The Complexities of Sustainably Managing Striped Bass

Introduction
Known throughout New England and the Mid-Atlantic as striper, rockfish, linesider, rollers, squidhound, or simply as “bass,” Atlantic striped bass is regularly referred to as America’s greatest game fish on the U.S. Atlantic coast. High demand for this species among fishermen and consumers coupled with the complexity of its seasonal distribution along the coast, make sustainable management of the Atlantic coast striped bass population complex and challenging. Stakeholders regularly call for the Commission to implement biologically, economically, and socially sound regulations within each jurisdiction and sector. As a result, the dynamic saga of Atlantic striped bass fishery management will likely continue for many years to come.

Today, thanks to the immense cooperative efforts of nearly all Commission member states and jurisdictions, Atlantic coastal striped bass populations appear healthy and capable of producing high levels of recruitment in any given year. However, the latest stock assessment results indicate that female spawning stock biomass (SSB) has declined steadily since 2004 and is approaching overfished status. Through the implementation of Addendum IV, and at the cost of substantial economic hardships, states and jurisdictions successfully reduced fishing mortality (F) to a more sustainable level. However SSB continues to decline and the Commission is once again facing difficult decisions in striped bass management.

Life History
On the Atlantic coast, Atlantic striped bass range from the St. Lawrence River in Canada to the St. John’s River in Florida. The migratory stock under Commission management ranges from Maine through North Carolina.

Atlantic striped bass are an anadromous species spending most of their adult life in oceanic or estuarine waters, and can live up to 30 years old. Mature individuals migrate into freshwater rivers and tributaries in early spring to spawn, releasing millions of eggs into the ecosystem, and then return to the ocean. The fertilized eggs eventually hatch into larvae which begin feeding on zooplankton. The larvae mature into juveniles and remain in coastal sounds and estuaries for two to four years before joining the coastal migratory population in the Atlantic Ocean.

In the ocean, fish tend to move north during the summer and south during the winter, but these migrations can be influenced by their age, sex, degree of maturity, and the river in which they were born. Important wintering grounds for the mixed stocks are located offshore from New Jersey to North Carolina. In general, Chesapeake Bay spawning areas produce the majority of coastal migratory striped bass.

Commercial & Recreational Fisheries
For centuries, Atlantic striped bass have supported valuable commercial and recreational fisheries on the Atlantic coast. Currently, commercial fisheries operate in eight Atlantic coastal jurisdictions, while recreational fisheries operate in 14. Commercial fishermen harvest Atlantic striped bass with a variety of gears including gillnets, pound nets, haul seines, trawls, and hook and line, while recreational fishermen use hook and line almost exclusively.

Increased fishing pressure in the 1970s coupled with degradation and loss of habitat led to stock collapse in the early 1980s. Commercial landings peaked in 1973 at almost 15 million pounds and then declined abruptly to less than two million pounds by 1983. During the mid-to-late 1980s, a number of states closed their Atlantic striped bass fisheries in order to initiate stock rebuilding. In the mid-1990s, the commercial fishery slowly grew again under a new management program (Amendment 4). Coastwide commercial landings rose from about 700,000 pounds in 1990 to 3.4 million pounds in 1995. Under Amendment 5, striped bass harvest grew from 3.4 million pounds in 1995 to 6 million pounds in 2002. Since the passage of Amendment 6, commercial harvest has been managed through a...
quota system and landings have averaged just shy of 7 million pounds annually from 2003 to 2014. The commercial quota was reduced starting in 2015 through the implementation of Addendum IV. Commercial landings are consistently dominated by Chesapeake Bay fisheries, which made up approximately 64% (3.1 million pounds) of the total commercial landings in 2015 (4.8 million pounds).

Between 1982 and 1989, recreational anglers landed an annual average of 1.4 million pounds due to a combination of low stock abundance and stringent regulations. Under Amendment 4, recreational landings grew from 2.2 million pounds in 1990 to 6.8 million pounds in 1994. The following year, with the declaration of restored stock status, recreational landings nearly doubled to 12.5 million pounds, and landings continued to increase to a record 31 million pounds in 2006. From 2007 to 2014, recreational landings averaged just over 25 million pounds annually. In 2015, recreational anglers harvested an estimated 18.2 million pounds, which can be attributed to implementation of more restrictive regulations via Addendum IV. Of those coastwide recreational landings, Maryland landed the largest percent in numbers of fish (30%), followed by New Jersey (21%), New York (20%), Massachusetts (13%) and Virginia (7%). Maine, New Hampshire, Rhode Island, Connecticut, Delaware, and Virginia accounted for the remaining harvest (9%). Anglers continue to release the vast majority of striped bass they catch; 73-90% have been released since implementation of Amendment 6 in 2003. The number of released fish peaked in 2006 at 23.3 million fish. Total numbers of releases have declined since then, averaging 8.7 million fish annually since 2007. An estimated 8.4 million fish were caught and released in 2015.

Stock Status
On a regular basis, female SSB and F are estimated and compared to target and threshold levels (i.e., biological reference points) in order to assess the status of the stock. The 2016 Atlantic striped bass stock assessment indicates the resource is not overfished nor experiencing overfishing relative to the biological reference points. Although the stock is not overfished, female SSB has continued to decline since 2004, and in 2015 is estimated at 129 million pounds just above the SSB threshold of 127 million pounds, and below the SSB target of 159 million pounds. Total F is estimated at 0.16 in 2015, a value that is below both the F threshold and target levels (0.22 and 0.18, respectively). Total removals were in 2015 were estimated at 3.02 million fish.

Despite recent declines in SSB, the stock is still well above the SSB during the moratorium that was in place in the mid-late 1980s. Atlantic striped bass experienced a period of strong recruitment (i.e., number of age-1 fish entering the population) from 1993 to 2004, followed by a period of lower recruitment from 2005 to 2011 (although not as low as the 1980’s stock collapse). Recruitment of the 2011 year-class was high, but was followed by the second lowest recruitment estimate on record going back to 1982. However, in 2015, recruitment was again high and estimated at 122.8 million age-1 fish (the
followed by the second lowest recruitment estimate on record going back to 1982. However, in 2015, recruitment was again high and estimated at 122.8 million age-1 fish (the 2014 year class), the 7th highest on record.

It is projected that if catch remains constant at 3.02 million fish each year for 2016-2018, there is a 39% chance of SSB falling below the threshold level in 2016, but only a 20% chance by 2018. This trend is largely driven by the presence of the 2011 year class (now age 5) which is presently maturing into the spawning stock, and is beginning its migration from the Chesapeake Bay into the coastal migratory population.

**Atlantic Coastal Management**

Prior to the passage of Atlantic Striped Bass Conservation Act (Striped Bass Act, 1984), the precursor to the Atlantic Coastal Fisheries Cooperative Management Act (1993), the Commission did not have the management authority that it does today. The Interstate Fishery Management Plan (FMP) for Atlantic Striped Bass (1981) and Amendments 1 and 2 (1984) only provided recommendations for how to sustainably manage the resource. Amendment 3 (1985) was the first enforceable plan under the Striped Bass Act. The Amendment implemented measures to protect the 1982 year class, the first modestly sized cohort for nearly a decade. Several states, beginning with Maryland, opted for an even more conservative approach and imposed a total moratorium on striped bass landings. The Amendment contained a trigger mechanism to reopen fisheries based on a juvenile abundance index, which was triggered with the recruitment of the 1989 year class. Subsequently, Amendment 4 (1989) was implemented and aimed to rebuild the resource rather than maximize yield. In 1995, the Commission declared Atlantic coastal striped bass stocks fully recovered.

Currently, Atlantic striped bass is managed through Amendment 6 to the FMP (2003). The Amendment introduced a new set of biological reference points based on female SSB, and a handful of management triggers based on the biological reference points. The coastal commercial quota was restored to 100% of the historical average landings during the 1970s, and coastal recreational fisheries were required to implement a two fish bag limit and a minimum size limit of 28 inches, except for the Chesapeake Bay fisheries, Albemarle-Roanoke (A/R) fisheries, and fisheries with approved conservation equivalency proposals. At the time, the Chesapeake Bay and A/R regulatory programs differed from that of the coastal migratory stock because these programs were predicated on a more conservative F target than the coastal migratory stock. The independent F target allowed these jurisdictions to implement separate seasons, harvest caps, and size and bag limits as long as they remained under that target.

A series of four addenda to Amendment 6 were implemented from 2007 to 2014. Addendum I (2007) established a bycatch monitoring program to improve stock assessments, and Addendum II (2010) modified the definition for recruitment failure, a term defined in the FMP and associated with one of its management triggers. Addendum III (2012) addresses illegal striped bass harvest and was developed in response to a multi-year, multi-jurisdictional investigation conducted within Chesapeake Bay that uncovered over one million pounds of illegally harvested striped bass with an estimated net worth of $7 million. The Addendum requires all states and jurisdictions with a commercial striped bass fishery to implement a commercial harvest tagging program whereby each commercially caught striped bass is affixed with a unique tag that must remain on the fish until purchased by the consumer.

The latest addendum was initiated in response to a steady decline in SSB since 2004. Implemented in 2014, Addendum IV reduces harvest (relative to regional-specific reference periods) by 25% along the coast and 20.5% in the Chesapeake Bay in order to reduce F to a more sustainable level and stabilize SSB. To achieve this, commercial quotas were cut and recreational bag limits were reduced from two fish to one. However, many state fisheries utilized the FMP’s conservation equivalency process resulting in a wide range of regulations across the coast. Additionally, since the A/R stock was deemed by the Commission to contribute minimally to the coastal migratory population, Addendum IV formally defers management of the A/R stock to the State of North Carolina under the auspices of the Commission, and using stock-specific biological reference points approved by the Board. Addendum IV continues to
set the coastwide regulatory program for Atlantic striped bass (i.e., commercial quotas and recreational bag and size limits).

Lastly, but perhaps most importantly, Addendum IV established one set of F reference points for the coastal migratory population in all management areas. Now, and as it was prior to Amendment 5, the Atlantic striped bass complex (excluding the A/R stock) is managed and modeled as a single stock with one set of SSB and F reference points for the coastal migratory population. In reality, the coastal migratory population is comprised of multiple stocks (i.e., the Chesapeake Bay, the Hudson River, and the Delaware Bay stocks), each with unique biological characteristics, and dynamic contributions to the coastal migratory population. While Addendum IV reference points include the effects of area-specific harvest of smaller fish on the coastwide SSB, they do not incorporate data on the sex ratio that exists in different areas where target fisheries occur. For example, data suggest that the Chesapeake Bay harvest is comprised of a greater proportion of males than females. Therefore, the Board is limited in its ability to maximize striped bass fishing opportunities for all stakeholders (while ensuring the sustainability of the resource) until stock assessment data and modeling approaches produce reliable stock-specific sex-based reference points for management use. The next benchmark assessment, which will attempt to address these concerns, is scheduled for review at the end of 2018.

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