amendment to their Weakfish FMP to eliminate an overfished situation. The Mid-Atlantic Council has also prepared an Amendment to the Atlantic Mackerel, Squid, and Butterfish FMP to limit entry into the squid and butterfish fisheries.

The proposed limited entry program will not force operators out of the fishery unless they clearly do not meet a minimum standard of involvement and activity in the fishery. The program is designed to continue over a period long enough to allow the number of operators to seek its own equilibrium level through natural attrition.

E. The cultural and social framework relevant to the fishery.

Many of the vessels in the fishery are owned and operated by independent, individual fishermen who have obtained their position of ownership through individual enterprise. There is a strong tradition of scup fishing within families. Many of the family operated businesses are the most vulnerable to an influx of additional vessels because they are not in a position to survive long periods without revenue, or to operate at significantly lower levels of gross revenue.

F. Any other relevant consideration.

The management program is designed to rebuild the stocks. However, the vessels currently in the fishery will have to sacrifice income opportunity as a part of the rebuilding program. While the net benefits to society from the management program are not in question, the benefits to individual operators who make the sacrifice could quickly be lost or eroded among new entrants. The length of the period of sacrifice is unknown. It would be unfair to dissipate the investment of these operators among a flood of opportunistic new entrants when it begins to appear that the stock is rebuilding. The proposed program of limited entry allows traditional operators to recoup at least a portion of their sacrifice. Such a program will promote resource stability and industry efficiency which is in the best interests of the fishing community and the nation.

2.3.1.2. Minimum fish size

Historic commercial length frequencies were used as an estimate of potential short-term impacts of length limits on the commercial scup fisheries (Tables 41 to 44). Specifically, commercial length frequencies from the NMFS Weighout Data and North Carolina DMF from 1982 to 1994 were used to determine potential size limit effects. In general, size frequency data indicated that potential size limit effects increased from north to south, were gear dependent, and varied from one year to the next.

Based on NMFS weighout data, approximately 19% of the measured scup were less than 9" TL for all otter trawl vessels with sampled landings (Table 44). This gear is associated with most of the commercial landings coastwide; otter trawl vessels accounted for over 74% of the coastwide landings based on 1983-1992 General Canvass data (Table 12).

A 9" TL minimum size regulation would have a slightly greater effect on landings from floating traps, the other predominant gear in the scup fishery. Based on NMFS weighout data, almost 26% of the measured fish were less than 9" TL for the 316 scup obtained from this gear from 1983 to 1991 combined (Table 44).

Size limit effects were more pronounced in North Carolina landings from the winter trawl fishery (Table 42). From 1982 to 1994, the amount of measured fish less than 9" TL ranged from 31.0% to 90.2%. However, North Carolina accounted for only 2% of the coastwide commercial landings on average from 1983-1992.

Combined, a coastwide commercial size limit of 9" TL would have affected approximately 10% to 39% of the scup landed by commercial fishermen for the years 1983-1993. Assuming that undersized fish are not caught and discarded, minimum size regulations have positive impacts on the stock. In general, because minimum sizes increase the size at full recruitment, yields are increased as fishermen catch larger, heavier fish. In addition, minimum size regulations can increase the resilience of the stock to overfishing, i.e., the biological reference points (F_{max}) can increase. Finally, minimum size regulations can increase spawning stock biomass by allowing more fish to spawn. Sexual maturity data for scup indicate that 50% of the scup are mature by a size of 6.8" TL and almost all are sexually mature by the time they reach a size of 10" TL.

A preliminary economic analysis of the impact of a reduction in discards was conducted by Mark Simonitsch (see comment letter in Appendix 2) and made available to Council staff during the hearing process. This analysis was modified slightly by Council staff and the results are as follows.

According to the Northeast Fishery Science Center (NEFSC), approximately 9.4, 9.2, and 13.9 million scup of age 0, 1, and 2, respectively, were discarded yearly on average from 1989 to 1993. If these scup had not been discarded but were allowed to survive to age 3 (average weight of 0.638 pounds), approximately 14.5 million additional pounds of scup would have been available for harvest over a three year period. Assuming an ex-vessel value of $0.54 per pound (Table 30), these discarded scup could have generated ex-vessel revenues of $7.8 million.

In addition to the reduction in discards, the implementation of a 9" TL minimum size limit will also have positive economic benefits. According to the NEFSC, on average (1989-1993), approximately 16 thousand pounds of age 0, 1.5 million pounds of age 1, and 8.1 million pounds of age 2 scup are landed yearly. Using the mean weight at age for commercial landings, and assuming that a 9" TL scup is a fish of age class 3 or less (Table 1), this would represent approximately 4.1 million pounds of scup measuring less than 9" TL. If these fish are assumed to be worth $0.18 per pound (Table 30), the potential foregone revenues from commercially landed scup measuring less than 9" TL would be $742,217 per year or approximately $2.2 million for a 3-year period.

However, this decrease in annual revenues are considered foregone earnings in one time period which may be realized later when the fish have grown to a larger size. If these scup were not landed but were allowed to survive to age 3, approximately 4.9 million additional pounds of scup would be available for harvest in the future. If these fish are assumed to be worth $0.54 per pound (Table 30), their potential ex-vessel value would be approximately $2.6 million. Thus the net benefit from delaying harvest until 9" TL would be at least $0.4 million for the three year period.

2.3.1.3. Minimum mesh size

Owners or operators of otter trawl vessels possessing 4,000 lbs or more of scup would only be allowed to fish with nets that have a minimum mesh size of 4.0" in the codend. During the development of this FMP, the Council and Commission were presented with data that indicated that the L_{50} (the length at which 50% of the scup are retained) is 8.3 inches for this mesh size (Table 45).

Retention lengths for scup were calculated by Mayo (1982) and are based on the relationship between length and body depth as derived by Smith and Norcross (1968). Although retention lengths were derived using body measurements, the results agree very well with selectivity experiments conducted by personnel at the University of Rhode Island (DeAlteris and Reifsteck 1990). Their results also indicated that the L_{50} for scup was 8.3" TL for a mesh size of 4.0" (Figure 14).

The results of the URI study indicate that approximately 80% of the 9" fish caught with a 4.0" mesh would be retained. These results suggest that a 9" minimum fish size combined with a 4.0" mesh may not decrease discards, i.e., a 4.0" mesh would catch a large number of 8" and smaller fish that would be discarded dead.
In addition to theoretical and empirical selectivity data, at-sea observations of the size distribution of scup caught and discarded are available from the NEFSC Sea Sampling Program. Scup discard data by mesh

size based on 1989-1993 NEFSC sea sampling of otter trawl tows which caught and measured scup are summarized in Table 46. It should be noted that this characterization of scup discards is based upon a limited number of sea sampled tows, especially for mesh sizes greater than 3.0 inches. Because of the limited nature of available data, all tows that caught scup which were subsequently measured were included in the analysis. As a result, the data set includes many tows where scup was not the target species.

In general, discarding of scup was high for the tows sampled, especially for mesh sizes less than 4.0 inches. This was due to the fact that the vast majority of scup caught in these mesh sizes were less than 9.0 inches (Table 46). The percent of scup discarded was highest for 3.0 inch mesh (93%), followed by liners (78%), 2.0 inch (74%), 4.5 inch (48%), and finally was lowest for 4.0 inch mesh (40%). The percent of scup retained that were less than 9.0 inches for the 4.0 and 4.5 inch meshes was considerably less compared to the smaller mesh sizes. From this perspective, the 4.0 inch mesh requirement should greatly reduce the proportion of scup below 9.0 inches that would have to be discarded relative to the status quo (i.e., the allowance of the use of smaller mesh sizes.) However, sea sampling data do suggest that some proportion of the scup less than 9" TL encountered would be retained by a 4.0 inch mesh.

During public testimony at Council and Commission meetings, commercial fishermen stated that a 4.0" mesh was the appropriate mesh for a 9" TL fish. They suggested that the results of the URI study were flawed because researchers had used a covered codend technique to estimate selectivity and, in fact, based on their personal experience at sea, a significant portion of the 9" TL fish that would encounter a 4.0" mesh would escape. Furthermore, these fishermen suggested that because most fishermen knew that this mesh was the appropriate size, compliance would be higher with the 4.0" mesh than it would be with a larger mesh size. As such, a greater reduction in the discard of small scup would occur with this mesh size then it would with a larger mesh.

Landings of scup represent only a portion of the fishing mortality experienced by the stock. Undersized scup, those less than 9" TL, experience both discard mortality and deaths due to encounters with commercial gear. The amount of fish dying due to these causes can be high with the current mesh sizes now used in the fishery, that is, an effective mesh size of 2.0" or less. Sea sampling data indicate that the weight of the discarded fish may be almost equivalent to the weight of the landings in some years. Discard rates are higher in years of good recruitment, that is, years when more small fish were available.

Scup are a component of the mixed trawl fishery in Southern New England and the Mid-Atlantic. Although Sea Sampling data indicate that fishermen may differentiate between species on a per tow basis (i.e., target a single species on a tow), fishermen land many different species on a per trip basis. Based on NMFS weighout data, scup are most frequently landed with *Loligo* squid, Atlantic mackerel, and silver hake. In fact, for trips landing 4,000 or more pounds of scup per trip, more *Loligo* squid were landed than scup in 1992 (Table 32).

However, this predominance of *Loligo* may reflect reduced availability of scup in 1992. Based on 1983 to 1987 data, the landings of otter trawl vessels landings 1,000 lbs or more of scup were composed primarily of scup (41%) (Table 47). *Loligo* accounted for only 17% of the landings.

The 4,000 pound threshold would not affect the majority of the vessels or trips that landed scup in 1992 or 1993. Based on NMFS weighout data, a threshold of 4,000 lbs per trip would have affected approximately 27% of the vessels and 10% of the trips landing scup in 1992 and 1993 (Tables 48 and 49). However, these trips accounted for 80% of the scup landed by otter trawl vessel in 1992 and 1993. Also, regulations that allow multiple nets onboard would allow fishermen who traditionally targeted multi-species on a trip, to fish for and retain other species with small mesh until the 4,000 pound threshold of scup was reached. These fishermen would then have to use the 4.0" mesh if they decided to target more scup. Once the threshold was reached fishermen would have to properly stow other codends for the remainder of the trip.

Landings of scup by fishermen targeting *Loligo* squid on the same trip could be affected by these regulations. Based on 1992 NMFS weighout data, 45% of the vessels and 29% of the trips landing 2,500

pounds or more of *Loligo* squid, landed over 95% of *Loligo* landed by all *Loligo* otter trawl fishermen (Tables 50 and 51). Based on this 2,500 pound threshold, scup comprise slightly more than 6% of the total fish landed on these trips (Table 52). However, the total pounds is slightly more than 50% of all scup landed by otter trawl fishermen in 1992.

In general, these regulations would modify some traditional fishing practices. The fishermen most affected by these regulations would be those fishermen who targeted scup first on their trip and retained more than 4,000 pounds of scup, before switching to other species for the remainder of their trip. Although, this group of fishermen is likely to be relatively small compared to total number of fishermen landing scup, landings of other species taken as bycatch by these fishermen could be affected.

Minimum mesh and fish size provisions will ensure that discards of sub-legal scup will be reduced. Greater gains will accrue to fishermen through protecting scup until they reach legal size. Discard mortality is extremely high for trawl caught fish and the problem is particularly acute when new year classes are abundant. The benefits of the proposed minimum fish size and mesh size regulations will be manifested through a more balanced age structure of the scup stock. Further, waste will be reduced due to (1) lower total discards and (2) lower mortality of net encounter.

The minimum net mesh size and threshold level could be changed annually, if appropriate, following the Scup FMP Monitoring Committee process set forth in 1.5.1.2.2.

Under the most ideal situation it could be expected that the economic benefits from the implementation of this alternative would have similar directional effects as those discussed under the minimum fish size alternative. This does not mean that the monetary values expected to result from the implementation of the minimum fish size limit alternative would increase with the implementing a minimum mesh size alternative. However, the implementation of both alternatives would likely enhance the possibility of decreasing discards in the fishery, as well as landings of scup of less than 9" TL.

The majority of the vessels that target scup in the otter trawl fishery use 4.0" mesh. Therefore, it is not expected that the implementation of this alternative would greatly affect current fishing practices.

2.3.1.4. Maximum roller diameter

It would be illegal for owners or operators of vessels issued moratorium permits to use roller rig trawl gear equipped with rollers greater than 18" in diameter. A 18" diameter corresponds to a maximum roller diameter used by some states to regulate this gear in state waters.

Roller diameter is correlated with vessel size and the ability of vessels to fish rough, hard bottom areas. Larger roller sizes require larger engine sizes to pull the net. An engine size with an associated horsepower of 800-900 hp is required to tow a net with 18" to 24" rollers whereas 10" to 12" rollers can be pulled by a boat using a-175-200 hp engine (D. Simpson pers. comm.).

Information is lacking as to the relationship between roller diameter and the size of obstruction that it can clear. In general, 10-12" diameter rollers can be used for fishing over rough bottom that can include ledges and cliffs. Limitations on roller size will make some areas of the ocean inaccessible to trawls by preventing fishermen from trawling in the harder, rough bottom areas. Thus scup associated with these areas would be protected from harvest allowing more fish to grow to maturity and spawn increasing stock biomass and yields.

2.3.1.5. Minimum escape vent requirement

Scup pots and traps would be required to have a circular escape vent of with a minimum of 3.1" in diameter or a square escape vent with a minimum of 2.25" for each side or an equivalent rectangular escape vent. The escape vent provision would be implemented at the start of the first calendar year following FMP approval so that fishermen would not be required to pull their pots and add vents in the middle of the season.

The body depth/length relationship derived by Smith and Norcross (1968) was used to derive the minimum sizes of scup that would be retained by fish traps fitted with escape vents (Table 53). An escape vent of 3.1" would allow scup less than approximately 9.0" TL to escape from the trap before it was brought to the surface.

Pots and traps accounted for approximately 2% of the total commercial landings for the period 1983-1992. Although only a small portion of scup are landed by fishermen using this gear, escape vents will allow for some undersized fish to escape alive increasing the amount of mature fish in the stock and increasing yields.

2.3.1.6. Degradable fasteners in traps

Scup pots would be required to have hinges and fasteners of one panel or door made of degradable materials. These materials would allow the door or panel of a trap to fall away from an unattended trap. This would prevent lost traps from "ghost fishing," i.e., continuing to catch and retain fish that could not be removed from the trap. Thus scup and other species of fish and invertebrates typically caught by these traps could escape preventing waste and lost yields in a number of fisheries.

Increases in costs from the implementation of this management strategy are expected to be minimal. Positive benefits would be derived from the prevention of "ghost fishing."

2.3.1.7. Seasonal and area closures

Gear-specific seasonal and area closures could be implemented to control fishing mortality and reduce discards in the commercial scup fishery. Seasonal and area closures would be based on the recommendations of the Scup FMP Monitoring Committee to the Council and ASMFC Board. The Council and Commission would consider those recommendations and submit their recommendations to the Regional Director. The Regional Director would then set the season and area closures.

NMFS General Canvass Data from 1988 to 1992 were used to determine the potential impact of seasonal closures on commercial landings of scup. The ASMFC technical committee decided that these years would be most representative of current conditions in the fisheries.

The Committee decided that seasonal closures for scup fishermen be applied on a coastwide basis. Calculations restricted the smallest unit of closure to one week. Seasonal closures were derived assuming that fishermen would recoup 0% and 15% of their landings during the open season. The 15% level applied to all mobile gears, including hook and line. Because of the fixed nature of the pots and traps, only a 0% (no recoupment) level was used for these gears.

If a recoupment level was assumed, calculations were made using a simple algorithm that accounted for changes in landings per day (LPD) during the open and closed seasons. For example, for scup landed by otter trawl fishermen, the time period from November 15 to January 31 accounted for 28% of the landings during 1988-1992. A closed season during these months would result in a fishing season that would be open for 8 1/2 months (February through November 14) or approximately 288 days. The amount of discretionary time during this open period would be 43 days (15% x 288 days). Since 72% of the landings occurred during the open period, the LPD during the open period would be 72 divided by the days fished or 245 (288-43). This LPD multiplied times the discretionary time (43 days) would result in a recoupment of 13%. As a result, the realized reduction in landings for the closed period February through May would be 15% (28% - 13%).

Seasonal closures ranged from slightly more than one month to four months depending on location (north or south) and gear type (Table 54). Seasonal closures could achieve the desired reductions if the following criteria were met:

1. The level of discretionary time used to derive the reductions is realistic. The assumed value of 15% may be an underestimate for some mobile gears.

2. All gear capable of catching scup be removed from the water during the closed period. Without such a provision, fishermen would continue to fish for other species during the closed period, catching and discarding scup in the process. For trawl fisheries, the technical committee recommended that mesh sizes of 5.5" diamond mesh or larger could continue to operate.

3. Landings patterns do not vary much from one year to the next, i.e., anticipated landings in year three of the management program are similar to the landings observed for 1988-1992.

Seasonal closures could be combined with area closures to reduce discards and prevent quota overruns. For example, based on 1989-1993 sea sampling and weighout data, statistical areas 537, 539, 616, and 622 (Figure 15), accounted for 75% of the landings (Table 55). Discard rates in these areas were approximately 40% or higher for these years (Table 56).

Any effective area/seasonal closure would require that NMFS be able to track commercial vessels on a real time basis to ensure compliance. Such a system could be comparable to the Vessel Monitoring System that will be implemented for groundfish and scallops by NMFS.

Seasonal and area closures would be designed to complement the quota based management system and reduce discards in the commercial fishery. However, it is important to note that seasonal and area closures would have to be designed such that fishermen would not negate seasonal and area closure effects by increasing effort or efficiency during the open season or area. In addition, the economic impact of the requirement that all gear capable of catching scup be removed from the water during a closure would have to be considered in regard to the catch of other important species that have been traditionally landed with scup on the same trip.

The short-term economic implication of area closures would be the lost of revenues from landings in the closed area versus landings from other areas or benefits from other activities. It is expected that the foregone earnings or lost in revenues to be small, because they will be realized shortly after the fish have grown to a larger size. The short-term economic implication of seasonal closures would depend on the duration of the closure, area to be closed, gear type been affected, and percent of fish recoup after the season reopens. Seasonal and area closures will complement other management measures and are expected to provide positive benefits by reducing fish mortality and protect habitat among others.

2.3.1.8. Commercial quota

Beginning in year 2, a quota would be allocated to the commercial fishery to reduce exploitation rates on the fully recruited age groups (i.e., fish larger than 9" TL). The commercial quota will be derived from a total allowable catch (TAC). The TAC will be calculated each year based on the target fishing mortality rate and the projected stock size estimates derived from annual stock assessment information.

The TAC will be allocated to the commercial and recreational fisheries based on the proportions of commercial and recreational catch for the years 1988-1992. Based on this data, 78% of the TAC would be allocated to the commercial fishery. An estimate of total coastwide discards would then be subtracted from the commercial TAC to derive the allowable level of harvest (commercial quota).

In determining how to allocate the TAC to the commercial and recreational fishermen, the Council and Commission examined several alternatives that allocated either catch or landings. They determined that allocating the TAC to the fisheries and then removing the discards to determine the annual harvest limits was fair and equitable to both the commercial and recreational fisheries.

A TAC has not yet been derived for 1997, the second year of the management program. As such, catch data for 1988-1992 were used to derive the average catch for those years to calculate a possible TAC for illustrative purposes. Based on these data, a 32% reduction in exploitation would equate to a TAC of 16.83 million pounds.

Based on a TAC of 16.83 million lbs, 13.13 million lbs would be allocated to the commercial fishery and 3.70 million lbs to the recreational fishery. Then, assuming an average discard rate based on 1988-1992 data for each fishery, and subtracting these discards from the catch, 5.64 million lbs would be allocated to the commercial fishery as a quota and 3.46 million lbs to the recreational fishery as a harvest limit (Table 57). If total discards (commercial and recreational) were removed from the TAC and then the landings allocated to each fishery (70% commercial and 30% recreational based on historic percentages), the commercial quota would have been slightly larger at 9.1 million lbs and the recreational harvest limit lower at 2.73 million lbs. Under this rejected alternative, the recreational fishery allocation would have been reduced because of high discards in the commercial fishery, i.e., the higher the commercial discards the lower the recreational harvest limit.

However, under the chosen allocation system, the commercial fishery has a direct incentive to reduce discards, i.e., the lower the discards the higher the quota for a given TAC. For example, if commercial discards were reduced by 30% to 5.24 million lbs and the TAC remained constant at 16.83 million lbs, the commercial quota would increase to 7.89 million lbs (Table 57). Conversely, if discards were to increase 30%, the commercial quota would be reduced to 3.39 million lbs. In both cases, the recreational harvest limit would remain the same at 3.46 million lbs. In addition to the direct benefit of an increase in quota, a reduction in discards will benefit both the commercial and recreational fisheries as fish survive to grow larger and spawn increasing the biomass available for harvest.

In summary, changes in the discard rate in the commercial fishery would affect the commercial quota when allocations are based on catches as well as landings. However, changes in the discard rate in the commercial fishery would only have a direct effect on the recreational harvest limit when allocations are based on landings. When allocations are based on catches, the commercial sector would receive the full effect of a change in the rate of discards, i.e., commercial quota would increase proportionally to the level of discard reduction. Under allocations based on catches, each fishery would be treated fairly with respect to their contribution to discards and the effect of those discards on their shares of TAC.

During the first year of the FMP, a system to distribute and manage the annual commercial quota will be developed by the Council and Commission. Coastwide, regional and state by state quotas will be considered in combination with different fractions of the fishing year, e.g., bimonthly quotas. The following is an analysis of two possible management systems; a state-by-state and a bimonthly, coastwide system.

In a state-by-state system, quotas would be distributed to the states based on their percentage share of commercial landings for the period 1988-1992. Assuming a coastwide quota of 5.64 million pounds, quotas would range from 7,890 lbs to 2.46 million lbs based on these percentages (Table 58).

A state-by-state quota system could allow for the most equitable distribution of the commercial quota to fishermen. Specifically, states under this alternative would have the responsibility of managing their quota for the greatest benefit of the commercial scup industry in their state. States could design allocation systems based on trip limits and seasons. States would also have the ability to transfer or combine quota increasing the flexibility of the system to respond to year to year variations in fishing practices or landings patterns.

However, state-by-state allocations would negatively affect fishermen who land in those states that do not have the capability of regulating a quota. Based on the quota system implemented for summer flounder, a few states have not been able to establish trip limit systems that ensure a continuous and steady supply of product over the season for producers and/or a fair an equitable distribution of flounder to all fishermen who have traditionally landed summer flounder in their state. In addition, some states have had problems coordinating their regulations with neighboring states to prevent large scale landings by fishermen in states with the most favorable trip limits. A similar situation could occur if a state-by-state system was implemented for scup.

As one alternative to a state-by-state system, the coastwide quota could be allocated on a bimonthly basis. The Regional Director would be required to prohibit landings by federally permitted vessels when any bimonthly quota had been reached.

The quota must apply throughout the management unit, that is, in both state and federal waters. All commercial landings during a bimonthly period would count toward the quota for that period. When the quota had been landed for a bimonthly period, fishing for and/or landing scup would be prohibited for the remainder of the period.

A bimonthly quota system could allow for an equitable allocation of the commercial quota to northern and southern participants as well as between the smaller day boats and larger offshore vessels. Due to the seasonal nature of the scup fishery, the quota would have to be divided into bimonthly units. To minimize effects on traditional landings patterns, the allocation to each period would be based on past landings instead of a system that divided the quota equally over the six periods. Based on 1988-1992 data, 22.4% would be allocated to period 3 (May-June) and only 5.3% to period 4 (July-August) (Table 59). The bimonthly allocations would range from 298,638 lbs to 1,713,199 lbs based on a annual quota of pounds 5.63 million lbs (Table 59). Based on state data for those years, fishermen would be able to maintain traditional landings patterns in most states (Tables 60 and 61).

A coastwide system would allow fishermen to land in any port along the coast and all commercial landings during a bimonthly period would count toward that quota for that period. When the quota had been landed for a bimonthly period, fishing for and/or landing scup would be prohibited for the remainder of the period. Landings in excess of the allocation for the period would be subtracted from the following years's quota for the same period. Trip limits would have to be implemented. Bimonthly allocations without trip limits would encourage derby-style fishing practices that would allow the quota to be landed by larger, more mobile vessels at the beginning of each period. As a result, supplies of scup would be discontinuous and smaller boats would be disadvantaged.

Trip limits would be established and modified throughout the two-month period to allow for a continuous supply of product and equitable distribution of scup to fishermen using both small and large vessels. For example, almost all of the landings in period 1 are attributable to fishermen using otter trawl vessels. A 10,000 pound trip limit could be established for the beginning of period 1. The limit would decrease to 5,000 lbs when 50% of the allocation was reached, 1,000 lbs when 75% of the quota was taken, and 500 lbs when 90% of the landings were reached.

Different trip limit systems could be designed for each period to ensure equitable distribution over each two-month period. Unlike a system where states have the flexibility to design their own systems, NMFS would be responsible for implementing trip limits for each period.

An overall quota for the commercial fishery is important to control mortality on the scup population. The minimum size regulation may reduce discard and escape mortality of undersized scup. However, decreases in mortality would occur only with the smaller fish; reductions in mortality would not occur for scup once they reached the legal size of 9" TL. Essentially the fish that contribute the most to the spawning population, fish 9" TL and larger, would continue to experience high mortality rates; overfishing would not be reduced. The commercial quota will control mortality on fully recruited, older fish.

This management measure will result in a short term reduction in the marketable catch and long term benefits as more fish mature and increase the size of the spawning stock. In addition, a reduction in the mortality of small scup will allow for an increase in yield or harvest as small fish that were previously killed grow larger and add weight to the stock.

Combined, these management measures, the minimum mesh and size regulations and the commercial quota, will prevent overfishing and reduce waste. As the stock rebuilds and exploitation rates remain constant, commercial quotas would increase.

2.3.2. Recreational Fishery

2.3.2.1. Possession limits, minimum size limits, and seasonal closures

Based on 1983 to 1994 MRFSS data, only 14% and 7% of the scup caught by recreational fishermen in the North and Mid-Atlantic, respectively, were caught in the EEZ (Table 23). In 1994, 15% of the total scup caught by recreational fishermen in these subregions originated in the EEZ. Thus, the effect of a 7" TL minimum size in the EEZ would be inconsequential for both fishermen and the stock.

However, because most of the recreational landings are attributed to state waters, minimum size limits would effect state landings. Based on 1990-94 intercept data, almost 4% of the measured scup were less than 7" TL for scup landed along the coast (Table 62). Analysis of intercept data from the states from New Jersey through North Carolina indicated that anglers harvested smaller fish in these states. Assuming a post-release mortality of 15%, the percent reduction in the number of scup killed by anglers associated with the minimum size limits would be 3.2% for the coast based on combined 1990-1994 data (Table 63).

The assumed level of post-release mortality (hooking and handling mortality) used in the above calculations is based on a study conducted in 1981. Howell and Simpson (1985) estimated hooking mortality for 360 scup caught by angling between July-September 1981. Scup were caught using No. 4 and No. 6 Mustad stainless steel hooks baited with squid or sandworms. Mortality estimates were derived by assuming that all fish hooked in the gills or esophagus were lethally injured (100% mortality) and all others would survive (0% mortality). Based on these assumptions, hooking mortality increased from 0% to 15% with increasing lengths of fish.

Based on the fishing mortality reduction schedule adopted by the Council and Commission, exploitation would have to be reduced 32% in year 2 to achieve the target F. MRFSS data for 1990-94 indicate that catch frequencies for scup ranged from 1 to 200 fish per day on a coastwide basis (Table 64). Based on these data, the reductions in exploitation associated with various possession limits for 1 to 50 scup per trip were calculated (Table 65). The coastwide possession limit associated with a 32% reduction in exploitation is 15 fish. The possession limit would increase when combined with size limits and/or seasons.

Analysis of scup recreational data indicated that nearly 90% of the annual landings occurred from July through October for the years 1990 to 1994 combined (Table 66). Seasons based on this MRFSS data could be established on a coastwide basis to reduce exploitation. A season could be combined with the size limit to allow for higher possession limits.

From 1983 to 1992 the largest percent of scup landed by recreational fishermen coastwide were taken from private/rental vessels with 77% of the total catch, followed by Party/Charter vessels with 12% of the total catch (Table 24). The group of individuals that could be most likely affected by the possession and minimum size limits are fishermen that are interested in obtaining very large catches per fishing trip.

The extent to which anglers in the charter and party boat recreational fishery will be affected by the proposed management practices can not be quantified at the present. However, from a 1990 charter and party boat survey conducted by the MAFMC (section 8.2.4 of the FMP) it is evident that, on average, angler's interest in catching scup is very low for the charter and party boats surveyed (Table 38). More specifically, as it relates to customer interest in catching scup from a large selection of recreational species, scup ranked last and second from the bottom for charter and party boats, respectively.

As it was mentioned in section 8.2 of this FMP, the potential to catch and ultimately consume fish is an integral part of the recreational experience, though studies have shown that non-catch related aspects of the fishing experience are often as highly regarded by anglers as the number and size of fish caught. The overall effect of size limits would be related to the individual preferences and expectations, that is, what is perceived as a good fishing trip.

It is expected that the implementation of minimum size limits will allow recreational fishermen to have larger fish available to them over the stock recovery period. This will likely mitigate the initial effects of the

size limits. The two year period before a possession limit is implemented will provide sufficient time for initial recovery without closing the fishery or affecting the economy or social structure of the participants in a detrimental manner.

In the long term, the implementation of the minimum size limits considered in this plan could enhance the recreational fishing opportunities through the management unit. Furthermore, implementation of a regional minimum size limit will likely enhance compliance by participants.

2.3.2.2. Evaluation of framework provisions

Based on a recommendation by the Council and the ASMFC Policy Board, the Regional Director and the states in their respective jurisdictions could modify the possession limit to between 0 and 50 scup per angler, the size limit from 7" TL to 10" TL, and open or close the fishing season for the entire year. Recreational limits would be revised according to specific criteria to account for changes in stock abundance and meet the time frame of the fishing mortality reduction strategy.

Short term impacts due to restrictive limits would be outweighed by the long term benefit of conserving the scup stock for future generations of recreational anglers. The possession limit could be as high as 50 scup, the size limit as low as 7" TL, and the season open throughout the year. However, decreases in restrictions would only occur under circumstances of increased scup abundance. Since the prevailing rate of fishing success would reflect increased stock abundance, the number of anglers catching their limit would be high for overly restrictive limits. Decreasing recreational restrictions by raising the possession limit, decreasing the size limit, or increasing the length of the fishing season would therefore decrease the number of affected anglers and have less adverse impact than the limit in force at the time.

If stock levels are allowed to continue to decline or the amount of effort by recreational anglers increases (more trips or more people) disproportionately to increases in stock size, landing rates for anglers would decline regardless of specific limits. Adverse impacts would therefore be measured against the prevailing rate of fishing success and would not be as great as when scup are abundant or angler effort is less. Although it is not possible to estimate exact impacts for hypothetical levels of scup abundance, it is clear that more restrictive limits than those proposed initially would have substantially less impact than a total fishery closure precipitated by stock collapse.

A zero possession limit or a season closed for the entire year would prohibit retention of scup by recreational fishermen and would have significant impacts, depending on the level of fishing success currently operative and the value anglers place on retention of catch. A 10" TL minimum size, the most restrictive minimum size limit proposed for this framework measure, would have had an associated percent reduction in exploitation of nearly 57% based on 1990-1994 coastwide MRFSS data (Table 63). These severe restrictions would only be implemented in the event that the stock continues to decline and stock collapse becomes imminent.

Reductions associated with these limits assume 100% compliance by recreational fishermen. Levels of noncompliance will be considered in annual reviews when assessing the impact of bag/size limits on the recreational fishery and determining if modification to the possession/size/season limits are necessary. A thorough and consistent enforcement program is required for this or any other FMP to succeed.

2.3.2.3. Recreational Harvest Limits

Beginning in year 2, a recreational harvest limit would be allocated to the recreational fishery to control fishing mortality. The harvest limit would be based on stock assessment information on projected stock size estimates for that year. Estimates of stock size coupled with the target fishing mortality rate would allow for a calculation of total allowable catch (TAC). An estimate of discards would then be subtracted from the TAC to derive the allowed level of landings (harvest limit). Based on the historic proportions of commercial and recreational catch for 1988 to 1992, 22% of the total target would be allocated to the recreational fishery. An analysis of this system was presented in section 2.3.1.8 above (commercial quota).

Because stock size has not been projected for 1997, the second year of the management program, landings data were used from 1988-1992 to derive average landings for those years to assess the potential impacts of the harvest limit. Based on these data, a 32% reduction in exploitation would equate to a recreational harvest limit of 3.46 million lbs in the second year of the management program (Table 57). This harvest limit would be achieved on a coastwide basis through a system of possession limits, size limits, and/or season. Year end total recreational landings would be compared to the harvest limit to ensure that the landings target was not exceeded.

From 1983 to 1992 the largest percent of scup landed by recreational fishermen coastwide were taken from private/rental vessels with 77% of the total catch, followed by Party/Charter vessels with 12% of the total catch (Table 24). The group of individuals that could be most likely affected by the possession and minimum size limits are fishermen that are interested in obtaining very large catches per fishing trip.

The extent to which anglers in the charter and party boat recreational fishery will be affected by the proposed management practice can not be quantified at the present. However, from a 1990 charter and party boat survey conducted by the MAFMC (section 8.2.4 of the FMP) it is evident that, on average, angler's interest in catching scup is very low for the charter and party boats surveyed (Table 38). More specifically, as it relates to customer interest in catching scup from a large selection of recreational species, scup ranked last and second from the bottom for charter and party boats, respectively.

As it was mentioned in section 8.2 of the FMP, the potential to catch and ultimately consume fish is an integral part of the recreational experience, though studies have shown that non-catch related aspects of the fishing experience are often as highly regarded by anglers as the number and size of fish caught. The overall effect of size limits would be related to the individual preferences and expectations, that is, what is perceived as a good fishing trip.

It is expected that the implementation of recreational harvest limits will allow recreational fishermen to have larger fish available to them over the stock recovery period. This will likely mitigate the initial effects of initial harvest limits. In the long term, the implementation of the recreational harvest limits considered in this plan could enhance the recreational fishing opportunities through the management unit. Furthermore, implementation of harvest limits in both the commercial and the recreational fisheries will likely enhance compliance by participants.

2.4. ALTERNATIVE TO THE AMENDMENT

2.4.1. Take no action at this time

2.4.1.1. Evaluation

The "No Action" alternative would not solve the problems identified in section 4 of the FMP. Further improvements and development of the US fishery would not be attained. The overall result from this action would likely be that net benefits would be affected in a negative manner.

2.4.2. A 9" TL minimum fish size and a 4.5" minimum mesh size in the otter trawl fishery when a vessel has 1,000 pounds or more of scup on board

2.4.2.1. Evaluation

If implemented, owners or operators of otter trawl vessels possessing 1,000 lbs or more of scup would only be allowed to fish with nets that have a minimum mesh size of 4.5" diamond (4.0" square) in the codend. The L_{50} (the length at which 50% of the scup are retained) is 9.1 inches for this mesh size (Table 45).

Landings of scup represent only a portion of the fishing mortality experienced by the stock. Undersized scup, those less than 9" TL, experience both discard mortality and deaths due to encounters with commercial gear. The amount of fish dying due to these causes can be high with the current mesh sizes

now used in the fishery, that is, an effective mesh size of 2.0" or less. Sea sampling data indicate that the weight of the discarded fish are almost equivalent to the weight of the landings in some years. Discard rates are higher in years of good recruitment, that is, years when more small fish were available.

During the development of this FMP, fishermen stated that a minimum mesh regulation would not be necessary if a minimum size regulation was implemented. They based their statements on the argument that it would be economically inefficient to catch large amounts of small scup that would then have to be sorted to retain only the legal sized fish. As a result, they indicated that they would modify their fishing practices to avoid small scup. In addition, they indicated that their traditional fishing practices would be disrupted by a minimum mesh provision.

Scup are a component of the mixed trawl fishery in Southern New England and the Mid-Atlantic. Although Sea Sampling data indicate that fishermen may differentiate between species on a per tow basis (i.e., target a single species on a tow), fishermen land many different species on a per trip basis. Based on NMFS weighout data, scup are most frequently landed with *Loligo* squid, Atlantic mackerel, and silver hake. In fact, for trips landing a 1,000 or more pounds of scup per trip, more *Loligo* squid were landed than scup (Table 72).

The 1,000 pound threshold would not effect a large portion of the vessels or trips that landed scup in 1992. Based on NMFS weighout data, a threshold of 1,000 lbs per trip would have affected approximately 52% of the vessels and 28% of the trips landing scup in 1992 (Tables 48 and 49). However, these trips accounted for over 95% of the scup landed by otter trawl vessel in 1992. Also, regulations that allow multiple nets on board would allow fishermen who traditionally targeted multiple species on a trip, to fish for and retain other species with small mesh until the 1,000 pound threshold of scup was reached. These fishermen would then have to use the 4.5" mesh if they decided to target more scup. Once the threshold was reached fishermen would have to properly stow other codends for the remainder of the trip.

Landings of scup by fishermen targeting *Loligo* squid on the same trip could be effected by these regulations. Based on 1992 NMFS weighout data, 45% of the vessels and 29% of the trips landing 2,500 pounds or more of *Loligo* squid, landed over 95% of *Loligo* landed by all *Loligo* otter trawl fishermen (Tables 50 and 52). Based on this 2,500 pound threshold, scup comprise slightly more than 6% of the total fish landed on these trips (Table 52). However, the total pounds is slightly more than 50% of all scup landed by otter trawl fishermen in 1992.

In general, these regulations would modify some traditional fishing practices. The fishermen effected by these regulations would be those fishermen who targeted scup first on their trip and retained more than 1,000 pounds of scup, before switching to other species for the remainder of their trip. Landings of other species taken as bycatch by these fishermen could be affected. Alternatively, if a fishermen had 1,000 lbs of scup on board, and desired to continue fishing with a small mesh net, he would be required to discard any scup caught in tows directed to other species. Thus, it is possible that discards would not be reduced and the benefits to the fishery, both the fishermen and the stock, would be minimal.

2.4.3. An 8" TL minimum fish size and a 4" mesh size in the otter trawl fishery when a vessel has 1,000 pounds or more of scup on board

2.4.3.1. Evaluation

If implemented, owners or operators of otter trawl vessels possessing 1,000 lbs or more of scup would only be allowed to fish with nets that have a minimum mesh size of 4.0" diamond (3.5" square) in the codend. The L_{50} (the length at which 50% of the scup are retained) is 8.3 inches for this mesh size (Table 45).

Landings of scup represent only a portion of the fishing mortality experienced by the stock. Undersized scup, those less than 9" TL, experience both discard mortality and deaths due to encounters with commercial gear. The amount of fish dying due to these causes can be high with the current mesh sizes now used in the fishery, that is, an effective mesh size of 2.0" or less. Sea sampling data indicate that the

weight of the discarded fish are almost equivalent to the weight of the landings in some years. Discard rates are higher in years of good recruitment, that is, years when more small fish were available.

During the development of this FMP, fishermen stated that a minimum mesh regulation would not be necessary if a minimum size regulation was implemented. They based their statements on the argument that it would be economically inefficient to catch large amounts of small scup that would then have to be sorted to retain only the legal sized fish. As a result, they indicated that they would modify their fishing practices to avoid small scup. In addition, they indicated that their traditional fishing practices would be disrupted by a minimum mesh provision.

Scup are a component of the mixed trawl fishery in Southern New England and the Mid-Atlantic. Although Sea Sampling data indicate that fishermen may differentiate between species on a per tow basis (i.e., target a single species on a tow), fishermen land many different species on a per trip basis. Based on NMFS weighout data, scup are most frequently landed with *Loligo* squid, Atlantic mackerel, and silver hake. In fact, for trips landing a 1,000 or more pounds of scup per trip, more *Loligo* squid were landed than scup (Table 72).

The 1,000 pound threshold would not effect the majority of the vessels or trips that landed scup in 1992. Based on NMFS weighout data, a threshold of 1,000 lbs per trip would have affected approximately 52% of the vessels and 28% of the trips landing scup in 1992 (Tables 48 and 49). However, these trips accounted for over 95% of the scup landed by otter trawl vessels in 1992. Also, regulations that allow multiple nets on board would allow fishermen who traditionally targeted multi-species on a trip, to fish for and retain other species with small mesh until the 1,000 pound threshold of scup was reached. These fishermen would then have to use the 4.0" mesh if they decided to target more scup. Once the threshold was reached fishermen would have to properly stow other codends for the remainder of the trip.

Landings of scup by fishermen targeting *Loligo* squid on the same trip could be effected by these regulations. Based on 1992 NMFS weighout data, 45% of the vessels and 29% of the trips landing 2,500 pounds or more of *Loligo* squid, landed over 95% of *Loligo* landed by all *Loligo* otter trawl fishermen (Tables 50 and 51). Based on this 2,500 pound threshold, scup comprise slightly more than 6% of the total fish landed on these trips (Table 52). However, the total pounds is slightly more than 50% of all scup landed by otter trawl fishermen in 1992.

In general, these regulations would modify some traditional fishing practices. The fishermen effected by these regulations would be those fishermen who targeted scup first on their trip and retained more than 1,000 pounds of scup, before switching to other species for the remainder of their trip. Landings of other species taken as bycatch by these fishermen could be affected. Alternatively, if a fishermen had 1,000 lbs of scup on board, and desired to continue fishing with a small mesh net, he would be required to discard any scup caught in tows directed to other species. Thus, it is possible that discards would not be reduced and the benefits to the fishery, both the fishermen and the stock, would be minimal.

2.4.4. No minimum fish side and a 4.5" minimum mesh size in the otter trawl fishery when a vessel has 1,000 or more of scup on board

2.4.4.1. Evaluation

This alternative would allow the market to control the minimum size of fish landed by commercial fishermen. Based on industry comment, most marketable fish are generally 9" TL or larger at the present time although the market will accept fish as small as 7" TL.

A 4.5" mesh would catch and retain smaller fish that would then be marketed. Without the additional incentive offered by a minimum size regulation, it is possible that fishermen would use smaller mesh not only to target smaller fish but also insure that more of the 9" TL fish were caught and retained, i.e., 50% of the 9.1" TL fish are retained by a 4.5" mesh.

Fishermen using other gears also catch and land scup. Because the minimum mesh provision would not apply to these fishermen, they would continue to fish for and retain small scup.

In general, this alternative would result in continued discarding and landings of small scup by commercial fishermen. The benefits to the fishery, both the fishermen and the stock, would be minimal.

2.4.5. State by state commercial quotas

2.4.5.1. Evaluation

The quota setting process is specified in section 1.5.1.2.2. Beginning in year 3, a quota would be allocated to the commercial fishery to control fishing mortality. The quota would be based on stock assessment information on projected stock size estimates for that year. Estimates of stock size coupled with the target fishing mortality rate would allow for a calculation of total allowable landings. Based on the historic proportions of commercial and recreational landings, 70% of the total target would be allocated to the commercial fishery.

To assess potential impacts of the quota, landings data were used from 1988-1992 to derive average landings for those years (11.732 million lbs). Based on these data, a 28% reduction in exploitation would equate to a commercial quota of 8.5 million lbs (72% x 11.732).

Quotas would be distributed to the states based on their percentage share of commercial landings for the period 1983-1992. Quotas would range from 12,030 lbs to 3.7 million lbs based on these percentages (Table 73).

A state-by-state quota system could allow for the most equitable distribution of the commercial quota to fishermen. Specifically, states under this alternative would have the responsibility of managing their quota for the greatest benefit of the commercial scup industry in their state. States could design allocation systems based on trip limits and seasons. States would also have the ability to transfer or combine quota increasing the flexibility of the system to respond to year to year variations in fishing practices or landings patterns.

However, state-by-state allocations would negatively affect fishermen who land in those states that do not have the capability of regulating a quota. Based on the quota system implemented for summer flounder, a few states have not been able to establish trip limit systems that ensure a continuous and steady supply of product over the season for producers and/or a fair an equitable distribution of flounder to all fishermen who have traditionally landed summer flounder in their state. In addition, some states have had problems coordinating their regulations with neighboring states to prevent large scale landings by fishermen in states with the most favorable trip limits. A similar situation could occur if a state-by-state system was implemented for scup.

2.4.6. Coastwide bimonthly commercial quotas

2.4.6.1. Evaluation

Beginning in year 3 a quota would be allocated to the commercial fishery to control fishing mortality. The quota would be based on stock assessment information on projected stock size estimates for that year. Estimates of stock size coupled with the target fishing mortality rate would allow for a calculation of total allowable landings. Based on the historic proportions of commercial and recreational landings for 1983 to 1992, 67% of the total target would be allocated to the commercial fishery (Table 11).

To assess potential impacts of the quota, landings data were used from 1988-1992 to derive average landings for those years (11.732 million lbs). Based on these data, a 28% reduction in exploitation would equate to a commercial quota of 8.5 million lbs (72% x 11.732).

A bimonthly quota system could allow for an equitable allocation of the commercial quota to northern and southern participants as well as between the smaller day boats and larger offshore vessels. Due to the seasonal nature of the scup fishery, the quota would have to be divided into bimonthly units. To minimize effects on traditional landings patterns, the allocation to each period would be based on past landings instead of a system that divided the quota equally over the six periods. Based on 1988-1992 data, 22.4% would be allocated to period 3 (May-June) and only 5.3% to period 4 (July-August) (Table 74). The bimonthly allocations would range from 450,000 lbs to 2,584,000 lbs based on a annual quota of pounds 8.5 million lbs (Table 74). Based on state data for those years, fishermen would be able to maintain traditional landings patterns in most states.

A coastwide system would allow fishermen to land in any port along the coast and all commercial landings during a bimonthly period would count toward that quota for that period. When the quota had been landed for a bimonthly period, fishing for and/or landing scup would be prohibited for the remainder of the period. Landings in excess of the allocation for the period would be subtracted from the following years's quota for the same period. Trip limits would have to be implemented. Bimonthly allocations without trip limits would encourage derby-style fishing practices that would allow the quota to be landed by larger, more mobile vessels at the beginning of each period. As a result, supplies of scup would be discontinuous and smaller boats would be disadvantaged.

Trip limits would be established and modified throughout the two-month period to allow for a continuous supply of product and equitable distribution of scup to fishermen using both small and large vessels. For example, almost all of the landings in period 1 are attributable to fishermen using otter trawl vessels. A 10,000 pound trip limit could be established for the beginning of period 1. The limit would decrease to 5,000 lbs when 50% of the allocation was reached, 1,000 lbs when 75% of the quota was taken, and 500 lbs when 90% of the landings were reached.

Different trip limit systems could be designed for each period to ensure equitable distribution over each two-month period. Unlike a system where states have the flexibility to design their own systems, NMFS would be responsible for implementing trip limits for each period. However, such a system would place a large administrative burden on NMFS at a time when additional resources are not available.

2.4.7. Seasonal closures in the commercial fishery for years 3 and beyond

2.4.7.1. Evaluation

NMFS General Canvass Data from 1988 to 1992 were used to determine the potential impact of seasonal closures on commercial landings of scup. The ASMFC technical committee decided that these years would be most representative of current conditions in the fisheries.

The Committee decided that seasonal closures for scup fishermen be applied on a coastwide basis. Calculations restricted the smallest unit of closure to one week. Calculated reductions were as close to 28% (the target reduction in the third year of the management program) as could be derived based on average monthly data from 1988-92 and the criteria decided on by the committee. In addition, seasonal closures were derived assuming that fishermen would recoup 0% and 15% of their landings during the open season. The 15% level applied to all mobile gears, including hook and line. Because of the fixed nature of the pots and traps, only a 0% (no recoupment) level was used for these gears.

If a recoupment level was assumed, calculations were made using a simple algorithm that accounted for changes in landings per day (LPD) during the open and closed seasons. For example, for scup landed by otter trawl fishermen, the time period from November 15 to January 31 accounted for 28% of the landings during 1988-1992. A closed season during these months would result in a fishing season that would be open for 8 1/2 months (February through November 14) or approximately 288 days. The amount of discretionary time during this open period would be 43 days (15% x 288 days). Since 72% of the landings occurred during the open period, the LPD during the open period would be 72 divided by the days fished or 245 (288-43). This LPD multiplied times the discretionary time (43 days) would result in a

recoupment of 13%. As a result, the realized reduction in landings for the closed period February through May would be 15% (28% - 13%).

Seasonal closures ranged from slightly more than one month to four months depending on location (north or south) and gear type (Table 54). Note that because otter trawls are the only gear that land significant amounts of scup in the south, all gear specific seasonal closures for scup would be coastwide. Seasonal closures could achieve the desired reductions if the following criteria were met:

1. The level of discretionary time used to derive the reductions is realistic. The assumed value of 15% may be an underestimate for some mobile gears.

2. All gear capable of catching scup be removed from the water during the closed period. Without such a provision, fishermen would continue to fish for other species during the closed period, catching and discarding scup in the process. For trawl fisheries, the technical committee recommended that mesh sizes of 5.5" diamond mesh or larger could continue to operate.

3. Landings patterns do not vary much from one year to the next, i.e., anticipated landings in year three of the management program are similar to the landings observed for 1988-1992.

Finally, any effective area/seasonal closure would require that NMFS be able to track commercial vessels on a real time basis to ensure a high level of compliance. Such a system could be comparable to the Vessel Monitoring System that will be implemented for groundfish and scallops by NMFS.

It is also important to note that fishermen could negate seasonal closure effects by increasing effort or efficiency during the open season. These increases could produce conditions in the stock that were equivalent to or worse than those before regulations.

In addition, the requirement that all gear capable of catching scup be removed from the water during a closure would have major impacts on the catch of other economically important species that have been traditionally landed with scup on the same trip.

2.4.8. Seasonal dependent minimum sizes in the commercial fishery: a 10" TL minimum size from October 1 - April 30 and a 9" TL minimum size for the rest of the year

2.4.8.1. Evaluation

This alternative recognizes the seasonal nature of the commercial scup fisheries. Based on 1983 to 1992 monthly data, most scup are harvested from state waters from May through September and from EEZ waters from October through April (Table 18). In addition, fixed gears such as floating traps, pound nets, and pots/traps as well as hook and line account for the majority of the landings from May through September and otter trawls are the predominant gear from October through April. Otter trawls and floating traps accounted for over 74% and 12% of the coastwide landings, respectively based 1983-1992 General Canvass data (Table 12).

Historic commercial length frequencies were used as an estimate of potential short-term impacts of length limits on the commercial scup fisheries (Tables 41 to 44). Specifically, commercial length frequencies from the NMFS Weighout Data and North Carolina DMF from 1982 to 1994 were used to determine potential size limit effects. In general, size frequency data indicated that potential size limit effects increased from north to south, were gear dependent, and varied from one year to the next.

Based on NMFS weighout data, approximately 19% of the measured scup were less than 9" TL for all otter trawl vessel with sampled landings (Table 44). A 9" TL minimum size regulation would have a slightly greater effect on landings from floating traps, the other predominant gear in the scup fishery. Based on NMFS weighout data, almost 26% of the measured fish were less than 9" TL for the 316 obtained from this gear from 1983 to 1991 combined.

A 10" TL minimum size limit would have a significantly greater effect on otter trawl landings. Based on 1983 to 1991 NMFS weighout data, over 59% of the fish measured from otter trawl landings were less than 10" TL. The proportion was even greater for scup measured from the North Carolina winter trawl fishery; almost 88% of the scup were less than 10" TL in 1991-1992 (Table 42). The effect of these minimum size regulations on fishermen using fixed gear would be the same as those identified in the preferred alternative.

However, a 10" TL minimum size in the otter trawl fishery could significantly reduce landings by these vessels in the short term. A large reduction in landings could have large negative economic consequences to fishermen, processors, and the consuming public. In addition, if these vessels continued to catch and discard smaller scup in the process, the benefits to the stock would be minimal.

Assuming that undersized fish are not caught and discarded, minimum size regulations have positive impacts on the stock. In general, because minimum sizes increase the size at full recruitment, yields are increased as fishermen catch larger, heavier fish. In addition, minimum size regulations can increase the resilience of the stock to overfishing, i.e., the biological reference points (F_{max}) can increase. Finally, minimum size regulations can increase spawning stock biomass by allowing more fish to spawn. Sexual maturity data for scup indicate that 50% of the scup are mature by a size of 6.8" TL. A total of a 100% would be mature by the time they reached a size of 10" TL.

2.4.9. Individual transferrable quotas

2.4.9.1. Evaluation

ITQs are a relatively new management technique where a total quota is divided into small parts and allocated to individual participants. Individual quotas or shares could be bought, sold or leased so that harvesters have flexibility in planning their fishing activities. Potential advantages of ITQs include increased profits, greater economic stability, improved product quality, improved safety, reduced gear conflicts and losses, elimination of derby-type fisheries, bycatch reduction, an improved investment climate, reduction of market gluts, and reduction in post-harvest waste (Anderson 1992). Potential disadvantages of ITQs include increased high-grading, under-reporting of catch, enforcement costs and problems, creation of a "rich mans club," changes in the makeup of the fishing fleet, and potential inequities of the initial allocation of quota shares due to lack of information (Anderson 1992).

An ITQ program could allow individual fishermen greater flexibility than any of the quota or seasonal closure based systems. That is, they could fish for scup when they wanted to, rather than being controlled by quota or seasonal closures.

As with the other alternatives, fishermen could not fish for (catch and discard as well as catch and land) scup after their allocations had been taken. This would require careful management of their allocations to assure that their participation in other small mesh fisheries did not violate their ITQ allocations.

An initial problem is associated with the initial allocation process. A great deal of time would be required to obtain and validate sales records to determine initial allocations. NMFS weighout data indicate that approximately 600 to 700 vessels could be eligible for allocations. Since not all vessels are captured in the weighout data base, the number could be considerably larger. It might be preferable to initiate management of the scup resource without ITQs to protect the resource and introduce an ITQ system subsequently.

2.4.10. An 8" TL minimum fish size limit in the recreational fishery coastwide in years one and two of the management program

2.4.10.1. Evaluation

Based on 1983 to 1994 MRFSS data, only 14% and 7% of the scup caught by recreational fishermen in the North and Mid-Atlantic, respectively, were caught in the EEZ (Table 23). In 1994, 15% of the total

scup caught by recreational fishermen in these subregions originated in the EEZ. Thus the effect of a 8" TL minimum size in the EEZ would be inconsequential for both fishermen and the stock.

However, minimum size limits would effect state landings. Based on 1990-94 intercept data, 4-16% of the measured scup were less than 8" TL for scup landed in states from Maine to New York (Table 62). On average, these states accounted for over 97% of the recreational landings on a coastwide basis (Table 25).

Analysis of intercept data for the states from New Jersey through North Carolina indicated that anglers harvested smaller fish in these states. Based on 1990-94 data, 28-58% of the measured scup were less than 8" TL (Table 62).

Thus, the associated reduction in landings resulting from the implementation of an 8" TL would have a larger consequence for southern states (NJ-NC) than northern (ME-NY). Assuming a post-release mortality of 15%, the percent reduction in the number of scup killed by anglers associated with the minimum size limits would be 13.2% based on combined 1990-1994 data (Table 63).

2.4.11. An 8" TL minimum fish size limit in the recreational fishery in the EEZ with a 7" TL minimum fish size limit in the states of New York through North Carolina and an 8" TL minimum fish size limit in the states of Connecticut through Maine in state waters in years one and two of the management program

2.4.11.1. Evaluation

Based on 1983 to 1994 MRFSS data, only 14% and 7% of the scup caught by recreational fishermen in the North and Mid-Atlantic, respectively, were caught in the EEZ (Table 23). In 1994, 15% of the total scup caught by recreational fishermen in these subregions originated in the EEZ. Thus the effect of a 8" TL minimum size in the EEZ would be inconsequential for both fishermen and the stock.

However, minimum size limits would effect state landings. Based on 1990-94 intercept data, 4-16% of the measured scup were less than 8" TL for scup landed in states from Maine to New York (Table 62). On average, these states accounted for over 97% of the recreational landings on a coastwide basis (Table 25).

Analysis of intercept data for the states from New Jersey through North Carolina indicated that anglers harvested smaller fish in these states. Based on 1990-94 data, 28-58% of the measured scup were less than 8" TL (Table 62). However, the percent of measured fish less than 7" TL ranged from 6-25%.

On average, the state of New York accounted for the majority of scup landed by recreational anglers from 1983-1992 (37%). In addition, only 4.1% of the scup measured by MRFSS field interviewers in New York were less than 7" TL. Thus the effect of a 7" TL minimum size in the state of New York would be inconsequential for both fishermen and the stock. In addition, relative to the preferred alternative, a 7" TL size limit in New York would reduce the effectiveness of a recreational size limit on a coastwide basis.

2.4.12. A threshold requirement to qualify for moratorium permit

2.4.12.1. Evaluation

The percent of otter trawl vessels, trips, and associated pounds for a given threshold (pounds) of scup landings was derived using 1992 and 1993 NMFS weighout data. These data indicate that the number of vessels landing scup decrease as the threshold amount increases. As an example, at a 5,000 pound threshold, only 25% of the vessels would qualify for the permit yet these vessels accounted for over 75% of the landings in the weighout data base (Table 49).

2.4.13. Separate management measures for party/charter boat fishermen

2.4.13.1. Evaluation

Based on 1983 to 1992 MRFSS data, anglers fishing from party/charter boats accounted for 12% of the recreational landings on a coastwide basis. Based on this data, 12% of the coastwide recreational harvest limit would be allocated to this user group. A combination of size and possession limits with seasons could then be used to achieve the allocation on an annual basis.

2.5. Summary and Expected Net Impact of Proposed Actions

This section is intended to briefly describe the economic impact of the preferred actions. A summary of impacts of all alternatives presented in this amendment are documented in Table RIR-1. The analysis utilized to evaluate the economic impact of the various proposed actions is mostly qualitative in nature. However, it provides the basis for making well reasoned management decisions.

The first alternative deals with the moratorium on commercial vessels. This alternative is expected to reduce problems of over-capitalization and dissipation of profits.

The second alternative deals with minimum fish size in the commercial fishery. This alternative will have a positive impact on the stock if sublegal fish are not caught and discarded. It is expected that this alternative will increase net benefits from the reduction in biological and economic waste from harvesting undersized scup.

The alternative dealing with minimum mesh requirement in the commercial fishery is expected to reduce discards and landings of sub-legal size scup. Positive effects from this option include an increase in yield over time.

The alternative dealing with the 18" maximum roller diameter is expected to protect scup in some areas therefore allowing more fish to grow to maturity and spawn increasing stock biomass and yields.

The minimum escape vent requirement would allow for some undersize fish to escape alive increasing the amount of mature fish in the stock and increasing yields.

Alternative number six deals with the requirement to have hinges and fasteners of one panel or door of scup pots made of degradable materials. The increase in costs from the implementation of this alternative are expected to be minimal. Positive benefits from the prevention of "ghost fishing" are expected from this alternative.

The alternative dealing with seasonal and area closures is expected to complement other commercial management measures and to provide positive benefits by reducing fish mortality.

The implementation of a commercial quota along with the implementation of other commercial regulations addressed in the scup FMP will increase benefits due to reduction in overfishing and prevention of stock collapse.

The alternative dealing with recreational harvest limits along with the implementation of other recreational regulations addressed in the scup FMP will increase benefits due to reduction in overfishing and prevention of stock collapse.

Table RIR-1. Summary of All Alternatives

Preferred Alternatives	Economic Effects
Moratorium on commercial vessels	Positive net benefits from reduction of potential over-capitalization and dissipation of profits
Commercial fish size limitation	Positive net benefits expected from a reduction in biological and economic waste derived from harvesting undersized scup
Minimum mesh requirement in the commercial fishery	Positive net benefits expected from a reduction in biological and economic waste derived from harvesting undersized scup
Maximum roller diameter	Potential increase in net benefits from allowing more animals to grow to maturity and spawn, increasing stock biomass and yields
Minimum escape vent requirement	Potential increase in net benefits from allowing more animals to grow to maturity and spawn, increasing stock biomass and yields
Degradable fasteners in traps	Positive net benefits from the prevention of "ghost fishing"
Seasonal and area closures	May decrease net benefits in the short-term. In the long-term may increase net benefits. Seasonal and area closures will complement other management measures and are expected to provide positive benefits by reducing fish mortality and protect habitat among others.
Commercial quota	Positive net benefits from a reduction in biological and economic waste, allowing for prevention of overfishing and stock rebuilding
Recreational possession limits, minimum size limits, and seasonal closures in the recreational fishery	Potential increase in net benefits from stock recovery and an increase in the availability of larger fish through the region
Evaluation of framework provisions	Expected to provide positive net benefits over the long term. Evaluation will require information on stock conditions available in years 2, 3, and beyond
Recreational harvest limit	Positive net benefits from a reduction in biological and economic waste, allowing for prevention of overfishing and stock rebuilding

Table RIR-1 (continued). Summary of All Alternatives

Non-Preferred Alternatives	Economic Effects
Take no action at this time	Further improvements and development of the US fishery would not be attained; net benefits would be negatively affected
A 9" TL minimum fish size and a 4.5" minimum mesh size in the otter trawl fishery when a vessel has 1,000 pounds or more of scup on board	Potential increase in net benefits
An 8" TL minimum fish size and a 4" mesh size in the otter trawl fishery when a vessel has 1,000 pounds or more of scup on board	Potential increase in net benefits
No minimum fish size and a 4.5" minimum mesh size in the otter trawl fishery when a vessel has 1,000 or more of scup on board	Minimal benefits because discards would continue
State by state commercial quotas	Potential benefits by allowing states flexibility to allocate quotas
Coastwide bimonthly commercial quotas	Potential benefits by allowing seasonal allocation of quotas
Seasonal closures in the commercial fishery for years 3 and beyond	Potential decrease in net benefits since fishermen may increase effort or efficiency during open season; also the removal of gear capable of harvesting scup from the water would have major impact on the catch of other economically important species
Seasonal dependent minimum sizes in the commercial fishery: a 10" TL minimum size from October 1 - April 30 and a 9" TL minimum size for the rest of the year	Potential decrease in net benefits because of the short term negative impacts on commercial fishermen
Individual transferable quotas	Initial problems associated with the initial allocation process
An 8" TL minimum fish size limit in the recreational fishery coastwide in years one and two of the management program	Potential negative benefits to fishermen in southern states

Table RIR-1 (continued). Summary of All Alternatives

Non-Preferred Alternatives	Economic Effects
An 8" TL minimum fish size limit in the recreational fishery in the EEZ with a 7" TL minimum fish size limit in the states of New York through North Carolina and an 8" TL minimum fish size limit in the states of Connecticut through Maine in state waters in years one and two of the management program	Potential negative benefits to fishermen in southern states. Potential problems with complience could develop
A threshold requirement to qualify for a moratorium permit	Potential implications would vary according to different threshold levels. The higher the threshold level, the lower the number of vessel that would qualify for permit under this alternative
Separate management measures for party/charter boat fishermen	Having separate management measures (harvest limit, minimum size limit, possession limit, and season) for party/charter boat fishermen versus other recreational fishermen would potentially create confusion in the industry

MAJOR RULE DETERMINATION

The analysis described above, even though qualitative in nature, shows that if the described management measures were to be enacted, they would not constitute a "major rule" under the criteria described in E.O. 12866 [p.RIR-1]. Furthermore, these actions would not have a significant economic impact on a substantial number of small entities.

3. Other E.O. 12866 Requirements

The FMP should not have an annual effect of $100 million or more. In 1993, the total commercial ex-vessel value of scup was $5.7 million. The ex-vessel value of scup in 1993 indicated a 26% decrease from the 1992 level and a 25% decrease from the 1983-1992 mean. Ex-vessel values for commercial landings of scup from 1983 to 1992 have been relatively stable.

The Sport Fishing Institute estimated that in 1985, direct sales related to marine recreational fishing for all species from North Carolina to Maine amounted to over $1.8 billion. Unfortunately, estimates of the economic activity specifically associated with scup were not provided separately but were combined with other species. In the North and Mid-Atlantic regions, scup impacts were not specifically enumerated due to the greater relative popularity and abundance of other species. Intercept surveys conducted by the NMFS indicate that in 1992 2.74% and 7.25% of the anglers interviewed indicated that they preferred or sought scup as the primary species targeted in the Mid-Atlantic and North Atlantic regions, respectively. The FMP is intended to allow the scup resource to rebuild in order to enhance recreational fishing opportunities through the management unit.

The FMP is not expected to lead to an increase in costs or prices to consumers. In recent years, the ex-vessel price per pound of scup caught commercially has shown a slight upward trend, indicating that supply and/or demand factors may be shifting. For the period between 1983 to 1993, the highest price for all size categories of scup occurred in 1989, at $.87/lb (adjusted). NMFS weighout data for 1993 indicate an average ex-vessel price of $.58 per pound coastwide, ranging from $0.18 per pound for pins to $1.33 per pound for jumbos. Continual increase in the demand of fish and shellfish in general (due to health awareness) could be the cause for increased ex-vessel revenue. However, the effects of this factor on ex-

vessel price can not be addressed quantitatively at this time. Potential reduction in landings and value attributed to this plan in its early years will not significantly increase overall ex-vessel scup price. Future increases in scup supply due to reduction in mortality, higher harvest weight, and stock stability, should maintain the consumer scup price level, holding everything else constant.

The implementation of this plan is not expected to create additional administrative, enforcement or information costs.

The FMP should not have 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.

4. Impacts of the Plan relative to the Regulatory Flexibility Act

4.1. Initial Regulatory Flexibility Analysis

4.1.1. Introduction

The purpose of the Regulatory Flexibility Act (RFA) is to minimize the adverse impacts from burdensome regulations and record keeping requirements on small businesses, small organizations, and small government entities. The category of small entities likely to be affected by the proposed plan is that of commercial scup fishermen, charter/headboats, and retailers wholesalers which have a high dependence on scup. The impacts of the proposed action on the fishing industry and the economy as a whole were discussed in sections 2.3 and 2.4 above. The following discussion of impacts centers specifically on the effects of the proposed action on the mentioned small businesses entities.

4.1.2. Determination of significant economic impact on a substantial number of small entities

According to guidelines on regulatory analysis of fishery management actions, a "substantial number" of small entries is more than 20 percent of those small entries engaged in the fishery (NMFS 1994). The Small Business Administration (SBA) defines a small business in the commercial fishing activity as a firm with receipts of up to $2.0 million annually. The number of vessels fishing for scup could range from 498 to 598 vessels (section 8.1.1.2 of the FMP). Based on unpublished NMFS weighout data, 427 otter trawl vessels landed scup in 1993 (Table 48). About half of the otter trawl vessels which reported landing any scup (211 out of 427) accounted for 95% of the catch. In 1985, a total of 454 party and 1,626 charter boats operated out of Atlantic coast ports from Maine through North Carolina (Table 35). The majority of the vessels in the scup fishery may readily qualify as small entities according to the SBA criteria. Given that he proposed action will affect many of these vessels, the "substantial number" criteria will be met.

At the present time there is no annual permit requirement for recreational fishing vessels taking scup within US waters. The National Marine Fisheries Service estimated that in 1991, a total of 23,416,000 trips were taken by marine recreational anglers in the Mid-Atlantic and North Atlantic regions (USDC 1992). Intercept surveys show that 2.74% of the anglers interviewed indicated that they preferred or sought scup as the primary species targeted in the Mid-Atlantic region and 7.25% in the North Atlantic region. That is, an estimated 2,339,250 angler trips (all modes) were nominally directed at scup in 1991. Over 72% of those directed scup trips were made in the North Atlantic region. A survey of the charter/party boat industry conducted by the Council in 1990 (section 8.2.4 of the FMP) indicated that boat owners ranked scup as one of the least desirable species.

Economic impacts on small business entities are considered to be "significant" if the proposed action would result in any of the following: a) a reduction in annual gross revenues by more than 5 percent; b) an increase in total costs of production by more than 5 percent as a result of an increase in compliance costs; c) an increase in compliance costs as a percent of sales for small entities at least 10 percent higher than compliance costs as a percent of sales for large entities; d) capital costs of compliance represent a significant portion of capital available to small entities, considering internal cash flow and external financing

capabilities; or, e) as a "rule of thumb," 2 percent of small businesses entities being forced to cease business operations (NMFS 1994).

4.1.2.1. Moratorium on commercial vessels

The intent of this provision is simply to cap entry into the fishery, so that any future gains in productivity and profitability which may occur will not be dissipated by future entrants. In this way, the individuals who make sacrifices today will be able to share in the benefits of future stock recovery, rather than others who experienced none of the hardship. Moratorium permits will curtail the entry into the industry of vessels that have not historically participated in the fishery. This will likely lead moratorium permits to accrue a substantial value. The factors set forth in section 303(b)(6) of the Magnuson Act (section 2.3.2.7) will be considered in implementing the moratorium.

4.1.2.2. Commercial minimum fish size

According to NMFS weighout data (excluding North Carolina), in 1991, the ex-vessel value of landed scup measuring less than 9" TL was approximately $35,000 (Table 30). Assuming this is the initial decrease in annual revenues for all participants in the fishery, and that it is evenly distributed over all participants in the fishery, each business unit would lose between $52 and $70 during the first year. This decrease in annual revenues are considered foregone earnings in one time period which may be realized later when the fish have grown to a larger size.

4.1.2.3. Minimum mesh requirement in the commercial fishery

It is believe that most vessels that participate in a direct scup fishery currently employ a 4" minimum mesh size. However, although not precisely quantifiable, it is possible that some vessels may need to replace existing nets with mesh size smaller than 4", in order to participate in a direct scup fishery. This could result in a more than 5 percent increase in cost of production in the short-term.

4.1.2.4. Maximum roller diameter

This action is likely to affect compliance cost for those vessels which currently use rollers with a diameter greater than 18". However, most commercial fishermen are now using rollers, use gear with roller sizes less than 18" diameter.

The cost of otter trawls vary considerable depending on numerous features that can be built into the trawl and the quality of material used. Generally, a 80-90 ft trawl net will cost about $5,000-$6,000 with 20 to 33 percent of the cost being the roller (D. Simpson pers. comm.). It is possible that the cost of compliance for some of the vessels that currently employ rollers with a diameter greater than 18", and have to purchase rollers with a diameter no greater than 18" could potentially reach 5% of the total cost of production for a limited number of vessels.

4.1.2.5. Minimum escape vent requirement

The intent of this option is to allow scup less than 9" TL to escape from the trap before they are brought to the surface. This will allow for undersize fish to escape alive increasing the amount of mature fish in the stock and increasing yields. The cost of placing escape vents in scup traps is expected to be minimal.

4.1.2.6. Degradable fasteners in traps

The cost of hinges and fasteners made of degradable material is likely to be lower than the galvanized or stainless hinges and fasteners commonly employed in the fishery (R. Sisson pers. comm.). Furthermore, this alternative would prevent lost traps from "ghost fishing."

4.1.2.7. Seasonal and area closures

Seasonal and area closures are expected to complement other management measures and are expected to provide positive benefits by reducing fish mortality and protect habitat among others. Although not precisely quantifiable, the proposed alternative could result in a more than 5 percent decrease in revenues for some vessels in the short-term. The initial lose in revenues may be recoup in the future as the stock rebuilds and more fish attain larger size.

4.1.2.8. Commercial quota

This option would be implemented in year 2 to control fishing mortality. The quota would be allocated to the commercial fishery based on stock assessment information on projected stocks for that year. This action will not have immediate effects on the fishery. The potential effects of measures implemented through this action will be analyzed when they are proposed. Commercial quotas, along with the other proposed regulations will prevent overfishing and reduce waste. As the stock rebuilds, commercial quotas would increase.

4.1.2.9. Recreational possession limits, minimum size limits, and seasonal closures

In year 1 and 2 of the management program, it would be illegal for recreational fishermen to possess whole scup or parts of scup less than 7" total length (TL) in the EEZ. The effect of a 7" TL minimum size in the EEZ would be of little consequence for both fishermen and the stock (2.3.2.1).

States would implement recreational size limits in state waters. On average (1983-1992), Massachusetts, Rhode Island and Connecticut accounted for 60% of the scup catch by weight (Table 25). These states already have in effect minimum size limits (Table 71). Massachusetts has in effect a 9" TL restriction, and Rhode Island and Connecticut both have an 8" TL restriction.

From 1983 to 1992 the largest percent of scup landed by recreational fishermen coastwide were taken from private/rental vessels with 77% of the total catch, followed by party/charter vessels with 12% of the total catch (Table 24). The group of individuals that could be most likely affected by the possession and minimum size limits are fishermen that are interested in obtaining very large catches per fishing trip. However, a survey of the party and charter boat (section 8.2.4 of the FMP) indicates that charter and party boat owners reported scup as the least desirable species for their customers.

It is expected that the implementation of minimum size limits will allow recreational fishermen to have larger fish available to them over the stock recovery period. This will likely mitigate the initial effects of the size limits.

4.1.2.10. Evaluation of framework provisions

The framework provision is intended to allow for changes in recreational limits, size limits and season closures to account for changes in stock abundance and meet the time frame of the fishing mortality reduction strategy. This action will not have immediate effects on the fishery. The potential effects of measures implemented through the framework provision will be analyzed when they are proposed.

4.1.2.11. Recreational harvest limits

This option could potentially be implemented in year 2 to control fishing mortality. The recreational harvest limits would be allocated to the fishery based on assessment information on projected stocks for that year. This action will not have immediate effects on the fishery. Recreational harvest limits, along with the other proposed regulations will prevent overfishing and reduce waste. As the stock rebuilds, harvest limits would increase.

4.1.3. Explanation of why is the action being considered

Refer to the section on Problems for Resolution of the FMP.

4.1.4. Objectives and legal basis for the rule

Refer to the section on Management Objectives of the amendment document. The Magnuson Fishery Conservation and Management Act of 1976 provides the legal basis for the rule.

4.1.5. Demographic analysis

Refer to the Scup Fishery Management Plan.

4.1.6. Cost analysis

Refer to the section on Regulatory Impact Analysis and Summary and Expected Net Impact of Proposed Action in the RIR.

4.1.7. Competitive effects analysis

The industry is primarily formed by small businesses (harvesters). There are no large businesses involved in the industry, therefore, there are no disproportional small versus large business effects. There are no disproportional cost of compliance among the affected small entities. With the exception of the potential compliance cost associated with the minimum roller diameter option mentioned above.

4.1.8. Identification of overlapping regulations

The proposed action does not create regulations that conflict with any state regulations or other federal laws.

4.1.9. Conclusions

The preceding Regulatory Flexibility Analysis indicate that most of the proposed regulations in this amendment do not result in significant economic impacts on small entries. However, the criterion of "significant economic impact" may be met because of the potential increase in operating costs of more than 5 percent due to the maximum roller diameter option and minimum mesh size options, and the potential decrease in revenues of more than 5 percent due to the seasonal and area closures option.

5. Paperwork Reduction Act of 1980

The Paperwork Reduction Act concerns the collection of information. The intent of the Act is to minimize the Federal paperwork burden for individuals, small business, State and local governments, and other persons as well as to maximize the usefulness of information collected by the Federal government.

It is assumed that most individuals that will potentially apply for scup operator permits already hold operator permits for summer flounder, multispecies and scallops. It is also expected than since most of the vessel operators already submit logbooks reports under the Northeast Multispecies, Scallop, and Summer Flounder FMPs, the implementation of this plan would not affect the reporting process to any significant extent.

6. Impacts of the Plan relative to Federalism

The FMP does not contain policies with federalism implications sufficient to warrant preparation of a federalism assessment under Executive Order 12612.

APPENDIX 6. PROPOSED REGULATIONS

Subpart C - General Provisions

§625.30 Purpose and scope.
§625.31 Definitions.
§625.32 Relation to other laws.
§625.33 Vessel permits.
§625.34 Dealer permit.
§625.35 Operator permits.
§625.36 Recordkeeping and reporting requirements.
§625.37 Vessel identification.
§625.38 Prohibitions.
§625.39 Facilitation of enforcement.
§625.40 Penalties.

Subpart D - Management Measures

§625.50 Catch quotas and other restrictions.
§625.51 Closure.
§625.52 Season and area restrictions.
§625.53 Minimum size.
§625.54 Gear restrictions.
§625.55 Possession limit.
§625.56 Sea sampler program.
§625.57 Experimental fishery.

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

Subpart C - General Provisions

§625.30 Purpose and scope.

The regulations in this part implement Amendment 8 to the Summer Flounder Fishery Management Plan: the Fishery Management Plan for the Scup Fishery (FMP). The FMP was prepared and adopted by the Mid-Atlantic Fishery Management Council in cooperation with the Atlantic States Marine Fisheries Commission and the New England and South Atlantic Fishery Management Councils. These regulations govern the conservation and management of scup. This part does not apply to scup south of 35° 15.3′ N. latitude, the latitude of Cape Hatteras Light, North Carolina.

§625.31 Definitions. In addition to the definitions in the Magnuson Act and in §620.2 of this chapter, the terms used in this part have the following meanings:

Being rerigged means physical alteration of the vessel or its gear had begun to transform the vessel into one capable of fishing commercially for scup.

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

Commission means the Atlantic States Marine Fisheries Commission.

Council means the Mid-Atlantic Fishery Management Council.

Dealer means any person who receives scup for a commercial purpose from the owner or operator of a vessel issued a moratorium permit under §625.33 other than solely for transport on land.

Fishery Management Plan (FMP) means the Fishery Management Plan for the Scup Fishery and any amendments thereto.

Fishing commercially means retaining scup in excess of the possession limit specified in §625.55.

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.

Regional Director means the Director, Northeast Region, NMFS, 1 Blackburn Drive, Gloucester, MA 01930, telephone 508-281-9250, or a designee.

Reporting week means a period of time beginning at 0001 local time on Sunday and ending at 2400 hours local time the following Saturday.

Scup means the species *Stenotomus chrysops*.

Scup Monitoring Committee means a committee made up of staff representatives of the Mid-Atlantic, New England, and South Atlantic Fishery Management Councils, the Northeast Regional Office of NMFS, the Northeast Fisheries Science Center, and Commission representatives. The Council Executive Director or his designee chairs the Committee.

Substantially similar harvesting capacity means the same or less Gross Registered Tonnage (GRT) and vessel registered length.

Total length (TL) means the distance from the tip of the snout to the tip of the tail (caudal fin) while the fish is lying on its side normally extended.

Under construction means that the keel has been laid.

Vessel registered length means that registered length specified on U.S. Coast Guard documentation or state registration if the state registered length is verified by a NMFS authorized official.

§625.32 Relation to other laws.

(a) The relation of this part to other laws is set forth in §620.3 of this chapter and paragraph (b) of this section.

(b) Additional regulations governing fishing for scup by foreign vessels in the EEZ are set forth in 50 CFR Part 611, Subparts A and C.

§625.33 Vessel permits.

(a) *General*

(1) *Requirement*. Subject to the eligibility requirements specified in paragraphs (b) and (c) of this section, the owner of a vessel of the United States, including a party or charter vessel, must obtain a permit issued under this part to fish for or retain scup in the EEZ.

(2) *Exemption*. Any vessel other than a party or charter boat that observes the possession limit in §625.55 is exempt from the permit requirement.

(3) *Condition*. Vessel owners who apply for a fishing vessel permit under this section must agree as a condition of the permit that the vessel's fishing, catch and pertinent gear (without regard to whether such fishing occurs in the EEZ or landward of the EEZ, and without regard to where such fish or gear are possessed, taken or landed) will be subject to all requirements of this part. All such fishing, catch and gear will remain subject to all applicable state requirements. If a requirement of this part and a management measure required by state law differ, any vessel owner permitted to fish in the EEZ must comply with the more restrictive requirement. Owners and operators of vessels fishing under the terms of a moratorium permit issued pursuant to paragraph (b) of this section must also agree, as a condition of the permit, not to

land scup in any state that the Regional Director has determined no longer has commercial quota available.

(b) *Moratorium permit.*

(1) A vessel is eligible to receive a permit to fish for and retain scup in excess of the possession limit in §625.55 in the EEZ if it meets the conditions for paragraphs (e) and (f) of this section and any of the following criteria:

(i) The vessel landed and sold scup between January 26, 1988, and January 26, 1993; or

(ii) The vessel was under construction for, or was being rerigged for, use in the directed fishery for scup on January 26, 1993, provided the vessel landed scup for sale prior to the effective date of these regulations; or

(iii) The vessel is replacing a vessel of substantially similar harvesting capacity which involuntarily left the scup fishery during the moratorium, and both the entering and replaced vessels are owned by the same person. Vessel permits issued to vessels that involuntarily leave the fishery may not be combined to create larger replacement vessels.

(iv) Vessels that are judged unseaworthy by the Coast Guard for reasons other than lack of maintenance may be replaced by a vessel of substantially similar harvesting capacity.

(2) *Restriction.* No one may apply for the permit specified in paragraph (b)(1) of this section more than 12 months after the effective date of these regulations, or the events specified under paragraphs (h)(1) and (2) of this section. This section does not affect annual permit renewals.

(c) *Party and charter boat permit.* Any party or charter boat is eligible for a permit to fish, other than a moratorium permit, if it is carrying passengers for hire, and is then subject to the possession limits specified in §625.55.

(d) *Information requirements.* In addition to applicable information required to be provided by paragraph (d)(1) of this section, an application for either a moratorium permit or a party and charter boat permit must contain at least the following information, and any other information required by the Regional Director: vessel name; owner name, mailing address, and telephone number; U.S. Coast Guard documentation number and a copy of the vessel's U.S. Coast Guard documentation or, if undocumented, the vessel's state registration number and a copy of the state registration; home port and principal port of landing; length; gross tonnage; net tonnage; engine horsepower; year the vessel was built; type of construction and type of propulsion; approximate fish hold capacity; type of fishing gear used by the vessel; number of crew; permit category; if owner is a corporation, a copy of the Certificate of Incorporation, and the names and addresses of all shareholders owning 25 percent or more of the corporation's shares; if the owner is a partnership, a copy of the Partnership Agreement and the names and addresses of all partners; if there is more than one owner, names of all owners having owned more than a 25-percent interest; the name and signature of the owner or the owner's authorized representative; permit number of any current or, if expired, previous federal fishery permit issued to the vessel; and a copy of charter/party boat license and number of passengers the vessel is licensed to carry (charter and party boats).

(1) An application for a permit under this section must be submitted and signed by the owner of the vessel on an appropriate form obtained from the Regional Director at least 30 days prior to the date on which the applicant desires to have the permit made effective. The Regional Director will notify the applicant of any deficiency in the application pursuant to paragraphs (d)(2), (e) and (f)(2) of this section. Applicants for moratorium permits shall provide information with the application sufficient for the Regional Director to determine if the vessel meets the eligibility requirements. Dealer weighout forms and notarized statements from marine architects or surveyors or shipyard officials will be considered acceptable forms of proof.

(2) *Permit information.*

(3) *Change in permit information.* Any change in the information specified in paragraph (d)(2) of this section must be submitted by the applicant in writing to the Regional Director within 15 days of the change.

(e) *Fees.* The Regional Director may charge a fee to recover administrative expenses of issuing a permit required under paragraphs (b) and (c) of this section. The amount of the fee is calculated in accordance with the procedures of the NOAA Finance Handbook for determining administrative costs of each special product or service. The fee may not exceed such costs and is specified with each application form. The appropriate fee must accompany each application; if it does not, the application will be considered incomplete for purposes of paragraph (f) of this section.

(f) *Issuance.*

(1) The Regional director will issue a permit under this section at any time during the fishing year to an applicant if:

(i) The application is complete as described in paragraph (d)(2) of this section; and

(ii) The applicant has complied with all applicable reporting requirements of §625.6 during the 12 months immediately preceding the application.

(2) Upon receipt of an incomplete application, or an application from a person who has not complied with all applicable reporting requirements of §625.6 during the 12 months immediately preceding the application, the Regional Director will notify the applicant of the deficiency. If the applicant fails to correct the deficiency within 30 days of the Regional Director's notification, the application will be considered abandoned.

(g) *Appeal of denial of permit.*

(1) Any applicant denied a moratorium permit may appeal to the Regional Director within 30 days of the notice of denial. Any such appeal shall be in writing. The only ground for appeal is that the Regional Director erred in concluding that the vessel did not meet the criteria in paragraph (b)(1) of this section. The appeal shall set forth the basis for the applicant's belief that the Regional Director's decision was made in error.

(2) The appeal may be presented, at the option of the applicant, at a hearing before an officer appointed by the Regional Director.

(3) The decision on the appeal by the Regional Director is the final decision of the Department of Commerce.

(h) *Expiration.* Except as provided in paragraph (b)(1)(iii) of this section, a permit expires:

(1) When the owner retires the vessel from the fishery;

(2) Upon the renewal date specified on the permit; or

(3) When the ownership of the vessel changes; however, the Regional Director may authorize the continuation of a moratorium permit for the scup fishery if the new owner requests. Applications for continuation of a permit must be addressed to the Regional Director.

(i) *Duration.* A permit is valid until it is revoked, suspended, or modified under 15 CFR Part 904, or until it otherwise expires or ownership changes or the applicant has failed to report any change in the information on the permit application to the Regional Director as specified in paragraph (d)(3) of this

section.

(j) *Alteration*. Any permit which has been altered, erased, mutilated is invalid.

(k) *Replacement*. Replacement permits for an otherwise valid permit may be issued by the Regional Director when requested in writing by the owner, stating the need for replacement, the name of the vessel, and the fishing permit number assigned. An application for a replacement permit will not be considered a new application. An appropriate fee may be charged for issuance of the replacement permit.

(l) *Transfer*. Permits issued under this part are not transferable or assignable. A permit will be valid only for the fishing vessel and owner for which it is issued.

(m) *Display*. The permit must be displayed for inspection upon request by any authorized official or any employee of NMFS designated by the Regional Director.

(n) *Suspension and revocation*. The Administrator may suspend, revoke, or modify any permit issued or sought under this section. Subpart D of 15 CFR Part 904 (Civil Procedures) governs the imposition of enforcement-related sanctions against a permit issued under this part.

§625.34 Dealer permit.

(a) *General*. Any dealer must have a valid permit issued under this section.

(b) *Permit application.*

(1) An applicant must apply for a dealer permit on a form provided by the Regional Director. The application must be signed by the applicant and submitted to the Regional Director at least 30 days before the date upon which the applicant desires to have the permit made effective. Applications must contain the name, principal place of business, mailing address and telephone number of the applicant. The Regional Director will notify the applicant of any deficiency in the application pursuant to paragraph (b)(3)(ii) of this section.

(2) *Change in permit information*. Any change in the information specified in paragraph (b)(1) of this section must be submitted by the applicant in writing to the Regional Director within 15 days of the change.

(3) *Issuance*.

(i) The Regional Director will issue a permit at any time during the fishing year to an applicant if:

(A) The application is complete; and

(B) The applicant has complied with all applicable reporting requirements of this section and §625.6(a) during the 12 months immediately preceding the application.

(ii) Upon receipt of an incomplete application, or an application from a person who has not complied with all applicable reporting requirements of paragraph (b)(1) this section and §625.6(a) during the 12 months immediately preceding the application, the Regional Director will notify the applicant of the deficiency. If the applicant fails to correct the deficiency within 30 days of the Regional Director's notification, the application will be considered abandoned.

(4) *Expiration*. The permit must be renewed annually and unless renewed annually will expire upon the renewal date specified in the permit.

(5) *Duration*. Any permit issued under this section remains valid until it is revoked, suspended or modified under 15 CFR part 904, or otherwise expires, or ownership changes, or the applicant has failed to

report any change in the information on the permit application to the Regional Director.

(6) *Alteration*. Any permit which is altered, erased, or mutilated is invalid.

(7) *Replacement*. The Regional Director may issue replacement permits for lost permits. Any application for a replacement permit shall not be considered a new permit.

(8) *Transfer*. A permit is not transferable or assignable. It is valid only for the person to whom it is issued.

(9) *Display*. The permit must be displayed for inspection upon request by an authorized officer or any employee of NMFS designated by the Regional Director.

(10) *Suspension and revocation*. The Administrator may suspend, revoke, or modify, any permit issued or sought under this section. Procedures governing permit enforcement-related sanctions or denials are found at Subpart D of 15 CFR Part 904.

(11) *Fees*. The Regional Director may charge a fee to recover administrative expenses of issuing a permit required under paragraph (b) of this section. The amount of the fee is calculated in accordance with the procedures of the NOAA Finance Handbook for determining administrative costs of each special product or service. The fee may not exceed such costs and is specified with each application form. The appropriate fee must accompany each application; if it does not, the application will be considered incomplete for purposes of paragraph (b)(3) of this section.

§625.35 Operator permit.

(a) *General*. Any operator of a vessel holding a valid federal scup permit under this part, or any operator of a vessel fishing for scup in the EEZ or in possession of scup in or harvested from the EEZ, must carry on board a valid operator's permit issued under this part.

(b) *Operator application*. Applicants for a permit under this section must submit a completed permit application on an appropriate form obtained from the Regional Director. The application must be signed by the applicant and submitted to the Regional Director at least 30 days prior to the date on which the applicant desires to have the permit made effective. The Regional Director will notify the applicant of any deficiency in the application pursuant to this section.

(c) *Condition*. Vessel operators who apply for an operator's permit under this section must agree as a condition of this permit that the operator and vessel's fishing, catch, and pertinent gear (without regard to whether such fishing occurs in the EEZ or landward of the EEZ, and without regard to where such fish or gear are possessed, taken, or landed), are subject to all requirements of this part while fishing in the EEZ or on board a vessel permitted under §651.33. The vessel and all such fishing, catch, and gear will remain subject to all applicable state or local requirements. Further, such operators must agree as a condition of this permit that if the permit is suspended or revoked pursuant to 15 CFR part 904, the operator cannot be on board any fishing vessel issued a Federal Fisheries Permit or any vessel subject to Federal fishing regulations while the vessel is at sea or engaged in offloading. If a requirement of this part and a management measure required by state or local law differ, any operator issued a permit under this part must comply with the more restrictive requirement.

(d) *Information requirements*. An applicant must provided at least all the following information and any other information required by the Regional Director: Name, mailing address, and telephone number; date of birth; hair color; eye color; height; weight; social security number (optional) and signature of the applicant. The applicant must also provide two color passport-size photographs.

(e) *Fees*. The Regional Director may charge a fee to recover the administrative expense of issuing a permit required under this section. The amount of the fee is calculated in accordance with the procedures of the NOAA Finance Handbook for determining the administrative costs of each special

product or service. The fee may not exceed such costs and is specified on each application form. The appropriate fee must accompany each application; if it does not, the application will be considered incomplete for purposes of paragraph (f) of the section.

(f) *Issuance*. Except as provided in subpart D of 15 CFR part 904, the Regional Director shall issue an operator's permit within 30 days of receipt of a completed application if the criteria specified herein are met. Upon receipt of an incomplete or improperly executed application, the Regional Director will notify the applicant of the deficiency in the application. If the applicant fails to correct the deficiency within 30 days following the date of notification, the application will be considered abandoned.

(g) *Expiration*. Federal operator permits must be renewed annually, and unless renewed will expire upon the renewal date specified in the permit.

(h) *Duration*. A permit is valid until it is revoked, suspended or modified under 15 CFR part 904, or otherwise expires, or the applicant has failed to report a change in the information on the permit application to the Regional Director as specified in paragraph (k) of this section.

(i) *Replacement*. Replacement permits, for otherwise valid permits, may be issued by the Regional Director when requested in writing by the applicant, stating the need for replacement and the Federal operator permit number assigned. An applicant for a replacement permit must also provide two color passport-size photos of the applicant. An application for a replacement permit will not be considered a new application. An appropriate fee may be charged.

(j) *Transfer*. Permits issued under this part are not transferable or assignable. A permit is valid only for the person to whom it is issued.

(k) *Change in application information*. Notice of a change in the permit holder's name, address, or telephone number must be submitted in writing to, and received by, the Regional Director within 15 days of the change in information. If written notice of the change in information is not received by the Regional Director within 15 days, the permit is void.

(l) *Alteration*. Any permit that has been altered, erased, or mutilated is invalid.

(m) *Display*. Any permit issued under this part must be maintained in legible condition and displayed for inspection upon request by any authorized officer.

(n) *Sanctions*. Vessel operators with suspended or revoked permits may not be on board a Federally permitted fishing vessel in any capacity while the vessel is at sea or engaged in offloading. Procedures governing enforcement related permit sanctions and denials are found at subpart D of 15 CFR part 904.

(o) *Vessel owner responsibility*. Vessel owners are responsible for ensuring that their vessels are operated by an individual with a valid operator's permit issued under this section.

§625.36 Recordkeeping and reporting requirements.

(a) *Dealers*.

(1) *Weekly report*. Dealers must send by mail to the Regional Director, or official designee, on a weekly basis on forms supplied by or approved by the Regional Director, a report on fish purchases. If authorized in writing by the Regional Director, dealers may submit reports electronically or through other media. The following information and any other information required by the Regional Director, must be provided in the report: name and mailing address of dealer; dealer number; name and permit number of the vessels from which fish are landed or received; dates of purchases; pounds by species; price by species; and port landed. If no fish are purchased during the week, a report so stating must be submitted.

(2) *Annual report*. All persons required to submit reports under paragraph (a)(1) of this section are required to complete the "Employment Data" section of the Annual Processed Products Reports; completion the other sections on that form is voluntary. Required data are the number of employees handling fishery products by month. Reports for a given calendar year must be submitted to: NMFS Statistics, 166 Water Street, Woods Hole, MA 02543, and must be postmarked by February 10 of the following year.

(3) *Inspection*. Upon the request of an authorized officer, or by an employee of NMFS designated by the Regional Director to make such inspections, the dealer must make immediately available for inspection copies of the required reports that have been submitted, or should have been submitted, and the records upon which the reports were based.

(4) *Record retention*. Copies of reports, and records upon which the reports were based, must be retained and be available for review for 1 year after the date of the last entry on the report. The dealer must retain such reports and records at its principal place of business.

(5) *Submitting reports*. Reports must be received or postmarked, if mailed, within 3 days after the end of each reporting week. Each dealer will be sent forms and instructions, including the address to which to submit reports, shortly after receipt of a dealer permit. If no fish were purchased during a week, a report so stating must be submitted.

(6) *At-sea activities*. All persons purchasing, receiving, or processing any scup at sea for landing at any port of the United States must submit information identical to that required by paragraphs (a)(1) and (2) of this section and provide those reports to the Regional Director or designee on the same frequency basis.

(b) *Vessel owners issued a moratorium permit.*

(1) *Fishing log reports*. The owner of any vessel issued a moratorium permit under §625.33 must maintain on board the vessel, and submit, an accurate daily fishing log report for all fishing trips regardless of species fished for or taken, on forms supplied by or approved by the Regional Director. If authorized in writing by the Regional Director, vessel owners may submit reports electronically, for example by using a vessel tracking system or other media. At least the following information, and any other information required by the Regional Director, must be provided: Vessel name, U.S. Coast Guard (USCG) documentation number (or state registration number if undocumented); permit number; date/time sailed; date/time landed; trip type; number of crew; gear fished; quantity and size of gear; mesh/ring size; chart area fished; average depth; latitude/longitude (or loran station and bearings); total hauls per area fished; average tow time duration; pounds by species of all species landed or discarded; dealer permit number; dealer name; date sold; port and state landed; and vessel operator's name, signature, and operator permit number (if applicable).

(2) *When to fill in the log*. Such log reports must be filled in, except for information required but not yet ascertainable, before offloading has begun. All information in paragraph (b)(1) of this section must be filled in for each fishing trip before starting the next fishing trip.

(3) *Inspection*. Upon the request of an authorized officer, or an employee of NMFS designated by the Regional Director to make such inspections, at any time during or after a trip, owners and operators must make immediately available for inspection, the fishing log reports currently in use, or to be submitted.

(4) *Record retention*. Copies of the fishing log reports must be retained and available for review for 1 year after the date of the last entry on the log.

(5) *Submitting reports*. Fishing log reports must be received or postmarked, if mailed, within 15 days after the end of the reporting month. Each owner will be sent forms and instructions, including the address to which to submit reports, shortly after receipt of a Federal Fisheries Permit. If no fishing trip is made during a month, a report so stating must be submitted.

(c) *Owners of party and charter boats.*

(1) *Fishing log reports.* The owner of any party or charter boat issued a moratorium permit under §625.4 and carrying passengers for hire shall maintain on board the vessel, and submit, an accurate daily fishing log report for each charter or party fishing trip, even if no scup is retained, on forms supplied by or approved by the Regional Director. The owner of any party or charter boat issued a scup permit other than a moratorium permit and carrying passengers for hire shall maintain on board the vessel, and submit, an accurate daily fishing log report for each charter or party fishing trip which lands scup. If authorized in writing by the Regional Director, vessel owners may submit reports electronically, for example, by using a vessel tracking system or other media. At least the following information, and any other information required by the Regional Director, must be provided: Vessel name, U.S. Coast Guard (USCG) documentation number (or state registration number if undocumented); permit number; date/time sailed; date/time landed; trip type; number of crew; number of anglers, quantity and size of gear; chart area fished; average depth; latitude/longitude (or loran station and bearings); average tow time duration; count by species of all species landed or discarded; port and state landed; and vessel operator's name, signature, and operator permit number (if applicable).

(2) *When to fill in the log.* Such log reports must be filled in before offloading has begun. All information required in paragraph (c)(1) of this section must be filled in for each fishing trip by the end of each fishing trip.

(3) *Inspection.* Upon the request of an authorized officer, or an employee of NMFS designated by the Regional Director to make such inspections, at any time during or after a trip, owners and operators must make immediately available for inspection the fishing log reports currently in use, or to be submitted.

(4) *Record retention.* Copies of the fishing log reports must be retained and available for review for 1 year after the date of the last entry on the log.

(5) *Submitting reports.* Fishing log reports must be received or postmarked, if mailed, within 15 days after the end of the reporting month. Each owner will be sent forms and instructions, including the address to which to submit reports, shortly after receipt of a Federal Fisheries Permit. If no scup is landed or no fishing trip is made during a month, a report so stating must be submitted.

§625.37 Vessel identification.

(a) *Vessel name.* Each fishing vessel subject to this Part and over 25 feet (7.6 m) in registered length must affix permanently its name on the port and starboard sides of the bow and, as possible, on its stern.

(b) *Official number.* Each fishing vessel subject to this Part and over 25 feet (7.6 m) in registered 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.

(c) *Numerals.* Except as provided in paragraph (e) of this section, the official number must be displayed in block arabic numerals in contrasting color at least 18 inches (45.7 cm) in height for fishing vessels over 65 feet (19.8 m) in registered length, and at least 10 inches (25.4 cm) in height for all other vessels over 25 feet (7.6 m) in registered length. The registered length of a vessel, for purposes of this section, is that registered length set forth in US Coast Guard or state records.

(d) *Duties of owner.* The vessel owner shall insure that each vessel subject to this part will:

(1) Keep the vessel's name and official number clearly legible and in good repair, and

(2) Ensure that no part of the vessel, its rigging, its fishing gear, or any other object obstructs the view of the official number from any enforcement vessel or aircraft.

(e) *Nonpermanent marking.* Vessels carrying recreational fishing parties on a per capita basis or by charter must use markings that meet the above requirements, except for the requirement that they be affixed permanently to the vessel. The nonpermanent markings must be displayed in conformity with the above requirements when the vessel is fishing for scup.

§625.38 Prohibitions.

(a) In addition to the general prohibitions specified in §620.7 of this chapter, it is unlawful for any person owning or operating a vessel issued a permit (including a moratorium permit) under §625.33 to do any of the following:

(1) Land or possess at sea any scup, or parts thereof, that fail to meet the minimum fish size specified in §625.53;

(2) Fail to affix and maintain markings as required by §625.37;

(3) Possess 4,000 or more pounds (1,814 kg) of scup, unless the vessel meets the minimum mesh requirement specified in §625.54,(a);

(4) Possess scup in other than a box specified in §625.55(d) if fishing with nets; having mesh that does not meet the minimum mesh-size requirement specified in §625.54(a).

(5) Land scup for sale, after the effective date published in the *FEDERAL REGISTER* notifying permit holders that commercial quota is no longer available.

(6) Fish with or possess nets or netting that do not meet the minimum mesh requirement, or that are modified, obstructed or constricted, if subject to the minimum mesh requirement specified in §625.54(a), unless the nets or netting are stowed in accordance with §625.54(e);

(7) Fish with or possess nets or netting that do not meet the minimum mesh requirement, or that are modified, obstructed or constricted unless the nets or netting are stowed in accordance with §625.54(e);

(8) Sell or transfer to another person for a commercial purpose, other than transport, any scup, unless the transferee has a dealer permit issued under §625.34;

(9) Carry passengers for hire, or carry more than three crew members for a charter boat or five crew members for a party boat, while fishing commercially pursuant to a moratorium permit issued pursuant to §625.33; or

(10) Refuse to embark a sea sampler if requested by the Regional Director.

(11) Sell any scup that fail to meet the minimum fish size specified in §625.53

(12) Use a scup pot or trap that does not have the hinges and fasteners of one panel or door made of one of the following degradable materials:

i. untreated hemp, jute, or cotton string of 3/16" (4.8 mm) diameter of smaller;

ii. magnesium alloy, timed float releases (pop-up devices) or similar magnesium alloy fasteners; or

iii. ungalvanized or uncoated iron wire of 0.094" (2.4 mm) diameter or smaller.

(13) Use a scup trap or pot that does not have a minimum escape vent of 3.1" in diameter or 2.25" square.

(14) Use roller rig trawl gear equipped with rollers greater than 18" in diameter.

(b) It is unlawful for the owner or operator of a party or charter boat issued a permit (including a moratorium permit) pursuant to §625.33, when the boat is carrying passengers for hire or carrying more than three crew members if a charter boat or more than five members if a party boat, to:

(1) Possess scup in excess of the possession limit established pursuant to §625.55;

(2) Possess scup smaller than the minimum size limit for recreational fishermen established pursuant to §625.53(b);

(3) Fish for scup other than during a season specified pursuant to §625.52;

(4) Refuse to embark a sea sampler if requested by the Regional Director; or

(5) Sell scup or transfer scup to another person for a commercial purpose.

(c) It is unlawful for any person to do any of the following:

(1) Possess in or harvest from the EEZ scup either in excess of the possession limit specified in §625.55 or before or after the time period specified in §625.52 (a), unless the person is operating a vessel issued a moratorium permit under §625.33 and the moratorium permit is on board the vessel and has not been surrendered, revoked, or suspended;

(2) Possess in or harvest from the EEZ scup before or after the time period or outside an area specified in §625.52(b)

(3) Possess in or harvest from the EEZ scup that do not meet the minimum size specified in §625.53(b);

(4) Possess nets of netting with mesh not meeting the minimum mesh requirement of §625.54 if the person possesses scup harvested in or from the EEZ in excess of the threshold limit of §625.54(a).

(5) Offload, cause to be offloaded, sell or buy any scup, whether on land or at sea, as an owner, operator, dealer, buyer or receiver in the scup fishery without accurately preparing and submitting in a timely fashion the documents required by §625.36;

(6) Purchase or otherwise receive, except for transport, scup from the owner or operator of a vessel issued a moratorium permit under §625.33 unless in possession of a valid permit issued under §625.55;

(7) Purchase or otherwise receive for commercial purposes scup caught by other than a vessel with a moratorium permit not subject to the possession limit in §625.55 unless the vessel has not been issued a permit under this part and is fishing exclusively within the waters under the jurisdiction of any state.

(8) Purchase or otherwise receive for a commercial purpose scup landed in a state after the effective date published in the *FEDERAL REGISTER* notifying permit holders that commercial quota is no longer available in that state;

(9) Make any false statement, oral or written, to an authorized officer, concerning the catching, taking, harvesting, landing, purchase, sale, possession, or transfer of any scup;

(10) Fail to report to the Regional Director within 15 days any change in the information contained in the permit application;

(11) Assault, resist, oppose, impede, harass, intimidate, or interfere with or bar by command, impediment, threat, coercion or refusal of reasonable assistance of an observer or sea sampler conducting his or her duties aboard a vessel; or

(12) Violate any other provision of this part, the Magnuson Act, or any regulation or permit issued under the Magnuson Act.

(d) All scup possessed aboard a party or charter boat issued a permit under §625.33(c) are deemed to have been harvested from the EEZ.

(e) It is unlawful for any person to violate any terms of a letter authorizing experimental fishing pursuant to §625.57 or to fail to keep such letter aboard the vessel during the time period of the experimental fishing.

§625.39 Facilitation of enforcement

See §620.8 of this chapter.

§625.40 Penalties.

See §620.9 of this chapter.

Subpart D - Management Measures

§625.50 Catch quotas and other restrictions.

(a) *Annual review*. Beginning with the first year of FMP implementation, the Scup Monitoring Committee will review the following data on or before August 15th of each year (the first meeting would be during the second year following implementation) to determine the allowable levels of fishing and other restrictions necessary to result in a exploitation rate of 47% in the second, third, and fourth years following FMP implementation, 33% in the fifth and sixth years following FMP implementation, and 19% in the seventh year following FMP implementation and thereafter:

(1) Commercial and recreational catch data;

(2) Current estimates of fishing mortality;

(3) Stock status;

(4) Recent estimates of recruitment;

(5) Virtual population analysis results;

(6) Levels of noncompliance by fishermen or individual states;

(7) Impact of size/mesh regulations;

(8) Sea sampling and winter trawl survey data, or, if sea sampling data are unavailable, length frequency information from the winter trawl survey and mesh selectivity analyses;

(9) Impact of gear other than otter trawls on the mortality of scup; and

(10) Any other relevant information.

(b) *Recommended measures*. Based on this review, the Scup Monitoring Committee will recommend to the Demersal Species Committee of the Council and the ASMFC the following measures to assure that the fishing mortality rate specified in paragraph (a) of this section is not exceeded:

(1) The commercial quota will be set from a range of 0 to the maximum allowed to achieve the fishing mortality specified in paragraph (a) of this section.

(2) Commercial minimum fish size;

(3) Minimum mesh size;

(4) The recreational possession limit will be set from a range of 0 to 50 scup to achieve the fishing mortality rate specified in paragraph (a) of this section;

(5) Recreational minimum fish size;

(6) Recreational season;

(7) Restrictions on gear other than otter trawls; and

(8) Season and area closures in the commercial fishery.

(c) *Annual fishing measures*. The Demersal Species Committee shall review the recommendations of the Scup Monitoring Committee. Based on these recommendations and any public comment, the Demersal Species Committee shall make its recommendations to the Council with respect to the measures necessary to assure that the applicable fishing mortality rate specified in paragraph (a) of this section is not exceeded. The Council shall review these recommendations. Based on these recommendations, and any public comment, the Council shall make recommendations to the Regional Director with respect to the measures necessary to assure that the fishing mortality rates specified in paragraph (a) of this section are not exceeded. Included in the recommendation will be supporting documents as appropriate, concerning the environmental and economic impacts of the proposed action. The Regional Director will review these recommendations and any recommendations of the Commission. After such review, the Regional Director will publish in the *Federal Register* a proposed rule on or before October 15 to implement a coastwide commercial quota and recreational harvest limit and additional management measures for the commercial fishery, and will publish in the *Federal Register* a proposed rule on or before February 15 to implement additional management measures for the recreational fishery, if he determines that these measures are necessary to assure that the fishing mortality rates specified in paragraph (a) of this section are not exceeded. After considering public comment on a proposed rule, the Regional Director will publish a final rule in the *Federal Register* to implement the measures necessary to assure that the fishing mortality rates specified in paragraph (a) of this section are not exceeded.

§625.51 Closure.

(a) *EEZ Closure*. The Regional Director shall close the EEZ to fishing for scup by commercial vessels for the remainder of the calendar year by publishing a notice in the *FEDERAL REGISTER* if he determines that the quota will be caught by the time the closure takes effect.

§625.52 Season and Area restrictions.

(a) Beginning with the second year following FMP implementation, vessels that are not eligible for a moratorium permit under §625.4 and fishermen subject to the possession limit may fish for scup only during the period specified by the Regional Director pursuant to the procedures in §625.50.

(b) Beginning with the second year following FMP implementation, commercial fishing vessels issued a moratorium permit may fish for scup only during the period and in the areas specified by the Regional Director pursuant to the procedures in §625.50.

§625.53 Minimum sizes.

(a) The minimum size for scup is 9 inches (22.9 cm) total length for all vessels issued a moratorium permit under §625.33, except on board party and charter boats carrying passengers for hire or carrying more than three crew members if a charter boat or more than five crew members if a party boat.

(b) The minimum size for scup is 7 inches (17.8 cm) total length for all vessels that do not qualify for a moratorium permit, or party and charter boats holding moratorium permits but fishing with passengers for hire or carrying more than three crew members if a charter boat or more than five crew members if a party boat.

(c) The minimum size applies to whole fish or any part of a fish found in possession, e.g., fillets. These minimum sizes may be adjusted pursuant to the procedures in §625.50.

(d) Beginning with the second year following FMP implementation, the minimum fish sizes set forth in paragraphs (a) and (b) of this section may be changed following the procedures in §625.50.

§625.54 Gear restrictions.

(a) *General.* Otter trawlers whose owners are issued a permit (including moratorium permit) under §625.33 and that land or possess 4,000 or more pounds (1,814 kg) of scup, per trip, must fish with nets that have a minimum mesh size of 4 inches (10.16 cm) diamond mesh applied throughout the codend for at least 75 continuous meshes forward of the terminus of the net, or, for codends with less than 75 meshes, the minimum-mesh-size codend must be a minimum of one-third of the net, measured from the terminus of the codend to the head rope, excluding any turtle excluder device extension.

(b) *Mesh-size measurement.* Mesh sizes are measured by a wedge-shaped gauge having a taper of two centimeters in eight centimeters and a thickness of 2.3 millimeters inserted into the meshes under a pressure or pull of five kilograms. The mesh size will be the average of the measurement of any series of 20 consecutive meshes for nets having 75 or more meshes, and 10 consecutive meshes for nets having fewer than 75 meshes. The mesh in the regulated portion of the net will be measured at least five meshes away from the lacings, running parallel to the long axis of the net.

(c) *Net modification.* No vessel subject to this part shall use any device, gear, or material, including, but not limited to nets, net strengtheners, ropes, lines, or chaffing gear, on the top of the regulated portion of a trawl net; except that, one splitting strap and one bull rope (if present), consisting of line or rope no more than 3 inches (7.2 cm) in diameter, may be used if such splitting strap and/or bull rope does not constrict in any manner the top of the regulated portion of the net, and one rope no greater that 0.75 inches (1.9 cm) in diameter extending the length of the net from the belly to the terminus of the codend along each of the following: The top, bottom, and each side of the net. "Top of the regulated portion of the net" means the 50 percent of the entire regulated portion of the net that (in a hypothetical situation) will not be in contact with the ocean bottom during a tow if the regulated portion of the net were laid flat on the ocean floor. For the purpose of this paragraph, head ropes shall not be considered part of the top of the regulated portion of a trawl net. A vessel shall not use any means or mesh configuration on the top of the regulated portion of the net, as defined in §625.54(e), if it obstructs the meshes of the net or otherwise causes the size of the meshes of the net while in use to diminish to a size smaller than the minimum specified in §625.54(a).

(d) *Mesh obstruction or constriction.*

(i) A fishing vessel may not use any mesh configuration, mesh construction, or other means on or in the top of the net, as defined in paragraph (d) of this section, if it obstructs the meshes of the net in any manner.

(ii) No vessel may use a net capable of catching scup in which the bars entering or exiting the

knots twist around each other.

(e) *Stowage of nets.* Otter trawl vessels retaining 4,000 pounds or more of scup and subject to the minimum mesh requirement may not have available for immediate use any net, or any piece of net, not meeting the minimum mesh size requirement, or mesh that is rigged in a manner that is inconsistent with the minimum mesh size. A net that conforms to one of the following specifications and that can be shown not to have been in recent use is considered to be not "available for immediate use":

(1) A net stowed below deck, provided:

(i) It is located below the main working deck from which the net is deployed and retrieved;

(ii) The towing wires, including the "leg" wires, are detached from the net;

(iii) It is fan-folded (flaked) and bound around its circumference.

(2) A net stowed and lashed down on deck, provided:

(i) It is fan-folded (flaked) and bound around its circumference;

(ii) It is securely fastened to the deck or rail of the vessel; and

(iii) The towing wires, including the leg wires, are detached from the net.

(3) A net that is on a reel and is covered and secured, provided:

(i) The entire surface of the net is covered with canvas or other similar material that is securely bound;

(ii) The towing wires, including the leg wires, are detached from the net; and

(iii) The codend is removed from the net and stored below deck.

(4) Nets that are secured in a manner approved by the Regional Director, provided that the Regional Director has reviewed the alternative manner of securing nets and has published that alternative in the *Federal Register*.

(f) Beginning with the second year following FMP implementation, the minimum net mesh set forth in paragraph (a) of this section may be changed following the procedures in §625.50.

(g) Beginning with the second year following FMP implementation, the Regional Director may impose restrictions on gear other than otter trawls following the procedures in §625.50.

§625.55 Possession limit.

(a) Beginning with the third year following FMP implementation, the Regional Director, pursuant to the procedures in §625.50, may limit the number of scup that may be possessed in or harvested from the EEZ unless that person is the owner or operator of a fishing vessel issued a moratorium permit under §625.33. Persons on board a commercial vessel that is not eligible for a moratorium permit under §625.33 are subject to this possession limit. The owner and operator and crew of a charter or party boat issued a moratorium permit under section 625.33(b) are not subject to the possession limit when not carrying passengers for hire and when the crew size does not exceed five for a party boat and three for a charter boat.

(b) If whole scup are processed into fillets, an authorized officer will convert the number of fillets to whole scup at the place of landing by dividing fillet number by 2. If scup are filleted into a single (butterfly)

fillet, such fillet shall be deemed to be from one whole scup.

(c) Scup harvested by vessels subject to the possession limit with more than one person on board may be pooled in one or more containers. Compliance with the daily possession limit will be determined by dividing the number of scup on board by the number of persons on board other than the captain and crew. If there is a violation of the possession limit on board a vessel carrying more than one person, the violation shall be deemed to have been committed by the owner and operator.

(d) Owners or operators of otter trawlers issued a permit (including a moratorium permit) under §625.4, and fishing with, or possessing on board, nets or pieces of net that do not meet the minimum mesh requirements and that are not stowed in accordance with §625.24(f), may not retain 4,000 pounds (1,814 kg) or more of scup. Scup on board these vessels shall be stored in a standard 100-pound (45.3 kg) tote that has a liquid capacity of 18.2 gallons (70 liters), or a volume of not more than 4,320 cubic inches (2.5 cubic feet or 70.79 cubic cm), and that is readily available for inspection.

§625.56 Sea sampler program.

(a) *Request to take sea sampler.* The Regional Director may request a fishing vessel issued a permit under §625.33 to take on board an observer or sea sampler to accompany the vessel on all fishing trips conducted during the period specified in the request. If requested by the Regional Director to take an observer or sea sampler, a vessel may not engage in any fishing operations for scup unless an observer or sea sampler is on board or unless the requirement is waived.

(b) *Responsibility for sea sampler placement.* If requested by the Regional Director to take a sea sampler, it is the responsibility of the vessel owner to arrange for and facilitate sea sampler placement. Upon notice, the Regional Director will provide information concerning sea sampler availability and placement.

(c) *Waiver.* The Regional Director may waive the sea sampler requirement based on a finding that the facilities for housing the sea sampler or for carrying out sea sampler functions are so inadequate or unsafe that the health or safety of the sea sampler or the safe operation of the vessel would be jeopardized.

(d) *Sea sampler functions.* If requested by the Regional Director to take a sea sampler, the vessel owner, vessel operator, and crew must cooperate with the sea sampler in the performance of the sea sampler's duties, including:

(1) Notifying the sea sampler in a timely fashion of when fishing operations are to begin and end;

(2) Allowing for the embarking and debarking of the sea sampler, as specified by the Regional Director, ensuring that transfers of sea samplers at sea are accomplished in a safe manner, via small boat or raft, during daylight hours as weather and sea conditions allow, and with the agreement of the sea sampler involved;

(3) Providing adequate accommodations and food;

(4) Allowing the sea sampler access to all areas of the vessel necessary to conduct sea sampler duties;

(5) Allowing the sea sampler access to communications and navigation equipment and personnel as necessary to perform sea sampler duties;

(6) Providing true vessel locations, by latitude and longitude or loran coordinates, as requested by the sea sampler;

(7) Notifying the sea sampler of any sea turtles, marine mammals, scup, or other specimens taken

by the vessel, as requested by the sea sampler;

(8) Providing the sea sampler with sea turtles, marine mammals, scup, or other specimens taken by the vessel, as requested by the sea sampler; and

(9) Providing storage for biological specimens, including cold storage if available, as requested by the sea sampler. These specimens must be retained on board the vessel, as instructed by the sea sampler or until retrieved by authorized personnel of the National Marine Fisheries Service.

§625.57 Experimental fishery.

(a) The Regional Director, in consultation with the Executive Director of the Council, may exempt any person or vessel from the requirements of this part for the conduct of experimental fishing beneficial to the management of the scup resource or fishery.

(b) The Regional Director may not grant such exemption unless he/she determines that the purpose, design, and administration of the exemption is consistent with the objectives of the FMP, the provisions of the Magnuson Act, and other applicable law, and that granting the exemption will not:

(1) Have a detrimental effect on the scup resource and fishery; or

(2) Cause any quota to be exceeded; or

(3) Create significant enforcement problems.

(c) Each vessel participating in any exempted experimental fishing activity is subject to all provisions of this FMP except those necessarily relating to the purpose and nature of the exemption. The exemption will be specified in a letter issued by the Regional Director to each vessel participating in the exempted activity. This letter must be carried aboard the vessel seeking the benefit of such exemption.

APPENDIX 7. ABBREVIATIONS AND DEFINITIONS OF TERMS

Act (MFCMA) - the Magnuson Fishery Conservation and Management Act of 1976, as amended, 16 USC 1801 et seq.

Adjusted dollars - dollars standardized to a base year based on the Consumer Price Index.

ASMFC (Commission) - Atlantic States Marine Fisheries Commission.

CFR - Code of Federal Regulations.

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

Committee - the Scup FMP Review and Monitoring Committee. The Committee is made up of staff representatives of the Mid-Atlantic, New England, and South Atlantic Fishery Management Councils, the Commission, the Northeast Regional Office of NMFS, the Northeast Fisheries Center, and the Southeast Fisheries Center. The MAFMC Executive Director or his designee chairs the Committee.

Council (MAFMC) - the Mid-Atlantic Fishery Management Council.

CPI - Consumer Price Index; a comparative ratio of a certain group of goods across time.

CPUE - catch per unit of effort.

Domestic Annual Harvest (DAH) - the capacity of US fishermen, both commercial and recreational, 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.

Exclusive Economic Zone (EEZ) - 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 for scup - any activity, other than scientific research vessel activity, which involves: (a) the catching, taking, or harvesting of scup; (b) any other activity which can reasonably be expected to result in the catching, taking, or harvesting of scup; or (c) any operations at sea in support of, or in preparation for, any activity described in paragraphs (a) or (b) of this definition.

Fishing mortality rate - the part of the total mortality rate (which also includes natural mortality) applying to a fish population that is caused by man's harvesting. Fishing mortality is usually expressed as an instantaneous rate (F), and can range from 0 for no fishing to very high values such as 1.5 or 2.0. The corresponding annual fishing mortality rate (A) is easily computed but not frequently used. Values of A that would correspond to the F values of 1.5 and 2.0 would be 78% and 86%, meaning that there would be only 22% and 14% of the fish alive (without any natural mortality) at the end of the year that were alive at the beginning of the year. Fishing mortality rates are estimated using a variety of techniques, depending on the available data for a species or stock.

$F_{0.1}$ - the rate of fishing mortality for a given method of fishing at which the increase in yield per recruit for a small increase in fishing mortality results in only 10% increase in yield per recruit for the same increase in fishing mortality from a virgin fishery.

F_{max} - a calculated instantaneous fishing mortality rate that is defined as "the rate of fishing mortality for a given method of fishing that maximizes the harvest in weight taken from a single year class of fish over its

entire life span".

FMP - fishery management plan.

FR - *Federal Register*.

GRT - gross registered ton.

ICES gauge - International Council for the Exploration of the Seas (ICES) longitudinal mesh gauge set a 4 kg pressure; as used in mesh selectivity studies.

Internal waters - marine waters landward of the territorial sea.

L_{50} - length at which 50% of the fish are mature.

M (natural mortality) - instantaneous rate of death attributable to all causes except fishing.

MSY - maximum sustainable yield. The largest average catch of yield that can continuously be taken from a stock under existing environmental conditions, while maintaining the stock size.

MRFSS - Marine Recreational Fishery Statistics Surveys, 1979 - 1988.

NEFC - the Northeast Fisheries Center of the NMFS.

NMFS - the National Marine Fisheries Service of NOAA.

NOAA - the National Oceanic and Atmospheric Administration of the US Dept. of Commerce.

OY - Optimum Yield.

Regional Director (RD) - the Regional Director, Northeast Region, NMFS.

Recruitment - the addition of fish to the fishable population due to migration or to growth. Recruits are usually fish from one year class that have just grown large enough to be retained by the fishing gear.

Scup pot or trap - a scup pot or trap would be defined by the state regulations that applied to a vessel's principal port of landing. The definition and the minimum escape vent requirement would apply to pots fished in both state and federal waters.

Secretary - the Secretary of Commerce, or his designee.

Spawning stock biomass per recruit (SSB/R) - measures the average or expected contribution of any one young fish to the spawning stock biomass over it lifetime. A useful reference point is the level of SSB/R that would be obtained if there were no fishing. This is a maximum value for SSB/R which can be compared to levels of SSB/R calculated for different fishing levels.

State waters - internal waters and the Territorial Sea.

Stock assessment - the biological assessment of the status of the resources. This analysis provides the official estimates of stock size, spawning stock size, fishing mortalities, recruitment, and other parameters used in this Plan. The data from these assessments shall constitute the "best scientific information currently available" as required by the Act.

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

Take - to catch and retain on board either in the hold lose or in boxes. It does not include fish from the most recent tow on deck and not yet sorted.

TL - total length.

Total Allowable Level of Foreign Fishing (TALFF) - that portion of the Optimum Yield made available for foreign fishing.

USDC - US Department of Commerce.

Year-class - the fish spawned or hatched in a given year.

Yield per recruit - the theoretical yield that would be obtained from a group of fish of one age if they were harvested according to a certain exploitation pattern over the life span of the fish. From this type of analysis, certain critical fishing mortality rates are estimated that are used as biological reference points for management, such as F_{max} and $F_{0.1}$.

Z - instantaneous rate of total mortality; the ratio of numbers of deaths per unit of time to population abundance during that time.