

2001 Summer Flounder, Scup, and Black Sea Bass Recreational Specifications

**Environmental Assessment
Regulatory Impact Review
Initial Regulatory Flexibility Analysis**

13 April 2001

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Environmental Assessment

Introduction

The management measures contained in the Summer Flounder, Scup and Black Sea Bass Fishery Management Plan (FMP) are intended to address the overfished condition of these stocks. The summer flounder measures are based on a management plan drafted by the State/Federal Summer Flounder Management Program pursuant to a contract between the New Jersey Division of Fish, Game, and Wildlife, and the National Marine Fisheries Service (NMFS). The State/Federal draft was adopted by the Atlantic States Marine Fisheries Commission (Commission) in 1982. The Mid-Atlantic Fishery Management Council (Council) adopted the FMP in April 1988 and NMFS approved it in September 1988. The FMP has been amended several times since its initial implementation, with Environmental Impact Statements prepared to consider the impacts of the three major amendments relevant to this action. Amendment 2 enacted management measures for the summer flounder fishery through final regulations implemented on December 4, 1992 (57 FR 57358). Amendment 8 enacted management measures for the scup fishery through final regulations implemented on September 23, 1996 (61 FR 43420). Amendment 9 enacted management measures for the black sea bass fishery through final regulations implemented on December 16, 1996 (61 FR 58461). Each of these amendments enacted comprehensive management measures to attain annual fishing targets and address overfishing. These amendments were adopted jointly by the Council and the Commission, so state regulatory actions complement federal management actions.

The management objectives of the FMP are as follows:

- 1) reduce fishing mortality in the summer flounder, scup and black sea bass fisheries to assure that overfishing does not occur;
- 2) reduce fishing mortality on immature summer flounder, scup, and black sea bass to increase spawning stock biomass;
- 3) improve the yield from the fishery;
- 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.

To attain these management objectives the FMP specifies the following measures that may be specified annually:

- * commercial quotas;

- * minimum sizes;
- * gear regulations;
- * recreational harvest limit;
- * recreational possession limit;
- * recreational seasons.

The environmental, economic and social impacts of the 2001 commercial quotas and recreational harvest limits for these fisheries (summer flounder, scup, and black sea bass) and other measures to ensure that the annual fishing targets specified in the FMP are attained were fully described in the "2001 Summer Flounder, Scup, and Black Sea Bass Specifications."

The Council met jointly with the Commission's Summer Flounder, Scup, and Black Sea Bass Board (Board) in December 2000, to adopt the 2001 recreational management measures for summer flounder, scup and black sea bass. The Council and Board considered the recommendations of the Summer Flounder, Scup, and Black Sea Bass Monitoring Committee, and information provided by Council staff, advisors, and public comments in the development of their recommendations. This document is an examination of the impacts to the environment that could result from the implementation of the 2001 recreational management measures recommended for the summer flounder, scup, and black sea bass fisheries. These measures include recreational size limits, recreational possession limits, and seasonal closures.

1.0 Annual Specification Process

Comprehensive measures enacted by Amendment 2 and modified in Amendments 3 through 7 were designed to rebuild the severely depleted summer flounder stock. Amendments 8 and 9 to the Summer Flounder, Scup and Black Sea Bass FMP implemented recovery strategies to rebuild the scup and black sea bass stocks, respectively. These amendments established Monitoring Committees which meet annually to review the best available scientific data and make recommendations regarding the total allowable landings and other management measures in the plan. The Committee's recommendations are made to achieve the target mortality rates established in the amendments to reduce overfishing. The Committee bases its recommendations on the following information: (1) commercial and recreational catch data; (2) current estimates of fishing mortality; (3) stock status; (4) recent estimates of recruitment; (5) virtual population analysis (VPA); (6) target mortality levels; (7) levels of regulatory noncompliance by fishers or individual states; (8) impact of fish size and net mesh regulations; (9) sea sampling data; (10) impact of gear other than otter trawls on the mortality of each species; and (11) other relevant information.

The Monitoring Committee makes a recommendation to the Council which in turn makes a recommendation to the Regional Administrator. The Regional Administrator reviews the recommendation and may revise it, if necessary, to achieve FMP

objectives. In addition, because the FMP is a joint plan with the Commission, the Board may adopt complementary measures.

2.0 Methods of Analysis

This analysis is an assessment of various management measures based on their impacts upon the environment. The analysis discusses the preferred recommendations as well as the alternatives that were evaluated. A full description of these alternatives is given in Section 3.0 of the Environmental Assessment (EA).

The Summer Flounder Monitoring Committee met in August 2000 to review the most recent catch and assessment information on summer flounder and make recommendations to the Council and Commission on the total allowable landings (TAL) for 2001. The Committee suggested that the TAL be 17.91 million lb based on an emergency rule implemented by NMFS to comply with a court order issued on April 25, 2000. The Council agreed with this recommendation, but the Commission adopted a higher TAL of 20.50 million lbs for 2001. However, following months of discussions, the Commission agreed on April 3, 2001, to reduce their TAL to 17.91 million lb. Based on these recommendations the recreational harvest limit for 2001 is 7.16 million pounds (40% of the TAL).

The Summer Flounder Monitoring Committee met again in December 2000 to review the 2001 recreational harvest limit and most recent landings data and make recommendations to the Council and Commission on recreational management measures to achieve this limit in 2001. In this document, the possession, size, and/or seasonal limits that will most likely achieve the Council's limit in 2001 are discussed.

The Scup Monitoring Committee met in August 2000 to review the most recent stock assessment information on scup and make suggestions to the Council and Commission on the recreational harvest limit for 2001. The Committee suggested that the total coastwide recreational harvest limit be 1.641 million lb. The Council and Commission disagreed and instead recommended that the limit be 1.771 million pounds. The Scup Monitoring Committee met again in December 2000 to review the 2001 recreational harvest limit and most recent landings data and make recommendations to the Council and Commission on recreational management measures to achieve this limit in 2001. In this document, the possession, size, and/or seasonal limits that will most likely achieve this limit in 2001 are discussed.

The Black Sea Bass Monitoring Committee met in August 2000 to review the most recent stock assessment information on black sea bass and make recommendations to the Council and Commission on the recreational harvest limit for 2001. Based on a committee suggestion, the Council and Commission recommended that the recreational harvest limit be 3.148 million lb for 2001. The Black Sea Bass monitoring

committee met again in December 2000 to review the 2001 recreational harvest limit and most recent landings data and make recommendations to the Council and Commission on recreational management measures to achieve this limit in 2001. In this document, the possession, size, and/or seasonal limits that will most likely achieve this limit in 2001 are discussed.

3.0 Description of Management Alternatives

This section provides a brief description of all considered management alternatives. Further discussion and evaluation of these alternatives is found in Section 6.0 of the EA.

3.1 Summer Flounder

The Council's preferred alternative is a 15.5" TL minimum fish size, an 3 fish possession limit, and an open season from May 25 to September 4 (or a closed season from January 1 to May 24 and September 5 to December 31). Two non-preferred alternatives were also examined: a) 16" TL minimum fish size, an 3 fish possession limit, and an open season from May 18 through September 14 (or a closed season from January 1 to May 17 and September 15 to December 31; a Monitoring Committee recommendation) and b) 15.5" TL minimum fish size, an 8 fish possession limit, and an open season from May 10 to October 2 (or a closed season from January 1 to May 9 and October 3 to December 31; status quo).

Based on 2000 MRFSS data for waves 1-5 (January through October) summer flounder recreational landings for 2000 are projected to be 15.63 million lb (7.09 million kg) or 110% more than the 7.41 million lbs (3.36 million kg) recreational harvest limit for 2001. As such, assuming 2001 will be similar to 2000, a 54% reduction in recreational landings is needed to achieve the recreational harvest limit of 7.16 million lb (3.25 million kg) for 2001. The preferred Council alternative could reduce recreational landings by 53% assuming 85% effectiveness of regulations (See EA, Sec. 6.3.2). The first and second non-preferred alternatives could reduce recreational landings by approximately 53% and 26%, respectively (See EA, Sec. 6.3.3). Projected reductions are based on the assumptions that regulations would be 85% effective in their implementation and implemented by all the states.

3.2 Scup

The preferred alternative is a 9" TL minimum fish size, a 50 fish possession limit and an open season from August 15 through October 31 (a closed season from January 1 to August 14 and November 1 to December 31). Two non-preferred alternatives were also examined: a) 9" TL minimum fish size, a 15 fish possession limit, and an open season from July 1 through September 29 (or a closed season from January 1 to June 30 and September 30 to December 31; a Monitoring Committee recommendation); and

b) 7" TL minimum fish size, a 50 fish possession limit, and no closed season (status quo).

Based on 2000 MRFSS data for waves 1-5 (January through October) scup recreational landings for 2000 are projected to be 5.197 million lb (2.357 million kg). Assuming 2001 will be similar to 2000, a 66% reduction in recreational landings is needed to achieve the recreational harvest limit of 1.771 million lb (0.803 million kg) for 2001. The preferred Council alternative could reduce landings by approximately 60% in 2001 assuming 85% effectiveness of the regulations (See EA, Sec. 6.4.2). The first and second non-preferred alternatives could reduce recreational landings by approximately 69% and 5%, respectively (See EA, Sec. 6.4.3). Projected reductions are based on the assumptions that regulations would be 85% effective in their implementation and implemented by all the states.

3.3 Black Sea Bass

The preferred alternative is an 11" TL minimum fish size, a 25 fish possession limit, and an open season from January 1 through February 28 and May 10 to December 31 (or a closed from March 1 to May 9). The following alternatives were also examined: a) 10" TL minimum fish size, a 15 fish possession limit, and an open season from June 1 to November 25 (or a closed from January 1 to May 31 and November 26 to December 31); and b) a 10" TL size limit, no bag limit, and no closed season (status quo).

Based on 2000 MRFSS data for waves 1-5 (January through October) black sea bass recreational landings for 2000 are projected to be 4.291 million lb (1.95 million kg). Assuming 2001 will be similar to 2000, a 27% reduction in recreational landings is needed to achieve the recreational harvest limit of 3.148 million lb (1.43 million kg) for 2001. The preferred Council alternative could reduce recreational landings by approximately 26% in 2001 assuming 85% effectiveness of the regulations (See EA, Sec. 6.5.2). The non-preferred alternatives could reduce landings by 37% and 9%, respectively, assuming 85% effectiveness of the regulations (See EA, Sec. 6.5.3).

4.0 General Fishery Description

4.1 Port and Community Description

The recreational summer flounder, scup, and black sea bass fisheries are important to many communities along the East Coast. However, data are not available to identify to what extent communities are dependent upon these recreational fisheries. The MRFSS program does not identify port and community level data and party/charter data available under VTR data only represent 13%, 15%, and 65%, of the total summer flounder, scup, and black sea bass recreational landings, respectively, from Maine through North Carolina.

A brief description of the relative importance of summer flounder, scup, and black sea bass recreational landings on the state level follows, based on MRFSS and VTR data. A full description of principal ports and communities is presented in Section 4.1 of the “2001 Summer Flounder, Scup, and Black Sea Bass Specifications.”

According to 1999 MRFSS estimates the top five states from Maine through North Carolina to land summer flounder were New Jersey, New York, Rhode Island, Virginia, and North Carolina (Table 1a). North Carolina landings were only slightly higher than Maryland and Connecticut’s summer flounder recreational landings which each accounted for 5% to 6% of the total summer flounder landings. Delaware and Massachusetts landed approximately 4% each of the total summer flounder recreational landings. VTR data indicate that summer flounder accounted for 34%, 13%, and 6%, of the total catch by party charter vessels in the states of New York, New Jersey, and Delaware, respectively, from 1996 to 1999 (Table 11).

The top five states to land scup in 1999 were Massachusetts, New York, Rhode Island, Connecticut, and New Jersey (Table 1a). These states accounted for nearly 100% of the total recreational scup landings in 1999. Delaware, Maryland, Virginia, and North Carolina each caught less than 1% of the total scup recreational landings. VTR data indicate that scup accounted for 17%, 15%, and 6% of the total catch by party charter vessels in the states of Massachusetts, New York, and Rhode Island, respectively, from 1996 to 1999 (Table 12).

The top five states to land black sea bass were Virginia, New Jersey, Maryland, New York, and North Carolina (Table 1a). Virginia and New Jersey accounted for 68% of the landings. The states of Rhode Island, Massachusetts, Connecticut, and Delaware each accounted for less than 3% of the total black sea bass recreational landings. VTR data indicate that black sea bass accounted for 47%, 38%, and 33%, of the total catch by party charter vessels in the states of Virginia, Maryland, and North Carolina, respectively, from 1996 to 1999 (Table 13). Black sea bass also accounted for at least 10% of the total catch of party/charter vessels in New Jersey, New York, and Delaware, from 1996-1999 (Table 13).

Table 1a. The percentage contribution by state to the total summer flounder, scup, and black sea bass recreational landings, 1999 MRFSS estimates.

State	Percent Summer Flounder Landings	Percent Scup Landings	Percent Black Sea Bass Landings
RI	10.59	20.95	1.79
MA	3.62	35.24	1.49
CT	5.28	10.90	0.11
NY	18.62	25.49	6.30
NJ	36.83	7.34	31.81
DE	4.43	0.01	2.94

MD	5.56	0.06	11.30
VA	9.27	0.00	38.00
NC	5.80	0.00	6.27
TOTAL	100.00	100.00	100.00

4.2 Analysis of Permit Data

A full description and analysis of the vessels permitted to participate in the commercial and recreational fisheries for summer flounder, scup, and black sea bass is presented in Section 4.2 of the “2001 Summer Flounder, Scup, and Black Sea Bass Specifications.”

5.0 Description of Fisheries

5.1 Summer Flounder

The commercial and recreational fisheries for summer flounder are outlined by principal port in Section 4.1 of the “2001 Summer Flounder, Scup, and Black Sea Bass Specifications.” Additional information can be found in Amendment 2 and subsequent amendments.

MRFSS data indicate that recreational landings have fluctuated since Amendment 2 regulations were implemented in 1993. Landings increased to 8.83 million lb (4 million kg) in 1993 from the 1992 level of 7.15 million lb (3.24 million kg). In 1994, recreational landings increased again to 9.33 million lb (4.23 million kg) and then declined to 5.42 million lb (2.46 million kg) in 1995. In 1996, 1997, 1998, and 1999, landings were 9.82 million lb (4.45 million kg), 11.87 million lb (5.38 million kg), 12.48 million lb (5.66 million kg), and 8.37 million lb respectively. Based on 2000 MRFSS data for waves 1-5 (January through October), summer flounder recreational landings for 2000 are projected to be 15.63 million lb (7.09 million kg).

5.1.1 Status of the Stock

The status of the summer flounder stock is evaluated annually. The most recent assessment, completed in June 2000 indicates that the summer flounder stock is overfished and overfishing is occurring with respect to the overfishing definition. The fishing mortality rate declined from 0.89 in 1995 to 0.52 in 1998 but is still in excess of the target and threshold F of 0.26. The complete assessment is detailed in the “31st Stock Assessment Review Committee Consensus Summary of Assessment.”

Total stock biomass on January 1 estimated by VPA (1982-1999) reached 22.0 million lb (48.5 million kg) in 1983 before falling to 7.30 million lb (16.1 million kg) in 1989. Total stock biomass has increased substantially since 1991 and in 1999 was estimated to be 18.78 million lb (41.4 million kg). The FMP Amendment 12 biomass target (B_{MSY}) required to produce maximum sustainable yield ($MSY = 46.1$ million lb or 20.91 million kg) is estimated to be $B_{MSY} = 234.57$ million lb (106.4 million kg) and the biomass threshold is one-half $B_{MSY} = 117.29$ million lb (53.2 million kg).

Spawning stock biomass (age 0 and older) has increased from 2.36 million lb (5.2 million kg) in 1989 to 13.29 million lb (29.3 million kg) in 1999, the highest level in the 1982-1999 VPA time series. The age structure of the spawning stock has also expanded in recent years.

VPA estimates indicate that 1996, 1997, and 1998 year classes were about average at 32 to 38 million fish. However, the assessment estimated the 1999 year class to be the smallest since 1988 at 19 million fish.

The assessment also provided information to develop stock projections and quota recommendations for the 2001 fisheries. This information indicates that the fishing mortality rate in 1999 could be 0.32 if the 1999 landing limits are not exceeded. The biomass projected for 2000 is about 94 million lb (42.6 million kg).

5.1.2 Stock Characteristics and Ecological Relationships

The stock characteristics and ecological relationships of summer flounder are fully described in Section 5.3 of Amendment 2. Additional information is available on age distribution of the catch, recruitment, mortality and stock biomass.

In the most recent summer flounder assessment, commercial landings, recreational landings, and discards at age were summed to provide a total fishery catch at age matrix for 1982-1999. The catch at age data indicates that the age structure of the spawning stock has expanded, with 78% of the at age-2 and older, and 10% at age-5 and older. Spawning stock biomass was estimated at 55.11 million lb (25 million kg) in 1998, the highest level in the 1982-1998 VPA time series.

The average recruitment from 1982 to 1998 was 40.6 million fish. The 1982 and 1983 year classes are the largest in the VPA time series, at 74 and 81 million fish, respectively. Recruitment declined from 1983 to 1988, with the 1988 year class the weakest at only 13 million fish. Recruitment since 1988 has generally improved, and the 1995 year class, at 47 million fish, was above average. The 1997 and 1998 year classes, at about 23 and 26 million fish, are estimated to be below average.

Fishing mortality on currently fully recruited ages 3 and 4 summer flounder has been high, varying between 0.8 and 2.2 during 1982-1996 (51%-83% exploitation), far in

excess of the overfishing definition ($F_{\text{threshold}} = F_{\text{target}} = F_{\text{max}} = 0.26$ or 21% exploitation). The fishing mortality rate has declined substantially since 1995 and was estimated to be 0.52 (37% exploitation) in 1998.

The fishing mortality rate on younger fish has also declined substantially. The annual partial recruitment of age-1 fish decreased from near 0.50 during most of the VPA series to 0.18 during 1997-1998; the partial recruitment of age-2 fish has decreased to 0.62 during 1997-1998. In fact, the mortality estimates in 1997 and 1998 for these age groups were the lowest in the time series, 1982-1998. These decreases in mortality relate to the commercial and recreational fishery regulations that have increased the minimum fish size and mesh size in those fisheries. For these reasons, the age range considered to be fully recruited to the fisheries, considered to be ages 2 and older in previous assessments, has been revised to include only ages 3 and older in the current assessment.

The NEFSC spring survey stock biomass index (1968-1999) peaked during 1976-1977, and in 1999 the estimate was at 90% of that peak. Total stock biomass has increased since 1991 and has been stable since 1994 at about 90.39 million lb (41.0 million kg), and in 1999 was estimated to be 91.27 million lb (41.4 million kg), which is 39% of the biomass target of $B_{\text{MSY}} = 234.57$ million lb (106.4 million kg), and 78% of the biomass threshold of one-half $B_{\text{MSY}} = 117.29$ million lb (53.2 million kg).

5.1.3 Economic Environment

Summer flounder continues to be an important component of the recreational fishery. An evaluation of the primary species sought as reported by anglers in recent intercept surveys indicates that summer flounder has increased in importance in the U.S. North Atlantic and Mid-Atlantic subregions, while decreasing in the South Atlantic subregion. The number of recreational anglers indicating that summer flounder is their primary species sought in the North Atlantic and Mid-Atlantic subregions have increased by 135% and 3%, respectively, from 1991 to 1999. The recent increase in preference of summer flounder may result in an increase in the overall importance associated with this species in those regions.

The socioeconomic characteristics of the various ports and communities along the Atlantic Coast that depend on the summer flounder, scup, and black sea bass fisheries were described and assessed by McCay *et al.* (1993) and McCay and Cieri (2000). A general description by principal port of the commercial and recreational importance of these fisheries is given in Section 4.1 of the "2001 Summer Flounder, Scup, and Black Sea Bass Specifications."

A detailed description of the economic aspects of the recreational fishery was presented in Section 8.2 of Amendment 2 to the Summer Flounder FMP, and was also discussed in Section 5.1.3 of the 2001 Summer Flounder, Scup, and Black Sea Bass

Specifications.

5.2 Scup

The commercial and recreational fisheries for scup are outlined by principal port in Section 4.1 of the "2001 Summer Flounder, Scup, and Black Sea Bass Specifications," and additional information is found in Amendment 8.

MRFSS data indicate that recreational landings declined steadily from a 1986 value of 11.6 million lb (5.26 million kg) to 1.34 million lb (0.61 million kg) in 1995, and then increased to 2.16 million lb (0.98 million kg) in 1996. In 1997, recreational landings were 1.20 million lb (0.54 million kg). Then in 1998, recreational landings decreased to 0.88 million lb (0.40 million kg) and increased in 1999 to 1.89 million lb (0.86 million kg). Based on 2000 MRFSS data for waves 1-5 (January through October) scup recreational landings for 2000 are projected to be 5.20 million lb (2.36 million kg).

5.2.1 Status of the Stock

The most recent assessment on scup, completed in June 2000, indicates that scup are over-exploited and at a low biomass level. SAW 31 concluded that "current index of spawning stock biomass is low and less than 5% of the biomass threshold." The complete assessment is detailed in the "31st Stock Assessment Review Committee Consensus Summary of Assessment."

The current assessment does indicate an increase in stock abundance in 1999 and 2000 based on NEFSC spring survey results. Spring survey results indicate that spawning stock biomass increased each year since 1998 and the NEFSC autumn survey results (kg/tow) are the highest in the time series since 1985. These survey results reflect the effects of a strong year class and a moderate to strong 1999 year class on the stock.

Amendment 12 to the Summer Flounder, Scup and Black Sea Bass FMP, which was partially approved by NMFS, established a biomass threshold based on this survey for scup. Specifically, a biomass threshold was defined as the maximum value of a 3-year moving average of the NEFSC spring survey catch per tow of spawning stock biomass (1977-1979 average = 2.77 kg/tow). The 1998-2000 index was about 5% of the biomass threshold.

Relative exploitation rates based on the spring survey (3 year moving average) and landings data suggest a general increase in exploitation from 1981 to 1995. Since then, relative exploitation rates have declined, the 1999 value is almost half of the 1997 value.

Estimates of fishing mortality rates for scup are uncertain. The SARC conducted

several analyses that indicated that F was at least 1.0 for ages 0-3 scup for the 1984 to 2000 time series. The SARC could not estimate F 's on older fish because they are not well represented in the surveys. However, the SARC did note that it was likely that the current F was "significantly higher than the reference point." The SARC noted that the truncation in lengths and ages in the surveys and landings suggest that the stock has experienced high fishing mortality rates

5.2.2 Stock Characteristics and Ecological Relationships

Estimates of mortality for ages 0-3 scup were close to 2.0 based on survey data suggesting that discard mortality has been high. However, the estimates are uncertain and do not account for availability of scup to the trawl gear or the fact that natural mortality is higher on smaller scup. The SARC concluded that F 's on ages 0-3 scup were at least 1.0.

The relative exploitation index may offer some clue as to current levels of mortality for older fish. Because the index is based on mostly landings of scup larger than 9" TL (the commercial minimum fish size and the recreational minimum fish size in MA and RI) and SSB, the index may indicate fishing mortality rates on the larger fish has declined in recent years.

Based on current information, scup abundance is likely to increase in 2001. Survey information indicates that regulations may have protected the 1997 year class and also indicate a large 1999 year class. If the 1999 year class is large and mortality of undersized fish is reduced, substantial biomass could be added to the stock by 2001.

5.2.3 Economic Environment

The socioeconomic characteristics of the various ports and communities along the Atlantic Coast that depend on the summer flounder, scup and black sea bass fisheries were described and assessed by McCay *et al.* (1993) and McCay *et al.* (2000). A general description by principal port of the commercial and recreational importance of these fisheries is given in Section 4.1 of the "2001 Summer Flounder, Scup, and Black Sea Bass Specifications."

A detailed description of the economic aspects of the recreational fishery was presented in Section 8.2 of Amendment 8 to the Summer Flounder FMP, and was also discussed in Section 5.2.3 of the 2001 Summer Flounder, Scup, and Black Sea Bass Specifications.

5.3 Black Sea Bass

The commercial and recreational fisheries for black sea bass are outlined by principal port in Section 4.1 of the "2001 Summer Flounder, Scup, and Black Sea Bass

Specifications,” and additional information is found in Amendment 9.

MRFSS data indicate that recreational landings have varied without trend since 1981 ranging from a low of 1.45 million lb (0.65 million kg) in 1984 to a high of 12.39 million lb (5.62 million kg) in 1986. Recreational landings in 1997, 1998, and 1999 were 4.27 million lb (1.94 million kg), 1.15 million lb (0.52 million kg), and 1.66 million lb (0.75 million kg), respectively. Based on 2000 MRFSS data for waves 1-5 (January through October) black sea bass recreational landings for 2000 are projected to be 4.29 million lb (1.95 million kg).

5.3.1 Status of the Stock

The most recent assessment on black sea bass, completed in June 1998, indicates that black sea bass are over-exploited and at a low biomass level (SAW 27). Fishing mortality for 1997, based on length based methods, was 0.73. The complete assessment is detailed in the “Report of the 27th Northeast Regional Stock Assessment Workshop.”

An update of NEFSC spring trawl survey was provided to the Council to guide management recommendations for the year 2001. Amendment 12 to the Summer Flounder, Scup and Black Sea Bass FMP, which was recently approved by NMFS, established a biomass threshold based on this survey. Specifically, the biomass threshold is defined as the maximum value of a three-year moving average of the NEFSC spring survey catch-per-tow (1977-1979 average of 0.9 kg/tow).

Survey results indicate black sea bass biomass has increased in recent years; the 1999 value was the highest value in the series since 1979. However, the 1999 index is large because of a single tow that caught a large number of black sea bass in an area slightly north of Cape Hatteras. If that tow is removed from the estimate, the index drops from 0.433 to 0.093 for 1999.

Because of the potential influence of extremely small or large number for a single tow, Gary Shepherd (pers. comm.) has suggested that the survey indices be log transformed to give a better indication of stock status. The transformed series indicates a general increase in the exploitable biomass since 1993. The preliminary index for 2000 of 0.322 is the highest in the time series since 1976 and would substantiate fishermen’s observations that black sea bass have become more abundant in recent years. The three-year moving average for 1998-2000 of 0.2011 is a 42% increase relative to the 1997-1999 average.

The spring survey can also be used as an index of recruitment. The survey indicates good year classes were produced from 1988 to 1992 (0.2 to 0.76 fish per tow), with a moderate year class in 1995, and poor year classes in 1993, 1994, 1996 and 1997. The 1999 index was about three times the average for the period 1968-1998 and the

fourth largest value since 1968. Preliminary results for 2000 indicate a strong year class; the index is 1.135, the highest in the time series.

Relative exploitation based on the total commercial and recreational landings and the moving average of the transformed spring survey index indicates a significant reduction in mortality in 1998 and 1999 relative to 1996 and 1997 levels. Based on length frequencies from the spring survey, and assuming length of full recruitment at 25 cm, the average F based on two length based methods was 0.75 (48% exploitation rate) in 1998 (G. Shepherd pers. comm.). Length based estimates are very sensitive to changes in the length used for full recruitment; average F's were 0.51 (37% exploitation) or 1.25 (66% exploitation) if a length of 23 or 27 cm was used in the calculations. Based on the relative index, exploitation rates in 1999 were nearly identical to those estimated for 1998.

5.3.2 Stock Characteristics and Ecological Relationships

The stock characteristics and ecological relationships are fully described in Section 5.3 of Amendment 9. In addition, the advisory report on black sea bass from SAW-27 states that "recent catches are well below the historical average, age and size structure is truncated, and survey biomass indices since the late 1980s have been one-tenth of those observed in the late 1970s. Average annual fishing mortality, estimated from length-based analyses, ranged from 0.56 to 0.79 during 1984-1997 and was 0.73 (48% exploitation) in 1997. Recruitment in 1997, as indicated by survey indices, was well below the 1972-1996 average." Additional, detailed information is available in the SAW-27 documents.

5.3.3 Economic Environment

The socioeconomic characteristics of various ports and communities along the Atlantic Coast that depend on the summer flounder, scup and black sea bass fisheries were described and assessed by McCay *et al.* (1993) and McCay and Cieri (2000). A general description by principal port of the commercial and recreational importance of these fisheries is given in Section 4.1 of the "2001 Summer Flounder, Scup, and Black Sea Bass Specifications."

A detailed description of the economic aspects of the recreational fishery was presented in Section 8.2 of Amendment 9 to the Summer Flounder FMP, and was discussed in Section 5.3.3 of the 2001 Summer Flounder, Scup, and Black Sea Bass Specifications.

5.4 1990 Survey of Charter and Party Boats

The charter and party boat industry is an important component of the fishery in several states of the management unit for these species. Tables 1-3 indicate the contribution

by mode of recreational landings of summer flounder, scup, and black sea bass. 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 that included all vessels which indicated they were involved in party and charter activities (permit Category 2). The list included 402 vessels.

Some of the results obtained from this survey may not accurately describe current fishing trends (e.g., interest and demand, desirability, etc.). For example, since this survey was conducted, scup landings have generally declined, reflecting a drop in availability, abundance, and/or angler interest. In addition, party/charter boats may be targeting other species that are relatively more abundant than scup (e.g., striped bass).

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 4). Massachusetts, New Jersey, New York, and Virginia were most heavily represented, accounting for 80% of survey mailings.

A total of 172 of the 202 surveys returned to the Council 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" are 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.

Calculating mean values of responses allows comparison of the different species using a single number for each. 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.

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 5). It was followed by bluefish (4.6), then summer flounder (3.6), Atlantic Mackerel (3.5), and striped bass (3.5). 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).

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 5). The top five desired species were: spot (4.6), large pelagics (3.9), bluefish (3.9), striped bass (3.7), and summer flounder (3.2).

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).

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 6). 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 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.

5.5 Marine Recreational Descriptive Statistics

In 1994, sportfishing surveys were conducted by NMFS in the Northeast Region (Maine to Virginia) to obtain demographic and economic information on marine recreational fishing participants from Maine to Virginia. Data from the surveys were then used to access socioeconomic characteristics of these participants, as well as to identify their marine recreational fishing preferences and their perceptions of current and prospective fishery management regulations. This information will be used in future stages of the research to estimate statistical models of the demand for marine recreational fishing for eight important recreational species. The information that follows is excerpted and paraphrased from a preliminary report by Steinback *et al.*

(1999).

"Marine recreational fishing is one of the most popular outdoor recreational activities in America. In 1992, the lowest level of participation during the last ten years, approximately 2.57 million residents of coastal states in the Northeast Region participated in marine recreational fishing in their own state. Participation increased approximately 5% in 1993 (2.7 million) and increased another 14% in 1994 (3.1 million), exceeding the ten-year average of 2.9 million. Although the total number of finfish caught in the Northeast Region has declined over the past ten years effort (trips) has remained relatively stable. An estimated 22.4 million fishing trips were taken in 1994, up from 19.3 million in 1993."

The following discussion contains demographic and socioeconomic characteristics of anglers, as well as their preferences, attitudes, and opinions, toward recreational fishing activities and regulations. There was little or no difference in mean age across subregions. "The largest proportion of anglers in both subregions were 36-45 years old (NE=28%, MA=25%). However, New England anglers were younger than Mid-Atlantic anglers. Results show that participation in marine recreational fishing increased with age, peaked between ages of 36 to 45, and subsequently declined thereafter. The resultant age distribution is similar to the findings of other marine recreational studies. However, the distribution is not reflective of the general population in these subregions. Bureau of the Census estimates indicate population peaks between the ages of 25 to 34 in both subregions, declines until the age of 64 and then increases substantially." The complete distribution of recreational anglers by age for both subregions is as follows: less than 18, 25.2% in NE and 25.6% in MA; between the ages of 18-24, 9.8% in NE and 9.7% in MA; between 25-34, 16.4% in NE and 17.0% in MA; between 35-44, 16.3% in NE and 16.2% in MA; between 45-54, 11.5% in NE and 11.8% in MA; between 55-64, 8.2% in NE and 8.4% in MA; and 65 and over, 12.6% in NE and 11.3% in MA. In this survey, anglers under the age of 16 were not interviewed and are not included in the analysis.

In both subregions, at least 88% of the anglers (age 25 and over) had obtained at least a high school degree (NE=91%, MA=88%). "While the educational background is similar across subregions, a greater portion of the anglers in New England earned college or post graduate/professional degrees (NE=29%, MA=23%). The shape of the educational distribution essentially mirrored the general population in both subregions. However, the average number of anglers without a high school degree was considerably lower than Bureau of the Census estimates (age 25 and over) for the general population. On the other hand, it appears that anglers in New England and the Mid-Atlantic earned less post graduate/professional degrees than Bureau of Census estimates."

When anglers were asked to describe their racial or ethnic origin, almost all of the anglers interviewed in both subregions considered themselves to be white (NE=95%,

MA=90%). "In the Mid-Atlantic, most of the remaining individuals were black (7%), leaving 3% to be of other ethnic origins. In New England, the remaining anglers were evenly distributed across other ethnic origins. The high occurrence of white fishermen is representative of the general population of the coastal states in New England. Approximately 94% of the population in 1993 was estimated to be white. However, in the Mid-Atlantic, the percentage of white anglers was considerable higher than Bureau of Census populations estimates, and the percentage of black fishermen was 12% lower."

When anglers were asked to indicate from a range of categories what their total annual household income was, only minor differences between subregions were found. "The largest percentage of household incomes fell between \$30,001 and \$45,000 for both subregions (NE=27%, MA=26%). In comparison to the general population, anglers' annual household incomes are relatively higher in both subregions...Results are consistent with previous studies which showed that angler household incomes are generally higher than the population estimates."

If it is assumed that "years fished" is a proxy for "experience," the survey data shows that anglers in New England are relatively less experienced than anglers in the Mid-Atlantic. The distribution of recreational anglers years of experience is as follows: 0-5 years of experience, 22% in NE and 16% in MA; 6-10 years of experience, 10% in NE and 10% in MA; 11-15 years of experience, 13% in NE and 14% in MA; 16-20 years of experience, 9% in NE and 9% in MA; 21-25 years of experience, 12% in NE and 12% in MA; 26-30 years of experience, 13% in NE and 12% in MA; and 30 or more years of experience, 21% NE and 26% in MA.

On average, it was found that New England anglers spent more on boat fees, lodging, and travel expenses than Mid-Atlantic anglers. "During the follow-up telephone portion of the survey, anglers that fished from a party/charter boat or a private/rental boat were asked how much they personally spent on boat fees for the trip in which they were interviewed. Boat fees averaged \$61.00 per trip in New England and \$51.00 in the Mid-Atlantic." Two categories of lodging expenses were obtained. "The first category (Lodging (>0)) is an estimate of the mean lodging expense per night for those anglers who indicated they spent at least one night away from their residence and personally incurred a lodging cost. Subsequently, the second category (Lodging (all)) is an estimate of mean lodging expenses across all overnight anglers, regardless of whether an angler incurred a lodging expense. Per night costs were estimated by dividing total lodging costs for the trip by the number of days the angler was away from his/her residence on the trip." Anglers that personally incurred lodging expenses spent \$58.00 on average per night in New England and \$47.00 per night in the Mid-Atlantic. "Across all overnight anglers, per night lodging expenses in New England averaged \$29.00 and in the Mid-Atlantic, \$21.00." Anglers expenditures also included money spent on gas, travel fares, tolls, and ferry and parking fees. "One-way travel expenditures averaged \$11.00 in New England and \$8.00 in the Mid-Atlantic per trip. Therefore, if arrival costs

are tantamount to departure costs, average round-trip travel expenses would approximate \$22.00 in New England and \$16.00 in the Mid-Atlantic."

A more recent survey conducted during 1998, social and economic data from marine recreational fishermen in the Northeast Region were gathered through an economic add-on to NMFS' Marine Recreational Statistics Survey (MRFSS). As part of this survey, anglers were asked to delineate trip expenditures and purchases of durable equipment used primarily for saltwater recreational fishing. The survey results are preliminary and have yet to be promulgated in a formal report (S. Steinback pers. comm.). Survey results indicate that the average trip expenditure in 1998 was \$49.78 for anglers fishing from a private/rental boat, \$35.06 for shore anglers, and \$68.60 for anglers that fished from a party/charter boat. Trip expenditures included the following consumable items: (1) food, drink, and refreshments; (2) lodging at motels, cabins, lodges, or campgrounds; (3) public transportation or car rental; (4) boat fuel; (5) guide or package fees; (6) access and/or boat launching fees; (7) equipment rental such as boat, fishing or camping equipment; (8) bait; and (9) ice (See RIR/IRFA, Sec 5.0).

Survey results show that over 50% of the anglers in both subregions indicated boat ownership (NE=51%, MA=53%). These results were obtained when anglers were asked if anyone living in their household owns a boat that is used for recreational saltwater fishing.

Regarding the duration of the interviewed trip, "at least 80% of the anglers in both subregions indicated they were on a one-day fishing trip (NE=80%, MA=84%). One-day fishing trips were defined to be trips in which an angler departs and returns on the same day. Less than one fourth of the respondents indicated the day fishing was part of a longer trip which they spent at least one night away from their residence (NE=20%, MA=16%)."

"Respondents were asked why they chose to fish at the site they were interviewed... 'Convenience' and 'better catch rates' were the main reasons why anglers chose fishing sites in both subregions. Forty-nine percent of the anglers in New England and 57% of the anglers in the Mid-Atlantic indicated 'convenience' as either first or second reason for site choice. 'Better catch rates' was the first or second stated reason for site choice by 51% of the anglers in New England and 50% of the anglers in the Mid-Atlantic. Other notable responses were 'always go there,' 'boat ramp,' 'access to pier,' and 'scenic beauty.'...Results indicate that although anglers chose fishing sites for many different reasons, sites that offered good catch rates and were convenient attracted the most anglers."

Recreational anglers were asked to rate recreational fishing against their other outdoor activities during the last two months. Specifically, they were asked if fishing was their most important outdoor activity, their second most important outdoor activity, or only one of many outdoor activities? "Over 60% of the respondents in both subregions

(NE=61%, MA=68%) reported marine recreational fishing was their most important outdoor activity during the past two months. Less than 30% in both subregions (NE=27%, MA=20%) said recreational fishing was only one of many outdoor activities." This is consistent with national outdoor recreation surveys carried over the past three decades indicating that fishing is consistently one of the top outdoor recreational activities in terms of number of people who participate.

Recreational anglers ratings of reasons (7 preestablished reasons) for marine fishing are presented in Table 7. More than 65% of the anglers in both subregions said that it was very important to go marine fishing because it allowed them to: spend quality time with friends and family (NE=81%, MA=85%); enjoy nature and the outdoors (NE=89%, MA=87%); experience or challenge of sport fishing (NE=69%, MA=66%); and relax and escape from my daily routine (NE=83%, MA=86%). "The reasons that were rated as not important by the largest proportion of anglers consisted of: catch fish to eat (NE=42%), to be alone (NE=55%, MA=58%), and to fish in a tournament or when awards were available (NE=79%, MA=73%). In the Mid-Atlantic, although to catch fish to eat was rated as being somewhat important by the largest proportion of anglers (40%), approximately 31% felt that catching fish to eat was very important. However, in New England, only 20% concurred. It is clear from these responses that marine recreational fishing offers much more than just catching fish to anglers. Over 80% of the respondents in both subregions perceived recreational fishing as a time to spend with friends and family, a time to escape from their daily routine, and time to enjoy nature and outdoors. While catching fish to eat is somewhat important to anglers, findings of this survey generally concur with previous studies that found non-catch reasons are rated highly by almost all respondents while catch is very important for about a third and catching to eat fish is moderately important for about another third."

"The economic survey sought to solicit anglers opinions regarding four widely applied regulatory methods used to restrict total recreational catch of the species of fish for which they typically fish: (1) limits on the minimum size of the fish they can keep; (2) limits on the number of fish they can keep; (3) limits on the times of the year when they can keep the fish they catch; and (4) limits on the areas they fish. Anglers were asked whether or not they support or opposed the regulations." As indicated in Table 8, strong support existed for all regulatory methods in both subregions. Limits on the minimum size of fish anglers could keep generated the highest support in both regions (NE=93%, MA=93%), while limits on the area anglers can fish, although still high, generated relatively lower support (NE=68%, MA=66%).

Regulations which limit the number of fish anglers can keep ranked second (NE=91%, MA=88%). The results from this solicitation indicate that recreational anglers in the Northeast Region appear to be conservation oriented and generally support regulations employed to restrict total catch. Not surprisingly, when analyzing anglers' opinions regarding the four widely applied regulatory methods, it was found that anglers in all modes indicated strong support for the regulatory measures. With minimum size limits

generating the strongest support, followed by catch limits, seasonal closures, and lastly, area closures (Table 9). "Although party/charter, private/rental, and shore respondents did offer varying degrees of support for each of a selection of regulatory measures, similar support existed across all modes. Support was highest for common regulatory methods currently being implemented in New England and the Mid-Atlantic (e.g., size and bag limits), than for area and seasonal closures."

5.6 Vessel Trip Report Data

Vessel trip report data (VTR) has been collected by NMFS since 1994 for the recreational and commercial fisheries. In the recreational fishery, this data is collected from party/charter vessels that have permits to operate in federal waters as required by the FMPs or amendments for Summer Flounder, Scup, Black Sea Bass, Northeast Multispecies, and Atlantic Mackerel, Butterfish, and Squids. VTR data was used to describe summer flounder, scup, and black sea bass catch disposition as well as contribution of these species to the total catch made by party/charter vessels for 1996 through 1999. VTR data for 1994 and 1995 was not used because reporting compliance was medium to low. Furthermore, neither year has been completely audited. As such, the VTR data for 1996 through 1999 is the most recent and complete data submitted by fishermen.

General trends in VTR data for party/charter boats indicate that for all species combined and for scup separately, the number of fish kept has increased overall since 1996 (Table 10). The number of summer flounder kept has decreased overall since 1996, while the number of black sea bass kept decreased from 1996 until 1998 and increased in 1999, and the number of scup kept has increased since 1996. General trends in VTR data indicate that number of fish discarded has increased from 1996 to 1998 for all species combined and for summer flounder and black sea bass, separately. The number of scup discarded decreased in 1999 relative to 1998. Total number of fish kept and discarded (all species) by party/charter boats decreased by 5.1% and increased by 4.5%, respectively, from 1998 to 1999. In the summer flounder fishery, the total number of fish kept decreased by 38.2% from 1998 to 1999, while the total number of fish discarded increased by 58.4%. In the scup fishery, the total number of fish kept increased by 5.2%, while the total number of fish discarded decreased by 31.3% from 1998 to 1999. In the black sea bass fishery, the total number of fish kept increased by 42.8%, while the total number of fish discarded increased by 45.8%.

Tables 11-13 detail the portion of the total summer flounder, scup, and black sea bass, respectively, of the total catch (number) made by anglers on party/charter vessels for the combined years of 1996-1999. Summer flounder contributed 13% of the total catch (by number) made by party/charter vessels for the 1996-1999 period (Table 11). The contribution of summer flounder to the total catch of party/charter vessels fluctuated throughout the year, ranging from 1% or less in January, February, March, April,

November and December to almost 24% in July, with the largest proportion (at least 13%) of summer flounder caught from May through September (Table 11). Analysis of the recreational landings by state indicates that the proportion of summer flounder in the total catch ranged from less than 1% to almost 34%.

Vessel trip reporting data indicate that scup contributed almost 8% of the total catch (by number) made by party/charter vessels for the 1996-1999 period (Table 12). The contribution of scup to the total catch of party/charter vessels fluctuated throughout the year, ranging from less than 1% in January, February, March, and April to 25% in October, with the largest proportion of scup caught from September to November (Table 12). Analysis of the recreational landings by state indicates that the proportion of scup in the total catch ranged from less than 1% to 16%.

Vessel trip reporting data indicate that black sea bass contributed 20% of the total catch (by number) made by party/charter vessels for the 1996-1999 period (Table 13). The contribution of black sea bass to the total catch of party/charter vessels fluctuated throughout the year, ranging from less than 10% in January, February, March, April, and August to almost 50% in November, with the largest proportion of black sea bass caught from May through December (Table 13). Analysis of the recreational landings by state indicates that the proportion of black sea bass to the total catch ranged from less than 1% to 47%.

6.0 Analysis of Impacts on the Environment

6.1 Impacts of Alternatives upon the Affected Environment

The environment in which these fisheries are prosecuted was described in detail by the Council in the FMP amendments that implemented fishery management plans for these fisheries (Amendments 2 and 10, summer flounder; Amendment 8, scup; Amendment 9, black sea bass). The fishery management plans for black sea bass and scup regulate the fisheries from Maine to Cape Hatteras, North Carolina, while the summer flounder fishery is regulated from Maine to the southern border of North Carolina.

In addition to the issue of general habitat degradation, several habitats within the summer flounder management unit are protected under the National Marine Sanctuaries Act of 1973. National marine sanctuaries can be established under the National Marine Sanctuaries Act of 1973. Currently, there are 11 designated marine sanctuaries that create 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 January 30, 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 February 8, 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 November 4, 1992, the Sanctuary was Congressionally designated. Implementing regulations (15 CFR 940) became effective March 1994. Commercial and recreational fishing are not specifically regulated by the 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. 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 Resources Division (SSMC4) Office of Ocean and Coastal Resource Management, NOAA, 1305 East-West Highway, Silver Spring, MD 20910.

6.2 Impacts of Alternatives upon Endangered or Threatened Species or Marine Mammal Populations

The impacts of the summer flounder, scup and black sea fisheries upon endangered and threatened species and marine mammal populations are described in detail by the Council in the FMP amendments that instituted fishery management measures for these fisheries (Amendments 2 and 10, summer flounder; Amendment 8, scup; Amendment 9, black sea bass).

Recreational fisheries, in general, have very limited interactions with marine mammals, sea turtles, shortnose sturgeon, or seabirds. Recreational fishermen do contribute to difficulties for these species of endangered and threatened marine life in that it is estimated that recreational fishermen discard over 227 million lb (103 million kg) of litter each year (O'Hara *et al.* 1988). More than nine million recreational vessels are registered in the United States. The greatest concentrations of recreational vessels in the United States are found in the waters off New York, New Jersey, the Chesapeake

Bay, and Florida (O'Hara *et al.* 1988). Recreational fishermen are also a major source of debris in the form of monofilament fishing line. The amount of fishing line lost or discarded by the 17 million U.S. fishermen during an estimated 72 million fishing trips in 1986 is not known, but if the average angler snares or cuts loose only one yard of line per trip, the potential amount of deadly monofilament line is enough to stretch around the world (O'Hara *et al.* 1988). Although the recreational fishery may impact these marine species, nothing considered in this alternative, relative to the status quo, will have a significant impact on marine mammals, sea turtles, shortnose sturgeon, and seabirds.

6.3 Impact of Summer Flounder Measures Upon the Environment

In this section the impacts of the evaluated summer flounder measures on the environment are examined. These measures were described in Section 3.1 of the EA.

The most recent stock assessment for summer flounder was completed in June 2000 and indicates that the summer flounder stock is overfished and overfishing is occurring with respect to the overfishing definition. Fishing mortality calculated from the average of the currently fully recruited ages (3-5) summer flounder has been high, varying between 0.9 and 2.2 during 1982-1997. The fishing mortality rate declined substantially since 1997 to 0.32 in 1999 but is still in excess of the target and threshold F of 0.26 (See EA, Sec. 5.1.1). Based on an emergency rule implemented by NMFS, to comply with a court order issued on April 25, 2000, the 2001 coastwide harvest limit is 17.91 million lb (8.12 million kg) which would have a 50 percent probability of achieving the target biomass of 148.8 million lb (67.5 million kg) by the end of 2001. The recreational harvest limit for 2001 would be 7.16 million lb (40% of 17.91 million lb) or 3.25 million kg.

A recreational harvest limit of 7.16 million lb (3.25 million kg) in 2001 would be 3% less than the recreational harvest limit established in years 1996 to 2000, and about 14.1% (8.37 million lb or 3.80 million kg) below the recreational landings for 1999. The proposed recreational harvest limit is approximately 54% below the projected 2000 landings of 15.63 million lb (7.09 million kg). As such, more restrictive limits (i.e., lower possession limits, greater minimum size limits, and/or shorter seasons) would be required to prevent anglers from exceeding the recreational harvest limit in 2001.

6.3.1 Harvest Limits and Management Measures - A Review

Recreational harvest limits have been established since 1993. In both 1993 and 1994, recreational landings were close to the harvest limits. The harvest limit established for 1993 was 8.38 million lb or 3.8 million kg (Table 14). In 1993, recreational fishermen landed 8.83 million lb (4 million kg), exceeding the target by approximately 0.5 million lb (0.23 million kg).

Most states implemented the coastwide recreational management measures of a 14" TL minimum fish size, a 6 fish possession limit, and an open season from May 15 to September 30 (or equivalent) in 1993. However, several states were out of compliance with the plan including CT (no possession limit or season), MD (10 fish possession limit), VA (10 fish possession limit and no season), and NC (13" TL minimum size, no possession limit or season). However, even with the implementation of some management measures in the states, recreational landings increased in 1993 relative to the 1992 landings of 7.15 million lb (3.24 million kg).

The harvest limit established for 1994 was 10.67 million lb (4.83 million kg). Estimated landings in 1994 were 9.33 million lb (4.23 million kg) or 1.34 million lb (0.61 million kg) less than the harvest limit.

Most states implemented the coastwide recreational management measures of a 14" TL minimum fish size, an 8 fish possession limit, and an April 15 to October 15 season (or equivalent) in 1994. However, two states did not fully implement the season in 1994; VA had no opening date but closed October 31 and NC had no closed season at all. In addition, several states maintained the 1993 possession limit and season for their 1994 season (NH, CT, and NY).

The Council and Commission approved a recreational harvest limit of 7.76 million lb (3.51 million kg) for 1995. The landings estimate of 5.5 million lb (2.49 million kg) for 1995 was approximately 2.3 million lb (1.03 million kg) lower than the harvest limit.

The limits implemented in 1995 were a 6 fish possession limit in the EEZ and an 8 fish possession limit in state waters, a 14" TL minimum fish size and no closed season. All states had a 14" TL minimum fish size in 1995 and most states implemented the 8 fish possession limit although several states (NH, CT, and NY) had a 6 fish possession limit.

The landings estimate for 1996 was about 3.2 million lb (1.45 million kg) greater than the limit approved by the Council and Commission for that year (7.41 million lb or 3.36 million kg). The management measures implemented in 1996 were an 8 fish possession limit, a 14" TL minimum fish size, and no closed season.

A harvest limit of 7.41 million lb (3.36 million kg) was adopted for 1997. Recreational landings exceeded this limit by over 4.4 million lb (1.99 million kg). The management measures implemented in 1997 were a 10 fish possession limit and a 14.5" minimum size limit.

A harvest limit of 7.41 million lb (3.36 million kg) was also adopted for 1998. Recreational landings exceeded this limit by 5.1 million lb (2.33 million kg). The management measures implemented in 1998 were an 8 fish possession limit and a 15" TL minimum fish size. However, some states did not implement these

management measures until late in the season.

The recreational harvest limit remained unchanged for 1999 at 7.41 million lb (3.36 million kg). The coastwide management measures implemented to control landings in 1999 were an 8 fish possession limit and a 15" TL minimum fish size, and an open season from May 29 to September 11 (or a closed season from Jan 1 - May 28 and Sept 12 - Dec 31). States were allowed to implement the coastwide management measures or equivalent management measures to reduce their 1998 landings by 40% (Table 15a).

The recreational harvest limit remained unchanged for 2000 at 7.41 million lb (3.36 million kg). The coastwide management measures implemented to control landings in 2000 were an 8 fish possession limit and a 15.5" TL minimum fish size, and an open season from May 10 to October 2 (or a closed season from Jan 1 - May 9 and Oct 3 - Dec 31). States were allowed to implement the coastwide management measures or equivalent management measures to reduce their 2000 landings by 44% (Table 15b).

6.3.2 Impact of Preferred Summer Flounder Measures

Current summer flounder recreational measures require a 15.5" TL minimum size, an 8 fish possession limit, and an open season from May 10 to October 2. The fact that these management measures can result in landings in excess of the 7.19 million lb (3.26 million kg) harvest limit indicates that further constraints on the recreational fishery are required for 2001. A combination of possession and size and seasonal limits can be used to control landings in 2001.

Recreational limits act to constrain landings as the availability of fish increases. If availability is low, few anglers will be affected by the regulations and landings will be lower than the harvest limit. As availability of summer flounder to anglers increases, the constraints imposed by the limits increase, i.e., anglers are more constrained by a size limit when there is a good year class of summer flounder produced and more constrained by a possession limit when the availability of larger fish is high. The correct limits will allow anglers to land up to the harvest limit but not exceed the limit.

To address this issue, it was determined which limits in 2000 would have constrained fishermen to the harvest limit of 7.16 million lb (3.26 million kg). Since the catch frequencies for the upcoming year are not known, data from the previous year are normally used to assess potential outcomes of various management measures.

Table 16 details percent reductions in landings for various combinations of possession and size limits based on 2000 data. This table addresses "what if" questions, e.g., if a 16" TL size limit had been in effect in 1998 how many fewer summer flounder would have been killed by anglers?

A season could also be used to control recreational landings. Council staff fit a Weibull cumulative distribution to the MRFSS landings by wave to determine the effect of various closed seasons. The derived equation was used to estimate the effect of various closed seasons for 2000. The equation is:

$$C_t = 99.92 * (1 - e^{-[(t/221.7)^{5.462}]})$$

where C_t = cumulative landings and t = time in days.

The preferred alternative would implement a 15.5" TL minimum fish size, a 3 fish possession limit, and an open season from May 25 to September 4 in 2001. Given a combination of a 15.5" TL size limit and a 3 fish possession limit, a potential reduction of 27.6% could occur (Table 16). In addition to this, a seasonal closure from January 1 to May 24 and September 5 to December 31 could potentially reduce landings by 24.9% (Table 17). This alternative could decrease landings by 52.5% assuming that the regulations are 85% effective and adopted by all the states.

However, the Council has a lower recreational harvest limit than the Commission for the 2001 recreational fishing year. In addition, through the Commission's adaptive management process the states adopted conservation equivalency for the fishing year 2001. As such, it is unlikely that any state will adopt the proposed coastwide management measures.

Conservation equivalency would allow states to deal with burden issues associated with the implementation of any component (e.g., seasonal closures) of the coastwide measures. However, if states do not implement the proposed coastwide recreational management measures, federal permit holders must abide by the most restrictive measures (state or federal), unless they surrender their federal permits.

Table 18 details the proportion of summer flounder harvested in state and federal waters. On average (1995-1999), approximately 93% of the harvested summer flounder (both number and weight) came from state waters. As such, approximately 7% of the harvested summer flounder will be affected by proposed federal measures and 95% of the harvested summer flounder will be affected by state management measures. Equivalent recreational management measures would allow the fishery to operate during critical fishing periods for each state while still achieving conservation goals. This would allow the summer flounder fishery to operate in a way that dissipates potential adverse economic effects in specific states.

There is very little information available to empirically estimate how sensitive the affected party/charter boat anglers might be to the proposed fishing regulations. It is possible that the proposed management measures could restrict the recreational fishery for 2001 and cause some decrease in recreational satisfaction (i.e. low bag limit, larger fish size or closed season). However, due to lack of data, these effects cannot

be quantified (See Regulatory Impact Review/Regulatory Flexibility Analysis (RIR/IRFA, Sec. 4.0). The economic impacts of the proposed management measures are fully described in Section 5.0 of the RIR/IRFA. The proposed recreational management measures are necessary to prevent anglers from exceeding the recreational harvest limit in 2001.

6.3.3 Impact of Non-Preferred Summer Flounder Measures

Two non-preferred alternatives were also examined: a) 16" TL minimum fish size, a 3 fish possession limit, and an open season from May 18 to September 14 (closed from January 1 to May 17 and September 15 to December 31) ; and b) 15.5" TL minimum fish size, an 8 fish possession limit, and an open season from May 10 to October 2 (closed from January 1 to May 9 and October 3 to December 31; status quo).

A combination of a 16" TL size limit and a 3 fish possession limit could reduce landings by approximately 36.6% (Table 16). In addition, a seasonal closure from January 1 to May 17 and September 15 to December 31 could potentially reduce landings by 17.2% (Table 17). This alternative could decrease landings by approximately 54% assuming the regulations are 85% effective and adopted by all the states. This non-preferred alternative was not chosen because the higher size limit could impose an unfair burden on the southern states. Length frequency data indicate that a larger number of undersized fish are sampled by MRFSS interviewers in North Carolina, e.g., in 2000 63.6% of the fish sampled were smaller than the minimum size limit, 15.5 inches.

A combination of a 15.5" TL size limit and a 6 fish possession limit could reduce landings by approximately 28% (Table 16). In addition, a seasonal closure from January 1 to May 9 and October 3 to December 31 could potentially reduce landings by approximately 8.8% (Table 17). This alternative could decrease landings by approximately 26% assuming the regulations are 85% effective and adopted by all the states. This non-preferred alternative was not chosen because it would allow recreational landings to exceed the harvest limit.

There is very little information available to empirically estimate how sensitive the affected party/charter boat anglers might be to the proposed fishing regulations. It is possible that the proposed management measures could restrict the recreational fishery for 2001 and cause some decrease in recreational satisfaction (i.e. low bag limit, larger fish size or closed season). It may be possible that, given the popularity of summer flounder among anglers, the more limiting time frame of closures may affect angler satisfaction and/or demand for party/charter trips. Due to lack of data, these effects cannot be quantified (See RIR/IRFA, Sec. 4.0). The economic impacts of the proposed management measures are fully described in Section 5.0 of the RIR/IRFA.

6.4 Impact of Scup Measures Upon the Environment

In this section the impacts of the evaluated scup measures on the environment are examined. These measures were described in Section 3.2 of the EA.

Amendment 8, which was approved by NMFS on July 29, 1996, established a recovery schedule to reduce overfishing on scup over a 7 year time frame. The target exploitation rate was 47% for scup from 1997 to 1999. In 2000 and 2001, the target exploitation rate is 33% and in 2002 and subsequent years, the target exploitation rate is based on F_{max} . Currently, the exploitation rate associated with F_{max} is 21%.

Estimates of fishing mortality rates for scup are uncertain. The SARC conducted several analyses that indicated that F was at least 1.0 for ages 0-3 scup for the 1984 to 2000 time series. The SARC could not estimate F 's on older fish because they are not well represented in the surveys. However, the SARC did note that it was likely that the current F was "significantly higher than the reference point." The SARC noted that the truncation in lengths and ages in the surveys and landings suggest that the stock has experienced high fishing mortality rates.

Although the magnitude of the mortality rates is unknown, relative exploitation rates have changed over the period. Relative exploitation rates based on total landings and the spring survey suggest a general increase in exploitation from 1981 to 1995. Since then, relative exploitation rates have declined; the 1999 value is almost half of the 1997 value.

The discards and mortality estimates for the fully recruited fish are also uncertain. The SARC spent considerable time discussing the problems associated with the limited discard data and concluded that "discarding of scup has been high through the time series approaching or exceeding landings." However, "high" was not defined and the exact magnitude of the discards is unknown.

Estimates of mortality for ages 0-3 scup were close to 2.0 based on survey data suggesting that discard mortality has been high. However, the estimates are uncertain and do not account for availability of scup to the trawl gear or the fact that natural mortality is higher on smaller scup. The SARC concluded that F 's on ages 0-3 scup were at least 1.0.

The relative exploitation index may offer some clue as to current levels of mortality for older fish. Because the index is based on mostly landings of scup larger than 9" TL (the commercial minimum fish size and the recreational minimum fish size in MA and RI) and SSB, the index may indicate fishing mortality rates on the larger fish has declined in recent years.

Based on current information, scup abundance is likely to increase in 2001. Survey information indicates that regulations may have protected the 1997 year class and also indicate a large 1999 year class. If the 1999 year class is large and mortality of

undersized fish is reduced, substantial biomass could be added to the stock by 2001.

In fact, deterministic projections of the NEFSC spring survey SSB based on year 2000 index values and mean recruitment from the 1993 to 2000 survey indicate that the SSB index could increase from .10 in 1999 to .24 in 2001 if the F on ages 0-4 was 1.0 (M. Mitro pers. comm.). Assuming an F=1.0 for 1999 and an average biomass that is at least identical to the 2000 value of 0.21 in 2001 (a value that is higher than 0.15 for 2000 and the projected 0.24 for 2001), exploitation rates could drop to 33% if the landings do not exceed 6.22 million pounds in 2001. Assuming the same level of discard to landings in 2001 as used in 2000 (0.57), the TAC would be 7.85 million pounds, which would implement a recreational harvest limit of 1.77 million lb (0.80 million kg).

In 1999, scup recreational landings were estimated at 1.89 million lb (0.86 million kg). As such, this harvest limit would decrease recreational landings by about 6% relative to the landings estimated for 1999. However, the projected recreational landings for 2000 of 5.19 million lb (2.35 million kg) would have to be reduced 66% to achieve the recreational harvest limit of 1.77 million lb (0.80 million kg). Recreational landings of scup have declined in recent years; from 1991 to 1997 recreational landings dropped by approximately 85%. This decrease occurred before the implementation of any recreational management measures (e.g., harvest limits, minimum size limits) and is probably due largely to a reduction in stock biomass. However, given the potential increased availability of scup in 2001, as well as the overage in 2000, more restrictive limits (i.e., lower possession limits, greater minimum size limits, and/or shorter seasons) would be required to prevent anglers from exceeding the recreational harvest limit in 2001.

6.4.1 Harvest Limits and Management Measures - A Review

The Council and Commission approved a recovery strategy that reduces overfishing on scup over a 7 year time frame. That recovery strategy called for minimum fish sizes and commercial gear regulations in 1996, year 1 of the plan. In 1996, the minimum size for the recreational fishery was 7" TL. The minimum fish size was also 7" TL in 1997 and 1998. A number of states had larger minimum sizes and maintained them for 2000 (Table 19).

Beginning in 1997, recreational harvest limits were established to achieve the target exploitation rates. The harvest limit in 1997 was 1.947 million lb (0.88 million kg). Estimated landings in 1997 were 1.2 million lb (0.54 million kg) or about 0.74 million lb (0.33 million kg) less than the limit.

The harvest limit approved for 1998 was 1.553 million lb (0.69 million kg). Estimated landings in 1998 were 0.88 million lb (0.40 million kg) or about 0.67 million lb (0.3 million kg) less than the limit.

The harvest limit approved for 1999 was 1.238 million lb (0.56 million kg). Estimated landings in 1999 were 1.89 million lb (0.89 million kg) or about 0.66 million lb (0.3 million kg) more than the limit.

The harvest limit approved for 2000 was 1.771 million lb (0.80 million kg). Based on projected landings of 5.19 million lb (2.35 million kg), the harvest limit will be surpassed by 3.43 million lb in 2000.

6.4.2 Impact of Preferred Scup Measures

The technical information regarding the role of recreational limits, recreational landings, and the effects of possession limits and size limits discussed in Section 6.3 of the EA is also relevant to this section.

Table 20 details percent reductions in landings for various combinations of possession and size limits based on 2000 data. This table addresses "what if" questions, e.g., if a 10" TL size limit had been in effect in 2000 how many fewer scup would have been killed by anglers?

Current scup recreational measures require a 7" TL minimum size, a 50 fish possession limit, and no closed season. The preferred alternative is a 9" TL minimum fish size, a 50 fish possession limit and an open season from August 15 through October 31 (closed from January 1 to August 14 and November 1 to December 31). The proposed preferred alternative could reduce recreational landings by 60% based on 2000 recreational data assuming regulations are 85% effective.

Landing frequencies for the first four waves of 2000 indicate about 90% of the trips had 24 or less fish per trip with about 50% of the trips landing 4 or less scup. Anglers were more successful in 2000 than they were in 1998. In 1998, about 50% of the successful trips landed 3 or less scup per trip.

Analysis of length frequencies indicate that few landings would have been constrained by the 7" TL size limit in the first four waves of 2000. There were few fish measured less than 7" TL and 7% were less than 8" TL. It is probable that the smaller fish would recruit to the fishery later in the year (i.e., September - October) increasing the number of small fish in the landings. However, in 1991, when recreational landings reached 8.1 million lb, only 5.6% of the measured fish were less than 7" TL.

In developing a recommendation for 2001 it is important to consider that the most recent assessment indicates that the scup biomass increased in 2000 and is likely to increase in 2001. In fact, the increase in angler success in 2000 indicates an increase in availability of scup. Survey information indicates that regulations may have protected the 1997 year class and also indicate a large 1999 year class. If the 1999 year class is large and mortality of undersized fish is reduced, substantial biomass could be added

to the stock by 2001.

Possession and size limits based on 1999 data could be used to constrain landings in 2001. In considering the appropriate limits it is important to remember that possession limits act to reduce mortality on the fully recruited, older fish and the minimum size limit reduces mortality on small fish. A season could also be used to control recreational landings.

The preferred alternative would implement a 9" TL minimum fish size, a 50 fish possession limit, and an open season from August 15 to October 31 (closed season from January 1 to August 14 and November 1 to December 31). Given a combination of a 9" TL size limit and a 50 fish possession limit, a potential reduction of 17.2% could occur (Table 20). In addition to this, a seasonal closure from January 1 to August 14 and November 1 to December 31 could potentially reduce landings by 42.8% (Table 21). Table 21 details the reduction in scup landings (number) associated with closing one day per wave, based on 1995 - 1999 MRFSS landings data. This alternative could decrease landings by 60% assuming that the regulations are 85% effective and adopted by all the states.

However, the Commission postponed action on scup at the December meeting and probably will adopt regulations that differ from the Council's proposed coastwide management measures. As such, it is unlikely that any state will adopt the proposed coastwide management measures.

A minimum size limit of 9" TL in 2001 was recommended because of the potential of increased availability of scup in 2001, as well as the fact that recreational landings could exceed the harvest limit in 2001. Because almost all of the scup are sexually mature by 9" TL, a 9" TL size limit could also increase spawning potential in the stock.

There is very little information available to empirically estimate how sensitive the affected party/charter boat anglers might be to the proposed fishing regulations. It is possible that the proposed management measures could restrict the recreational fishery for 2001 and cause some decrease in recreational satisfaction (i.e. low bag limit, larger fish size or closed season). However, due to lack of data, these effects cannot be quantified (See RIR/IRFA, Sec. 4.0). The economic impacts of the proposed management measures are fully described in Section 5.0 of the RIR/IRFA. The proposed recreational management measures are necessary to prevent anglers from exceeding the recreational harvest limit in 2001.

6.4.3 Impact of Non-Preferred Scup Measures

The technical information regarding the role of recreational limits, recreational landings,

and the effects of possession limits and size limits discussed in Section 6.3 of the EA is also relevant to this section.

Two non-preferred alternatives were also considered: a) 9" TL minimum fish size, a 15 fish possession limit, and an open season from July 1 to September 29 (closed from January 1 through June 30 and September 30 through December 31); and b) 7" TL minimum fish size, a 50 fish possession limit, and a no closed season (status quo).

A combination of a 9" TL size limit and a 15 fish possession limit could reduce landings by approximately 28% (Table 20) assuming regulations are 85% effective and adopted by all the states. The seasonal closure from January 1 through June 30 and September 30 through December 31 could reduce landings an additional 41%. This non-preferred alternative could result in approximately a 9% higher reduction in landings than the preferred alternative if adopted by all the states. However, it was not chosen because the Council believed that this possession limit/size limit combination could have considerably more impact than that indicated by analysis of MRFSS data. At the December 2000 Council meeting, the Council heard substantial public input that suggested that a possession limit of less than 50 fish would reduce landings by much more than the 9% suggested by the data and could have adverse economic impact to the party/charter industry. As such, these limits were rejected by the Council and Commission.

A 7" TL size limit and a 50 fish possession limit, the status quo, could reduce landings by approximately 5% (Table 20), assuming a 85% effectiveness and adopted by all the states. This non-preferred alternative could result in the recreational landings in excess of the recreational harvest limit. As such, these limits were rejected by the Council and Commission.

There is very little information available to empirically estimate how sensitive the affected party/charter boat anglers might be to the proposed fishing regulations. It is possible that the proposed management measures could restrict the recreational fishery for 2001 and cause some decrease in recreational satisfaction (i.e. low bag limit, larger fish size or closed season). However, due to lack of data, these effects cannot be quantified (See RIR/IRFA, Sec. 4.0). The economic impacts of the proposed management measures are fully described in Section 5.0 of the RIR/IRFA.

6.5 Impact of Black Sea Bass Measures upon the Environment

In this section the impacts of the evaluated black sea bass measures on the environment are examined. These measures were described in Section 3.3 of the EA.

The most recent assessment on black sea bass, completed in June 1998, indicates that black sea bass are over-exploited and at a low biomass level (SAW 27). Fishing mortality for 1997, based on length based methods, was 0.73. The complete

assessment is detailed in the "Report of the 27th Northeast Regional Stock Assessment Workshop."

An update of NEFSC spring trawl survey was provided to the Council to guide management recommendations for the year 2001. Amendment 12 to the Summer Flounder, Scup and Black Sea Bass FMP, which was recently approved by NMFS, established a biomass threshold based on this survey. Specifically, the biomass threshold is defined as the maximum value of a three-year moving average of the NEFSC spring survey catch-per-tow (1977-1979 average of 0.9 kg/tow).

Survey results indicate a significant increase in black sea bass biomass in 2000; the 2000 value (0.434 kg/tow) was the highest value in the series since 1979. However, the 1999 index is large because of a single tow that caught a large number of black sea bass in an area slightly north of Cape Hatteras. If that tow is removed from the estimate, the index drops from 0.433 to 0.093 for 1999, a value that is only slightly different from prior year values.

Because of the potential influence of extremely small or large number for a single tow, Gary Shepherd (pers. comm.) has suggested that the survey indices be log transformed to give a better indication of stock status. The transformed series indicates a general increase in the exploitable biomass since 1993. The preliminary index for 2000 of 0.322 is the highest in the time series since 1976 and would substantiate fishermen's observations that black sea bass have become more abundant in recent years. The three-year moving average for 1998-2000 of .2011 is a 42% increase relative to the 1997-1999 average.

The spring survey can also be used as an index of recruitment. The survey indicates good year classes were produced from 1988 to 1992 (0.2 to 0.76 fish per tow), with a moderate year class in 1995, and poor year classes in 1993, 1994, 1996 and 1997. The 1999 index was about three times the average for the period 1968-1998 and the fourth largest value since 1968. Preliminary results for 2000 indicate a strong year class; the index is 1.135, the highest in the time series.

Relative exploitation based on the total commercial and recreational landings and the moving average of the transformed spring survey index indicates a significant reduction in mortality in 1998 and 1999 relative to 1996 and 1997 levels. Based on length frequencies from the spring survey, and assuming length of full recruitment at 25 cm, the average F based on two length based methods was 0.75 (48% exploitation rate) in 1998 (G. Shepherd pers. comm.). Length based estimates are very sensitive to changes in the length used for full recruitment; average F's were 0.51 (37% exploitation) or 1.25 (66% exploitation) if a length of 23 or 27 cm was used in the calculations. Based on the relative index, exploitation rates in 1999 were nearly identical to those estimated for 1998.

Amendment 9, which was approved by NMFS on November 15, 1996, established a recovery schedule to reduce overfishing on black sea bass over an 8 year time frame (the first year was 1996). That same schedule was used in Amendment 12 to meet SFA requirements. The target exploitation rate established by this schedule for 2000 is 48%. In 2001, the target exploitation rate drops to 37%.

The best available information on stock status indicates that stock size has increased in recent years. In fact, the 3-year average for 1998-2000 is 42% larger than the value for 1997-1999. In addition, the recruitment index for 2000 is the highest in the time series, 1968-2000. If protected, this year class should allow for additional stock rebuilding in 2001 and beyond. Although the exploitation rate for 2000 is uncertain, relative exploitation rates have declined in recent years. If the 2001 biomass is at least equal to the 2000 value, and assuming an exploitation rate of 48% in 1998, the TAL could remain the same and the exploitation rate could drop to 35%, very close to the target of 37% for 2001.

Amendment 9 specifies that the 2001 TAL will be allocated to the commercial and recreational fisheries based on 1983 to 1992 landings data. Based on this data, 49% would be allocated to the commercial fishery as a commercial quota and 51% to the recreational fishery as a harvest limit. Based on a TAL of 6.173 million lb, the commercial quota would be 3.025 million lb (49%) for 2000. The recreational harvest limit would be 3.148 million lb (51%).

6.5.1 Harvest Limits and Management Measures - A Review

The Council and the Commission approved a recovery strategy that reduces overfishing on black sea bass over a 8 year time frame. That recovery strategy called for minimum fish sizes and commercial gear regulations in 1996 and 1997, years 1 and 2 of the plan. In 1996, the minimum size for the recreational fishery was 9" TL. However, the minimum fish size was only in place for the last couple of weeks of 1996. The minimum fish size remained at 9" TL in 1997.

The Council and Commission approved a harvest limit of 3.148 million lb for 1998 (1.42 million kg). The management measures that were proposed to control landings were a 10" TL minimum size limit and a closure from August 1 to August 15. Some states implemented these regulations late or not at all in 1998. In addition, although the plan requires a coastwide possession, size, and/or seasonal limit some states implemented alternative regulations in 1998. Landings in 1998 were 1.29 million lb (0.59 million kg).

The recreational harvest limit of 3.148 million lb (1.42 million kg) remained unchanged 1999. The management measures that were proposed to control landings were a 10" TL minimum size limit, no possession limit, and no closed season. However, some states implemented a 20 fish possession limit (Table 22). Landings in 1999 were 1.66 million lb (0.75 million kg).

The 2000 harvest limit was also 3.148 million lb. Projected landings for 2000 are 4.29 million lb or about 1.14 million lb more than the limit.

6.5.2 Impact of Preferred Black Sea Bass Measures

The technical information regarding the role of recreational limits, recreational landings, and the effects of possession limits and size limits discussed in Section 6.3 of the EA is also relevant to this section.

Table 23 details the percent reductions in landings for various combinations of possession and size limits based on 1999 data. This table addresses "what if" questions, e.g., if a 12" TL size limit had been in effect in 1999 how many fewer black sea bass would have been killed by anglers?

Current black sea bass recreational measures require a 10" TL minimum size, no possession limit, and no closed season. The preferred alternative was to establish a 11" TL minimum size, a 25 fish possession limit, and an open season from January 1 to February 28 and May 10 to December 31 (closed from March 1 through May 9) for 2001. This size and possession limit would reduce recreational landings by almost 22%, based on 2000 recreational landings and assuming recreational landings are 85% effective (Table 23). The closed season would reduce landings an additional 4.5% (Table 24). Table 24 details the reduction in black sea bass landings (number) associated with closing one day per wave, based on 1995 - 1999 MRFSS landings data. These measures combined could reduce landings a total of 26%.

Landing frequencies for the first four waves of 2000 indicate that 90% of the trips landed 15 or less fish per trip with slightly less than 50% of the successful trips landing about 3 black sea bass. This compares to 1999 (all waves) when 50% of the trips landed about 2 black sea bass per trip.

Analysis of length frequencies indicate that landings were constrained by the 10" TL size limit in the first four waves of 2000. A total of 12.1% of the measured black sea bass were less than 10" TL in 2000 samples compared to 26.5% in 1997, the year before the 10" size limit was implemented.

Several possible management measures can be considered in developing management recommendations. Possession and size limits could be used to constrain landings in 2001 based on 2000 data. In considering the appropriate limits it is important to remember that possession limits act to reduce mortality on the fully recruited, older fish and the minimum size limit reduces mortality on small fish. A season could also be used to control recreational landings.

In developing a recommendation for 2001 it is important to consider that the most recent assessment information on black sea bass. The NEFSC spring survey indicates

that stock size has increased in recent years and is likely to increase in 2001. In addition, survey results indicate that the 2000 value was the highest since 1976. In fact, the three-year moving average for 1998-2000 of 0.2011 is a 42% increase relative to the 1997-1999 average.

If availability of black sea bass increases, the possession limit will act to control landings and will have more of an effect. If availability is low, few anglers will be affected by the regulations and landings will be lower than the harvest limit. As such, this alternative considers a possession limit be implemented in 2001 to control landings in case of increased availability.

There is very little information available to empirically estimate how sensitive the affected party/charter boat anglers might be to the proposed fishing regulations. It is possible that the proposed management measures could restrict the recreational fishery for 2001 and cause some decrease in recreational satisfaction (i.e. low bag limit, larger fish size or closed season). However, due to lack of data, these effects cannot be quantified (See RIR/IRFA, Sec. 4.0). It is important to mention that drastic changes in management measures could lead to increased levels of noncompliance. The economic impacts of the proposed management measures are fully described in Section 5.0 of the RIR/IRFA. The proposed recreational management measures are necessary to prevent anglers from exceeding the recreational harvest limit in 2001.

6.5.3 Impact of Non-Preferred Black Sea Bass Measures

The technical information regarding the role of recreational limits, recreational landings, and the effects of possession limits and size limits discussed in Section 6.3 of the EA is also relevant to this section.

Two non-preferred alternatives were also considered in this fishery: a) 10" TL minimum fish size, a 15 fish possession limit, and an open season from June 1 to November 25 (closed from January 1 to June 24 and November 26 to December 31); and b) a 10" TL minimum size limit, no possession limit, and no closed season (status quo).

Given a combination of a 10" TL size limit and a 15 fish possession limit, a reduction in recreational landings of 16.1% could occur, based on 2000 recreational landings and assuming the regulations would be 85% effective in their implementation (Table 23). The seasonal closure from January 1 through May 31 and November 26 through December 31 could result in a potential reduction of 21% (Table 24) for a total reduction of 37% under the first non-preferred alternative. However, this alternative was not chosen, because the season was less equitable to the states than the season in the preferred alternative. The projected reductions by state are closer to the projected reduction for the coast for the seasonal closure under the preferred alternative than this alternative, as indicated in Table 24. In addition, landings data show that more large fish were available in 2000. The higher size limit in the preferred alternative would allow

for an increase in the spawning potential of the stock.

Given a combination of a 10" TL size limit, no possession limit, and no closed season, a potential reduction of approximately 9% could occur with the implementation of the second non-preferred alternative (Table 23), based on 2000 recreational landings and assuming that regulations would be 85% effective in their implementation. This alternative was not chosen because it would allow recreational landings to exceed the recreational harvest limit.

There is very little information available to empirically estimate how sensitive the affected party/charter boat anglers might be to the proposed fishing regulations. It is possible that the proposed management measures could restrict the recreational fishery for 2001 and cause some decrease in recreational satisfaction (i.e. low bag limit, larger fish size or closed season). The economic impacts of the proposed management measures are fully described in Section 5.0 of the RIR/IRFA. The proposed recreational management measures are necessary to prevent anglers from exceeding the recreational harvest limit in 2001.

6.6 Social Impacts

A full description of principal ports and communities is presented in Section 4.1 of the "2001 Summer Flounder, Scup, and Black Sea Bass Specifications." Additional information obtained from a party/charter boat industry survey conducted by the MAFMC detailing the importance of summer flounder, scup, and black sea bass to this industry is presented in Section 5.4 of the EA. In addition to this, demographic and economic information on marine recreational fishing participants by region is presented in Section 5.5 of the EA. There is no data available at the port or community level that shows the dependence of the party/charter boat fishery, the private/rental boat fishery, or the shore fishery on summer flounder, scup, and black sea bass. Even though, the proposed management measures could affect the demand for trips for a specific species, it is not expected that it would affect in a negative way the overall number of recreational fishing trips in the North and Mid-Atlantic regions (See RIR/IRFA, Sec. 5.0). As such, there should not be significant adverse impacts to ports and communities.

A distinction needs to be made, however, between impacts to individuals and impacts to communities. Where the number of affected individuals in a community is large, the types and degree of impacts are likely to be the same at each level. Where the numbers of individuals are small, however, they may not be.

While some individual fishermen and their families may find the final recreational management measures for 2001 to have significant impacts, the larger communities and towns in which they live will not.

7.0 Essential Fish Habitat Assessment

An Essential Fish Habitat (EFH) Assessment was conducted and is included in Section 7.0 of the “2001 Summer Flounder, Scup, and Black Sea Bass Specifications.” This assessment evaluated the affects of the proposed quotas (total allowable landings or total allowable catch) on EFH. An EFH consultation was conducted on October 13, 2000. This consultation found the adverse impacts to habitat resulting from the proposed 2001 quotas to be minimal. Since this action establishes measures to achieve the recreational harvest limits evaluated as part of the proposed quotas, no further EFH consultation is required.

8.0 List of Agencies and Persons Consulted in Formulating the Proposed Action

The proposed summer flounder, scup and black sea bass specifications were submitted to the National Marine Fisheries Service (NMFS) by the Mid-Atlantic Fishery Management Council.

9.0 List of Preparers of the Environmental Assessment

This environmental assessment was prepared by the Mid-Atlantic Council and the Northeast Regional Office of NMFS, and is based, in part, on information provided by the Northeast Fisheries Science Center.

10.0 Finding of No Significant Environmental Impact

Having reviewed the environmental assessment and the available information relating to the proposed action, I have determined that there will be no significant adverse environmental impact resulting from the action and that preparation of an environmental impact statement on the action is not required by Section 102(2)(c) of the National Environmental Policy Act or its implementing regulations.

Assistant Administrator for
Fisheries, NOAA

Date

REGULATORY IMPACT REVIEW AND INITIAL REGULATORY FLEXIBILITY ANALYSIS

1.0 Introduction

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. This 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. This 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 this 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. This RIR addresses many items in the regulatory philosophy and principles of Executive Order (E.O.) 12866.

Also included is an Initial Regulatory Flexibility Analysis (IRFA). This analysis is being undertaken in support of a complete analysis for the 2001 recreational specifications for fishing for summer flounder, scup and black sea bass. A complete description of the need for, and objectives of, this rule can be found in the Introduction of the Environmental Assessment (EA). A description of the principal ports and communities is presented in Section 4.1 of the "2001 Summer Flounder, Scup, and Black Sea Bass Specifications." In addition, an analysis of permit data and a description of the fisheries are presented in Sections 4.2 and 5.0 of the EA, respectively. The legal basis of this rule can be found in Section 1.0 of the EA.

2.0 Evaluation Of E.O. 12866 Significance

The proposed action does not constitute a significant regulatory action under E.O. 12866 for the following reasons. First, it will not have an annual effect on the economy of more than \$100 million. The measures considered in this regulatory paper will not affect gross revenues or indirect and induced effects generated by the party/charter, private/rental, or other sectors offering goods and services to anglers engaged in the summer flounder, scup, and black sea bass fisheries to the extent that \$100 million annually economic impact will occur in any of these fisheries individually or combined.

Projected data from Marine Recreational Fisheries Statistics Survey (MRFSS) indicate that 31,976,555 trips were taken in the Northeast Region (Maine-North Carolina) in 2000. It is estimated that the number of trips by fishing mode was: 1,625,597 party/charter boat trips, 17,197,541 private/rental boat trips, and 13,153,417 shore trips (See RIR/IRFA, Sec. 5.0).

The proposed summer flounder, scup, and black sea bass recreational management measures could decrease party/charter boat trips by 2.64%, 1.44%, and 0.09%, respectively, if adopted by all the states. In addition, 2.10%, 0.36%, and 0.01% of the private/rental boat trips and 0.41%, 0.14%, and virtually no shore trips (0.0001%) were estimated to decrease as a consequence of the proposed summer flounder, scup, and black sea bass recreational management measures, respectively. As such, the total number of party/charter boat, private/rental boat, and shore trips may decrease by approximately 42,916; 361,148; and 53,929 in the summer flounder fishery, by 23,409; 61,911; and 18,415 in the scup fishery, and by 1,463; 1,720; and 13 in the black sea bass fishery, respectively, if these management measures are adopted by all the states (See RIR/IRFA, Sec. 5.0).

The proposed management measures could potentially decrease gross revenues of businesses providing goods and services to anglers participating in the party/charter boat, private/rental boat, and shore fisheries for those species. This decrease in revenues can be estimated by multiplying the changes in the number of party/charter boat, private/rental boat, and shore fishing trips estimated above by the projected average expenditure by fishing mode for 2001 paid by anglers. Adjusted mean trip expenditures (2001 equivalent) for party/charter boat trips is \$75.34, \$54.67 for private/rental boat trips, and \$38.51 for shore trips. As such, it is estimated that revenues for business providing goods and services for anglers engaged in these fisheries could decrease by approximately \$31,116,283 in 2001 compared to 2000 if these management measures are adopted by all the states. The contribution of individual species to this total revenue decrease is as follows: \$25,054,058 for summer flounder, \$5,857,470 for scup, and \$204,755 for black sea bass (See RIR/IRFA, Section 5.0).

The potential losses presented in the above paragraph included only the direct effects of angler expenditures; the sales generated from initial purchases by anglers (e.g., party/charter access fees paid to owners of for-hire vessels). Indirect and induced effects also occur because businesses providing goods and services to anglers must purchase goods and services, which in turn, generate more sales. These ripple effects (i.e., multiplier effects) continue until the amount remaining in a local economy is negligible. Although indirect and induced effects could be estimated by constructing an input-output model of the Northeast region coastal states, a model of this kind was not available. Nevertheless, an approximation to indirect and induced effects can be made by assuming a multiplier effect of 1.5 - 2.0. It is likely that the multiplier for this sector of the fishery falls within those values. As such, the overall economic impact of the proposed management measures for the summer flounder fishery could range from \$37,581,087 ($\$25,054,058 \times 1.5$) to \$50,108,116 ($\$25,054,058 \times 2.0$), from \$8,786,205 ($\$5,857,470 \times 1.5$) to \$11,714,940 ($\$5,857,470 \times 2.0$) for the scup fishery, and from \$307,133 ($\$204,755 \times 1.5$) to \$409,510 ($\$204,755 \times 2.0$) for the black sea bass fishery if these management measures are adopted by all the states. These values combined would result in an overall economic impact ranging from \$46,674,425 to \$62,232,566.

The potential economic losses described above assume the worse potential impact case scenario. However, the proposed management measures for the summer flounder, scup, and black sea bass fisheries are for the EEZ. The states through the Atlantic States Marine Fisheries Commission will implement alternative measures for summer flounder and scup. More specifically, the Atlantic States Marine Fisheries Commission adopted reduction strategies smaller than those adopted by the Council for summer flounder and have not taken action on scup recreational measures for 2001. States also, will implement conservation equivalency measures for summer flounder that would allow specific states to implement management measures tailored to maintain fishing practices that maximize angler participation in those states. Since those management measures have not yet been established they are not incorporated into this analysis.

On average, for the 1995-1999 period, the percentage (number of fish) of summer flounder, scup, and black sea bass harvested in EEZ waters was approximately 7.3%, 13.4%, and 80.7%, respectively (Table 18). Assuming that states will implement management measures in state waters that would allow anglers to continue to fish for summer flounder and scup according to traditional fishing practices, then the values associated with the percentage contribution of summer flounder and scup in EEZ waters to the total harvest can be employed to extrapolate the impacts of the proposed management measures in the EEZ. This was calculated by multiplying the dollar value associate with the overall impact for the summer flounder and scup fisheries derived above by the proportion associated for these species harvested in EEZ waters. As such, the overall impact of the proposed management measures for the summer flounder fishery could be from \$2,743,419 ($\$37,581,087 \times 7.3\%$) to \$3,657,892 ($\$50,108,116 \times 7.3\%$) and from \$1,177,351 ($\$8,786,205 \times 13.4\%$) to \$1,569,802 ($\$11,714,940 \times 13.4\%$) for the scup fishery (See RIR/IRFA, Section 5.0). These values combined with the estimated values for black sea bass presented above, would result in an overall economic impact ranging from \$4,227,903 to \$5,637,204.

In addition, losses of this magnitude are not likely to occur given that anglers will continue to have the ability to engage in catch and release fishing for summer flounder, scup, and black sea bass and because of the numerous alternative target species available to anglers. Unfortunately, very little information is available to empirically estimate how sensitive the affected party/charter boat anglers might be to the proposed regulations. The fact that the proposed regulations affect the number and size of the fish that can be kept or landed and do not prohibit anglers from engaging in catch and release fishing, the overall losses are likely to be somewhat lower.

The proposed action benefits in a material way the economy, productivity, competition and jobs. The proposed action will not adversely affect, in the long-term, competition, jobs, the environment, public health or safety, or state, local, or tribal government communities. Second, the proposed action will not create a serious inconsistency or otherwise interfere with an action taken or planned by another agency. No other agency

has indicated that it plans an action that will affect the summer flounder, scup or black sea bass fisheries in the EEZ. Third, the proposed action will not materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of their participants. And, fourth, the proposed action do not raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in E.O. 12866.

3.0 Paperwork Reduction Act of 1995

The Paperwork Reduction Act (PRA) concerns the collection of information. The intent of the PRA 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.

The Council is not proposing measures under this regulatory action that require review under PRA. There are no changes to existing reporting requirements previously approved under OMB Control Nos. 0648-0202 (Vessel permits), 0648-0229 (Dealer reporting) and 0648-0212 (Vessel logbooks).

4.0 Initial Regulatory Flexibility Analysis

4.1 Introduction and Methods

The Regulatory Flexibility Act (RFA) requires the federal rulemaker to examine the impacts of proposed and existing rules on small businesses, small organizations, and small governmental jurisdictions. In reviewing the potential impacts of proposed regulations, the agency must either certify that the rule "will not, if promulgated, have a significant economic impact on a substantial number of small entities," or prepare an Initial Regulatory Flexibility Analysis. The Small Business Administration (SBA) defines a small business in the commercial fishing and recreational fishing activity, as a firm with receipts (gross revenues) of up to \$3.0 million annually. The category of small entities likely to be affected by the proposed rule are party/charter boats harvesting summer flounder, scup, and/or black sea bass. This proposed rule could affect any party/charter vessel holding an active federal permit for summer flounder, scup, and/or black sea bass as well as vessels that fish for any of these species in state waters. Data from the Northeast permit application database indicates that in 1999 there were 694 vessels permitted to take part in the summer flounder, scup, and/or black sea bass fisheries in the EEZ. The Northeast landings database indicates that 364 party/charter vessels participated in the summer flounder, scup, and/or black sea bass fisheries in 1999.

This rule would apply to the following small entities: summer flounder, scup and/or black sea bass charter/party permit holders, as well as those actively participating in the fisheries. While permit holders represent the universe of entities whose normal

activities might be directly affected by these regulations - whether or not the individual permit holder chooses to fish in a given year - impacts may also be felt by a smaller group of permitted entities, namely, those who actively participated, i.e. landed fish, in 1999. Latent fishing power (in the form of unfished permits) represents a real and considerable force to alter the impacts on a fishery, but vessels actively participating in the fishery are dependent on a particular species. It is impossible to predict how many - or who - will or will not participate in these fisheries in 2001.

This analysis will present information relative to the impacts of this proposed action on small entities. The basic approach adopted in this analysis is an assessment of various management measures from the standpoint of determining the resulting changes in revenue on party/charter vessels. Data on costs and revenues for party/charter vessels are not available in the NMFS files containing vessel data. As such, revenues for party/charter vessels participating in these fisheries were estimated by employing various assumptions which are described below. The effects of actions were analyzed by employing quantitative approaches to the extent possible. Where quantitative data were not available, qualitative analyses were conducted. The MAFMC invites public comment on this IRFA, and the qualitative and quantitative aspects of it in particular.

There is very little information available to empirically estimate how sensitive anglers might be to the proposed fishing regulations. In order to conduct a more complete analysis, cumulative impacts were examined by estimating the number of recreational fishing trips that could be affected by the proposed management measures. To date, the first five waves of MRFSS effort data are available for 2000. Preliminary MRFSS data (waves 1-5) for 2000 was used to estimate the total number of trips taken by anglers in 2000 in the Northeast Region. Wave six effort estimates were calculated by multiplying 1999 estimates by the average change in effort across waves one through five from 1999 to 2000. The total number of trips affected by the proposed regulations was then determined by estimating the number of trips that could be constrained by the evaluated proposed measures. Finally, potential loss in revenues were estimated by multiplying the number of potentially affected trips in 2001 by the average trip expenditure incurred by anglers.

It is also assumed that, if any of the management measures for these species in 2001 is unchanged from the status quo, recreational satisfaction will not be affected, regardless of changes in recreational landings. As such there will be no additional recreational fishing trips affected in 2001 as compared to the base year (2000). That is, demand for party/charter boat trips would not be affected.

4.2 Recordkeeping and Reporting

As stated in Section 3.0 of the RIR/IRFA, this proposed action does not propose new reporting or recordkeeping measures. There are no changes to existing reporting requirements. Currently, all summer flounder, scup or black sea bass

federally-permitted dealers must submit weekly reports of fish purchases. The owner or operator of any vessel issued a moratorium vessel permit for summer flounder, scup or black sea bass, 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. The owner of any party or charter boat issued a summer flounder, scup or black sea bass permit other than a moratorium permit and carrying passengers for hire must submit an accurate daily fishing log report for each charter or party fishing trip that lands summer flounder, scup, or black sea bass unless such a vessel is also issued another permit that requires regular reporting, in which case a fishing log report is required for each trip regardless of species retained.

4.3 Relevant Federal Rules

This proposed action will not duplicate, overlap or conflict with any other federal rules.

5.0 Analysis of Impacts of Proposed Measures

5.1 Summer Flounder Fishery Impacts

5.1.1 Summer Flounder Preferred Alternative

The preferred alternative would implement a 15.5" TL minimum fish size, a 3 fish possession limit, and an open season from May 25 to September 4 (or a closed season from January 1 to May 24 and September 5 to December 31) for 2001. These management measures could reduce landings by approximately 53% if implemented by all the states (See EA, Sec. 6.3.2). Based on projected 2000 landings and the proposed recreational harvest limit for 2001, landings would have to be reduced 54% to achieve the harvest limit in 2001 assuming no change in angler effort or stock abundance. As such, the reduction in landings associated with the proposed management measures (53%) under this preferred alternative are in line with the necessary reduction in landings. Current summer flounder recreational measures are a 15.5" TL minimum size, an 8 fish possession limit, and an open season from May 10 to October 2 (or a closed season from January 1 to May 9 and October 3 to December 31). As such, the difference between the proposed coastwide summer flounder recreational measures for 2001 and the status quo is a decrease in the possession limit and a shorter fishing season.

Summer flounder recreational data indicate that in only two of the last eight years (1994 and 1995) recreational landings have been less than the recreational harvest limits (Table 25). In 1998 and 1999, recreational landings of summer flounder were 12.48 million lb (5.66 million kg) and 8.37 million lb (3.80 million kg), respectively. The summer flounder recreational landings in 1998 and 1999 were 5.07 million lb (2.30 million kg) and 0.96 million lb (0.44 million kg) over the recreational harvest limit for those years, respectively. For 2000, recreational landings are projected to be 8.22

million lb (3.73 million kg) above the allowable recreational harvest limit of 7.41 million lb (3.36 million kg).

The proposed recreational harvest limit for 2001 is 7.16 million lb (3.25 million kg). This recreational harvest limit is 3.4% below the recreational harvest limit implemented in 2000 and about 54% below the projected recreational landings for that year (Table 25). Since there is no mechanism to deduct overages directly from the recreational harvest limit, any overages to the recreational harvest limit must be addressed by the way of adjustments to the management measures (fish size, bag limit and/or season). The proposed recreational management measures are necessary to prevent anglers from exceeding the recreational harvest limit in 2001.

Table 18 details the proportion of summer flounder harvested in state and federal waters. On average (1995-1999), approximately 92.7% of the harvested summer flounder (number) came from state waters. Since, states have opted to implement reduction strategies different from those being implemented by the Council, approximately 7.3% of the harvested summer flounder (number) will be affected by the proposed federal measures. More specifically, the Atlantic States Marine Fisheries Commission adopted a reduction strategy that is smaller than that adopted by the Council. In addition to this, states will implement conservation equivalency measures that would allow specific states to implement management measures tailored to maintain fishing practices that maximize angler participation in specific states. These state management measures have not yet been established and thus not incorporated into this analysis. As such, about 93% of the harvested summer flounder (number) will be affected by the state management measures.

The contribution of summer flounder to the total catch (by number) made by party/charter vessels varied by month for the period 1996-1999 (Table 11). The contribution of summer flounder to the total catch of party/charter vessels fluctuated throughout the year, ranging from less than 1% in January, February, March, April, November and December to 24% in July, with the largest proportion (about 13%) of summer flounder caught from May through September. The preferred alternative would allow for an open season from May 25 to September 4 (or a closed season from January 1 to May 24 and September 5 to December 31). VTR data indicates that the contribution of summer flounder to the total catch of party/charter vessels was small (<5%) during the proposed closed period of time for most states with the exception of Delaware and New York during the month of May and Delaware, New Jersey, and New York during the month of September (Table 11). It is possible that a summer flounder seasonal closure during those months could affect recreational satisfaction to such an extent that the demand for recreational party/charter trips could decrease for that time period. However, taking into consideration that 1) approximately 93% of the harvested summer flounder (number) came from state waters, 2) that states through the Atlantic States Marine Fisheries Commission implemented reduction strategies lower than those approved by the Council, and that 3) states will implement equivalent measures

that allow the summer flounder fishery to stay open during critical fishing periods to maximize angler participation, the demand for recreational party/charter trips should not be significantly affected. As such, the summer flounder fishery will operate in a way that dissipates potential adverse economic effects in specific states.

Effort

Projected data from the Marine Recreational Fisheries Statistics Survey (MRFSS) indicate that 31,976,555 trips were taken by anglers in 2000 in the Northeast Region. Anglers fishing from a private or rental boat were estimated to have fished more trips than shore and party/charter anglers combined (17,197,541 trips). Shore anglers were projected to have fished 13,153,417 trips and party/charter boat anglers about 1,625,597 trips. To date, the first five waves of MRFSS effort data are available for 2000. Wave six effort estimates were calculated by multiplying 1999 estimates by the average change in effort across waves one through five from 1999 to 2000.

Staff at the Northeast Fisheries Science Center estimated the proportion of trips taken in 2000 that would have been affected by the implementation of the summer flounder measures proposed under the preferred alternative for the 2001 fishing year. It was estimated that 2.10% of the trips aboard private or rental boats in 2000 would have been affected by the 2001 measures, 0.41% of the shore trips, and 2.64% of the trips aboard party/charter boats. In other words, 361,148 (2.10%) angler trips taken aboard private and rental boats in 2000 landed at least one summer flounder that was less than 15.5 inches, or landed more than 3 summer flounder, or landed at least one summer flounder during the proposed closed season. Assuming angler effort in 2001 is similar to 2000 and catch rates remain about the same, the proposed 3 fish possession limit and the extended closed season (the size limit remains constant) are projected to affect approximately 2.10% (361,148 trips) of the total private/rental boat effort in 2001. Table 26 shows the projected impact of the 2001 regulations on private/rental, shore, and party/charter effort in the Northeast region.

However, given that only about 7.3% of the harvested summer flounder (number) comes from EEZ waters, and that states have implemented reduction strategies lower than those proposed by the Council and will also implement conservation equivalencies, the number of trips affected by the proposed management measures should be considerably lower than the value indicated above. In addition, a decrease in effort of this magnitude is not likely to occur given that anglers will continue to have the ability to engage in catch and release fishing for summer flounder and because of the numerous alternative target species available to anglers.

Expenditures

During 1998, social and economic data from marine recreational fishermen in the Northeast Region were gathered through an economic add-on to NMFS' Marine

Recreational Statistics Survey (MRFSS). As part of this survey, anglers were asked to delineate trip expenditures and purchases of durable equipment used primarily for saltwater recreational fishing. Although results of the survey are preliminary and have yet to be promulgated in a formal report, the estimated mean trip-related expenditures were used to project the potential losses associated with the proposed 2001 regulations.

Survey results indicate that the average trip expenditure in 1998 was \$49.78 for anglers fishing from a private/rental boat, \$35.06 for shore anglers, and \$68.60 for anglers that fished from a party/charter boat (Table 27). Trip expenditures included the following consumable items: (1) travel; (2) food, drink, and refreshments; (3) lodging at motels, cabins, lodges, or campgrounds; (4) public transportation or car rental; (5) boat fuel; (6) guide or package fees; (7) access and/or boat launching fees; (8) equipment rental such as boat, fishing or camping equipment; (9) bait; and (10) ice. Expenditures on durable items such as rods, reels, tackle, special fishing clothing, etc., had not been fully analyzed at the time of this report was prepared and are not included in the subsequent analysis. Although expenditures on durable items may also be affected by the proposed regulations, the extent of the impact would be difficult to quantify since these items can be used for many trips.

Potential reduced expenditures associated with the proposed 2001 regulations can be estimated by adjusting the 1998 average trip expenditures to their 2001 equivalent and multiplying by the projected number of affected trips in 2001¹. Adjusted average trip expenditures in 2001 dollars are \$75.34 for party/charter boat trips, \$54.67 for private/rental boat trips, and \$38.51 for shore trips. For example, the multiplication of private/rental mean trip expenditures adjusted to its 2001 equivalent (\$54.67) and the projected number of affected trips (361,148) results in total expenditures of \$19,743,961 (Table 26). As such, if the regulations proposed under the preferred alternative result in a decrease in the number of private/rental boat fishing trips, businesses that supply trip-related goods and services to this mode could lose up to \$19,743,961 in 2001 compared to 2000. Using the same type of analysis, it was estimated that the decrease in total expenditures associated with party/charter boat trips and shore trips in 2001 compared to 2000 are \$3,233,291 and \$2,076,806, respectively. As such, the total reduction in trip expenditures (all modes combined) is estimated at \$25,054,058. However, this value assumes implementation of the federal management measures by all the states.

Reductions in expenditures of this magnitude are not likely to occur given that anglers

¹1998 average trip-related expenses were adjusted to their 2001 equivalent by using the Bureau of Labor Statistics Consumer Price Index. Since the price index has yet to be calculated for 2001, a 10-year average annual increase from 1991-2000 (2.82%) was used to adjust the expenditure estimates from 2000 to 2001.

will continue to have the ability to engage in catch and release fishing for summer flounder and because of alternative target species available to anglers. Unfortunately, very little information is available to empirically estimate how sensitive the affected anglers might be to the proposed regulations. The fact that the proposed regulations affect the number and size of the fish that can be kept or landed and do not prohibit anglers from engaging in catch and release fishing, the overall losses are likely to be substantially lower. The results presented in Table 26 show the maximum potential losses associated with the regulations proposed under the preferred alternative. If the total number of recreational fishing trips is unaffected by the regulations (i.e., total expenditures remain constant) then no losses will occur to businesses that supply trip-related goods and services.

Overall Economic Impact

The potential losses generated in the expenditure analysis presented above describe only the direct effects of angler expenditures; the sales generated from initial purchases by anglers (e.g., party/charter access fees paid to owners of for-hire vessels). Indirect and induced effects also occur because businesses providing goods and services to anglers must purchase goods and services, which in turn, generate more sales. These ripple effects (i.e., multiplier effects) continue until the amount remaining in a local economy is negligible. Although indirect and induced effects could be estimated by constructing an input-output model of the Northeast region coastal states, a model of this kind was not available.

Nevertheless, an approximation to indirect and induced effects can be made by assuming a multiplier effect of 1.5 - 2.0. It is likely that the multiplier for this sector of the fishery falls within those values. As such, the overall economic impact of the proposed management measures for the summer flounder fishery could be from \$37,581,087 ($\$25,054,058 \times 1.5$) to \$50,108,116 ($\$25,054,058 \times 2.0$).

The proposed management measures for the summer flounder are for the EEZ. The states through the Atlantic States Marine Fisheries Commission will implement alternative measures for summer flounder. More specifically, the Atlantic States Marine Fisheries Commission adopted reduction strategies smaller than those adopted by the Council for summer flounder for 2001. States also, will implement conservation equivalency measures for summer flounder that would allow specific states to implement management measures tailored to maintain fishing practices that maximize angler participation in those states. Since those management measures have not yet been established they are not incorporated into this analysis.

On average, for the 1995-1999 period, the percentage (number of fish) of summer flounder harvested in EEZ waters was 7.3%. Assuming that states will implement management measures in state waters that would allow angler to continue to fish for these species according to traditional fishing practices, then the values associated with

the percentage contribution of these species in EEZ waters to the total harvest can be employed to extrapolate the impacts of the proposed management measures. As such, the overall impact of the proposed management measures for the summer flounder fishery could be from \$2,743,419 ($\$37,581,087 \times 7.3\%$) to \$3,657,892 ($\$50,108,116 \times 7.3\%$).

The potential economic losses described above (expenditures and overall economic impact sections) assume the worse potential impact case scenario. However, losses of this magnitude are not likely to occur given that anglers will continue to have the ability to engage in catch and release fishing for summer flounder and because of the numerous alternative target species available to anglers. Unfortunately, very little information is available to empirically estimate how sensitive the affected party/charter boat anglers might be to the proposed regulations. The fact that the proposed regulations affect the number and size of the fish that can be kept or landed and do not prohibit anglers from engaging in catch and release fishing, the overall losses are likely to be somewhat lower.

Party/charter Vessels

Party and charter vessels that target summer flounder could be directly impacted by the proposed regulations. These measures are projected to affect approximately 2.64% of the total angler trips taken aboard party/charter boats in 2001, assuming catch rates and angler effort in 2001 are similar to 2000 (Table 26). In other words, 42,916 (2.64%) angler trips taken aboard party/charter boats in 2001 are projected to land at least one summer flounder that is less than 15 inches, land more than 3 summer flounder, or land at least one summer flounder during the proposed closed season. Total party/charter boat earnings associated with these trips can be determined by multiplying the number of potentially affected trips in 2001 (42,916) by the average fee paid by anglers (\$39.09 - 2001 equivalent of the average fee paid by anglers in 1998 based on information collected through an economic add-on to NMFS' Marine Recreational Fishery Statistics Survey) in the Northeast region (\$1,677,586). Analysis of Northeast logbook data indicated that 318 party/charter vessels participated in the summer flounder fishery in 1999. Assuming that the same number of vessels will participate in 2001, the potential impact per boat could be up to \$5,275 ($\$1,677,586/318$). As such, if the regulations proposed under the preferred alternative result in a decrease in the number of recreational fishing trips, on average, each party/charter vessel could lose up to \$5,275 or 2.64% of their revenue in 2001 compared to 2000.

However, losses of this magnitude are not likely to occur given that the proposed management measures for the summer flounder are for the EEZ. The states through the Atlantic States Marine Fisheries Commission will implement alternative measures for summer flounder. More specifically, the Atlantic States Marine Fisheries Commission adopted reduction strategies smaller than those adopted by the Council for summer flounder for 2001. States also, will implement conservation equivalency

measures for summer flounder that would allow specific states to implement management measures tailored to maintain fishing practices that maximize angler participation in those states. Since those management measures have not yet been established they are not incorporated into this analysis. Given these factors, the demand for recreational party/charter trips should not be significantly affected. Thus the monetary impact per boat should be considerably lower than that estimated above.

In addition to this, anglers will continue to have the ability to engage in catch and release fishing for summer flounder and because of the numerous alternative target species available to anglers. Unfortunately, very little information is available to empirically estimate how sensitive the affected party/charter boat anglers might be to the proposed regulations. The fact that the proposed regulations affect the number and size of the fish that can be kept or landed and do not prohibit anglers from engaging in catch and release fishing, the overall losses are likely to be lower.

On average, for the 1995-1999 period, the percentage (number of fish) of summer flounder harvested in EEZ waters was 7.3%. Assuming that states will implement management measures in state waters that would allow angler to continue to fish for these species according to traditional fishing practices, then the values associated with the percentage contribution of these species in EEZ waters to the total harvest can be employed to extrapolate the impacts of the proposed management measures. Therefore, party/charter revenue losses per boat could range anywhere from no revenue losses up to \$385 ($\$5,275 \times 7.3\%$), on average, of total expected boat revenue in 2001.

In previous years states were allowed to chose between the coastwide management measures or conservation equivalency measures. In some instances, some states (e.g., Massachusetts) chose the least restrictive set of management measures regardless of the reduction associated with such selection. However, under the Atlantic States Marine Fisheries Commission reduction strategies and conservation equivalency measures, states would be required to implement specific management measures that achieve the desire reduction in their recreational landings or conservation goals. As such, it is entirely possible that party/charter boats operating in states that had previously chosen the least restrictive management measures last year (thus maximizing landings in 2000) may be more severely affected in 2001 relative to 2000 than party/charter boats operating in states that had chosen more restrictive management measures in 2000. Finally, it is also expected that party/charter vessels that target a larger selection of species would be able to handle these regulations better than vessels that exclusively fish for summer flounder.

While keeping fish is moderately important to anglers in the Mid-Atlantic, over 42% of anglers in New England in 1994, indicated catching fish to eat was not an important reason for marine fishing (Steinback and O'Neil 1998). Although these anglers are not likely to be the ones constrained by the regulations, findings of this study generally concur with previous studies that found non-catch reasons for participating in marine

recreational fishing were rated much higher than keeping fish for food. In combination with alternative target species available to anglers, the findings of the Steinback and O'Neil (1998) study suggest that at least some of the potentially affected anglers would not reduce their effort when faced with the landings restrictions proposed under the preferred alternative.

5.1.2 Summer Flounder Non-Preferred Alternative 1

The first non-preferred alternative would implement a 16" TL minimum fish size, a 3 fish possession limit, and an open season from May 18 to September 14 (or a closed season from January 1 to May 17 and September 15 to December 31) for 2001. These management measures could reduce landings by approximately 54% if implemented by all the states (See EA, Sec. 6.3.3). Based on projected 2000 landings and the proposed recreational harvest limit for 2001, landings would have to be reduced 54% to achieve the harvest limit in 2001 assuming no change in angler effort or stock abundance. As such, the reduction in landings associated with the proposed management measures (54%) under this non-preferred alternative are in line with the necessary reduction in landings. Current summer flounder recreational measures are a 15.5" TL minimum size, an 8 fish possession limit, and an open season from May 10 to October 2 (or a closed season from January 1 to May 9 and October 3 to December 31). As such, the difference between the proposed coastwide summer flounder recreational measures for 2001 and the status quo is an increase in the size limit, a decrease in the possession limit, and increase the fishing season.

The discussion regarding historical recreational harvest limits and landings, landings by area, the contribution of summer flounder to the total catch (by number) made by party/charter vessels by month, recreational trip expenditures by mode, and overall assumptions used to conduct the analysis presented under the preferred summer flounder alternative also applies to the analysis under this non-preferred alternative.

Effort

Under this non-preferred alternative, it was estimated that 2.20% of the trips aboard private or rental boats in 2000 would have been affected by the 2001 measures, 0.51% of the shore trips, and 2.72% of the trips aboard party/charter boats. In other words, 378,346 (2.20%) angler trips taken aboard private and rental boats in 2000 landed at least one summer flounder that was less than 16 inches, or landed more than 3 summer flounder, or landed at least one summer flounder during the proposed closed season. Assuming angler effort in 2001 is similar to 2000 and catch rates remain about the same, the proposed 3 fish possession limit, the size limit decrease, and the extended closed season are projected to affect approximately 2.20% (378,346 trips) of the total private/rental boat effort in 2001. Table 26 shows the projected impact of the 2001 regulations on private/rental, shore, and party/charter effort in the Northeast region.

However, given that only about 7.3% of the harvested summer flounder (number) comes from EEZ waters, and that states have implemented reduction strategies lower than those proposed by the Council and will also implement conservation equivalencies, the number of trips affected by the proposed management measures should be considerably lower than the value indicated above. In addition, a decrease in effort of this magnitude is not likely to occur given that anglers will continue to have the ability to engage in catch and release fishing for summer flounder and because of the numerous alternative target species available to anglers.

Expenditures

Potential reduced expenditures associated with the proposed 2001 regulations can be estimated by adjusting the 1998 average trip expenditures to their 2001 equivalent and multiplying by the projected number of affected trips in 2001. For example, the multiplication of private/rental mean trip expenditures adjusted to its 2001 equivalent (\$54.67) and the projected number of affected trips (378,346) results in total expenditures of \$20,684,176 (Table 26). As such, if the regulations proposed under this non-preferred alternative result in a decrease in the number of private/rental boat fishing trips, businesses that supply trip-related goods and services to this mode could lose up to \$20,684,176 in 2001 compared to 2000. Using the same type of analysis, it was estimated that the decrease in total expenditures associated with party/charter boat trips and shore trips in 2001 compared to 2000 are \$3,331,233 and \$2,583,328, respectively. As such, the total reduction in trip expenditures (all modes combined) is estimated at \$26,598,737. However, this value assumes implementation of the federal management measures by all the states.

Reductions in expenditures of this magnitude are not likely to occur given that anglers will continue to have the ability to engage in catch and release fishing for summer flounder and because of alternative target species available to anglers. Unfortunately, very little information is available to empirically estimate how sensitive the affected anglers might be to the proposed regulations. The fact that the proposed regulations affect the number and size of the fish that can be kept or landed and do not prohibit anglers from engaging in catch and release fishing, the overall losses are likely to be substantially lower. The results presented in Table 26 show the maximum potential losses associated with the regulations proposed under this non-preferred alternative. If the total number of recreational fishing trips is unaffected by the regulations (i.e., total expenditures remain constant) then no losses will occur to businesses that supply trip-related goods and services.

Overall Economic Impact

The potential losses generated in the expenditure analysis presented above describe only the direct effects of angler expenditures; the sales generated from initial purchases by anglers (e.g., party/charter access fees paid to owners of for-hire vessels). Indirect

and induced effects also occur because businesses providing goods and services to anglers must purchase goods and services, which in turn, generate more sales. These ripple effects (i.e., multiplier effects) continue until the amount remaining in a local economy is negligible. Although indirect and induced effects could be estimated by constructing an input-output model of the Northeast region coastal states, a model of this kind was not available.

Nevertheless, an approximation to indirect and induced effects can be made by assuming a multiplier effect of 1.5 - 2.0. It is likely that the multiplier for this sector of the fishery falls within those values. As such, the overall economic impact of the proposed management measures for the summer flounder fishery could be from \$39,898,103 ($\$26,598,735 \times 1.5$) to \$53,197,470 ($\$26,598,735 \times 2.0$).

The proposed management measures for the summer flounder are for the EEZ. The states through the Atlantic States Marine Fisheries Commission will implement alternative measures for summer flounder. More specifically, the Atlantic States Marine Fisheries Commission adopted reduction strategies smaller than those adopted by the Council for summer flounder for 2001. States also, will implement conservation equivalency measures for summer flounder that would allow specific states to implement management measures tailored to maintain fishing practices that maximize angler participation in those states. Since those management measures have not yet been established they are not incorporated into this analysis.

On average, for the 1995-1999 period, the percentage (number of fish) of summer flounder harvested in EEZ waters was 7.3%. Assuming that states will implement management measures in state waters that would allow angler to continue to fish for these species according to traditional fishing practices, then the values associated with the percentage contribution of these species in EEZ waters to the total harvest can be employed to extrapolate the impacts of the proposed management measures. As such, the overall impact of the proposed management measures for the summer flounder fishery could be from \$2,912,562 ($\$39,898,103 \times 7.3\%$) to \$3,883,415 ($\$53,197,470 \times 7.3\%$).

The potential economic losses described above (expenditures and overall economic impact sections) assume the worse potential impact case scenario. However, losses of this magnitude are not likely to occur given that anglers will continue to have the ability to engage in catch and release fishing for summer flounder and because of the numerous alternative target species available to anglers. Unfortunately, very little information is available to empirically estimate how sensitive the affected party/charter boat anglers might be to the proposed regulations. The fact that the proposed regulations affect the number and size of the fish that can be kept or landed and do not prohibit anglers from engaging in catch and release fishing, the overall losses are likely to be somewhat lower.

Party/charter Vessels

Party and charter vessels that target summer flounder could be directly impacted by the proposed regulations. These measures are projected to affect approximately 2.72% of the total angler trips taken aboard party/charter boats in 2001, assuming catch rates and angler effort in 2001 are similar to 2000 (Table 26). In other words, 44,216 (2.72%) angler trips taken aboard party/charter boats in 2001 are projected to land at least one summer flounder that is less than 16 inches, land more than 3 summer flounder, or land at least one summer flounder during the proposed closed season. Total party/charter boat earnings associated with these trips can be determined by multiplying the number of potentially affected trips in 2001 (44,216) by the average fee paid by anglers (\$39.09 - 2001 equivalent) in the Northeast region (\$1,728,403). Analysis of Northeast logbook data indicated that 318 party/charter vessels participated in the summer flounder fishery in 1999. Assuming that the same number of vessels will participate in 2001, the potential impact per boat could be up to \$5,435 (1,728,403/318). As such, if the regulations proposed under this non-preferred alternative result in a decrease in the number of recreational fishing trips, on average, each party/charter vessel could lose up to \$5,435 or 2.72% of their revenue in 2001 compared to 2000.

However, losses of this magnitude are not likely to occur given that the proposed management measures for the summer flounder are for the EEZ. The states through the Atlantic States Marine Fisheries Commission will implement alternative measures for summer flounder. More specifically, the Atlantic States Marine Fisheries Commission adopted reduction strategies smaller than those adopted by the Council for summer flounder for 2001. States also, will implement conservation equivalency measures for summer flounder that would allow specific states to implement management measures tailored to maintain fishing practices that maximize angler participation in those states. Since those management measures have not yet been established they are not incorporated into this analysis. Given these factors, the demand for recreational party/charter trips should not be significantly affected. Thus the monetary impact per boat should be considerably lower than that estimated above.

In addition to this, anglers will continue to have the ability to engage in catch and release fishing for summer flounder and because of the numerous alternative target species available to anglers. Unfortunately, very little information is available to empirically estimate how sensitive the affected party/charter boat anglers might be to the proposed regulations. The fact that the proposed regulations affect the number and size of the fish that can be kept or landed and do not prohibit anglers from engaging in catch and release fishing, the overall losses are likely to be lower.

On average, for the 1995-1999 period, the percentage (number of fish) of summer flounder harvested in EEZ waters was 7.3%. Assuming that states will implement management measures in state waters that would allow angler to continue to fish for these species according to traditional fishing practices, then the values associated with

the percentage contribution of these species in EEZ waters to the total harvest can be employed to extrapolate the impacts of the proposed management measures. Therefore, party/charter revenue losses per boat could range anywhere from no revenue losses up to \$397 (\$5,435 x 7.3%), on average, of total expected boat revenue in 2001.

In previous years states were allowed to chose between the coastwide management measures or conservation equivalency measures. In some instances, some states (e.g., Massachusetts) chose the least restrictive set of management measures regardless of the reduction associated with such selection. However, under the Atlantic States Marine Fisheries Commission reduction strategies and conservation equivalency measures, states would be required to implement specific management measures that achieve the desire reduction in their recreational landings or conservation goals. As such, it is entirely possible that party/charter boats operating in states that had previously chosen the least restrictive management measures last year (thus maximizing landings in 2000) may be more severely affected in 2001 relative to 2000 than party/charter boats operating in states that had chosen more restrictive management measures in 2000. Finally, it is also expected that party/charter vessels that target a larger selection of species would be able to handle these regulations better than vessels that exclusively fish for summer flounder.

While keeping fish is moderately important to anglers in the Mid-Atlantic, over 42% of anglers in New England in 1994, indicated catching fish to eat was not an important reason for marine fishing (Steinback and O'Neil 1998). Although these anglers are not likely to be the ones constrained by the regulations, findings of this study generally concur with previous studies that found non-catch reasons for participating in marine recreational fishing were rated much higher than keeping fish for food. In combination with alternative target species available to anglers, the findings of the Steinback and O'Neil (1998) study suggest that at least some of the potentially affected anglers would not reduce their effort when faced with the landings restrictions proposed under the preferred alternative.

5.1.3 Summer Flounder Non-Preferred Alternative 2

The second non-preferred summer flounder alternative maintains the status quo at an 8 fish possession limit, a 15.5 inch minimum size, and an open season from May 10 to October 2 (or a closed season from January 1 to May 9 and October 3 to December 31). The implementation of this non-preferred alternative could potentially reduce recreational landings by approximately 26% from the projected 2000 recreational landings if implemented by all the states (See EA, Sec. 6.3.3).

This alternative would maintain the same management measures that were in place in 2000. Thus, assuming angler effort in 2001 is similar to 2000 and catch rates remain constant there will be no additional recreational fishing trips affected in 2001 as compared to 2000. Therefore, angler expenditures should be unaffected.

5.2 Scup Fishery Impacts

5.2.1 Scup Preferred Alternative

The preferred alternative would implement a 9" TL minimum fish size, a 50 fish possession limit, and an open season from August 15 to October 31 (or a closed season from January 1 to August 14 and November 1 to December 31) for 2001. These management measures could reduce landings by approximately 60% if implemented by all the states (See EA, Sec. 6.4.2). Based on projected 2000 landings and the proposed recreational harvest limit for 2001, landings would have to be reduced 66% to achieve the harvest limit in 2001 assuming no change in angler effort or stock abundance. As such, the reduction in landings associated with the proposed management measures (60%) under this preferred alternative are slightly below the required reduction in landings. Current scup recreational measures are a 7" TL minimum size, a 50 fish possession limit, and no season. As such, the difference between the proposed coastwide scup recreational measures for 2001 and the status quo is a decrease in the size limit and a shorter fishing season.

Scup recreational landings have declined over 89% for the period 1991 to 1998 (Table 28). The number of fishing trips has also declined over 86% for this same time period. This decrease in the recreational fishery has occurred both with and without any recreational measures being in place, and it is perhaps a result from the stock's being over-exploited and at a low biomass level. In addition, party/charter boats may be targeting other species that are relatively more abundant than scup (e.g., striped bass), thus accounting for the decrease in the number of fishing trips in this fishery.

Recreational harvest limits in the scup fishery were first implemented in 1997 (Table 28). Recreational landings in 1997 and 1998 were below the recreational harvest limit for those years. However, in 1998 and 1999 recreational landings were above the recreational harvest limit for those years. Recreational landings are projected to be 5.14 million lb (2.33 million kg) in 2000 or about 415% over the allowable recreational harvest limit of 1.24 million lb (0.56 million kg).

The proposed recreational harvest limit for 2001 is 1.76 million lb (0.80 million kg). This recreational harvest limit is approximately 42% above the recreational harvest limit implemented in 2000 and about 66% below the projected recreational landings for that year (Table 28). Since there is no mechanism to deduct overages directly from the recreational harvest limit, any overages to the recreational harvest limit must be addressed by the way of adjustments to the management measures (fish size, bag limit and/or season). The proposed recreational management measures are necessary to prevent anglers from exceeding the recreational harvest limit in 2001.

Table 18 details the proportion of scup harvested in state and federal waters. On average (1995-1999), approximately 86.6% of the harvested scup (number) came from

state waters. States may opt to implement reduction strategies different from those being implemented by the Council. Approximately 13.4% of the harvested scup (number) will be affected by the proposed federal measures. These state management measures have not yet been established and thus not incorporated into this analysis. As such, about 87% of the harvested scup (number) will be affected by the state management measures.

The contribution of scup to the total catch (by number) made by party/charter vessels varied by month for the period 1996-1999 (Table 12). The contribution of scup to the total catch of party/charter vessels fluctuated throughout the year, ranging from less than 6% from January through August and December to 25% in October, with the largest proportion (about 14%) of scup caught from September through November. The preferred alternative would allow for an open season from August 15 to November 1 (or a closed season from January 1 to August 14 and November 2 to December 31). VTR data indicates that the contribution of summer flounder to the total catch of party/charter vessels was small (<5%) during the proposed closed period of time for most states with the exception of Massachusetts during the months of May, June, and July, New Jersey and New York during the month of November, and Rhode Island during the months of July and November (Table 12). It is possible that a scup seasonal closure during those months could affect recreational satisfaction to such an extent that the demand for recreational party/charter trips could decrease for that time period. However, taking into consideration that approximately 87% of the harvested scup (number) came from state waters and that states through the Atlantic States Marine Fisheries Commission may implement alternative reduction strategies, the demand for recreational party/charter trips should not be significantly affected.

Effort

Projected data from the Marine Recreational Fisheries Statistics Survey (MRFSS) indicate that 31,976,555 trips were taken by anglers in 2000 in the Northeast Region. Anglers fishing from a private or rental boat were estimated to have fished more trips than shore and party/charter anglers combined (17,197,541 trips). Shore anglers were projected to have fished 13,153,417 trips and party/charter boat anglers about 1,625,597 trips. To date, the first five waves of MRFSS effort data are available for 2000. Wave six effort estimates were calculated by multiplying 1999 estimates by the average change in effort across waves one through five from 1999 to 2000.

Staff at the Northeast Fisheries Science Center estimated the proportion of trips taken in 2000 that would have been affected by the implementation of the scup measures proposed under the preferred alternative for the 2001 fishing year. It was estimated that 0.36% of the trips aboard private or rental boats in 2000 would have been affected by the 2001 measures, 0.14% of the shore trips, and 1.44% of the trips aboard party/charter boats. In other words, 61,911 (0.36%) angler trips taken aboard private and rental boats in 2000 landed at least one scup that was less than 9 inches, or

landed more than 50 scup, or landed at least one scup during the proposed closed season. Assuming angler effort in 2001 is similar to 2000 and catch rates remain about the same, the proposed size limit and closed season (the possession limit remains the same) are projected to affect approximately 0.36% (61,911 trips) of the total private/rental boat effort in 2001. Table 29 shows the projected impact of the 2001 regulations on private/rental, shore, and party/charter effort in the Northeast region.

However, given that only about 13.4% of the harvested scup (number) comes from EEZ waters, and that states may implement reduction strategies lower than those proposed by the Council, the number of trips affected by the proposed management measures should be considerably lower than the value indicated above. In addition, decrease in effort of this magnitude is not likely to occur given that anglers will continue to have the ability to engage in catch and release fishing for scup and because of the numerous alternative target species available to anglers.

Expenditures

During 1998, social and economic data from marine recreational fishermen in the Northeast Region were gathered through an economic add-on to NMFS' Marine Recreational Statistics Survey (MRFSS). As part of this survey, anglers were asked to delineate trip expenditures and purchases of durable equipment used primarily for saltwater recreational fishing. Although results of the survey are preliminary and have yet to be promulgated in a formal report, the estimated mean trip-related expenditures were used to project the potential losses associated with the proposed 2001 regulations.

Survey results indicate that the average trip expenditure in 1998 was \$49.78 for anglers fishing from a private/rental boat, \$35.06 for shore anglers, and \$68.60 for anglers that fished from a party/charter boat (Table 27). Trip expenditures included the following consumable items: (1) travel; (2) food, drink, and refreshments; (3) lodging at motels, cabins, lodges, or campgrounds; (4) public transportation or car rental; (5) boat fuel; (6) guide or package fees; (7) access and/or boat launching fees; (8) equipment rental such as boat, fishing or camping equipment; (9) bait; and (10) ice. Expenditures on durable items such as rods, reels, tackle, special fishing clothing, etc., had not been fully analyzed at the time of this report was prepared and are not included in the subsequent analysis. Although expenditures on durable items may also be affected by the proposed regulations, the extent of the impact would be difficult to quantify since these items can be used for many trips.

Potential reductions in expenditures associated with the proposed 2001 regulations can be estimated by adjusting the 1998 average trip expenditures to their 2001 equivalent and multiplying by the projected number of affected trips in 2001. Adjusted average trip expenditures in 2001 dollars are \$75.34 for party/charter boat trips, \$54.67 for private/rental boat trips, and \$38.51 for shore trips. For example, the multiplication of

private/rental mean trip expenditures adjusted to its 2001 equivalent (\$54.67) and the projected number of affected trips (61,911) results in total expenditures of \$3,384,674 (Table 29). As such, if the regulations proposed under the preferred alternative result in a decrease in the number of private/rental boat fishing trips, businesses that supply trip-related goods and services to this mode could lose up to \$3,384,674 in 2001 compared to 2000. Using the same type of analysis, it was estimated that the decrease in total expenditures associated with party/charter boat trips and shore trips in 2001 compared to 2000 are \$1,763,634 and \$709,162, respectively. As such, the total reduction in trip expenditures (all modes combined) is estimated at \$5,857,470. However, this value assumes implementation of the federal management measures by all the states.

Reductions in expenditures of this magnitude are not likely to occur given that anglers will continue to have the ability to engage in catch and release fishing for scup and because of alternative target species available to anglers. Unfortunately, very little information is available to empirically estimate how sensitive the affected anglers might be to the proposed regulations. The fact that the proposed regulations affect the number and size of the fish that can be kept or landed and do not prohibit anglers from engaging in catch and release fishing, the overall losses are likely to be substantially lower. The results presented in Table 29 show the maximum potential losses associated with the regulations proposed under the preferred alternative. If the total number of recreational fishing trips is unaffected by the regulations (i.e., total expenditures remain constant) then no losses will occur to businesses that supply trip-related goods and services.

Overall Economic Impact

The potential losses generated in the expenditure analysis presented above describe only the direct effects of angler expenditures; the sales generated from initial purchases by anglers (e.g., party/charter access fees paid to owners of for-hire vessels). Indirect and induced effects also occur because businesses providing goods and services to anglers must purchase goods and services, which in turn, generate more sales. These ripple effects (i.e., multiplier effects) continue until the amount remaining in a local economy is negligible. Although indirect and induced effects could be estimated by constructing an input-output model of the Northeast region coastal states, a model of this kind was not available.

Nevertheless, an approximation to indirect and induced effects can be made by assuming a multiplier effect of 1.5 - 2.0. It is likely that the multiplier for this sector of the fishery falls within those values. As such, the overall economic impact of the proposed management measures for the scup fishery could be from \$8,786,205 ($\$5,857,470 \times 1.5$) to \$11,714,940 ($\$5,857,470 \times 2.0$).

The proposed management measures for scup are for the EEZ. The states through the Atlantic States Marine Fisheries Commission will implement alternative measures for

scup. More specifically, the Atlantic States Marine Fisheries Commission may adopt reduction strategies smaller than those adopted by the Council for scup for 2001. Since those management measures have not yet been established they are not incorporated into this analysis.

On average, for the 1995-1999 period, the percentage (number of fish) of scup harvested in EEZ waters was 13.4%. Assuming that states will implement management measures in state waters that would allow angler to continue to fish for scup according to traditional fishing practices, then the values associated with the percentage contribution of scup in EEZ waters to the total harvest can be employed to extrapolate the impacts of the proposed management measures. As such, the overall impact of the proposed management measures for the scup fishery could be from \$1,177,351 ($\$8,786,205 \times 13.4\%$) to \$1,569,802 ($\$11,714,940 \times 13.4\%$).

The potential economic losses described above (expenditures and overall economic impact sections) assume the worse potential impact case scenario. However, losses of this magnitude are not likely to occur given that anglers will continue to have the ability to engage in catch and release fishing for scup and because of the numerous alternative target species available to anglers. Unfortunately, very little information is available to empirically estimate how sensitive the affected party/charter boat anglers might be to the proposed regulations. The fact that the proposed regulations affect the number and size of the fish that can be kept or landed and do not prohibit anglers from engaging in catch and release fishing, the overall losses are likely to be somewhat lower.

Party/charter Vessels

Party and charter vessels that target scup could be directly impacted by the proposed regulations. These measures are projected to affect approximately 1.44% of the total angler trips taken aboard party/charter boats in 2001, assuming catch rates and angler effort in 2001 are similar to 2000 (Table 29). In other words, 23,409 (1.44%) angler trips taken aboard party/charter boats in 2001 are projected to land at least one scup that is less than 9 inches, land more than 50 scup, or land at least one scup during the proposed closed season. Total party/charter boat earnings associated with these trips can be determined by multiplying the number of potentially affected trips in 2001 (23,409) by the average fee paid by anglers (\$39.09 - 2001 equivalent) in the Northeast region (\$915,058). Analysis of Northeast logbook data indicated that 126 party/charter vessels participated in the scup fishery in 1999. Assuming that the same number of vessels will participate in 2001, the potential impact per boat could be up to \$7,262 ($\$915,058/126$). As such, if the regulations proposed under this non-preferred alternative result in a decrease in the number of recreational fishing trips, on average, each party/charter vessel could lose up to \$7,262 or 1.44% of their revenue in 2001 compared to 2000.

However, losses of this magnitude are not likely to occur given that the proposed management measures for the scup fishery are for the EEZ. The states through the Atlantic States Marine Fisheries Commission may implement alternative measures for scup. More specifically, the Atlantic States Marine Fisheries Commission may adopt reduction strategies smaller than those adopted by the Council for scup 2001. Since those management measures have not yet been established they are not incorporated into this analysis. Given these factors, the demand for recreational party/charter trips should not be significantly affected. Thus the monetary impact per boat should be considerably lower than that estimated above.

In addition to this, anglers will continue to have the ability to engage in catch and release fishing for scup and because of the numerous alternative target species available to anglers. Unfortunately, very little information is available to empirically estimate how sensitive the affected party/charter boat anglers might be to the proposed regulations. The fact that the proposed regulations affect the number and size of the fish that can be kept or landed and do not prohibit anglers from engaging in catch and release fishing, the overall losses are likely to be lower.

On average, for the 1995-1999 period, the percentage (number of fish) of scup harvested in EEZ waters was 13.4%. Assuming that states will implement management measures in state waters that would allow angler to continue to fish for scup according to traditional fishing practices, then the values associated with the percentage contribution of scup in EEZ waters to the total harvest can be employed to extrapolate the impacts of the proposed management measures. Therefore, party/charter revenue losses per boat could range anywhere from no revenue losses up to \$973 ($\$7,262 \times 13.4\%$), on average, of total expected boat revenue in 2001.

While keeping fish is moderately important to anglers in the Mid-Atlantic, over 42% of anglers in New England in 1994, indicated catching fish to eat was not an important reason for marine fishing (Steinback and O'Neil 1998). Although these anglers are not likely to be the ones constrained by the regulations, findings of this study generally concur with previous studies that found non-catch reasons for participating in marine recreational fishing were rated much higher than keeping fish for food. In combination with alternative target species available to anglers, the findings of the Steinback and O'Neil (1998) study suggest that at least some of the potentially affected anglers would not reduce their effort when faced with the landings restrictions proposed under the preferred alternative.

5.2.2 Scup Non-Preferred Alternative 1

The first non-preferred alternative would implement a 9" TL minimum fish size, a 15 fish possession limit, and an open season from July 1 to September 29 (or a closed season from January 1 to June 30 and September 30 to December 31) for 2001. These management measures could reduce landings by approximately 69% if implemented by

all the states (See EA, Sec. 6.4.3). Based on projected 2000 landings and the proposed recreational harvest limit for 2001, landings would have to be reduced 66% to achieve the harvest limit in 2001 assuming no change in angler effort or stock abundance. As such, the reduction in landings associated with the proposed management measures (69%) under this non-preferred alternative are slightly above the required reduction in landings. Current scup recreational measures are a 7" TL minimum size, a 50 fish possession limit, and no season. As such, the difference between the proposed coastwide scup recreational measures for 2001 and the status quo is an increase in the size limit, and a decrease in the bag limit and fishing season.

The discussion regarding historical recreational harvest limits and landings, landings by area, the contribution of scup to the total catch (by number) made by party/charter vessels by month, recreational trip expenditures by mode, and overall assumptions used to conduct the analysis presented under the preferred scup alternative also applies to the analysis under this non-preferred alternative.

Effort

Under this non-preferred alternative, it was estimated that 0.36% of the trips aboard private or rental boats in 2000 would have been affected by the 2001 measures, 0.08% of the shore trips, and 1.40% of the trips aboard party/charter boats. In other words, 61,911 (0.36%) angler trips taken aboard private and rental boats in 2000 landed at least one scup that was less than 9 inches, or landed more than 15 scup, or landed at least one scup during the proposed closed season. Assuming angler effort in 2001 is similar to 2000 and catch rates remain about the same, the proposed 15 fish possession limit, the size limit increase, and the extended closed season are projected to affect approximately 0.36% (61,911 trips) of the total private/rental boat effort in 2001. Table 29 shows the projected impact of the 2001 regulations on private/rental, shore, and party/charter effort in the Northeast region.

However, given that only about 13.4% of the harvested scup (number) comes from EEZ waters, and that states implemented reduction strategies lower than those proposed by the Council and will also implement conservation equivalencies, the number of trips affected by the proposed management measures should be considerably lower than the value indicated above. In addition, decrease in effort of this magnitude is not likely to occur given that anglers will continue to have the ability to engage in catch and release fishing for scup and because of the numerous alternative target species available to anglers.

Expenditures

Potential reductions in expenditures associated with the proposed 2001 regulations can be estimated by adjusting the 1998 average trip expenditures to their 2001 equivalent and multiplying by the projected number of affected trips in 2001. For example, the

multiplication of private/rental mean trip expenditures adjusted to its 2001 equivalent (\$54.67) and the projected number of affected trips (61,911) results in total expenditures of \$3,384,674 (Table 29). As such, if the regulations proposed under this non-preferred alternative result in a decrease in the number of private/rental boat fishing trips, businesses that supply trip-related goods and services to this mode could lose up to \$3,384,674 in 2001 compared to 2000. Using the same type of analysis, it was estimated that the decrease in total expenditures associated with party/charter boat trips and shore trips in 2001 compared to 2000 are \$1,725,135 and \$405,241, respectively. As such, the total reduction in trip expenditures (all modes combined) is estimated at \$5,515,050. However, this value assumes implementation of the federal management measures by all the states.

Reductions in expenditures of this magnitude are not likely to occur given that anglers will continue to have the ability to engage in catch and release fishing for scup and because of alternative target species available to anglers. Unfortunately, very little information is available to empirically estimate how sensitive the affected anglers might be to the proposed regulations. The fact that the proposed regulations affect the number and size of the fish that can be kept or landed and do not prohibit anglers from engaging in catch and release fishing, the overall losses are likely to be substantially lower. The results presented in Table 29 show the maximum potential losses associated with the regulations proposed under this non-preferred alternative. If the total number of recreational fishing trips is unaffected by the regulations (i.e., total expenditures remain constant) then no losses will occur to businesses that supply trip-related goods and services.

Overall Economic Impact

The potential losses generated in the expenditure analysis presented above describe only the direct effects of angler expenditures; the sales generated from initial purchases by anglers (e.g., party/charter access fees paid to owners of for-hire vessels). Indirect and induced effects also occur because businesses providing goods and services to anglers must purchase goods and services, which in turn, generate more sales. These ripple effects (i.e., multiplier effects) continue until the amount remaining in a local economy is negligible. Although indirect and induced effects could be estimated by constructing an input-output model of the Northeast region coastal states, a model of this kind was not available.

Nevertheless, an approximation to indirect and induced effects can be made by assuming a multiplier effect of 1.5 - 2.0. It is likely that the multiplier for this sector of the fishery falls within those values. As such, the overall economic impact of the proposed management measures for the summer flounder fishery could be from \$8,272,575 ($\$5,515,050 \times 1.5$) to \$11,030,100 ($\$5,515,050 \times 2.0$).

The proposed management measures for scup are for the EEZ. The states through the

Atlantic States Marine Fisheries Commission will implement alternative measures for scup. More specifically, the Atlantic States Marine Fisheries Commission may adopt reduction strategies smaller than those adopted by the Council for scup for 2001. Since those management measures have not yet been established they are not incorporated into this analysis.

On average, for the 1995-1999 period, the percentage (number of fish) of scup harvested in EEZ waters was 13.4%. Assuming that states will implement management measures in state waters that would allow angler to continue to fish for these species according to traditional fishing practices, then the values associated with the percentage contribution of these species in EEZ waters to the total harvest can be employed to extrapolate the impacts of the proposed management measures. As such, the overall impact of the proposed management measures for the summer flounder fishery could be from \$1,108,525 ($\$8,272,575 \times 13.4\%$) to \$739,017 ($\$5,515,050 \times 13.4\%$).

The potential economic losses described above (expenditures and overall economic impact sections) assume the worse potential impact case scenario. However, losses of this magnitude are not likely to occur given that anglers will continue to have the ability to engage in catch and release fishing for scup and because of the numerous alternative target species available to anglers. Unfortunately, very little information is available to empirically estimate how sensitive the affected party/charter boat anglers might be to the proposed regulations. The fact that the proposed regulations affect the number and size of the fish that can be kept or landed and do not prohibit anglers from engaging in catch and release fishing, the overall losses are likely to be somewhat lower.

Party/charter Vessels

Party and charter vessels that target scup could be directly impacted by the proposed regulations. These measures are projected to affect approximately 1.40% of the total angler trips taken aboard party/charter boats in 2001, assuming catch rates and angler effort in 2001 are similar to 2000 (Table 29). In other words, 22,898 (1.40%) angler trips taken aboard party/charter boats in 2001 are projected to land at least one scup that is less than 9 inches, land more than 15 scup, or land at least one scup during the proposed closed season. Total party/charter boat earnings associated with these trips can be determined by multiplying the number of potentially affected trips in 2001 (22,898) by the average fee paid by anglers (\$39.09 - 2001 equivalent) in the Northeast region (\$895,083). Analysis of Northeast logbook data indicated that 126 party/charter vessels participated in the scup fishery in 1999. Assuming that the same number of vessels will participate in 2001, the potential impact per boat could be up to \$7,104 ($\$895,083/126$). As such, if the regulations proposed under this non-preferred alternative result in a decrease in the number of recreational fishing trips, on average, each party/charter vessel could lose up to \$7,104 or 1.40% of their revenue in 2001

compared to 2000.

However, losses of this magnitude are not likely to occur given that the proposed management measures for the scup fishery are for the EEZ. The states through the Atlantic States Marine Fisheries Commission may implement alternative measures for scup. More specifically, the Atlantic States Marine Fisheries Commission may adopt reduction strategies smaller than those adopted by the Council for scup for 2001. Since those management measures have not yet been established they are not incorporated into this analysis. Given these factors, the demand for recreational party/charter trips should not be significantly affected. Thus the monetary impact per boat should be considerably lower than that estimated above.

In addition to this, anglers will continue to have the ability to engage in catch and release fishing for scup and because of the numerous alternative target species available to anglers. Unfortunately, very little information is available to empirically estimate how sensitive the affected party/charter boat anglers might be to the proposed regulations. The fact that the proposed regulations affect the number and size of the fish that can be kept or landed and do not prohibit anglers from engaging in catch and release fishing, the overall losses are likely to be lower.

On average, for the 1995-1999 period, the percentage (number of fish) of scup harvested in EEZ waters was 13.4%. Assuming that states will implement management measures in state waters that would allow angler to continue to fish for these species according to traditional fishing practices, then the values associated with the percentage contribution of these species in EEZ waters to the total harvest can be employed to extrapolate the impacts of the proposed management measures. Therefore, party/charter revenue losses per boat could range anywhere from no revenue losses up to \$952 ($\$7,104 \times 13.4\%$), on average, of total expected boat revenue in 2001.

While keeping fish is moderately important to anglers in the Mid-Atlantic, over 42% of anglers in New England in 1994, indicated catching fish to eat was not an important reason for marine fishing (Steinback and O'Neil 1998). Although these anglers are not likely to be the ones constrained by the regulations, findings of this study generally concur with previous studies that found non-catch reasons for participating in marine recreational fishing were rated much higher than keeping fish for food. In combination with alternative target species available to anglers, the findings of the Steinback and O'Neil (1998) study suggest that at least some of the potentially affected anglers would not reduce their effort when faced with the landings restrictions proposed under the preferred alternative.

5.2.3 Scup Non-Preferred Alternative 2

The second non-preferred scup alternative maintains the status quo at a 50 fish possession limit, a 7 inch minimum size, and no season. The implementation of this

non-preferred alternative could potentially reduce recreational landings by approximately 5% from the projected 2000 recreational landings if implemented by all the states (See EA, Sec. 6.4.3).

This alternative would maintain the same management measures that were in place in 2000. Thus, assuming angler effort in 2001 is similar to 2000 and catch rates remain constant there will be no additional recreational fishing trips affected in 2001 as compared to 2000. Therefore, angler expenditures should be unaffected.

5.3 Black Sea Bass Fishery Impacts

5.3.1 Black Sea Bass Preferred Alternative

The preferred alternative would implement an 11" TL minimum fish size, a 25 fish possession limit, and an open season from January 1 to February 28 and from May 10 to December 31 (or a closed season from March 1 to May 9) for 2001. These management measures could reduce landings by approximately 26% (See EA, Sec. 6.5.2). Based on projected 2000 landings and the proposed recreational harvest limit for 2001, landings would have to be reduced 27% to achieve the harvest limit in 2001 assuming no change in angler effort or stock abundance. As such, the reduction in landings associated with the proposed management measures (27%) under this preferred alternative are in line with the necessary reduction in landings. Current black sea bass recreational measures are a 10" TL minimum size and no possession or close season. As such, the difference between the proposed coastwide black sea bass recreational measures for 2001 and the status quo is a decrease in the possession limit, size limit, and fishing season.

Black sea bass recreational data indicate that in only one of the last three years (2000) recreational landings have been more than the recreational harvest limits (Table 30). In 1998 recreational landings of black sea bass were 1.15 million lb (0.52 million kg) or 2 million lb (0.91 million kg) below the allowable harvest limit. In 1999 recreational landings of black sea bass were 1.70 million lb (0.77 million kg) or 1.45 million lb (0.66 million kg) below the allowable harvest limit. However, for 2000, recreational landings are projected to be 1.82 million lb (0.83 million kg) above the allowable recreational harvest limit of 3.15 million lb (1.43 million kg).

The proposed recreational harvest limit for 2001 is 3.15 million lb (1.43 million kg). This recreational harvest limit the same as the recreational harvest limit implemented in 2000 and about 27% below the projected recreational landings for that year (Table 30). Since there is no mechanism to deduct overages directly from the recreational harvest limit, any overages to the recreational harvest limit must be addressed by the way of adjustments to the management measures (fish size, bag limit and/or season). The proposed recreational management measures are necessary to prevent anglers from exceeding the recreational harvest limit in 2001.

The contribution of black sea bass to the total catch (by number) made by party/charter vessels varied by month for the period 1996-1999 (Table 13). The contribution of black sea bass to the total catch of party/charter vessels fluctuated throughout the year, ranging from about 1% in April to 50% in November, with the largest proportion (about 20%) of black sea bass caught from May through June and from September through November. The preferred alternative would allow for an open season from January 1 to February 28 and from May 10 to December 31 (or a closed season from March 1 to May 9). VTR data indicates that the contribution of black sea bass to the total catch of party/charter vessels was small (<5%) during the proposed closed period of time for most states with the exception of New Jersey in March and Maryland, North Carolina, and Virginia during the month of April (Table 13). It is possible that a black sea bass seasonal closure during those months could affect recreational satisfaction to such an extent that the demand for recreational party/charter trips could decrease for that time period.

Effort

Projected data from the Marine Recreational Fisheries Statistics Survey (MRFSS) indicate that 31,976,555 trips were taken by anglers in 2000 in the Northeast Region. Anglers fishing from a private or rental boat were estimated to have fished more trips than shore and party/charter anglers combined (17,197,541 trips). Shore anglers were projected to have fished 13,153,417 trips and party/charter boat anglers about 1,625,597 trips. To date, the first five waves of MRFSS effort data are available for 2000. Wave six effort estimates were calculated by multiplying 1999 estimates by the average change in effort across waves one through five from 1999 to 2000.

Staff at the Northeast Fisheries Science Center estimated the proportion of trips taken in 2000 that would have been affected by the implementation of the black sea bass measures proposed under the preferred alternative for the 2001 fishing year. It was estimated that 0.01% of the trips aboard private or rental boats in 2000 would have been affected by the 2001 measures, virtually no shore trips (0.0001%), and 0.09% of the trips aboard party/charter boats. In other words, 1,720 (0.10%) angler trips taken aboard private and rental boats in 2000 landed at least one black sea bass that was less than 11 inches, or landed more than 25 black sea bass, or landed at least one black sea bass during the proposed closed season. Assuming angler effort in 2001 is similar to 2000 and catch rates remain about the same, the 25 fish possession limit, and decreased size limit and fishing season are projected to affect approximately 0.10% (1,720 trips) of the total private/rental boat effort in 2001. Table 31 shows the projected impact of the 2001 regulations on private/rental, shore, and party/charter effort in the Northeast region.

However, decrease in effort of this magnitude is not likely to occur given that anglers will continue to have the ability to engage in catch and release fishing for black sea bass and because of the numerous alternative target species available to anglers.

Expenditures

During 1998, social and economic data from marine recreational fishermen in the Northeast Region were gathered through an economic add-on to NMFS' Marine Recreational Statistics Survey (MRFSS). As part of this survey, anglers were asked to delineate trip expenditures and purchases of durable equipment used primarily for saltwater recreational fishing. Although results of the survey are preliminary and have yet to be promulgated in a formal report, the estimated mean trip-related expenditures were used to project the potential losses associated with the proposed 2001 regulations.

Survey results indicate that the average trip expenditure in 1998 was \$49.78 for anglers fishing from a private/rental boat, \$35.06 for shore anglers, and \$68.60 for anglers that fished from a party charter boat (Table 27). Trip expenditures included the following consumable items: (1) travel; (2) food, drink, and refreshments; (3) lodging at motels, cabins, lodges, or campgrounds; (4) public transportation or car rental; (5) boat fuel; (6) guide or package fees; (7) access and/or boat launching fees; (8) equipment rental such as boat, fishing or camping equipment; (9) bait; and (10) ice. Expenditures on durable items such as rods, reels, tackle, special fishing clothing, etc., had not been fully analyzed at the time of this report was prepared and are not included in the subsequent analysis. Although expenditures on durable items may also be affected by the proposed regulations, the extent of the impact would be difficult to quantify since these items can be used for many trips.

Potential reductions in expenditures associated with the proposed 2001 regulations can be estimated by adjusting the 1998 average trip expenditures to their 2001 equivalent and multiplying by the projected number of affected trips in 2001. Adjusted average trip expenditures in 2001 dollars are \$75.34 for party charter boat trips, \$54.67 for private/rental boat trips, and \$38.51 for shore trips. For example, the multiplication of private/rental mean trip expenditures adjusted to its 2001 equivalent (\$54.67) and the projected number of affected trips (1,720) results in total expenditures of \$94,032 (Table 31). As such, if the regulations proposed under the preferred alternative result in a decrease in the number of private/rental boat fishing trips, businesses that supply trip-related goods and services to this mode could lose up to \$94,032 in 2001 compared to 2000. Using the same type of analysis, it was estimated that the decrease in total expenditures associated with party charter boat trips and shore trips in 2001 compared to 2000 are \$110,222 and \$501, respectively. As such, the total reduction in trip expenditures (all modes combined) is estimated at \$204,755.

However, reductions in expenditures of this magnitude are not likely to occur given that anglers will continue to have the ability to engage in catch and release fishing for black sea bass and because of alternative target species available to anglers. Unfortunately, very little information is available to empirically estimate how sensitive the affected anglers might be to the proposed regulations. The fact that the proposed regulations

affect the number and size of the fish that can be kept or landed and do not prohibit anglers from engaging in catch and release fishing, the overall losses are likely to be substantially lower. The results presented in Table 31 show the maximum potential losses associated with the regulations proposed under the preferred alternative. If the total number of recreational fishing trips is unaffected by the regulations (i.e., total expenditures remain constant) then no losses will occur to businesses that supply trip-related goods and services.

Overall Economic Impact

The potential losses generated in the expenditure analysis presented above describe only the direct effects of angler expenditures; the sales generated from initial purchases by anglers (e.g., party/charter access fees paid to owners of for-hire vessels). Indirect and induced effects also occur because businesses providing goods and services to anglers must purchase goods and services, which in turn, generate more sales. These ripple effects (i.e., multiplier effects) continue until the amount remaining in a local economy is negligible. Although indirect and induced effects could be estimated by constructing an input-output model of the Northeast region coastal states, a model of this kind was not available.

Nevertheless, an approximation to indirect and induced effects can be made by assuming a multiplier effect of 1.5 - 2.0. It is likely that the multiplier for this sector of the fishery falls within those values. As such, the overall economic impact of the proposed management measures for the black sea bass fishery could be from \$307,133 ($\$204,755 \times 1.5$) to \$409,510 ($\$204,755 \times 2.0$).

The potential economic losses described above (expenditures and overall economic impact sections) assume the worse potential impact case scenario. However, losses of this magnitude are not likely to occur given that anglers will continue to have the ability to engage in catch and release fishing for black sea bass and because of the numerous alternative target species available to anglers. Unfortunately, very little information is available to empirically estimate how sensitive the affected party/charter boat anglers might be to the proposed regulations. The fact that the proposed regulations affect the number and size of the fish that can be kept or landed and do not prohibit anglers from engaging in catch and release fishing, the overall losses are likely to be somewhat lower.

Party/charter Vessels

Party and charter vessels that target black sea bass could be directly impacted by the proposed regulations. These measures are projected to affect approximately 0.09% of the total angler trips taken aboard party/charter boats in 2001, assuming catch rates and angler effort in 2001 are similar to 2000 (Table 31). In other words, 1,463 (0.09%) angler trips taken aboard party/charter boats in 2001 are projected to land at least one

black sea bass that is less than 11 inches, land more than 25 black sea bass, or land at least one black sea bass during the proposed closed season. Total party/charter boat earnings associated with these trips can be determined by multiplying the number of potentially affected trips in 2001 (1,463) by the average fee paid by anglers (\$39.09 - 2001 equivalent) in the Northeast region (\$57,189). Analysis of Northeast logbook data indicated that 261 party/charter vessels participated in the black sea bass fishery in 1999. Assuming that the same number of vessels will participate in 2001, the potential impact per boat could be up to \$219 (\$57,189/261). As such, if the regulations proposed under the preferred alternative result in a decrease in the number of recreational fishing trips, on average, each party/charter vessel could lose up to \$219 or 0.09% of their revenue in 2001 compared to 2000.

However, losses of this magnitude are not likely to occur given that anglers will continue to have the ability to engage in catch and release fishing for black sea bass and because of the numerous alternative target species available to anglers. Unfortunately, very little information is available to empirically estimate how sensitive the affected party/charter boat anglers might be to the proposed regulations. The fact that the proposed regulations affect the number and size of the fish that can be kept or landed and do not prohibit anglers from engaging in catch and release fishing, the overall losses are likely to be lower.

While keeping fish is moderately important to anglers in the Mid-Atlantic, over 42% of anglers in New England in 1994, indicated catching fish to eat was not an important reason for marine fishing (Steinback and O'Neil 1998). Although these anglers are not likely to be the ones constrained by the regulations, findings of this study generally concur with previous studies that found non-catch reasons for participating in marine recreational fishing were rated much higher than keeping fish for food. In combination with alternative target species available to anglers, the findings of the Steinback and O'Neil (1998) study suggest that at least some of the potentially affected anglers would not reduce their effort when faced with the landings restrictions proposed under the preferred alternative.

5.3.2 Black Sea Bass Non-Preferred Alternative 1

The first non-preferred alternative would implement a 10" TL minimum fish size, a 15 fish possession limit, and an open season from June 1 to November 24 (or a closed season from January 1 to May 31 and November 25 to December 31) for 2001. These management measures could reduce landings by approximately 37% (See EA, Sec. 6.5.3). Based on projected 2000 landings and the proposed recreational harvest limit for 2001, landings would have to be reduced 27% to achieve the harvest limit in 2001 assuming no change in angler effort or stock abundance. As such, the reduction in landings associated with the proposed management measures (37%) under this non-preferred alternative is 10% higher than the required reduction in landings. Current black sea bass recreational measures are a 10" TL minimum size, no possession limit,

and no closed season. As such, the difference between the proposed coastwide black sea bass recreational measures for 2001 and the status quo is a decrease in the possession limit and fishing season.

The discussion regarding historical recreational harvest limits and landings, the contribution of black sea bass to the total catch (by number) made by party/charter vessels by month, recreational trip expenditures by mode, and overall assumptions used to conduct the analysis presented under the preferred black sea bass alternative also applies to the analysis under this non-preferred alternative.

Effort

Under this non-preferred alternative, it was estimated that 0.01% of the trips aboard private or rental boats in 2000 would have been affected by the 2001 measures, virtually no shore trips (0.0003%), and 0.83% of the trips aboard party/charter boats. In other words, 1,720 (0.01%) angler trips taken aboard private and rental boats in 2000 landed at least one black sea bass that was less than 10 inches, or landed more than 15 black sea bass, or landed at least one black sea bass during the proposed closed season. Assuming angler effort in 2001 is similar to 2000 and catch rates remain about the same, the proposed 15 fish possession limit and the closed season (the size limit remains the same) are projected to affect approximately 0.01% (1,720 trips) of the total private/rental boat effort in 2001. Table 31 shows the projected impact of the 2001 regulations on private/rental, shore, and party/charter effort in the Northeast region.

However, decrease in effort of this magnitude is not likely to occur given that anglers will continue to have the ability to engage in catch and release fishing for black sea bass and because of the numerous alternative target species available to anglers.

Expenditures

Potential reductions in expenditures associated with the proposed 2001 regulations can be estimated by adjusting the 1998 average trip expenditures to their 2001 equivalent and multiplying by the projected number of affected trips in 2001. For example, the multiplication of private/rental mean trip expenditures adjusted to its 2001 equivalent (\$54.67) and the projected number of affected trips (1,720) results in total expenditures of \$94,032 (Table 31). As such, if the regulations proposed under this non-preferred alternative result in a decrease in the number of private/rental boat fishing trips, businesses that supply trip-related goods and services to this mode could lose up to \$94,032 in 2001 compared to 2000. Using the same type of analysis, it was estimated that the decrease in total expenditures associated with party/charter boat trips and shore trips in 2001 compared to 2000 are \$1,016,487 and \$1,502, respectively. As such, the total reduction in trip expenditures (all modes combined) is estimated at \$1,112,021.

However, reductions in expenditures of this magnitude are not likely to occur given that anglers will continue to have the ability to engage in catch and release fishing for black sea bass, and because of alternative target species available to anglers. Unfortunately, very little information is available to empirically estimate how sensitive the affected anglers might be to the proposed regulations. The fact that the proposed regulations affect the number and size of the fish that can be kept or landed and do not prohibit anglers from engaging in catch and release fishing, the overall losses are likely to be substantially lower. The results presented in Table 31 show the maximum potential losses associated with the regulations proposed under this non-preferred alternative. If the total number of recreational fishing trips is unaffected by the regulations (i.e., total expenditures remain constant) then no losses will occur to businesses that supply trip-related goods and services.

Overall Economic Impact

The potential losses generated in the expenditure analysis presented above describe only the direct effects of angler expenditures; the sales generated from initial purchases by anglers (e.g., party/charter access fees paid to owners of for-hire vessels). Indirect and induced effects also occur because businesses providing goods and services to anglers must purchase goods and services, which in turn, generate more sales. These ripple effects (i.e., multiplier effects) continue until the amount remaining in a local economy is negligible. Although indirect and induced effects could be estimated by constructing an input-output model of the Northeast region coastal states, a model of this kind was not available.

Nevertheless, an approximation to indirect and induced effects can be made by assuming a multiplier effect of 1.5 - 2.0. It is likely that the multiplier for this sector of the fishery falls within those values. As such, the overall economic impact of the proposed management measures for the black sea bass fishery could be from \$1,668,032 ($\$1,112,021 \times 1.5$) to \$2,224,042 ($\$1,112,021 \times 2.0$).

The potential economic losses described above assume the worse potential impact case scenario. However, losses of this magnitude are not likely to occur given that anglers will continue to have the ability to engage in catch and release fishing for black sea bass and because of the numerous alternative target species available to anglers. Unfortunately, very little information is available to empirically estimate how sensitive the affected party/charter boat anglers might be to the proposed regulations. The fact that the proposed regulations affect the number and size of the fish that can be kept or landed and do not prohibit anglers from engaging in catch and release fishing, the overall losses are likely to be somewhat lower.

Party/charter Vessels

Party and charter vessels that target black sea bass could be directly impacted by the

proposed regulations. These measures are projected to affect approximately 0.83% of the total angler trips taken aboard party/charter boats in 2001, assuming catch rates and angler effort in 2001 are similar to 2000 (Table 31). In other words, 13,492 (0.83%) angler trips taken aboard party/charter boats in 2001 are projected to land at least one black sea bass that is less than 10 inches, land more than 15 black sea bass, or land at least one black sea bass during the proposed closed season. Total party/charter boat earnings associated with these trips can be determined by multiplying the number of potentially affected trips in 2001 (13,492) by the average fee paid by anglers (\$39.09 - 2001 equivalent) in the Northeast region (\$527,402). Analysis of Northeast logbook data indicated that 261 party/charter vessels participated in the black sea bass fishery in 1999. Assuming that the same number of vessels will participate in 2001, the potential impact per boat could be up to \$2,021 (\$527,402/261). As such, if the regulations proposed under this non-preferred alternative result in a decrease in the number of recreational fishing trips, on average, each party/charter vessel could lose up to \$2,021 or 0.83% of their revenue in 2001 compared to 2000.

However, losses of this magnitude are not likely to occur given that anglers will continue to have the ability to engage in catch and release fishing for black sea bass and because of the numerous alternative target species available to anglers. Unfortunately, very little information is available to empirically estimate how sensitive the affected party/charter boat anglers might be to the proposed regulations. The fact that the proposed regulations affect the number and size of the fish that can be kept or landed and do not prohibit anglers from engaging in catch and release fishing, the overall losses are likely to be lower.

While keeping fish is moderately important to anglers in the Mid-Atlantic, over 42% of anglers in New England in 1994, indicated catching fish to eat was not an important reason for marine fishing (Steinback and O'Neil 1998). Although these anglers are not likely to be the ones constrained by the regulations, findings of this study generally concur with previous studies that found non-catch reasons for participating in marine recreational fishing were rated much higher than keeping fish for food. In combination with alternative target species available to anglers, the findings of the Steinback and O'Neil (1998) study suggest that at least some of the potentially affected anglers would not reduce their effort when faced with the landings restrictions proposed under the preferred alternative.

5.3.3 Black Sea Bass Non-Preferred Alternative 2

The second non-preferred black sea bass alternative maintains the status quo at a 10 inch minimum size limit, no possession limit and no seasonal closure. The implementation of this non-preferred alternative could potentially reduce recreational landings by approximately 9% from the projected 2000 recreational landings (See EA, Sec. 6.5.3).

This alternative would maintain the same management measures that were in place in 2000. Thus, assuming angler effort in 2001 is similar to 2000 and catch rates remain constant there will be no additional recreational fishing trips affected in 2001 as compared to 2000. Therefore, angler expenditures should be unaffected.

5.4 Combined Summer Flounder, Black Sea Bass, and Scup Fishery Impacts

In 1999, 694 vessels held a Federal party/charter permit for summer flounder, black sea bass or scup (Table 32). A portion of these vessels held only a summer flounder, black sea bass or scup permit, but most of the vessels held permits for at least two of the species and a large number of vessels held permits for all three species. However, according to 1999 Northeast logbook data only about one-half of the vessels (364) that held Federal permits reported angler landings of summer flounder, black sea bass or scup in 1999 (Table 32). Of the vessels that reported angler landings, a small number landed only one of the species, but most landed at least two of the species and some landed all three species during the course of the 1999 fishing year. Thus, for vessels that carry passengers that land more than one of the regulated species during 2001, their potential revenue losses may be higher than the species specific losses discussed in Sections 5.1.1, 5.2.1, and 5.3.1 of the RIR/IRFA. The combined estimated percent of angler effort subject to all of the measures proposed under the preferred alternatives for summer flounder, black sea bass, and scup in 2001 adds up to 2.47% of the total effort aboard private/rental boats, 0.55% of shore trips, and 4.17% of the total effort aboard party and charter boats (assuming effort and catch rates remain constant). However, losses of this magnitude are not likely to occur given that anglers will continue to have the ability to engage in catch and release fishing for summer flounder, scup, and black sea bass and because of the numerous alternative target species available to anglers. Unfortunately, very little information is available to empirically estimate how sensitive the affected party/charter boat anglers might be to the proposed regulations. The fact that the proposed regulations affect the number and size of the fish that can be kept or landed and do not prohibit anglers from engaging in catch and release fishing, the overall losses are likely to be somewhat lower.

In addition to this, states through the Atlantic States Marine Fisheries Commission will implement alternative measures for summer flounder and possibly scup. Since those management measures have not yet been established they are not incorporated into this analysis. Given these factors, the demand for recreational trips should not be significantly affected. Thus angler effort should be considerably lower than that estimated above.

Table 1. The percentage (%) of summer flounder caught and landed by recreational fishermen for each mode, North Atlantic, Mid-Atlantic, and North Carolina, 1986-1998.

Mode	Catch (Number)			Landing (Weight)		
	North Atlantic	Mid- Atlantic	North Carolina	North Atlantic	Mid- Atlantic	North Carolina
Shore	6.2	7.9	45.7	3.8	4.2	38.0
Party / Charter	1.7	10.6	0.4	2.0	14.5	0.5
Private / Rental	92.1	81.4	53.9	94.2	81.3	61.5

Source: Unpublished MRFSS data.

Table 2. The percentage (%) of scup caught and landed by recreational fishermen for each mode, North Atlantic, Mid-Atlantic, and North Carolina, 1986-1998.

Mode	Catch (Number)			Landing (Weight)		
	North Atlantic	Mid- Atlantic	North Carolina	North Atlantic	Mid- Atlantic	North Carolina
Shore	8.8	7.9	46.1	5.5	4.7	29.1
Party / Charter	12.2	18.8	5.1	13.6	18.5	10.8
Private / Rental	79.0	73.3	48.8	80.9	76.8	60.0

Source: Unpublished MRFSS data.

Table 3. The percentage (%) of black sea bass caught and landed by recreational fishermen for each mode, North Atlantic, Mid-Atlantic, and North Carolina, 1986-1998.

Mode	Catch (Number)			Landing (Weight)		
	North Atlantic	Mid- Atlantic	North Carolina	North Atlantic	Mid- Atlantic	North Carolina
Shore	4.9	10.6	12.2	2.1	2.1	1.9
Party / Charter	15.4	45.8	16.7	19.5	66.6	45.2
Private / Rental	79.4	43.6	71.1	78.3	31.3	52.7

Source: Unpublished MRFSS data.

Table 4. Charter and party boat survey distribution and returns, 1990.

<u>State</u>	<u>Number sent</u>	<u>Usable returns</u>	<u>Non-usable returns</u>
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	<u>6</u>	<u>2</u>	<u>1</u>
Total	592	172	30

Table 5. Relative Customer Interest and Success in Catching Selected Species in 1989. (1 = Low, 2 = Somewhat Low, 3 = Moderate, 4 = Somewhat High, and 5 = High).

<u>Species</u>	<u>Charter boats</u>		<u>Party boats</u>	
	<u>Interest (mean)</u>	<u>Success (mean)</u>	<u>Interest (mean)</u>	<u>Success (mean)</u>
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 6. Party and charter boat operating experience in 1985 and 1989.

	<u>Charter</u>		<u>Party</u>	
	<u>1985 (mean)</u>	<u>1989 (mean)</u>	<u>1985 (mean)</u>	<u>1989 (mean)</u>
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 7. Recreational anglers' ratings (mean) of reasons for marine fishing, by subregion.

Statement	New England			Mid-Atlantic		
	Not Important	Somewhat Important	Very Important	Not Important	Somewhat Important	Very Important
To Spend Quality Time with Friends and Family	4.4%	14.3%	81.3%	3.0%	12.0%	85.0%
To Enjoy Nature and the Outdoors	1.4%	10.1%	88.5%	1.1%	11.6%	87.3%
To Catch Fish to Eat	42.2%	37.4%	20.4%	29.3%	40.1%	30.6%
To Experience the Excitement or Challenge of Sport Fishing	6.2%	24.9%	68.8%	8.4%	26.0%	65.6%
To be Alone	55.0%	27.9%	17.1%	57.7%	25.8%	16.4%
To Relax and Escape from my Daily Routine	3.4%	13.3%	83.3%	2.6%	11.9%	85.5%
To Fish in a Tournament or when Citations are Available	78.6%	14.0%	7.4%	73.4%	17.1%	9.5%

Source: Steinback *et al.*, 1999.

Table 8. Recreational anglers' ratings (mean) of fishing regulation methods, by subregion.

Type of Regulation	New England		Mid-Atlantic	
	Support	Oppose	Support	Oppose
Limits on the Minimum Size of Fish You Can Keep	92.5%	7.5%	93.2%	6.8%
Limits on the Number of Fish You Can Keep	91.1%	8.9%	88.3%	11.7%
Limits on the Times of the Year When You Can Keep the Fish You Catch	78.8%	21.2%	77.1%	22.9%
Limits on the Areas You Can Fish	67.9%	32.1%	66.0%	34.0%

Source: Steinback *et al.*, 1999.

Table 9. Recreational anglers' ratings (mean) of fishing regulation methods, by mode.

Type of Regulation	Party/Charter		Private/Rental		Shore	
	Support	Oppose	Support	Oppose	Support	Oppose
Limits on the Minimum Size of Fish You Can Keep	92.1%	7.9%	94.4%	5.6%	90.1%	9.9%
Limits on the Number of Fish You Can Keep	87.9%	12.1%	90.0%	10.0%	87.7%	12.3%
Limits on the Times of the Year When You Can Keep the Fish You Catch	79.2%	20.8%	78.3%	21.7%	75.0%	25.0%
Limits on the Areas You Can Fish	74.4%	25.6%	65.9%	34.1%	63.6%	36.4%

Source: Steinback *et al.*, 1999.

Table 10. Party/charter boats catch disposition (number of fish) from VTR data for all species, summer flounder, scup, and black sea bass, ME-NC, 1996-1999.

	All species		Summer flounder		Scup		Black sea bass	
	# of fish Kept	# of fish discarded	# of fish Kept	# of fish discarded	# of fish Kept	# of fish discarded	# of fish Kept	# of fish discarded
1996	3,385,534	1,281,615	346,648	384,972	318,946	47,831	1,197,819	199,731
1997	3,836,547	1,306,266	369,334	304,634	252,359	46,530	871,321	140,667
1998	3,590,045	2,058,840	324,681	334,433	398,024	101,558	471,049	278,223
1999	3,772,959	1,957,156	200,632	529,749	418,735	69,778	672,475	405,751

Source: Vessel Trip Report data.

Table 11. The percentage (%) contribution of summer flounder to the total catch by party charter vessels, 1996-1999.

STATE	<u>JAN</u>	<u>FEB</u>	<u>MAR</u>	<u>APR</u>	<u>MAY</u>	<u>JUN</u>	<u>JUL</u>	<u>AUG</u>	<u>SEP</u>	<u>OCT</u>	<u>NOV</u>	<u>DEC</u>	<u>TOTAL</u>
CT	0.00	0.00	0.00	0.00	1.07	2.29	3.18	1.97	0.68	0.00	0.00	0.00	1.46
DE				0.02	7.86	12.54	3.92	11.66	6.72	1.74	0.64	0.00	5.77
ME		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.00	0.00	0.00	0.02
MD	0.00	0.00	0.00	0.03	0.31	0.80	0.31	0.26	0.24	0.07	0.01	0.00	0.25
MA	0.00	0.00	0.00	0.00	0.04	0.45	2.38	0.54	0.17	0.03	0.00	0.00	0.56
NH				0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00
NJ	0.00	0.00	0.00	0.10	6.19	14.28	22.39	27.03	15.34	4.76	0.22	0.10	12.59
NY	0.00	0.00	0.16	0.46	51.34	54.77	60.69	47.14	17.10	3.29	0.55	0.00	33.54
NC	0.00	0.00	0.00	0.00	1.29	1.26	1.94	1.72	0.19	0.18	0.00		1.32
RI	0.00	0.00	0.00	0.00	1.46	16.14	20.03	1.10	1.36	0.03	0.18	0.00	2.78
VA		0.00	0.00	8.06	1.90	1.65	0.76	1.02	0.43	0.66	4.91	0.00	1.61
Total	0.00	0.00	0.02	0.19	13.74	19.61	23.63	17.57	12.51	3.51	0.49	0.00	13.19

Source: Vessel Trip Report data.

Table 12. The percentage (%) contribution of scup to the total catch by party charter vessels, 1996-1999.

STATE	<u>JAN</u>	<u>FEB</u>	<u>MAR</u>	<u>APR</u>	<u>MAY</u>	<u>JUN</u>	<u>JUL</u>	<u>AUG</u>	<u>SEP</u>	<u>OCT</u>	<u>NOV</u>	<u>DEC</u>	<u>TOTAL</u>
CT	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.04	0.62	0.55	1.30		0.29
DE				0.00	0.00	0.00	0.00	1.54	0.09	0.04	0.00	0.00	0.26
ME	0.00	0.00	0.00	0.00	0.01	0.03	0.00	0.01	0.01	5.64	0.00	0.00	0.48
MD	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	6.94	1.24	0.28	1.11
MA	0.00	0.00	0.00	0.02	21.55	38.40	14.83	9.17	25.07	19.16	0.04	0.00	16.62
NH				0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NJ	1.26	0.75	0.86	0.00	0.02	0.02	0.06	0.31	4.04	19.87	22.81	1.55	5.19
NY	0.00	0.00	0.00	0.00	0.20	0.64	1.41	3.68	34.86	47.70	22.19	2.46	14.64
NC	0.00	0.00	0.00	0.00	0.00	0.08	1.57	2.37	0.03	0.96	0.00	0.00	1.07
RI	0.00	0.00	0.00	0.00	0.00	0.42	9.78	1.12	21.92	35.91	23.39	3.38	5.53
VA		0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.04	0.14	0.00	0.00	0.09
Total	0.83	0.48	0.45	0.00	4.37	5.60	2.00	2.39	14.24	25.06	20.32	1.27	7.80

Source: Vessel Trip Report data.

Table 13. The percentage (%) contribution of black sea bass to the total catch by party charter vessels, 1996-1999.

STATE	<u>JAN</u>	<u>FEB</u>	<u>MAR</u>	<u>APR</u>	<u>MAY</u>	<u>JUN</u>	<u>JUL</u>	<u>AUG</u>	<u>SEP</u>	<u>OCT</u>	<u>NOV</u>	<u>DEC</u>	<u>TOTAL</u>
CT	0.00	0.00	0.00	0.00	0.05	0.01	0.02	0.03	0.16	0.13	0.39		0.08
DE				0.00	64.87	32.61	4.40	4.89	24.59	42.57	0.00	0.00	10.73
ME	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.38	0.00	0.00	0.03
MD	0.00	0.00	0.00	7.44	91.16	87.38	15.26	2.30	19.68	80.09	96.59	88.53	38.08
MA	0.00	0.00	0.00	0.00	1.76	1.28	2.44	1.36	2.02	1.25	0.00	0.00	1.39
NH				0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.01
NJ	11.13	10.71	5.03	1.45	30.59	28.03	15.39	16.73	38.83	57.97	51.94	14.64	28.74
NY	0.00	0.03	0.01	0.25	4.54	14.41	11.14	18.63	25.57	26.53	35.78	5.91	17.42
NC	0.00	1.84	0.00	22.93	43.97	27.36	39.30	35.17	34.97	24.93	14.55	0.00	32.65
RI	2.62	0.00	0.00	0.01	0.06	0.48	1.08	0.10	1.51	3.22	11.63	12.27	0.77
VA		0.00	0.54	43.14	67.56	17.89	16.31	10.52	85.13	91.19	92.87	89.38	47.37
Total	7.29	6.94	2.69	1.43	18.93	19.45	11.04	9.56	28.39	45.01	49.09	13.08	20.00

Source: Vessel Trip Report data.

Table 14. Summary of management measures for the summer flounder recreational fishery, 1993-2000.

<u>Measure</u>	<u>1993</u>	<u>1994</u>	<u>1995</u>	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>
Harvest Limit (m lb)	8.38	10.67	7.76	7.41	7.41	7.41	7.41	7.41
Landings (m lb)	8.83	9.33	5.42	9.82	11.87	12.48	8.37	15.63 ^b
Possession Limit	6	8	6/8	10	8	8	8	8
Size Limit (in TL)	14	14	14	14	14.5	15	15	15.5
Open Season	5/15-9/30	4/15-10/15	-	-	-	-	5/29-9/11	5/10-10/2

^bProjected based on Waves 1-5.

Table 15. Summer flounder 1999 (Table A) and 2000 (Table B) recreational management measures.

Table A

<u>State</u>	<u>Minimum Size (inches)</u>	<u>Possession Limit</u>	<u>Open Season</u>
Massachusetts	15.0	8	May 29 - Sept. 11
Rhode Island	15.0	8	May 29 - Sept. 11
Connecticut	15.0	8	May 29 - Sept. 11
New York	16.0	8	Jan. 1 - Dec. 31
New Jersey	15.5	8	May 15 - Oct. 11
Delaware	15.0	8	Jan. 1 - July 14 Aug. 8 - Dec. 31
Maryland			
Bay	15.0	8	May 8 - Dec. 31
Coastal	15.5	8	April 15 - Nov. 30
Potomac River Fisheries Commission	15.0	4	May 1 - Dec. 31
Virginia	16.0	8	Jan. 1 - July 23 Aug. 1 - Dec. 31
North Carolina	15.0	8	Jan. 1 - Dec. 31

Table B

<u>State</u>	<u>Minimum Size (inches)</u>	<u>Possession Limit</u>	<u>Open Season</u>
Massachusetts	15.5	8	May 10 - Oct. 2
Rhode Island	15.5	8	May 10 - Oct. 2
Connecticut	15.5	8	May 10 - Oct. 2
New York	15.5	8	May 10 - Oct. 2
New Jersey	15.5	8	May 6 - Oct. 20
Delaware	15.5	8	May 10 - Oct. 2
Maryland			
Bay	15	8	May 15 - Dec. 31
Coastal	15.5	8	April 15 - Dec. 11
Potomac River Fisheries Commission	15	8	May 15 - Dec. 31
Virginia	15.5	8	March 29 - July 23 August 2 - Dec. 31

North Carolina

15

8

Jan. 1 - Dec. 31

13 April 2001

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Table 16. The effect of various size and possession limits on 2000 summer flounder recreational landings. The tables contain the proportional reduction in number of summer flounder landed assuming regulations are 100% effective (Table A) and 85% effective (Table B).

Table A - 100% Effective

		Size (TL ")				
BAG	-	14	15	15.5	16	
		0.000	0.062	0.128	0.205	0.335
1	0.527	0.552	0.579	0.604	0.653	
2	0.277	0.318	0.362	0.413	0.495	
3	0.164	0.214	0.266	0.325	0.430	
4	0.101	0.155	0.211	0.277	0.393	
5	0.063	0.119	0.179	0.249	0.370	
6	0.035	0.094	0.156	0.229	0.354	
7	0.016	0.076	0.140	0.215	0.344	
8	0.003	0.063	0.129	0.206	0.336	

Table B - 85% Effective

		Size (TL ")				
BAG	-	14	15	15.5	16	
		0.000	0.052	0.108	0.174	0.285
1	0.448	0.469	0.492	0.514	0.555	
2	0.235	0.270	0.308	0.351	0.420	
3	0.140	0.181	0.226	0.276	0.366	
4	0.086	0.132	0.179	0.236	0.334	
5	0.053	0.101	0.152	0.212	0.315	
6	0.030	0.080	0.133	0.194	0.301	
7	0.014	0.065	0.119	0.183	0.292	
8	0.002	0.054	0.110	0.175	0.286	

Table 17. Percent reduction (%) in landings associated with various closed seasons for summer flounder, based on 1994-1998 MRFSS data (catch in number).

<u>Closed Season</u>	<u>%</u>
January 1 - April 30	3.6
January 1 - May 31	11.9
January 1 - June 14	18.6
January 1 - June 30	28.8
January 1 - July 14	39.9
January 1 - July 31	55.2
January 1 - August 14	67.9
January 1 - August 31	81.5
January 1 - September 14	89.4
January 1 - September 30	95.8
July 1 - July 14	11.1
July 1 - July 31	26.4
July 1 - August 14	39.1
July 1 - August 31	52.6
August 1 - August 31	26.3
August 1 - December 31	44.8
August 15 - December 31	32.1
September 1 - December 31	18.6
September 15 - December 31	10.7
October 1 - December 31	4.2

Table 18. Summer flounder, scup, and black sea bass recreational harvest by year and area, Maine to North Carolina.

Year	Summer Flounder (A+B1) (number of fish)		Scup (A+B1) (number of fish)		Black Sea Bass (A+B1) (number of fish)	
	State < 3 mi	EEZ > 3 mi	State < 3 mi	EEZ > 3 mi	State < 3 mi	EEZ > 3 mi
1995	96.03%	3.97%	67.22%	32.78%	19.71%	80.29%
1996	94.23%	5.77%	93.29%	6.71%	23.95%	76.05%
1997	90.82%	9.18%	91.18%	8.82%	13.55%	86.45%
1998	93.83%	6.13%	89.12%	10.88%	16.13%	83.87%
1999	88.30%	11.70%	91.38%	8.62%	27.36%	72.64%
Average	92.67%	7.33%	86.63%	13.37%	19.29%	80.71%

Source: MRFSS.

Table 19. Scup recreational management measures for 2000 by state.

<u>State</u>	<u>Minimum Size</u>	<u>Possession Limit</u>
Massachusetts	9"	50
Rhode Island	9"	50
Connecticut	8"	50
New York	7"	50
New Jersey	7"	50
Delaware	7"	None
Maryland	7"	None
Virginia	7"	50
North Carolina	7"	None

Source: Beal, pers. comm.

Table 20. The effect of various size and possession limits on 2000 scup recreational landings. The tables contain the proportional reduction in number of scup landed assuming regulations are 100% effective (Table A) and 85% effective (Table B).

Table A - 100% Effective
Size (TL")

BAG	No	7	8	9	10
	0.000	0.063	0.098	0.203	0.421
1	0.841	0.855	0.859	0.860	0.877
2	0.710	0.736	0.743	0.752	0.792
3	0.618	0.657	0.668	0.683	0.725
4	0.552	0.602	0.615	0.636	0.678
5	0.497	0.553	0.567	0.593	0.638
6	0.449	0.508	0.523	0.558	0.605
7	0.408	0.469	0.484	0.524	0.577
8	0.368	0.431	0.446	0.491	0.552
9	0.332	0.394	0.409	0.459	0.529
10	0.297	0.359	0.374	0.429	0.508
15	0.173	0.235	0.270	0.330	0.439
20	0.110	0.173	0.208	0.268	0.421
25	0.063	0.125	0.160	0.220	0.421
30	0.038	0.100	0.135	0.203	0.421
35	0.025	0.088	0.123	0.203	0.421
40	0.013	0.075	0.110	0.203	0.421
45	0.000	0.063	0.098	0.203	0.421

Table B - 85% Effective
Size (TL")

BAG	No	7	8	9	10
	0.000	0.053	0.083	0.172	0.357
1	0.715	0.727	0.730	0.731	0.746
2	0.603	0.626	0.632	0.639	0.673
3	0.526	0.559	0.568	0.581	0.616
4	0.469	0.512	0.522	0.540	0.577
5	0.422	0.470	0.482	0.504	0.543
6	0.382	0.432	0.445	0.474	0.514
7	0.347	0.399	0.412	0.446	0.490
8	0.313	0.366	0.379	0.417	0.469
9	0.282	0.335	0.348	0.390	0.450
10	0.252	0.305	0.318	0.365	0.432
15	0.147	0.200	0.230	0.281	0.373
20	0.094	0.147	0.177	0.228	0.357
25	0.053	0.106	0.136	0.187	0.357
30	0.032	0.085	0.115	0.172	0.357
35	0.021	0.074	0.104	0.172	0.357
40	0.011	0.064	0.094	0.172	0.357
45	0.000	0.053	0.083	0.172	0.357

Table 21. Projected reduction in scup landings (in number) associated with closing one day per wave. Based on 1995-1999 MRFSS landings data.

<u>State</u>	<u>Wave 1</u>	<u>Wave 2</u>	<u>Wave 3</u>	<u>Wave 4</u>	<u>Wave 5</u>	<u>Wave 6</u>
MA	0	0	0.48	0.52	0.63	0
RI	0	0	0.02	0.81	0.79	0.01
CT	0	0	0.18	0.58	0.83	0.03
NY	0	0	0.23	0.71	0.65	0.04
NJ	0	0	0	0.01	1.46	0.16
DE	0	0	0	0.15	1.41	0.08
MD	0	0	0	0.75	0	0.88
VA	0	0	0	0.74	0.87	0.02
NC	0	0.12	0.65	0.45	0.31	0.09
Coast	0	0	0.23	0.60	0.77	0.03

Table 22. Black sea bass recreational management measures for 1999 by state.

<u>State</u>	<u>Minimum Size</u>	<u>Possession Limit</u>	<u>Closed Season</u>
Massachusetts	12"	20	None
Rhode Island	10"	None	None
Connecticut	10"	20	None
New York	10"	None	None
New Jersey	10"	None	None
Delaware	10"	None	None
Maryland	10"	None	None
PRFC	10"	None	None
Virginia	10"	50	None
North Carolina	10"	20 ^A	None

^A 20 Fish possession limit applies only south of Cape Hatteras, no bag limit north of Cape Hatteras.

Source: Beal, pers. comm.

Table 23. The effect of various size and possession limits on 2000 black sea bass recreational landings. The tables contain the proportional reduction in number of black sea bass landed assuming regulations are 100% effective (Table A) and 85% effective (Table B).

Table A - 100% Effective

BAG	No	Size (TL ")				
		8	9	10	11	12
	0.011	0.071	0.089	0.108	0.253	0.406
1	0.747	0.755	0.766	0.774	0.798	0.828
2	0.590	0.608	0.621	0.632	0.669	0.729
3	0.460	0.489	0.504	0.518	0.564	0.669
4	0.362	0.402	0.418	0.432	0.495	0.632
5	0.274	0.323	0.341	0.354	0.452	0.595
6	0.233	0.290	0.308	0.324	0.422	0.567
7	0.200	0.260	0.278	0.294	0.394	0.538
8	0.180	0.240	0.257	0.274	0.375	0.519
9	0.165	0.225	0.243	0.259	0.361	0.505
10	0.151	0.211	0.229	0.247	0.349	0.493
11	0.138	0.198	0.215	0.234	0.337	0.481
12	0.125	0.185	0.203	0.222	0.324	0.469
13	0.114	0.174	0.192	0.211	0.313	0.460
14	0.104	0.163	0.181	0.200	0.302	0.452
15	0.093	0.153	0.170	0.189	0.292	0.444
20	0.052	0.112	0.129	0.149	0.267	0.420
25	0.011	0.071	0.089	0.108	0.253	0.406

Table B - 85% Effective

BAG	No	Size (TL ")				
		8	9	10	11	12
	0.009	0.060	0.075	0.091	0.215	0.345
1	0.635	0.642	0.651	0.658	0.679	0.704
2	0.501	0.516	0.528	0.537	0.569	0.620
3	0.391	0.416	0.428	0.440	0.479	0.569
4	0.308	0.342	0.356	0.367	0.420	0.537
5	0.233	0.274	0.290	0.301	0.384	0.506
6	0.198	0.247	0.262	0.276	0.359	0.482
7	0.170	0.221	0.236	0.250	0.335	0.457
8	0.153	0.204	0.219	0.233	0.318	0.441
9	0.140	0.191	0.206	0.220	0.307	0.430
10	0.129	0.179	0.195	0.210	0.296	0.419
11	0.117	0.168	0.183	0.199	0.286	0.409
12	0.107	0.157	0.173	0.189	0.276	0.398
13	0.097	0.148	0.163	0.179	0.266	0.391
14	0.088	0.139	0.154	0.170	0.257	0.384
15	0.079	0.130	0.145	0.161	0.248	0.378
20	0.044	0.095	0.110	0.126	0.227	0.357
25	0.009	0.060	0.075	0.091	0.215	0.345

Table 24. Projected reduction in black sea bass landings (in number) associated with closing one day per wave based on 1995-1999 MRFSS landings data.

<u>State</u>	<u>Wave 1</u>	<u>Wave 2</u>	<u>Wave 3</u>	<u>Wave 4</u>	<u>Wave 5</u>	<u>Wave 6</u>
MA	0.0000	0.0000	0.3542	0.4042	0.8743	0.0000
RI	0.0000	0.0001	0.0383	0.4280	0.5828	0.5831
CT	0.0000	0.0000	0.1601	0.4725	0.9990	0.0000
NY	0.0000	0.0000	0.2562	0.4177	0.9073	0.0513
NJ	0.0000	0.0021	0.2977	0.1782	1.0830	0.0754
DE	0.0000	0.0016	0.2974	0.4092	0.3842	0.5402
MD	0.0000	0.0176	0.6056	0.1121	0.3055	0.5967
VA	0.0000	0.0811	0.4024	0.2818	0.4475	0.4218
NC	0.0000	0.1922	0.4657	0.6264	0.2565	0.0882
Coast	0.0000	0.0204	0.3615	0.2070	0.8121	0.2349

Table 25. Number of summer flounder recreational fishing trips, recreational harvest limit, and recreational landings from 1991 to 2001.

Year	Number of Fishing Trips ^a	Recreational Harvest Limit (million lb)	Recreational Landings of Summer Flounder (million lb) ^b
1991	4,645,993	None	7.96
1992	3,751,815	None	7.15
1993	4,829,252	8.38	8.83
1994	5,761,918	10.67	9.33
1995	4,742,194	7.76	5.42
1996	5,086,347	7.41	9.82
1997	5,620,055	7.41	11.87
1998	5,296,982	7.41	12.48
1999	4,230,627	7.41	8.37
2000	N/A	7.41	15.63 ^c
2001	-	7.16	-

^a Number of fishing trips as reported by anglers in the intercept survey indicating that the primary species group sought was summer flounder, North Atlantic, Mid-Atlantic, and South Atlantic regions combined. Estimates are not expanded. Source: MRFSS.

^b From Maine to North Carolina. Source: MRFSS.

N/A = Data not available.

^c Projected landings based on 1999 data for waves 1-5 (January through October).

N/A = Data not available.

Table 26. Potential effort, maximum reduction in trip expenditures, and average estimated maximum gross revenue loss per party/charter vessel associated with the proposed summer flounder recreational management measures for 2001 in the Northeast Region (ME-NC).

	MRFSS Projected Total Estimated Angler Trips in 2001	Estimated Percent of Angler Trips Affected by Measures	Estimated Angler Trips Affected by Measures	Maximum Reduction in Trip Expenditures	Estimated Maximum Gross Revenue Loss	Number of Participating Party/Charter Vessels (VTR 1999)	Average Estimated Maximum Gross Revenue Loss per Party/Charter Vessel in 2001
Party/Charter							
Preferred	1,625,597	2.64%	42,916	\$3,233,291	\$1,677,586	318	\$5,275
Non-Preferred 1	1,625,597	2.72%	44,216	\$3,331,233	\$1,728,403	318	\$5,435
Non-Preferred 2	1,625,597	Status Quo - No Change					
Private/Rental							
Preferred	17,197,541	2.10%	361,148	\$19,743,961			
Non-Preferred 1	17,197,541	2.20%	378,346	\$20,684,176			
Non-Preferred 2	17,197,541	Status Quo - No Change					
Shore							
Preferred	13,153,417	0.41%	53,929	\$2,076,806			
Non-Preferred 1	13,153,417	0.51%	67,082	\$2,583,328			
Non-Preferred 2	13,153,417	Status Quo - No Change					

Table 27. Average daily trip expenditures by recreational fishermen in the Northeast region by mode, in 1998.

Expenditures	Party/Charter	Private/Rental	Shore
	\$		
Travel	4.00	4.09	4.41
Food, drink, refreshments	17.10	15.51	16.73
Lodging at motels, cabins, lodges, campgrounds	5.49	1.65	5.37
Public transportation	1.06	0.53	0.76
Boat fuel	0	15.24	0
Guide or package fees	35.60	0	0
Access and/or boat launching fees	0.67	3.06	0.44
Equipment	1.70	0.37	0.22
Bait	1.67	6.64	5.21
Ice	1.31	2.69	1.92
Total	68.60	49.78	35.06

Table 28. Number of scup recreational fishing trips, recreational harvest limit, and recreational landings from 1991 to 2001.

Year	Number of Fishing Trips ^a	Recreational Harvest Limit (million lb)	Recreational Landings of Scup (million lb) ^b
1991	763,284	None	8.09
1992	495,201	None	4.41
1993	252,017	None	3.20
1994	221,074	None	2.63
1995	153,008	None	1.34
1996	145,814	None	2.16
1997	118,266	1.95	1.20
1998	105,283	1.55	0.88
1999	133,703	1.24	1.89
2000	N/A	1.24	5.14 ^c
2001	-	1.76	-

^a Number of fishing trips as reported by anglers in the intercept survey indicating that the primary species group sought was scup, North Atlantic, Mid-Atlantic, and South Atlantic regions combined. Source: MRFSS.

^b From Maine to North Carolina. Source: MRFSS.

^c Projected landings based on 1999 data for waves 1-5 (January through October).

N/A = Data not available.

Table 29. Potential effort, maximum reduction in trip expenditures, and average estimated maximum gross revenue loss per party/charter vessel associated with the proposed scup recreational management measures for 2001 in the Northeast Region (ME-NC).

	MRFSS Projected Total Estimated Angler Trips in 2001	Estimated Percent of Angler Trips Affected by Measures	Estimated Angler Trips Affected by Measures	Maximum Reduction in Trip Expenditures	Estimated Maximum Gross Revenue Loss	Number of Participating Party/Charter Vessels (VTR 1999)	Average Estimated Maximum Gross Revenue Loss per Party/Charter Vessel in 2001
Party/Charter							
Preferred	1,625,597	1.44%	23,409	\$1,763,634	\$915,058	126	\$7,262
Non-Preferred 1	1,625,597	1.40%	22,898	\$1,725,135	\$895,083	126	\$7,104
Non-Preferred 2	1,625,597	Status Quo - No Change					
Private/Rental							
Preferred	17,197,541	0.36%	61,911	\$3,384,674			
Non-Preferred 1	17,197,541	0.36%	61,911	\$3,384,674			
Non-Preferred 2	17,197,541	Status Quo - No Change					
Shore							
Preferred	13,153,417	0.14%	18,415	\$709,162			
Non-Preferred 1	13,153,417	0.08%	10,523	\$405,241			
Non-Preferred 2	13,153,417	Status Quo - No Change					

Table 30. Number of black sea bass recreational fishing trips, recreational harvest limit, and recreational landings from 1991 to 2001.

Year	Number of Fishing Trips ^a	Recreational Harvest Limit (million lb)	Recreational Landings of BSB (million lb) ^b
1991	N/A	None	4.19
1992	218,700	None	2.71
1993	296,370	None	4.84
1994	265,402	None	2.95
1995	315,165	None	6.21
1996	282,972	None	4.00
1997	313,052	None	4.27
1998	N/A	3.15	1.15
1999	N/A	3.15	1.70
2000	N/A	3.15	4.29 ^c
2001	-	3.15	-

^a Number of fishing trips as reported by anglers in the intercept survey indicating that the primary species group sought was summer flounder, North Atlantic, Mid-Atlantic, and South Atlantic regions combined. Estimates are not expanded. Source: MRFSS.

^b From Maine to North Carolina. Source: MRFSS.

^c Projected landings based on 1999 data for waves 1-5 (January through October).

N/A = Data not available.

Table 31. Potential effort, maximum reduction in trip expenditures, and average estimated maximum gross revenue loss per party/charter vessel associated with the proposed black sea bass recreational management measures for 2001 in the Northeast Region (ME-NC).

	MRFSS Projected Total Estimated Angler Trips in 2001	Estimated Percent of Angler Trips Affected by Measures	Estimated Angler Trips Affected by Measures	Maximum Reduction in Trip Expenditures	Estimated Maximum Gross Revenue Loss	Number of Participating Party/Charter Vessels (VTR 1999)	Average Estimated Maximum Gross Revenue Loss per Party/Charter Vessel in 2001
Party/Charter							
Preferred	1,625,597	0.09%	1,463	\$110,222	\$57,189	261	\$219
Non-Preferred 1	1,625,597	0.83%	13,492	\$1,016,487	\$527,402	261	\$2,021
Non-Preferred 2	1,625,597	Status Quo - No Change					
Private/Rental							
Preferred	17,197,541	0.01%	1,720	\$94,032			
Non-Preferred 1	17,197,541	0.01%	1,720	\$94,032			
Non-Preferred 2	17,197,541	Status Quo - No Change					
Shore							
Preferred	13,153,417	0.0001%	13	\$501			
Non-Preferred 1	13,153,417	0.0003%	39	\$1,502			
Non-Preferred 2	13,153,417	Status Quo - No Change					

Table 32. Number of vessels that held federal Northeast party/charter permits in 1999 and the associated number of vessels that reported landings in 1999, by permitted species/species groups.

Species	Number of Federally Permitted Party/Charter Vessels in 1999	Number of Party/Charter Vessels that Reported Landings in 1999
Black Sea Bass	553	261
Scup	520	126
Fluke	637	318
Black Sea Bass or Scup	615	271
Black Sea Bass or Fluke	675	358
Scup or Fluke	679	335
Black Sea Bass or Scup or Fluke	694	364