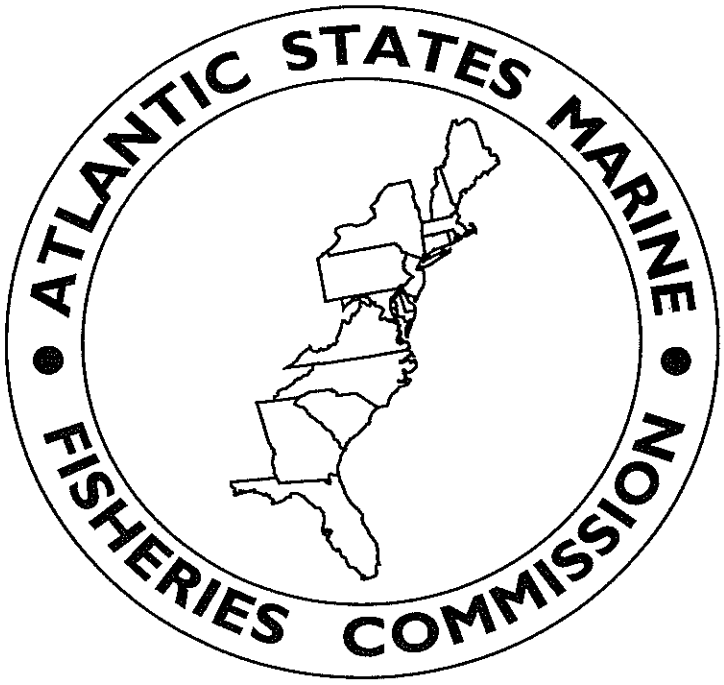
Special Report No. 60
of the

Atlantic States Marine Fisheries Commission



1995 Annual Review of Interstate Fishery Management Plans

March 1996

ATLANTIC STATES MARINE FISHERIES COMMISSION

1995 ANNUAL REVIEW

OF

INTERSTATE FISHERY MANAGEMENT PLANS

Prepared by the Staff of the
ASMFC Interstate Fishery Management Program

Edited by
Richard T. Christian

Preface

This report is a compilation of individual reviews of fishery management plans (FMPs) developed (and those currently under development) through the Commission's Interstate Fisheries Management Program (ISFMP). Each review was conducted by plan review teams chaired by staff of the ISFMP. ISFMP staff were responsible for writing their respective plan reviews in coordination with team members. Authors and members of the PRTs are so indicated on the cover page of each review.

The purpose of this collection of reviews is to present a summary of the requirements of each FMP, status of the fisheries under the specific FMP, and the status of plan implementation by the participating states. These plans are reviewed annually by members of the respective technical committees under the direction of ISFMP staff.

Partial funding for this project was provided through a financial assistance agreement (grant no. 14-48-0009-95-1225) with the U.S. Fish and Wildlife Service Federal Aid in Sport Fish Restoration Program.

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Plan Review Team

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March 1996

1995 REVIEW OF THE ASMFC FISHERY MANAGEMENT PLAN FOR AMERICAN LOBSTER *(Homarus americanus)*

I. Status of the Fishery Management Plan

The goals of the 1978 American Lobster Fishery Management Plan were to: 1) develop a structure of institutional arrangements for effective regionalized management of lobster stocks that occur within two or more political jurisdictions; 2) coordinate the collection and analysis of statistical and scientific data for the fishery resource; 3) promote efficiency in harvesting and utilization of the resource, Develop and maintain a healthy commercial fishery; and maintain opportunities for participation in a recreational lobster fishery. Objectives include: 1) adjusting the minimum size limits on the basis of the best scientific information available; 2) develop regional programs to control lobster fishing effort and regulate fishing mortality rates; 3) implement uniform collection, analysis and dissemination of biological and economic data; 4) increase brood stock abundance to minimize the risk of stock depletion and recruitment failure; 5) minimize lobster injury and mortality associated with fishing; 6) develop standard gear marking procedures to the extent practical; and 7) maintain existing social and cultural features of the industry wherever possible.

Amendment #1 of the ASMFC American Lobster Fishery Management Plan, implemented in November 1990, calls for member states to adjust their lobster regulations to meet the minimum carapace lengths called for in federal waters under Amendment 4 of the the New England Fishery Management Council lobster FMP. The NEFMC plan calls for the formation of Effort Management Teams in four geographic areas charged with developing the details of an effort reduction program.

The Management Unit extends from Maine through North Carolina. States between Maine and Virginia, except Pennsylvania, have a declared interest in the Plan. States from Maine through New Jersey are required to be in compliance with the Plan. The ASMFC American Lobster Management Board remains active. Along

with the NEFMC Lobster Oversight Committee, it is responsible for monitoring progress on Plan Amendments.

II. Status of the Stocks

The assessment for American lobster was reviewed during the Stock Assessment Workshop (SAW) 16, Stock Assessment Review Committee (SARC) meeting held at Woods Hole on June 21-25, 1993 considered three stock units: 1) Gulf of Maine (GOM), 2) Georges Bank-Southern Offshore (GB-S.OFF), 3) South of Cape Cod to Long Island Sound (SCC-LIS). A natural mortality of M=0.1 was assumed for all assessment units. If the present 3.25 inch gauge size is maintained, mortality will have to be reduced by 20% in the GOM and by as much as 50% in southern New England. Overfishing is defined by the F10% Eggs Per Recruit (EPR) reference point.

Fishing mortality inshore is sufficiently high enough that the fishery is dependent on lobsters within one or two molt groups of the minimum size. Offshore stocks have been more heavily exploited in recent years but abundance indices, both commercial CPUE and fishery independent, appear to be stable.

A Peer Review of the Population Dynamics of Lobster was held on March 25 - 29, 1996. A final report is due to be released in mid-July, 1996. The assessment for American lobster is scheduled to be reviewed during the Stock Assessment Workshop (SAW) 22, Stock Assessment Review Committee (SARC) meeting held at Woods Hole on June 17-21, 1996 with a final report due later in the summer.

III. Status of the Fishery

American lobster landings rose to historic high levels in 1991 (29,000 mt) from 15-20,000 mt during the period 1978-87 before declining to 25,000 mt in 1992 (Table 1). GOM landings, which account for 71% of the total, varied between 11,900 and 14,200 mt for 10 years prior to 1989 then rose dramatically to a peak 20,500 mt in 1991. Based

on preliminary data, catches in 1994 for GOM remained relatively stable from 1993 levels.

SCC-LIS landings account for 14% of the coastwide total, and had increased steadily from 1978 to peak landings of 4,200 mt in 1991 before declining to 3,900 mt in 1992. GB-S.OFF landings peaked in 1988 at 6,100 mt declining to 2,700 mt in 1992, the lowest level in ten years. Commercial CPUE declined along with landings in GOM as did fishery independent indices of both pre-recruit and fully-recruited size groups. More moderate reductions in indices of abundance were observed in the SCC-LIS and GB-S.OFF units. Based on preliminary data, catches in 1994 for SCC-LIS remained relatively stable from 1993 levels.

Pots accounted for more than 99% of landings in 1992, with inshore pots contributing 86% and offshore pots 13%. Trawl landings accounted for less than 1% of the total in 1992. Trawl landings have accounted for as much as 20% of landings prior to 1972, but have contributed less than 5% annually since. The offshore pot fishery developed in 1971, consistently contributing 2,000-5,000 mt annually. In contrast, inshore pot fishery landings have nearly doubled over the past 20 years from 10,000-12,000 mt in the mid-70s to 15,000-20,000 in recent years.

The magnitude of recreational landings is unknown.

IV. Status of Research and Monitoring

Ongoing research and monitoring efforts in states from Maine to New York are focused on larval, juvenile and adult growth and recruitment parameters. Fishery statistics are monitored by NMFS and all states from Maine to North Carolina, except Virginia.

V. Status of Management Measures

In October 1995, the ISFMP Policy Board voted to begin the process to amend the Lobster FMP. Amendment #3 is scheduled to be approved by spring of 1997.

VI. Current State-by-State Implementation per Compliance Requirements (as of established date)

All states are currently in compliance with required measures: a 3 1/4 inch minimum carapace length.

1995 REVIEW OF THE ATLANTIC STATES MARINE FISHERIES COMMISSION FISHERY MANAGEMENT PLAN FOR **AMERICAN SHAD AND RIVER HERRING** *(Alosa sp.)*

by the ASMFC Plan Review Team

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January, 1996

1995 REVIEW OF THE ASMFC FISHERY MANAGEMENT PLAN FOR THE AMERICAN SHAD AND RIVER HERRING(*Alosa sp.*)

I. Status Of The Fishery Management Plan

Date of FMP Approval:	October, 1985
Management Unit:	Maine through Florida
States With Declared Interest:	Maine through Florida
List Of Active Boards/Committees:	Shad & River Herring Management Board, Technical Committee, Stock Assessment Subcommittee, Plan Review Team, Plan Development Team

The goal of the FMP is to promote, in a coordinated coast– wide manner, the protection and enhancement (including restoration) of shad and river herring stocks of the Atlantic seaboard. The Plan further specifies four (4) management objectives as follows:

1) Control exploitation to ensure survival and enhancement of depressed stocks and continued well–being of stocks exhibiting no perceived decline;

2) Improve habitat accessibility and quality consistent with management actions for non-anadromous fisheries;

3) Initiate programs to reintroduce alosid stocks to historical spawning areas, expand existing restoration programs, and initiate enhancement programs for depressed stocks; and

4) Recommend and support research programs that will produce data to enhance management capabilities.

The Plan Review Team and the Management Board have determined that the original 1985 FMP is no longer adequate for protecting or restoring shad and river herring stocks. Although improvement has been seen in certain stocks, *Alosa*

populations remain severely depressed. This situation is unlikely to change under the current management plan because the FMP does not require any specific management approach or monitoring program within the management unit, asking only that states provide annual summaries of restoration efforts and ocean fishery activity. Moreover, the plan does not provide for adaptive management in light of stock growth or declines. Accordingly, the Management Board has directed a Plan Development Team and Citizen Advisory Panel to begin major revision of the 1985 FMP through a Plan amendment. Amendment 1 is scheduled for adoption in the fall of 1996.

During the fall of 1995, some members of the Management Board became concerned about the protracted timeline for completing Amendment 1 and the possibility of further collapse in American shad stocks. Subsequently, the Board asked the Technical Committee and Citizen Advisory Panel to develop interim measures that they felt could be implemented for the spring 1996 shad fisheries. After much discussion over anecdotal and scientific information, and mounting pressure in some jurisdictions to relax American shad regulations, the Management Board voted to "freeze" the current fishery by keeping all existing (or more conservative) shad regulations in place through July 1996. This motion was taken under the "emergency action" clause in the Interstate Fishery Management Program charter, and has full enforceability under the Atlantic Coastal Fisheries Cooperative Management Act.

II. Status of The Stocks

The Plan addresses four different species: Hickory Shad (*Alosa mediocris*), American Shad (*Alosa sapidissima*), Alewife (*Alosa pseudoharengus*), and Blueback Herring (*Alosa aestivalis*).

Hickory Shad – This species historically occurred in significant abundance from Virginia to Florida. Although commercial landings data suggest a declining trend in abundance, the lack of accurate commercial and recreational harvest data make it difficult to ascertain the status of the stocks. North Carolina has historically led the southeast in harvest, but harvest has declined in recent years due to restrictions on gill net size imposed by other management plans. Hickory shad are abundant in upper Chesapeake Bay compared to recent years.

American Shad – The status of American shad stocks by region and key river systems are as follows:

New England (Maine through Connecticut): Maine and New Hampshire runs continue to remain at low levels of abundance. The 1995 Merrimack River run passed above the Lawrence Dam (13,800+ fish) was a 345% increase over the 1994 run and the largest return of shad since 1992, although this partially could be a function of increased fish passage efficiency. The 1995 Pawcatuck River run of 547 adults was the second lowest in the past five years. The 1995 Connecticut River shad run, the lowest in 30 years, was 304,500 adults and represents a continuing decline from the previous year (325,600) and the return of 1.6 million adults in 1992.

Mid–Atlantic (New York through Virginia): The Hudson River stock is exhibiting mixed abundance indices. Catch per effort for females has risen steadily between 1992-1994, while catch of males has declined. Commercial landings remain near historic lows, although anecdotal information for spring 1995 indicates an excellent run. The 1995 Delaware River juvenile index of 200 fish per seine haul was slightly higher than the long-term average, but the adult population estimate for 1995 of 510,000 fish was well below the 1992 high. Maryland's stocks still remain at historic lows, although the upper Chesapeake Bay 1995 shad run of 336,000 fish represents a 259% increase from the 1994 estimate of 129,500. Personnel in Virginia reported excellent shad runs in the Pamunkey River while collecting hatchery broodstock in spring 1995.

South Atlantic (North Carolina through Florida): Personnel in South Carolina reported the 1995 run of shad up the Santee-Cooper system was excellent. In general, shad stocks seem to be still depressed with some improvement occurring in rivers such as the Altamaha in Georgia and the Savannah River between South Carolina and Georgia.

River Herring – The status of river herring stocks by region is as follows:

New England: River herring runs in most Maine rivers, which historically produced large harvests, continue at historic low levels. However, the 1995 Androscoggin River run of 32,002 adults increased 166% compared to 1994. Runs in New Hampshire streams have been relatively stable in recent years, while the runs in the Merrimack River in 1995 (33,400+ adults) substantially increased over 1994 levels and were the highest since 1992. The 1992 run in Rhode Island's Gilbert Stuart Brook (32,300) was a 50% increase over the 1991 run, but still well below the recent 12–year average annual run of 55,000 adults.

Mid–Atlantic: Recent data are scarce for Mid-Atlantic river herring stocks. The Hudson River 1993 blueback herring juvenile index was lower than 1992, and about the same as the lower indices of the early 1980s. Blueback herring appear to be expanding and are now colonizing the Mohawk River, a major tributary to the Hudson. The 1993 alewife index was lower than 1992, but only slightly below the long term average (1980–92). Maryland's 1985–1993 juvenile alewife indices on the Choptank, Chester, Patuxent, and Nanticoke Rivers increased significantly in all four rivers, while the blueback herring indices showed no significant trend over the same period. The 1993 alewife and blueback herring indices on the Mattaponi and Pamunkey Rivers were higher than 1992, but well below the long term mean (1979–present).

South Atlantic: As with the Mid-Atlantic region, reliable data on river herring fisheries in the Southeast are scarce. From 1986–1991, Albemarle Sound juvenile indices for alewives have been almost nonexistent and blueback herring indices have been very low in comparison to pre–1986 data. Generally, river herring stocks remain depressed in the Southeast, with some improvement in South Carolina populations.

III. Status of the Fisheries

American shad, hickory shad, and river herring formerly supported important commercial and recreational fisheries throughout their range. The fisheries for all these species have declined dramatically from historic highs. American shad coastal intercept fisheries occur in all states except Georgia and Pennsylvania. Following is a summary of fisheries by species:

Hickory Shad – Atlantic coast (Maryland to Florida) hickory shad landings are poorly monitored. The National Marine Fisheries Service does not record data for this species, and state data are questionable. This is primarily because of mixing with American shad upon landing, poorly understood geographic ranges, and poorly monitored recreational fishing areas. This species supports significant recreational fisheries in some areas, but good recreational harvest data do not exist. The most recent and complete data are for North Carolina, which has historically dominated the commercial fishery. Hickory shad landings of 18,603 pounds in 1992 were up slightly from the 16,466 pounds landed in 1991.

American Shad – For the last decade, Atlantic coast American shad landings have averaged about 3.5 million pounds annually. Although in–river fisheries have traditionally dominated the catch, coastal intercept fisheries have increased in recent years. A total moratorium on Virginia's American shad fishery in Chesapeake Bay and its tributaries was implemented on January 1, 1994, and Maryland closed its estuarine fisheries in 1980. Recent trends in fisheries by state, year, and region (ocean vs. river) are provided in Table 2.

River Herring – Atlantic coast river herring landings have ranged from a high of 74,852,000 pounds in 1958 to a low of less than 5,000,000 pounds in recent years. During the past decade, Maine, North Carolina, and Virginia have accounted for approximately 90% of coastwide landings.

Bycatch of river herring in Atlantic herring (*Clupea harengus*) fisheries is a potential concern, especially for the recovery of depressed stocks of the Chesapeake and waters further south. ASMFC and its federal partners should monitor this bycatch regularly, and work to reduce it should it threaten the recovery of any river herring stock.

New England: Since 1976, Maine has been the major contributor to New England river herring landings. Landings throughout the region have shown a major downward trend since the early 1970s and in the past four (4) years, Maine landings have declined dramatically in those rivers which traditionally contributed the majority of the catch. During 1992, the Damariscotta River harvest of 21,350 pounds was the lowest on record and the fishery was closed for the 1993, 1994, and 1995 season.

Mid–Atlantic: Landings have declined dramatically since the mid 1960s and have remained very low in recent years, particularly in Maryland and Virginia, which were traditionally the major producers in the mid–Atlantic area.

South Atlantic: Landings reached a low in the early 1980s and have been variable since that time. 1992 North Carolina landings of 1.7 million pounds was an increase of 9% over the 1991 landings. The state's 1993 landings of 800,000 pounds represents a decrease of 53% from the 1992 landings.

IV. Status of Research and Monitoring

As noted above, the Plan does not require states to conduct fishery-dependent or fishery -independent monitoring of *Alosa* fisheries. Nonetheless, some jurisdictions continue important research initiatives for these species.

Fish lifts at Conowingo Dam on the lower Susquehanna River took a record 61,650 shad (the 1994 record was 32,330), and over 100,000 blueback herring in 1995. The shad catch continues a 10 year trend of increasing abundance and the level of bluebacks at Conowingo has not been equalled since 1974. Most shad and over 20,000 herring were successfully stocked upstream of all dams on the Susquehanna, with some transported to other watersheds (e.g. Patapsco River, MD). During May and June, about 10 million shad fry were reared, marked with tetracycline and stocked in the river above dams. Major fish passage facilities are under construction at Holtwood and Safe Harbor dams with expected completion by late summer, 1996.

An extensive angler use and harvest survey was conducted on the Delaware River by the Delaware River Shad Fishermen's Association in spring 1995. Compared to a similar survey from 1986, angler use was substantially down, but average catch per angler day was about the same.

The New York Department of Environmental Conservation and the University of Maryland collaborated on a shad tag and release study on the Hudson River. Over 2,500 shad were tagged and the U.S. Fish and Wildlife Service is maintaining tag return information from this effort, as well as a limited tagging effort on the lower Delaware.

Using electrofishing gear below Essex Dam on the Merrimack River, U.S. Fish and Wildlife Service biologists collected and successfully transported 474 shad and 10,600 herring to spawning waters above Amoskeag Dam in Manchester, New Hampshire. Some of the herring came from coastal weirs in New Hampshire.

Most states in the northeast and mid–Atlantic are heavily involved with fish passage construction and stocking of adult and juvenile alosids to enhance/restore shad and river herring stocks. However, with few exceptions, overall Atlantic coast shad and river herring stocks have continued to decline.

V. Status of Management Measures

In the spring of 1994, the ISFMP Policy Board ascertained and approved two compliance requirements in the original shad and river herring FMP:

1. Each state, in cooperation with NMFS, will monitor and document existing and new EEZ and territorial sea fisheries for anadromous alosids, and report this information to ASMFC.

2. Each state shall evaluate the potential for anadromous alosid restoration within their internal waters, and provide it to ASMFC along with a summary description of ongoing restoration efforts, and a statement of anticipated restoration activities for the next five years.

The status of each state's compliance with these measures is provided in Table 1. As noted in Section I, the Management Board has determined that the original Plan and its few mandatory measures are insufficient for protecting and restoring Alosid stocks along the east coast. Accordingly, the 1985 fishery management plan will be amended in 1996. A Plan Development Team has been formed, and has generated a Public Information Document (PID) summarizing the species' life histories, fishery information, and options for new management measures. States are encouraged to conduct public information meetings on the PID and report public opinion to the Management Board while the first draft of Amendment 1 is being developed.

VI. Current State–by–State Implementation of Compliance Requirements as of January 1, 1996.

In the spring of 1994, the ISFMP Policy Board ascertained and approved two compliance requirements in the 1985 shad and river herring FMP:

1. Each state, in cooperation with NMFS, will monitor and document existing and new EEZ and territorial sea fisheries for anadromous alosids, and report this information to ASMFC.

2. Each state shall evaluate the potential for anadromous alosid restoration within their internal waters, and provide it to ASMFC along with a summary description of ongoing restoration efforts, and a statement of anticipated restoration activities for the next five years.

The first requirement dictates that states submit a status report on ocean intercept

alosid fisheries. The restoration report should focus on three areas. First, the report should summarize all current alosid restoration efforts (including stocking programs, fish passage construction, and water quality improvement). Second, the report should identify state rivers that currently do not support alosid populations but could if specific improvements were made in passage, stocking, or water quality. Last, as noted above, the report should summarize any of these types of restoration efforts planned for the next five years.

On October 5, 1996 the Management Board also required that states leave existing or more restrictive management measures in place for American shad fisheries through July 5, 1996. This action was taken because of anecdotal and scientific information that some shad stocks are severely depressed, and because of mounting pressure in some jurisdictions to relax or reopen shad fisheries. This requirement was made under the "Emergency Action" clause in the ISFMP charter, and shall be treated as a formal amendment to the Plan until it expires.

Table 1. Shad and River Herring Compliance Requirements

	ME	NH	MA	RI	CT	NY	PA	NJ	DE	MD	PRFC	VA	DC	NC	SC	GA	FL
1	Y	Y	Y	Y	Y	Y	NA	Y	Y	Y	NA	Y	NA	Y	Y	Y	Y
2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
3	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

1 = Monitor/document existing and new territorial sea fisheries for anadromous alosids;
2 = Evaluate potential for anadromous alosid restoration within internal waters
3 = Leave existing or more conservative shad regulations in place until 7/7/96

Y = yes N = no NA = not applicable

VII. Recommendations of the Plan Review Team

The Plan Review Team recommends accelerated development of Amendment 1 to the Fishery Management Plan for American Shad and River Herrings. Delays imposed by data supply problems and multiple government shutdowns have already jeopardized the fall 1996 completion date. Below is a list of important milestones that should be adhered to for timely completion of Amendment 1:

February - May 1996: States hold public information meetings on PID

February - March 1996: Stock Assessment Subcommittee drafts new stock assessment for American shad. PDT continues working on background information (life history, socioeconomic & protected species issues) for first draft of Amendment 1.

April 1996: River herring stock assessment completed. Hickory shad data reviewed and analyzed at least qualitatively.

May 1996: Monitoring and regulatory options drafted by PDT. Regulatory options (quotas, creel limits, etc.) reviewed and approved by Technical Committee, Citizen Advisory Panel, and Management Board.

June - July 1996: PDT incorporates approved regulatory and monitoring options in first draft of amendment, Management Board consults with Citizen Advisory Panel and approves first draft in late July.

August 1996: First draft sent out for public hearings. Public comment presented to Management Board.

September 1996: Necessary revisions made to first draft, second draft submitted to Management Board

October 1996: Final draft approved by ASMFC

We wish to recognize and thank the State of Pennsylvania for its continued funding support of the Shad & River Herring Technical Committee activities. Without the Interjurisdictional Fisheries Act Funds provided by Pennsylvania, this important work could not have been continued.

1995 REVIEW OF THE ATLANTIC STATES MARINE FISHERIES COMMISSION FISHERY MANAGEMENT PLAN FOR **ATLANTIC CROAKER** *(Micropogonias undulatus)*

Plan Review Team

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December, 1995

1995 Review of The ASMFC Fishery Management Plan For Atlantic Croaker *(Micropogonias undulatus)*

I. Status of the Fishery Management Plan

The management plan for Atlantic croaker was adopted in 1987 and includes the states from Maryland through Florida. In reviewing the early plans created under the Interstate Fisheries Management Plan process, the croaker plan was seen by ASMFC as in need of review and possible revision. A Wallop-Breaux grant from U. S. Fish and Wildlife Service was provided to conduct a comprehensive data collection workshop for croaker. The workshop would lay the groundwork for a major amendment to the 1987 FMP. The October 1993 workshop at the Virginia Institute of Marine Science was attended by university and state agency representatives from six states. Presentations on fishery-dependant and fishery-independent data, population dynamics and bycatch reduction devices were made and discussed. All state reports and a set of recommendations were included in a workshop report.

Subsequent to the workshop and independent of it, the South Atlantic State/Federal Fisheries Management Board of ASMFC reviewed the status of several plans in order to define the compliance issues to be enforced under the Atlantic Coastal Fisheries Cooperative Management Act (ACFCMA). The Board found recommendations in the plan to be vague and no longer valid. The Board recommended that an amendment be prepared to the croaker FMP to define the management measures necessary to achieve the goals of the FMP. In their final schedule for compliance under the ACFCMA, the ISFMP Policy Board adopted the finding that the FMP does not contain any management measures that states are required to implement.

In order for an plan amendment to proceed, a Plan Development Team needs to be appointed by the Management Board. The workshop proceedings will provide a good starting place for plan revision.

II. Status of the Stock

The area of greatest abundance on the Atlantic Coast extends from Chesapeake Bay to Florida, although significant catches are made in some years as far north as New

York. The species is a major component of the sample in generalized fishery independent trawl and seine surveys in several states. Annual recruitment is highly variable. Mean abundance of croaker (7-28 cm) from the Southeast Area Monitoring and Assessment Program's (SEAMAP) spring shallow water trawl survey in the South Atlantic Bight increased from 1990 to 1992. North Carolina juvenile indices have been down since the mid-80's with a 14 year low in 1991, followed by a slight increase in 1992. Maryland and Virginia surveys indicate high juvenile abundance in the mid-70's with another peak in the mid-1980s. Juvenile abundance was low in Virginia rivers during 1991 through 1993. A total mortality rate of 55-60% has been calculated for Chesapeake stocks. Recruitment is highly dependent on natural environmental conditions. Analysis done at VIMS indicates that croaker stocks in Chesapeake Bay seem to have a biological capacity to resist growth overfishing.

III. Status of the Fishery

From 1979 to 1994 the recreational catch of croaker from Delaware through the Florida Atlantic coast has varied from 3.6 to a high of 23 million fish in 1994. Commercial landings from New York to Florida have varied from a million pounds in 1970 to 64 million pounds in 1945. Coastal landings in 1994 were 10.8 million pounds. The CPUEs from North Carolina commercial fisheries were highest in 1985 and 1986, but have since declined in all but the sink net and flynet fisheries. Croaker remain a major component of the seine, fish trawl and pound net fisheries in Virginia and North Carolina. Small croaker are a major part of the bycatch of the South Atlantic shrimp trawl fishery. North Carolina landings continued to decline in 1992; however, Virginia landings increased eight-fold from 1991.

IV. Status of Research and Monitoring

Catch and effort data are collected by state commercial and recreational statistics programs. Fishery-independent data, from Cape Hatteras to Cape Canaveral, are collected in the SEAMAP program. Recruitment indices are available from ongoing juvenile surveys in Delaware, Maryland, Virginia, North Carolina, Florida and through the SEAMAP program. VIMS has conducted studies on temperature tolerance, and developed a juvenile recruitment model based on the effect of winter water temperature and offshore wind velocities. Also at VIMS, there is an ongoing

project to develop population dynamics parameters and to evaluate growth overfishing potential. Virginia Marine Resources Commission and North Carolina are evaluating the use of culling panels in pound nets for the release of small spot and croaker. North Carolina found a 4'x 4' escape panel (1 1/4" bar mesh) produced noticeable escapement of small fish. Maryland DNR is conducting a hook and line mortality study. Gear research on bycatch in shrimp trawls will continue under interstate and federal sponsorship.

V. Status of Management Measures and Issues

The Fishery Management Plan for Atlantic Croaker identifies the following management measures (recommendation 1 as amended) for implementation:

1. Promote the development and use of bycatch reduction devices through demonstration and application in trawl fisheries.

2. Promote increases in yield per recruit through delaying entry to croaker fisheries to age one and older.

Although the ISFMP Policy Board judged that FMP management recommendations were too vague and did not furnish objective compliance criteria, progress has been made on developing bycatch reduction devices (BRDs). The October 1993 spot and croaker workshop proceedings summarize much of the recent experimental work on bycatch reduction and examine the population implications of bycatch reduction. It is becoming clear that there are economically viable shrimp gears that reduce finfish bycatch. At the state level, North Carolina has been testing bycatch reduction devices in the shrimp trawl fishery and has achieved finfish reductions of 50-70% with little loss of shrimp. North Carolina requires fish excluder devices in every trawl (except try nets) in the shrimp fishery (commercial and recreational). In the North Carolina flynet fishery, where a large portion of the croaker catch occurs, there is a new requirement for a minimum tailbag mesh of 3 1/2 inch diamond or 3 inch square. Furthermore, the state of North Carolina has banned flynet fishing in waters south of Cape Hatteras. This requirement will reduce the catch of small croaker. The states of Florida through North Carolina have promoted and require the use of TEDs in state waters. None of the states have minimum trawl mesh sizes or culling panels in directed gears. Evaluation of the beneficial effects of these BRDs to croaker stocks, which are a component of a mixed species fishery and a mixed species bycatch needs further work. A target reduction in bycatch of croaker may be a suitable objective criteria in an amended plan. Size limits that are in place in the

states have been there for several years and do not represent a response to the FMP. The Potomac River Fisheries Commission has retained its 10 inch minimum size. Maryland's General Assembly passed a law in 1993 reducing the 10 inch limit to nine inches and setting a creel limit of 20 fish. Delaware has no plans to change its minimum size of eight inches. None of the other states plan to implement a size limit in the foreseeable future.

VI. Current State-by State Implementation of FMP Compliance Requirements

There are no specific compliance requirements.

VII. Recommendations

1. Develop an amended croaker FMP with objective compliance criteria.
2. Implement the recommendations in the 1993 Spot and Croaker Workshop Report, as follows:
   a) Management recommendations in the 1987 Spot and Croaker FMPs should be adopted and implemented by appropriate regulations or legislation.
   b) In Trawl fisheries or other fisheries that take significant numbers of spot and croaker, states should monitor and report on the extent of unutilized bycatch and fishing mortality on fish less than age 1.
   c) Mortality or harvest of less than age 1 croaker should be minimized by a minimum size limit, minimum mesh size regulations or other gear restrictions.
   d) The effects of mandated bycatch reduction devices (BRDs) on croaker and spot catch should be evaluated on those states with significant commercial harvests.
   e) Research on BRDs should be a funding priority.
   f) Fishery dependent and independent size and sex specific relative abundance estimates should be developed.
   g) Cooperative coastwide spot and croaker juvenile indices should be developed to clarify stock status.
   h) Criteria should be cooperatively developed for aging spot and croaker otoliths and scales
   i) A yield per recruit analysis should be cooperatively developed.
3. Encourage those states with minimum sizes to keep them.

1995 REVIEW OF THE ATLANTIC STATES MARINE FISHERIES COMMISSION FISHERY MANAGEMENT PLAN FOR **ATLANTIC MENHADEN** *(Brevoortia tyrannus)*

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1995 REVIEW OF THE ASMFC FISHERY MANAGEMENT PLAN FOR ATLANTIC MENHADEN *(Brevoortia tyrannus)*

I. Status of the Fishery Management Plan

The 1992 Revision of the 1981 FMP was approved at the 1992 Annual Meeting of the ASMFC. Management authority is vested in the states because the vast majority of landings come from state waters. There is a single stock which migrates along the Atlantic Coast. All Atlantic Coast states except Pennsylvania and New Hampshire have declared an interest in the menhaden program. The ASMFC program operates under the direction of the Atlantic Menhaden Board (AMB), with technical work conducted by the Atlantic Menhaden Advisory Committee (AMAC). The goal of the FMP is "To manage the Atlantic menhaden fishery in a manner that is biologically, economically, and socially sound while protecting the resource and its users." The 10 objectives of the FMP include use of the best scientific information as the basis for regulations, support for high quality habitat, maintenance of the stock, optimum utilization, public education, product research, maintenance of the long-term database, improvement of data collection, enhancement of the Captains Daily Fishing Report, and promotion of cooperative research.

The fishery is managed on the basis of an annual review of three specific items conducted by AMAC each spring: 1) status of the stock and fishery, 2) evaluation of requests for allocations by states for harvest under Internal Waters Processing (IWP) arrangements, and 3) state management actions which may affect the fishery. Following its review, the AMAC sends a report to the AMB, which reports to the ISFMP Policy Board. The ASMFC forwards the Board's IWP recommendations directly to the governors of states which apply for allocations.

II. Status of the Stock

The stock is healthy, with nine age classes represented in 1994. Overall population size is in the same range as that during the peak of the fishery. Natural mortality is considered to be M = 0.45. Overall fishing mortality (F) is about 1.0, with age-specific values ranging from F=1.6 (age 2) to F = 0.104 for age-0. Recruitment to age-1 has been good to excellent since the mid-1970s, with average estimates during 1990-1994

of 2.8 billion, compared to the minimum acceptable level of 2.0 billion. Average estimated spawning stock biomass (mature females) for 1990-1994 was 46,220 metric tons (mt), well over twice the minimum level (17,000 mt) considered acceptable by AMAC. Maximum spawning potential (MSP) during 1990-1994 has averaged 7%, a level considered by AMAC to be quite adequate. Since spawning stock biomass and MSP are based on virtual population analysis (VPA) results, and VPA values for the most recent years are the least reliable, both figures must be considered as preliminary estimates. Age composition of fish in the 1994 landings was age-0 (3%), age-1 (21%), age-2 (62%), age-3 (12%), age-4^+ (2%). Age-2 fish made up 80% of the South Atlantic catch, and 71% of the Chesapeake Bay harvest. Landings from the Mid-Atlantic area were age 2 (37%), age 3 (39%), and age 4+ (22%). No landings were made from the Gulf of Maine. A cold water mass located off the "elbow" of Cape Cod may have prevented menhaden from migrating to the Gulf of Maine in 1994.

III. Status of the Fishery

The 1994 harvest for reduction was 260,000 mt, about 19% below the 1994 level, and about 25% below the average of the five previous years. Nominal effort (vessel-weeks) in 1994 declined by 8% from 1993, principally because of lack of fish in Maine, and reduced effort in Virginia and North Carolina. Only 20 vessels landed menhaden during the 1994 season; the small boats from the Gulf of Maine did not fish. Three shoreside plants operated in 1994, one in Beaufort, NC; and two in Reedville, VA. The Chesapeake Bay fishery dominated the landings. Bait landings are estimated at about 35,000 mt for 1993, the last year for which data are available for all Atlantic coast states. The bait fishery is becoming more important from North Carolina to New England.

IV. Status of Research and Monitoring

The Menhaden Team of the NMFS laboratory in Beaufort, NC has the principal research and monitoring responsibility for the Atlantic menhaden fishery. Their monitoring and analytic work is expected to continue. Several states have improved their juvenile monitoring programs, which include data on menhaden. The industry continues to cooperate by providing set-by-set data through the Captains Daily Fishing Reports (CDFR). Beaufort Menhaden Team personnel are entering current year and historical CDFR data into a database for analysis. A pilot bait fishery sampling program was conducted in 1994 in Massachusetts, New Jersey,

and North Carolina. Some differences in age composition between bait and reduction catches were noted, but sample sizes were very small.

V. Status of Management Measures and Issues

There are no regulatory recommendations stemming from the FMP.

VI. Current State-by-State Implementation of FMP Compliance Requirements as of August 1, 1994.

There are no regulatory requirements in the menhaden FMP.

VII. Recommendations of FMP Review Team

Following its IWP review, an allocation of 60,000 mt was recommended for Maine. Because the stock is healthy, there are no recommendations for additional restrictions on the fishery. The 1990 "Fact Sheet" has been updated and will be published in 1995. University researchers are urged to evaluate use of coastal power plant impingement data as a possible means to estimate young-of-the-year abundance; this issue has been brought to the ASMFC Management and Science Committee.

1995 REVIEW OF THE ATLANTIC STATES MARINE FISHERIES COMMISSION FISHERY MANAGEMENT PLAN FOR **ATLANTIC SEA HERRING** *(Clupea harengus)*

Plan Review Team

George Lapointe (ASMFC), Chair
Dave Stevenson (ME)

March 1996

1995 REVIEW OF THE ASMFC FISHERY MANAGEMENT PLAN FOR ATLANTIC SEA HERRING (Clupea harengus)

I. Status of the Fishery Management Plan

This Atlantic States Marine Fisheries Commission (ASMFC) fishery management plan (FMP) which was approved in 1994 establishes a management goal and eight management objectives for the U.S. Atlantic herring (Clupea harengus) resource. Some of these objectives can be achieved in this plan and some can only be reached through a joint ASMFC/New England Fishery Management Council (NEFMC)) FMP.

The FMP defines overfishing for the sea herring coastal stock complex on the basis of the fishing mortality rate (F) which will reduce the stock to 20% of its maximum spawning potential (MSP) and provides a procedure for determining annual internal waters processing (IWP) allocation between three management areas based on the target fishing mortality. It also proposes an institutional framework for developing and implementing future management action involving the Commission, the New England and Mid-Atlantic Councils, and (possibly) Canada, maintains existing state spawning closure regulations, and recommends a number of measures intended to prevent damage to herring spawning habitat and egg beds.

The overfishing definition is established in this FMP strictly for the purpose of making IWP allocations. In the event that the stock becomes over-exploitation the future, adult and/or juvenile catch limits may be needed within individual areas according to guidelines which will be developed by the Plan Development Team.

II. Status of the Stock

The U.S. Atlantic coastal herring resource which occupies the management unit area covered by this FMP (Virginia to New Brunswick) has grown rapidly from less than 100,000 metric tons (mt) in 1981 to an estimated 3.4 million mt at the beginning of 1993 (age 3 or older fish). This increase is due largely to the recovery of the Georges Bank/Nantucket Shoals component of the stock which supported a large foreign fishery during the 1960s and early 1907s, but collapsed in the early 1970s as a result of over-exploitation.

Currently, the shock is large and considerably underutilized. It will increase in size even further in the near future under current exploitation. With a target fishing mortality rate corresponding to 20% MSP, exploitable biomass at the beginning of 1993 was 694,000 mt.

III. Status of the Fishery

Commercial fisheries for Atlantic herring along the U.S. east coast and in New Brunswick only remove about 100,000 mt a year, or 2.9% of the 1993 population. It has been estimated that the resource can easily sustain a 25% annual fishing mortality rate without being overfished. Well over 90% of the total commercial harvest is taken from the Gulf of Maine in weirs (fixed gear) and with purse seines (mobile gear). Primary domestic uses of the resource are canning and bait. Total wholesale value of canned herring products in Maine and New Brunswick in 1994 was about $100 million.

Under a provision of the Magnuson Fishery Conservation and Management Act, sales of herring to foreign processing ships operation in state internal waters have been conducted in Massachusetts, Maine, Rhode Island, New York, and New Jersey through issuance of Internal Waters Processing (IWP) permits. These IWP sales continue to provide a new market opportunity for U.S. fishermen. In general, however, the fishery remains market limited. The total IWP ASMFC allocation was 340,000 mt for the fishing year July 1, 1994 though June 30, 1995. This amount was allocated among the ASMFC management areas with 102,000MT for Area 1, 136,000MT for Area 2, and 102,000MT for Area 3.

For the current fishing year, the Section allocated 16,000 mt each to Massachusetts and Maine and allocated the remaining tonnage of 70,000MT to reserve. For Area 2, Rhode Island and New York were allocated 21,600MT and 14,400MT, respectively, with 100,000MT being put in a reserve. The logic for these decisions was that if a state's IWP(s) are successful (e.g., a foreign vessel is anchored in state waters and the fishery is strong), the reserve can be used. Additionally, the Section recommended an allocation of 20,000MT for Area3 in the event that a Preliminary Management Plan (PMP) could be developed in time to allow Joint Venture fishing on George's Bank.

IV. Status of Research and Monitoring

(not included in this review)

V. Status of Management Measures and Issues

Atlantic herring have been managed on the U.S. east coast by means of an agreement between the states of Maine, New Hampshire, Massachusetts, and Rhode Island which established annual three to four week spawning closures. The agreement was adopted in 1983 and endorsed by the ASMFC. The agreement replaced a federal management plan which was implemented in 1978 and withdrawn by the Secretary of Commerce in 1982 once it became clear that catch quotas for adult herring in the Gulf of Maine were not going to be enforced in state waters. In the absence of a federal FMP for Atlantic herring, herring was placed on the prohibited species list, which eliminated directed fisheries by foreign nationals or joint ventures for herring in the U.S. Exclusive Economic Zone (EEZ).

With the development of IWP fisheries in the mid-1980s, it became clear that the 1983 interstate agreement was no longer adequate to manage the U.S. Atlantic herring resource. This agreement was not comprehensive enough to manage the resource, primarily because an allocation process was needed to equitably divide IWP shares between states receiving IWP applications. To address this problem the affected states, working through the ASMFC Atlantic Herring Section, developed an IWP allocation process over the past several years now established as part of the new FMP. In addition, a second memorandum of understanding was circulated for signature to the states of Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, and New Jersey in 1993 to demonstrate the intent of these states to cooperatively manage Atlantic herring.

In addition to IWPs, there have been other changes in the fishery and in resource assessment procedures which require a new approach for managing this resource throughout its range. With the dramatic growth of the stock, particularly offshore and in southern New England and mid-Atlantic coastal waters, more states have declared an interest in IWP opportunities and in the management of the resource. Indeed, as a transboundary stock, both the U.S. and Canada should develop complementary management objectives.

The Herring Section reommended that a Preliminary Management Plan (PMP) be developed by the National Marine Fisheries Service, with assistance from the

Herring Plan Developement Team, to allow Joint Venture fishing on George's Bank as a means of providing fishing opportunity and shifting effort from nearshore waters, particularly in the Gulf of Maine.

For management purposed, this FMP establishes three management areas within U.S. waters of the northwest Atlantic. Two areas (#1 and #2) include state and federal waters north and south of Cape Cod and another area (#3) includes federal waters on Georges Bank. A procedure is defined by which the ASMFC Herring Technical Advisory Committee (TAC), working with the National Marine Fisheries Service, and if necessary, the Canadian Department of Fisheries and Oceans, will annual assess the coastal stock complex (defined as extending from New Brunswick to its southernmost extension on the U.S. Atlantic coast), estimate the total adult surplus biomass available for harvest, and recommend to the ASMFC Herring Section how much of the surplus to hold in reserve and how much to allocate for IWP harvest. The Section will act on these recommendations and divide the total IWP allocation between the three management areas and the individual states within each area, with no single area receiving more that 50% of the total. This FMP further recommends that each state ensure the monitoring the IWP landings through the use of trained observers placed aboard IWP processing vessels or through the use of log books.

This FMP is an Atlantic States Marine Fisheries Commission plan. Since it is not a joint Council/Commission plan, it cannot be (nor is it intended to be) fully implemented in federal waters without the cooperation of the New England and Mid-Atlantic Fishery Management Councils and the development and implementation of federal FMP. However, until such time as a joint FMP is completed and adopted which will allow full management of the resource throughout the EEZ, the management authority embodied in this plan will reside with the ASMFC and be implemented through the states' authority to regulate IWP landings. Furthermore, even though the states have the authority to regulate domestic landings of fish caught inside or outside to state waters, this management plan does not place any new restrictions or controls on the domestic herring fishery.

VI. Recommendations of FMP Review Team

1. Encourage the New England Fishery Management Council to develop a management plan for the EEZ;

2. Promote continued meeting with Canadian fisheries officials to develop complementary management objectives;

3. Assure that the Clean Water Act (Section 319) Non-Point Source Plans and coastal Non-Point Pollution Control Plans are developed and implemented such that adverse impacts of non-point source pollutants on Atlantic herring are minimized;

4. Strengthen enforcement of sewage discharge, or National Pollutant Discharge Eliminations System (NPDES) permit effluent limits from treatment plants, and ensure proper maintenance and operation of domestic septic systems;

5. Implement effective oil and toxic chemical spill prevention and control programs to prevent accidental release, and prioritize cleanup plans to protect areas where Atlantic herring spawn or areas inhabited by Atlantic herring at different stages of their life history;

6. Establish and enforce vessel "non discharge" zones, and promote education of recreational boaters to reduce contamination of nearshore waters from chronic fuel spills and waste disposal;

7. Prohibit dredging activities, including disposal of dredge spoil, in areas where herring are known to deposit eggs;

8. Assist industrial siting councils in siting new power plants so that impingement and entrainment of Atlantic herring are minimized;

9. Establish critical spawning habitat areas or special management zones to protect spawning aggregations of herring and or demersal egg masses; and

10. Prohibit use of bottom-tending gear (e.g., otter trawls and dredges in designated spawning areas during spawning closures. The exact locations of restricted areas will be determined by the Technical Advisory Committee.

1995 REVIEW OF THE ATLANTIC STATES MARINE FISHERIES COMMISSION FISHERY MANAGEMENT PLAN FOR **ATLANTIC STRIPED BASS** *(Morone saxatilis)*

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March 1996

1995 REVIEW OF THE ASMFC FISHERY MANAGEMENT PLAN FOR ATLANTIC STRIPED BASS (*Morone saxatilis*)

I. Status of the Fishery Management Plan

Jurisdictions with a declared interest in striped bass are from Maine through North Carolina, including Pennsylvania, the Potomac River Fisheries Commission, and the District of Columbia. Under the Atlantic Striped Bass Conservation Act (P.L. 98-613), implementation of the FMP is mandatory. Implementation of the FMP is monitored by the Commission's Striped Bass Board (Board) and Striped Bass Technical Committee (Technical Committee).

During 1994, states operated under Amendment 4 to the Striped Bass Fishery Management Plan (FMP). In order to address inequities that have developed between commercial and recreational striped bass fishermen, the Striped Bass Management Board (Management Board) voted to approve Addendum VI to Amendment 4 at their December 15, 1994 meeting. The Addendum allowed a coastwide elevation of commercial harvest caps beginning January 1, 1995. Commercial caps have been largely frozen since 1990 at 20% of historic levels, and this has resulted in mostly static commercial harvest in most states since the reopening of the striped bass fisheries. Conversely, recreational fishermen have been restricted only in season length, daily possession, and minimum size limits. As the stock has expanded, recreational landings have tripled (in pounds) over the last four years.

Amendment 5 to the FMP was approved at the meetings of the Striped Bass Management Board, the Commission's INterstate Fishery Management Program's Policy Board, and the full Commission in early March 1995. The Amendment allows increased harvest by both recreational and commercial fishermen as a result of the recovery of the Chesapeake Bay stock.

Under the new Amendment, standard minimum sizes for Atlantic striped bass are now 20 inches in bays and estuaries (producer areas), and 28 inches along the coast. Furthermore, recreational fishermen are allowed two fish per day and a year round fishing season. Likewise, commercial harvest quotas will rise substantially in 1995.

As in the past, states will be granted flexibility to deviate from these standards upon review by the Striped Bass Technical Committee and approval by the Management Board. Amendment 5 replaces all previous amendments to the FMP, and became effective on April 1, 1995.

State proposals to conduct striped bass fisheries in 1995 under Amendment 5 management regimes were reviewed and approved during the Management Board meeting of March 31, 1995. Some states had a suite of options approved by the Management Board, and will choose one alternative from those after public hearings are conducted.

The effectiveness of the Roanoke River/Albemarle Sound (NC) striped bass plan is undetermined at this time. In April 1994, the Management Board voted to allow North Carolina to implement an alternative management regime (as per Amendment 4) for a period of one year, and to generate a status report after that period. In April of 1995, the Striped Bass Stock Assessment Subcommittee reviewed this status report and deemed it insufficient for judging the efficacy of the plan or the health of the Roanoke River stock. The subcommittee chairman has travelled to North Carolina with other observers, and has conducted an intense analysis of the state's datasets. A report on this work is forthcoming, and will be discussed by both the Technical Committee and Management Board to determine what steps, if any, should be taken to ensure the recovery of the Roanoke River stock of striped bass.

II. Status of the Stocks

The Stock Assessment Subcommittee met for its annual workshop from April 17-20, 1995 in Annapolis, MD. The subcommittee evaluated current estimates of fishing mortality, indices of stock biomass and juvenile production for the Hudson, Delaware, Chesapeake, Albemarle/Roanoke River and mixed coastal stocks. Evaluations were based on results from fishery independent surveys, commercial and recreational fisheries dependent indices and tagging studies.

Fishery independent estimates of juvenile production indicate that in most stocks, striped bass populations are continuing to increase. The Chesapeake and Hudson systems had average or above average juvenile abundance indices. The Albemarle

system had an index which was the highest on record.

Indices of adult abundance in Chesapeake Bay and offshore areas remained stable or showed a slight decrease over 1993, although downward trends may be explained by the omission of Potomac River sampling sites by Maryland DNR. The SSB model used for biological reference point evaluation indicated an increasing level of spawning stock biomass in 1994.

Fisheries dependent indices consisted of recreational CPUE from the MRFSS data, volunteer angler data from several states and commercial CPUE from Massachusetts and New York. The indices were either stable or showed increased levels from 1993 to 1994.

Estimates of fishing mortality were based on tag and release information. Mortality estimates for all sizes of fish ranged from 0.16 to 0.32 with the median value of 0.23. There was a 5% chance that the estimate of F would exceed the target fishing mortality of 0.25 There were slightly higher estimates of fishing mortality on sub-legal fish, which will be further explored by the subcommittee.

The consensus of the subcommittee was that the fishing mortality on the stock continues to be at or below the target value, and the population of striped bass continues to increase, although possibly at a slower rate than in previous years.

III. Status of the Fishery

Commercial landings were 1,691,814 pounds in 1992, 1,916,902 pounds in 1993, and 1,926, 337 pounds in 1994. Total recreational landings were 5,001,613 pounds in 1992, 6,588,000 pounds in 1993, and 7,199,549 pounds in 1994 (excluding Pennsylvania and North Carolina, which had no data available from MRFSS). As noted above, total catch (landed fish + released fish) has increased with increasing participation in catch and release fisheries.

IV. Status of Research and Monitoring

State and federal agencies participate i and fund striped bass research and monitroing programs. Program status has historically been reported at an annual

Striped Bass Study Workshop designed to enhance information exchange between striped bass researchers and mangers. A summary of the workshops and collection of abstracts is published annually by the National Marine Fisheries Service. Due to funding shortfalls, the 1994 workshop will probably the last one conducted under this appropriation.

All states with commercial fisheries (Massachusetts, Rhode Island, New York, Delaware, Maryland, Virginia, PRFC and North Carolina) are required to define the catch composition (age, length, sex) of these fisheries. States with significant commercial fisheries (Massachusetts, New York, Maryland, Virginia, and PRFC) are required to collect catch/effort data. States with significant recreational fisheries (Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Maryland, Virginia and PRFC) are required to follow specific guidelines for collecting catch composition and catch/effort information from these fisheries.

Amendment 4 also required fishery independent monitoring programs in some states. Juvenile abundance indices are determined by Maine, New York, New Jersey, Maryland, Virginia, and North Carolina. Spawning stock assessments are performed by New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, and North Carolina. Tagging is conducted by state and federal agencies to determine survivorship and migration patterns in the coastal migratory stock. The tagging is done by personnel in NMFS, USFWS and marine fisheries agencies in Massachusetts, New York, New Jersey, Delaware, Maryland, Virginia, and North Carolina.

Preparation of Amendment 5 was ongoing during 1994. Amendment 5 will continue the research and monitoring requirements of Amendment 4 (with some clarification of mandatory sampling sites) until implementation of a coastwide virtual population analysis in 1997. At that point, the Striped Bass Stock Assessment Subcommittee will determine which of the monitoring programs are not necessary for tuning the VPA and can be dropped.

Over 6 million hatchery-reared striped bass have been marked with coded-wire tags (CWT's) since 1985. The evaluation of the coastwide stocking program was completed in 1994 (see ASMFC Special Report No. 43). Stocking of coded wire tagged fish has been terminated as of 1994, but sampling of fish for tag returns will continue for several years in order to fully assess the impact of the program.

V. Status of Management Measures

Amendment 4, in effect during 1994, allowed coastal states to institute a 34" minimum size limit without seasonal closures, or a 28" minimum with seasons. Some states maintained more stringent measures for their ocean striped bass fisheries. Producer area states (New York, New Jersey, Delaware, Maryland, Potomac River Fisheries Commission, Virginia, North Carolina) could institute 18" minimum sizes inside appropriate estuaries. Commercial fisheries are capped at 20% of average historical levels (1972-79) except for Maryland, which uses a harvest control model to determine quotas. States could vary their regulations yearly as long as the Technical Committee and Board accepted that the regime was conservationally equivalent to the Amendment 4 guidelines

The National Marine Fisheries Service maintains a ban on striped bass fishing activity and possession of striped bass in the Exclusive Economic Zone (EEZ), with the exception of a defined route to and from Block Island in Rhode Island.

VI. Current state-by-state implementation of FMP compliance requirements as of July 1, 1995

The FMP has several compliance requirements, similar in both Amendment 4 and Amendment 5, for states with declared interest. These requirements involve both the operational and regulatory aspects of state striped bass management programs, and are enforceable via the Atlantic Striped Bass Conservation Act.

The operational compliance requirements dictate certain state reporting and monitoring requirements, and are summarized in Amendment 4, Amendment 5, and Table 1 of this report. All states with commercial fisheries (Massachusetts, Rhode Island, New York, Delaware, Maryland, Virginia, PRFC and North Carolina) are required to define the catch composition (age, length, sex) of these fisheries. States with significant commercial fisheries (Massachusetts, New York, Maryland, Virginia, and PRFC) are required to collect catch/effort data. States with significant recreational fisheries (Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Maryland, Virginia and PRFC) are required to follow specific guidelines for collecting catch composition and catch/effort information from these fisheries.

The FMP also requires fishery independent monitoring programs in some states. Juvenile abundance indices are determined by Maine, New York, New Jersey, Maryland, Virginia, and North Carolina. Spawning stock assessments are performed by New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, and North Carolina. Tagging is conducted by state and federal agencies to determine survivorship and migration patterns in the coastal migratory stock. The tagging is done by personnel in NMFS, USFWS and marine fisheries agencies in Massachusetts, New York, New Jersey, Delaware, Maryland, Virginia, and North Carolina.

All states must submit an annual harvest report for the previous year by April 1. The report summarizes the activity and results of monitoring programs required by the FMP, the regulations in effect, and estimates of harvest/nonharvest losses.

Regulatory compliance requirements dictate quotas, minimum sizes, season lengths, and creel limits for state striped bass fisheries. During 1994, states operated under Amendment 4 to the FMP, which dictated a commercial harvest cap equal to 20% of the state's average harvest from 1972-1979. Recreational fisheries in non-restored producer areas must be constrained by an 18" minimum size and accompanying measures that maintain fishing mortality at or below 0.25. The Hudson River, which has sustained no stock collapse, was allowed a fishing mortality rate of 0.50 during 1994. Coastal recreational fisheries are constrained by a minimum size of 34" (28" with appropriate fishing season), and a creel limit of 1 fish per day. Some states have been allowed to implement alternative regulations which are conservationally equivalent to these regulations (Table 2).

Amendment 5, implemented in March 1995, also dictates that states submit semi-annual law enforcement activity reports. These reports, in a standardized format, detail the effort and success involved in enforcing striped bass regulations. As of July 1, 1995

VII. Recommendations

1. Continue implementation of Amendment 5 to the FMP in 1995.

2. Begin development of virtual population analysis (VPA) for use in setting coastwide TAC after 1996.

3. Reevaluate the suitability of North Carolina's striped bass fishery management plan in spring of 1995.

Table 1
Status of State Compliance with FMP Operational Requirements
(Y = In compliance, N = Out of Compliance, N/A = Not applicable)

State	Fishery-independent monitoring	Fishery-dependent monitoring	Annual reporting
ME	Y	N/A	Y
NH	N/A	N/A	Y
MA	Y	Y	Y
RI	N/A	Y	Y
CT	N/A	Y	Y
NY	Y	Y	Y
NJ	Y	Y	Y
PA	Y	N/A	Y
DE	Y	Y	Y
MD	Y	Y	Y
PRFC	N/A	Y	Y
DC	N/A	Y	Y
VA	Y	Y	Y
NC	Y	Y	Y

Table 2
Regulatory Compliance Requirements
Recreational Striped Bass Fisheries

STATE	SIZE LIMITS	DAILY CREEL LIMIT	SEASONAL QUOTA (LB)	OPEN SEASON
ME[1]	36" min.	1	none	All year Spawning areas: 1 July - 1 Dec.
NH[1]	32" min.	1	none	All year
MA[1]	34" min.	1	none	All year
RI[1]	28" min.	2	none	All year
CT[1]	28" min.	2	none	1 April - 14 Dec.
NY[1]	**HUDSON RIVER:** 18" min. **OCEAN AND DELAWARE R.:** 36" min.	**HUDSON RIVER:** 1 **OCEAN AND DELAWARE R.:** 1	none	**HUDSON RIVER:** 15 Mar. - 31 Nov. **OCEAN:** 8 May - 15 Dec.
NJ[1]	28" **TROPHY:** 28" min.	2 **TROPHY:** 1/day in addition to regular fishery	Trophy fishery of 224,015 lbs. from commercial cap	Delaware R. spawning grounds : 1 June - 31 March **OTHER RIVERS:** 1 Mar. - 31 Dec. **OCEAN:** All year
PA[1]	34" min.	1	none	Trenton Falls to state line: 1 Jun. - 31 Mar.
DE[1]	28" min.	2	none	All year, except Delaware R. spawning grounds : 1 June - 31 March

[1]State is in compliance with FMP

Table 2
Regulatory Compliance Requirements
Recreational Striped Bass Fisheries

STATE	SIZE LIMITS	DAILY CREEL LIMIT	SEASONAL QUOTA (LB)	OPEN SEASON
MD[1]	**FALL:** 18" **SPRING:** 32" 28 Apr-31 May 26" 1 Jun.-4 Jul. **OCEAN:** 28"	**FALL:** 2 **SPRING:** 1 **OCEAN:** 2	**FALL:** none **SPRING:** Portion of 25,000 fish cap **OCEAN:** none	**FALL:** 1 Sept. - 19 Nov. (rec & charter) **SPRING:** 28 Apr. - 4 Jul. **OCEAN:** 1 Apr.- 31 Dec.
PRFC[1]	**FALL:** 18" **SPRING:** 32"	**FALL:** 2 rec. & charter **SPRING:** 1 rec. & charter	**FALL:** none **SPRING:** Portion of 25,000 fish cap	**FALL:** 16 Sept. - 17 Dec. **SPRING:** 20 May - 4 June
DC[1]	18" min. 36" max.	1	none	5 Jun. - 31 July 1 Sept. - 19 Nov.
VA[1]	**FALL:** 18" min. **SPRING:** 18"-28" **TROPHY:** 32" **OCEAN:** 28" min.	**FALL:** 2 **SPRING:** 2 **TROPHY:** 1 **OCEAN:** 2	**TROPHY:** Portion of 25,000 fish cap	**FALL:** 17 Oct. - 31 Dec. **SPRING:** 16 May - 15 Jun. **TROPHY:** 1-15 May **OCEAN:** 6 May - 31 Dec.
NC[1]	**ROANOKE R.:** 18" min. but no fish between 22"-27" April-May **SOUNDS/RIVERS** 18" min. **OCEAN:** 28" min.	**SOUNDS & RIVERS:** 3 **OCEAN:** 1	**ROANOKE R.:** 29,500 **ALBEMARLE SD.** 15,000 spring 15,000 fall **OTHER SOUNDS & RIVERS:** none **OCEAN:** none	**ROANOKE RIVER** Feb. 19 till quota Wed, Sat, Sun only **ALBEMARLE SD.** Feb. 19 till quota met Nov. 15 till quota met **OTHER SOUNDS & RIVERS:** All year **OCEAN:** 1 Dec - 31 Mar

[1]State is in compliance with FMP

Table 3
Regulatory Compliance Requirements
Commercial Striped Bass Fisheries

STATE	SIZE LIMITS	SEASONAL QUOTA (LB)	OPEN SEASON
ME[1]	no fishery		
NH[1]	no fishery		
MA[1]	34" min.	750,000	1 July until quota reached (3 wks open, 1 wk. closed; 3 wks. open)
RI[1]	37" min. (Hook/line) 20-26" (trap net)	95,366 (Hook/line) 57,092 (trap net)	1 Jan. till quota
CT[1]	no fishery		
NY[1]	24" - 36"	681,745	July 1 - Dec. 15
NJ[1]	no fishery	Trophy fishery of 224,015 lbs. from commercial cap	
PA[1]	no fishery		
DE[1]	18" - 36"	33,867	1 Mar. - 30 April Spawning grounds: 1 June - 31 Mar.
MD[1]	**BAY & RIVERS:** 18" min. **OCEAN:** 24" min.	**BAY & RIVERS:** 1,222,000 **OCEAN:** 100,000	**BAY & RIVERS:** TBA (Pound nets, haul seine) TBA (Hook and line) 1 Dec. 95 - 28 Feb. 96 {Gill net} **OCEAN:** 1 Nov. 95 - 30 Mar. 96 (Gillnets and trawls)
PRFC[1]	18"	229,000	Gillnet: 13 Nov. - 22 Dec. (Mon.-Thurs.) 15 -31 Jan. 96 12 Feb. 96 - 31 Mar. 96 Poundnet: 5-30 June and 1 Sept. -15 Dec. Hook and line: 1 Aug. - 15 Sept. and 1-31 Dec.
DC[1]	no fishery		

[1]State is in compliance with FMP

Table 3
Regulatory Compliance Requirements
Commercial Striped Bass Fisheries

STATE	SIZE LIMITS	SEASONAL QUOTA (LB)	OPEN SEASON
VA[1]	**BAY & RIVERS:** 18" **OCEAN:** 28" min.	876,940	June 1 - Dec. 31
NC[1]	**ALBEMARLE SD.** 18" min. **OCEAN:** 28" min.	**ALBEMARLE SD.** 98,000 3 fish/day in winter **OCEAN:** 334,195	**ALBEMARLE SD.:** 1 Jan. till quota met **OCEAN:** TBA

[1]State is in compliance with FMP

1995 REVIEW OF THE ATLANTIC STATES MARINE FISHERIES COMMISSION FISHERY MANAGEMENT PLAN FOR **ATLANTIC STURGEON** *(Acipenser oxyrhyncus)*

Plan Review Team

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January, 1996

1995 REVIEW OF THE ASMFC FISHERY MANAGEMENT PLAN FOR ATLANTIC STURGEON *(Acipenser oxyrhyncus)*

I. Status of the Fishery Management Plan

Year of the plan's adoption: 1990
Management unit: Maine through Florida
States with a declared interest: Maine through Florida
Active committees: Atlantic Sturgeon Management Board, Aquaculture and Stocking Subcommittee, Plan Review Team

The goal of the FMP is to provide the framework to allow restoration of the Atlantic sturgeon resource to fishable abundance throughout its range. For purposes of this FMP, fishable abundance is defined as 700,000 lbs. per year, which is 10% of the 1890 landings of 7 million pounds. Management objectives include:

1. Protect Atlantic Sturgeon from further depletion;
2. Improve knowledge of the Atlantic sturgeon stock;
3. Enhance and restore the stock of Atlantic sturgeon; and
4. Coordinate Atlantic sturgeon research and management activities throughout the Atlantic coast range.

The Atlantic States Marine Fisheries Commission (ASMFC) sponsored an Atlantic Sturgeon Planning and Assessment Workshop in Sandy Hook, New Jersey from December 11-13, 1995. The workshop was called in light of new and growing concerns over the health of the Hudson River stock, diminishing populations in other areas along the coast, and the adequacy of the 1990 ASMFC fishery management plan (FMP) to protect and enhance these stocks.

After the workshop, the Plan Review Team developed a list of conclusions and recommendations for the Management Board's consideration: these can be found in Section VII of this report.

II. Status of the Stock

The Hudson River continues to support the largest population on the east coast. Several participants at a recent ASMFC sturgeon workshop (see above) spent time

updating and refining the stock assessment model used to analyze the Hudson River population. Evidently, the standard seven (7) foot minimum size mandated in the FMP protects only about 50% of the spawning females in this stock, and protects about 80% of the spawning males. Accordingly, the 5 foot minimum size permitted in New York and New Jersey has probably resulted in recruitment overfishing. In addition, the ratio of males to females in the Hudson population has shown an alarming shift from 6:1 to 3:1 in recent years, with fish over seven (7) feet in length very scarce. Studies funded by the Hudson River Foundation in 1995 suggest that natural production of yearling sturgeon in the Hudson was extremely weak, perhaps fewer than 5,000 fish.

In addition to the Hudson River model output, workshop participants discussed other population trends. Tagging of juvenile sturgeon in the Delaware River system has yielded population estimates that dropped from 5,000 individuals in 1991 to less than 1,000 in 1994, with several fish subsequently captured in the New Jersey commercial fishery. Atlantic sturgeon have not been recorded in Chesapeake Bay since 1979. Other jurisdictions have reported sporadic, incidental captures or remnant populations in isolated river systems.

Certain researchers spent time at the workshop working on fishing mortality estimates for the Hudson stock. They determined that a reasonable means to stock recovery would be a fishing mortality (F) which yields an eggs per recruit (EPR) value that is 50% that of an unfished or "virgin" population. This approach yielded a target F of 0.03, which is far below the current F of 0.20 - 0.25.

III. Status of the Fishery

There are no directed recreational fisheries for Atlantic sturgeon on the east coast. Until recently, coastwide commercial landings have hovered around 200,000 - 300,000 pounds. Implementation of the ASMFC management plan in 1990 required states to impose more severe harvest restrictions, and landings have fallen from a 1990 high of 250,000 pounds to less than 100,000 pounds in 1994.

Recent shortages of caviar have once again made the species very valuable to commercial fishermen, and the Hudson River population provides the only major source of fish. New York and New Jersey now have the primary fisheries on the East Coast, and have been allowed to implement a five (5) foot minimum size with quotas of approximately 18,000 and 15,500 pounds respectively. New York has

exceeded its quota, however, in both 1994 (18,180 lbs. over) and 1995 (788 lb. over). The current FMP has no requirements for overage paybacks in subsequent fishing years, but New York and New Jersey have initiated unilateral proposals for restricting or closing their fisheries in 1996, which should help restore the Hudson stock.

IV. Status of Research and Monitoring

The 1990 FMP does not require any research or monitoring initiatives in participating jurisdictions, except that New York and New Jersey must document landings at their alternative five (5) foot minimum size. Nonetheless, several state and federal agencies have begun or continued research projects on Atlantic sturgeon to further understand the species' life history, genetics, behavior, and aquaculture. Some of these include:

- Reproductive conditions of Hudson River stock (U. Calif./Davis - Hudson River Foundation)
- Diet in marine waters (National Biol. Service, assisted by NJ Dept. of Environmental Protection)
- Hydroacoustic surveys in Connecticut River and Hudson River (National Biol. Service - U.S. Fish and Wildlife Service)
- Mitochondrial DNA analysis to delineate subspecies (NY Univ. and Hudson River Foundation)
- mtDNA analysis to determine stock contributions in NY fishery (NY Univ. and Hudson River Foundation)
- Behavior and diet studies in early life history stages (National Biol. Service)
- Juvenile sturgeon habitat use in Hudson River (U. Mass. and NMFS)
- Ultrasonic telemetry studies of sturgeon movement (National Biol. Service, Hudson River Foundation)
- Fin ray aging studies (Chesapeake Biol. Lab and U. Calif./Davis)
- Sturgeon bycatch in Winyah Bay shad fisheries (SC Wildlife and Marine Resources Commission)
- Tagging of juvenile and adult Atlantic sturgeon in the Delaware and Hudson Rivers (National Biol. Service and DE Dept. of Natural Resources & Environmental Control)
- Survival of juvenile Atlantic sturgeon with pectoral spine and barbel removal (SC Wildlife and Marine Resources Commission)

In addition, the Northeast Fishery Center of the U.S. Fish and Wildlife Service at

Lamar, PA has worked with numerous state, federal, and university partners in developing culture techniques for Atlantic sturgeon. Hudson River brood fish were successfully spawned each year since 1993, and successful studies have been completed on broodfish collection, spawning factors, diet, tagging, and marking techniques.

V. Status of Management Measures and Issues

Mandatory regulatory measures require each state to adopt either:

a). a minimum TL of at least seven (7.0) feet and institute a monitoring program, with at least mandatory reporting of commercial landings, or

b). a moratorium on all harvest, or

c). if a state deviates from either of the above, it must submit alternative measures to the Plan Review Team for determination of the conservation equivalency.

In addition to these mandatory regulations, several recommendations in the FMP are being implemented by the states, including development of a coastwide tagging database, culture techniques, incorporation of shortnose sturgeon issues in Atlantic sturgeon research (and vice versa), stock identification, and management of Atlantic sturgeon in the EEZ.

In 1994, at the request of the Plan Review Team, the Aquaculture and Stocking Subcommittee for Atlantic sturgeon prepared a manual entitled *Breeding and Stocking Protocol for Cultured Atlantic Sturgeon.* This protocol specifies purposes for culture and stocking, genetic and ecological considerations, broodstock selection criteria and minimum numbers necessary to reduce inbreeding, categorizes the major stocks, and suggests stocking numbers and sizes, program planning and duration, and evaluation needs. This manual underwent extensive review by state, federal and other interested parties prior to submission to ASMFC, but has not been officially adopted by ASMFC.

VI. Current State-by-State Implementation of FMP Compliance Requirements as of January 1, 1996.

All east coast jurisdictions are in compliance with the FMP. ME, NH, MA, PA, DC, PRFC, VA, NC, SC, and FL have closures on Atlantic sturgeon fisheries. RI, CT, DE,

MD, and GA have the recommended 7-foot minimum size limit for the species. New York and New Jersey instituted a 5 foot size limit with seasonal restrictions, quotas, mandatory reporting of catch and extensive monitoring. Lacking the current information on the status of the Hudson River stock, when these measures were adopted (NY -1992 and NJ - 1994), the PRT accepted them as conservation equivalents to the 7 ft. minimum size standard. Table 1 lists Atlantic sturgeon regulations by state.

VII. Recommendations/findings of FMP Review Team

1. Atlantic sturgeon stocks in general, and the Hudson River population in particular, continue to decline in spite of measures in an ASMFC species management plan.

2. Fishing mortality on Hudson River sturgeon is six to seven times the level necessary for stock rebuilding.

3. The 5 foot minimum size in New York and New Jersey sturgeon fisheries is no longer conservationally equivalent to the 7 foot standard in the FMP, at the current quotas.

4. Given the excessive mortality, recruitment overfishing, growth overfishing, and skewed sex ratio in the Hudson River population, the PRT recommends that New York and New Jersey adopt one of the following measures (in order of preference):

    a. Possession and harvest moratorium for at least 5 years
    b. Seven foot minimum size *or*
    c. Conservationally equivalent measure to be reviewed by the PRT and Management Board.

5. The current ASMFC fishery management plan for Atlantic sturgeon will not lead to the recovery of the east coast stocks and should be amended. Plan revisions should include a higher minimum size or complete moratorium, enhanced monitoring programs, specifications on the role of cultured fish in stock enhancement and restoration programs, and adaptive management provisions.

6. The recommendations of the Aquaculture and Stocking Committee should be followed.

7. The Management Board should form an Atlantic Sturgeon Technical Committee, Plan Development Team, and Citizen Advisory Panel to assist the PDT in developing a plan amendment to strengthen Atlantic sturgeon conservation efforts coastwide.

Table 1: Atlantic Sturgeon Regulations by State as of 1/96

State	Total Closure	Size Limit (ft.)	Other	In compliance
ME	X			Y
NH	X			Y
MA	X			Y
RI		7		Y
CT		7		Y
NY		5*	Marine and river quotas totalling 17,919 lb. Seasonal restrictions Log books required	Y
NJ		5*	Quota of 15,475 lbs. Log books required	Y
PA	X			Y
DE		7		Y
MD		7		Y
DC	X			Y
PRFC	X			Y
VA	X			Y
NC	X			Y
SC	X			Y
GA		7		Y
FL	X			Y

* When these limits were adopted they were deemed to be conservationally equivalent to ASMFC mandatory measures.

1995 REVIEW OF THE DEVELOPMENT OF A JOINT ATLANTIC STATES MARINE FISHERIES COMMISSION/ MID-ATLANTIC FISHERY MANAGEMENT COUNCIL PLAN FOR **Black Sea Bass *(Centropristis striata)***

Prepared by:

John Carmichael, (ASMFC)

March 1996

1995 Review of the Development of a Joint ASMFC/Mid-Atlantic Fishery Management Council Plan for Black Sea Bass *(Centropristis Striata)*

I. Status of the Fishery Management Plan

The Commission's management of scup was initiated as one component of a multi-species FMP addressing summer flounder, scup and black sea bass. In 1990, summer flounder was singled out for immediate action under a joint ASMFC and Mid-Atlantic Fishery Management Council Plan. Further action on the scup-black sea bass plan was delayed until 1992 to expedite the summer flounder FMP and a series of amendments which followed. Public hearings on the Black Sea Bass FMP are expected during early Spring 1996.

The management unit of the ASMFC/MAFMC joint Plan includes all black sea bass in U.S. waters in the western Atlantic Ocean from Cape Hatteras, North Carolina northward to the Canadian border. The objectives of the plan are to reduce fishing mortality to assure overfishing does not occur, reduce fishing mortality on immature black sea bass to increase spawning stock biomass, improve yield from the fishery, promote compatible regulations among states and between Federal and State jurisdictions, promote uniform and effective enforcement, and to minimize regulations necessary to achieve the stated objectives. Overfishing is defined as fishing in excess of F_{max}, which is equal to F=0.29. This represents an annual exploitation rate of 23%. The plan intends to reduce fishing mortality over an 8 year period.

Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Delaware, Maryland, Virginia, and North Carolina have declared an interest in black sea bass. The Commission's Summer Flounder, Scup, and Black Sea Bass Management Board and the MAFMC Demersal Species Committee guide development of the Plan. The Commission maintains a Scup and Black Sea Bass Technical Committee to address technical issues. A Plan Review Team will be developed once the Plan is approved.

II. Status of the Stocks

With a 1993 annual exploitation rate of 65% (F=1.05) and a 1984–1993 average of 70% (F=1.39) , black sea bass are currently overexploited. Fishing mortality rates exceeded F_{max} from 1984–1993, and the annual exploitation rate neared 75% from

1991–1993. While spring survey indices from the NEFSC recovered from record lows observed from 1979–1982, since 1985 they have stabilized far below the levels of the mid-1970's. Additionally, CPUE in the mid-Atlantic trawl fishery has declined since 1988 to a low of 1.0 metric tons per day in 1993. Recruitment, below average for several years, reached a record low in 1993. If the current low recruitment continues the stock could collapse. In spite of a potential maximum age of 15 years, the age structure is highly truncated with only 4.5% of the stock in 1993 greater than age 3. Since most black sea bass begin life as females and change to males between ages 2 and 5, the truncated age structure may result in a shortage of males and ultimately disrupt reproduction.

III. Status of the Fishery

Black sea bass are taken both commercially and recreationally, with most landings taken in the EEZ. Recreational landings averaged 4.6 million pounds between 1979 and 1993, and accounted for 31 to 87% of the total annual landings. A large proportion of the recreational landings are taken on party and charter boats. Otter trawls and fish pots are the principal commercial gear types. From 1980 - 1993, commercial landings averaged 3.3 million pounds, about half the level that was maintained from 1887 through 1948.

IV. Status of Research and Monitoring

North Carolina monitors length, age, and catch-per-unit-of-effort for scup and black sea bass as part of their winter trawl survey. The Virginia Institute of Marine Science collects information to compute a young-of-the-year index (YOY) for black sea bass as part of their Juvenile fish and blue crab trawl survey. Recruitment and stock abundance data are provided by the NEFSC spring trawl survey. The 20th SARC/SAW reviewed an analytical (VPA) assessment of black sea bass in 1995.

V. Status of Management Measures

The following measures are under consideration for the Black Sea Bass FMP:

Years 1 and 2:

Commercial:

1) 9 in. minimum size;
2) an otter trawl minimum mesh of 4.0 in. for vessels with 100 pounds of

more on board.

3) minimum escape vent of 1 3/8 in. x 6 in. or 2.5 in. in diameter.

Recreational:

1) 9 in. minimum size.

Year 3 and beyond:

Commercial:

1) 10 in. minimum, which may be adjusted annually;
2) otter minimum mesh of 4.5 in. for vessels with 100 pounds or more on board, which may be adjusted annually;
3) minimum escape vent of 1.5 in. x 6 in. or 2.75 in. in diameter;
4) annual quota, with possible trip limits.

Recreational:

1) 10 in. minimum, which may be adjusted annually;
2) a possession limit, which may be adjusted annually; and
3)an open season, which may be adjusted annually.

All years:

1) a moratorium on entry of new commercial vessels;
2) degradable fasteners in traps;
3) maximum roller diameter of 18 in.;
4) provision of a commercial experimental fishery;
5) commercial and party/charter boat, dealer, and operator permits; and
6) commercial and party/charter trip report and dealer reports.

VI. Current State-by State Regulations

As the Plan has not been adopted, there are no compliance criteria at this time.

VI. Recommendations

1. Continue development of the joint FMP.
2. Improve estimation of discard mortality for commercial and recreational fisheries.
3. Determine an appropriate quota management program.
4. Appoint a Plan Review Team.
5. Strive to achieve regulations that are compatible with the South Atlantic Fishery Management Council's black sea bass regulations.

1995 REVIEW OF THE ATLANTIC STATES MARINE FISHERIES COMMISSION FISHERY MANAGEMENT PLAN FOR **BLUEFISH** *(Pomatomus saltatrix)*

Plan Review Team

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1995 REVIEW OF THE ASMFC FISHERY MANAGEMENT PLAN FOR BLUEFISH *(Pomatomus saltatrix)*

I. Status of the FMP

The FMP for the Bluefish fishery was adopted by ASMFC's member states in October, 1989 and approved by the Secretary of Commerce in March, 1990. This FMP, the result of a joint effort by the ASMFC and the Mid-Atlantic Fishery Management Council (MAFMC), is unique in that it represents the first management plan to be jointly developed by an interstate commission and a Federal Fishery Management Council. The goal of the FMP is to conserve the bluefish resource along the Atlantic coast. Five objectives have been adopted:

1. Increase understanding of stock and fishery.
2. Provide highest availability to U.S. fishers; maintain, within limits, traditional uses (commercial fishery not exceeding 20% of total catch).
3. Enhance management throughout the range.
4. Prevent recruitment overfishing.
5. Reduce waste.

States with a declared interest in the bluefish FMP include all member states except Pennsylvania. Management issues are addressed through the ASMFC Bluefish Management Board and the MAFMC Coastal Migratory Species Committee. Technical advice is provided by an ASMFC Bluefish Technical Committee, annual plan monitoring and framework adjustment recommendations are the responsibility of a joint ASMFC-MAFMC Technical Monitoring Committee, and stock assessment issues are handled by the ASMFC Stock Assessment Subcommittee. The Commission and the Mid-Atlantic Council are currently working together on an amendment to the FMP to provide additional management measures to more effectively prevent overfishing.

II. Status of the Stock

The stock is considered to be over-exploited and at a low level of abundance for the period in which recreational catch and survey abundance indices are available (1974-1994). Present recreational catch levels (27.5 million pounds-1994) are about 24% of the catch levels of the early 1980's. Fully-recruited fishing mortality rates (F) for bluefish increased from about 0.2 in 1982 to about 0.45 in 1993 and have been above FMSY since at least 1986. Stock biomass declined from 326,000 mt in 1982, the historic high, to 86,000 mt in 1993, a decrease of 74%. Recruitment varied from 75 to 87 million fish during 1982-1984, but has declined substantially since then, with the best recent year classes recruiting to the stock in 1988 and 1989. Recruitment since 1989 has been below average, and the 1993 year class of 4 million fish is the poorest

in the time series. The NEFSC autumn inshore bottom survey (Cape Cod to Cape Hatteras) is used to predict recruitment. The survey indicated an increase in recruitment in 1994.

The 1993 estimate of fishing mortality was F-0.45 (an exploitation rate of 32%) and exceeded F_{MSY} (0.15 - 0.25), the biological reference point used in the FMP to define overfishing. The mid point of these values, 0.2 equates to an exploitation rate of 16%. Thus, the exploitation rate would have to be reduced 50% (32% to 16%) to achieve F_{MSY}.

III. Status of the Fishery

Commercial bluefish landings, which had declined by over 33% to 10.4 million pounds in 1989, increased to 13.8 million pounds in 1990 and then dropped to the lowest value in the time series of 8.5 million pounds in 1994. The recreational bluefish catch declined steadily from a 1986 value of 114.7 million pounds to 27.5 million pounds in 1994, the lowest value in the time series. Both the 1994 commercial landings and recreational catch were below the 1979 to 1994 average of 13.3 and 77.2 million pounds, respectively.

Five states, RI, NY, NJ, NC, and FL, accounted for over 80% of the commercial landings in 1994 with most landings occurring in the states of New Jersey (22%) and North Carolina (21%).

MRFSS estimates indicate that by number, recreational catches dropped to a series low of 8.9 million fish in 1993 (Table 1). Catches increased in 1994 to 11.8 million fish but were still below the 1979 to 1994 average of 23.9 million fish.

Table 2 provides bluefish commercial landings and recreational catch comparisons.

IV. Status of Research and Monitoring

Most states, as well as NMFS, maintain some provision for bluefish catch reporting through the collection of state commercial landings data and by involvement in the NMFS Marine Recreational Fishery Statistics Survey.

The NMFS autumn trawl survey has been accepted by the bluefish stock assessment subcommittee as the best available measure of bluefish year class success along the Atlantic coast.

Some states conduct fishery-independent resource assessment surveys using trawls, seines, and trammel nets. Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Maryland, Virginia, North Carolina, and South Carolina use trawls to monitor adult and juvenile finfish species, including bluefish. New York uses ocean

and bay haul seines to monitor fish populations. Maryland and Virginia use haul seines in the Chesapeake Bay to monitor fish populations, including bluefish. South Carolina conducts standardized trawl sampling as part of SEAMAP activities for Atlantic Ocean from Cape Hatteras to Cape Canaveral. Bluefish are one of 23 target species being monitored. Georgia uses an estuarine trammel net survey to assess finfish populations, including bluefish.

Massachusetts monitors commercial landings by a dealer survey program. Delaware requires monthly reporting from the commercial gill net fishery. North Carolina samples bluefish from various commercial fisheries to determine the size and age composition of the catch. Connecticut monitors the recreational fishery by use of a "cooperating angler" program. North Carolina monitors size and age composition of bluefish from recreational landings. New York Sea Grant is conducting research on catch and release mortalities of bluefish using S-K funding. Researchers at SUNY, Stony Brook, Marine Science Research Center, are studying the association between spawning season and recruitment of young-of-the-year bluefish in New York.

Due to concerns about the ability of the North Carolina age key to properly characterize the coastwide bluefish stock and ageing errors associated with aging by scales, the Technical Committee has proposed a preliminary study comparing scale and otolith ages of bluefish collected in each state. The study calls for each state to collect scales and otoliths of 10 fish from each 5 inch length increment between 5 and 40 inches. The results will be compiled and reviewed by the Technical Committee. The Committee will the recommend what changes, if any, are justified.

V. Status of Management Measures and Issues

As of February 6, 1995 fourteen states and the Potomac River Fisheries Commission have either implemented the ten fish possession limit for recreational anglers advocated in the FMP or a measure determined to have conservation equivalency. The State of Pennsylvania was exempted from compliance. Table 3 provides a summary of the status of implementation of the recreational possession limit.

As of August 3, 1995 thirteen states have implemented licensing of fishermen who take bluefish for commercial purposes. New Jersey has yet to implement state licensing of commercial bluefish fishermen and Pennsylvania was exempted from compliance.

Developing issues within the fishery.

The Bluefish FMP limits the commercial fishery to 20% of the total catch (recreational catch plus commercial landings) each year. Based on the text in the plan, the purpose of the commercial quota is to maintain the traditional uses of bluefish and protect the stock from a rapid increase in commercial harvest. As such,

the quota does not have a biological basis (i.e., a quota based on estimates of stock size combined with a target fishing mortality rate), but rather addresses an allocation issue.

The decision to implement commercial controls for the upcoming year is based on two separate indices. Index A is a projection of the commercial share for the upcoming year based on a three year moving average of both the commercial landings and the total bluefish catch. Based on 1979 to the 1994 data, the projected 1996 commercial share (Index A) would be 24.9%. Index B is the percent difference in the commercial share from one year to the next. The commercial share (Index B) actually decreased from 1993 to 1994 by 0.6%.

The FMP requires that a commercial quota be implemented for 1996, since the commercial fishery is projected to equal or exceed the 20% limit during the upcoming year (based on Index A). However, the FMP is silent in regard to the calculation of the coastwide quota. Since the commercial quota addresses allocation of the bluefish resource, the quota for 1996 should be based on an estimate of the recreational catch for 1996. In 1994, the Council and Commission decided to use a three year average of the recreational catch for 1991-1993 to estimate the recreational catch for 1995. The projected recreational catch for 1996, based on this methodology and the average catch for 1992-1994, would be 31,754,000 lbs. This allows for a total catch of 39,692,500 pounds (31,754,000/80%). Thus, the coastwide commercial quota in 1996 would be 7,938,500 lbs. (20% x 39,692,500).

On July 28, 1995, the Bluefish Monitoring Committee recommended a 20% reduction in exploitation in 1996 and that such a reduction be accomplished by implementing a 3 fish possession limit or its equivalency and furthermore that possession limit not exceed 10 fish under any equivalency option. The Committee also recommended a 1996 coastwide commercial quota of 7.938 million pounds with allocation to the states based on the per cent landings for each state during the period 1984-93. The recommended commercial quota for 1996 represents a 17% reduction from the 1995 quota.

The Mid-Atlantic Fishery Management Council accepted the Committee's 1996 commercial quota recommendation, but decided to maintain the recreational bag limit at 10 fish. The Commission's Bluefish Management Board initially adopted the recommended quota and 3 fish bag limit. However, in response to the ASMFC Bluefish Citizens Advisory Panel and the testimony of commercial and recreational fishermen, the Board decided to maintain the status quo of 1995 until amendment 1 is completed in 1996, and passed a 10 fish recreational bag limit and commercial quota of 9.583 million pounds. Each state receives the same quota allocation in 1996 as it received in 1995 (Table 4).

Both the Council and Commission recognize that the current Bluefish FMP provides insufficient tools for proper management of this fishery. Therefore, they are working to develop Amendment 1 to the Bluefish FMP. The ASMFC Bluefish

Technical Committee and Citizen Advisory Panel held preliminary discussions of amendment 1 during Fall 1995. The development schedule calls for approval of a hearing draft in April 1996, and final approval of Amendment 1 in late Summer.

VI. Current State-by-State Implementation of FMP Compliance Requirements as of August 1, 1994

The following are specific FMP compliance requirements:

1. Each state must restrict the possession of bluefish by anglers to not more than ten fish per day, or have an ASMFC-approved equivalent conservation program.

2. Each state must restrict its commercial fishery to the quota adopted under procedures specified in the FMP.

The Atlantic States Marine Fisheries Commission's Bluefish Management Board reviewed state commercial quota implementation proposals during the July 27, 1994 meeting in Providence, Rhode Island. The states of Maine, South Carolina, and Georgia were granted exemptions from the commercial quota requirements under the following provisions:

> *"The states of Georgia, South Carolina, and Maine be exempted from the commercial quota requirements of the Bluefish FMP, provided that these states monitor their annual landings and landings not exceed 100,000 pounds in Maine and 20,000 pounds in the other states. These states will provide annual monitoring reports for their commercial quota. This question will be further reviewed and addressed in Amendment #1 to the Bluefish FMP."*

The ASMFC Bluefish Technical Committee reviewed state commercial and recreational management measures during Spring 1995 and recommended to the Bluefish Management Board that all states were in compliance with the provisions of the Plan. On September 11 1995 the Management Board reviewed state regulations and determined that each state was in compliance with the provisions outlined in the plan.

VII. Recommendations of FMP Review Team

1. Work on Amendment 1 should continue.

2. The state of New Jersey should enact a license for fishermen to sell bluefish.

3. A fee should be charged for all commercial permits issued by the state of landing or the National Marine Fisheries Service. The fee charged for

commercial permits should be sufficiently high to discourage their purchase to circumvent the recreational possession limit.

4. The National Marine Fisheries Service (NMFS) collects some biological information from commercially important species through the use of port agents in the states. NMFS should be directed to target commercial landings of bluefish wherever possible. Size and age composition of the fisheries by gear type and statistical area should be collected.

5. Further research on catch and release mortalities should be encouraged. Information on the methodology and value of successful release procedures should be provided to bluefish anglers.

6. Commercial discarding of bluefish should be examined, especially within the shrimp trawling fishery.

7. States are encouraged to participate in the scale - otolith age comparison study that has been proposed by the Technical Committee.

Table 1. Recreational catch from 1979 - 1994 in thousands of bluefish. Data from MRFSS.

Year	Catch (1,000 fish)
1979	35746
1980	41515
1981	31261
1982	27220
1983	30137
1984	26508
1985	22474
1986	30411
1987	27603
1988	13365
1989	17799
1990	16436
1991	18292
1992	11351
1993	8886
1994	11838
Average	23934

Table 2. Bluefish Commercial Landings and Recreational Catch (thousands of pounds) for the period of 1979 to 1994.

Year	Comm.	Rec.	Total	% Comm.
1979	12,410	140,565	152,975	8.1
1980	15,117	153,468	168,585	9.0
1981	16,459	10,1963	118,422	13.9
1982	15,430	82,535	97,965	15.8
1983	15,799	100,042	115,841	13.6
1984	11,862	75,505	87,367	13.6
1985	13,500	60,147	73,647	18.3
1986	14,676	114,727	129,403	11.3
1987	14,503	100,224	114,727	12.6
1988	15,789	62,002	77,791	20.3
1989	10,449	53,656	64,105	16.3
1990	13,770	43,834	57,604	23.9
1991	13,580	51,113	64,693	21.0
1992	11,480	39,345	50,825	22.6
1993	10,027	28,396	38,423	26.1
1994(prelim)	8,501	27,521	36,022	23.6
Average	13,335	77,190	90,525	14.7

Source: NMFS General Canvass and MRFSS data.

Table 3. Status Of Bluefish Fishery Management Plan Implementation by States as of August 3, 1995.

State	10 Fish Recreational Limit	Date Adopted
ME	Yes	5/09/92
NH	Yes	2/27/90
MA	Yes	8/22/90
RI	Yes	3/11/91
CT	Yes*	4/22/94
NY	Yes	9/01/91
NJ	Yes	2/06/95
PA	****	--------
DE	Yes	10/23/90
MD	Yes	5/01/90
PRFC	Yes	7/01/90
VA	Yes	5/01/90
NC	Yes***	7/13/94
SC	Yes	4/10/92
GA	Yes**	9/13/89
FL	Yes	6/17/93

* Connecticut implemented a 10 fish possession limit for bluefish > 12" TL. Possession of bluefish less than 12" in length (snappers) in Connecticut was unlimited. Connecticut's regulation was determined not to have conservation equivalency to the FMP (1991). On April 22, 1994 Connecticut amended their creel limit regulations on bluefish to include snapper bluefish. Connecticut's regulation was approved as equivalent to the FMP (1994).

** Georgia implemented a 15 bluefish creel limit, a minimum size limit of 12" FL and a March 16 - December 31 season. Georgia's regulation determined to have conservation equivalency to the FMP (1990).

*** North Carolina effective 7/13/94 adopted a 20 bluefish creel limit and a minimum size limit of 12" TL. North Carolina's regulation was approved as equivalent to the FMP (1994).

****Exempted from compliance by the ISFMP Policy Board.

Table 4. State-by-state commercial bluefish quotas for 1996 based on a coastwide quota of 9.583 million pounds and 1983-1992 NMFS General Canvass Data (Quotas are unchanged from 1995).

State	1983-92 Total	%	Quota
ME	868,083	0.641	61,433
NH	972,365	0.718	68,813
MA	9,696,199	7.160	686,189
RI	12,019,880	8.876	850,634
CT	1,718,865	1.269	121,642
NY	15,011,672	11.086	1,062,359
NJ	22,023,645	16.264	1,558,589
DE	2,277,700	1.682	161,190
MD	3,877,024	2.863	274,373
VA	12,912,278	9.536	913,788
NC	41,590,251	30.714	2,943,296
SC	37,436	0.028	2,649
GA	10,030	0.007	710
FL	12,397,189	9.155	877,335
TOTAL	135,412,617	100.000	9,583,000

1995 REVIEW OF THE ATLANTIC STATES MARINE FISHERIES COMMISSION FISHERY MANAGEMENT PLAN FOR **NORTHERN SHRIMP** *(Pandalus borealis)*

Plan Review Team
George Lapointe (ASMFC), Chair
Doug Grout (NH)
Dan Schick (ME)

March 1996

1995 REVIEW OF THE ASMFC FISHERY MANAGEMENT PLAN FOR NORTHERN SHRIMP *(Pandalus borealis)*

I. Status of Fishery Management Plan

- Date of FMP approval: October 1986
- Lead agency and group with purview: ASMFC, Northern Shrimp Section
- Management unit: Western Gulf of Maine Northern Shrimp Stock
- States with declared interest: Maine, New Hampshire, Massachusetts
- States added/deleted since last review: None
- List of active boards/committees: Northern Shrimp Section, Northern Shrimp Technical Committee.

This plan presents a management approach for the western Gulf of Maine northern shrimp stock which is intended to generate the greatest possible economic and social benefits from its harvest over time. Regulatory measures have been designed to optimize yield, recognizing that natural fluctuations in abundance will occur.

II. Status of the Stock

The Technical Committee has developed indices of abundance and biomass (stratified mean catch per tow (CPT) in numbers and weight) from summer trawl survey data (1984-1993). Index values for both numbers and weight peaked in 1986 and 1990 with the recruitment, growth, and subsequent passage of the strong 1982 and 1987 year classes through the fishery. In 1993, the CPT of (assumed) age 1 shrimp showed a marked improvement over 1989-1992 levels, indicating the presence of a strong 1992 year class. Based on CPT data, this year class appears to be somewhat smaller in size than the 1987 year class and is not expected to begin recruitment to the fishery until the 1995 winter season.

Although conditions for the resource as a whole have improved in 1993 due to the appearance of a strong 1992 year class, the 1993 index of harvestable biomass (9.69 kg) shows no significant improvement over the 1992 value (9.17 kg) which was the lowest in the time series. Instantaneous total mortality (Z), after averaging 0.60 during 1986-1990, increased to an average of 0.90 for 1991-1992 but has since dropped to 0.70 in 1993. These estimates are much lower than levels observed during the early to mid-1970s and suggest that current exploitation rates are within acceptable

limits.

III. Status of the Fishery

Most shrimp fishing in the Gulf of Maine is conducted by otter trawling, although a small trap fishery is employed off the central Maine coast. The number of vessels estimated to have participated in the 1992 and 1993 fisheries was about 275 (over 70% were from Maine ports), a decline from earlier years (1982-1991) when 300-400 vessels participated. The number of fishing trips increased considerably since the late 1970s. Total trips peaked at 12,300 during the 1987 season, but has since shown a decline, dropping to 9,000 trips in 1995.

Annual landings of Gulf of Maine northern shrimp declined from an average of 11,400 metric tons (t) during 1969-1972 to about 400 t in the late 1970s. In the 1980s, landings increased steadily to slightly over 5,000 t in 1987 and then dropped to less than 3,100 t in 1988. Annual landings rose again to 4,400 t in 1990 but have shown a declining trend since then, with data for the 1994 fishing season indicating a total of 3,7000t of shrimp landed.

Decreases in effort and landings in recent years are thought to be a reflection of diminishing resource conditions and stricter fishing regulations.

IV. Status of Research and Monitoring

The Technical Committee continues to conduct the northern shrimp trawl survey each August aboard the NMFS research vessel, *R/V GLORIA MICHELLE*. Both state and federal agents sample the commercial catch coastwide to provide information on age and sex composition; federal efforts are relied on to collect catch and effort statistics. Since 1989, the NMFS Domestic Sea Sampling Program has provided valuable insight into the magnitude of demersal finfish bycatch that occurs in the Gulf of Maine northern shrimp fishery. This effort was enhanced in 1993 by additional sea-sampling conducted by the Massachusetts Division of Marine Fisheries. Hopefully, future work in this area will lead to development of definitive estimates on a species by species basis.

Trawls designed to reduce mortality on non-targeted finfish species have become a key management tool in this fishery. Finfish separator and excluder devices (the

Nordmore Grate) are currently regulated, while testing of gear refinements continues. It is crucial to the longevity of this fishery and to those fisheries with which it interacts, that this work proceed.

V. Status of Management Measures & Issues

Management of northern shrimp is somewhat unique in that the participating states of Maine, New Hampshire and Massachusetts have designated the ASMFC as the joint regulatory agency under Amendment One to the ASMFC Compact.

For the 1994/95 season, the Technical Committee recommended a three month fishing season (Jan.-Mar.) in order to reduce exploitation on a declining northern shrimp resource. Following public hearings, the Northern Shrimp Section approved: 1) a December 15, 1994-April 15, 1995 season, 2) gear restrictions that included a net mesh minimum size of 1 3/4 inches, a maximum length for ground cables, legs, bridles, etc. in any combination of 15 fathoms and such ground cables had to be bare or uncovered wire or chain 3) the mandatory use of the Nordmore Grate system installed in the trawl, or other approved finfish excluder trawls, and 4) a restriction prohibiting the bycatch of regulated groundfish species.

In addition, boats fishing for shrimp in the Exclusive Economic Zone (EEZ) were required to get an Exempted Fisheries Program Certificate from the NMFS.

VI. Current State-by-State Implementation of FMP Compliance Requirements as of August 1, 1995.

Requirement	Implementation Date	ME	NH	MA
1 3/4" Mesh Size	immediate	Y	Y	Y
Season Limits	immediate	Y	Y	Y
Info. Collection	immediate	Y	Y	Y
Bycatch Reduction Provisions	immediate	Y	Y	Y

VII. Recommendations of the FMP Review Team

1. This review finds no need to update the 1986 Northern Shrimp FMP.

2. All current research and monitoring activities are essential to the long-term management of the fishery and should be maintained, giving priority consideration to the summer trawl survey as the Technical Committee's principal assessment tool.

3. Since the northern shrimp fishery in the western Gulf of Maine can have significant impact on other fisheries, efforts to quantify the magnitude of bycatch by species, area and season need to be continued, and the steps necessary to limit negative impacts must be taken.

1995 REVIEW OF THE ATLANTIC STATES MARINE FISHERIES COMMISSION FISHERY MANAGEMENT PLAN FOR **RED DRUM** *(Sciaenops ocellatus)*

Plan Review Team

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March 1996

1995 REVIEW OF THE ASMFC FISHERY MANAGEMENT PLAN FOR RED DRUM *(Sciaenops ocellatus)*

I. Status of the Fishery Management Plan

The Commission adopted a fisheries management plan for red drum in 1984. The original management unit included the states from Florida to Maryland. In 1988, the ISFMP Policy Board requested all states from Florida to Maine to implement plan requirements to prevent development of northern markets for southern fish. This action was the first of two revisions to the 1984 plan. The second revision came with adoption of Amendment #1 in 1991. Amendment #1 replaced the 1984 plan with one developed jointly between the Commission and the South Atlantic Fishery Management Council. The plan adopted by the Council prohibits harvest of red drum in the Exclusive Economic Zone (EEZ), thereby placing regulatory responsibility at the state level. However, cooperative state/federal efforts are augmented under provisions in the Council plan to direct federal data collection and analyses for long-term objectives to rebuild overfished stocks.

The goal of Amendment #1 is to attain optimum yield from the fishery over time. Optimum yield is defined as the amount of harvest that can be taken while maintaining the spawning stock biomass per recruit (SSBR) level at or above 30% of the level that would result at a fishing mortality rate of F=0. The management objectives are: 1) assure escapement by controlling fishing mortality; 2) address incompatibility and inconsistency among state and federal regulations; and 3) promote cooperative collection, analysis, and utilization of biological and socio-economic data.

II. Status of the Stock

Because no direct estimates are available on the current status of the adult stock, model results imply potential longer term, equilibrium effects. It is important to remember that population models used in the assessment (specifically yield per recruit and maximum equilibrium spawning potential) are based on equilibrium assumptions.

Estimates of 1992-94 escapement (relative survival of red drum from age at entry to fishery to age 4) range from 10.4% for the northern region (NC and north) and 17.2% for the southern region (South Carolina and south). Unpublished data from Florida show much higher escapement rates of between 55-62%; this may mean that escapement rates in Georgia and South Carolina are lower than the regional estimate. Estimates of maximum equilibrium spawning potential (the ratio of

spawning stock biomass per recruit with and without fishing mortality) range from 9.0% for the northern region (NC and north) and 14.0% for the southern region (South Carolina and south). This may be an overestimate because most states north of Georgia allow a fishery for adults and the analysis assumes no adult fishing mortality.

Fishery independent data collected by Georgia and North Carolina indicate that the question of when offshore emigration or reduced availability begins (during or after age 3) continues to be a source of bias which tends to result in overestimates of fishing mortality. Since no direct estimates are available on the current status of the adult stock, model results imply potential longer term, equilibrium effects. In this regard, the joint Commission/Council plan development team maintains that the MRFSS, as the basis of management data, provides insufficient information to assess the status of red drum stocks.

III. Status of the Fishery

Since 1980, no landings of red drum have been recorded in states north of New Jersey. Of the mid-Atlantic states, Virginia and Maryland have reported small landings since the 1980s. South Atlantic commercial landings show no particular temporal trends, averaging about 300,000 pounds annually. Based on available information from tagging studies, a large portion of harvests in state waters appear to be supported primarily by catches of sub-adult red drum (0-5 yr).

Historically, the major commercial producers have been North Carolina and Florida. No commercial harvests are allowed in Florida under current state regulations, and commercial harvests of red drum in North Carolina are controlled by an annual quota. The present mid-Atlantic recreational fishery extends from Maryland southward along Virginia's barrier islands, into the Chesapeake Bay. However, the National Marine Fisheries Service (NMFS) Marine Recreational Fisheries Statistics Survey (MRFSS) recorded no landings north of Virginia during 1993.

In 1994, total catch was 1,915,700 lbs with recreational anglers accounting for 92% of the harvest.

IV. Status of Research and Monitoring

In cooperation with the states, information on status of the stocks has been compiled by the NMFS laboratory in Beaufort, North Carolina annually since 1990. Additional fishery independent data are collected by the states which have been utilized at the Beaufort lab for coastwide stock assessments. Virtual population

analyses utilizing the MRFSS as a the primary data source for the stock assessment, form the basis for the current management program. Additional fishery independent data are collected by Georgia and North Carolina.

In November, 1994, the states of North Carolina, South Carolina, and Georgia initiated a multi-year study to collect fishery-independent data utilizing trammel nets and tagging techniques. The Florida Marine Research Institute continues to monitor juvenile red drum abundance in the northern Indian River Lagoon. A monitoring program, which uses trammel nets to catch subadult red drum for tagging and age composition sampling, also continues in Florida.

V. Status of Management Measures and Issues

With approval of Amendment #1, the Commission adopted a "phased-in" approach to attain the management goal of 30% SSBR in the fishery. The initial phase requires all states to adopt measures which would achieve a 10% SSBR; this requirement appears to have been met. However, the next step necessary in this approach toward attaining a 30% SSBR remains unclear. Confidence in available data and the lack of information on adult stocks have caused the process to languish.

In order for the Commission and South Atlantic Council to continue to work jointly and move toward attainment of the 30% SSBR goal, an amendment process would have to be initiated for both the state and federal plans. An amendment to the federal plan would require a rebuilding schedule as mandated by the federal 602 regulations. Such a schedule could help clarify the next step in the Commission's "phased-in" approach to plan implementation. Development of a Council amendment also would require the National Marine Fisheries Service to provide fisheries data to support these activities in order to update the Council's Red Drum Source Document.

Currently, the consensus of the Commission/Council joint Plan Development Team is to await the results of a the multi-state, fishery-independent study underway in Georgia, South Carolina and North Carolina which would help fill in current data gaps. Initiation of a joint plan amendment process should not begin until analysis of the multi-state independent sampling project is completed, currently anticipated in 1998.

VI. Current State-by-State Implementation of FMP Compliance Requirements as of August 1, 1994

Amendment #1 designates a series of steps to achieve the target SSBR level of 30%. Currently, the South Atlantic Board has determined that the states must adopt the plan requirements which will attain an SSBR level above 10% (first step of phased-in approach). The 10% scenario requires states to adopt either of two options:

1) 18-in. TL min., 27-in TL max., and a 5-fish bag limit with one fish exceeding 27 in. TL; or

2) 14-in. TL min., 27-in. TL max., and 5-fish bag limit, with no fish exceeding 27 in. TL.

Based on the most recent assessment (Vaughan 1995), the first step of the phased in approach (SSBR > 10%) appears to have been met.

Table 1 presents current state regulations for red drum. North Carolina manages its commercial fishery using a quota and size limits.

VII. Recommendations of FMP Review Team

1. The Commission and the Regional Fishery Management Councils should continue to collaborate on cooperative review of stock assessments and formulation of management measures.
2. States north of New Jersey should adopt the plan management measures.
3. The management unit should be divided at the North Carolina/South Carolina border, and thus be managed as two separable subunits of an Atlantic stock.
4. States should maintain annual age-length keys.
5. Mark-recapture and genetic discrimination should be a research priority for definition of unit stock on adults.
6. Conduct fishery-independent sampling of subadult and adult red drum on an interstate basis.
7. Research on stock enhancement should focus on genetic implications and cost benefits. The introduction of unmarked fish should be discouraged until efficacy of such an approach is validated.
8. Additional research on temporal and spacial aspects on red drum is needed after higher priority research needs established above have been accomplished.
9. A technical review of North Carolina's commercial quota should be made

to determine its conservation equivalency in relation to the two management options in the plan.

10. States with significant fisheries should be encouraged to collect socio-economic data on red drum fisheries through add-ons to the MRFSS or by other means.
11. The NMFS MRFSS should increase effort to intercept nighttime fisheries for red drum.

Table 1. 1995 Atlantic Coastal States' red drum regulations, north to south as of August 1, 1995.

State	Size Limit (TL in)	Possession Limit	Other Measures	Meets Plan Requirements
ME*	none	none	none	N/A
NH*	18 - 27	none	0 fish > 27" TL	N/A
MA*	Minimum 14	none	none	N/A
CT*	none	none	0 fish < 32" TL	N/A
RI*	none	none	none	N/A
NY*	14 min.	none	2 fish > 32" TL	N/A
NJ	18 min.	none	2 fish > 32" TL	yes
PA**	none	none	none	no
DE	18 min.; 27 max.	5 fish	1 fish >27" TL	yes
MD	18 min.; 27 max.	5 fish	1 fish > 27" TL	yes
PRFC *	18 min.; 27 max.	5 fish	1 fish > 27" TL	yes
VA	18 min.	5 fish	1 fish > 27" TL	yes
NC	18 min.	5 fish	1 fish > 27" TL; Commercial quota=250,000 lb.; No sale over 27"	yes
SC	14 min; 27 max.	5 fish	gamefish - no sale	yes
GA	14 min.	5 fish	0 fish > 27" TL	yes
FL	18 min.	1 fish	gamefish - no sale	yes

* states not within management unit, but requested to implement complementary regulations

** no fisheries are prosecuted for red drum in Pennsylvania

Note: No harvest of red drum is allowed in Federal waters (3-200 miles) under the South Atlantic Fishery Management Council Plan.

1995 REVIEW OF THE DEVELOPMENT OF A JOINT ATLANTIC STATES MARINE FISHERIES COMMISSION/ MID-ATLANTIC FISHERY MANAGMENT COUNCIL PLAN FOR **SCUP** *(Stenotomus chrysops)*

Prepared by:

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March 1996

1995 Review of The Development of A Joint Atlantic States Marine Fisheries Commission/Mid-Atlantic Fishery Managment Council Plan For Scup *(Stenotomus chrysops)*

I. Status of the Fishery Management Plan

The Commission's management of scup was initiated as one component of a multi-species FMP addressing summer flounder, scup and black sea bass. In 1990, summer flounder was singled out for immediate action under a joint ASMFC and Mid-Atlantic Fishery Managment Council Plan. Further action on the scup-black sea bass plan was delayed to expedite the summer flounder FMP and a series of amendments which followed. In 1993 the Commission and Council resumed work on a scup FMP.

A draft scup FMP for pulic hearing was approved by the Commission and the Council in December 1994, and public hearings were held in July 1995. The Commission is expected to approve the Scup Fishery Management Plan in Spring 1996.

The FMP includes a seven year plan for reducing fishing effort and restoring the stock. The primary concerns are excessive discarding of scup and near collapse of the stock. Among the management measures to be implemented in the first year of the plan are: dealer and vessel permitting and reporting, 9" commercial minimum size, 4" mesh restriction for vessels retaining over 4,000 pounds of scup, and a 7" recreational minimum size. The biological reference point to define overfishing is F_{MAX}, defined as F=0.25.

A coastwide Total Allowable Catch (TAC) will be implemented in the second year of the plan. The TAC will be set yearly and separated into a commercial quota and a recreational harvest limit. During the first year of the plan, a procedure for management and distribution of the coastwide commercial quota will be developed by the Commission. To provide managment flexibility for addressing unforseen conditions in the fishery, the plan contains framework provisons that allow implementation of time and area closures. Changes in the recreational minimum size may also be made through framework procedures.

States with a declared interest in the Scup FMP include Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Delaware, Maryland, Virginia, and North Carolina. The Commissions Summer Flounder, Scup, and Black Sea Bass Management Board serves as the species management board, and the Demersal Species Committee guides plan development for the MAFMC. The Commission maintains a Scup Technical Committee, and the Management Board will appoint a Plan Review Team in spring 1996.

II. Status of the Stock

Scup were assessed under the 19th Northeast Regional Stock Assessment Workshop (19th SAW). The Consensus Summary of the Stock Assessment Review Committee (SARC) indicated that scup are currently overfished and at a low biomass level. Fishing mortality is excessive and beyond any biological reference points, averaging F=1.36 between 1984 and 1993 and ranging from F=0.96 in 1990 to F=2.13 in 1988. Recruitment has declined since the mid-1980's, with the 1991 and 1992 year classes among the weakest. Spawning stock biomass has declined steadily to a record low of about 10 million pounds in 1993. The age structure is highly truncated, with only 6.5% of the stock in 1992-1993 age 3 and older. Of special concern is the targetting of younger, immature fish by the fishery, with ages 0-2 averaging 74% of the total catch (numbers of fish) during 1984-1991 and 87% in 1992-1993. The SARC cautions that recruitment failure in a single year could result in a collapse of the fishery.

III. Status of the Fishery

The low abundance of scup is reflected in the reduced commercial landings in recent years. The 9.7 million pounds landed in 1993 is only 20% of the over 48.5 million pound peak observed in 1960, is a 25% decline from 1992, and is only slightly above the record low of 8.2 million pounds landed in 1989. Annual commercial landings averaged under 22 million pounds during 1930–1947, increased to over 41 million pounds from 1953-1964, then declined to averages between 15 and 22 million pounds from 1974 to 1986. Since 1987, landings have varied between 8 and 13 million pounds. Commercial landings have accounted for about 70% of the total landings since 1983, with otter trawls being the predominate gear. Coastwide from 1983 to 1992, about 69% of the scup landed commercially came from the Exclusive Economic Zone (EEZ). However, in New England, landings are fairly equally divided between state waters and the EEZ, and in North Carolina landings are almost exclusively from the EEZ. More scup are harvested in Rhode Island than any other state, and Rhode Island, New York, and New Jersey typically account for over 80% of the total coastwide landings.

The recreational fishery for scup is significant; recreational fishermen accounted for 20 to 50% of total annual catches from 1984–1993. Recreational fishermen caught over 5.6 million scup in 1994, which is less than half the 1983–1994 average of 12 million fish and is the lowest catch observed over the time period. Recreational fishermen released from 13–24% of their catch during 1983–1994. Most recreational landings come from state waters. By state, anglers in New York catch the greatest proportion of scup , and anglers from New York to Massachusetts accounted for over 97% of the average annual landings from 1983 to 1992.

IV. Status of Research and Monitoring

Abundance indices are available from surveys conducted by the NEFSC, Massachusetts, Rhode Island, Connecticut, and the Virginia Institute of Marine Science.

V. Status of Management Measures and Issues

The Draft FMP establishes a 7 year program for reducing exploitation on scup and restoring the stock. It also specifies minimum size requirements and commercial gear restrictions including a minimum mesh size, a maximum roller diameter, and pot and trap degadeable fastener and escape vent provisions. Commercial operator, vessel and dealer reporting and permitting requirements are included in the FMP. Management measures that could be implemented in the future under framework provisions include seasonal and area closures.

Overexploitation and excessive discarding are important issues in development of the scup FMP. The proposed management measures can deal directly with overexploitation, but excessive discarding is a more difficult matter. Scup is a component of the Mid-Atlantic mixed species trawl fishery which relies principally on summer flounder, scup, and black sea bass, and also harvests Loligo squid and winter, witch, and yellowtail flounder. Management measures designed for a directed scup fishery will not be succesful if they lead to increased discards by non-directed fisheries, and must therefore address the needs of the resource while considering the realities of a number of fisheries. Framework measures enacted through this FMP could be used to manage the mixed trawl fishery as a strategy for addressing its' problems is developed.

There is a lack of uniform management among states and between State and Federal jurisdictions. Since scup are highly migratory, fishing activities in the EEZ or individual states could adversely impact the stocks. This also leads to confusion regarding regulations and enforcement difficulties.

Data collection should be improved so that the management system may better respond to the needs of the fishery.

VI. Recommendations

1. Continue joint development of the Scup FMP with the Mid-Atlantic Fishery Management Council;
2. The Technical Committee should conduct a survey of scup research and monitoring activities by state and develop a list of research needs;
3. A Plan Review Team should be created;

4. The Scup Advisory Panel should be finalized and provide input for addressing problems with the mixed trawl fishery.

VII. Implementation of FMP Compliance Requirements as of August 1, 1995

As this FMP is still under development, there are no compliance requirements at this time.

1995 DRAFT REVIEW OF THE ATLANTIC STATES MARINE FISHERIES COMMISSION FISHERY MANAGEMENT PLAN FOR **SPANISH MACKEREL** (*Scomberomorus maculatus*)

Plan Review Team

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March 1996

1995 DRAFT REVIEW OF THE ASMFC FISHERY MANAGEMENT PLAN FOR SPANISH MACKEREL (*Scomberomorus maculatus*)

I. Status of the Plan

The federal Fishery Management Plan for the Coastal Migratory Pelagic Resources (1983) and the Atlantic States Marine Fisheries Commission's Fishery Management Plan for Spanish Mackerel (1990) manage Atlantic Group Spanish mackerel in the state and federal Atlantic waters south of the New York/Connecticut border through the east coast of Florida. The states of Florida through New York, excluding Pennsylvania, have a declared interest in the ASMFC Spanish mackerel FMP. The goal of the ASMFC Spanish Mackerel FMP is to complement federal management in state waters, to conserve the Atlantic Group Spanish mackerel resource throughout its range, and to achieve compatible management among the states that harvest Spanish mackerel. The ASMFC FMP objectives are to: 1) allow recovery of overfished populations and stabilize the stock at a level to produce MSY; 2) achieve compatible management throughout the range; 3) provide a flexible management system responsive to changes in the fishery and/or information; 4) promote cooperative interstate research and comprehensive monitoring activities and establish mandatory, timely reporting for quota monitoring; 5) minimize disruption of traditional fisheries and markets; and 6) minimize waste in the fishery.

Atlantic Group Spanish mackerel are managed on the basis of the annual recommendations of the joint Gulf of Mexico and South Atlantic Fishery Management Councils-appointed Mackerel Stock Assessment Panel, a technical group which reviews the stock assessments and makes annual determinations of Acceptable Biological Catch (ABC). The South Atlantic Fishery Management Council (SAFMC) determines needed annual adjustments to regulatory measures such as TAC, bag limits, size limits, and trip limits. The SAFMC's Mackerel Committee includes representatives from the Mid-Atlantic Council and a fishermen's Advisory Panel incorporating South Atlantic and Mid-Atlantic representation in their deliberations. A Plan Review Team comprised of Council, Commission, and State representatives annually reviews the status of implementation of the interstate FMP and reports to the South Atlantic Board. The South Atlantic State/Federal Fisheries Management Board serves as the Commission's Spanish mackerel management board and reports to the ISFMP Policy Board. The interstate FMP is intended to be a flexible plan which tracks the

federal FMP; thus, the SAFMC has the lead on Spanish mackerel management.

The consensus of the Spanish Mackerel Plan Review Team is that the goal of the plan and its management objectives continue to be valid. Significant progress toward implementation of the interstate Spanish mackerel plan has been made by the South Atlantic and most Mid-Atlantic States.

II. Status of the Stocks

The Mackerel Stock Assessment Panel (MSAP) conducted a partial stock assessment for Atlantic Group Spanish mackerel in 1995. These analyses included virtual population analyses of estimated numbers caught at age. The expected yield from Atlantic Group Spanish mackerel for the 1994/95 fishing year (FY 94/95) is **6.0** million pounds. Results of the 1995 partial assessment of the Atlantic Group Spanish mackerel indicate the current fishing mortality rate on fully recruited year classes (2+) is 0.49, which is less than the $F_{30\%\ SPR}$ fishing rate of 0.68. The median SPR at the beginning of FY 95/96 is estimated to be 55%. The 1995/96 Allowable Biological Catch (ABC) range is 4.9 to 14.7 million pounds. The Atlantic Spanish Mackerel assessment analysis is predicated on very minimal estimates of bycatch. Inclusion of bycatch in the 1996 assessment is expected to lower the ABC and SPR. The Atlantic Group Spanish mackerel is considered by the MSAP not overfished for the current fishing year. Cooperative State/Federal management has achieved a successful stock recovery.

III. Status of the Fishery

Spanish mackerel remain important recreational and commercial fisheries in South Atlantic waters and are gaining importance in the Mid-Atlantic states. Trip limits implemented in state and federal waters off Florida continued to prevent premature closure of the commercial fishery before the end of the fishing year.

During FY 94/95, Florida was again the major commercial producer of Spanish mackerel, accounting for 75% of the 94/95 commercial landings of 4,135,592 pounds (Table 1). The July 1, 1995 net ban will no doubt have a great effect on future commercial landings in Florida, and change the characteristics of the fishery. North Carolina and Virginia were the other major producers, accounting for 21% of the FY 94/95 commercial landings. The commercial fishery continued to expand in the

northern range of the stock. Approximately 148,000 pounds of Spanish mackerel were landed commercially from New Jersey northward, with catches in New York almost tripling from 1993. The commercial fishery coastwide is predominantly in state waters.

The Marine Recreational Fisheries Statistics Survey (MRFSS) estimates that total recreational catch during FY 1994/95 was 1,336,000 pounds. The fishery's resurgence into the stock's historical northern range continues.

IV. Status of Research and Monitoring

In addition to conducting the bi-annual stock assessments, the NMFS-Southeast Fisheries Center (SEFSC) is studying length and weight at age and size frequency; fishing mortality and migration; collecting age data and CPUE by area, season, fishery, and gear; monitoring bycatch from shrimp trawls; investigating methods to predict year class strength and calculating estimates of recruitment. The NMFS is also collecting economic information through a North Carolina State University demand study on finfish. The Gulf and South Atlantic Fisheries Development Foundation and several states (NC, SC, GA, and FL) are evaluating finfish bycatch in the southeastern shrimp trawl fishery, inclusive of Spanish mackerel.

Abundance trends continue to be monitored primarily through fishery dependent sources. Catch is monitored by the States and the NMFS-SEFSC through the cooperative commercial statistics collection program and the MRFSS. The commercial catch is monitored most intensively in the winter and early spring by the State of Florida and the NMFS as the commercial quota is approached.

V. Management Measures

In response to the 1995 MSAP Report, the SAFMC has recommended a Total Allowable Catch (TAC) for FY 1994-95 of 9.4 million pounds, which is 200,000 pounds above the 1993/94 season TAC. This TAC is allocated equally, at 4.7 million pounds and 3.1 million fish (4.6 million pounds) to the commercial and recreational sectors. The bag limits in federal waters for FY95-96 will remain 10 fish per person per day throughout the stock's management range (Florida through New York). Trip limits for the commercial fishery in federal waters remain unchanged, with incremental limits off Florida and a year-round 3,500 pound daily

possession/landing limit for vessels from Georgia through New York. The timing of the fishing year is such that it is unlikely the commercial quota will affect any of the Mid-Atlantic states. The commercial fishery coastwide has been predominately in state waters; however, the Florida state net ban, which became effective on July 1, 1995 will likely shift the fishery into federal waters. States are beginning to implement effort control, North Carolina has implemented a two-year moratorium on issuance of new commercial licenses. Maryland has capped its commercial licenses at the existing number for a five-year period. Virginia has a two-year delayed entry into its gill net fishery. New York has a restrictive period for commercial licensing of non-residents and income-related eligibility requirements associated with certain fisheries.

VI. Implementation of FMP Compliance Requirements as of August 1, 1995.

Since adoption of the interstate Spanish mackerel FMP in 1990, South and Mid-Atlantic states have responded to the plan's recommendations through implementation of bag limits, size limits, commercial trip limits, and/or provisions for seasonal closures (Table 2) to complement the Council's measures for federal waters. In February, 1994 the South Atlantic State/Federal Fishery Management Board determined the following measures of the ASMFC Spanish Mackerel FMP to be mandatory for compliance with the interstate plan: quota closures, 10 fish bag limit, 12-inch fork length minimum size, 3.5-inch minimum stretch mesh size for the directed gill net fishery, and commercial trip limits or landing restrictions (3,500 lb/trip from Georgia through New York; incremental trip limits in Florida). The suspense date for compliance was March 20, 1995. All nine states with a declared interest have achieved full regulatory compliance with the ASMFC plan. The recovery of the Spanish mackerel fishery throughout its historical range continues to benefit from management measures in State waters (Florida in particular) and federal waters.

VI. Recommendations

A. Regulatory Recommendations

1. The passage of a constitutional amendment banning nets in Florida waters is expected to displace the southeast Florida gill net fishery into adjacent federal waters and/or into state and federal waters north of Florida. In order to prevent disruption of traditional fisheries and avoid user conflicts, it is

recommended that states with commercial Spanish mackerel fisheries north of Florida adopt the recommended trip limits.

2. States should be considered *de minimis* with regard to trip and landing limits (FMP measure 8.6.8) if their landings are less than five percent of the target commercial quota. If a state's landings are 5% or greater of the target commercial quota, the state should implement the required trip or landing limits in the next fishing year. Any state with de minimis status should provide monitoring reports for their commercial fishery on a timely enough basis to prevent quota overages.

3. The quota closure requirement should not be applicable to the states north of Florida as long as the fishing year remains April-March.

B. Amendments

1. In light of the mandatory nature of state regulatory requirements implied as a result of federal action, it is preferable that the Commission have a mechanism to independently affirm those measures. This can be accomplished through:

   a. an amendment to the ASMFC plan to incorporate a framework mechanism for tracking the federal FMPs adjustments to TACs, bag limits, size limits, trip limits, and other regulatory measures.
   b. a joint federal/interstate FMP for Spanish mackerel.

   Given limited resources, the latter is probably the most efficient mechanism to accomplish complementary state/federal management of Spanish mackerel, with the South Atlantic Council remaining as lead. However, a joint plan is not feasible until the SAFMC has a separate FMP for coastal migratory pelagics, which is being discussed. Until an amendment or joint plan is feasible, South and mid-Atlantic states should remain actively involved in the joint councils' regulatory process for Atlantic Group Spanish mackerel. The SAFMC Mackerel Committee could be expanded to have more MAFMC representation.

2. The federal and interstate FMPs should clarify what constitutes a directed fishery.

C. Research and Monitoring Recommendations

The following information and research needs have been identified in the 1994 Report of the Mackerel Stock Assessment Panel, with the first two considered priority:

1. Determine the bycatch of spanish mackerel in the directed shrimp fishery in Atlantic Coastal waters
2. Evaluate potential bias of the lack of appropriate stratification of the data used to generate age-length keys for Atlantic and Gulf spanish mackerel
3. Develop fishery independent methods of monitoring stock size of Atlantic spanish mackerel (consider aerial surveys used in south Florida waters)
4. Evaluation of CPUE indices relative to standardization methods and management history, with emphasis on greater temporal and spatial resolution in estimates of CPUE.
5. Completion of research on applicability of assessment and management models for dynamic species such as Spanish mackerel.
6. Yield per recruit analyses are needed relative to alternative selective fishing patterns.
7. States should be encouraged to consider MRFSS add-ons or other mechanisms for collection of socioeconomic data under the guidance of the ASMFC Management and Science Committee's Recreational Statistics Committee.
8. More timely reporting of mid-Atlantic catches is needed for quota monitoring.

Table 1. Commercial Landings (in pounds) of Spanish Mackerel along the Atlantic Coast, 1978-1994.

FY	MA	RI	CT	NE**	NY	NJ	DE	MD	VA	MID-ATL	NC	SC	GA	FLEC	TOTAL	% OF QUOTA
78						100		100	1,600	1,800	39,851	608	211	5,510,538	5,553,008	
79									700	700	125,73	150	2,201	4,885,628	4,901,252	
80						600			8,300	8,900	75,306	6,769	1,491	9,811,053	9,903,519	
81					500	500			3,500	4,500	508,38	*	518	4,174,432	4,230,288	
82					1,000				12,700	13,900	188,827	1,081	745	3,758,603	3,963,156	
83					600				3,500	4,200	40,897	706	0	5,947,102	5,992,905	
84					300				10,000	10,400	127,467	1,321	114	2,397,373	2,536,675	
85	969			969	100				15,300	15,400	173,165	847	1	3,244,980	3,434,393	
86	432			432	3,200				168,400	173,100	231,050	6,375	1,335	4,003,351	4,415,211	
87	9,447			9,447	16,600			4,800	251,200	296,600	503,307	961	255	3,501,071	4,302,094	
88	11,979			11,979	19,200			4,300	291,600	332,000	431,965	1,029	726	3,071,562	3,837,282	126
89	10,008			10,008	17,700			7,700	365,823	391,223	589,383	1,605	50	2,853,177	3,835,438	123
90	22,039			22,039	24,300			22,091	491,649	586,040	838,836	305	491	2,564,308	3,969,980	126**
91	20,000	9,000		39,000	149,000			62,000	446,000	734,000	858,808	348	197	2,849,132	4,442,485	127**
92	608	2,277		2,885	31,873	0		37,930	271,313	392,867	738,328	50	71	2,416,588	3,547,904	105**
93	5	2,843	0	2,848	42,063	0		9,445	330,078	404,622	589,822	480	95	3,940,275	4,935,294	110**
94	3,273	893			124733	19,915		3,252	352,391		531,355	*	*	3,099,780		103

* Confidential data.

** Includes Mid-Atlantic landings; excludes NewEngland landings.

Table 2. State Regulations (New York through Florida) for Spanish Mackerel on the Atlantic Coast.(As of December 1995)

State	Bag Limit	Size Limit	Other
NY	10 fish	14" TL min.	3,500 lb commercial trip limit
NJ	10 fish	14" TL min.	
DE	10 fish	14" TL min.	
MD	10 fish	14" TL min.	Declaration allowing regulation through framework. Gill net mesh sizes for Chesapeake Bay.
VA	10 fish	14" TL min.	Size limit exemption for pound net fishery; closure when quota reached; 3500 lb trip limit.
NC	10 fish	12" FL min.	3,500 lb commercial trip limit (Spanish and king mackerel combined); finfish excluder devices required in shrimp trawls. Purse gill net prohibition.
SC	10 fish	12" FL min.	3,500 lb commercial trip limit tracking by reference the federal FMP.
GA	10 fish	12" FL min.	Season closed December 1 - March 15.
FL	10 fish	12" FL min.	3 1/2 inch minimum mesh size, 600 yd. maximum length net. Commercial daily trip limits: 1,500 lb April 1 - November 30; December 1 until 75% of adjusted quota reached-unlimited harvest on Monday, Wednesday, and Friday; 1,500 lb per vessel per day on Tuesday and Thursday; 500 lb per vessel per day on Saturday and Sunday; >75% adjusted quota until quota fulfilled-1,000 lb per vessel per day; >100% of adjusted quota-500 lb per vessel per day.

1995 REVIEW OF THE ATLANTIC STATES MARINE FISHERIES COMMISSION FISHERY MANAGEMENT PLAN FOR **SPOT** *(Leiostomus xanthurus)*

Plan Review Team

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March 1996

1995 REVIEW OF THE ASMFCFISHERY MANAGEMENT PLAN FOR SPOT(*Leiostomus xanthurus*)

I. Status of the Fishery Management Plan

The management plan for spot was adopted in 1987 and includes the states from Delaware through Florida. In reviewing the early plans created under the Interstate Fisheries Management Plan process, the spot plan was seen by ASMFC as in need of review and possible revision. A Wallop-Breaux grant from U. S. Fish and Wildlife Service was provided to conduct a comprehensive data collection workshop for spot. The workshop would lay the groundwork for a major amendment to the 1987 FMP. The October 1993 workshop at the Virginia Institute of Marine Science was attended by university and state agency representatives from six states. Presentations on fishery-dependant and fishery-independent data, population dynamics and bycatch reduction devices were made and discussed. All state reports and a set of recommendations were included in a workshop report.

Subsequent to the workshop and independent of it, the South Atlantic State/Federal Fisheries Management Board of ASMFC reviewed the status of several plans in order to define the compliance issues to be enforced under the Atlantic Coastal Fisheries Cooperative Management Act (ACFCMA). The Board found recommendations in the plan to be too vague and perhaps no longer valid. The Board recommended that an amendment be prepared to the spot FMP to define the management measures necessary to achieve the goals of the FMP. In their final schedule for compliance under the ACFCMA, the ISFMP Policy Board adopted the finding that the FMP does not contain any management measures that states are required to implement.

In order for an plan amendment to proceed, a Plan Development Team needs to be appointed by the Management Board. The workshop proceedings will provide a good starting place for plan revision.

II. Status of the Stock

The area of greatest abundance on the Atlantic Coast extends from Chesapeake Bay to South Carolina. Except for Virginia, there is no specific spot stock status survey, but the species is a major component of the sample in generalized trawl and seine

surveys in several states. An analysis of spot catches in Maryland's juvenile seine survey shows a trend of increasing abundance from 1957 to 1976, and then, through 1992, more moderate numbers punctuated by occasional years of high abundance. Spot young-of-year abundance in the Virginia Chesapeake Bay trawl survey has fluctuated widely without showing a trend. The indices in 1992 and 1993 were, however, relatively low. The North Carolina Pamlico Sound Survey juvenile spot index has fluctuated without trend since 1979.

III. Status of the Fishery

From 1979 to 1991, the recreational catch of spot from Delaware through the Florida Atlantic coast has varied from 11.5 to 31 million fish. The 1994 recreational landings were 18.2 million fish. Commercial landings from New York to Florida have varied from less than one half million pounds to 14.5 million pounds. In 1994, landings from Delaware to Florida were 8.4 million pounds. In Virginia and North Carolina, the two states with the vast majority of catch, landings have been very stable since 1987; Virginia catches exhibit a recent increase. Long term CPUE from the North Carolina commercial fisheries have fluctuated without any apparent trend. Small spot remain a major component of the bycatch in seine, fish trawl and pound net fisheries in the Chesapeake and in North Carolina, as well as a large part of the bycatch of the South Atlantic shrimp trawl fishery.

IV. Status of Research and Monitoring

Catch and effort data are collected by the commercial and recreational statistics programs conducted by the states. Fishery-independent data for spot are collected in the SEAMAP program from Cape Hatteras to Cape Canaveral. Recruitment indices are available from ongoing juvenile surveys in Delaware, Maryland, Virginia, North Carolina and Florida. Efforts are now underway to develop a comprehensive juvenile index utilizing data from many states. Research on the life history and population dynamics of spot in the Chesapeake is presently being conducted jointly by Old Dominion University and VIMS. Virginia Marine Resources Commission and North Carolina Marine Fisheries investigated the use of culling panels in pound nets to release small croaker, spot, and weakfish. North Carolina has conducted gear research on the four main gear types (shrimp trawl, flynet, long haul seine, and pound net) responsible for the bulk of the scrap fish landings in North Carolina in order to reduce the catch of small fish.

V. Status of Management Measures and Issues

The Fishery Management Plan for Spot identified the following management measures (recommendation 1 as amended) for implementation:

1. Promote the development and use of bycatch reduction devices through demonstration and application in trawl fisheries.

2. Promote increases in yield per recruit through delaying entry to spot fisheries to age one and older.

Although the ISFMP Policy Board judged that FMP management recommendations were too vague and did not furnish objective compliance criteria, progress has been made on developing bycatch reduction devices (BRDs). The October 1993 spot and croaker workshop proceeding summarize much of the recent experimental work on bycatch reduction and examines the population implications of bycatch reduction. It is becoming clear that there are economically viable shrimp gears that reduce finfish bycatch. At the state level, North Carolina has been testing bycatch reduction devices in the shrimp trawl fishery and has achieved finfish reductions of 50-70% with little loss of shrimp. North Carolina requires fish excluder devices in every trawl (except try nets) in the shrimp fishery (commercial and recreational). In the North Carolina flynet fishery, where a large portion of the spot catch occurs, there is a new requirement for a minimum tailbag mesh of 3 1/2 inch diamond or 3 inch square. Furthermore, the state of North Carolina has banned flynet fishing in waters south of Cape Hatteras. This requirement will reduce the catch of small croaker. The states of Florida through North Carolina have promoted and require the use of TEDS in state waters. None of the states have minimum trawl mesh sizes or culling panels in directed gears. Evaluation of the beneficial effects of these BRDs to spot stocks, which are a component of a mixed species fishery and a mixed species bycatch, needs further work. A target reduction in bycatch of spot may be a suitable objective criteria in an amended plan. None of the states plan to implement a size limit in the foreseeable future.

VI. Current State-by-State Implementation of FMP Compliance Requirements

There currently are no requirements.

1995 REVIEW OF THE ASMFC FISHERY MANAGEMENT PLAN FOR SPOTTED SEATROUT (Cynoscion nebulosus)

I. Status of the Fishery Management Plan

- Date of FMP approval: 1984
- Lead agency and group with purview: ASMFC
- Management unit: Spotted seatrout in the territorial sea of the Atlantic Ocean from Maryland through the Florida Keys.
- States with declared interest: Maryland, Virginia, North Carolina, South Carolina, Georgia, and Florida
- Other states affected by FMP requirements: None
- States added/deleted since last review: None
- List of active Boards/Committees: South Atlantic State/Federal Fisheries Management Board, Management and Science Committee, and Plan Review Team
- Amendments: Amendment Number 1, approved by Policy Board November, 1991, added an objective of maintaining a spawning potential ratio (SPR) of at least 20% to minimize the possibility of recruitment failure.

The goal of the plan is "to perpetuate the spotted seatrout resource in fishable abundance throughout its range and generate the greatest possible economic and social benefits from its harvest and utilization over time." The plan's objectives are to : 1). attain over time optimum yield; 2). maintain a spawning potential ratio of at least 20% to minimize the possibility of recruitment failure; 3). promote conservation of the stocks in order to reduce the inter-annual variation in availability and increase yield per recruit; 4). promote the collection of economic, social, and biological data required to effectively monitor and assess management efforts relative to the overall goal; 5). promote research that improves understanding of the biology and fisheries of spotted seatrout; 6). promote harmonious use of the resource among various components of the fishery through coordination of management efforts among the various political entities having jurisdiction over the spotted seatrout resource; 7). promote determination and adoption of standards of environmental quality and provide habitat protection necessary for the maximum natural protection of spotted seatrout.

It is the opinion of the Advisory Committee and Plan Review Team that the goal and objectives of the plan are still valid but full implementation of the FMP has still

not been achieved.

II. Status of the Stocks

Fluctuations in spotted seatrout landings (both commercial and recreational) have varied considerably during the last 15 years, but since most of these reported landings have no meaningful effort data associated with them, they are not useful as indicators of the status of the stocks. Some states are beginning to accumulate catch/effort data, especially in regards to the recreational fisheries, which should provide insight into the status of the stocks over time.

Both Florida and South Carolina have run virtual population analyses on local stocks of spotted seatrout. Florida's spotted seatrout management plan has a goal of a 35% spawning stock ratio (SSR) while South Carolina has adopted the ASMFC plan objective of maintaining a spawning potential ratio (SPR) of at least 20% to minimize the possibility of recruitment failure. Florida's data indicate that the management measures currently contained in their plan will not achieve the plan goal of a 35% SSR while South Carolina's preliminary analysis indicates that fishing effort needs to be reduced approximately 20% to meet the plan objective of a 20% SPR. Population analyses on other stocks within the region have not been conducted at this time.

III. Status of the Fishery

Spotted seatrout are taken both commercially and recreationally in the South Atlantic region (North Carolina through the East coast of Florida) although in South Carolina the species has been declared a gamefish and can only be taken recreationally.

During the ten year period from 1984 through 1993, spotted seatrout recreational catches in the South Atlantic region ranged from 1.295 million to 3.019 million fish and averaged 1.970 million fish according to the Marine Recreation Fisheries Statistics Survey. During the second half of this period, reported recreational catches increased by 6.4% for the region. Recreational landings in 1994 totalled 1,825,882 pounds. By state, landings were (pounds): MD, 4,816; VA, 170,954; NC, 688,941; SC, 146,303; GA, 467,471; FL, 347,043.

During the ten year period from 1984 through 1993, the majority of the commercial landings (in terms of pounds of fish landed) were from North Carolina (51.2%) followed by the east coast of Florida (44.7%). During this period, North Carolina landings ranged from 109 thousand pounds to 661 thousand pounds. During the second half of this period, commercial landings were up in North Carolina by 119.6% while landings on the East coast of Florida were down by 22.5%. In 1994, commercial landings totalled 42,002 pounds in VA, 412,681 pounds in NC, 5,112 pounds in GA, and 247,666 pounds in FL. Commercial landings of spotted seatrout in Maryland are reported with weakfish, and SC has no commercial fishery,

IV. Status of Research and Monitoring

No directed research in spotted seatrout is currently being conducted in Virginia or Maryland. Georgia is conducting a fishery independent monitoring program with trammel nets. Personnel are conducting research to determine exploitation rates, annual survival, movements and age-growth rates. South Carolina has an extensive directed research program on this species, supported with Wallop-Breaux funds. Current project objectives include determining the rates of utilization and movements of spotted seatrout; locating and mapping sites of spawning aggregations with the use of hydrophones; deriving indices of juvenile abundance and attempting to correlate these data with future abundance estimate of adults. North Carolina has completed the fourth year of a five year Wallop-Breaux funded study of spotted seatrout life history. Fish are collected monthly for age and growth, to determine spawning season, and to determine size and age at maturity. Florida DNR implemented a juvenile finfish monitoring program in the northern Indian River Lagoon in the spring of 1990. The goal of this sampling program is to develop a recruitment index for spotted seatrout. Under a State/Federal Cooperative Agreement with NMFS, length composition data are being collected from commercial catches made along the Florida east coast.

V. Status of Management Measures

All states which declared an interest in spotted seatrout have established a minimum size limit of at least 12 inch TL as called for in the FMP. Collection of improved catch and effort data from the commercial and recreational fisheries has been initiated in all states as recommended in the FMP.

South Carolina has declared spotted seatrout a gamefish, imposed a creel

limit of 15 fish per angler per day and has a minimum size limit of 12" TL. Florida has a commercial minimum size limit of 15" TL and a 75 fish daily possession limit; commercial harvest is limited to hook and line and castnets. Florida has a recreational slot limit of 15 - 20" TL , one fish over 20" may be kept per day; a recreational bag limit of 5 fish/day; and seasonal closures of January - April north of Volusia County, and November - December for Volusia and counties south. Georgia has a daily bag limit of 25 fish, a minimum size of 12" TL and fish must be landed with head and fins intact. North Carolina has a 12" TL minimum size limit. Virginia has a 14" TL commercial and recreational minimum size; recreational possession limit of 10 fish; and a commercial quota. Maryland has a 14" TL minimum recreational size and 10 fish possession limit; a 12" TL minimum commercial size limit and seasonal closures and mesh restrictions.

VI. Recommendations

1. Efforts should be continued towards achieving full implementation of the FMP.
2. Collection of commercial and recreational landings data should be continued, and increased emphasis should be placed on obtaining complimentary effort data.
3. Development and implementation of methodologies to monitor stock status such as pre-recruit indices and virtual population analyses should receive more attention as should effort data associated with catches and size composition data on catches.
4. The spotted seatrout FMP should be reviewed periodically and updated to incorporate new data and research findings and to assess the status of stocks and the fisheries.

VII. Current Sate-by-State Regulations per Compliance Requirements

Compliance with current regulations by state:

Requirement	No. Carolina	So. Carolina	Georgia	Florida
12" TL Min. Size	12"TL	12"TL	12"TL	14"TL

1995 REVIEW OF THE ATLANTIC STATES MARINE FISHERIES COMMISSION FISHERY MANAGEMENT PLAN FOR **SUMMER FLOUNDER** ***(Paralichthys dentatus)***

Plan Review Team

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1995 REVIEW OF THE ASMFC FISHERY MANAGEMENT PLAN FOR SUMMER FLOUNDER *(Paralichthys dentatus)*

I. Status of the Fishery Management Plan

Summer flounder (Paralichthys dentatus) fisheries are managed jointly by the ASMFC and the Mid-Atlantic Fishery Management Council (MAFMC). The original ASMFC Fishery Management Plan recommended a 14 inch minimum size and was prepared in 1982. The MAFMC Plan, prepared in 1988 and based on the ASMFC plan, established a 13" minimum size with a framework measure to increase the minimum size to 14". Since then, six amendments have been developed and all were approved but Amendment I which would have required a 5–1/2" minimum mesh size in the codend of trawls.

Amendment two (approved in August 1992) provided a strategy for reducing fishing mortality to F_{MAX}, balanced against reasonable impacts on the fishermen. Management measures included:

1. A moratorium on entry into the commercial fishery
2. Vessel moratorium permits
3. Reporting requirements
4. Establishment of a monitoring committee
5. Establishment of an annual commercial quota
6. Minimum mesh requirements and an exemption program
7. Recreational fishery measures including size limits, possession limits and seasonal closures.

Amendment three (approved in July 1993) provided slight revisions in the mesh requirement exemption program. Amendment four (approved in September 1993) revised the state-specific shares of the coastwide quota allocation in response to an under-reporting issue which led to a decreased allocation to Connecticut. Amendment five (approved in December 1993) allowed states to transfer or combine their commercial quota shares. Amendment six (approved in May 1994) allows properly stowed nets with a cod end mesh size less than that stipulated in the plan to be aboard vessels in the summer flounder fishery.

The objectives of the FMP have not changed and are to: 1) reduce fishing mortality of summer flounder to assure overfishing does not occur; 2) reduce fishing mortality on immature summer flounder to increase spawning stock biomass; 3) improve yield from the fishery; 4) promote compatible management regulations between State and Federal jurisdictions; 5) promote uniform and effective

enforcement of regulations; and 6) minimize regulations to achieve the stated objectives.

The management unit includes summer flounder in U.S. waters in the western Atlantic Ocean from the southern border of North Carolina northward to the U.S. - Canadian border. States with a declared interest in the summer flounder FMP include all those from North Carolina through Maine except Pennsylvania. An ASMFC plan review team and species board, and the MAFMC Demersal Species Sub-committee are actively working on this plan. Technical advice is provided by a joint ASMFC-MAFMC Technical Monitoring Committee.

II. Status of the Stock

According to the Advisory Report of the 20th Northeast Regional Stock Assessment Workshop (20th SAW), the summer flounder stock is at a medium level of historical abundance and is overexploited. Fishing mortality (F) has been excessive in recent years, peaking at 1.9 in 1988, and declining to 0.7 for 1994. This decline in F corresponds to a decrease in annual exploitation from 79% in 1988 to 46% in 1994. After declining 72% from 1983 to 1989, spawning stock biomass has increased from a record low in 1989 of 11.7 million pounds to 32.6 million pounds in 1994. Recruitment has improved in recent years, and the 1994 year class, estimated as 50 million fish, is the strongest since 1986. Although the stock is rebuilding, the fishery continues to be dependent on incoming recruitment. The age structure remains truncated, with only about 26% of the stock at ages 3 and older. Under equilibrium conditions at Fmax, at least 77% of the stock would be expected to be age 3 and older.

III. Status of the Fishery

During the late 1980's landings declined dramatically, reaching a low of 9.3 million pounds in the commercial fishery in 1990 and 3.1 million pounds in the recreational fishery in 1989 (Figure 1). Following these record lows, both commercial and recreational landings show an increasing trend in recent years.

The fishery is managed through a coastwide quota, allocated 40% recreational and 60% commercial. The total quota for 1994 was 26.7 million pounds, 16.0 million pounds commercial and 10.67 million pounds recreational. Of the 23.8 million pounds of summer flounder landed in 1994, 14.5 million pounds were landed in the commercial fishery and 9.3 million pounds were landed recreationally. The fishing mortality rate in 1994 was F = 0.7.

The coastwide total quota for 1995 was set at 19.4 million pounds. After adding a court ordered 3.05 million pounds, the 1995 commercial quota was 14.6 million pounds. The 1995 recreational harvest limit was 7.8 million pounds. The predicted fishing mortality rate for 1995 is F = 0.5.

IV. Status of Research and Monitoring

Several states and NMFS conduct seasonal sampling cruises using an otter trawl to assess the condition of summer flounder populations inshore and in the Exclusive Economic Zone (EEZ). In addition, New York conducts a survey of anglers on open boats on Great South Bay to collect data on age and size composition from which mortality rates are calculated. New Jersey collects data from the commercial trawl fishery, conducts an ocean trawl survey from which data on summer flounder are collected, and catch-per-unit-of-effort and distribution information is generated for juveniles and adults. Maryland constructs a juvenile index from trawl data collected in the ocean side bays and is also compiling data on population age, sex, and size from fluke taken in pound nets, and Delaware conducts a trawl survey which collects information on the summer flounder resources. North Carolina conducts two otter trawl surveys for juvenile fluke, conducts tagging programs to determine migrations and to assess mortality, and collects information on age and growth and catch-per-unit-of-effort for the winter trawl fishery. Virginia prepares a young-of-the-year index from data collected from beach seine and trawl surveys.

V. Status of Management Measures and Issues

Management measures imposed upon harvesters of summer flounder include annual quotas, minimum sizes, minimum mesh requirements for trawls, permits and administrative fees for dealers and vessels, a moratorium on entry into the fishery, mandated use of sea samplers, monitoring of sea turtles in the southern part of the management unit, and collection of data and record keeping by dealers and processors.

Annual commercial quotas were implemented in all states on January 1, 1993, and all states reached or exceeded their quota with the exception of New York, Connecticut, and Rhode Island. The annual coastal commercial quota of 12.4 million pounds was exceeded by about 2% in 1993, and in 1994 the commercial fishery landed about 1.5 million pounds less than the quota. The management of the quota system utilized in this plan has become increasingly problematic and as a

result, the Commission and the Mid-Atlantic Fishery Management Council are currently in the process of resolving this issue.

A minimum size limit of 14 inches with an eight fish possession limit has been established for the recreational fisheries in 1995. No coastwide seasonal closures have been established for 1995.

Minimum sizes which comply with the FMP are in effect in all states within the management unit, and cod end restrictions are in effect in Maine, New Hampshire, Massachusetts, New Jersey, and North Carolina. Total closures are imposed on mobile gear in Virginia, New Hampshire, and Delaware. New Hampshire prohibited the landing of summer flounder. Due to a significant bycatch of sea turtles in the winter trawl fishery, a sea turtle conservation requirement has been added to Amendment 2.

Although some delays have occurred in implementation of plan recommendations, states are generally in compliance with plan recommendations especially when dealing with the fishery occurring in the EEZ (Table 1).

VI. Current State by State Implementation of FMP Requirements

Compliance Requirements of the Summer Flounder Plan Follow:

1. A 13" minimum size for the commercial fishery.
2. A 5 1/2" codend mesh requirement for otter trawls used in the summer flounder fishery.
3. A 14" minimum size for the recreational fishery.
4. A daily possession limit in the recreational fishery of 8 fish.

Tables 1 and 2 give the current (as of August 1, 1995) state regulations implemented in response to the FMP compliance requirements.

VII. Recommendations of FMP Review Team

The review team urges that states maintain flexibility in implementing regulations intended to accomplish the goals of the plan in order to maximize the benefit to the summer flounder stocks and to minimize the economic hardships that the fishing industry may face.

The NEFSC sea sampling program collection of summer flounder data should be continued. This should include improved areal and temporal coverage, adequate

length and age sampling, and continued sampling after fishery closures. This sampling is important to evaluate the effects of season and area closures and gear restrictions, changes in directed summer flounder fishing related to stock abundance and regulations, and discards related to fishery closures and trip limits.

The NEFSC winter trawl survey should be continued. Analyses of winter survey data suggest that this survey provides more reliable and precise indices of abundance than the spring and autumn surveys.

Research to determine discard mortality rates and length and age frequency of commercial and recreational discards should be continued.

Research directed at evaluating the mesh exemption program should be continued, with increased sample sizes to allow reliable statistical testing of results.

The Plan Review Team and the participants of future Stock Assessment Review Committee's should continue to advise the Management and Science Committee of research and data needs as they are identified. Research which has been completed and whose results have not been reported should be made available to the Technical Monitoring Committee for their use, and the results of ongoing research should be provided in a timely manner.

In order to reduce the regulatory burden on states with low landings of summer flounder, it is recommended that a "de minimis" standard be included in the plan. A possible landings value for determining "de minimis" could be 1/10 of 1.0% of the coastwide quota. States meeting this standard would then be exempted from certain management requirements such as area and seasonal closures or other measures as defined by the management board. States which operate under the "de minimis" exemption should have in place a process to prohibit landings of summer flounder in order to prevent "dumping" or the development of a directed fishery.

Table 1. Current State by State Implementation of FMP Compliance Requirements (August 1, 1994) Summer Flounder

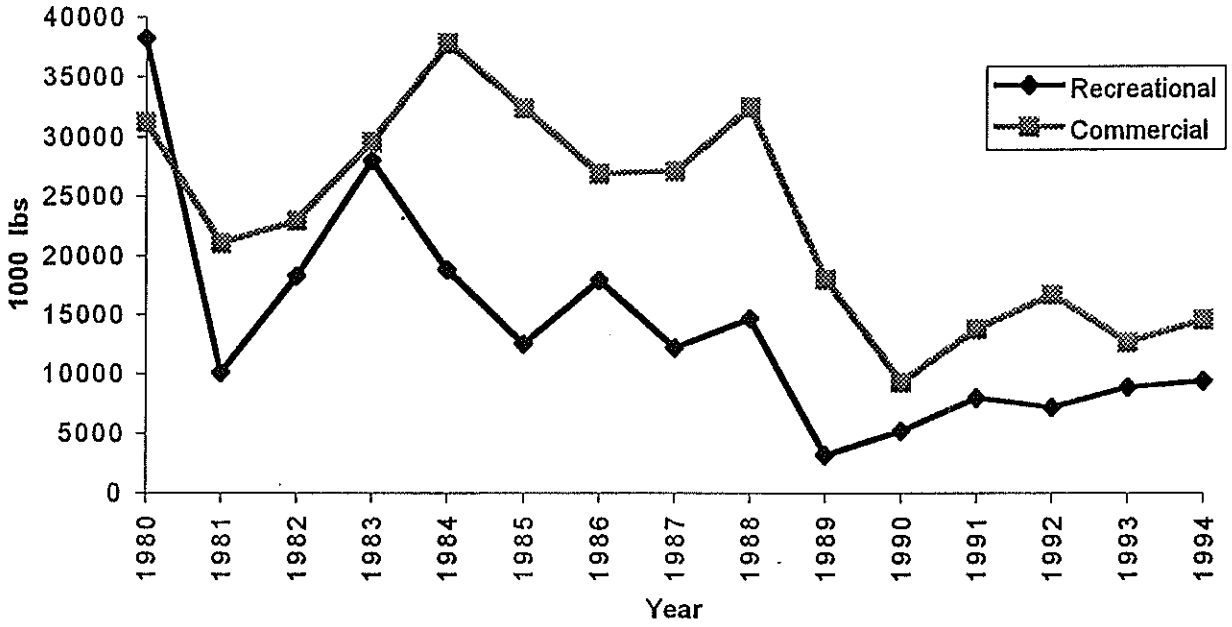
State	Recreational			Commercial	
	Size (in.)	Creel	Closures	Size(in)	5.5" mesh
ME	14	None	None	13	Yes
NH	14	6	9/31–5/14	14*	No
MA	14	8	11/1–5/14	14	Yes
RI	14	8	10/16–4/14	14	Yes
CT	14	6	9/31–5/14	14	Yes
NY	14	6	9/31–5/14	14	YES
NJ	14	8	10/31–4/29	14	YES
DE	14	8	None	14 (gill net 13)	**
MD	14	8	None	13	YES
PRFC *	14	8	11/1–4/30	14	–
VA	14	8	None	13	**
NC	14	8 Ocean none sounds	None	14	Yes (Ocean)

* Landings Prohibited ** Trawling Prohibited

Table 2. State compliance with required management measures

State	Commercial size 13"	5 1/2" Mesh	Recreational size 14"	Recreational possession limit
ME	Y	Y	Y	Y
NH	Y	NA	Y	Y
MA	Y	Y	Y	Y
RI	Y	Y	Y	Y
CT	Y	Y	Y	Y
NY	Y	Y	Y	Y
NJ	Y	Y	Y	Y
DE	Y	NA	Y	Y
MD	Y	Y	Y	Y
VA	Y	NA	Y	Y
PRFC	Y	NA	Y	Y
NC	Y	Y	Y	Y
SC	Y	NA	NA	NA
GA	Y	NA	NA	NA
FL	Y	NA	NA	NA

Figure 1. Summer Flounder commercial and recreational landings in thousands of pounds from 1980-1994.



1995 STATUS REPORT ON DEVELOPMENT OF THE ATLANTIC STATES MARINE FISHERIES COMMISSION FISHERY MANAGEMENT PLAN FOR **TAUTOG** *(Tautoga onitis)*

Prepared by

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March 1996

1995 STATUS REPORT ON DEVELOPMENT OF THE ASMFC FISHERY MANAGEMENT PLAN FOR TAUTOG (*Tautoga onitis*)

I. Status of Fishery Management Plan Development

In May 1993 the ASMFC voted to initiate the development of a Fishery Management Plan for Tautog. The primary rationale for development of a Tautog FMP is the vulnerability of tautog to overfishing. Additional concerns center around localized overfishing and increasing commercial fishing effort. States declaring interest in tautog are: Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Delaware, Maryland, and Virginia. Plan development began in 1994 and a Draft FMP is expected to be approved for Public Hearing in December 1995. Final adoption of the Plan is expected in March 1996.

II. Status of Stocks

Tautog are a long lived species, with individuals over age 30 reported from Rhode Island (1960's) and Connecticut (1980's). Females mature (80%) at age 3. Natural mortality (M) has been estimated at M=0.15 for males and M=0.2 for females. Tautog are currently considered overfished, with fishing mortality exceeding the interim target fishing mortality rate of F=0.15. Estimates of fishing mortality from NJ to MA range from F=.15 to F=0.86, and the fully recruited fishing mortality rate for 1994 is estimated to be 0.71. In addition to the evidence of overfishing indicated by estimates of fishing mortality, abundance indices show about a 64% decline since 1984. For states south of NJ, a lack of data hampers efforts to estimate current fishing mortality rates and tautog abundance.

III. Status of Fishery

The tautog fishery extends from Maine to Virginia with the principal fishery occurring south of Cape Cod. Approximately 80% of landings are from state waters in both the commercial and recreational fisheries. From 1982-1991 commercial landings averaged 8.7% of total landings, however between 1989 and 1991 commercial landings accounted for 15% of landings. Over the 1982-1991 time period the ex-vessel value increased steadily, from $76,000 in 1982 to $588,000 in 1991, reflecting both increased landings and price paid per pound.

A directed fishery occurs off Virginia, principally on ocean reefs and wrecks. Artificial reefs support very significant fisheries in the mid-Atlantic. Natural structure inshore also supports directed fisheries from at least New Jersey northward.

In the recreational fishery, tautog ranked between fourth and seventh in species sought in both the North Atlantic and Mid-Atlantic Subregions in 1989 and 1990 accounting for between 5.4% and 9.7% of all trips. Species groups typically ranking higher in both subregions were "none", bluefish and winter flounder. In the North Atlantic, cod, striped bass and scup may rank higher, whereas in the Mid-Atlantic summer flounder are more frequently sought.

Commercial fishery landings are distributed among several gear types with otter trawls accounting for 40% of landings between Maine and Virginia (1982-1991). Gillnets and hand lines each accounted for 14%, while lobster traps and fish pots contribute 12% and 6% respectively.

Commercial interest in tautog has increased in response to higher market prices, exceeding $1.00/lb at times. Others factors are the development of a live market for small fish, and restrictions imposed on the take of other species such as striped bass, summer flounder and winter flounder.

IV. Status of Research and Monitoring

Length/age and abundance data are collected in trawl surveys in Massachusetts, Rhode Island, Connecticut, New York, New Jersey and Delaware. New York is also collecting length and age data from party boats Rhode Island is tagging tautog to determine movements and to estimate mortality. Age, growth and reproduction have been recently examined in Virginia. Data to determine fishing mortality rates for states south of New Jersey are needed.

V. Status of Management Measures and Issues

Plan under development with the goal of having the Plan approved in the Spring of 1996.

VI. Current State-by-State Implementation of FMP Compliance Requirements as of August 1, 1995.

Specific FMP compliance criteria will be determined upon plan approval.

VII. Recommendations of FMP Review Team

1. Proceed with development of the FMP.

2. Strive to fulfill the research needs identified in the Draft FMP:

   a. Establish state-by-state long-term surveys to gather information on tautog abundance, length-frequency, age, catch/release (hooking) mortality and CPUE. This is especially needed in the southern portion of the species range.

   b. Define the specific spawning and pre-spawning aggregating areas and wintering areas of juveniles and adults used by all major local populations, as well as the migration routes used by tautog to get to and from spawning and wintering areas and the criteria or times of use.

   c. Define local and regional movement patterns and site fidelity in the southern part of the species range. This information may provide insights into questions of aggregation vs. recruitment to artificial reef locations.

   d. Define the source of offshore eggs and larvae (in situ or washed out coastal spawning).

   e. Explore possible regional and local genetic differences (stock differentiation) and relate these to recruitment, growth, and exploitation rates. These differences can help support appropriate region-specific management strategies.

   f. Confirm that tautog, like cunner, hibernate in the winter, and in what areas, for how long, and are there special habitat requirements during these times. This information will aid in understanding behavior variability and harvest availability.

g. Define the susceptibility of juveniles to coastal/anthropogenic contamination and resulting effects. This information will aid in assessment and management of habitat/population damage.

h. Define the role of prey type and availability in local juvenile/adult population dynamics. This information can explain differences in local abundance, movements, growth, fecundity, etc.

i. Define larval diets and prey availability requirements. This information can be used as determinants of recruitment success.

j. Define the status (condition and extent) of optimum or suitable juvenile habitats and trends in specific areas important to the species. It is critical to protect these habitats or to stimulate restoration or enhancement, if required.

1995 REVIEW OF THE ATLANTIC STATES MARINE FISHERIES COMMISSION FISHERY MANAGEMENT PLAN FOR **WEAKFISH***(Cynoscion regalis)*

Plan Review Team

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March 1996

1995 REVIEW OF THE ASMFC FISHERY MANAGEMENT PLAN FOR WEAKFISH *(Cynoscion regalis)*

I. Status of the FMP

The Atlantic States Marine Fisheries Commission (ASMFC) adopted its first Fishery Management Plan for Weakfish in 1985. Amendment No. 1 to the FMP which superseded the original plan was adopted in 1992, and Amendment No. 2 was adopted in October 1994. Weakfish are managed as a single stock throughout their coastal range (based on analysis of their mitochondrial DNA). All states from Massachusetts to Florida and the PRFC have a declared interest in the Weakfish FMP. Responsibility for the FMP is assigned to the Weakfish Management Board, a Plan Review Team, a Technical Committee, a Stock assessment sub committee and a Citizen's Advisory Panel. A Plan Development Team is currently working on Amendment No. 3 to the FMP, scheduled for adoption by March 31, 1996.

II. Status of the Stock

Weakfish recruitment has declined markedly from 166 million age 0 recruits in 1989 to 59 million age 0 recruits in 1993. The 1994 annual exploitation rate has been estimated as about 76%, with F = 1.89. A target exploitation rate of 25% is necessary to achieve the biological reference point, F20 = 0.34, equivalent to a maximum spawning potential (MSP) of 20% of an unfished spawning stock. Recent levels of MSP are at a low level and have been estimated as 2.7%. The 1994 exploitation rate would need to be lowered by 82% to reach the biological reference point.

III. Status of the Fishery

MRFSS estimates indicate the 1994 recreational landings were 810 MT, with most catches occurring from inshore mid-Atlantic waters. Commercial landings were 2767 MT in 1994, with 57% of the total coastwide catch being landed in North Carolina. During 1994, 75% of coastwide commercial landings came from state waters; during 1992-93, an average of 46% of the coastwide landings came from state waters. During 1994, 66% of North Carolina's commercial landings came from state waters, as compared to an average of 33% during 1992-93.

IV. Status of Research and Monitoring

New Jersey and Delaware conduct small trawl surveys in Delaware Bay to determine a juvenile index for weakfish. Delaware, Maryland, Virginia and North Carolina collect age, size and weight and CPUE data from large trawl surveys. Delaware and Maryland monitor size and age composition of their commercial fisheries. Virginia also monitors sex, size, and age from commercial fisheries and sex and size from recreational fisheries. North Carolina samples juvenile abundance and continues to evaluate by catch in shrimp trawls equipped with BRDs. The Gulf and South Atlantic Fisheries Development Foundation is evaluating the overall finfish by-catch in shrimp trawls. North Carolina and South Carolina, with the assistance from several other state and federal partners, are reviewing different ageing methods for weakfish. Georgia is conducting fishery independent and fishery dependent sampling of shrimp trawl bycatch.

V. Status of Management Measures and Issues

Table 1 presents a listing of approved management measures expected to achieve at least a 25% reduction in the weakfish exploitation rate during the April 1, 1995 through March 31, 1996 period.

VI. Current State-by-State Implementation of FMP Compliance Requirements as of December 31, 1995

The following measures must be observed by all states in the implementation of the Fishery Management Plan for Weakfish.

1. Each state with directed fisheries for weakfish (Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Delaware, Maryland, Virginia, North Carolina, Florida, Potomac River Fisheries Commission) must implement a minimum size for weakfish of 12 inches, or establish equivalent conservation measures approved by the Weakfish Management Board.

2. States that have mesh restrictions must maintain at least their current minimum mesh sizes as of September 1, 1994. After July, 1995, each state from New Jersey through North Carolina, including the Potomac River Fisheries Commission must implement appropriate mesh size restrictions in gill nets and

1995 REVIEW OF THE ATLANTIC STATES MARINE FISHERIES COMMISSION FISHERY MANAGEMENT PLAN FOR **WINTER FLOUNDER** *(Pleuronectes americanus)*

Prepared by

Frank Lockhart (ASMFC)

March 1996

1995 REVIEW OF THE ASMFC FISHERY MANAGEMENT PLAN FOR WINTER FLOUNDER *(Pleuronectes americanus)*

I. Status of Fishery Management Plan

The Interstate Fishery Management Plan for Inshore Stocks of Winter Flounder was adopted by the Commission in May, 1992. An implementation strategy was also adopted at that time and printed separately as Addendum I to the plan. The Winter Flounder Management Board is responsible for monitoring Plan implementation.

The plan contains specific fishery management and habitat protection/ enhancement measures to meet the following goals: to maintain winter flounder stocks in sufficient abundance to support stable, productive commercial and recreational fisheries; to preserve, maintain, and enhance habitat and environmental quality necessary for optimal growth and reproduction; to the extent possible, minimize incompatibility in management practices between this and other northwest Atlantic management plans, recognizing that winter flounder stocks vary biologically and may justify differing strategies; to the extent possible, minimize conflicts between competing uses of the winter flounder resource.

The designated management unit for the plan includes the state waters of Maine through Delaware. States declaring an interest in the Plan include; Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey and Delaware. States required to comply with the FMP include all states identified above and the state of Pennsylvania.

II. Status of Stocks

Two inshore Management Units are identified: **Gulf of Maine** (GOM) - waters north of Cape Cod; **Southern New England/mid-Atlantic** (SNE/MA) - waters south of Cape Cod to the Delaware-Maryland border. Previously, the SNE and MA areas were considered separately but they were combined this year because growth data and tagging studies showed more similarity between the SNE and MA regions than previously thought. This change was accepted by the Stock Assessment Review Committee (SARC). Another change accepted by the SARC was lowering natural mortality from M=0.35 to M=0.20. This change was based on updated catch and age data which showed the presence of older fish (up to 16 years old) in the exploited

population, leading the technical committee to adopt the conventionally accepted M=0.20.

In SNE/MA, fishing mortality averaged over ages 4-5 has fluctuated without trend between 0.57 and 1.38 since 1985 and has averaged 1.07; mean fishing mortality in 1993 was F=0.83. For the GOM unit, fishing mortality has fluctuated around a mean of F=1.21 since 1978; mean fishing mortality in 1993 was F=2.00.

Fishery independent surveys show abundance has generally declined in SNE since the late 1970's. The NMFS spring index has varied without trend since 1982. Abundance indices in the mid-Atlantic also show a general decline. Periodic surveys in Delaware estuaries show winter flounder abundance declined between the 1966-70 period and the 1980-81 surveys, and no winter flounder were taken in recent Delaware trawl surveys. In the GOM, indices were generally below average.

III. Status of Fishery

Coastwide commercial landings declined from 11,200 MT in 1981 to an historic low level of 3,000 MT in 1993. In GOM, commercial landings were at their all time low of 596 MT. Commercial landings are caught primarily in the EEZ, comprising on average (1989-93) 86% of the total. The primary gear is the otter trawl, accounting for almost 94% of the landings in 1993.

Recreational catches reached a peak in 1985 of 13.3 million fish but declined thereafter. In 1994, landings were 1.1 million fish (548 MT), well below the 1986-1994 average of 3.7 million fish (1,674 MT).

IV. Status of Research and Monitoring

Several states (MA, RI, CT, NY, NJ, DE) and NMFS conduct trawl surveys in which winter flounder are taken. Indices of abundance and estimates of fishing rate are produced from most surveys. Separate young-of-year surveys in several states provide early indices of recruitment within each management area. Fishery dependent indices of stock condition are also available from MRFSS and commercial sampling/statistics programs

V. Status of Management Measures and Issues

The Plan calls for harvest control strategies which will achieve the target management reference point (F_{40}) in three steps. All states were initially required to have implemented measures to achieve F_{25}. By Jan. 1, 1995 measures to achieve F_{30} were in place, and by Jan. 1, 1999, the Plan requires that F_{40} be achieved. All states currently have plans that were approved by the Winter Flounder Management Board in 1995, however, changes in the most recent stock assessment concludes that none of the states are currently achieving a fishing mortality rate corresponding to F_{30}.

The New England Fishery Management Council's Amendment 5 of the Groundfish Plan included winter flounder and requires a 12" minimum size and 5.5" (S. of Cape Cod) or 6" (GOM) mesh for directed groundfish trips. Vessels fishing with smaller mesh in the regulated mesh areas while in an exempted small mesh area are limited to 10% groundfish species, by weight, up to a maximum of 500 lbs. The Plan also calls for a 50% reduction in fishing effort in 10% increments over five years. Effort reduction under the Groundfish Plan was initiated in May, 1994. At the end of 1994, the council passed emergency regulations that closed prime fishing areas on Georges Bank (Areas I & II; Nantucket Lightship) and addressed re-direction of fishing effort into GOM and SNE. At the same time, development of Amendment #7 started. Amendment #7 extended days at sea controls and requires that any fishing by an EEZ-permitted vessel be conducted with not less than 6" mesh (diamond or square) in SNE waters east of 72° 30'.

VI. Current State-by-State Implementation of FMP Compliance Requirements as of August 1, 1995.

By January 1, 1995, the states of ME, NH, MA, RI, CT, NY, NJ, PA, DE are required to: 1) report to ASMFC concerning habitat protection efforts with other in-state agencies; 2) implement an approved plan to achieve a minimum 30% MSP. Since Pennsylvania does not have a winter flounder fishery, they are not included in the following table of fishery restrictions. Habitat protection measures however, are required of all states including Pennsylvania.

VII. Recommendations of FMP Review Team

The New England Fishery Management Council should carefully monitor the effectiveness of management strategies to reduce winter flounder exploitation in federal waters. States should revise plans to meet new reference points as described in the updated stock assessment.

Table 1: State Regulations for Winter Flounder

	COMMERCIAL			RECREATIONAL		
State	**Min Size (in)**	**Cod-end Mesh (in)**	**Closed Season**	**Min Size (in)**	**Bag Limit**	**Closed Season**
ME	11	5.5		11		
NH	12	NA	No Trawling	12		
MA	12	6.0 GOM, 5.5 SCC/ 100 lb all flndr sp	Night Closure to mobile gear, Feb 1 - April 30 < 1mi GOM	12	10	Mar. 1 - Apr 30
RI	12	6.0	Opens April; Closed when quota (90,000 pounds) met in MLMA.* 100 lb. Trip limit in MLMA	12	4	June 1 - Mar. 31
CT	12	4.0 July 1- Nov 14, 5.5 Nov 15 - June 30	Mar. 1 - Apr 14	11	8	
NY	12	4.5 / 300 lb	None	11	None	None
NJ	10	None	No Trawling < 2mi	10	None	None
DE	12	None	No Trawling	12	None	None

*Marine Life Management Area -- Narragansett Bay, coastal salt ponds, and Little Narragansett Bay