WHAT HAPPENED TO WEAKFISH?

By Russell L. Allen, Principal Fisheries Biologist

What happened to weakfish? Everywhere I go these days, that is the question anglers ask the most. The plight of the weakfish has been a perplexing saga involving a myriad of potential limiting factors over which fisheries managers have little or no control. There are many theories as to why weakfish have declined so rapidly in recent years but there exists little data to provide adequate insight as to the exact *cause* of the decline. However, before we focus on the current status of weakfish and present-day management concerns, it's best to look back in time at the management process for a better understanding of how our knowledge of the weakfish population decline evolved.

Weakfish were overfished, by both commercial and recreational fishers, beginning in the mid-1970s through the 1980s. If you did not live the stories about overfishing in Delaware Bay, likely you heard about it. Overfishing stimulated local management measures through voluntary efforts by the states of New Jersey and Delaware, and coastwide management through the auspices of the Atlantic States Marine Fisheries Commission (ASMFC).

FISHERY MANAGEMENT PLANS EVOLVE

In 1985, the ASMFC developed and adopted a coastwide Weakfish Fishery Management Plan (Plan) in an attempt to protect the species from overfishing but it was inadequate to stop the weakfish decline. A few years later, New Jersey and Delaware formed the Bi-State Weakfish Commission, which made recommendations to the states' fisheries agencies and adopted regulations to restrict the weakfish harvest in their waters. At the request of both states, the ASMFC also began to update the Plan. Amendment 1 was adopted in 1992 with Amendment 2 close behind in 1994. Unfortunately, management measures outlined in these documents were voluntary and went largely unheeded, so weakfish stocks continued to decline. The passage of the Atlantic Coastal Fisheries Cooperative Management Act in 1993 finally put some regulatory teeth into the ASMFC, which mandated that states fully implement the provisions of the Plan and its amendments.

By 1996, the Atlantic States Marine Fisheries Commission had adopted Amendment 3 as a long-term recovery plan to restore weakfish to healthy levels in order to maintain commercial and recreational harvests consistent with a self-sustaining spawning stock. The major objective of Amendment 3 was to restore the weakfish population over a five-year period by reducing fishing pressure 32 percent in both the commercial and recreational fisheries. The results were impressive and in the late 1990s, the outlook was better for the future of weakfish. Amendment 4 was passed in 2002 to set more appropriate fishing targets as the stock continued to rebuild.

GOING UP OR GOING DOWN?

Unfortunately, no one told Mother Nature. While managers were preparing for a weakfish resurgence, something else was happening—unknown to anyone—which would eventually cause a rapid increase in weakfish mortality. But first let's focus on what took place.

According to the ASMFC's 2000 stock assessment, the weakfish spawning stock had exceeded expectations and was continuing to increase while recruitment of young weakfish had reached more than 60 million per year. The percentage of older fish (six years and older) in the population had increased from a low of 0.3 percent in 1996 to a high of 6.9 percent by 2001. However, there were also disturbing signs. Landings were decreasing. Other indications from independent fishery surveys suggested that the situation was not as rosy as the assessment appeared. Some of the ASMFC's Technical Committee members also were not convinced population growth was occurring. So the they worked diligently to analyze all available data, which eventually confirmed that the species had actually taken a turn for the worse.


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The Technical Committee's work proved that weakfish biomass had actually been declining since 1995 to an all time low by 2007.

SO WHAT HAPPENED TO WEAKFISH?

Recent analysis indicates that fishing mortality did not cause the rapid decline, but that natural mortality has increased substantially since the late 1990s. Natural mortality can be described as deaths from all non-human induced activity. Some of the more common issues potentially affecting weakfish are predation, competition, environmental stressors and lack of food.

The conventional methodologies for assessing weakfish were obviously not working, so in 2004 the ASMFC Technical Committee began working on alternative research models that take into account trophic interactions—or feeding relationships—among certain species. These interactions are especially useful when factoring in predation by striped bass and spiny dogfish on young weakfish. The results of various research models showed an increasing trend in natural mortality that has led to the weakfish stock being labeled as depleted. But to convince others to believe the ASMFC Technical Committee was another story. It took five years for the rest of the scientific community to fully accept the Technical Committee findings and this relatively new concept. The result is a 2009 peer-reviewed and accepted stock assessment outlining that natural mortality is the culprit behind the current depleted state of the weakfish stock.

So what are the natural mortality factors weighing on weakfish? Several scientific models were used to explore likely scenarios of increasing natural mortality. All models investigated indicate that the weakfish spawning stock was very low. The analyses found that factors such as predation, competition and changes in the environment have had a stronger influence on recent weakfish stock dynamics than has fishing mortality. Predation from striped bass and spiny dogfish definitely dominate the conversation when talking to the public, but there are many other factors that could influence a weakfish downturn.

Competition with Atlantic croaker, decreasing prey items such as bay anchovy and Atlantic menhaden and increasing water temperatures may all be playing key roles in the weakfish decline. Projections suggest that little

stock growth is possible with the current high mortality levels, even if the East Coast were under a harvest moratorium. This is because current fishing mortality represents only a small component of total mortality, thus considerably reducing the management "leverage" of a moratorium. The bottom line is that weakfish have declined and the Atlantic States Marine Fisheries Commission must do *something*.

NEW AMENDMENT REDUCES HARVEST

Last November, the ASMFC's management board voted to approve Addendum IV to the Weakfish Fishery Management Plan, which included a requirement to reduce harvest by more than 50 percent through a one fish recreational bag limit and 100-pound trip limit for commercial fisheries. Although many options were on the table, the ASMFC decided this was presently the best management fit. Managers realize that rebuilding the weakfish stock will also require a reduction in natural mortality, which they have limited ability to influence. However, these current regulations were enacted to allow rapid growth in the stock should natural mortality decrease.

Weakfish

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WHERE DO WE GO FROM HERE?

It will take time for weakfish stocks to return to the glory days of the late 1970s and early 1980s. However, because of their prolific spawning potential, weakfish could make a rapid recovery if natural mortality declines. Current production of young weakfish has remained stable in recent years so the table is set already if these year classes are able to survive. Published articles from the 1970s documented an increase in large weakfish resulting from the last weakfish population explosion, so the potential for a strong recovery exists.

DO YOUR PART

The key to a successful weakfish recovery will be to significantly increase the population in the older age classes to ensure a better age structure of the stock. (See *What Do Fish Tell Us?* for more on biological sampling, page 28.) New Jersey Division of Fish and Wildlife encourages anglers to practice catch and release during this current low level of the weakfish population. Anglers are invited to work with Fish and Wildlife by logging onto our online Volunteer Angler Survey (see page 8) whenever you catch a weakfish—or take any fishing trip for that matter—to provide us with as much information as possible. Your valuable input will go a long way towards helping biologists track the recovery of this once-plentiful fish.

REFERENCES

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