Striped Bass
Morone saxatilis

Interesting Fish Facts:
•Average Chesapeake Bay 6-year old female produces 500,000 eggs, while a 15-year old produces 3 million eggs
•Bass tagged in the Bay have been recaptured in Canadian waters, over 1,000 miles away

Largest Recorded: 125 pound female, NC, 1891

Age at Maturity:
•Females - 50% mature at age 6 (25 - 26"); 100% mature at age 9 (32")
•Males - 100% mature at age 3 (18")

Age at Recruitment:
Chesapeake Bay Fishery = age 4 (18")
Coastal Fishery = age 8 (28")

Stock Status:
Not overfished, overfishing is not occurring

Species Profile: Atlantic Striped Bass
The Challenges of Managing a Restored Stock

Introduction

Striped bass have formed the basis of one of the most important fisheries on the Atlantic coast for centuries. They have been regulated since European settlement of North America. Early written accounts recorded their great abundance. Striped bass were once so plentiful they were used to fertilize fields. Like those earlier years, today's Atlantic striped bass population is thriving. After numbering less than five million fish in 1982, the resource was rebuilt to over 65 million fish in 2005. The payoff for the years of restricted harvest has been big. Recreational fishing for striped bass is at an all-time high. Commercial fisheries have also benefited with increases in commercial quotas, yielding greater economic profits. Now the Commission's focus is to manage a restored stock and address emerging challenges such as disease and discard mortality.

Life History

The Commission's striped bass management program centers on the migratory population and spawning stocks from Maine through North Carolina, but the species can be found as far north as the St. Lawrence River in Canada and as far south as the St. John's River in Florida. A long-lived species (at least up to 30 years of age), striped bass typically spend the majority of their adult life in coastal estuaries or the ocean, migrating north and south seasonally and ascending to rivers to spawn in the spring.

Mature females (age six and older) produce large quantities of eggs (see side-bar), which are fertilized by mature males (age two and older) as they are released into riverine spawning areas. While developing, the fertilized eggs drift with the downstream currents and eventually hatch into larvae. The larvae and post-larvae begin feeding on microscopic animals during their downstream journey. After their arrival in the nursery areas, located in river deltas and the inland portions of coastal sounds and estuaries, they mature into juveniles. They remain in coastal sounds and estuaries for two to four years and then join the coastal migratory population in the Atlantic Ocean. In the ocean, fish tend to move north during the summer and south during the winter. Important wintering grounds for the mixed stocks are located from offshore New Jersey to North Carolina. With warming water temperatures in the spring, the mature adult fish migrate to riverine spawning areas to complete their life cycle. The majority of the coastal migratory stock originates in the Chesapeake Bay spawning areas, with significant contributions from the spawning grounds of the Hudson and Delaware Rivers.

Commercial & Recreational Fisheries

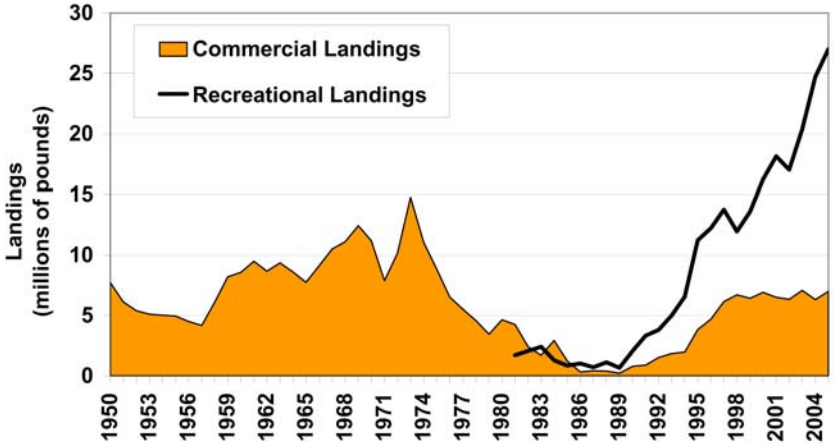
Commercial fishermen harvest striped bass with a variety of gears including gill nets, pound nets, haul seines, and hook-and-line. Commercial harvest peaked at almost 15 million pounds in 1973, then declined to 3.5 million pounds in 1983, a 77 percent decrease. During the early to mid-1980s, a number of states closed their striped bass fisheries in order to initiate rebuilding of the stocks. The commercial fishery grew slowly under a partial reopening of state waters in the early 1990s, with coastwide harvest rising from 825,000 pounds in 1990 to 2.01 million pounds in 1994. Most of this growth resulted from the fact that Maryland was permitted to impose flexible quotas that have risen with increasing stock size.

Under restored status, the striped bass commercial harvest steadily grew from 3.4

million pounds in 1995 to peak at over seven million pounds in 2003 and 2005 (Figure 1). Beginning in 2003, the commercial quotas increased under Amendment 6 allowing the states to implement coastal commercial quotas equivalent to the average harvest during 1972-1979.

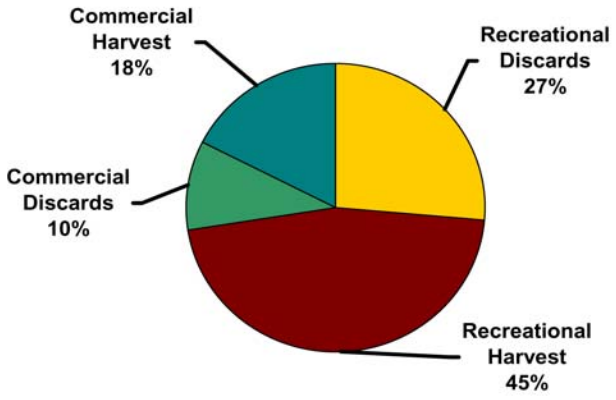
The growing popularity of saltwater recreational fishing since the 1960s and 1970s, and the lack of recreational harvest caps in most states, led the sport fishing sector to land a larger percentage of the total catch. Recreational harvest grew from 3.1 million pounds in 1990 to over 26 million pounds in 2005 (Figure 1).

Figure 1. Annual Coastal Atlantic Striped Bass Landings
Source: NOAA Fisheries Website, 2006



Striped bass discard mortality is estimated to account for more than 36% of the overall fishing-related removals in 2004. Figure 2 shows the breakdown of striped bass landings and discard losses by fishing sector in 2004. Draft Addendum I, now out for public review and comment, intends to address the issue of discard mortality by proposing the establishment of a data collection program to assess the accuracy of current fishery discard estimates and their overall impact on the striped bass population.

Figure 2. Atlantic Striped Bass Catch in 2004 (5.2 Million Fish Total)
Source: ASMFC Atlantic Striped Bass Technical Committee, 2005

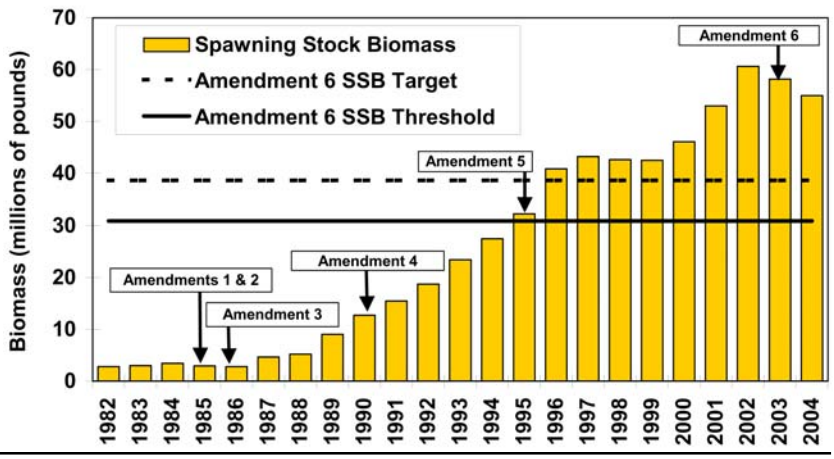


Stock Status

The latest annual assessment, conducted in late 2005, determined that striped bass are not overfished and overfishing did not occur in 2004. Not only is female spawning stock biomass nearly 20 times greater than the levels seen in the early 1980s, but since 1996 it has been above both the threshold and target levels set in Amendment 6 (Figure 3). Female spawning stock biomass peaked in 2002 at 60.6 million pounds. Since the moratoria in the mid-1980s, fishing mortality generally has trended upward. The 2004 average fishing mortality rate for ages 8 to 11 equaled 0.40, which is above the Amendment 6 Ftarget of 0.30, but below the F threshold of 0.41. However, it was the consensus of the Technical Committee members that this was likely an overestimate.

Overall, the Atlantic stocks of striped bass appear to be abundant in number, capable of producing strong incoming year classes, and are being fished at levels within the bounds of the current fishery management plan (FMP). The population is considered fully exploited.

Figure 3. Atlantic Striped Bass Female Spawning Stock Biomass
Source: ASMFC Atlantic Striped Bass Technical Committee, 2005



Atlantic Coastal Management Considerations

Before the Interstate FMP for Striped Bass (1981), states independently promulgated regulations (i.e. minimum size limits) to constrain the fishing mortality on the Atlantic coast striped bass population. Striped bass fisheries would not be where they are today, however, without the support of the 1984 Atlantic Striped Bass Conservation Act. This Act, which was the precursor to the Atlantic Coastal Fisheries Cooperative Management Act, provided

Atlantic coastal states with the necessary tools to cooperatively and more effectively conserve and manage striped bass stocks.

In an effort to regenerate the scarce mature adult portion of the population, many of the jurisdictions implemented moratoria in the mid-1980s to protect the 1982 and subsequent year classes. As a result of Amendments 4's stringent management program, the Commission declared Atlantic coastal striped bass stocks fully recovered in 1995.

Amendment 6

Since Amendment 4, the foundation of the striped bass management program has been to maintain harvest below a target fishing mortality rate (F). While Amendment 6, approved in 2003, modified the F targets and thresholds, it also introduced a new set of biological reference points to more effectively monitor the status of the population. On an annual basis, the female spawning stock biomass is monitored to ensure this portion of the population remains above the threshold of 30.9 million pounds to avoid an overfished status. These reference points, as well as new management triggers, have enabled the Management Board to be more responsive to changes in the stock.

In addition to the control rule, Amendment 6 phases in new regulations for both the commercial and recreational fisheries. In 2003, the coastal commercial quota for striped bass was restored to the states' historical average landings during the 1972-1979 base period, a 43 percent increase from the 2002 coastal commercial quotas. For the 2006 fishing year, the coastal commercial quota is set at over 3.7 million pounds. In the recreational fisheries, all states were required to implement a two fish bag limit with a minimum size limit of 28 inches, except for the Chesapeake Bay fisheries, Albemarle-Roanoke fisheries, and states with approved conservation equivalency proposals. The Chesapeake Bay and Albemarle-Roanoke regulatory programs differ from the coastal migratory stock because these programs are predicated on a more conservative F target than the coastal migratory stock. The independent F target allows these jurisdictions to implement separate seasons, harvest caps, and size and bag limits as long as they remain under that target.

Emerging Challenges

Despite the success of the striped bass management program, there are some concerns about the species' health. One disease of particular concern is mycobacteriosis, a bacterial infection resulting in a variety of external and internal symptoms including skin lesions, stunted growth, inflammation, tissue destruction, and formation of scar tissue in one or more organs. The infection progresses slowly in fish and has been characterized as a "wasting disease" due to loss of body mass. Recent Maryland Department of Natural Resource surveys indicate that as many as 60 percent of striped bass in the Chesapeake Bay may have this disease, which does not appear to be common in any other species in the Bay. First diagnosed in the Chesapeake Bay in 1997, at least 10 species of mycobacteria have

Offshore Waters to Remain Closed to Striped Bass Fishing

After carefully examining a proposal to reopen offshore marine waters in the Atlantic Ocean for striped bass fishing, NOAA has announced it will maintain the 1990 federal closure.

NOAA closed marine areas between three and 200 miles offshore to recreational and commercial striped bass fisheries to complement a rebuilding plan instituted by the Commission in 1981. The rebuilding plan, supported by the federal closure, was successful and scientists declared striped bass populations fully rebuilt in 1995. In April 2003, the Commission asked NOAA to evaluate available scientific information to determine if the federal ban should be lifted.

After a 2005 stock assessment confirmed that the species is at a sustainable population size and not being overharvested, NOAA issued an options paper in April 2006 outlining potential management strategies to allow striped bass fishing to resume in offshore waters. These strategies included a range of options, from reopening the fisheries with minimum size and catch limits, to maintaining the federal ban.

NOAA's proposal did not call for an increase in the annual catch quota for striped bass, established by the Commission to maintain the population size. Even though the annual cap on catches would have remained the same, regardless of whether the fish were caught in nearshore or offshore waters, the majority of those who commented believed that reopening offshore fisheries would result in higher catches.

NOAA based the decision on a review of trends in the fishery and the species' stock status. The data show that there has been an increase in fishing mortality of striped bass and a slight decrease in female spawners since the Commission requested a reevaluation of the federal ban. Although the stock as a whole is not being overharvested, any increased fishing pressure would likely result in over fishing before NOAA and the Commission could respond with a new regulation. Since these issues would undermine the long-term conservation of Atlantic striped bass, the agency has determined that offshore waters should remain closed at this time.

been isolated from striped bass lesions. Fish are probably exposed to these bacteria early in life with infection rates increasing with age: 11 percent in one year olds and 60 percent in three to five year olds. The recovery and mortality rates resulting from this disease within the Chesapeake Bay are not currently known. Scientists from both Maryland and Virginia continue to study this issue and monitor the situation.

Concern has also been raised over the nutritional needs of striped bass. A number of studies are being conducted to evaluate prey availability and what relation, if any, it might have to the prevalence of disease in the striped bass population. A multispecies model, incorporating predator-prey and competitor interactions between striped bass, Atlantic menhaden, bluefish, and weakfish, is under development. Fisheries scientists and managers will use this model to help determine interspecies relationships and help forecast multiple species abundance trends. For more information, please contact Nichola Meserve, FMP Coordinator, at nmeserve@asmfc.org.