

# CHESAPEAKE BAY PROGRAM

## *Annual Progress Report*

**Chesapeake Bay Alosid,  
Blue Crab, Bluefish, and  
Weakfish/Spotted Seatrout  
Fishery Management Plans**



**December 1992**



Printed on Recycled Paper

Chesapeake Executive Council

## **Annual Progress Report**

Chesapeake Bay Alosid, Blue Crab,  
Oyster, Bluefish, Weakfish/Spotted Seatrout,  
American Eel, Atlantic Croaker/Spot,  
and Summer Flounder

**Chesapeake  
Bay  
Program**

December 1992

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## INTRODUCTION

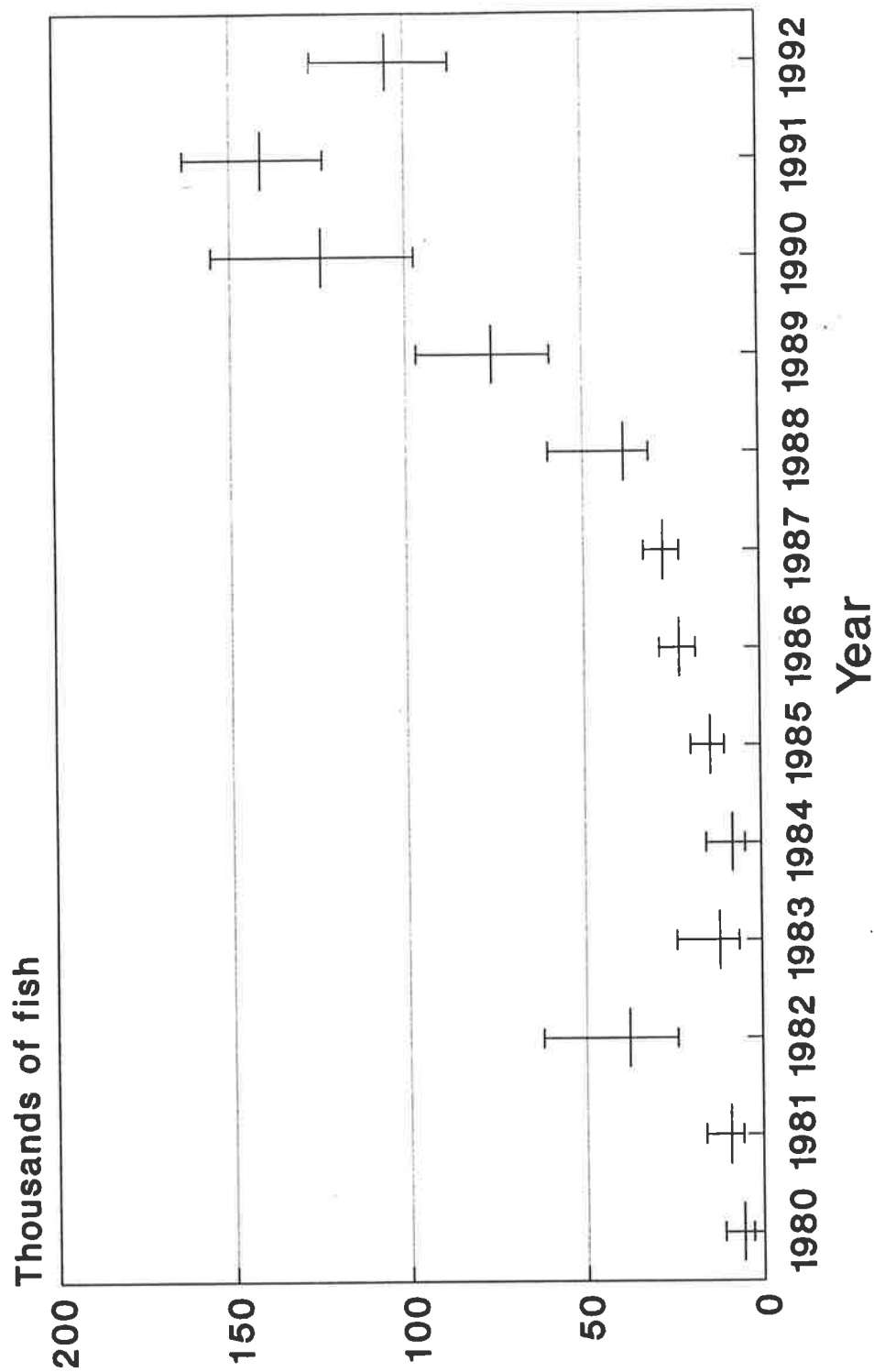
Each year the fishery management plans adopted by the Chesapeake Bay's Executive Committee are reviewed and updated. The annual review provides a format for incorporating new information, evaluating progress toward achieving objectives, and updating management strategies. The fishery management process began under the 1987 Chesapeake Bay Agreement when commercially, recreationally, and ecologically valuable finfish and shellfish species were selected for the development of baywide fishery management plans (FMPs). The species selected for plan development and their adoption schedule is provided in Table 1. The following report reviews the progress of adopted management plans during 1992 except for striped bass. The progress report for striped bass is under separate cover in order to include the entire commercial fishing season. In this report, each major problem addressed in the FMPs has been highlighted and is followed by a discussion of pertinent issues. After the narrative, an implementation table provides a detailed presentation of each action recommended by a particular plan and relative comments regarding the action's implementation. For previous updates, refer to the 1990 and 1991 Annual Progress Reports. For details on problem areas and management strategies, refer to the appropriate management plan.

### Chesapeake Bay Alosid Management Plan

#### Declining Abundance

Although the 1989 Alosid FMP defined the first problem for alosids as "declining abundance," alosid abundance in the Chesapeake Bay has been stable but reduced from historic levels. The Alosid FMP addresses four different species: American shad (*Alosa sapidissima*); hickory shad (*A. mediocris*); blueback herring (*A. aestivalis*); and alewife herring (*A. pseudoharengus*). In 1980, Maryland imposed a moratorium on the harvest of American shad from the Chesapeake Bay, followed in 1981 by a moratorium on hickory shad. The criterion for reopening a fishery is an increase in annual population estimates for three consecutive years and a stock size of 500,000 fish in the upper Bay. The 1992 adult shad estimate was 105,255 fish. This was a 25% decrease from the 1991 estimate of 141,000 fish (Figure 1). Since the criterion for reopening the fishery was not met, the moratorium on harvesting shad in Maryland's portion of the Chesapeake Bay will continue during 1993. American shad commercial landings in Virginia were approximately 450,000 pounds in 1991 and preliminary landings for 1992 are 478,000 pounds (Figure 2). The Chesapeake Bay Program requested that Virginia consider a moratorium on harvesting shad in the Bay and its tributaries. Adoption of a moratorium would aid the overall restoration effort and support the goals of the Chesapeake Bay Fishery Management Plan and the Atlantic States Marine Fisheries Commission (ASMFC) Alosid Plan. The Virginia Commission considered the proposal at their December 1992 meeting. They approved a 30 day

Figure 1. American shad population estimates for the upper Bay



season (Mar. 15- Apr. 15, 1993) for American shad within the Chesapeake Bay and tributaries, followed by a moratorium, thereafter. Virginia will continue its maximum gill net length restriction of 3,000 yds. per boat.

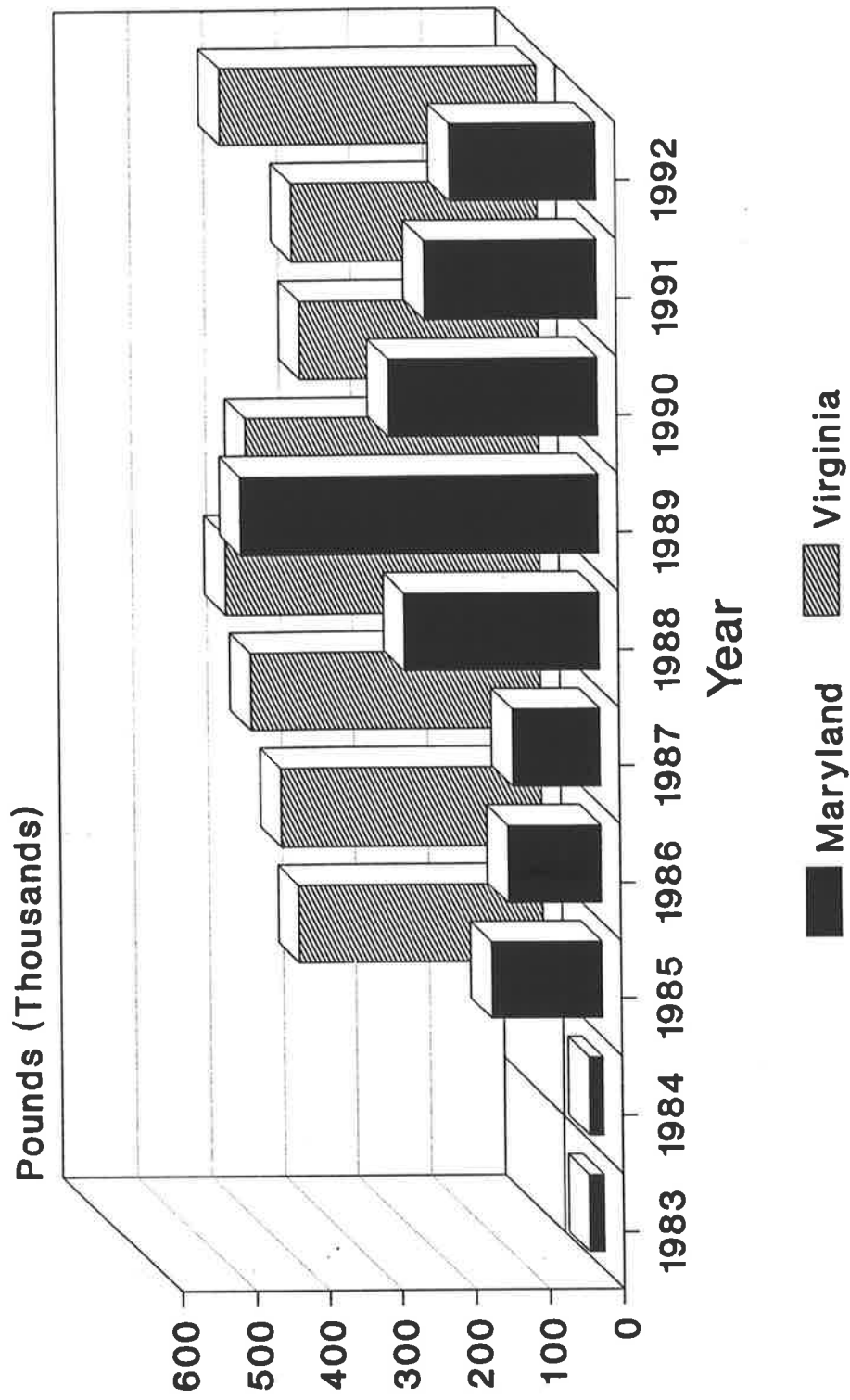
Although recommendations were made to control river herring harvest, no actions have been taken. Commercial river herring landings in Maryland were 191,700 pounds during 1991 and preliminary 1992 landings are 210,600 pounds. During 1992, adult river herring were monitored on the Nanticoke River. Catch-per-unit-of-effort (CPUE) for alewife was 11.8, a 15% increase over 1991. For blueback herring, CPUE was 5.97, a 57% decrease from 1991. A total of 8,500 pounds of river herring were transported to 6 locations in the Patapsco River and Big Elk Creek drainages. Regulations for increasing mesh size and prohibiting harvest in restoration areas have not been drafted. If areas were closed to river herring harvest they would include the Bush, Patapsco, Elk, Susquehanna rivers and Tuckahoe Creek. Currently, Maryland requires a 2 1/2" minimum mesh size for gill nets. Commercial river herring landings in Virginia were approximately 700,000 pounds during 1991 and preliminary 1992 landings are 1.1 million pounds. Virginia requires a 2 7/8" minimum mesh size for gill nets. North Carolina, Virginia, and Maine are the only states with substantial commercial river herring fisheries and account for 90% of the total landings (NOAA 1992).

Shad and river herring monitoring continued at the Conowingo Dam fish lifts. Two fish lifts were operational during the 1992 migration season. A total of 25,721 American shad, 34,880 blueback herring and 3,629 alewife herring were caught. The American shad catch was 1,506 fish or 5.5% fewer than in 1991 but 10,000 more than in 1990 when only one lift was operating. The average four-year capture trend in shad returns continued to improve. Catch per fishing hour for American shad at both lifts was 20.8, slightly lower than in 1991 (24.5).

Management actions and strategies for hickory shad did not change during 1992. Maryland continued its moratorium on the harvest of hickory shad from the Bay and its tributaries. Overall hickory shad catch from the Conowingo fish lift (upper Bay) during 1990 and 1991 was 77 and 120 fish, respectively. A total of 396 hickory shad was caught using two lifts during 1992. The Potomac River Fisheries Commission (PRFC) continued their 2 fish/person/day creel limit on hickory shad. Reported hickory shad commercial catch in Virginia was 2,200 pounds during 1991. The District of Columbia implemented a moratorium on American shad, hickory shad, and blueback herring during 1992. The moratorium will remain in place until further notice and will be guided by stock assessment studies.

An agreement was reached on constructing fish passage at the three dams upstream from Conowingo on the Susquehanna River (refer

Figure 3. American shad landings from the Atlantic Ocean & seaside bays





Monitoring of adult river herring from the Nanticoke River continued during 1992. Average length of alewife herring during 1992 was 9.6", the same as the 1991 average length, with most fish age IV and V. Estimates of annual mortality for alewife herring were 73% for males and 63.4% for females. The 4 year mean mortality was 73% for males and 61.4% for females. There was a 12.5% increase in the observed number of repeat spawners. The average length of blueback herring during 1992 was 9.7", slightly less than the 1991 average of 9.8". Most bluebacks were age VI. Mortality estimates for blueback herring were 45.1% for males and 36.9% for females. The 4 year mean mortality was 52.2% for males and 46.2% for females. There was a 6% increase in the observed number of repeat spawners.

The overall abundance of juvenile American shad in the upper Bay is low. During 1992, there were fewer young-of-the-year American shad than in previous years. For river herring, weekly samples were taken with a mid-water trawl from May through September. The 1992 juvenile alewife CPUE from the Nanticoke River was 214, an 18% increase over the 1991 CPUE. There has been a gradual increase in juvenile alewife abundance since 1989. Reproduction and survival were also good in the Chester, Choptank and Patuxent rivers. The 1992 juvenile blueback CPUE from the Nanticoke River was 18, a 61% decrease from the 1991 CPUE. Upward trends in blueback abundance occurred in the Chester and Patuxent rivers while the Choptank and Nanticoke rivers exhibited a downward trend.

Monitoring of upstream migration of adult river herring and ichthyoplankton sampling were conducted on the Little Patuxent and Gunpowder rivers during 1992. Estimates of the number of blueback herring utilizing the Denil ladder at Winter's Run (Gunpowder River) were calculated based on April and May observations and ranged between 6,000 and 10,000 fish. The monitoring project confirmed the utilization of fish ladders by anadromous fish. Biological monitoring proposals have been submitted for three areas during 1993. In addition to monitoring upstream migration of adults and ichthyoplankton, the downstream migration of juveniles has been included in the proposal.

### **Habitat Loss and Degradation**

The presence of dams and other stream blockages have contributed to the decline of anadromous and catadromous fish species in the Bay by limiting access to habitat. Under the 1987 Chesapeake Bay Agreement, the jurisdictions committed to restoring natural passage for migratory fish. To date, the fish passage strategy has resulted in the construction of 13 fish passages in Maryland, 4 in Virginia, and 1 in the District of Columbia. It has opened 174.2 miles of historic migratory fish spawning and nursery habitat. Fish passage has also developed, maintained, and expanded trap/transport and hatchery elements of fish reintroduction

## **References**

NOAA Technical Memo. 1992. Status of fishery resources off northeastern United States for 1991. "American Shad." NMFS-F/NEC-86.

ALOSID CONT'D.

Problem Area	Action	Date	Comments
2. Overfishing (cont'd)	2.2 A) Implement a coastal shad tagging program to determine which stocks are being exploited in the intercept fishery.	1991-1992	Results from 1991 & 1992 study indicate that the coastal fishery is mixed & highly variable from year to year.
	B) Control the coastal intercept fishery through a combination of gear restrictions, seasonal and areal closures, and harvest limits.	1992 Continue	A coastal shad season was continued during 1992 by both MD & VA. MD will continue a coastal season during '93.
	C) Continue to monitor and document its territorial seas intercept fishery for American shad.	1993	MD coastal landings during 1992 were 199,000 lbs. VA coastal landings during 1992 were 432,000 lbs. VA will continue its genetic analysis of the shad stocks taken in its intercept fishery.
	2.3.1 Virginia will control river herring harvest during spawning migrations through gear restrictions & spawning area closures.	1991	VA has restricted use of commercial fishing gear in the spawning areas in the Chickahominy River below Walker's Dam.
	2.3.2 MD & VA will monitor river herring bycatch through the MAFMC and support the following recommendations: a) Foreign fishery will stay 20 miles offshore; b) Maximum bycatch of 1% for river herring in foreign & domestic mackerel fisheries with a cap on total allowable bycatch; c) Intercept fisheries will be discouraged.	In effect	River herring bycatch is being monitored under the MAFMC Squid, Mackerel, and Butterfish FMP. River herring stocks have been relatively stable since 1968.

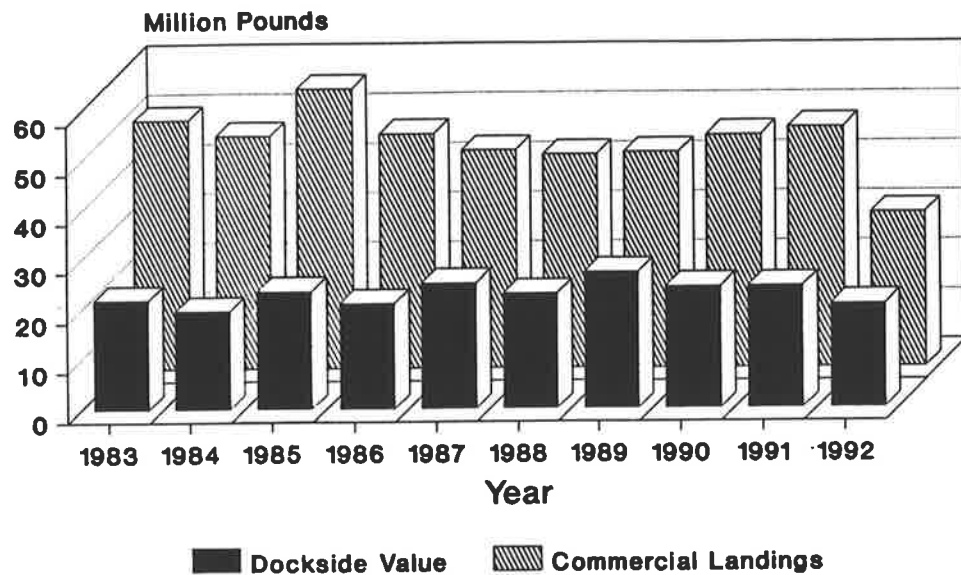
ALOSID CONT'D.

Problem Area	Action	Date	Comments
4. Habitat Loss and Degradation (cont'd)	<p>4.2.1 MD &amp; PA will continue to work within SRAFR's ongoing programs to ensure downstream passage for juveniles and adults.</p> <p>4.2.2 A) Promote use of Susquehanna brood stock for PA restocking. B) VA will expand funding for Pamunkey/Mattaponi shad hatcheries.</p> <p>4.3 A)- E) Technical issues regarding water quality at Conowingo Dam.</p> <p>4.4 Establish new water classification system based on living resources, habitat, &amp; water quality.</p> <p>4.5 Promote Bay Agreement water quality commitments.</p>	<p>Continue</p> <p>Continue</p> <p>1993</p> <p>Continue</p> <p>Variable</p>	<p></p> <p>Continue hatchery funding. VDGIF will initiate a shad stocking program on the upper James River.</p> <p>Standards have been implemented since 1989.</p> <p>The Bay Program will add a tributary initiative which will set nutrient reduction goals for major tributaries.</p>

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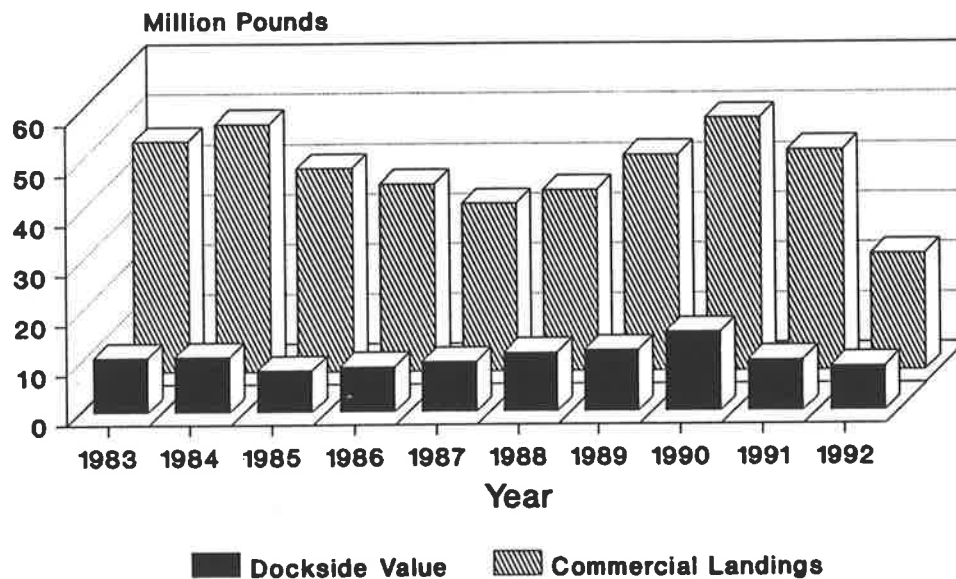
ASMFC = Atlantic States Marine Fisheries Commission  
 DCFM = District of Columbia, Fisheries Management  
 MAFMC = Mid-Atlantic Fisheries Management Council  
 MDNR = Maryland Department of Natural Resources  
 PRFC = Potomac River Fisheries Commission  
 SRAFR = Susquehanna River Anadromous Fish Restoration Commission  
 VDGIF = Virginia Department of Game and Inland Fisheries  
 VIMS = Virginia Institute of Marine Science  
 VMRC = Virginia Marine Fisheries Commission

**Figure 4a. Maryland Commercial Blue Crab Landings and Value**



•1992 preliminary data

**Figure 4b. Virginia Commercial Blue Crab Landings and Value**



•1992 preliminary data  
Hard crab landings only

Possible means to address this issue include: restricting the crab pot to commercial use, requiring crab pots sold for noncommercial use to be equipped with cull rings and biodegradable panels, a recreational crab license required for any amount of catch, and a limit of one pot per property regulated by the issuance of annual pot tags. Virginia requires no license for the taking of up to 1 bushel of hard crabs and 2 dozen peeler crabs by dip net, hand line, or 2 crab pots in any one day for personal use only.

Peeler mortality estimates during 1990 were as high as 66% according to a MDNR survey of 86 crab shedding operations. Considering the poor harvests of 1992 season, a crab shedding operation license may be more acceptable if the purpose behind the license is to educate the crab shedding operator on reducing shedding mortality and better manage the soft crab fishery.

### **Stock Assessment Deficiencies**

The methods for collecting and calculating blue crab commercial catch in Maryland are being evaluated by the Chesapeake Biological Laboratory of the University of Maryland and should be completed by October 1993. Recreational shell fish surveys conducted in Maryland estimated the blue crab recreational catch was 41.2 million pounds in 1983 and 21.5 million pounds in 1988. In 1990, catch data for the Maryland recreational blue crab fishery were collected from access-intercept and telephone surveys. Catch estimates were calculated according to gear/license categories instead of averaged together. The estimated 1990 recreational blue crab catch using the new methodology was 11.0 million pounds (Stagg et al. 1992). These recreational values represent between 19% and 44% of the total harvest and emphasize the significance of the recreational catch. If the recreational catch has increased proportionately with the noncommercial crabbing licenses issued, the unreported crab catch could be far greater than previously surveyed. A recreational license could provide important catch and effort data for the recreational crab fishery. Currently, there is a bill under consideration that would require recreational crabbers to obtain a sportfishing license. However, it would not be effective for collecting catch and effort data.

The 1992 Summer Trawl and Winter Dredge Surveys conducted by VIMS, MDNR and the University of Maryland continue to provide valuable, fishery independent population data. Winter habits and habitat (depth and substrate) preferences are also being evaluated. A better understanding of winter habits and wintering grounds is essential for decisions on establishing crab sanctuaries in Maryland, as specified in the management plan.

The VMRC Stock Assessment Program continued its collection of catch and effort data from the winter crab dredge fishery during the 1991/92 season (December through March). The VMRC catch and effort survey was implemented during the 1988/89 season and relies on boat captain and dockside interviews for data and information. Only 59 informational log sheets were completed during the 1988/89 season, compared to more than 700 completed log sheets for the 1991/92 crab dredge season. Highest CPUE (bushels of crabs per hour) values were associated with December harvests. By month, CPUE values ranged from 6.8 bushels/hour (December, 1991; n=251 boat

Areas to be pursued during the 1993 management year include:

- 1) A revision of the 1989 blue crab management recommendations.
- 2) Continue monitoring the status of the blue crab fishery and determine the need and means of controlling effort.
- 3) Continue collecting and analyzing data from summer and winter surveys and implement the best management measures.
- 4) Continue improving the data base for both the commercial and recreational fisheries.

#### **References**

Stagg, C., M. Holloway, L. Rugolo, K. Knotts, L. Kline and D. Logan. 1992. Evaluation of the 1990 recreational, charter boat, and commercial striped bass fishing surveys, and design of a recreational blue crab survey. Maryland Dept. of Nat. Res., Chesapeake Bay Research and Monitoring Division, Annapolis, MD.

# BLUE CRABS (cont'd)

Problem Area	Action	Date	Comments
2. Wasteful harvesting practices (cont'd)	<p>2.2 MD and VA will promote the use of cull rings and continue to evaluate the effectiveness of cull rings from crab pot studies.</p> <p>2.3 A) MD will prohibit harvest of sponge crabs; B) VA will monitor the harvest of female crabs in the dredge fishery;</p> <p>C) MD &amp; VA will investigate the extent of mortality on mature female crabs used as bait in the eel fishery; D) PRFC will continue to prohibit possession of egg-bearing females.</p> <p>2.4 A) VA will continue prohibition of abandoned crab pots; B) MD will evaluate the need for regulation of abandoned crab pots; C) MD will assess biodegradable panels in crab pots; D) MD &amp; VA will improve enforcement; E) PRFC will consider regs for abandoned pots.</p> <p>2.5 Promote reduction of peeler mortalities in floats &amp; shedding operations. size limits on all crabs based on yield</p>	<p>1989</p> <p>1990</p> <p>Variable</p> <p>1992</p> <p>Continue</p>	<p>Voluntary usage of cull rings estimated at 50%. Mandatory usage is under consideration.</p> <p>MD adopted prohibition on harvest of sponge crabs in 1989. MD crabbers recommend a prohibition on importing sponge crabs. VA will continue winter dredge surveys &amp; CPUE data collection.</p> <p>Investigation of the extent of mortality on mature female crabs used as bait in the Bay eel fishery is incomplete. PRFC is collecting additional data on sex ratios.</p> <p>A) VA code has been changed. B) Current regulation prohibits crab pots in the water from 1/1 to 3/31 in MD; stronger enforcement is being evaluated; C) biodegradable panels in crab pots have been tested and data is under review, jute may be the best material, currently examining the economics of using a panel; D) Improved enforcement is underway; E) No regs have been proposed by PRFC.</p> <p>MD BCAC considering the need for shedding license; other jurisdictions discussing the need for a shedding license.</p> <p>The 1992-1993 winter crab study is underway as joint effort between MD and VA; mature crab abundance has decreased, immature abundance remains average; cool weather and reduced food contributed to decreases.</p>
3. Stock Assessment Deficiencies	3.1 A)-B) Continue summer and winter surveys.	Continue	

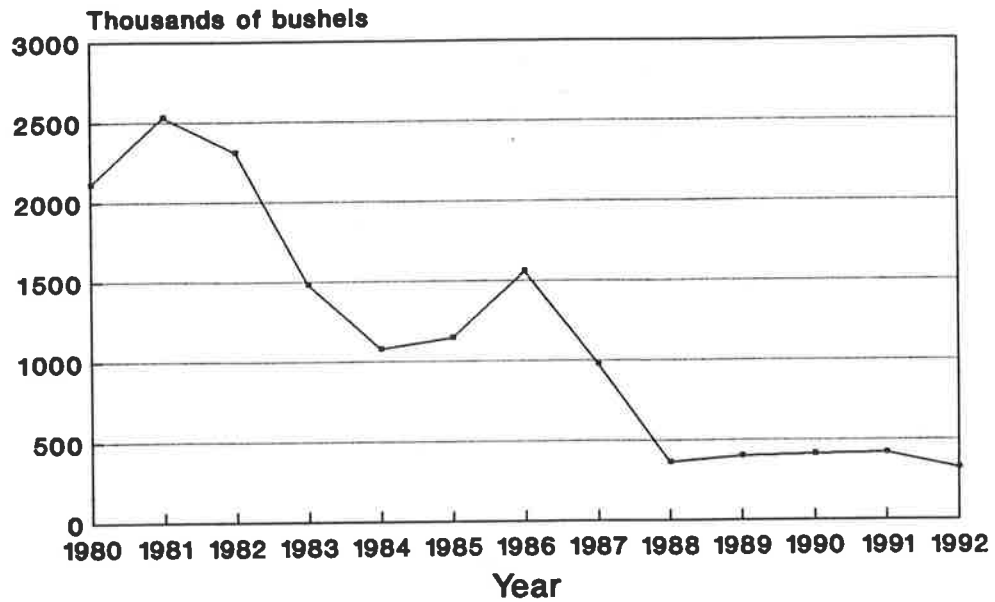


BLUE CRAB (cont'd)			
Problem Areas	Action	Date	Comments
4. Regulatory Conflict Issues (cont'd)	4.4 A) MD maintains point assignment system; B) VA will consider a point system;  4.4 C) Make enforcement consistent among jurisdictions; D) PRFC will continue "second offender" program.	Continue	Continue
5. Habitat Degradation	5.1 Support Bay Agreement  5.2 MD and VA will establish crab sanctuaries where harvest may be controlled and environmental modifications are restricted.  5.3 Support SAV and wetland research and management, development of habitat requirements documents.	Variable  1991  Variable	D) Provides increased penalties for the repeat offender. VA also has a repeat offender program.  MD and VA conduct research and coordinate with local, state, and federal agencies and private groups. In addition, the Bay Program will begin a tributary initiative which will set nutrient reduction goals for major tribes.  VA has extensive lower Bay sanctuary; MD winter dredge survey will identify crab overwintering areas for consideration as crab sanctuaries.  Continue

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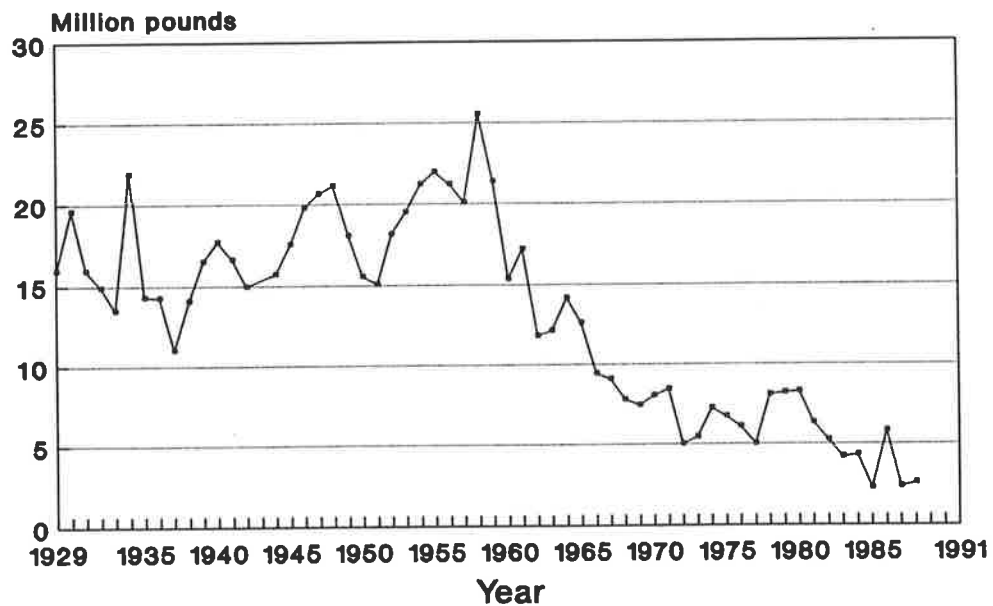
BCAC = Blue Crab Advisory Committee  
 CBSAC = Chesapeake Bay Stock Assessment Committee  
 CPUE = Catch per unit of effort  
 PRFC = Potomac River Fisheries Commission  
 SAV = Submerged Aquatic Vegetation

**Figure 5a. Maryland Commercial Oyster Landings by Season\***

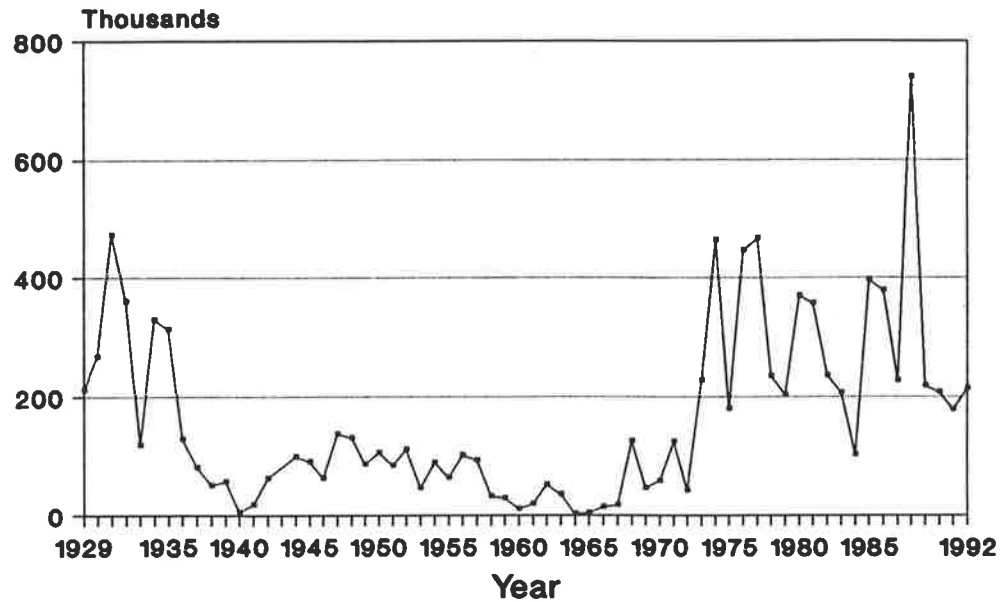


\*Previously reported by calendar year

**Figure 5b. Virginia commercial landings for oysters**

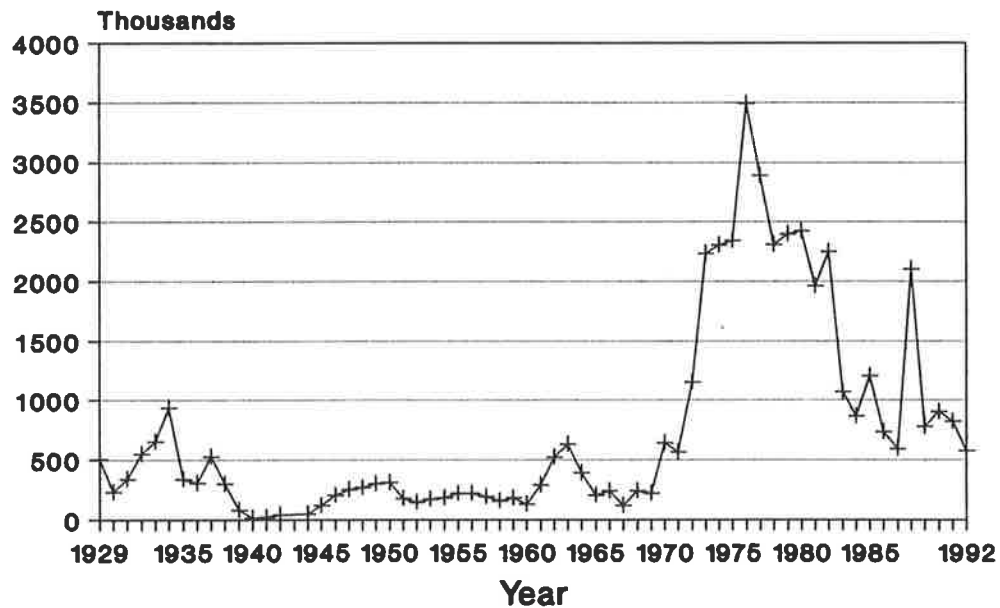


**Figure 6a. Commercial bluefish landings from Maryland**



•1992 preliminary data

**Figure 6b. Commercial bluefish landings from Virginia**



## **Research and Monitoring**

Virginia has implemented mandatory reporting for their commercial fishery which should improve catch statistics for bluefish from the Chesapeake Bay. Maryland has continued its mandatory finfish reporting procedures. Beginning in 1991, Maryland charter boat captains were required to report their recreational catch on a weekly basis. This information provides some data on the recreational harvest of bluefish from the Maryland portion of the Bay. Preliminary data from 1992 indicates that 215,000 pounds of bluefish were caught. Although this is a decrease from 1991 (333,800 pounds), comparable effort estimates are not available. During 1991, CPUE was estimated using the number of bluefish caught divided by the number of fishing days. Since charter boats may make more than one trip per fishing day, the 1992 logbook questions were better defined. During 1992, CPUE (number of bluefish caught divided by the number of charter boat trips) was 10.4 fish/trip or 20.4 pounds/trip. As a long-term data base is established, bluefish recreational trends may be determined. Both Maryland and Virginia have continued to support the MRFSS.

The VMRC's Stock Assessment Program continued its collection of biological data from commercial finfish species during 1991. This fishery dependent sampling program began in 1989. Average bluefish length has increased from 14" in 1990 to 15" in 1991. Most of the fish sampled were from gill net catches. Females comprised approximately 60% of the catch. Although bluefish is not a target species for VIMS juvenile recruitment survey, juvenile bluefish are caught in the striped bass beach seine survey. From this survey, CPUE for juvenile bluefish have remained steady from 1990 through 1991.

## **Habitat and Water Quality Issues**

Support of the habitat and water quality commitments in the 1987 Chesapeake Bay Agreement has continued. In addition, a tributary initiative program has begun. This program will focus on the shallow spawning and nursery areas for finfish. Although bluefish eggs have only been reported in the southern portion of the Chesapeake Bay, the Bay is an important nursery and feeding habitat for juveniles and adult bluefish. Refer to "Habitat Overview" for additional details on habitat and finfish.

## **Conclusion**

Coastwide commercial landings did not trigger the implementation of a commercial quota for bluefish. Three coastal states have not implemented the 10 fish creel limit or a conservation equivalent. The current estimates of fishing mortality on adult and YOY bluefish exceed the biological reference points (0.30-0.35) and may indicate the need to reduce mortality by 10% to 20%. The Chesapeake Bay jurisdictions have implemented the MAFMC/ASMFC recommendations, are continuing to monitor the recreational and commercial fisheries, and have the authority to implement commercial controls if necessary.

**1992 ANNUAL PROGRESS REPORT  
CHESAPEAKE BAY BLUEFISH IMPLEMENTATION PLAN**

<b>Problem Area</b>	<b>Action</b>	<b>Date</b>	<b>Comments</b>
<b>1. Stock Status &amp; Increased Fishing Pressure</b>	1.1.1 Continue to participate in scientific & technical meetings for managing bluefish along the coast & in estuarine waters.	Continue	
	1.1.2.1 Will adhere to state allocations established by the MAFMC/ASMFC if commercial harvests levels meet criteria in the coastal plan.	Continue	Recreational catch declined and commercial catch remained relatively stable. Coastal catch restrictions were not imposed.
	1.1.2.2 Will continue present licensing requirements for harvest and sale; VA will establish a 10 fish creel limit for its commercial hook & line fishery & pursue a license for that fishery.	1991	VA implemented a 10 fish creel limit for all bluefish harvested by hook and line. A recreational fishing license for VA Bay and commercial H&L for VA tidal waters will be in effect in 1993.
	1.1.2.3 MD will establish a 10 fish/person/day recreational creel limit. VA & PRFC instituted 10 fish creel in summer 1990. Creel limits and minimum legal sizes may be modified as appropriate.	1991	A 10 fish/person/day creel limit was implemented by the Bay jurisdictions during 1991. MD and PRFC will continue their 8" minimum size limit for bluefish.
<b>2. Waste-ful Harvest Practice</b>	2.1.1 A 10 fish creel limit will minimize wastage.	1991	Chesapeake Bay jurisdictions have implemented a 10 fish creel limit.
	2.1.2 Educate the general public about the need to reduce waste in the bluefish fishery.	1991	Jurisdictions are promoting hook & release via brochures and press releases. Awareness by the general public has increased & more are practicing conservation.
	2.1.3. Assess factors causing waste in the commercial fishery and identify potential solutions.	1991	VA samples pound net catches and MD will have a program in place summer 93. VA is promoting plastic escape panels in pound nets.

## Chesapeake Bay Weakfish/Spotted Seatrout Fishery Management Plan

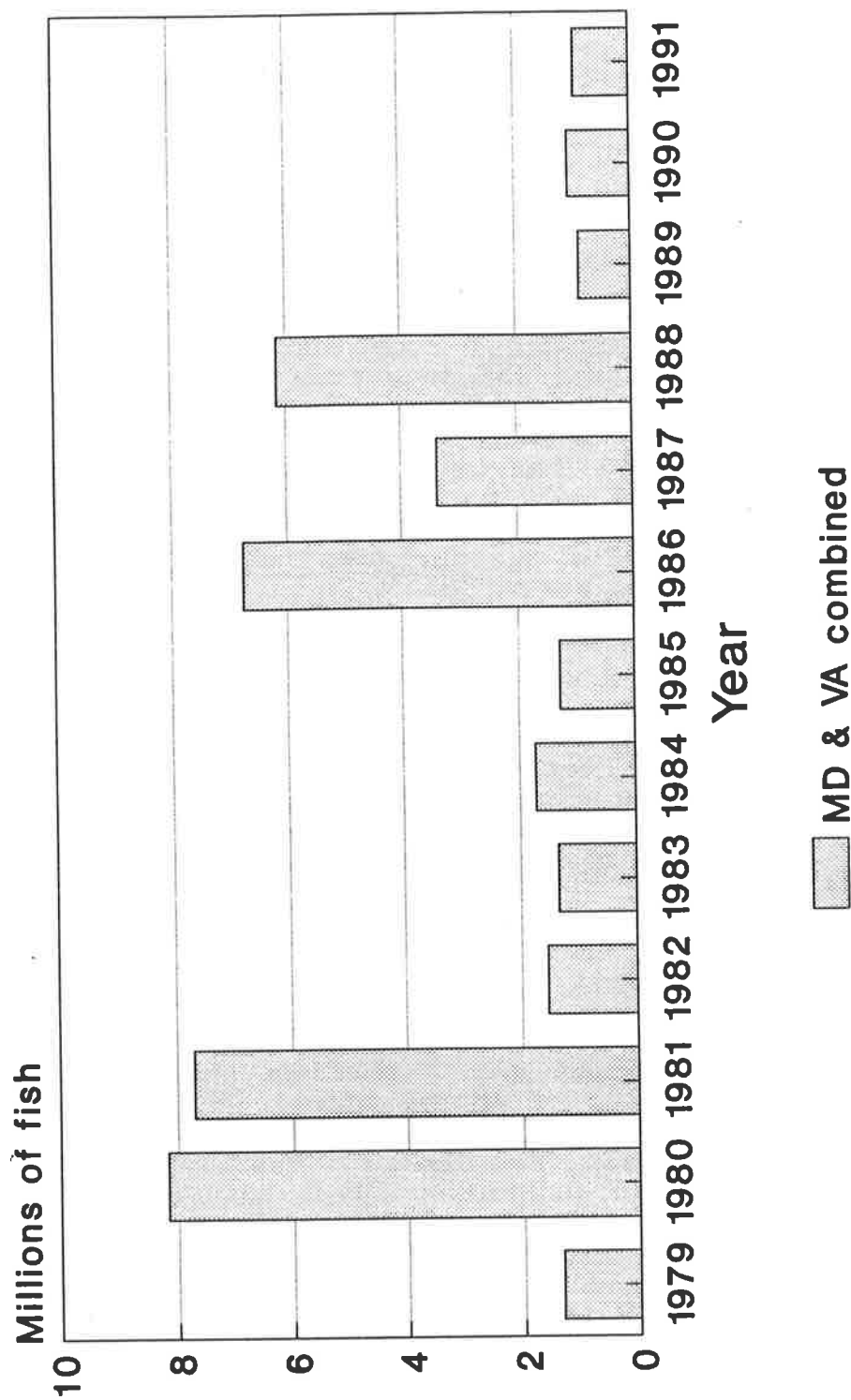
### Overfishing

Commercial weakfish (Cynoscion regalis) landings from the Chesapeake Bay have continued to decrease. During 1991, 262,000 pounds were landed in Maryland and 1.1 million pounds in Virginia. Preliminary 1992 landings are 381,800 pounds for Maryland and 549,900 pounds for Virginia (Figure 7a & b). Recreational weakfish landings have been estimated by the Marine Recreational Fisheries Statistics Survey (MRFSS) since 1979 (Figure 8). The estimated number of weakfish caught by marine recreational anglers from Maryland and Virginia has averaged 1.0 million fish over the last 3 years (1989-1991).

The Atlantic coast weakfish stock is overfished. Estimates of fishing mortality (F) exceed 0.9 and represent an increase from an average F of 0.7 during the years 1982-1987. Preliminary 1992 stock estimates indicate that fishing mortality has increased and may be as high as 1.4 or 1.5 (approximately 70 to 78% of the stock being harvested annually). Estimates of maximum spawning potential (MSP) range between 7 and 12%. These values are low and indicate a reduced spawning stock biomass due to recruitment overfishing (ASMFC 1992). The overfishing status of the weakfish stock triggered the development of Amendment #1 to the 1985 ASMFC Weakfish FMP. Amendment #1 recommends that the number of weakfish being killed annually be reduced by 52% over a four year period (1991-1995) and sets a target fishing mortality rate (F) of 0.34 (approximately 30% of the stock being harvested annually) and MSP at 20%. Initially, a 25% reduction in exploitation is recommended. The Weakfish Technical Committee will be re-evaluating and updating the age and growth data, virtual population analysis, and yield per recruit. Updates will most likely affect the biological reference points (F=0.34 and MSP=20%). If current fishing rates continue, the chance of recruitment failure and stock collapse increases.

Amendment #1 to the ASMFC Weakfish FMP was developed in 1991 to initially reduce weakfish exploitation by 25%. Amendment #1 recommendations include: a combination of minimum size limits with appropriate mesh restrictions by gear; seasonal and areal closures for the commercial fisheries; size/bag limits for the recreational fisheries; and reduction of bycatch mortality in non-directed fisheries, especially the South Atlantic shrimp fisheries. Each state was given flexibility in determining specific management measures to achieve a 25% reduction, but not less than a 15% reduction, in annual exploitation during 1992. Although Maryland proposed the following regulations, none were implemented during 1992: a 12" minimum size limit; a 3 1/8" minimum mesh size for gill nets; a 3 3/4" minimum mesh size for otter trawls; a seasonal closure from October 15-31, inclusive for the ocean fisheries; and a 5 fish per person per day creel limit for the recreational fishery. Maryland maintained a 10" minimum size limit for weakfish during 1992. The following regulations have been submitted for 1993: a 12" minimum size limit; a 10 fish per person per day creel limit in 1993 and a 5 fish per person per day creel limit in 1994; a 3" minimum mesh size for otter trawls and gill nets; and a closed commercial season from July 1-Sept. 30. The proposed 1993 regulations must go through the public hearing process and should

**Figure 8. Estimated number of weakfish caught by recreational anglers**



Data from MRFSS

## **Stock Assessment and Research Needs**

From 1989 through 1992 the number of weakfish sampled by the VMRC Stock Assessment Program for biological characteristics (size, sex, age) increased. Average length over the years has been similar with lengths of 13.9" in 1989, 13.5" in 1990, and 13.3" in 1991. The program has provided important length-frequency data from Virginia for the mid-Atlantic stock assessments. Spotted seatrout lengths (n=917) ranged from 8.8" to 26.8" TL and averaged 15.7" during 1991. Spotted seatrout sex composition favored males and more fish were collected from haul seines than gill nets and pound nets.

Results from the University of Maryland's pound net sampling program did not provide information on weakfish and spotted seatrout. Maryland's proposed multi-species sampling program will target those species under fishery management plans in the Bay. Comparison of the 1991 and 1992 juvenile finfish bycatch from the blue crab summer trawl survey suggests juvenile weakfish were more abundant during 1992 in Maryland. Data from the Maryland Coastal Marine Finfish Survey indicate that weakfish trawl catches are extremely variable and haul seines catches of weakfish are low.

Preliminary 1992 data from the Maryland charterboat logbooks indicate that 45,000 pounds of weakfish were caught during 1992 at an average weight of 1.5 pounds. The charterboat recreational catch increased from 1991 (22,000 lbs with an average weight of 1.7 lbs). An average of 2.9 weakfish/trip were taken from May through November 1992 with the highest catch in July.

## **Habitat Loss and Degradation**

The jurisdictions have continued to promote improved water quality and habitat goals for all finfish species within the Bay. Weakfish and spotted seatrout rely on estuarine areas for spawning, nursery, and feeding grounds. Seaside bays should also be included in goals and strategies for water quality and habitat improvement as they are also important weakfish and spotted seatrout nursery grounds.

## **Recreational-Commercial Conflicts**

Differences among Maryland, PRFC, and Virginia size limits and recreational creel limits for weakfish and spotted seatrout have caused some concern from Maryland and Virginia fishermen. Conflicts arising from the use of gill nets have not been reported since a uniform marking system went into effect in Virginia. Areal restrictions for using commercial gears have also helped reduce the number of conflicts between recreational and commercial fishermen.

## **Conclusion**

The Atlantic coast weakfish stock is overfished. Recommendations for reducing exploitation by 25% and at least 15% during 1992 were not implemented by the Bay jurisdictions. Preliminary examination of 1992 stock assessment data indicates



**1992 ANNUAL PROGRESS REPORT  
CHESAPEAKE BAY WEAKFISH/SPOTTED SEATROUT IMPLEMENTATION SCHEDULE**

Problem Area	Action	Date	Comments
1. Overfishing	1.1.1 MD, VA & PRFC will continue stock assessment work & analyses of catch/effort data described in Action 2.1 to improve management measures for controlling overharvest.	Continue	
	1.1.2. a) MD & PRFC will propose an increase in the minimum size limit for weakfish from 10" to 12"; b) VA will continue to enforce its minimum size limit of 9" for weakfish; c) Bay jurisdictions will pursue discussions on a consistent baywide minimum size for weakfish.	1991	VA implemented a 12" min. size limit for H&L & gill net; a 10" min. was adopted for haul seine & pound net with a 10% tolerance by wt. PRFC implemented a 13" min. size for weakfish during 1992. MD has a 10" in place but has proposed a 12" size limit for 1993.
	1.1.3 MD, PRFC & VA will continue to enforce their 12" minimum size limit for spotted seatrout.	Continue	In 1992, PRFC implemented a 13" min. size limit. VA implemented a 14" min. size with a 5% tolerance for haul seine & pound net.
	1.1.4 MD will continue its Delay of Application program for commercial fishing licenses to control fishing effort. VA will continue to pursue a limited & delayed entry program.	Continue	In MD, charter boat captain licenses are now under the Delay of Application procedure. VA implemented a delayed entry program in 1993 & VMRC was given authority to implement limited entry.
	1.1.5 MD, PRFC & VA will evaluate recreational & commercial creel limits for weakfish & spotted seatrout H&L fisheries, & implement them as needed.	1991-1992	VA implemented a 15 fish creel for weakfish & a 10 fish creel for spotted seatrout during '92. PRFC implemented a 10 fish creel for both species. MD has no creel limits but has proposed a 10 fish creel for both species during '93 & a 5 fish creel during '94.

**WEAKFISH/SPOTTED SEATROUT CONT'D.**

<b>Problem Area</b>	<b>Action</b>	<b>Date</b>	<b>Comments</b>
<b>3. Habitat Loss and Degradation</b>	3.1 1-7) Continue to set specific objectives for water quality goals & review management programs.	Continue	The Bay Program will add a tributary initiative which will set nutrient reduction goals for major tributaries.
<b>4. Recreational &amp; Commercial Conflicts</b>	4.1 Continue to address fishing conflicts & issues with existing advisory groups. 4.2. a) VMRC adopted a uniform marking system & a minimum mesh size of 2 7/8" for gill nets in tidal waters. b) MD adopted a marking system based on VA's scheme for drift gill nets in the striped bass fishery.	Continue  Continue	Interjurisdictional conflicts have arisen because of the different size and creel limits.  VA also restricts gill net by area & season.

**LEGEND:**

ASMFC = Atlantic States Marine Fisheries Commission

FEDs = Finfish exclusion devices

MAFMC = Mid-Atlantic Fisheries Management Council

MRFSS = Marine Recreational Fisheries Statistics Survey

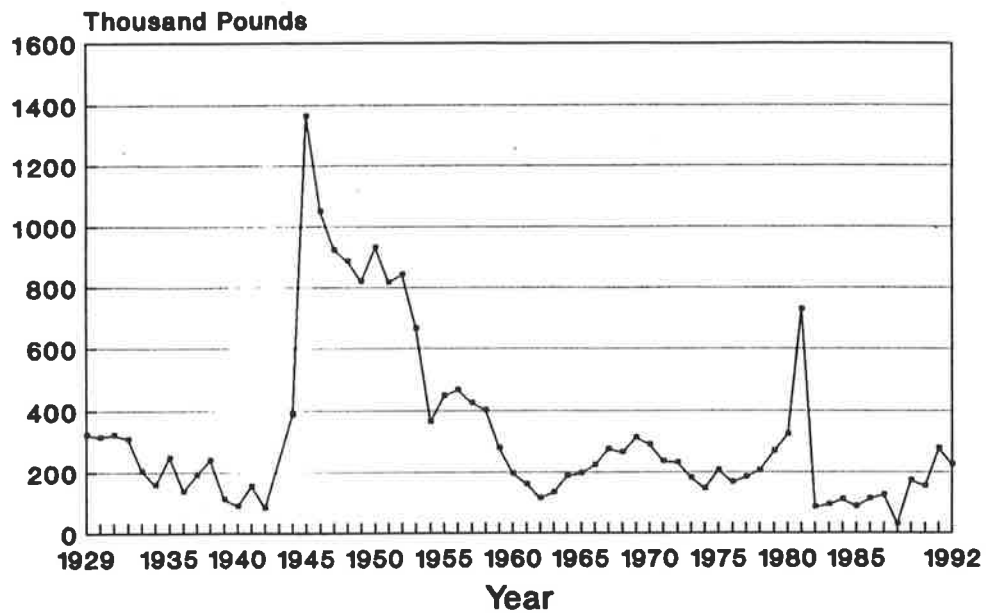
PRFC = Potomac River Fisheries Commission

TEDs = Trawl efficiency devices or turtle exclusion devices

VIMS = Virginia Institute of Marine Science

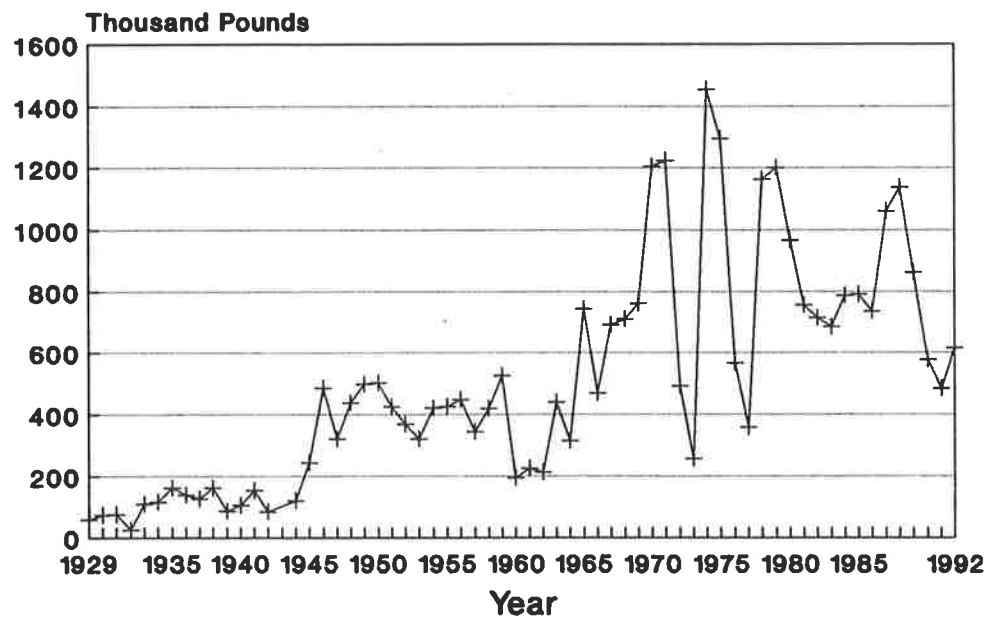
VMRC = Virginia Marine Resources Commission

**Figure 9a. Reported Commercial Landings of American Eel from Maryland**



•1992 preliminary data

**Figure 9b. Reported Commercial Landings of American Eel from Virginia**



•1992 preliminary data

**Areas of prime importance during 1993 are:**

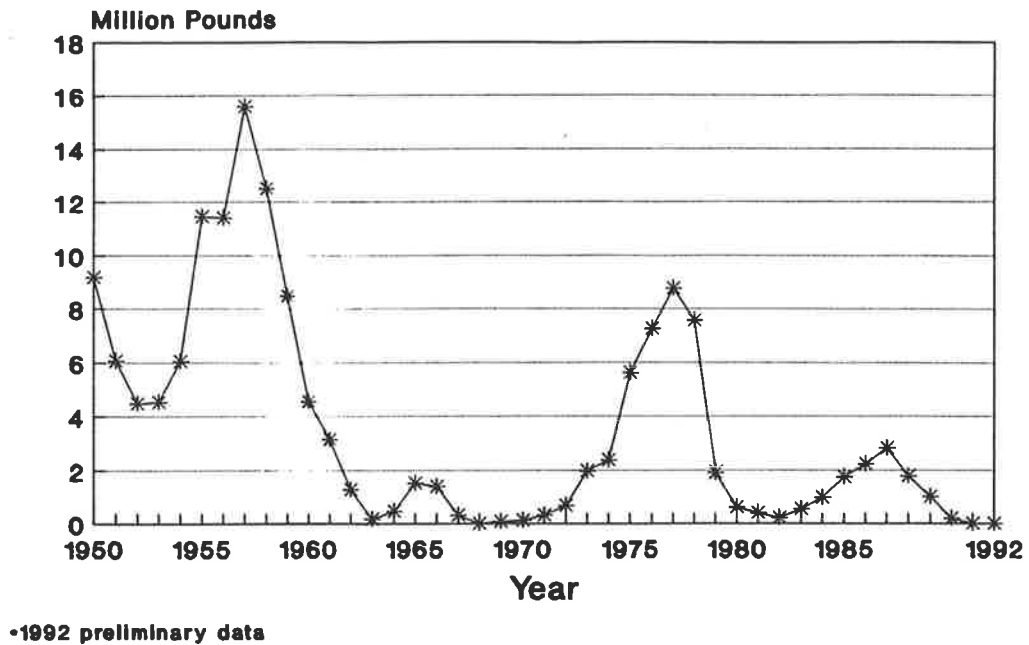
- 1) Implement a minimum size limit and minimum mesh size in the Maryland portion of the Bay;**
- 2) Evaluate the commercial crab bait eel catch in Maryland;**
- 3) Promote basic biological and socioeconomic research.**

1992 ANNUAL PROGRESS REPORT  
CHESAPEAKE BAY AMERICAN EEL IMPLEMENTATION PLAN

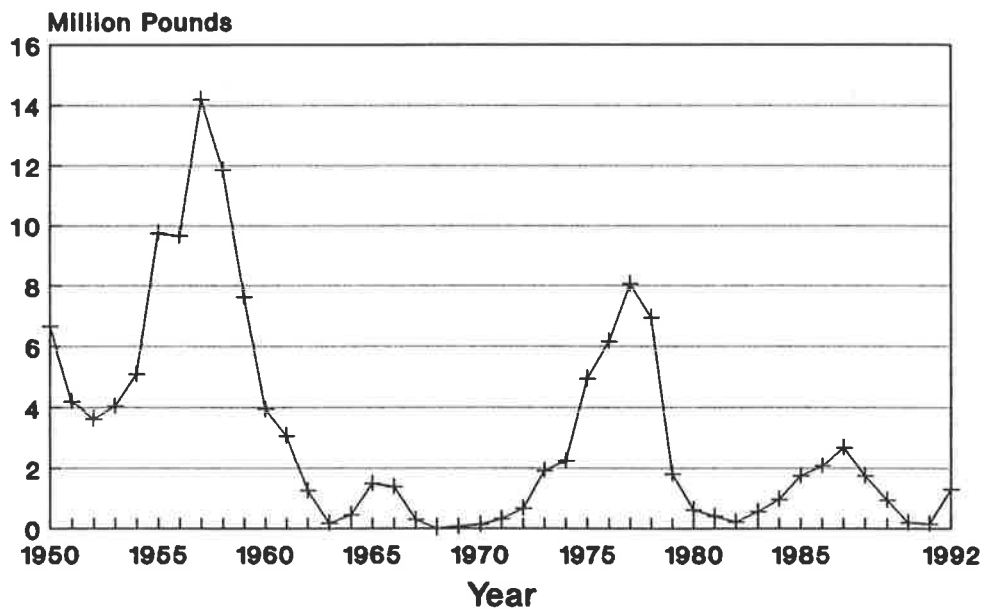
Problem Area	Action	Date	Comments
4. Habitat and Water Quality Issues	4.1 Continue to provide stream passage.	Continue	Requires coordination with other agencies.
	4.2 Continue to set specific objectives for water quality goals and habitat requirements.	Continue	In addition to the 1987 Chesapeake Bay Agreement, a Bay tributary initiative will set nutrient reduction goals for major tributaries.

LEGEND:  
DC = District of Columbia  
PFC = Pennsylvania Fish Commission  
PRFC = Potomac River Fisheries Commission

**Figure 10a. Commercial Landings for Atlantic Croaker from Maryland**



**Figure 10b. Commercial Landings for Atlantic Croaker from Virginia**



No stock identification studies have been conducted on spot. Commercial catch and effort data are collected by state fishery statistics programs. Recreational fishery statistics have been collected by the MRFSS. Fishery independent data for spot is collected in the SEAMAP program. Recruitment indices are available from ongoing juvenile surveys in Maryland, Virginia, and other jurisdictions. The Maryland juvenile spot index during 1992 was the lowest recorded since 1970 with the last large year-class in 1988. Low juvenile spot abundance was also noted by the Maryland Blue Crab summer trawl survey. The baywide trawl survey conducted by VIMS also recorded low levels of juvenile spot. The weighted geometric mean catch per tow was 1.95 in 1992 compared to 16.6 in 1991 and 44.5 in 1990. Environmental conditions such as weather and wind probably played a large role in the decline of juvenile spot during 1992. Spot stocks should be closely monitored during 1993.

#### **Harvest of Small Croaker and Spot**

The impact of bycatch, scrap catch, and discard mortality on croaker and spot stocks is significant, especially from fishing practices in North Carolina. "A Research Plan Addressing Finfish Bycatch in the Gulf of Mexico and South Atlantic Fisheries" has been developed by ASMFC and distributed for final review. Bycatch reduction devices (BRDs) in the southern shrimp fishery and fish separators in the finfish trawl fishery are specific means by which the waste could be curtailed. Since October 1992, North Carolina requires one or more functional finfish excluder devices (FEDs) on shrimp trawl tailbags. In addition, the flynet fishery in the Atlantic Ocean, which is responsible for harvesting large amounts of small croaker and spot, are required to have tailbags with a minimum mesh of 3" square or 3 1/2" diamond. Tests in North Carolina of bycatch reduction devices indicate a reduction of 50-70% in finfish bycatch with minor loss of shrimp. Virginia and North Carolina are also testing escape panels in pound nets to reduce the bycatch of small fish. The Chesapeake Bay jurisdictions will continue to promote the use of BRDs along the Atlantic coast.

Maryland, PRFC, and Delaware are the only jurisdictions with a minimum size limit for croaker. Maryland's 10 inch minimum requirement was a market size decision rather than a resource protection measure when it was implemented in the 1950's. PRFC also has a 10 inch limit. Delaware regulates an 8 inch minimum. Historically, Maryland has caught approximately 3% of the coastal landings. The effects of Maryland's 10 inch limit on coastal stocks are probably undetectable. A 10 inch minimum size delays harvest until ages 1 and 2 and allows approximately 50% of age 2 croakers to mature. The Maryland legislature is currently considering legislation which would reduce the minimum size of croaker from 10" to 9" and a creel limit of 20 fish per person per day. This legislation would also provide for additional Atlantic croaker stock assessment studies. According to a recent Maryland recreational survey (July-August 1992), less than half of the fish (n = 335) caught were 9 to 10 inches. A creel limit of 20 fish at 9 inches probably would not affect the total catch of most fishermen and would be consistent with the objectives of the Chesapeake Bay Fishery Management Plan. Virginia may implement a minimum size, depending on a VIMS analysis of length frequency data.

1992 ANNUAL PROGRESS REPORT  
CHESAPEAKE BAY ATLANTIC CROAKER AND SPOT IMPLEMENTATION SCHEDULE

Problem Area	Action	Date	Comments
1. Stock Status	1.1. MD, VA & PRFC will continue to participate in scientific and technical meetings for management of the fishery along the Atlantic coast and in estuarine waters.  1.2.1a Md & PRFC will continue 10' minimum size for croaker.  1.2.1b VA will implement a minimum size limit for croaker if suggested by length-frequency analyses currently being conducted by VIMS & ODU.  1.2.2. Jurisdictions will evaluate the need for implementing a minimum size limit for spot.	Continue  Continue  1993  1992	Bay jurisdictions will continue to monitor Bay stocks.  There is legislation under consideration for a 9" minimum size and a 20 fish creel limit in Maryland.  Data analysis should be completed by January 1994.  No minimum size is recommended at this time.
2. Harvest of Small Spot and Croaker	2.1.1 a) Jurisdictions will promote the development and use of trawl efficiency devices in the southern shrimp fishery and promote the use of bycatch reduction devices in the fin fish trawl fishery. b) VA will continue its prohibition on trawling in State waters and will maintain its 2'7/8" minimum mesh for gill nets. c) MD will continue its 4-6" gill net restriction during June 15 through September 30 and implement a 3" minimum	Continue  Continue  1992	The jurisdictions have worked through ASMFC/MAFMC to promote the use of TEDs & BRDs. Use of these devices has been successful in eliminating some bycatch of small fish including croaker and spot.  MD prohibits summer gill net use and anchor and stake gill net use at anytime in the Bay.



## Chesapeake Bay Summer Flounder Management Plan

### Overfishing

Total Atlantic coast landings of summer flounder (Paralichthys dentatus) increased from 11.9 million pounds in 1990 to 13.7 million pounds in 1991, with the greatest increase in the Chesapeake region. The majority (>90%) of commercial landings are caught in the Exclusive Economic Zone (EEZ, 3-200 miles offshore). Fishing activity generally follows the summer flounder migration pattern. Effort is concentrated to the north and inshore during the summer and to the south and offshore during the winter. Summer flounder landed in Maryland and Virginia are primarily harvested in offshore coastal waters by otter trawls. The Maryland commercial harvest for the Chesapeake Bay and ocean fisheries reached an all time high in 1979 at 1.7 million pounds. Since then the commercial harvest has dramatically declined (Figure 12). There was a slight increase in commercial landings in 1990 and 1991. Preliminary commercial landings for 1992 are 319,000 pounds. Virginia implemented a ban on trawling in its territorial seas (0-3 miles) in 1989. Virginia summer flounder landings have historically been an order of magnitude higher than the Maryland harvest and peaked in 1979 at 10 million pounds. Harvests in the 1980s have ranged from 3.6 million pounds (1981,1989) to 9.6 million pounds (1984). Virginia commercial harvest for summer flounder in 1991 was 3.6 million pounds and preliminary landings for 1992 are 5.0 million pounds (Figure 12).

The status of the summer flounder stock has not changed since the management plan was adopted by the Executive Council in 1991. The resource is overfished. Overfishing is defined by the MAFMC/ASMFC as fishing in excess of the  $F_{max}$  level or  $F=0.23$ . Current fishing mortality ( $F$ ) on the summer flounder stock is at least 1.4 (about six times the MAFMC target level) and may be as high as 2.1. These fishing mortality rates equate to an exploitation rate between 65% and 80%. Current fishing rates have precipitated a decline in the spawning stock biomass per recruit level to about 2% to 3% of the maximum level. Results from the Northeast Fisheries Center (NEFC) spring survey indicate stock biomass has declined from 1.21 kg/tow (1985) to 0.27 kg/tow (1990). Population analysis indicate that the stock is sustained primarily by fish aged 2 and younger. During the 1990 NEFC survey, no summer flounder older than age 3 were collected. Age composition of the summer flounder stock is severely compressed and represents further evidence of overfishing. Significant reductions in fishing mortality are needed to avoid stock collapse. The MAFMC/ASMFC adopted a strategy to reduce fishing mortality on summer flounder to 0.53 for three years. This requires a reduction in exploitation of approximately 47%. In year four and following years, the target  $F$  would be  $F_{max}$  or 0.23.

In September 1992, the ASMFC and the MAFMC adopted a coastwide 12.35 million pound commercial quota for summer flounder. Based on historical landings (1980-1989), Maryland was allocated a 2% share or 255,176 pounds and Virginia was allocated 21.6% or 2.7 million pounds. Because a 14" minimum size in conjunction with a 5 1/2" minimum mesh size for nets can cause large amounts of 13" discarded

fish (the nature of mesh selectivity), the ASMFC and MAFMC agreed to start with a 13" commercial size limit to minimize wastage. In addition to the 13" minimum size limit, the MAFMC/ASMFC have recommended a 5.5" minimum mesh size, authority to close the fishery when the quota is met and requirement of a federal permit for the commercial fishery. The quota will go into effect, January 1993. Each state is required to close State waters to commercial fishing for summer flounder when their quota is met. Each State must submit a plan by which the State will manage the quota, size limit, and mesh regulation. Maryland has declared summer flounder in need of conservation for authority to regulate the summer flounder fishery and drafted emergency regulations to comply with MAFMC/ASMFC recommendations to reduce exploitation. Maryland established a quarterly allocation system for the commercial quota. Virginia will allocate their quota between inshore and offshore harvest. In addition, the offshore harvest will be allocated on a quarterly basis. A 10% tolerance by weight of fish less than 13" for pound nets will be maintained. The PRFC implemented a 14" size limit for the commercial fishery during 1992.

Recreational landings of summer flounder from the Atlantic coast comprises approximately 38% of the total catch (1980-1989). The estimated recreational harvest of summer flounder has averaged 18.7 million pounds (1981-1989). The coastal harvest declined between 1988 and 1989 to 3.5 million pounds then rebounded slightly (5.3 million pounds) in 1990. Preliminary 1992 data from Maryland charterboat logbooks indicate that 46,000 pounds of summer flounder were caught in Maryland at an average weight of 1.4 pounds. Maryland drafted emergency regulations for the recreational summer flounder fishery that went into effect, March 1, 1993. The regulations include a 14" minimum size limit, a 10 fish/person/day creel limit, an open fishing season from June 15th through October 30th in the Bay, and a May 15th-September 30th season for the Maryland coastal recreational fishery. Virginia's regulations for the recreational fishery were implemented January 1, 1993 and include a 14" minimum size limit, a 10 fish/person/day creel limit and no recreational season. The PRFC implemented a 14" size limit and a 10 fish creel limit for the recreational fishery during 1992.

Summer flounder are also part of an overall mixed species trawl fishery and are landed as bycatch. Discarded bycatch is significant and underestimated as a component of total mortality for summer flounder. The incidental bycatch of small summer flounder in non-directed fisheries impacts recruitment. Management actions for reducing the non-directed catch of summer flounder included evaluating escape panels in pound nets and monitoring the species composition of Virginia's bait fishery. Results indicate significant decreases in bycatch of juvenile finfish for a wide variety of species. However, the body shape of flounder would require designing a separate panel for use in pound nets.

### **Stock Assessment**

From 1986 to 1990, the Virginia Institute of Marine Science (VIMS) conducted a stock assessment study to determine the stock composition of inshore populations of summer flounder, determine seasonal migratory patterns, and define age-growth characteristics and size at maturity. A total of 12,339 summer flounder were tagged

growing need to identify sensitive areas and protect coastal habitat (Casey et al. 1992).

### **Conclusion**

The summer flounder stock is overfished. Actions to counteract the current high fishing mortality rates, low spawning stock biomass and age compression will be implemented (January 1993).

The following areas should be emphasized during 1993:

- 1) Work towards baywide compliance with MAFMC/ASMFC recommendations for reducing exploitation on summer flounder;
- 2) Monitor seasonal commercial quotas and close the commercial fishery when necessary;
- 3) Continue and improve monitoring of the recreational and commercial fisheries;
- 4) Continue tagging program to collect data on migration and stock composition.

### **References**

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# SUMMER FLOUNDER CONT'D.

Problem Area	Action	Date	Comments
1. Overfishing (cont'd)	<p>1.3a. MD will collect information from its pound net &amp; ocean trawl fisheries to develop strategies for reducing bycatch of undersized flounder &amp; other species.</p> <p>1.3b. VA will monitor species composition &amp; biological characteristics of its pound net fishery &amp; take steps to reduce bycatch as needed.</p> <p>1.3c. MD, VA &amp; PRFC will work with the MAFMC &amp; ASMFC to encourage protection of immature flounder.</p>	<p>1992</p> <p>Continue</p> <p>Continue</p>	<p>MD is drafting a proposal to sample summer flounder &amp; other species from pound nets, trawls, &amp; fyke nets within the Bay. Sampling is scheduled for spring '93 &amp; is dependent on federal funding.</p> <p>Escape panels for reducing bycatch of juvenile finfish were tested in 1992. Testing will continue in 1993.</p>
2. Stock Assessment and Research Needs	<p>2.1 Conduct stock identification work.</p> <p>2.2 Continue collection of data from commercial catches.</p> <p>2.3 Continue on-going commercial fisheries statistics programs; VA will pursue its mandatory reporting system; VA &amp; MD will continue to supplement the MRFSS.</p> <p>2.4 Continue the baywide trawl survey to measure size, age, sex, distribution, abundance, and CPUE.</p>	<p>Continue</p> <p>Variable</p> <p>Continue</p>	<p>VMRC has continued stock assessment work including summer flounder. MD will sample pound nets if funding approved.</p> <p>Mandatory reporting has been implemented in VA.</p> <p>MD is drafting a multi-species sampling program which will examine size, age &amp; sex of selected species from commercial gear types &amp; a limited creel census if funding is approved. VIMS will continue baywide trawl survey &amp; juvenile flounder index to predict future population size.</p>

## **Habitat Overview for Fishery Management**

The habitat section in most of the FMPs has been rather generic in scope with few specific habitat issues identified. The habitat narratives have included the value of protecting both coastal and estuarine waters, the need for "good" water quality, problems with habitat degradation, adequate dissolved oxygen concentrations, the effects of toxic substances, and the need to protect SAV and wetlands. The jurisdictions have continued to support the habitat and water quality commitments of the 1987 Chesapeake Bay Agreement. Under the Agreement, strategies were developed to reduce nutrients, reduce toxic substances, reduce conventional pollutants, protect wetlands, restore SAVs, and identify the impacts of acid rain. During 1991, the initial strategies were reevaluated and the following conclusions were made:

- 1) Significant improvements in water quality and living resources habitat conditions have occurred in the mainstem of the Chesapeake Bay;
- 2) There is a need to expand program efforts to include the tributaries since most of the finfish and shellfish spawning grounds and essential habitat are in the tributaries;
- 3) In order to meet the 40% nutrient reduction goal, intensified efforts to control nonpoint sources of pollution from agriculture and developed areas will be necessary;
- 4) There is a demonstrable link between water quality conditions and the survival and health of submerged aquatic vegetation (SAV);
- 5) Implementation of the Clean Air Act Amendments will provide additional opportunities to achieve nitrogen reductions;
- 6) Achieving a 40% nutrient reduction goal challenges the limits of current point and nonpoint source control technologies.

The re-evaluation provided the impetus to add a tributary initiative to the Bay Program. This initiative will focus on developing strategies to reduce nutrient input in the major tributaries. In addition, a habitat workgroup has been formed to discuss specific habitat requirements for each FMP species and to identify specific monitoring programs that will link water quality and living resources. By defining specific habitat requirements, relevant information derived from the monitoring programs can be used to coordinate and guide Bay Program activities.