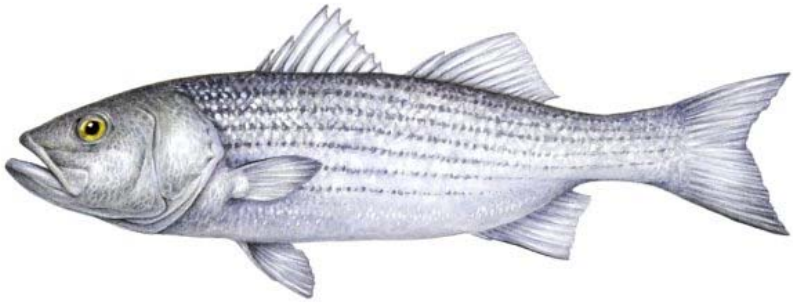
# Seafood Watch
## Seafood Report

MONTEREY BAY AQUARIUM®

# Atlantic striped bass
(*Morone saxatilis*)





Final Report
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# About Seafood Watch® and the Seafood Reports

Monterey Bay Aquarium's Seafood Watch® program evaluates the ecological sustainability of wild-caught and farmed seafood commonly found in the United States marketplace. Seafood Watch® defines sustainable seafood as originating from sources, whether wild-caught or farmed, which can maintain or increase production in the long-term without jeopardizing the structure or function of affected ecosystems. Seafood Watch® makes its science-based recommendations available to the public in the form of regional pocket guides that can be downloaded from the Internet (seafoodwatch.org) or obtained from the Seafood Watch® program by emailing seafoodwatch@mbayaq.org. The program's goals are to raise awareness of important ocean conservation issues and empower seafood consumers and businesses to make choices for healthy oceans.

Each sustainability recommendation on the regional pocket guides is supported by a Seafood Report. Each report synthesizes and analyzes the most current ecological, fisheries and ecosystem science on a species, then evaluates this information against the program's conservation ethic to arrive at a recommendation of "Best Choices", "Good Alternatives" or "Avoid." The detailed evaluation methodology is available upon request. In producing the Seafood Reports, Seafood Watch® seeks out research published in academic, peer-reviewed journals whenever possible. Other sources of information include government technical publications, fishery management plans and supporting documents, and other scientific reviews of ecological sustainability. Seafood Watch® Fisheries Research Analysts also communicate regularly with ecologists, fisheries and aquaculture scientists, and members of industry and conservation organizations when evaluating fisheries and aquaculture practices. Capture fisheries and aquaculture practices are highly dynamic; as the scientific information on each species changes, Seafood Watch's sustainability recommendations and the underlying Seafood Reports will be updated to reflect these changes.

Parties interested in capture fisheries, aquaculture practices and the sustainability of ocean ecosystems are welcome to use Seafood Reports in any way they find useful. For more information about Seafood Watch® and Seafood Reports, please contact the Seafood Watch® program at Monterey Bay Aquarium by calling 1-877-229-9990.

**Disclaimer**

Seafood Watch® strives to have all Seafood Reports reviewed for accuracy and completeness by external scientists with expertise in ecology, fisheries science and aquaculture. Scientific review, however, does not constitute an endorsement of the Seafood Watch® program or its recommendations on the part of the reviewing scientists. Seafood Watch® is solely responsible for the conclusions reached in this report.

Seafood Watch® and Seafood Reports are made possible through a grant from the David and Lucile Packard Foundation.

## Executive Summary

Atlantic striped bass is a large, anadromous species that is highly sought after in both commercial and recreational fisheries from Maine to North Carolina. There are three main stocks, originating from the Chesapeake Bay, the Hudson River, and the Delaware River, respectively, as well as a mixed coastal population that is seasonally migratory throughout its range. Over 70% of the striped bass population utilizes the Chesapeake Bay and its tributaries for spawning and nursery grounds. During the 1970s and early 1980s, overfishing and habitat degradation (poor water quality) in the Chesapeake Bay decimated the striped bass population. Severe harvest restrictions in the early 1990s and community effort to improve environmental conditions has, however, allowed the stock to rebound to record levels. Striped bass are caught in recreational fisheries with mainly hook and line gear, and in commercial fisheries with net gear (pound nets, gillnets, haul seines, trawls). These gear types are thought to be relatively benign with respect to habitat, although some interactions with protected or endangered species do occur on occasion. Management of striped bass is comprehensive, and includes fishery monitoring, long-term fisheries-independent research, establishment of size or slot limits, quotas, and overfishing thresholds, and inclusion of discards in calculating total fishing mortality. A stock assessment is completed each year for Atlantic striped bass, as mandated by the Atlantic Striped Bass Conservation Act.

**NOTE**: Due to potential PCB contamination, there are health warnings for consumption of Atlantic striped bass. Consumers should contact the Environmental Protection Agency or state agencies for further information.

## Table of Ranks

| | Conservation Concern | | | |
|---|---|---|---|---|
| **Sustainability Criteria** | **Low** | **Moderate** | **High** | **Critical** |
| Inherently Vulnerability | √ | | | |
| Status of Stocks | √ | | | |
| Nature of Bycatch | √ **(Hook & line)** | √ **(Net gears)** | | |
| Habitat Effects | √ | | | |
| Management Effectiveness | √ | | | |

**Overall Evaluation and Seafood Ranking:**

- A seafood product is given the overall recommendation "**Avoid**" if two or more criteria are ranked Concern: High (red) OR if one or more criteria are ranked Concern: Critical (black) in the table above.
- A seafood product is given the overall recommendation "**Caution**" if three or more criteria are ranked Concern: Moderate (yellow) OR when the "Status of Stocks" and "Management Effectiveness" criteria are both ranked Concern: Moderate.
- A seafood product is given the overall recommendation "**Best Choices**" if three or more criteria are ranked Concern: Low (green) AND no remaining criteria are ranked Concern: High or Concern: Critical.

## Overall Seafood Recommendation:

**Best Choice** Good Alternative Avoid

## Introduction

Atlantic striped bass (*Morone saxatilis*) is a large, anadromous[1] species in the family Moronidae. Its natural range extends along the eastern coast of North America from northern Florida to the St. Lawrence Estuary, Canada, and along the Gulf of Mexico from western Florida to Texas (Setzler et al. 1980). Along the U.S. Atlantic coast, striped bass are prominent, particularly in the largest estuaries: Chesapeake Bay, Delaware Bay, the Hudson River and Albemarle and Pamlico Sounds (Fig. 1). Atlantic striped bass have also been introduced into the Pacific Ocean, as well as rivers, lakes and reservoirs throughout the U.S., and to foreign countries such as Russia, France and Portugal (Hill et al. 1989). The species has historically been one of the most important recreational and commercial fishes along the U.S. East Coast, particularly for anglers in and around the Chesapeake Bay. Consequently, striped bass is the state fish of Maryland.

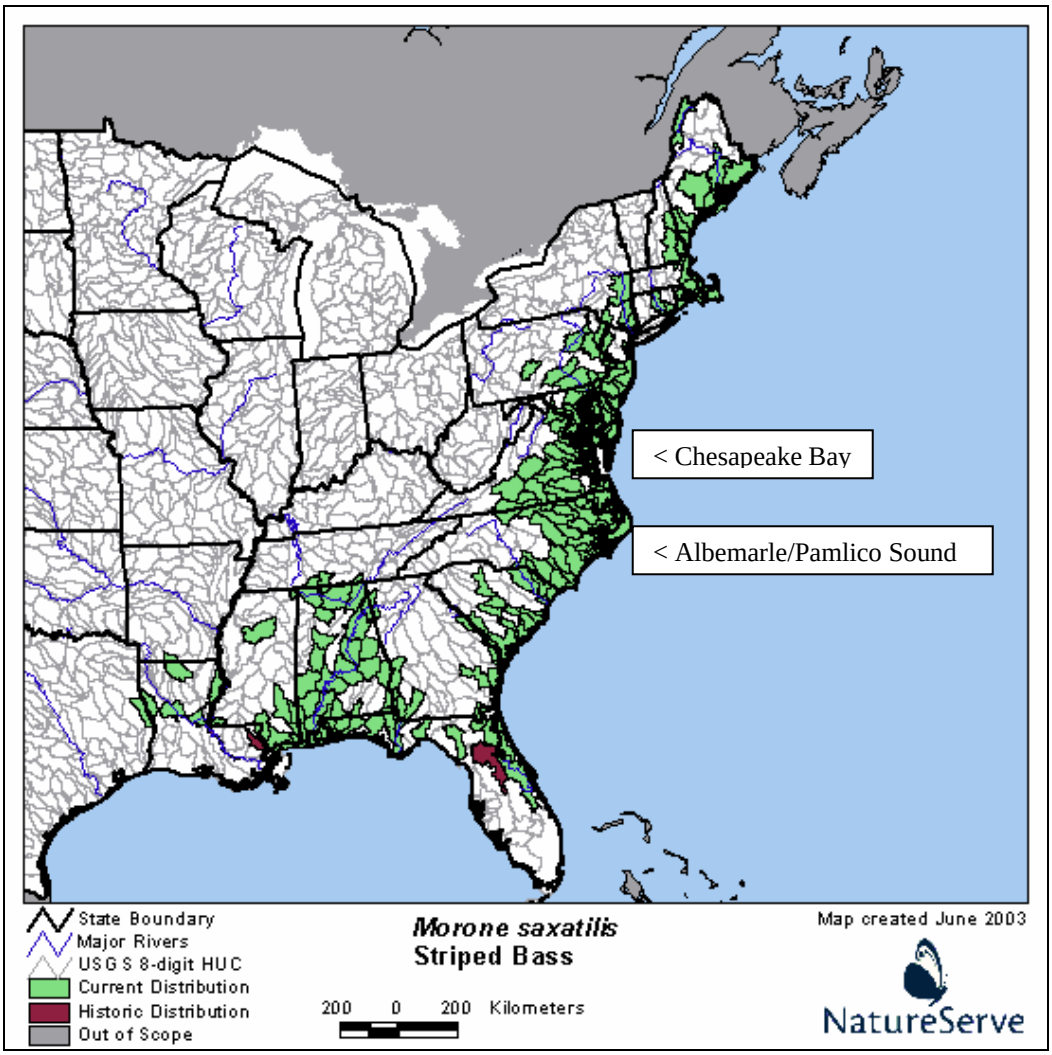


Figure 1. Current and historical distribution of Atlantic striped bass, based on USGS surveys (Courtesy: NatureServe[2]).

[1] Spawns in freshwater and migrates to the ocean.
[2] http://www.natureserve.org/

Atlantic striped bass are caught commercially with a variety of gears, depending on the area fished and individual state regulations. In 2002, the predominant gear type was hook and line, followed by sink and drift gillnets, pound nets, seines, and otter trawls (Fig. 2). Massachusetts is predominantly a hook and line fishery, while Maryland and North Carolina are predominantly drift gillnet fisheries, and Virginia is mostly a sink gill net fishery (NMFS 2002). A very small percentage (3%) of striped bass landings are caught using otter trawls.

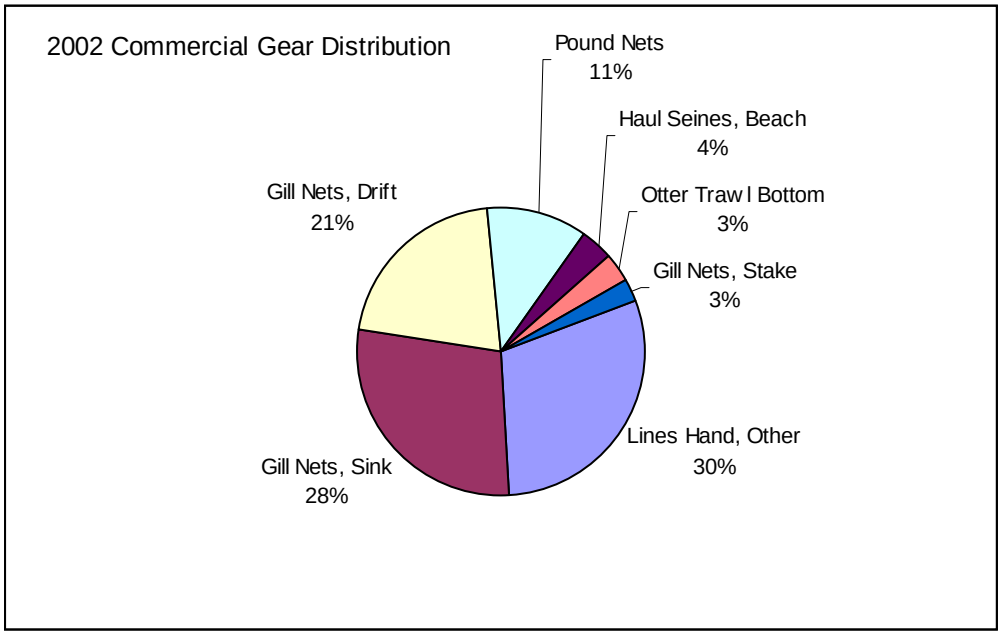


Figure 2. Commercial gear distribution for striped bass in 2002 (NMFS 2002).

Annual commercial landings of striped bass along the Eastern Seaboard from the early 1960s to the mid-1970s were between 8 and 14 million pounds (MP; 3,600 – 6,300 metric tons; Fig. 3). Recreational harvest was not well documented during that period, but may have equaled commercial landings (ASMFC 2003b). Due to heavy fishing pressure on striped bass stocks and the decline in water quality in the Chesapeake Bay, the striped bass population plummeted in the late 1970s. This decline prompted state and federal legislators to pass amendments creating an Emergency Striped Bass Study (ESBS) program in 1979, and later the Atlantic Striped Bass Conservation Act, which imposed a moratorium on striped bass harvest in states not complying with the interstate fishery management plan (ASMFC 2003b). Over the last 20 years, state and federal managers, as well as commercial and recreational fishers, have worked together to return stocks to healthier levels. In 1995 striped bass stocks were declared rebuilt. Limits on fishing have paid off: current catches are eight times higher than they were 20 years ago (ASMFC 2004).

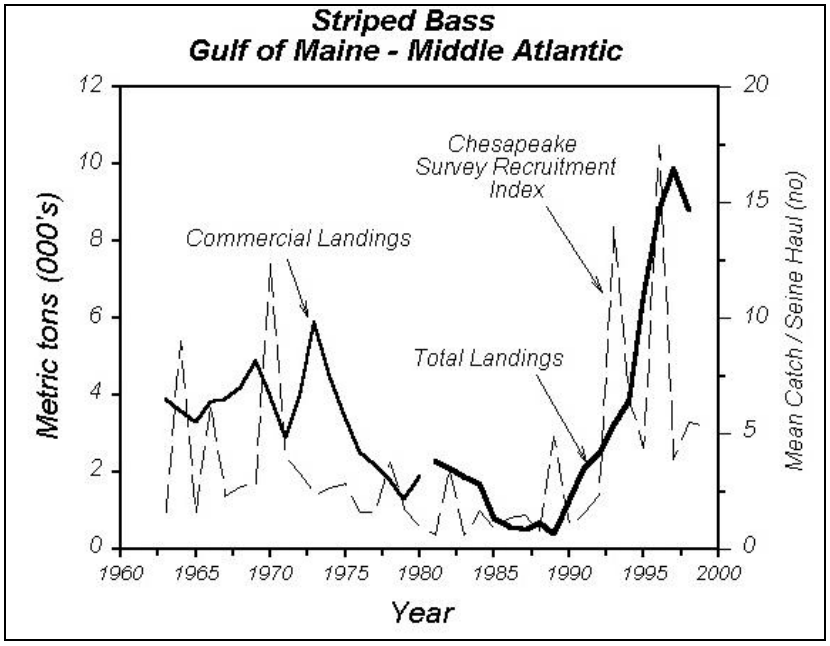


Figure 3. Landings and recruitment index for Atlantic striped bass (Shepard 2000).

The largest commercial landings of striped bass are generally from the Chesapeake Bay (Maryland and Virginia), Massachusetts, and New York (ASMFC 2003b). In the last 10 years, recreational fishing for striped bass has surpassed commercial fisheries, partially due to a limit on commercial catch and an increase in the number of recreational anglers, as well as an increase in the number of fish (ASMFC 2003b). In 2002, recreational landings topped 18.5 MP, while commercial landings were less than 6 MP (NMFS 2003). States with the highest recreational landings (by weight) in 2002 were Massachusetts, New Jersey, and New York (Fig. 4).

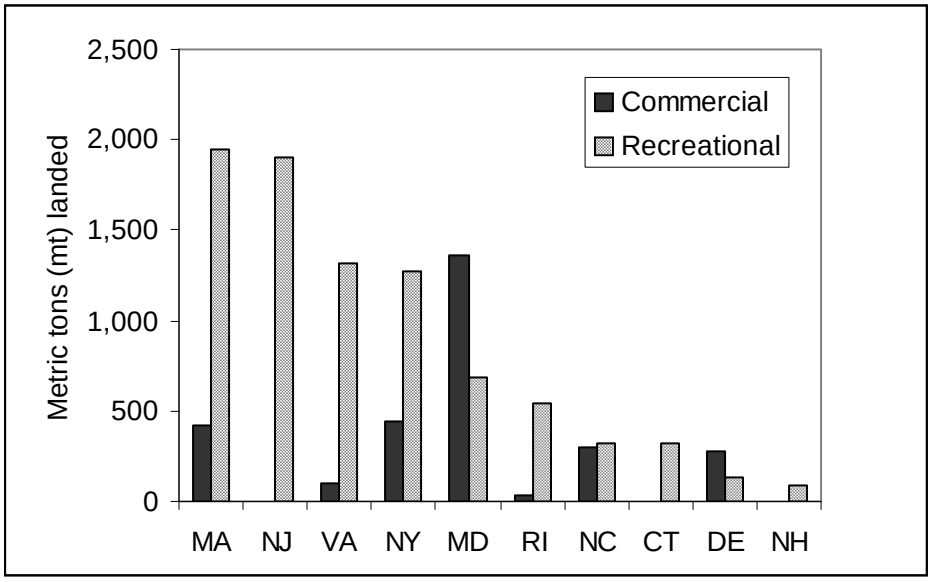


Figure 4. Commercial and recreational harvest (mt) by state for 2002 (NMFS 2002; ASMFC 2003b).

**Scope of the analysis and the ensuing recommendation**:
Although Atlantic striped bass, along with their respective fisheries, can be found in eastern Canada and on the U.S. West Coast, this report focuses only on wild U.S. Atlantic coast populations and their fisheries. Atlantic striped bass will be referred to as striped bass throughout this document.

**Availability of Science**
Primary literature covers a great deal of striped bass life history, as well as studies on disease and aquaculture. Several studies have centered on otolith ageing or microchemistry (including analyses on the degree of mixing between stocks using chemical signals in otoliths), scale age research or early life history. Although the primary literature aided in evaluating life history characteristics, stock assessment and management documents provided most of the information for other evaluation criteria in this report.

## Market Availability

### Common/Market Names

Striped bass is often called “temperate” or “true” bass to distinguish it from species such as largemouth, smallmouth, and spotted bass, which are actually members of the sunfish family (Centrarchidae). In the Chesapeake Bay, striped bass is commonly called striper, rockfish, linesider, roller, squidhound and greenhead (ASMFC 2004). This species is not to be confused with hybrid striped bass (*M. saxatilis* crossed with *M. chrysops*), which is mostly farmed. When used for sushi or sashimi, striped bass is commonly sold as *suzuki*.

### Seasonal Availability

Atlantic striped bass are available most months of the year. The use of gear type varies by season, with many hook and line fisheries operating in the summer months.

### Product Forms

Striped bass may be purchased fresh or frozen, whole or filleted (except in NJ where wild caught striped bass are prohibited for sale).

### Import/Export Statistics

There are no records of trade of striped bass through U.S. Customs Districts. Since almost half of the catch is recreational, it is logical to assume that most striped bass is consumed regionally.

# Analysis of Seafood Watch® Sustainability Criteria for Wild-Caught Species

## Criterion 1: Inherent Vulnerability to Fishing Pressure

Atlantic striped bass are moderately long-lived; the oldest fish on record was aged at 30 years (Table 1; Secor et al. 1995). Growth is fairly fast ($k^3 = 0.12$); 50% of females mature by age 6 and 25-26 inches and 100% mature at age 9 and 32 inches (ASMFC 2004). All males are mature by age 3, or about 18 inches, the size at which most fish recruit to the fishery (ASMFC 2004). Larger, older females produce significantly more eggs. For example, a 6-yr old female may produce 500,000 eggs, while a 15-yr old female may produce about 3 million eggs (ASMFC 2004). The historical record size for an Atlantic striped bass is 125 pounds. The fish was a female, caught off the coast of North Carolina in 1891 (ASMFC 2004).

Table 1. Life history characteristics for Atlantic striped bass.

| COMMON NAME | GROWTH RATE/MAX SIZE | AGE @ 1st MATURITY | LONGEVITY, VALIDATED? | FECUNDITY | Reference: |
|---|---|---|---|---|---|
| Atlantic striped bass | K = 0.12, 200 cm TL max size | Females: age 4; males: age 2 | To 30 yrs, no | 200,000 (age 3) to 5,000,000 (age 16) eggs* | (Olsen and Rulifson 1992; Secor et al. 1995; ASMFC 2003b; Froese and Pauly 2004) |

* This estimate is representative only of Roanoke and Albemarle Sound.

Atlantic striped bass inhabit coastal waters along the eastern coast of North America from the St. Lawrence River in Canada to Albemarle Sound in North Carolina (ASMFC 2003b). Stocks inhabiting coastal rivers from the Tar-Pamlico River in North Carolina south to the St. Johns River in Florida are thought to be endemic and riverine, apparently not migrating out to the Atlantic Ocean (Richkus 1990). Migratory patterns for striped bass at different life stages vary by location, but generally juveniles migrate downstream in summer and fall, while adults migrate upriver to spawn in spring, afterwards returning to the ocean. Juveniles less than two years of age generally do not migrate to coastal areas (ASMFC 2003b). Coastal oceanic adults move north along the coast in summer and fall, and south during the winter (Shepherd 2000 *in* ASMFC 2003b). The extent of migration varies between sexes and populations, with larger female bass typically migrating farthest (Hill et al. 1989). Coastal migratory stocks may range as for north as Nova Scotia and large numbers of the population winter off the coasts of Virginia and North Carolina (ASMFC 2003b).

Spawning occurs in freshwater rivers and estuaries along the Atlantic coast, particularly in the tributaries of the Chesapeake and Delaware Bays, and the Hudson and Roanoke Rivers (ASMFC 2003b). The spawning season varies geographically: in Florida fish spawn in mid-February; in the St. Lawrence river in Canada fish spawn in June and July (ASMFC 2003b). Spawning is initiated through increased water temperature; the optimal spawning temperature is 17-19˚ C (Bain and Bain 1982). Fertilized eggs are buoyant and need current to remain suspended in the water column, where they will hatch after about 30 hours (longer if temperature is less than 22˚

[3] The growth coefficient, k, is a parameter described by the Von Bertalanffy Growth Function (VBGF), a commonly used growth function in fisheries science for elucidating age and growth characteristics of fishes. After von Bertalanffy (1938).

C; Hill et al. 1989). Newly hatched larvae take approximately 20 to 30 days to develop fins and become juveniles, at a length of about 30 mm. Fully developed juveniles migrate to nearshore areas in search of sandy bottoms (ASMFC 2003b). Juvenile striped bass may school in a group of several thousand, and are an important prey species for other finfish such as bluefish (*Pomatomus saltatrix*) and weakfish (*Cynoscion spp*.; Buckel et al. 1999).

The Chesapeake Bay and its tributaries are the spawning and nursery grounds for 70-90% of the striped bass population (Herbst 2002). Environmental degradation in the early 1980s caused by coastal development, water pollution, and alteration of waterways (dams, channels, dredging, etc.), compromised habitat quality for striped bass and other marine species in the Chesapeake Bay and may have been a contributing factor in striped bass decline during that time period (Richards and Rago 1999). Over the last 20 years, government and local communities have undertaken major efforts to improve migration routes, water quality and habitat in the Chesapeake Bay;. However serious obstacles to the full restoration of habitat quality remain (such as seasonal hypoxia in the Bay; Secor and Gunderson 1998). The Chesapeake Bay Program and other state or privately funded entities continue to monitor pollutant levels within the Chesapeake Bay and other indicators of ecosystem health such as species population size and mortality rates.

**Summary**

Striped bass have a very broad species range; they are found from the Gulf of Mexico to the St. Lawrence River in Canada. Although life history characteristics vary slightly among populations, in general this species is moderately long-lived (to 30 years) and has a relatively low age at first maturity (4 years for females, 2 years for males). Females, particularly older, larger individuals, may be highly fecund. Except for aggregating to spawn, the species does not exhibit behaviors that make it particularly vulnerable to fishing pressure.

**Inherent Vulnerability Rank:**

**Resilient** Moderately Vulnerable Highly Vulnerable

## Criterion 2: Status of Wild Stocks

There are several coast-wide striped bass stocks from Maine to North Carolina, but the largest originate primarily from the Chesapeake Bay, the Delaware Bay and the Hudson River (ASMFC 2003a). These stocks were last assessed in 2003 by the Technical Committee, which operates under the Atlantic States Marine Fisheries Commission (ASMFC) Striped Bass Management Board. The annual assessment uses information from annual recreational and commercial catches (including discards), scientific research programs, and indices of abundance from state and federal sources. The data are applied to a population model (Virtual Population Analysis, VPA) to determine overall biomass, spawning stock biomass, age and size structure, and recruitment. In addition, many state and federal agencies participate in tag-release programs for striped bass, which aids in the calculation of annual survival and annual fishing mortality rates (NMFS 2003). The Maryland Department of Natural Resources (MD DNR) also conducts a thorough assessment of the Chesapeake Bay stock and monitors recruitment annually (MDDNR 2003).

*Overall Stock Status*

Results from the 2003 stock assessment indicate that striped bass stocks are at high levels of abundance relative to the 1980s (Fig. 5), and are capable of supporting current landings (ASMFC 2003b). The number of individuals in the population has increased due to moderate fishing mortality and consistent production of juvenile fish punctuated by years of high juvenile survival (NMFS 2003). Estimated abundance of striped bass on January 1, 2003 was 44.8 million fish (Table 2) (ASMFC 2003a; NMFS 2003). This is a tenfold greater population size than the estimate of 4.6 million fish in 1982 (NMFS 2003). Overfishing is not occurring, and the stock is not overfished, but is considered fully exploited by the ASMFC.

One issue of concern is the possibility that the age distribution within striped bass stocks is skewed towards younger individuals. In 2003 the majority of commercial landings consisted of fish ages 4-6 (61%; NMFS 2003), and the 2000-2001 year classes (ages 2-3) comprised almost 60% of the striped bass population (57% of $B_{2003}$; NMFS 2003). These individuals are immature or have only recently matured, indicating they have had little time to contribute to the population before recruiting to the fishery. Because larger, older females contribute the greatest reproductive potential, recruitment may be lessened by the absence of older females.

Table 2. Biological reference points for Atlantic striped bass (ASMFC 2003b).

| $SSB_{2002}$ | $SSB_{threshold}$ | $B_{2003}$ | $F_{2002}$ | $F_{MSY}$ |
|---|---|---|---|---|
| 49.2 MP | 30.9 MP | 44.8 age-1+ individuals | 0.29-0.35* | 0.41 |

* This is the range of F that represents mortality of ages 4-11 and ages 8-11.

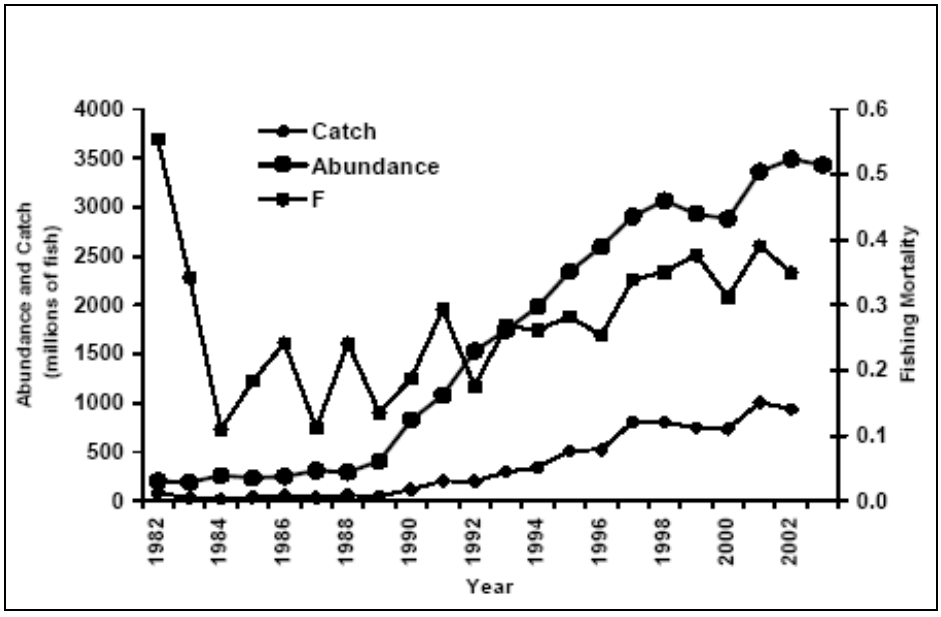


Figure 5. Estimated striped bass abundance, total striped bass catch, and striped bass fishing mortality (to age 11 only) for fish ages 8 to 13 from 1982-2003 (NMFS 2003).

*Individual Stock Status*

Many separate spawning populations of striped bass are present along the mid-Atlantic coast, and are impacted by geographically distinct fishing effort. For example, striped bass in North Carolina's Albemarle Sound/Roanoke River are not part of the coastal migratory stock.

Consequently, taking fish from that area impacts only that stock, whereas fish removed from Massachusetts state waters are from a mixed coastal group comprised of fish from several stocks[4]. It is important to assess individual stock health so overfishing does not occur at the local level. Table 3 describes the stock status for the three primary regions, based on the 2003 assessment.

Table 3. Individual stock status description for three primary striped bass stocks (ASMFC 2003a).

| Location | Fishing Mortality, F | Spawning Stock | Recruitment |
|---|---|---|---|
| Chesapeake Bay | $F_{Baywide} = 0.22$ | Abundance of age 8+ has increased since 1999 | YOY* abundance 2002 was below 1957-2001 average |
| Hudson River | Questionable | No data available | YOY 2002 = 12.3NPS* < 1982-2001 avg. of 14.6 NPS |
| Delaware River | $F_{2002} = 0.26\text{-}0.37$ | 2003 mean increase, females age 10 most abundant | Variable; 2003 = estimated record high |

* YOY = Young of the year; NPS = number per set

Fishery-dependent indicators of stock health, such as catch per unit effort (CPUE), have increased since the 1980s and been generally stable in recent years. For example, both the Maryland commercial (Fig. 6) and Connecticut recreational (Fig. 7) CPUEs show an increasing trend over the last 10-20 years, leveling off in the last few years.

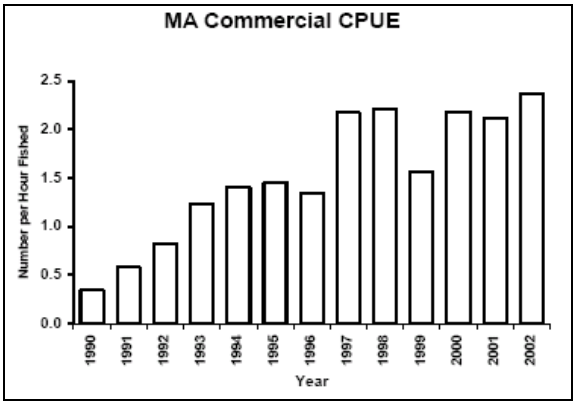


Figure 6. Massachusetts Commercial CPUE for striped bass (ASMFC 2003a).

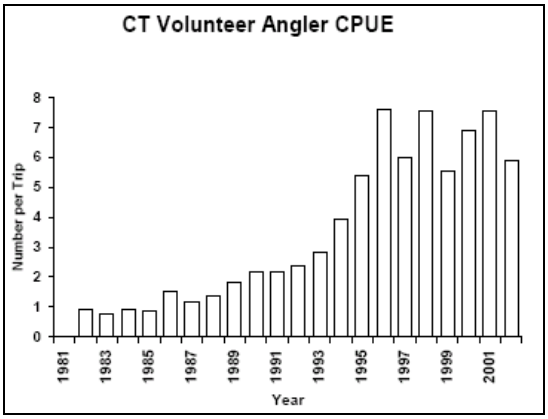


Figure 7. Connecticut volunteer angler CPUE (ASMFC 2003a).

**Summary**

According to the latest assessment, striped bass is abundant and overfishing is not occurring. Based on available biological reference points, CPUE data, and data gathered from various state agencies (gillnet surveys, haul seine index, etc.), striped bass stocks appear to be stable or increasing slightly. The age distribution appears to be skewed towards younger individuals, but

[4] Shepherd, G. 2004. Personal communication. Research Fishery Biologist. Northeast Fisheries Science Center, Woods Hole Laboratory, 166 Water St., Woods Hole, MA 02536.

the species is fairly resilient and should normalize with an appropriate control of fishing pressure.

**Status of the Stocks Rank:** Healthy Moderate Poor Critical

## Criterion 3: Nature of Bycatch

*Seafood Watch® defines sustainable wild-caught seafood as marine life captured using fishing techniques that successfully minimize the catch of unwanted and/or unmarketable species (i.e., bycatch). Bycatch is defined as species that are caught but subsequently discarded (injured or dead) for any reason. Bycatch does not include incidental catch (non-targeted catch) if it is utilized, accounted for and/or managed in some way.*

The primary net gear types used to catch striped bass in the commercial fishery (pound nets, gillnets, trawls) have been observed to occasionally interact with endangered or protected species. The Mid-Atlantic Coastal Gillnet fishery has been classified as Category II with respect to the Marine Mammal Protection Act (MMPA), indicating occasional interactions with marine mammals (Steve et al. 2001). NOAA Fisheries Observers onboard 40 directed striped bass fishing trips in 1999 documented the release of one dead bottlenose dolphin (*Tursiops truncatus*) (ASMFC 2003b). No other marine mammal interactions within striped bass fisheries have been recorded in the ASMFC database. However, the ASMFC database does show various interactions with other endangered or protected species such as Atlantic and shortnose sturgeon (*Acipenser oxyrinchus, A. brevirostrum*) and Atlantic salmon (*Salmo salmar*), as well as sea turtles and seabirds (specific species not mentioned) (ASMFC 2003b). Although it is difficult to link sturgeon mortality directly to vessels targeting only striped bass, research has shown sturgeon to utilize the same habitat where many coastal net fisheries operate, particularly in the Chesapeake Bay and off the North Carolina Outer Banks (Welsh et al. 2002; Stein et al. 2004).

Hook and line fisheries normally do not interact with endangered or protected species. Although there is no evidence to support or refute this statement, it is reasonable to assume that catching striped bass with hook and line gear involves little or no bycatch, except for undersized catch (i.e., regulatory discards).

**Summary**

The net gear types used to target Atlantic striped bass are known to interact with some endangered and protected species. Even though the frequency of interactions is minimal[5], the potential for interaction is reason for concern. Hook and line fisheries, however, are assumed to involve negligible bycatch.

**Nature of Bycatch Rank:**

Low (Hook & Line Gears) Moderate (Net Gears) High Critical

[5] Megan Gamble. 2004. Personal Communication. ASMFC, 1444 Eye St., NW, 6th floor, Washington, D.C. 20005.

## Criterion 4: Effect of Fishing Practices on Habitats and Ecosystems

Gillnets, pound nets, haul seines, and hook and line gear are the gears primarily used to catch striped bass (ASMFC 2003b). The use of these gears varies by state and area. For example, in Maryland (Chesapeake Bay) during the 2002 season, drift gill nets and commercial hook and line were allocated 75% of the striped bass fishing quota (1.8 MP), and pound nets and haul seines were given 25% (587,850 pounds). Due to the static nature of gillnets, pound nets, and hook and line gear, they are thought to have minimal impacts on marine habitats (West et al. 1994).

A portion of the striped bass landings in Maryland is also caught with mobile trawl gear[6]. Trawling impacts sea-floor communities by scraping the ocean bottom causing: 1) sediment re-suspension (turbidity) and smoothing; 2) removal of and/or damage to non-target species; and 3) destruction of three-dimensional habitat (biotic and abiotic; Auster and Langton 1999). The degree of impact is determined by many factors, most notably: 1) the type and weight of gear used; 2) the resilience of the seabed; and 3) the amount and frequency of the disturbance. Given the shallow, soft-bottom nature of Atlantic coastal areas (see Appendix I) where trawl gear is used to target striped bass, as well as the limited use of this gear, it is assumed that trawling for striped bass represents a minor conservation concern.

**Summary**

The predominant gear types used to catch striped bass are gillnets, pound nets, haul seines, and hook and line gear. These gears are all relatively static and benign with respect to habitat. Some trawling is used to harvest striped bass in Maryland, but due to the predominant soft bottom sediment type over which this gear is used (Chesapeake Bay), the impact of trawling for striped bass on habitats and ecosystems is likely minor.

**Effect of Fishing Practices Rank:**

Benign | Moderate | Severe | Critical

## Criterion 5: Effectiveness of the Management Regime

The Atlantic States Marine Fisheries Commission (ASMFC), 14 coastal jurisdictions (12 states from Maine to North Carolina, Washington, D.C., and the Potomac River Fisheries Commission), NOAA Fisheries and the U.S. Fish and Wildlife Service are responsible for managing Atlantic striped bass stocks in U.S. waters. These stocks are currently managed under the Interstate Fishery Management Plan (FMP) for Atlantic Striped Bass, which was first implemented in 1981 (ASMFC 2003b). The FMP includes measures to prevent overfishing, maintain a sustainable spawning stock biomass, achieve equitable management among the 14 jurisdictions, and identify critical striped bass habitats (ASMFC 2003b). The FMP has been amended six times; the first 4 amendments provided measures to aid in the rebuilding of the striped bass stocks (Fig. 8). Amendment 4, implemented in 1989, reopened the fishery during an initial period of stock recovery, while Amendment 5 established a management program for the recovered stock. Most recently, in February 2003, Amendment 6 was approved to implement a long-term management regime that would support and maintain economically viable commercial

[6] http://www.dnr.state.md.us/fisheries/education/rockfish/rockfish.html

fisheries, a self-sustaining spawning stock by improvement to essential habitat, and an increase in the population of older age classes (ASMFC 2003b; NMFS 2003). This newest amendment has a slightly more conservative fishing mortality target, and for the first time sets a biomass target and threshold. It also requires monitoring of bycatch and discard mortality to determine bycatch, discard and mortality rates of bycatch species in specific fisheries, and inclusion of bycatch mortality in stock assessment calculations (ASMFC 2003b).

There are commercial fisheries operating in eight of the 14 jurisdictions regulated by the ASMFC FMP. Commercial fishing for striped bass is prohibited in the following states: New Jersey, Pennsylvania, Connecticut, New Hampshire, Maine, and the District of Columbia (ASMFC 2003b). Effort in the commercial fishery is limited through permits (determined by individual states, based on allocated quota) and regulated by an annual quota (see Table 3), while the recreational fishery is regulated with creel and size limits (NMFS 2003).

The FMP for striped bass also requires an annual stock assessment, which is produced by the Striped Bass Technical Committee. Research is conducted cooperatively among jurisdictions and involves regular collection of fisheries-dependent (landings) and independent (tag-recapture, juvenile trawl surveys, age/size structure, etc.) data.

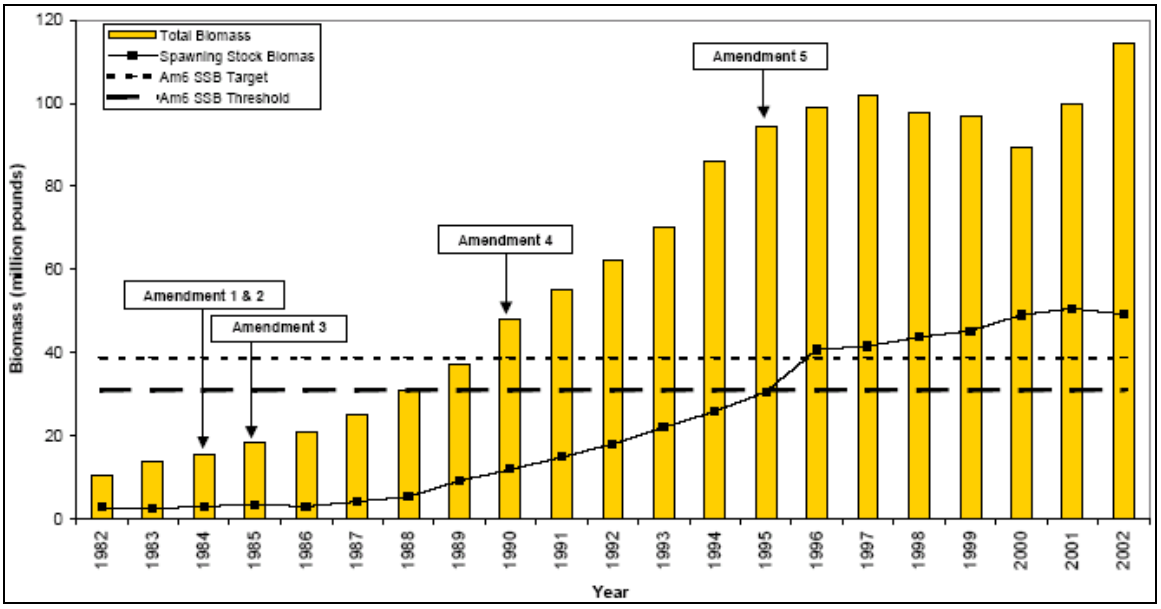


Figure 8. Atlantic striped bass total and female spawning stock biomass, 1982-2002, with notes on regulatory history (ASMFC 2003a).

Currently, fishers are allowed to catch striped bass in state waters (0-3 miles offshore) only. NOAA Fisheries, however, is considering a recommendation from the ASMFC to evaluate the implementation of regulations that would allow the harvest of Atlantic striped bass in federal waters (3-200 miles offshore). This may include implementing a 28-inch minimum size limit and allowing states the ability to adopt more restrictive rules for fishermen and vessels licensed in their jurisdictions.

**Summary**
Atlantic striped bass stocks have successfully recovered and managers have maintained stock abundance since recovery was declared in 1995. The stocks are regularly assessed and the fisheries are monitored. Management measures have resulted in the continued maintenance of stock abundance and ecosystem integrity within striped bass fisheries.

**Effectiveness of Management Rank:**

**Highly Effective** | Moderately Effective | Ineffective | Critical

## Overall Evaluation and Seafood Recommendation

Atlantic striped bass is a fairly resilient species that is highly sought after in both commercial and recreational fisheries from Maine to North Carolina. Its primary spawning and nursery grounds are in the Chesapeake Bay and its tributaries. During the 1970s and early 1980s, overfishing and habitat degradation in the Chesapeake Bay decimated the striped bass population. Since then, a series of management regulations, as well as community effort, has improved environmental conditions and contained overfishing, allowing the stock to rebound to record levels. Striped bass are caught mainly with hook and line gear in the recreational fishery, and with pound nets, gillnets, haul seines, and otter trawls in the commercial fishery. These gear types are thought to be relatively benign with respect to habitat, although some interactions with protected or endangered species do occur on occasion. Management of striped bass is comprehensive, and includes fishery monitoring, fishery-independent research, establishment of size limits, quotas and overfishing thresholds, and inclusion of discards in calculating total fishing mortality. Atlantic striped bass is given the overall seafood recommendation of "Best Choices."

Table of Ranks

| | Conservation Concern | | | |
|---|---|---|---|---|
| **Sustainability Criteria** | **Low** | **Moderate** | **High** | **Critical** |
| Inherently Vulnerability | √ | | | |
| Status of Stocks | √ | | | |
| Nature of Bycatch | √ **(Hook & line)** | √ **(Net gears)** | | |
| Habitat Effects | √ | | | |
| Management Effectiveness | √ | | | |

## Overall Seafood Recommendation:

**Best Choice** | Good Alternative | Avoid

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***Scientific review does not constitute an endorsement of Seafood Watch® on the part of the reviewing scientists; the Seafood Watch® staff is solely responsible for the conclusions reached in this report.***

## Supplemental Information

The Environmental Defense Fund has issued a consumption advisory for striped bass due to elevated levels of PCBs and mercury. Environmental Defense applies the same risk-based methodology as the U.S. Environmental Protection Agency (EPA) to data from government studies and papers published in scientific journals. More detailed information about the Environmental Defense advisory can be found at www.edf.org/seafoodfhealth.

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**Appendix I. Geomorphology of the New England fishing grounds, from (NEFMC 1998).**

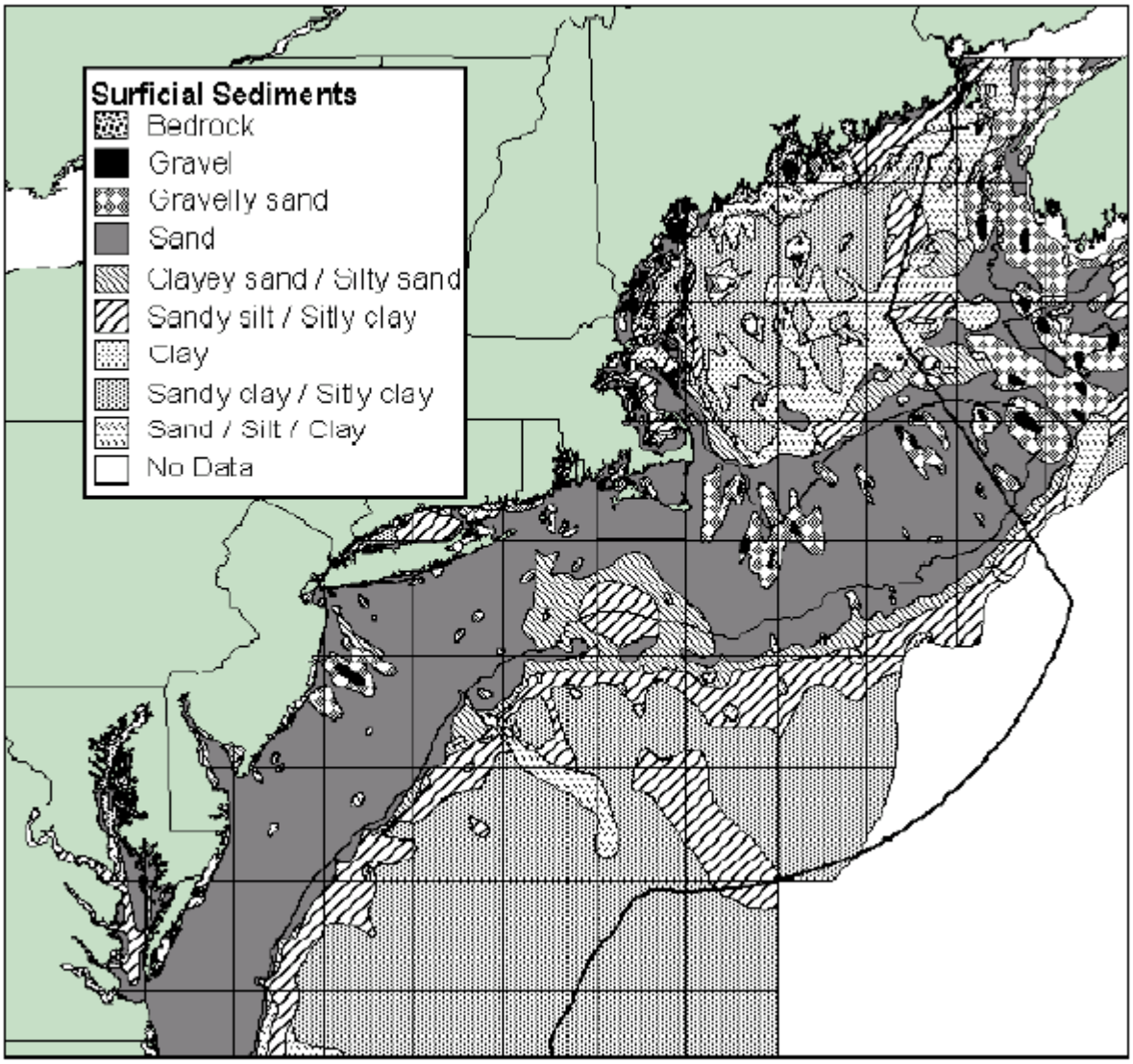


Figure A1. Map showing the distribution of sediments in the Gulf of Maine, Georges Bank, and southern New England. Southern New England sediment distributions are similar to those observed in the Mid-Atlantic Basin.