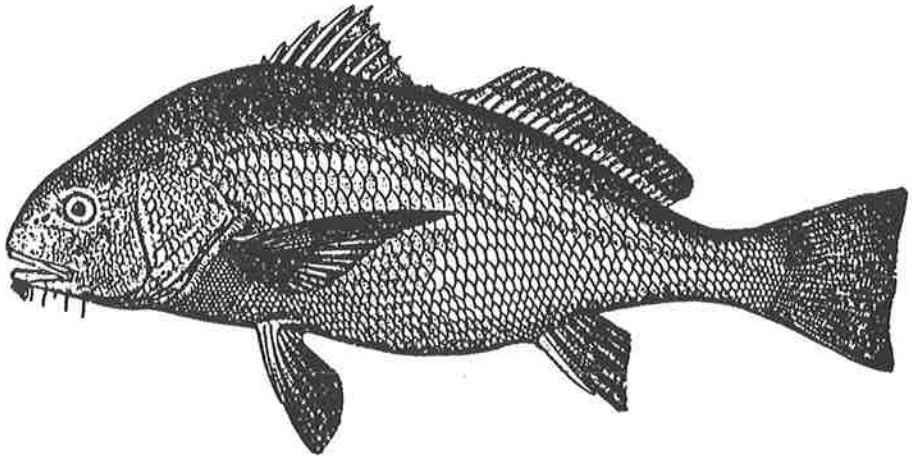
CBP/TRS 110/94
April 1994

Chesapeake Bay Black Drum Fishery Management Plan



Agreement Commitment Report 1993

Chesapeake Bay Program

Printed on Recycled Paper

Chesapeake Bay Black Drum Fishery Management Plan

Agreement Commitment Report

September 1993

Printed by the U.S. Environmental Protection Agency for the Chesapeake Bay Program

ADOPTION STATEMENT

We, the undersigned, adopt the Chesapeake Bay Black Drum Management Plan, in partial fulfillment of Living Resources Commitment Number 4 of the 1987 Chesapeake Bay Agreement:

> *"...by July 1989 to develop, adopt, and begin to implement a Bay-wide management plan for oysters, blue crabs and American shad. Plans for other major commercially, recreationally and ecologically valuable species should be initiated by 1990."*

We recognize the need to commit long-term, stable financial support and human resources to the task of enhancing and perpetuating the black drum stock.

Date September 15, 1993

For the Commonwealth of Virginia

For the State of Maryland

For the Commonwealth of Pennsylvania

For the United States of America

For the District of Columbia

For the Chesapeake Bay Commission

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ACKNOWLEDGEMENTS

The Chesapeake Bay Black Drum Management Plan was developed under the direction of the Fisheries Management Workgroup. Staff from the Virginia Marine Resources Commission (VMRC), Plans and Statistics Department, Fisheries Management Division were responsible for writing the plan and addressing comments on the draft versions. Support was provided by staff from the Maryland Department of Natural Resources (MDNR), Tidewater Administration, Fisheries Division. Contributing VMRC staff included David Boyd, Roy Insley, Lewis Gillingham and Sonya Knur. MDNR staff included Nancy Butowski and Harley Speir. Thanks are due to Verna Harrison and Ed Christoffers for guiding the plan through the development and adoption process. Carin Bisland, from the EPA's Chesapeake Bay Liason Office, assisted with production of title pages and fact sheets, and with printing and distribution. Finally, we express gratitude to members of the various Chesapeake Bay Committees and Workgroups and to the public who commented on the plan.

Members of the Fisheries Management Workgroup were:

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EXECUTIVE SUMMARY

Introduction

One of the strategies for implementing the Living Resources Commitments of the 1987 Chesapeake Bay Agreement is to develop and adopt a series of baywide fishery management plans (FMPs) for commercially, recreationally, or ecologically valuable species. The FMPs are to be implemented by the Commonwealth of Pennsylvania, Commonwealth of Virginia, District of Columbia, Potomac River Fisheries Commission, and State of Maryland as appropriate. Under a timetable adopted for completing management plans for several important species, the black drum FMP was scheduled for completion in December 1992.

A comprehensive approach to managing Chesapeake Bay fisheries is needed because biological, physical, economic, and social aspects of the fisheries are shared among the Bay's jurisdictions. The Chesapeake Bay Program's Living Resources Subcommittee formed a Fisheries Management Workgroup to address the commitment in the Bay Agreement for comprehensive, bay-wide fishery management plans. The workgroup is composed of members from government agencies, the academic community, the fishing industry, and public interest groups representing Pennsylvania, Maryland, Virginia, the District of Columbia, and the federal government.

Development of Fishery Management Plans

An FMP prepared under the 1987 Chesapeake Bay Agreement serves as a framework for conserving and wisely using a fishery resource of the Bay. Each management plan contains a summary of the fishery under consideration, a discussion of problems and issues that have arisen, and recommended management actions. An implementation plan is included at the end of the FMP to provide additional details on the actions that participating jurisdictions will take and the mechanisms for taking these actions.

Development of a fishery management plan is a dynamic, ongoing process. The process starts with initial input by the Fishery Management Workgroup, is followed by public and scientific review of the management proposals, and then by endorsement by the appropriate Chesapeake Bay Program committees. A management plan is adopted when it is signed by the Chesapeake Bay Program's Executive Committee. In some cases, regulatory and legislative action will have to be initiated, while in others, additional funding and staffing may be required to fully implement a management action. A periodic review of each FMP will be conducted under the auspices of the Bay Program's Living Resources Subcommittee, to incorporate new information and to update management strategies as needed.

Goal Statement

The goal of the Chesapeake Bay Black Drum Management Plan is to enhance and perpetuate black drum stocks in the Chesapeake Bay and its tributaries, and throughout their Atlantic coast range, so as to generate optimum long-term ecological, social and economic benefits from their commercial and recreational harvest and utilization over time.

To meet this goal, a number of objectives must be met. They include promoting the development of guidelines by the Atlantic States Marine Fisheries Commission (ASMFC) and the Mid-Atlantic Fishery Management Council (MAFMC) for coastwide management of the black drum fishery, providing for fair allocation of the resource, promoting efficient harvesting practices, promoting biological and economic research and pursuing standards of environmental quality and habitat protection. These objectives are incorporated into the problems and management strategies discussed below.

Problem Areas and Management Strategies

Problem 1: Status of Stocks. Stock identification, coastal spawning movements, overwintering areas, stock size, natural and fishing mortality rates, size and age at sexual maturity, age and sex structure of the population and annual reproductive success, are all lacking for East Coast black drum.

Strategy 1: Bay jurisdictions will support the research to determine essential biological characters of the stock.

Problem 2: Fishing Mortality. Both the commercial and recreational harvest is composed of many year classes and show large year to year fluctuations in numbers of fish landed.

Strategy 2: States will monitor the commercial and recreational harvest of black drum and adopt regulations to stabilize the harvest.

Problem 3: Gear Conflicts. Recreational fishermen congregate in very specific areas for black drum. Certain types of mobile commercial gear limit the opportunity for recreational anglers.

Strategy 3: Designate "high-use" recreational areas, during the black drum season, where only rod and reel angling would be allowed during the day.

Problem 4: Habitat Issues. Estuarine areas are utilized by black drum stocks for nursery and feeding grounds. Increasing urbanization and industrial development of the Atlantic coastal plain has resulted in a decrease in the environmental quality of many estuarine communities. Estuarine habitat loss and degradation in Chesapeake Bay may contribute to declines in black drum stocks.

Strategy 4: The jurisdictions will continue their efforts to improve water quality and define habitat requirements for the living resources in the Chesapeake Bay.

INTRODUCTION

MANAGEMENT PLAN BACKGROUND

As part of the 1987 Chesapeake Bay Agreement's commitment to protect and manage the natural resources of the Chesapeake Bay, the Bay jurisdictions are developing a series of fishery management plans covering commercially, recreationally, and selected ecologically valuable species. Under the agreement's Schedule for Developing Baywide Resource Management Strategies, a list of the priority species was formulated, with a timetable for completing fishery management plans as follows:

- oysters, blue crabs and American shad by July 1989;
- striped bass, bluefish, weakfish and spotted seatrout by 1990;
- croaker, spot, summer flounder and American eel by 1991;
- red and black drum by 1992; and
- Spanish mackerel, king mackerel, tautog, black sea bass and freshwater catfish by 1993

A comprehensive and coordinated approach by the various local, state and federal groups in the Chesapeake Bay watershed is central to successful fishery management. Bay fisheries are traditionally managed separately by Pennsylvania, Maryland, Virginia, the District of Columbia, and the Potomac River Fisheries Commission (PRFC). There is also a federal Mid-Atlantic Fishery Management Council, which has management jurisdiction for offshore fisheries (3-200 miles), and a coast-wide organization, the Atlantic States Marine Fisheries Commission (ASMFC), which coordinates the management of migratory species in state waters (internal waters to 3 miles offshore) from Maine to Florida. The state/federal Chesapeake Bay Stock Assessment Committee (CBSAC) was responsible for developing a Baywide Stock Assessment Plan, which included collection and analysis of fisheries information, but does not include the development of fishery management plans.

Consequently, a Fisheries Management Workgroup, under the auspices of the Chesapeake Bay Program's Living Resources Subcommittee, was formed to address the commitment in the Bay Agreement for Baywide fishery management plans. The Fisheries Management Workgroup is responsible for developing fishery management plans with a broad-based view. The workgroup's members represent fishery management agencies from Maryland, Pennsylvania, Virginia, the District of Columbia, and the federal government; the Potomac River Fisheries Commission; the Bay area academic community; the fishing industry; conservation groups; and interested citizens. Establishing Chesapeake Bay FMP's, in addition to coastal FMP's, creates a format to specifically address problems that are unique to the Chesapeake Bay. They

also serve as the basis for implementing regulations in the Bay jurisdictions.

WHAT IS A FISHERY MANAGEMENT PLAN?

A Chesapeake Bay fishery management plan provides a framework for the Bay jurisdictions to undertake compatible, coordinated management measures to conserve and utilize a fishery resource. A management plan includes pertinent background information, lists management actions that need to be taken, the jurisdictions responsible for implementation, and an implementation timetable.

A fishery management plan is not an endpoint in the management of a fishery; rather, it is part of a dynamic, ongoing process consisting of several steps. The first step consists of analyzing the complex biological, economic and social aspects of a particular finfish or shellfish fishery. The second step includes defining a fishery's problems, identifying potential solutions, and choosing appropriate management strategies. Next, the chosen management strategies are put into action or implemented. Finally, a plan must be regularly reviewed and updated to respond to the most current information on the fishery; this requires that a management plan be adaptive and flexible.

GOALS AND OBJECTIVES FOR FISHERY MANAGEMENT PLANS

The goal of fisheries management is to protect the reproductive capability of the resource while providing for its optimal use by man. Fisheries management must include biological, economic and sociological considerations to be effective. Three simply stated objectives to protect the reproductive capabilities of the resource while allowing its optimal use include:

- quantify biologically appropriate levels of harvest;
- monitor current and future resource status to ensure harvest levels are conserving the species while maintaining an economically viable fishery; and
- adjust resource status if necessary, through management efforts.

MANAGEMENT PLAN FORMAT

The background section of this management plan summarizes:

- natural history and biological profile of black drum;
- FMP status and management unit;

- fishery parameters;
- habitat issues;
- historical fishery trends;
- economic perspective;
- current resource status;
- current laws and regulations in the Chesapeake Bay; and
- data and analytical needs.

The background information is derived primarily from the document entitled, Chesapeake Bay Fisheries: Status, Trends, Priorities and Data Needs and is supplemented with additional data. Inclusion of this section as part of the management plan provides historical background and basic biological information for the species.

The management section of the plan, which follows the background, defines:

- the management goal and objectives for the species;
- problem areas for the species;
- management strategies to address each problem area; and
- action items with a schedule for implementation.

THE CHESAPEAKE BAY PROGRAM'S FISHERY MANAGEMENT PLANNING PROCESS

The planning process starts with initial input by the Fisheries Management Workgroup and development of a draft plan. This is followed by a review of the management proposals by Bay program committees, other scientists and resource managers, and the public. After a revised draft management plan is prepared, it must be endorsed by the Chesapeake Bay Program's Living Resources Subcommittee and Implementation and Principal Staff committees. The plan is then sent to the Executive Committee for adoption.

Upon adoption by the Executive Committee, the appropriate management agencies implement the plan. In 1990, the Maryland legislature approved § 4-215 of the Natural Resources Article giving the Maryland Department of Natural Resources authority to regulate a fishery once an FMP has been adopted by regulation. In Virginia, FMP recommendations are pursued either by legislative changes or through a public regulatory process conducted by the Commission (VMRC). A periodic review of each FMP is conducted by the Fisheries Management Workgroup to incorporate new information and to update management strategies as needed.

SECTION 1. BACKGROUND

Black Drum--Life History

The black drum, Pogonias cromis, is a member of the drum family, Sciaenidae

Black drum occur along inshore waters and estuaries from Argentina to the Gulf of Mexico. They are also found throughout the east coast of Florida and up the Atlantic Coast as far as New England. Black drum most commonly occur from the Chesapeake Bay south. The largest numbers occur along the Texas coast in Corpus Christi Bay and Laguna Madre.

Black drum spawn at the mouth of the Chesapeake Bay and seaside inlets of Eastern Shore when the water temperature reaches 57 to 67 degrees F, sometime between April and early June. Mature fish may contain over 30 million eggs. Separate studies conducted by researchers at the Virginia Institute of Marine Science and Old Dominion University documented the viability of black drum eggs and the production of larvae within the Bay but scientific collections of young-of-the-year black drum remain sparse for Chesapeake Bay. A modest catch of young-of-the-year black drum by commercial gill and pound nets in October of some years suggest a fall down-Bay migration. A lower thermal limit of 37 degrees F has been observed for black drum from the Gulf Coast. It is possible that juvenile and adult black drum could over-winter in the Bay system during mild winters or if suitable thermal refugia were encountered.

Tagging results from Georgia, Florida and Texas show limited black drum movement during the first three years of life. It is believed young black drum migrate from estuarine habitat to offshore habitat at age four along the Texas coast. Mature adults return to the estuarine system for spawning, dispersing throughout the Bay and nearby ocean waters.

FMP Status and Management Unit:

No previous management plans or other source documents exist for Atlantic Coast black drum. Much of the information regarding black drum has been derived from work along the Gulf Coast. The management unit is unknown; however, current evidence indicates that separate Gulf Coast and Atlantic Coast stocks may exist.

Fishery Parameters

Status of exploitation:	Unknown
Long term potential catch:	Unknown
Importance of recreational fishery:	Important in the Gulf,

especially popular in Mississippi and Texas. Along the Atlantic Coast, subadults are often caught, though no directed fishery exists. In the Chesapeake Bay and throughout the seaside inlets of Eastern Shore and Delaware Bay (Delaware and New Jersey), a directed fishery exists for large "trophy" adults. The fish are typically caught during a very short period of time in the spring.

Importance of commercial fishery:

Important commercial fishery in the Gulf of Mexico. Commercial landings in Texas averaged 1.3 million pounds from 1977-1982. A very small commercial fishery exists along the Atlantic coast with most fish coming from the Eastern Shore of Virginia.

Large black drum support a directed three to five week spring fishery on the Delmarva Peninsula. Local demand is high for the "drum fish" during this time. In recent years the price paid to the harvester averaged $0.35/pound for whole fish and $1.35/pound for fillets. Landings in Virginia averaged slightly over 100,000 pounds during the past 30 years.

Fishing mortality rates:

Unknown

Biological Profile

Fecundity:

A 1929 study estimated a 43 inch TL Gulf Coast drum contained 6,000,000 eggs. A Chesapeake Bay study completed in 1988, estimated a 39 inch TL female contained >30,000,000 eggs.

Age\Size at maturity:

Black drum become sexually mature by the end of their

	second year when they are 11 to 13 inches on the Gulf Coast. Using Chesapeake Bay samples, Richards, 1973, determined age II black drum were 16 inches and weighed over two pounds.
Longevity:	Recent studies indicate, fish over 47 inches TL can exceed 40 years of age.

Spawning and Larval Development

Spawning season:	Spawning can occur in the Chesapeake Bay from April to mid-June.
Spawning area:	Black drum spawn at the mouths of major rivers and Bays.
Location:	Delaware Bay, south to the Gulf of Mexico including the Chesapeake Bay. Locally, black drum spawn near the mouth of Chesapeake Bay and seaside inlets of Eastern Shore.
Salinity:	20-35ppt
Temperature:	In the Chesapeake Bay, black drum are known to spawn between 57 to 68 degrees F.

Young-of-year-juveniles

Location:	Juveniles prefer shallow, nutrient rich waters typical of the tidal estuary habitat. Young-of-the-year remain in this environment until they reach approximately 2.5 inches, when some move to deeper bay water.
Salinity:	Juvenile drum can tolerate salinities from near freshwater conditions to 35ppt.
Temperature:	Young-of-the-year tolerate a wide range of temperatures associated with the estuarine environment.

Subadults and Adults

Location:	On the Gulf Coast, most black drum stay in shallow bay areas until they reach sexual maturity. Subadult black drum are predominantly an estuarine species, common in shallow estuaries throughout the Gulf of Mexico. Texas tagging results show very little movement (intra-bay); 60% were captured less than five miles from where initially tagged. Black drum migrate from the estuarine habitat to the offshore Gulf habitat at age four or older. Mature adults return to the estuarine systems only for spawning.
Salinity:	Estuarine species - wide range of salinities - older individuals tend to be found in higher salinity waters.
Temperature:	Larger, older fish appear to tolerate temperatures down to 37 degrees F. Below this temperature, the fish become lethargic and high mortalities have been observed along the Gulf Coast.

Habitat Issues

Coastal and estuarine areas are extremely important as feeding, nursery and spawning areas for black drum. Any major alteration of these habitats could disrupt the life cycle of black drum. Black drum depend upon the use of the Chesapeake Bay estuary, as such, the degradation through landfill, dredging and run-off of domestic and/or industrial wastes will certainly have negative effects on the stock.

The Fisheries

An important black drum commercial fishery occurs in the Gulf of Mexico while a smaller fishery occurs along the Atlantic Coast. The majority of the Atlantic Coast commercial catch comes from the Chesapeake Bay region.

In Virginia, the commercial fishery for black drum is directed at large adults during the months of April, May and early June (Figure 1). The average size fish is over 40 pounds and most are

in spawning condition during the first of the season. Except for young-of-the-year, juvenile black drum are rare. In a 1990 study, the average age drum was 27 years (n= 1000, Figure 2). Over 40 year classes and fish as old as 57 years were represented in the sample. Drift gill nets, anchored gill nets and pound nets account for most of the commercial catch (Figure 3). In some years fish caught by trot line and rod and reel make up a significant portion of the commercial catch. From mid-June until October, both large adults and juveniles are caught in very small numbers by various non-directed fisheries. The general trend in gears has been toward large meshed drift and anchored gill nets. Commercial landings have fluctuated in the last 35 years with peaks in 1966 (391,000) and 1968 (325,000). Low levels occurred in 1975 (7,000) and 1980 (4,000 pounds) (Figure 4). The two most recent years for which fishery landings are available, 1990 and 1991, there were 82,000 and 105,000 pounds landed, respectively. Weather and other conditions, such as market demand and improved data collection (mandatory reporting since 1986), account for some variability in commercial landings.

In December 1991 a Black Drum Workshop group, composed of members from the recreational and commercial fishing industries reccommended that the VMRC cap the black drum catch by establishing a quota for the commercial fishery and a individual bag limit for recreational fishermen. Subsequently, the Commission adopted a 120,000 pound commercial quota (average landings for the past five years) and a one fish daily bag limit for recreational fishermen.

Maryland's commercial black drum fishery is very small. Landings have been variable, ranging between 400 and 90,000 pounds (Figure 5). The average harvest since 1980 has been 15,000 pounds but the 1991 reported harvest of 42,000 pounds was the highest since 1966. Value of the 1991 commercial black drum harvest was estimated at $8,315, a small fraction of the value of Bay finfish landings. Most of the Maryland landings are harvested by pound nets in the Bay with only a small amount taken by the oceanside fisheries.

Coastwide estimates indicate the recreational fishery harvests more black drum than the commercial fishery with the Gulf of Mexico accounting for the majority of the landings. Recreational estimates range between 4.5 million fish (1979) and 640,000 fish (1989) for the Gulf of Mexico and Atlantic Coast combined(Figure 6).

Historically, the recreational fishery for "trophy" black drum in Virginia, has over-shadowed the commercial fishery, with an estimated 486,000 pounds landed in 1985 and 669,000 pounds in 1986. Currently it takes a 70 pound black drum to qualify for a Virginia Saltwater Fishing Tournament Citation. In 1986 and 1987 respectively, 245 and 108 black drum met or exceeded the qualifying criteria (Figure 7). In 1991, the number of citations dropped to a ten year low of 23 (includes releases). Like the commercial fishery, the recreational fishery is a spring fishery

with the month of May producing the greatest share of trophy fish (Figure 7). In 1958, when the Virginia Saltwater Tournament began, the qualifying weight for black drum was 50 pounds. The minimum citation weight was increased to 75 pounds in 1976 but was then lowered to 70 pounds in 1983. Release citations for black drum were added to the State sponsored program in 1988. Black drum must be at least 44 inches to qualify for the special release citation.

In Maryland, the recreational season for catching black drum is of short duration. During years when the recreational catch was estimated, the harvest was highly variable. In 1979, a Maryland sportfishing survey estimated black drum recreational harvest was 160,000 pounds. The same survey conducted in 1980, concluded that no black drum were caught. Data from the 1991 charter boat log books indicate that over 25,000 pounds of black drum were caught by charter boat fishermen. Over 75% of the reported harvest was taken during May and June with an average weight of 50 pounds. Charter boat data from 1991 also indicate that smaller fish weighing 1 1/2 pounds to 2 1/2 pounds were caught during September and October. The number of citations for black drum caught in Maryland during 1991 was the highest since 1972 but participation in the program has been variable from year to year (Figure 8).

During the Virginia black drum "season", hotels, marinas, and other associated industries are bustling on the Eastern Shore. Trophy black drum are an important drawing card for out-of-state fishermen, making the recreational black drum fishery an important part of the Eastern Shore economy.

The Virginia commercial and recreational fisheries are concentrated into a few weeks, with the month of May registering the highest percentage of the landings. Both fisheries are centered in a small area, with the bulk of the landings coming from the lower end of the Delmarva Peninsula. Conflict between the two fisheries for "prime" fishing locations exists. There is no conflict between commercial and recreational black drum fisheries in Maryland.

Resource Status

Many questions surround the status of the black drum stocks. Years of apparent low abundance, are followed by years of above average landings. The average age of the fish encountered in the Virginia fishery (>20 years) suggests other causes, rather than fishing pressure, for the observed short term declines in landings. Most fish entering the Virginia fishery have been mature for a minimum of a decade before being subjected to directed fishing mortality.

Laws and Regulations

Limited entry: The Virginia Marine Resources

	Commission will have the power to limit entry into a fishery in 1993. Maryland's Delay of Application Process, effective 1 September 1989, requires previously unlicensed applicants to wait two years after registering with MDNR before obtaining a license to harvest finfish.
Minimum size limit:	16" TL in Virginia. No size limit in Maryland or on the Potomac River.
Creel limit:	One fish per person per day in Virginia. No creel limit in Maryland or on the Potomac River.
Harvest quotas:	The Virginia Marine Resources Commission established a commercial harvest quota of 120,000 pounds for 1992. A mandatory reporting system has been in effect since 1987. No quota in Maryland or on the Potomac River.
By-catch restrictions:	None
Season:	No closed season
Gear: Area Restrictions	
Maryland -	Purse seines, trawls, trammel nets and mono-filament gill nets are prohibited. (Otter and beam trawls are legal on the Atlantic coast at distances of one mile or more offshore). Prohibition on gill netting in most areas of Chesapeake Bay and its tributaries during the summer. Minimum stretch mesh size restrictions: pound net, 1.5"; haul seine, 2.5".
Virginia -	Trawling is prohibited in the Chesapeake Bay and Territorial Sea. It is unlawful to set,

place or fish a fixed fishing device of any type within 300 yards of the Chesapeake Bay Bridge Tunnel. No trot lines may be set on the seaside of Eastern Shore. A Special Management Zone, bounded by a line drawn from the Cape Charles Jetty to the

C-12 Buoy to the RN-28 Buoy, then south along the CBBT, then north along the CBBT to Fishermen's Island, then over north along the coast, returning to the Cape Charles Jetty, was established in 1992, where it is unlawful to set or fish gill nets or trotlines from 7 AM to 8:30 PM of each day during May 1 to June 7. Minimum stretch mesh size restrictions: Pound net, 2", gill nets, 2 7/8", haul seines, 3" (nets over 200 yards long). No haul seine can be longer than 1000 yards in length or deeper than 40 meshes. Also, Sections 28.1-52 and 28.1-53 of the Code of Virginia outline placement, total length and distance requirements for fishing structures.

Potomac River - Current moratorium on any new gill net or hook and line licenses. The use of a spear, gig, purse net, beam trawl, otter trawl or trammel net are prohibited. Mesh size restrictions on pound net- 1.5", haul seine- 1.5", fyke net- 1.5", fish pot-2.0", gill net 5.0" with a maximum of 7.0". Length limitations on pound net (1200'), stake gill net (600'), anchor gill net (600' X 12'), fyke net (400'), haul seine (1200' or 2400'), fish pot (10'). Seasonal restrictions: Pound net - February 15 through December 15; Anchor or stake gill net- June 1 through November 30;

Drift gill net- closed; Haul seine- January 1 through December 31 except Saturdays June 1 through August 31 and Fridays and Saturdays September 1 through May 31.

Status of Traditional Fishery Management Approaches

The following definitions have been adapted from the documents, "Status of the Fishery Resources Off the Northeastern United States" for 1989 and 1990 (NOAA Technical Memoranda NMFS-F/NEC-72 and 81), "Amendment 2 to the Fishery Management Plan for the Summer Flounder Fishery" (MAFMC, 1991) and "The Atlantic Coast Red Drum Fishery Management Plan" (SAFMC, 1990). For a more thorough review of fisheries terminology, refer to these documents under the "definitions" section.

Catch-Effort or CPUE: Defined as the number or weight of fish caught during a specific unit of fishing time and considered a basic measure of abundance or stock density.

Estimates of Mortality: A mortality rate is the rate at which fish die from natural causes or fishing. Mortality rates can be expressed in terms of instantaneous or annual mortality. Instantaneous rates are used extensively in fisheries management for ease of comparing the relative importance of different sources of mortality. Annual mortality rates can easily be converted to percentages, while instantaneous rates cannot. The instantaneous total mortality rate (Z) is the natural logarithm of the ratio of the number of fish alive at the beginning of the same period of time. Fishing mortality is usually expressed in terms of an instantaneous rate (F), as is natural mortality (M). For example, an instantaneous total mortality rate (Z) of 1.5 equals annual mortality rate of 0.78 or 78% annual total mortality. Instantaneous mortality rates are additive, but annual rates are not.

Yield-per-recruit (YPR): The theoretical yield that would be obtained from a group of fish of one year-class if harvested according to a certain exploitation rate over the life-span of the fish.

Spawning Stock Biomass (SSB) and Spawning Stock Biomass per Recruit (SSBR): SSB is the weight of all adult females in the population, calculated as the remaining number of individual females in each year-class, times the percent that are mature, times their average weight. SSBR is the total contribution of a cohort (year-class) to the SSB over its lifetime, determined by summing its contribution at each age.

Maximum Sustainable Yield (MSY): The largest average catch or yield that can be continuously taken from a stock under existing

environmental conditions, while maintaining stock size.

Virtual Population Analysis (VPA): An analysis of the catches from a given year-class over its life in the fishery.

Catch-Effort:	Mandatory reporting began in 1987 (commercial). A VMRC funded Creel Effort Survey was conducted by Dr. Jones of Old Dominion University during the spring 1988 and 1989 seasons. Both the commercial and recreational fisheries are seasonal. Because of variable migration and seasonality it is questionable whether CPUE for these fisheries reflect true variations in abundance of the "stock."
Estimates of mortality:	Unknown for Atlantic Coast fish.
Yield-per-Recruit:	On the Gulf Coast, black drum mature in their second year. A 16" minimum size would protect fish until spawning age, if the Chesapeake Bay "stock" has the same maturity schedule. The most rapid growth is observed during the first 4 years. Yield per recruit modeling is being undertaken at Old Dominion University.
Stock-Recruitment:	Relationship between the adult spawning stock entering the Bay during the spring and recruitment is unclear. After their first year, the immature black drum is an unusual occurrence in the Chesapeake Bay. Recent research at Chesapeake Biological Lab and Old Dominion University suggests that survival of larval black drum may be significantly reduced by ctenophore predation.
MSY:	Unknown
VPA Analysis:	Has not been carried out.

Data and Information Needs

1. Stock identification, determination of coastal spawning movements, overwintering areas and the extent of stock

mixing.

2. Estimate of stock size.

3. Improved estimates of the recreational harvest and catch\effort data for commercial and recreational fisheries.

4. Estimates of natural and fishing mortality rates.

5. Estimates of annual reproductive success.

6. Validation of aging technique.

7. Reproductive biology of black drum for the east coast, specifically, size and age at sexual maturity, age and sex structure, fecundity and spawning periodicity of the Chesapeake Bay population.

8. Socioeconomics of the black drum fishery.

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SECTION 2. BLACK DRUM MANAGEMENT

Management strategies and actions will be implemented by the jurisdictions to protect and enhance the stocks of black drum utilizing the Chesapeake Bay. Existing regulations regarding the harvest of this species will continue to be enforced except where otherwise indicated by the plan.

A. GOAL AND OBJECTIVES

The goal of this plan is to:

Enhance and perpetuate black drum stocks in the Chesapeake Bay and its tributaries, and throughout their Atlantic coast range, so as to generate optimum long-term ecological, social and economic benefits from their commercial and recreational harvest and utilization over time.

To meet this goal, the following objectives must be met:

1) Promote development of guidelines by the Atlantic States Marine Fisheries Commission, the South-Atlantic Fishery Management Council and the Mid-Atlantic Fishery Management Council for coastwide management of black drum stocks and make Bay regulatory actions compatible where possible.

2) Promote protection of the resource by maintaining a clear distinction between conservation goals and allocation issues.

3) Maintain black drum spawning stocks at a size which minimizes the possibility of recruitment failure.

4) Promote the cooperative interstate collection of economic, social and biological data required to effectively monitor and assess management efforts relative to the overall goal.

5) Promote fair allocation of allowable harvest among various components of the fishery.

6) Continue to provide guidance for the development of water quality goals and habitat protection necessary to protect the black drum population within the Bay and state coastal waters.

B. PROBLEM AREAS AND MANAGEMENT STRATEGIES

Problem 1: Status of Stocks The current status of the black drum fishery is unknown. Years of apparent low abundance are followed by years of above average landings. The average age of fish encountered in the Virginia fishery is over 20 years with as many as 40 different year classes represented. The old age of the average fish suggests other causes rather than fishing pressure

is affecting the short term fluctuations seen in the fishery. Information is lacking for coastal spawning movements, overwintering areas, stock size, natural and fishing mortality rates, annual reproductive success, size and age at sexual maturity, age and sex structure for the east coast stock.

Strategy 1: The states will promote research on characterizing the biological components of the black drum population.

ACTION 1: Virginia will continue tagging of black drum, begun in 1988 and augmented by a Wallop Breaux funded project in 1992, to determine coastal movement of Chesapeake Bay stock. Virginia will continue to fund research to determine age, fecundity and spawning periodicity of black drum. Virginia's Stock Assessment Program will continue to sample the commercial and recreational catch to determine length, weight and sex. Maryland will continue to support the Old Dominion black drum tagging study.

IMPLEMENTATION 1:
1) Continue

Problem 2: Fishing Mortality Both the commercial and recreational harvest is composed of many year classes and show large year to year fluctuations in numbers of fish landed. The impact of fishing on the stock is unknown. For this reason, it is important to prevent expansion of the fisheries and assure that overfishing does not occur.

STRATEGY 2: The states will monitor the commercial and recreational harvest of black drum and adopt regulations to stabilize the harvest.

ACTION 2A: Virginia requires each commercial harvester and buyer to obtain a permit and report weekly during the season (since 1988). Virginia has established a 16-inch minimum size limit, a 120,000 pound commercial quota and a one fish recreational bag limit. Virginia will consider limiting entry into the commercial fishery for black drum. Virginia will continue to monitor the commercial and recreational fishery landings.

IMPLEMENTATION 2A:
1) 1992; Continue

ACTION 2B: Maryland will adopt a 16" minimum size limit and a one fish per person per day recreational creel limit.

IMPLEMENTATION 2B:
1) 1993

ACTION 2C: The PRFC will consider similar size and bag limits for black drum once Virginia and Maryland regulations are established.

IMPLEMENTATION 2B:
1) Open

ACTION 2D:
As data become available Maryland and PRFC will assess the need for harvest restrictions in the commercial Black Drum Fishery.

IMPLEMENTATION 2D:
1) Open

PROBLEM 3: Gear Conflicts. Conflicts occur between recreational and commercial fishermen vying for the same black drum resource, especially off Cape Charles. Recreational fishermen congregate in very specific areas for black drum. Certain types of mobile commercial gear, specifically trot line and gill net, limit the opportunity for recreational anglers.

STRATEGY 3: High use areas will be designated, in time and space, during the black drum season for rod and reel angling only.

ACTION 3: Virginia has established a Special Black Drum Management Zone, whose boundaries include recreational "high-use" areas such as the Cabbage Patch and Latimer Shoals. During the time period of 1 May through 7 June, no gill net or trot line may be in the established zone from 7 AM to 8:30 PM.

IMPLEMENTATION 3:
1) 1992

Problem 4: Habitat Issues. Estuarine areas are utilized by black drum stocks for nursery and feeding grounds. Increasing urbanization and industrial development of the Atlantic coastal plain has resulted in a decrease in the environmental quality of many estuarine communities. Estuarine habitat loss and degradation in Chesapeake Bay may contribute to declines in black drum stocks.

STRATEGY 4: The District of Columbia, Environmental Protection Agency, Maryland, Pennsylvania, the Potomac River Fisheries Commission, and Virginia will continue to promote the commitments of the 1987 Chesapeake Bay Agreement and the 1992 Amendments. The achievement of the Bay commitments will lead to improved water quality and enhanced biological production.

ACTION 4: The District of Columbia, Environmental Protection Agency, Maryland, Pennsylvania, the Potomac River Fisheries Commission, and Virginia will continue

to set specific objectives for water quality goals and review management programs established under the 1987 Chesapeake Bay Agreement. The Agreement and documents developed pursuant to the Agreement call for:

1) Developing habitat requirements and water quality goals for various finfish species.
2) Developing and adopting basinwide nutrient reduction strategies.
3) Developing and adopting basinwide plans for the reduction and control of toxic substances.
4) Developing and adopting basinwide management measures for conventional pollutants entering the Bay from point and nonpoint sources.
5) Quantifying the impacts and identifying the sources of atmospheric inputs on the Bay system.
6) Developing management strategies to protect and restore wetlands and submerged aquatic vegetation.
7) Managing population growth to minimize adverse impacts to the Bay environment.

IMPLEMENTATION 4:
Continuing.

CHESAPEAKE BAY BLACK DRUM
MANAGEMENT PLAN IMPLEMENTATION

PROBLEM AREA	ACTION	DATE	RESPONSIBLE AGENCY & METHOD	ADD. STAFF OR $$	COMMENTS/ NOTES
1. Stock Status	1. Virginia will continue tagging of black drum, and continue funding research to determine age, fecundity, and spawning periodicity of black drum. VA's Stock Assessment Program will continue to sample the commercial and rec catch to determine length, weight and sex. MD will continue to support the tagging study in the Bay.	Continue	VMRC - A MDNR - A		

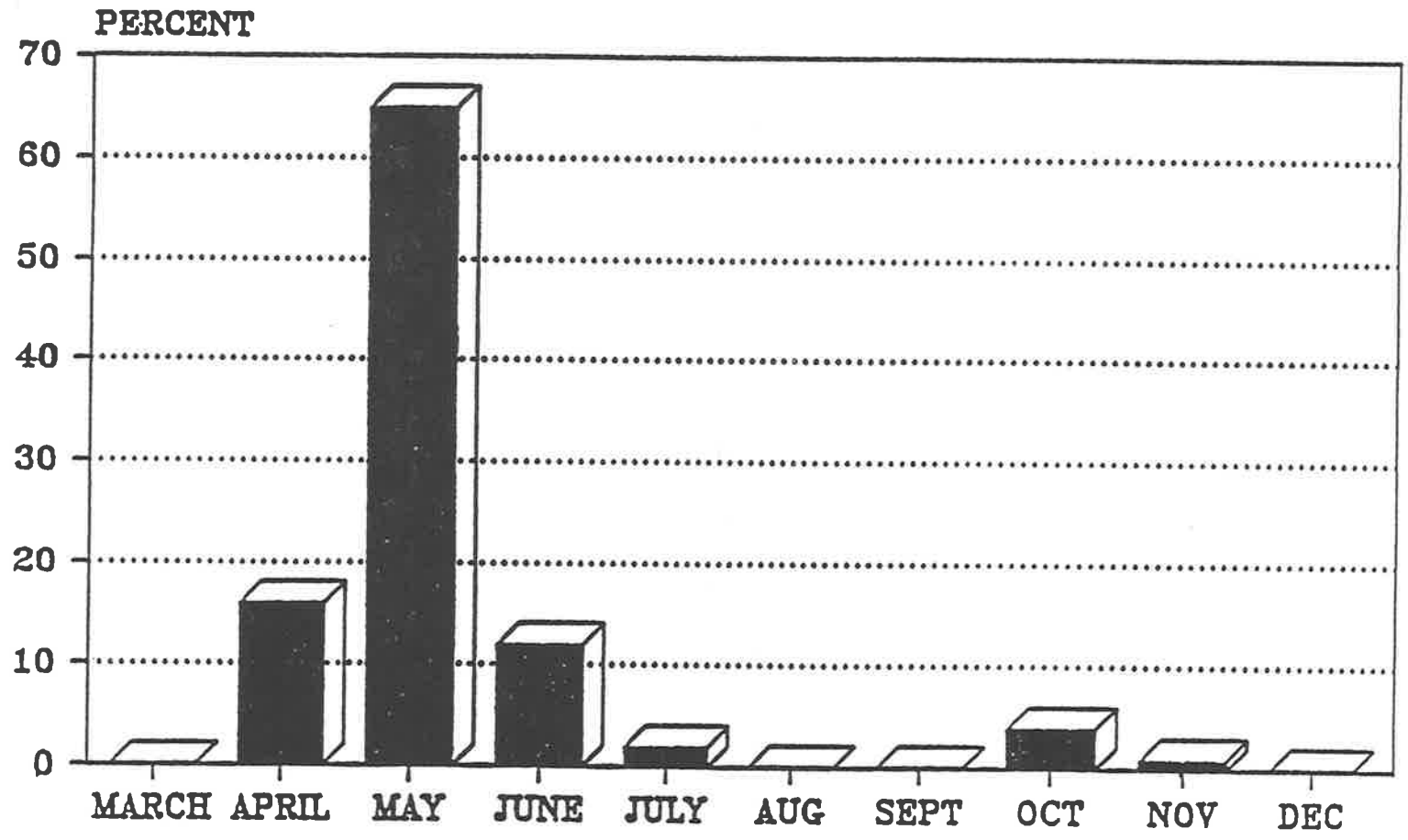
2. Fishing Mortality	2a. VA requires each commercial harvester and buyer to obtain a permit and report weekly during the season. VA has established a 120,000 pound commercial quota, 16" size limit and 1 fish/person/day creel limit. VA will consider limited entry into the commercial fishery and continue to monitor the commercial and recreational landings.	2a - 1992; Continue	2a - VMRC - A,R,L		
	2b. MD and PRFC will adopt a 16"minimum size limit and a one fish per person per day rec creel limit.	2b - 1993	2b - MDNR - A,R PRFC - A,R		
	2c. Md and PRFC will assess the need for commercial restrictions on the black drum harvest as data becomes available.	2c - Open	2c - MDNR - A,R PRFC - A,R		
3. Gear conflicts	3. VA has established a Special Black Drum Management Zone, for "high use" areas. During 1 May through 7 June, no gill net or trot line may be in the established zone from 7 AM to 8:30 PM.	1992	VMRC - A,R,L		

4. Habitat Issues	4. The jurisdictions will continue to set specific objectives for water quality goals and review management programs established under the 1987 Chesapeake Bay Agreement.	Continuing	DCFM - A EPA - A MDNR - A PFC - A PRFC - A VMRC - A		

Legend: VMRC = Virginia Marine Resources Commission
MDNR = Maryland Department of Natural Resources
PRFC = Potomac River Fisheries Commission
DCFM = District of Colombia, Fisheries Managment

A = Administrative action
R = Regulation
L = Legislation

BLACK DRUM LANDINGS
BY MONTH (1986-91)

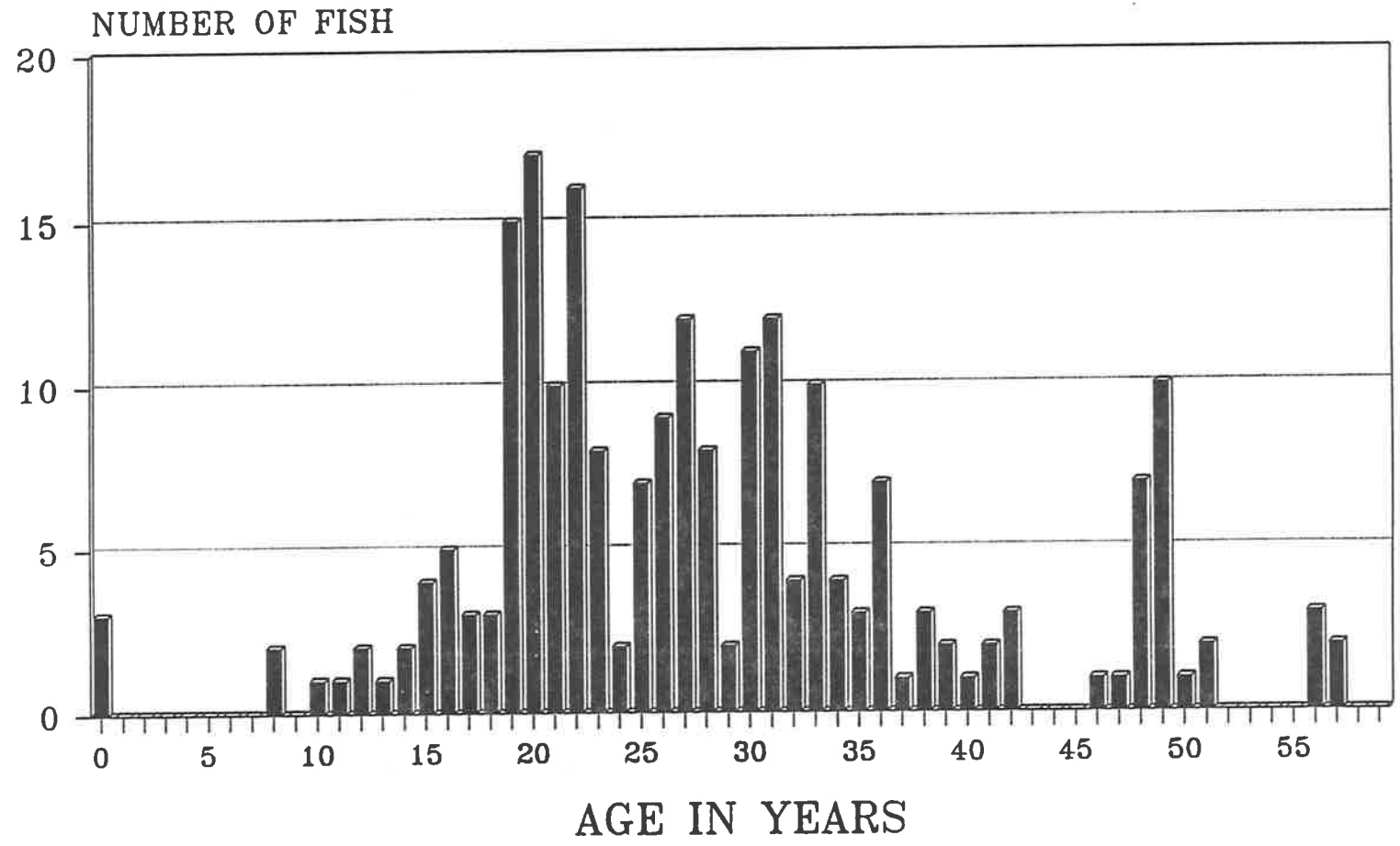


>800 pounds in Mar, Aug, Sept, Dec

FIGURE 1

VIRGINIA DATA

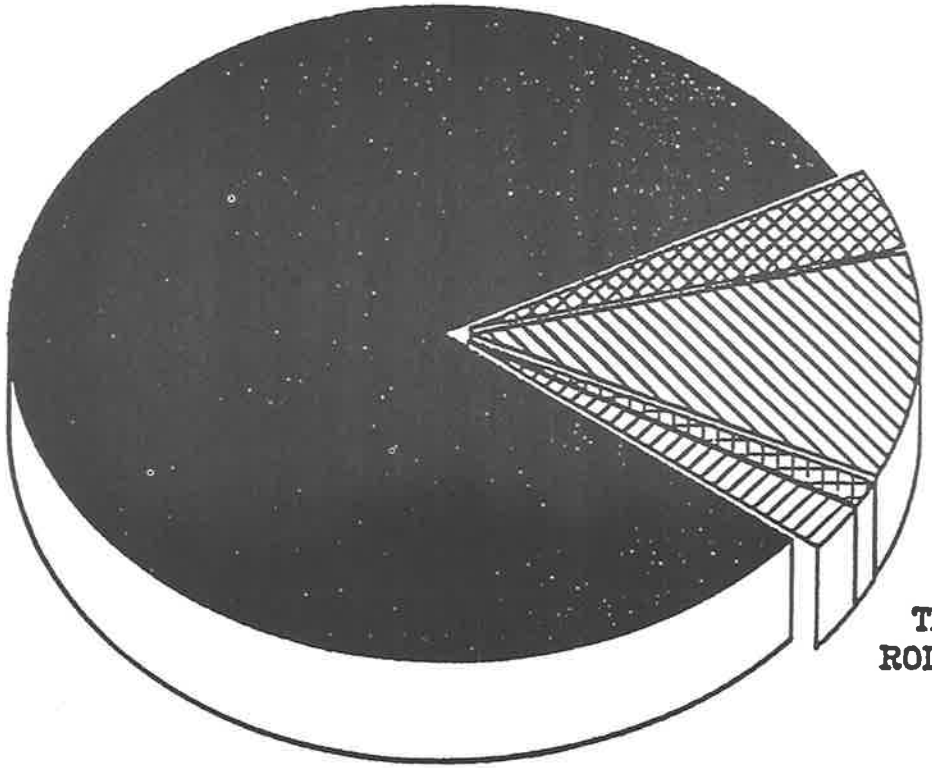
AGE COMPOSITION OF CATCH
FROM VIRGINIA



1990 commer & rec

FIGURE 2

BLACK DRUM LANDINGS BY GEAR
1986-1991

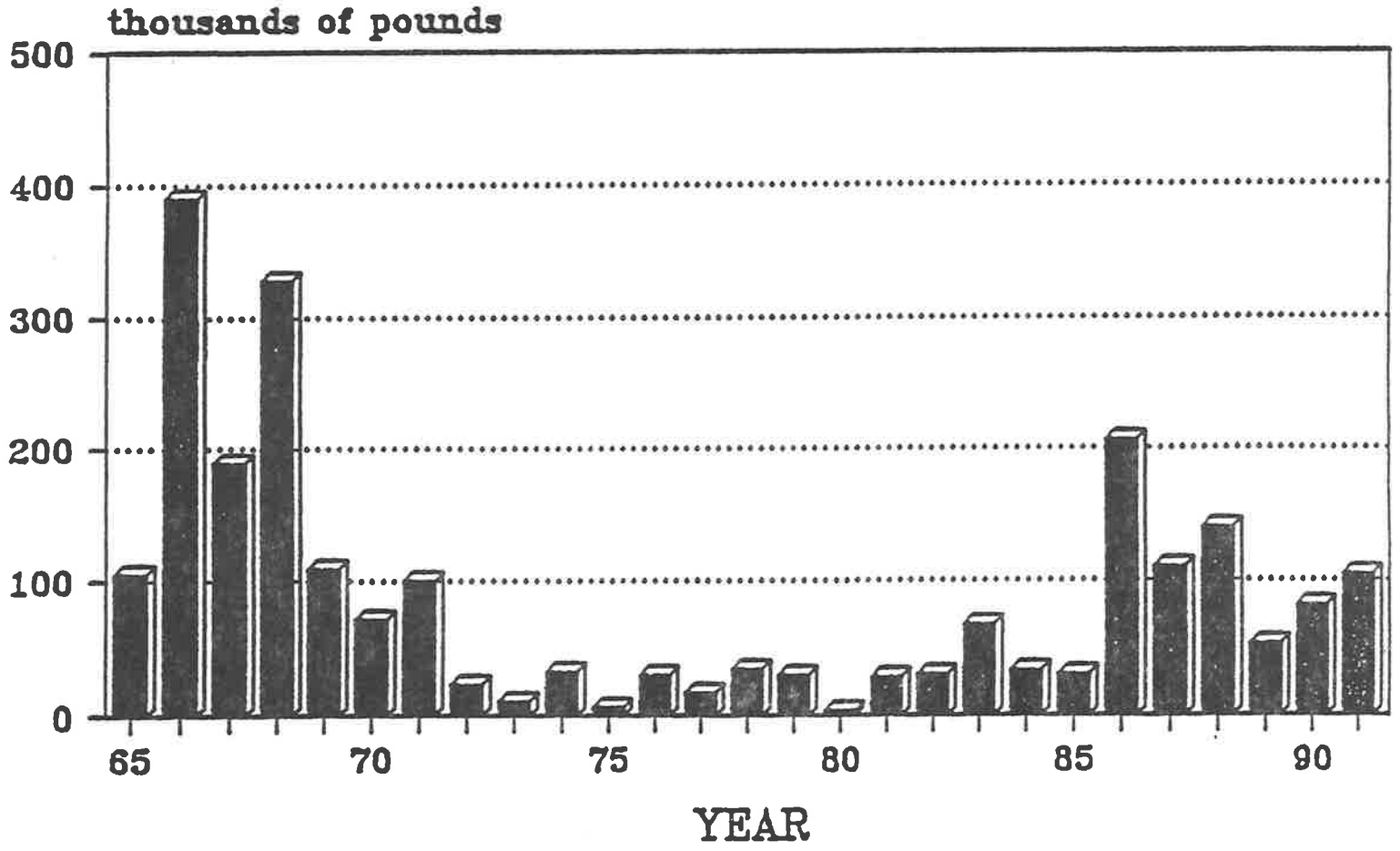


1991 data preliminary

FIGURE 3

VIRGINIA DATA

COMMERCIAL LANDINGS
BLACK DRUM



mandatory reporting since mid-1987

FIGURE 4

VIRGINIA DATA

Maryland Commercial Landings for Black Drum from 1965-1991.

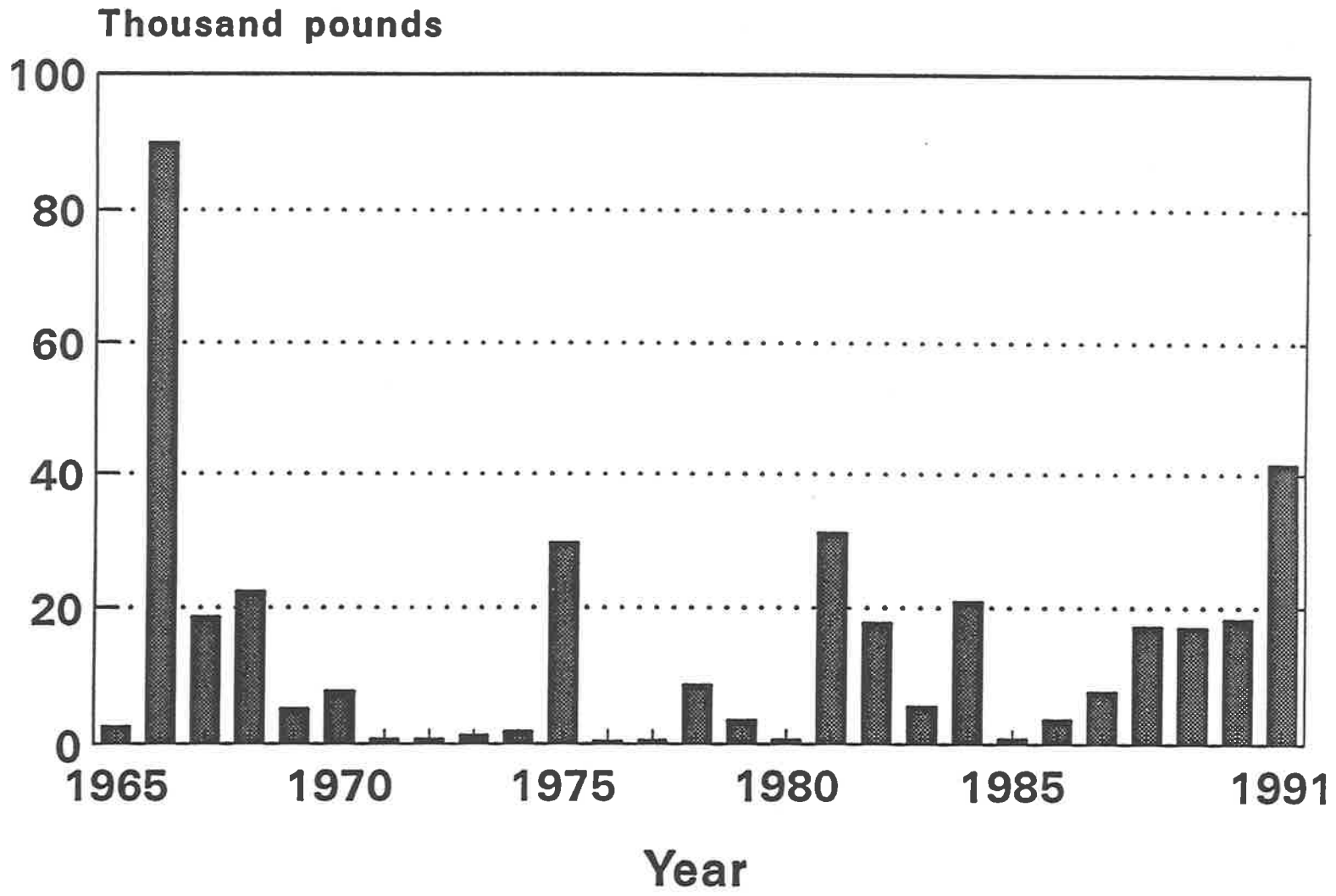
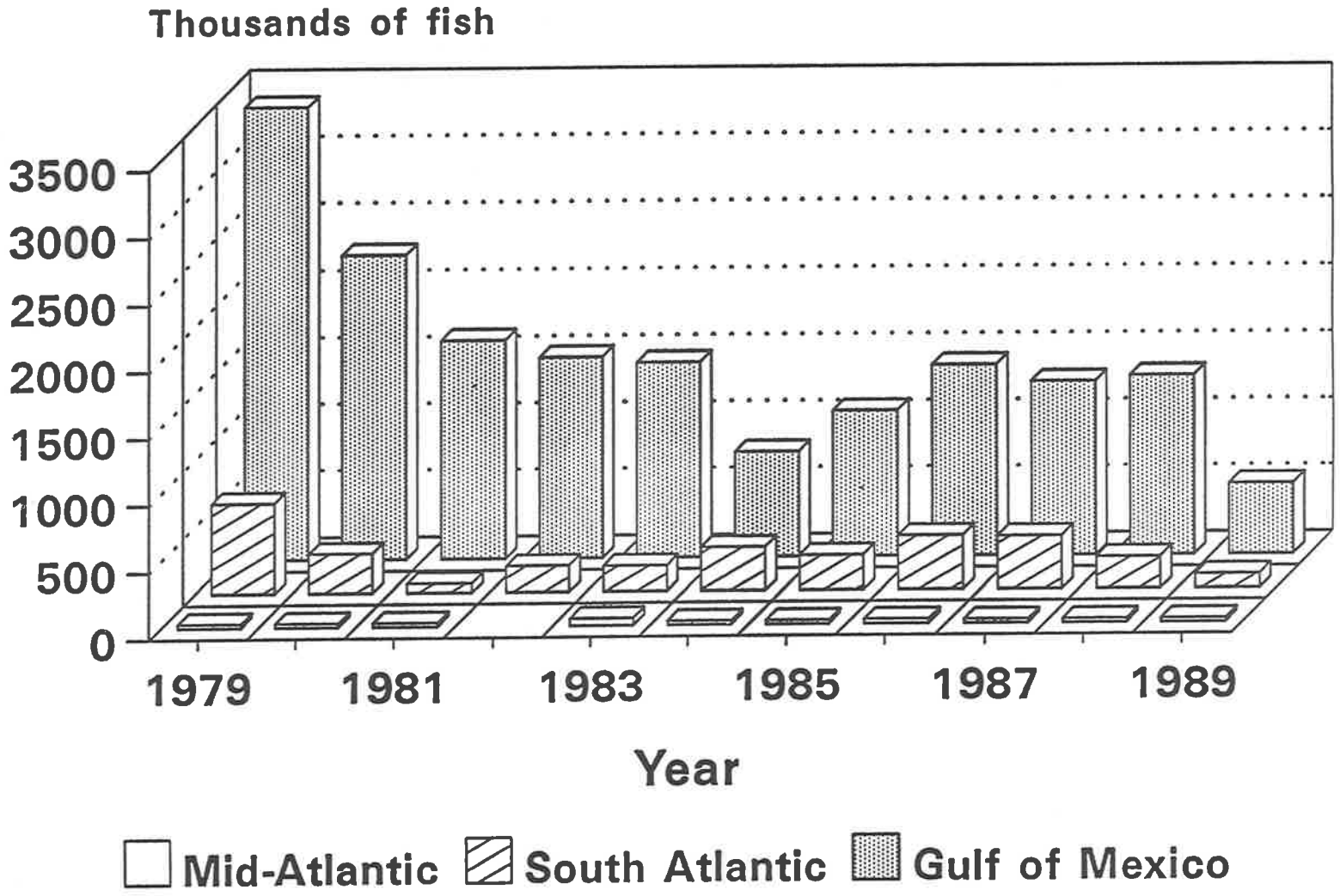


FIGURE 5

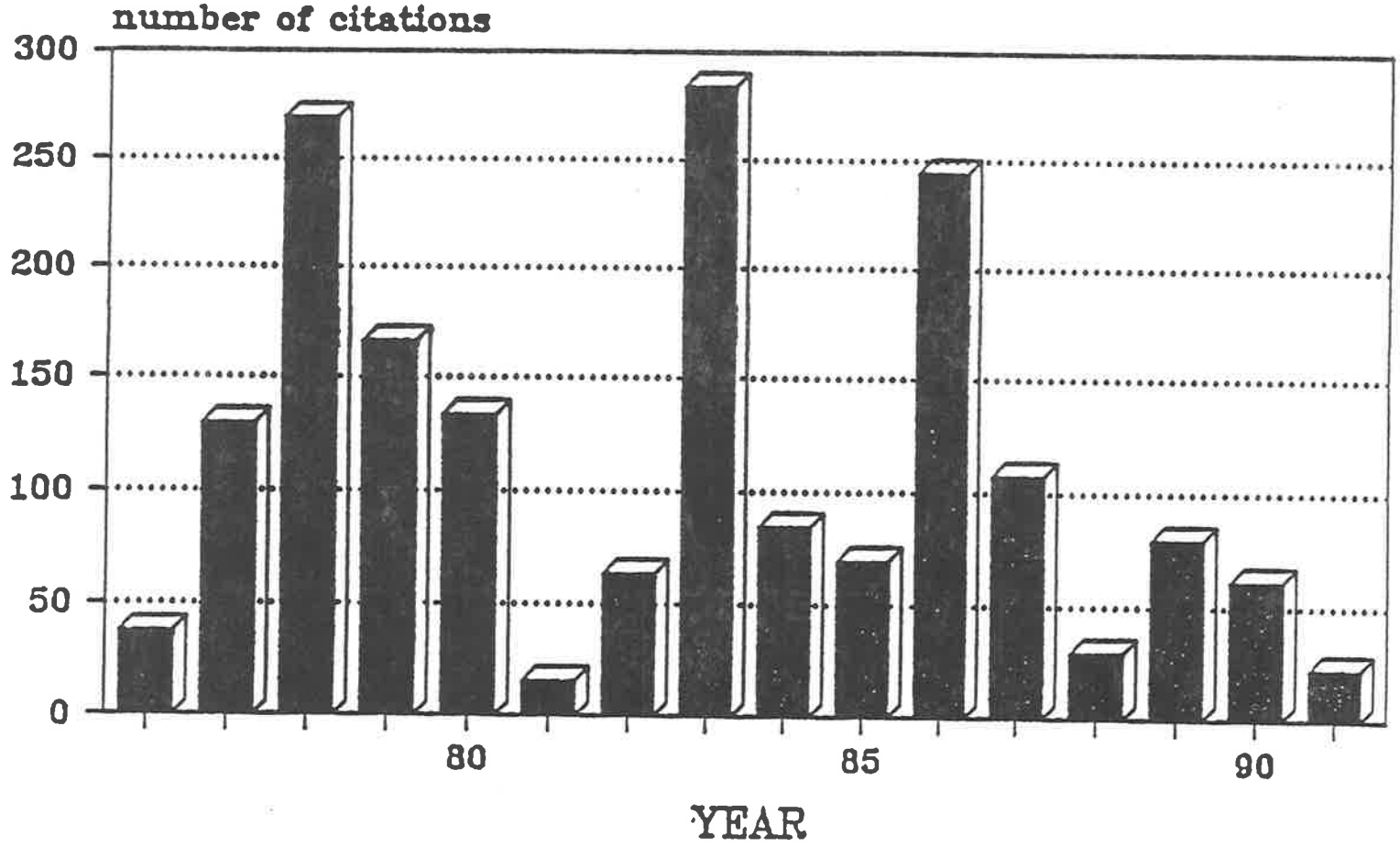
Estimated black drum recreational landings by region



Data from MRFSS

FIGURE 6

BLACK DRUM CITATIONS
1976-1991



includes releases since 1989

FIGURE 7

VIRGINIA DATA.

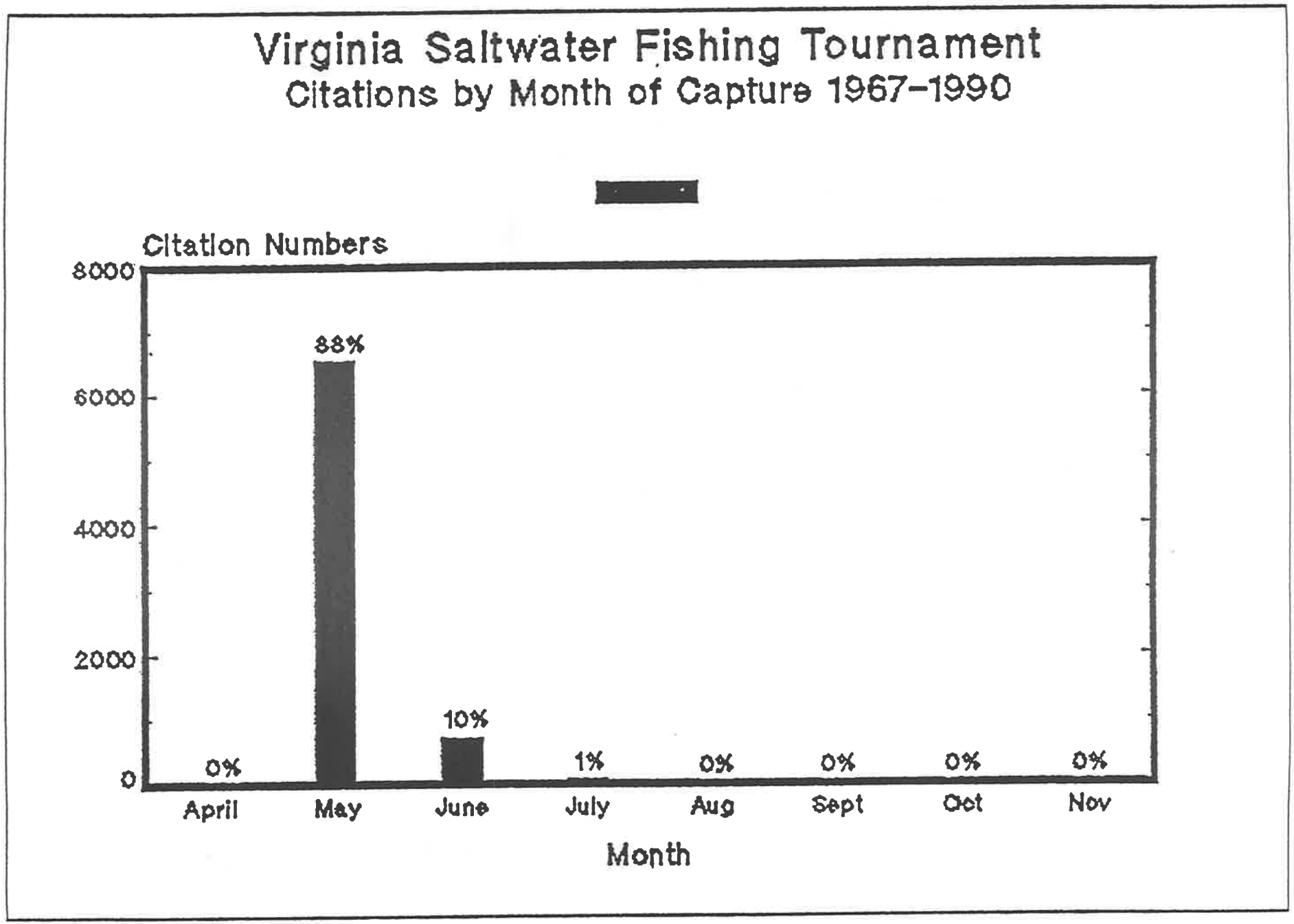
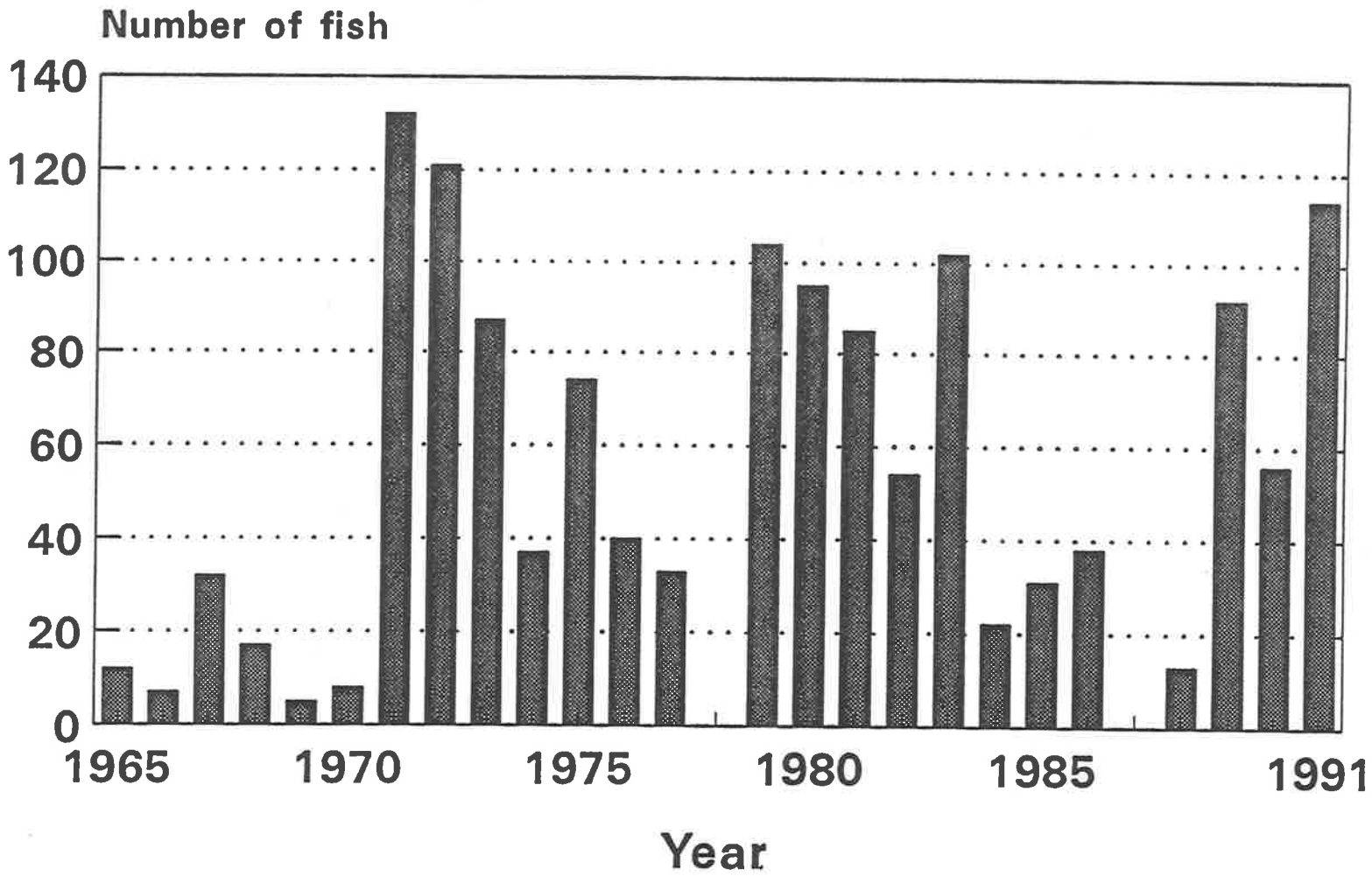

Virginia Saltwater Fishing Tournament
Citations by Month of Capture 1967-1990
Citation Numbers
8000
6000
4000
2000
0
88%
10%
0%
1%
0%
0%
0%
0%
April
May
June
July
Aug
Sept
Oct
Nov
Month

FIGURE 8

Number of citations for black drum caught in Maryland, 1965-1991



Citations for >40 lbs.

FIGURE 9