

METHODS OF FISHERY MANAGEMENT IN THE MIDDLE ATLANTIC STATES

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Although the Middle Atlantic States are generally considered to include only that area from New York to Delaware, the present discussion will include fishing and fishery controls in the five states of New York, New Jersey, Delaware, Maryland and Virginia. Fishery management practices to be discussed will cover species which inhabit the coastal waters and migrate into bays and rivers at various times of their lives. North Carolina has not been included in the discussion even though fishing there may have a material effect on species common to the more northern areas. Since there are no controls on fishing outside the three mile limit, no consideration will be given to such species as the porgy, sea bass and menhaden which are taken mainly offshore beyond the territorial limits of the states.

The fisheries of the area under discussion were exploited at an early date in the development of this country. By 1880 commercial fishing was widely done with the use of various types of gears including several types of gill nets, purse nets, haul seines, and pound nets. These nets harvested a diversified crop of about 50 species totaling 511,275,000 pounds or one-third of the total fishery production in the United States. Since 1880, there have been great fluctuations in the total catch. The 1943 yield of 466,378,000 pounds, using more modern gears, and utilizing new fishing areas and species not taken in abundance in 1880, indicates some declines in production of certain fish.

Those interested in the fisheries in the latter part of the 18th century interpreted the early fluctuations as signs of depletion, particularly in certain valuable species such as the shad, and attempted to devise means of halting the declines in production. The thinking of the time, as reflected by the activity of the U.S. Fish Commission and certain of the states, was that hatcheries would be able to stem the declines and stabilize the fisheries without imposing many restrictions on the fishermen. For example, hundreds of millions of shad were hatched by the Federal and State fish culturists and released as fry. As production continued to drop, the hatchery effort was increased. But as the fish became less plentiful, the hatcheries became more expensive and were unable to maintain their fry production. The Federal Government gradually abandoned the program of attempting to maintain the anadromous fish population artificially.

A new policy was slowly developed by the states in the form of restrictions on fishermen limiting by varying degrees their fishing activities. This phase of fishery management began during the so-called "artificial propagation" period and to a considerable degree extends to the present time.

Imposition of size limits was one of the restrictions attempted as a practical conservation measure. In almost every state, this expansion of size limits was extended to cover practically all major species taken within its territorial waters. For example, in Maryland, out of 20 species caught commercially in considerable quantities 12 are controlled by size limits and the records of the other states are much the same. The obvious question is, "How were the sizes determined and what were the considerations?" Prior to 1940 only a few fish had been studied from a biological standpoint. Since few facts were available as to age, size of maturity and natural mortality, it is obvious that the limits were set up by guess, or because of considerations not related directly to biology. Size

limits in Maryland were undoubtedly the result of economic considerations rather than biological factors. The demands of the market were often louder than the life history of the species. A size limit of 8 inches was placed on croakers in Maryland. From a biological standpoint, it had little value, since croakers are sexually mature sometime before they reach this minimum size. Besides this, many undersized croakers are destroyed in the fishing operation. Therefore, the only practical value such a size limit could possibly have, is to place on the market a more desirable product. This undoubtedly was the reason for it.

The attempts at management of the striped bass through size limits show a different approach to the problem. Prior to 1939, the size limits on this important commercial and game fish ranged from a minimum size of 10 inches with a maximum weight of 20 pounds on all striped bass taken in Delaware waters to 11 inches minimum and 15 pounds maximum in Maryland. Still other sizes were in effect for the States of New York, New Jersey and Virginia. Again it is difficult to determine the reasons for these various limits except on the basis that they represented the best opinions of the local people, tempered somewhat by what was politically expedient. Then, an intensive investigation of the biology and life history of this species was begun. As soon as facts became available, there was a shift toward a coordinate policy of controls by all states catching striped bass, since it was shown that all shared a common population. The principles developed by the striped bass research are far reaching and will be discussed later. However, the conclusion can be drawn that size limits have been used successfully in some cases in fishery management, although the method of arriving at a specific size has not generally been sound. In some cases, the size limits undoubtedly have acted as a deterrent to the fishing industry rather than serving as a conservation measure to give more production. So that I will not be misunderstood, I want to make it clear at this time that, in my opinion, size limits can be a most useful tool in fishery management when the sizes are developed on a factual basis and set up in relation to other regulations and local fishing conditions.

A second method of management which has been used by some of the Middle Atlantic States is "closed seasons." Presumably, the closed season was originally designed to protect a specific species of fish or shellfish on the spawning grounds on the theory that once the animal had migrated that far they had gotten to "home base" and should be allowed to spawn unmolested. So far, however, there is little evidence to indicate that this method has had any major effect on the abundance of any species in the area. For example, Maryland has maintained a closed season of several months on crabs, but the size of the population continues to fluctuate over a wide range. Closed seasons might be useful if they were part of an overall plan to reduce the fishing rate, but the economic effect might be detrimental to the fishermen.

The third method is to limit the size of meshes. Mesh sizes of various gears are rather generally imposed on the industry on the theory that small fish will be permitted to escape. This has accomplished its purpose to some extent although the reasons are not readily apparent for having a 2½ inch stretched mesh as the minimum size for gill nets in Maryland. There is no positive proof that this law has had any great bearing on the fish population in the Chesapeake Bay. This is especially true in a State such as Maryland, where gill nets are used to take many species of varying body sizes. To serve as a practical method of management, it would be necessary to set up sizes of mesh dependent upon the species to be caught. In all states the catches are mixtures of a number of species which make the determination of a proper size for all almost impossible. It is also probable that mesh sizes were established to meet economic problems.

Various other management methods are applied in the several states, in an effort to produce maximum yields. All such controls are restrictions on the fishermen's activities. For example, in New York, all gill net fishermen fishing for shad in the Hudson River are required to remove their nets for a certain period of time each week to afford the shad an opportunity to migrate to the spawning ground. On the opposite side of the Hudson River in New Jersey waters the number of shad nets is limited by spacing of nets, while the overall length is also specified. In Maryland the length of pound nets is limited so that a wide space will be provided for fish to migrate to the spawning grounds. All of these

laws, with the exception of size limits, actually handicap the individual fisherman in varying degrees, on the theory that ultimately the increase in abundance of fish will repay him for his sacrifices.

In Maryland, after six years of fishing under the limited licensing system, the fishermen, administrators and biologists are convinced of the merit of the Maryland plan in controlling the fishing rate and giving increased production from our fisheries. It is realized, of course, that control by Maryland of any species which migrates to other states will not assure an increased yield, if the fisheries in the other areas are not regulated also. However, until the war period came along, the many restrictions, together with a declining fish population, were merely driving the fishermen out of business.

The Maryland Fishery Management Plan, covered by a previous speaker, was based on a different principle. An attempt was made to take into consideration the situation facing a fisherman who wished to use his gear efficiently and at the same time provide for future production. This method of management is attained by limiting the number of fishermen who may license, and thus limiting the amount of gear used. Other Middle Atlantic States are becoming increasingly aware of the necessity to develop a new philosophy of fishery management different from the blind restrictions which have generally been adopted in the past.

The development of the Atlantic States Marine Fisheries Commission has given added impetus to this thinking. In the Chesapeake states, it provides the machinery for Maryland and Virginia to examine their mutual problems in relationship to each other and in relation to the other states who share their fisheries.

It is now becoming apparent to those of us from the Middle Atlantic States that successful maintenance of the fisheries on a high sustained yield cannot be expected so long as we have the broad gaps in knowledge of the habits of our fish, the rate of fishing, and the annual crops harvested. Both Maryland and Virginia are greatly expanding their fisheries research programs by providing additional funds. Within the past two months, a Chesapeake Bay Institute financed jointly by Maryland, Virginia, and the U. S. Navy, with certain further assistance from the U. S. Fish and Wildlife Service, has been set up. Its function will be to carry out an intensive hydrographic study of the Bay, so that basic information will be available on which to base future regulations.

It might be said that we are now entering the third phase of fishery management, at least in the Chesapeake area. Facts must be available on which to base legislative and administrative decisions. Along with this trend, there is an equally important trend to place in the hands of the state fishery administrators discretionary powers to make rules and regulations. Maximum utilization of a crop can only be attained when the administrators are in a position to permit it, and on the other hand depletion cannot be halted if the inflexible laws permit continued overfishing.

The wise use of discretionary powers by administrative officials necessitates having available the latest research material, a thorough knowledge of the fisheries and their requirements, and the development of practical regulations to meet the needs of the fisheries. To effectuate such a program, administrators and scientists must coordinate their activities so that new facts can be applied promptly, and new research projects started when the need is recognized.

Probably the most important tool to biologists in analyzing a fishery is an adequate systematic inventory of the catch on a permanent basis. Catch statistics are equally important to the administrator, since they serve as an indicator of the trends in the fisheries. Atlantic States have been slow in developing adequate catch records. Until 1944 no Middle Atlantic State made any effort to collect catch records on its fisheries. The gears were usually licensed, although prior to 1941, for example, only about half of the fishermen in Maryland were required by law to license their nets.

The records available on production were the results of annual canvasses made by statistical agents of the U. S. Fish and Wildlife Service. It is obvious that such a system

did not give total production figures although the statistics are probably valid to indicate general fluctuations. This statement is in no sense critical of the old Bureau of Fisheries or the present U. S. Fish and Wildlife Service. Limited funds and staff would not even permit these canvasses in all states in all years so that there are gaps in this information. Actually, we are extremely indebted to the Federal authorities since these records are the only ones in existence.

The Fish and Wildlife Service, through the Atlantic States Marine Fisheries Commission, brought the need for daily catch record data forcibly to the attention of the Atlantic States in 1944. Maryland had already recognized the need and taken steps to collect daily statistics from the individual fishermen. This work is being handled by the Maryland Department of Research and Education since the figures are so essential for the interpretation of their biological data. The system has been in effect four years and the cooperation of the fishermen is most gratifying. They realize that all of us involved in one part or another of the fishing industry must know production, if we are to consider intelligently problems of maintaining and increasing yields. About 95% of all licensed fishermen are now regularly reporting their catches. Furthermore, the Maryland Commercial Watermen's Association, which is the fisherman's own organization in Maryland, has offered its assistance in getting the returns from all fishermen.

Maryland has been greatly assisted in this work by the statistical staff of the U. S. Fish and Wildlife Service who have advised with our personnel, and have made possible machine tabulation of the schedules. This is a major contribution since reports run into the thousands.

Virginia has also become increasingly aware of the need for adequate records and increased research. Dr. Nelson Marshall, Director of the Virginia Fisheries Laboratory, has already outlined some of his work. When this program is put into effect a more exact measure of fishery production in the Chesapeake Bay will be possible, thus paving the way for better management.

The Federal government is also collecting catch records from other segments of the fishing industry. It would seem wise, however, for the states to assume the responsibility for collecting these data for their use to insure that the information is always available as a basis for management. It is my understanding that none of the Southern Atlantic States collect daily catch records. It would seem wise for them to attempt to do so with all possible speed.

The Middle Atlantic States would improve their relationships and thereby help their fisheries. One basic fact which must be recognized by all of us is that state lines are not respected by migratory fish. For example, the weakfish or trout is hatched off North Carolina, spends its early years in and adjacent to the Chesapeake Bay and its later years along the coasts of Delaware, New Jersey and New York. To be effective, a management plan for this species would have to be on a highly coordinated basis.

In the Chesapeake Bay the shad move from the ocean into Virginia waters and then into Maryland on their way to spawn in fresh water. Any action by either State to manage such a fishery could be nullified by inaction or uncoordinated action by the other. Unified action and thinking has not been accomplished in Chesapeake Bay or in Delaware Bay where a similar situation exists. Before full results can be expected in management this thinking must be changed. We must have a realistic approach to the problems which has not always been the case in the past. Furthermore, it requires a recognition on the part of the states that they have an obligation to the other states who share in the fisheries. Each state must make the necessary regulations to assist in attaining a high level of production. The idea of integrated action by two states was advanced recently by a Chesapeake-Potomac Commission. This group was authorized by the legislatures of Maryland and Virginia to study the fisheries in the Chesapeake Bay and make recommendations for their management. They proposed that a joint authority, composed of representatives from both states, be set up. This authority would have full powers to make rules and regulations to manage the fisheries. It is significant that they also urged a greatly expanded research program to supply a basis for

management. While the Commission recognized that certain species were badly depleted and needed prompt action, it is also significant that they made no attempt to specify immediate controls different from those already in effect. Their conclusion was that unsound legislation should be gradually replaced with regulations based on scientific facts as these facts became known. Virginia considered this matter but did not take action to adopt the program. Many people in Maryland feel this to be unfortunate and are urging the Maryland Legislature to act favorably on the proposal.

I cite this study, not as a blueprint for action by the Middle Atlantic States, but rather as an illustration of the thinking now prevalent in this area. With such discussions being carried on, with adequate records being accumulated, with expanding facilities for research, and with a recognition that management must be based on facts and at the same time have practical regulation, the wise use of our middle Atlantic fisheries resources in the future seems assured.