

A Recommendation to  
Amend the Atlantic Menhaden  
Fishery Management Plan  
  
To Protect and Preserve  
Menhaden's Ecological Role  
in Chesapeake Bay  
and Throughout its Range

Presented to the  
Atlantic States Marine Fisheries Commission  
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by the

National Coalition for Marine Conservation  
Leesburg, Virginia



“In the long run, I look forward to the day when fishery conservation and management are carried out with full knowledge of the interactions between the managed species and the living and nonliving components of their environment. I believe we are making steady progress toward the goal of an ecosystem approach to management.

“In recent years, we have begun to move away from single species concepts of management, like maximum sustainable yield, and toward the multispecies concept of optimum yield. Optimum yield encourages the consideration of ecological factors in devising management strategies, as well as economic and social factors. Within a few years, I expect that most fishery management plans prepared by the Regional Fishery Management Councils will be multispecies plans, which will take into account predator-prey relationships in particular. Not too long after that, I hope we will use an ecosystem approach to fishery management.”

This statement was part of the keynote remarks by then-NOAA Administrator Richard Frank at a Striped Bass Symposium sponsored by the National Coalition for Marine Conservation in March 1980.

In spite of Dr. Frank’s optimism, we’ve only begun to take the first tentative steps toward an ecosystem approach to managing marine fisheries during the last several years, primarily due to the recommendations of the 1999 Report to Congress of the Ecosystems Principles Advisory Panel. In many respects, we are today only marginally closer to making ecosystem-based fishery management a reality than we were 23 years ago.

In 1980, the main concern was the role of environmental changes in the disappearance of striped bass. Today, the return of striped bass is now part of modern fish conservation lore, a success story that has served as an example of what is possible in single-species management. But there are new, multispecies concerns having to do with the striper’s main prey, Atlantic menhaden, and the sustainability of the present rockfish recovery. These concerns are serious and legitimate, and they will not go away until they are addressed in a well-defined, informed and comprehensive manner.

Two years ago, the Atlantic States Marine Fisheries Commission (ASMFC) began the task of constructing a process for integrating traditional single-species management into a forward looking, multispecies framework. The National Coalition for Marine Conservation (NCMC) has encouraged and participated in this effort, which we believe could eventually provide guidance and direction to not only the ASMFC but also other fishery management bodies faced with similar challenges.

Unfortunately, we are also convinced that circumstances are overtaking the Commission in the matter of Atlantic menhaden and its present and future role in the coastal ecosystem. The Interstate Fishery Management Plan (FMP) for Atlantic Menhaden and the Menhaden Stock Assessment, as presently constituted, are not equipped to address concerns regarding maintenance of an adequate population to serve forage and water quality functions, particularly as they impact striped bass and the Chesapeake Bay. The prospects for remedial action in the foreseeable future are not good, according to the timelines outlined in the draft multispecies framework.

The NCMC believes the circumstances, as described herein, warrant the ASMFC taking a precautionary approach to the conservation and management of menhaden and dependent predators under its jurisdiction. The weight of scientific information available to us, although marked by uncertainty, nevertheless indicates potential problems with significant ramifications for a wide range of species. The uncertainties involved, far from providing an excuse for inaction, instead demand a deliberate and informed response from the Commission. Because of the protracted process required to amend a fishery management plan, especially an amendment that would take management into new and uncharted territory, the ASMFC should begin this process immediately.

#### Recommendation

**The National Coalition for Marine Conservation respectfully urges the Atlantic Menhaden Management Board to initiate the process of amending the Interstate Fishery Management Plan for Atlantic Menhaden to address concerns about the diminished ecological role of menhaden, on a regional as well as coastwide basis, with the goal of incorporating, as necessary, new objectives, reference points and management measures designed to protect and preserve the sustainability of the menhaden resource and associated species and the fisheries that depend on them.**

The present Menhaden FMP (as amended in 2001) includes among its objectives that of managing the menhaden fishery to reduce impacts on species that are ecologically dependent on menhaden and to promote improved water quality through maintenance of a healthy menhaden population. It does not, however, contain a “plan” to actually accomplish these objectives.

Indeed, there are over 100 FMPs developed and administered by federal and interstate management bodies in the United States. But precious few are truly *plans* in the sense that they anticipate future events and prepare

accordingly. The regulations contained in most FMPs are a *reaction* to problems that have become severe enough as to be beyond denial. In this case, that approach could be disastrous. And yet it seems the ASMFC is content to wait for the Menhaden Technical Committee to report that overfishing is occurring before making any change in management strategy.

The single-species Menhaden Stock Assessment, even though it concludes that menhaden are not overfished and that overfishing is not occurring, provides little comfort in the broader ecosystem context. First of all, it is done on a coastwide stock, which doesn't account for the possibility, and in this case likelihood, of localized depletion in Chesapeake Bay where the menhaden reduction fishery is concentrated. Nor does the assessment account for the forage needs of a wide range of predators. It only measures the health of the stock in terms of its ability to sustain the current commercial harvest.

Whether that harvest – in terms of how many fish are taken, of what age/size and where they are caught – is in truth sustainable is precisely the question that must be answered. To say that menhaden are not “overfished” (according to the single-species definition in the FMP) and therefore conclude that “ecosystem overfishing” is not occurring is to beg the question.

### Clear and Compelling Signs of Trouble

We believe, as do other fishing and conservation organizations along with thousands of anglers from Maine to Florida, that there is a danger to striped bass and other key predators if we continue to harvest menhaden the way we do. But we also believe there is an opportunity now to change how we fish for menhaden, in a way that respects its role in the food chain, *before* an ecological crisis occurs.

The large-scale commercial menhaden reduction fishery is a hundred years old. Concerns about the impact of an excessive menhaden harvest on other species are at least several decades old. But events are overtaking us, converging in both time and space. Chesapeake Bay, the nation's largest estuary, was once the most productive ecosystem on the Atlantic seaboard. Some 2,700 species of fish, birds and other animals spend their lives in the Bay, or at least a crucial part (to breed, feed or mature) between migrations up and down the coastline. The Chesapeake is at once the mother of the Atlantic's striped bass population and the center of its menhaden fishery.

In Chesapeake Bay, predator demand is reaching unprecedented highs while available prey is at an all-time low.

A growing number of conservationists and biologists believe the continued high level of menhaden harvest in the Bay, if not curtailed, could jeopardize the hard-earned recovery of striped bass and other species, while hindering efforts to clean up the Bay environment. The situation practically cries out for an ecosystem-based approach to management but, although well-intentioned moves are being made in this direction, the system moves without urgency while we continue to manage without caution.

The evidence of an existing or pending ecological crisis in Chesapeake Bay and beyond is circumstantial but nonetheless compelling.

- The harvest of Atlantic menhaden, a stock found from Maine to Florida, has become more and more concentrated within Chesapeake Bay. Since 1997, 58% of the entire East Coast catch (by weight; nearly 70% by numbers of fish) has been taken from waters of the Bay.
- The Chesapeake is the striped bass' main spawning ground. Possibly as much as 90% of the coastal migratory population breeds there.
- The spatial consolidation of the menhaden reduction fishery in the Bay has coincided with the return of striped bass, a key predator, beginning in 1990.
- The numbers of striped bass and other consumers of menhaden (bluefish and gray trout, as well several species of water birds among them) have increased dramatically as a result of concerted efforts to rebuild previously depleted populations. As a result, total demand for prey is now at a level not experienced for decades, and growing.
- The number of adult striped bass is still on the rise, desirably so, as we seek a more stable age-structure in the population. For large adult striped bass, the most prolific egg-producers and thus the key to a sustainable fishery for the future, immature menhaden are the preferred prey. The diet of mature bass typically consists of 70-80% menhaden, primarily sub-adult fish (under the age of 3).
- Nearly 9 of 10 menhaden harvested by the purse seine (reduction) fishery are of prime forage size. Last year, for example, 73% of the menhaden catch in Chesapeake Bay was sub-adult fish (age 0-2).
- Juvenile menhaden abundance has been in decline since 1990 and is currently at an all-time low.

- Chesapeake Bay historically has produced nearly half (47%) of each new generation of menhaden for the coastwide stock. Indices of juvenile abundance are poorest in the Bay.
- The number of loons, osprey and other waterbirds nesting in the Bay or stopping there during their coastal migrations is down from a decade ago. Some scientists speculate the reason for the decline may be a lack of small menhaden.
- The catch of underweight or "skinny" rockfish has been commonplace since the early days of the comeback in the mid-1990s. Samples collected from the Bay have confirmed that on average bass carry only 10-25% of the body fat typically found in healthy fish.
- The reduced weight-to-length ratio strongly suggests poor nutritional health among the Bay's striped bass population. There are indications bass are feeding more on alternative and less nutritious prey, namely bay anchovy and blue crab, which are themselves at historical low supplies.
- Up to half the Bay's striped bass are infected with mycobacteria, a chronic wasting disease that scientists believe is stress-related and could be linked to malnutrition and/or poor water quality. The disease, rare in wild fish, first appeared in 1997 and has been increasing in frequency and severity ever since. It now has been detected in the coastal population as well.
- Oxygen-sucking, fish-killing algae blooms are turning more and more of Chesapeake Bay into dead zones, devoid of life. The number and size of such areas in the Bay has reached alarming levels. Excess nutrients, mainly nitrogen and phosphorous in run-off from farmland and inadequate wastewater treatment plants, produce the blooms that cut off life-giving light to seagrasses on the bottom then suck the oxygen out of the water when they decompose. Fish and crabs either go elsewhere or die.
- Menhaden are a principal filter feeder of the Bay's waters, second only to oysters, which are virtually extinct. Menhaden control nutrient levels through grazing and transfer into fish tissue and make energy available for consumption by predators. Scientists recognize the potential to control water quality by regulating removals of menhaden.

The present menhaden management program does not accommodate consideration of these and other concerns. It features no process for assimilating this information into the stock assessment or informing management decisions.

As the Menhaden Stock Assessment Peer Review panel noted in its recent report to the ASMFC, the 2003 assessment does not measure the stock's capacity to provide adequate forage for other species. The panel noted that, while the assessment tracked status on a coastwide basis "it would not detect localized depletion and reduced ecological function that could occur when the fishery is concentrated in one part of the coast." Instead, it considers only whether the stock is of a size capable of providing the maximum sustainable yield to the menhaden fishery. It contains no triggers or mandate for action except if overfishing occurs in the strictly single-species context.

### Needed: A Precautionary Approach

The Ecosystems Principles Advisory Panel recommended an incremental approach to implementing ecosystem-based management, starting with predator-prey interactions. There are compelling reasons, we believe, to begin by protecting forage species abundance in order to serve conservation of predator populations. During the past few decades, we've fished down the populations of many ocean predators. We are now in the process of restoring their numbers. Demand for prey is going up and will only increase. It is critical, therefore, that we make sure – at least, as certain as we can be in a highly uncertain business – that we aren't pulling the rug out from under our few hard-won management successes.

We've talked and worried about the menhaden situation for at least the last seven years. Meanwhile, the reasons for concern have grown in number and severity. Meanwhile, the amount of menhaden that can be taken from (Virginia waters of) Chesapeake Bay remains completely unregulated, as does the composition of the catch (size/age). As the distinguished fishery biologist Peter Larkin advised us on the subject of predator-prey management 25 years ago, "The world won't wait while we figure it all out."

We need to act now to prevent overfishing of menhaden in the Chesapeake, by implementing risk-adverse policies, at least until we have the answers to some increasingly disturbing questions. The alternative may be an ecological disaster. That's a chance we aren't willing to take.

To this end, the National Coalition for Marine Conservation urges the Atlantic States Marine Fisheries Commission to amend the Interstate Fishery Management Plan for Atlantic Menhaden in four ways:

- 1. Make preservation of an adequate supply of menhaden as forage for predators and as a critical filter feeder of coastal waters, on both a coastwide and regional (e.g., Bay-wide) basis, the primary plan objective.**

The slow progress in meeting the plan's ecosystem goals, along with those outlined elsewhere (e.g., the Chesapeake Bay Agreement), underscores the need to elevate these objectives to *at least* an equal level with that of sustaining a fishery. Such a change would facilitate adoption of specific management objectives in the allocation of menhaden as a harvestable resource on the one hand and as both a forage fish and a consumer of primary production on the other.

- 2. Expand the FMP's information base to more fully describe and comprehend the links among associated species, incorporating all available information on ecosystem health and integrity.**

The FMP contains only a superficial portrait of the ecological significance of menhaden. It should be expanded and enhanced to describe the significant food web with quantitative and qualitative assessments of interspecies relationships on a regional (e.g., Bay-wide) as well as coastwide basis. Numerous studies in the literature, as well as preliminary work being done, support concerns about the diminished role of menhaden in ecosystem dynamics and should be incorporated into the information base. An expanded database would help provide scientists with a comprehensive analysis for use in making an ecosystem-based assessment of the status of the menhaden population.

- 3. Add a definition of "ecosystem overfishing" as an alternative to traditional overfishing criteria.**

Using an MSY-based benchmark for setting the fishing mortality rate ( $F_{MAX}$ ) is incompatible with an ecosystem-based approach to managing marine fisheries; as either a management goal, or a trigger for preventing "ecosystem overfishing"<sup>☆</sup>. Under MSY, fishery managers strive to keep a fish population at the level capable of producing the greatest amount of surplus growth available for harvest on an annual basis, a population level that may not be optimal for preserving the integrity of predator-prey relationships. An "ecosystem overfishing" definition should account for ecological linkages and

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<sup>☆</sup> Generally speaking, ecosystem overfishing occurs when reducing one component of the ecosystem adversely impacts another, or precipitates (often unknown or unpredictable) changes in the environment.

include calculable reference points and triggers for action. This new definition would facilitate setting an Optimum Yield that properly takes into account ecological factors.

- 4. Establish a conservative, precautionary total allowable catch (TAC) that provides a suitable buffer against ecosystem overfishing, with appropriate measures to control the harvest of immature menhaden and disperse effort away from nursery areas.**

The ASMFC, by choosing not to regulate the harvest of menhaden, has neglected the ecological consequences of overfishing. In turn, it has relegated management responsibility for menhaden to the individual states. In the absence of interstate guidance, a number of states have been forced to act unilaterally, without benefit of a coherent and cohesive coastwide *plan*. Adoption of such a plan, as recommended above, will require a restructuring of the fishery *and* of the current regulatory system.

The present unsustainable situation in the menhaden fishery – that is, the preponderance of menhaden being taken from a small part of the fish’s range (Chesapeake Bay and adjacent waters), leading to localized depletion of the targeted juvenile population in the Bay – is a consequence of apparent contraction of the stock’s migratory range (a sign of overfishing) as well as contraction of the reduction industry itself. But it is also due in part to restrictions justifiably imposed by a number of states seeking either to reduce conflicts with other fisheries or protect the forage base on a local level or both.

Interstate management measures adopted under the Menhaden FMP should:

- Substantially reduce the overall catch of menhaden;
- Disperse effort throughout the range of the fish as befits a coastwide stock; and,
- Strictly limit the harvest of sub-adult menhaden (age 0-2), with emphasis on protecting the forage base within Chesapeake Bay.

The amendment process should examine, and submit for public review and comment, a wide range of options for achieving these management objectives, including seasonal or year-round closure of menhaden nursery areas.