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OCTOBER 2015

STRIPERS FOR THE FUTURE

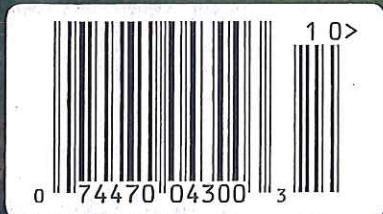


STRIPER HOTSPOT: FISH A BRIDGE

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THINK LIKE A FISH



BY JOHN TIEDEMANN

ENSURING STRIPERS FOR THE FUTURE

Photo by Gary Caputi.

Every striped fisherman dreams of catching a 'trophy' fish - imagining the excitement of landing a 40-, 50-, or even 60-pounder. While catching a fish of this magnitude offers the thrill of a lifetime, many longtime striped anglers and conservationists have become concerned that recent boom years of striped fishing have resulted in the indiscriminate killing of large numbers of bigger, older females.

What is the rationale for keeping a trophy-sized striped bass? It certainly can't be for their value as table fare. Big stripers are extremely oily and don't taste as savory as smaller ones. Larger stripers also accumulate exponentially higher levels of contaminants like PCBs, which are classified by the U.S. EPA as probable human carcinogens and responsible for health advisories warning the public to limit their consumption of larger striped bass in states throughout the Mid-Atlantic and Northeast.

Even so, the Internet, walls of many bait and tackle shops, and pages of newspapers and some popular publications continue to be overloaded with pictures of anglers displaying and even hugging large stripers, apparently killed simply for weigh-in and photo opportunities without consideration for the fate of the fish or the resource. However, there are some glimmers of hope within the angling community. For example, on the tournament front, many long-running striped tournaments have changed their formats to include catch-and-release categories or catch and release only. In addition, recent campaigns like the Stripers Forever 'Release a Breeder Club' and the Maryland Coastal Conservation Association's 'My Limit is One' are encouraging anglers throughout the striped coast to adopt a conservation ethic by voluntarily releasing all stripers over 36 inches.

Let's review some important facts about striped bass and their life history that support the conservation value of practicing catch-and-release of larger fish.

In the 1970s, striped bass stocks along the Atlantic coast plummeted to a low of just under 5 million fish. After implementation of a variety of conservation and management measures the population had reached approximately 8.9 million fish by 1982. During the 1990s population levels increased steadily, reaching a peak of 70.8 million fish in 2004. However, after 2004, poorer spawning success and subsequent decreases in

recruitment were responsible for the population declining to approximately 50 million fish by 2010.

Ironically, as the population was declining during the 2000s, the number of anglers targeting stripers continued to increase. As a result, in the Mid-Atlantic and New England regions, the recreational harvest has annually exceeded 1.5 million between 2011 and 2014. In addition, even though anglers caught and released an additional 26 million stripers between 2011 and 2014,

Big stripers should be returned to the water as soon as possible to ensure a healthy release.



fishery managers estimate that 8 percent of these fish die. This translates to over 2.1 million additional stripers being removed from the Mid-Atlantic/New England population during that period.

The striped bass that anglers target includes fish from different year classes. A year class is comprised of the fish spawned and hatched in a given year, thus it can be viewed as a 'generation' of fish. Year class strength varies annually based on a number of factors including spawning success and survival of offspring through the critical first years of life. Environmental conditions also affect year class strength. For example, water temperatures after larvae are transported downstream from spawning areas into estuarine zones are critical to larval survival, development and overall year class success. In years when temperatures are lower than average, food densities tend to be lower, the duration of development is longer and larvae are exposed to predators for longer periods of time. When temperatures are higher, development takes a shorter period of time and coincides with increased food in an environment of reduced predation. Likewise, fluctuations in temperature, salinity, prey availability and predation in estuarine nursery areas can have an impact on young fish for several years beyond their first year before they join migratory adults in their movements to offshore waters.

Overall, this means that although there are boom years that produce strong year classes, other years can be a bust. For example, the Hudson River produced a relatively good 2009 year class, but this was preceded and followed by several years of much poorer spawning success. Chesapeake Bay's 2011 year class was strong, but was followed by a historic low in 2012. The 2013 and 2014 year classes were better, but still below the 61-year average for the bay.

Although stripers from different stocks mature at different ages but, in general, females typically reach maturity between 4 to 6 years old (a 4-year-old might be approximately 21 to 28 inches; a 6-year-old 26 to 28 inches) and spawning stocks are traditionally dominated by the mature adults from a few strong year classes. Unfortunately since 2004, the spawning stock biomass has continued to decline. This trend is driven by a combination of factors including the overall lack of strong year classes in the past decade and the fact that females from the few relatively good year classes in recent years are just beginning to mature and enter the spawning stock. The intense harvest of larger mature female stripers has also factored into this decline.

Regrettably, some anglers believe that selectively harvesting larger stripers enhances the growth and survival of smaller fish causing less damage to the resource. Contrary to this popular belief, fishermen that value larger, older fish strip away these individuals from the reproductive population. Mature female striped bass are extremely fecund, producing large numbers of eggs and spawning multiple times during their life. In addition, while there is evidence of skip-spawning behavior in mature stripers (i.e., not spawning in each successive year) tied to the overall condition of individual fish (e.g., deficient diet, poor nutritional condition, resulting in decreased residual body weight and low energy reserves) there is no documented evidence that females reach a point where they halt spawning altogether.

In terms of fecundity, the number of eggs produced by female striped bass varies based on age, length and weight, and larger females produce disproportionately more eggs than smaller females. Several studies reported in Bruce Collette and Grace Klein-MacPhee's 2002 installment of *Bigelow and Schroeder's Fishes of the Gulf of Maine* (Smithsonian Institu-

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tion Press) have estimated the mean number of eggs produced by mature female striped bass per pound of body weight in East Coast spawning grounds. One study in North Carolina reported that female striped bass produced approximately 80,000 eggs/pound of body weight; a Chesapeake Bay study estimated fecundity at 62,000 to 112,000 eggs/pound of body weight; and a Hudson River study estimated that females produced an average of 78,500 eggs/pound of body weight.

Based on these studies, an average egg production for a female striped bass might be approximately 83,000 eggs/pound of body weight. Using this figure, a mature 28-inch female striper, which would weigh about 10 pounds, would produce approximately 830,000 eggs. A 30-inch female weighing in at 12 pounds would produce close to a million eggs. At 36 inches, a female striper typically weighs approximately 19 pounds and would produce over 1.5 million eggs while a 43-inch female averaging 32 pounds would produce over 2.6 million eggs! Perhaps even more astonishing is that during the Chesapeake Bay fecundity study, one age 13 female (which would be approximately 40 inches and 26-plus pounds) sampled had produced over 4 million eggs! So, the call for anglers to practice conservation by releasing larger stripers, especially trophy-size fish, has great merit in enhancing spawning success.

In addition to having exponentially greater fecundity, older larger females also exhibit greater fitness than their smaller counterparts, a measure of the contribution of an individual to future generations. They tend to be more experienced and successful spawners providing the population with an earlier and longer spawning season and spreading their reproductive outputs across many years. They produce larger fitter eggs that produce fitter larvae that grow faster and are more likely to survive during periods of unfavorable environmental conditions. The higher fitness of eggs and larvae produced by older, larger females results having more metabolic energy reserves that allow them to invest more energy in each offspring. They provision larvae with significantly more nourishment via larger oil globules than those produced by small females. Larger oil globules aid larval growth and survival including making larvae more resistant to starvation.

So, removal of older, larger individuals from the stock leads to an exponential reduction in the number of eggs and larvae produced, shortening of the reproductive season, decreased chances that larvae will encounter favorable environmental conditions and lowered average survival potential of larvae produced. Potential lowering of genetic diversity over time is also a concern. Stocks with high genetic diversity are more likely to produce offspring with high fitness especially in a variable environment. The harvest of older, larger striped bass strips away these individuals from the reproductive population and their value to the overall success of the stock.

So any time a fish of 30 pounds or larger is killed, it likely removes an extremely fecund female from the spawning stock. And although only a small percentage of eggs produced by these fish may survive when they spawn, continuous reductions in fecund spawners and their egg production can impact future year classes. It is also important to note that female striped bass grow larger than males and that most bass over 30 pounds or about 42 to 43 inches are probably females.

Perhaps of even greater importance for anglers along the striper coast to consider are the findings of historical studies reported in *Bigelow and Schroeder's Fishes of the Gulf of Maine* that indicate that, although striped bass stocks along the northeastern coast of the U.S and Canadian coasts coningle during migratory movements and stock composition fluctuates from year to year, there is evidence that the coastal migratory stock in waters north of Delaware Bay is predominantly females. This means that in the northern Mid-Atlantic and Northeast we may in fact be targeting primarily female fish within the ocean and coastal fishery.

As striped bass anglers, it's all about choices we make. So, the next time you hook up with a large 'trophy' category striper, remember that this fish is probably a female and if she is released, she will continue to contribute to the success of future year classes. Releasing big older breeders to spawn again is one key to maintaining a healthy striped bass fishery. By doing so, recreational anglers can make a personal choice to play a major role in the conservation of striped bass and help ensure there are stripers for the future! 📌

Editor's Note:

John Tiedemann is the Assistant Dean in the Monmouth University School of Science and Director of the Marine and Environmental Biology and Policy Program. A lifelong resident of New Jersey, he has spent his career working on marine and environmental issues affecting the state's coastal zone. When not at work he can be found fishing or surfing along New Jersey's northern coast.



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