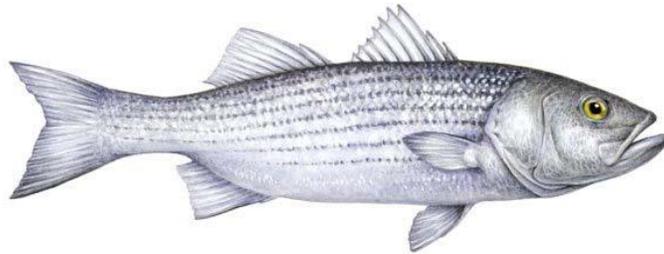


Monterey Bay Aquarium Seafood Watch®

Atlantic Striped Bass

Morone saxatilis



US Atlantic Region

Hook and Line, Pound Net, and Gillnet

Fisheries Standard Version F3.1

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Disclaimer

Seafood Watch and The Safina Center strive to ensure that all our Seafood Reports and recommendations contained therein are accurate and reflect the most up-to-date evidence available at the time of publication. All our reports are peer-reviewed for accuracy and completeness by external scientists with expertise in ecology, fisheries science or aquaculture. Scientific review, however, does not constitute an endorsement of the Seafood Watch program or of The Safina Center or their recommendations on the part of the reviewing scientists. Seafood Watch and The Safina Center are solely responsible for the conclusions reached in this report. We always welcome additional or updated data that can be used for the next revision.

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About Seafood Watch®

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 www.seafoodwatch.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® 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.

Guiding Principles

The Safina Center and Seafood Watch define sustainable seafood as originating from sources, whether fished or farmed, that can maintain or increase production in the long-term without jeopardizing the structure or function of affected ecosystems.

Based on this principle, Seafood Watch and the Safina Center have developed four sustainability **criteria** for evaluating wild-catch fisheries for consumers and businesses. These criteria are:

- How does fishing affect the species under assessment?
- How does the fishing affect other, target and non-target species?
- How effective is the fishery's management?
- How does the fishing affect habitats and the stability of the ecosystem?

Each criterion includes:

- Factors to evaluate and score.
- Guidelines for integrating these factors to produce a numerical score and **rating**.

Once a rating has been assigned to each criterion, we develop an overall recommendation. Criteria ratings and the overall recommendation are color-coded to correspond to the categories on the Seafood Watch pocket guide and the Safina Center's online guide:

Best Choice/Green: Are well managed and caught in ways that cause little harm to habitats or other wildlife.

Good Alternative/Yellow: Buy, but be aware there are concerns with how they're caught.

Avoid/Red: Take a pass on these for now. These items are overfished or caught in ways that harm other marine life or the environment.

Summary

Atlantic striped bass is an anadromous game and commercial fish species found in coastal systems and estuaries from the Gulf of St. Lawrence to Florida. This report covers the U.S. Atlantic striped bass fishery on the coastal migratory stock found on the U.S. East Coast that is harvested primarily with hook and line, gillnet, and pound net gears.

Atlantic striped bass is managed by the Atlantic States Marine Fisheries Commission (ASMFC). The last benchmark assessment was peer reviewed and approved for management use in 2013, and updated in 2015 using catch and index data through 2014. Based on results of the 2015 update, the Atlantic coastal stock is not overfished, nor is it experiencing overfishing. The stock was estimated below the target spawning stock biomass (SSB) but above the threshold level. Fishing mortality was similarly estimated to be between its target and threshold levels.

Three gear types are typically used to target striped bass: hook and line, gillnet, and pound net. Hook and line gear has minimal bycatch except for sublegal striped bass (i.e., undersized, or outside the slot size limit), which experiences low mortality as a result, and some bluefish. Gillnet fisheries catching Atlantic striped bass also encounter American shad, Atlantic sturgeon, river herring, weakfish, and white perch. Of these, shad, sturgeon, and weakfish are the most concerning, given the depleted or unknown status of those stocks or species, their documented interactions, and the gears' reduced ability to release fish alive when compared to other gear types (e.g., pound nets, hook and line). Pound net gear also encounters river herring, shad, sturgeon, and weakfish. But mortality of shad, sturgeon, and weakfish in pound nets is less concerning, given the stationary nature of the fishery, its lower incidence of encounters, and the ability to release these species of fish alive. Overall, pound net gear scored better than gillnet gear for bycatch interactions. Only river herring, a NOAA Fisheries-designated "species of concern," was problematic.

ASMFC manages the coastwide migratory stock. This body produces regular stock assessment reports complete with reference points, projections, and measures of uncertainty. These assessments are regularly updated and peer reviewed. Managers follow scientific advice and member states must monitor and enforce commercial quotas, recreational bag limits and size limits, closed seasons, and other measures. Enforcement of and compliance by harvesters is moderate. The ASMFC fishery management and conservation process includes ample opportunity for stakeholder input.

The estuarine and coastal areas where the fishery takes place mostly comprises sand, silt, and clay, with little long-term damage occurring as a result of the gear used in this fishery. But gillnet and pound net gear types do disturb the bottom to some extent, so they have moderate habitat impact. Striped bass is an important predatory fish in these ecosystems. Efforts are underway to better account for predator-prey relationships (e.g., striped bass and menhaden) during the fishery management process, through ecosystem-based management approaches. Striped bass' role as a top-down predator on species of concern has not been examined on a population level.

Overall, the hook and line fishery rates a "Best Choice" due to stock status, adequate management, and low habitat impact. The gillnet and pound net fisheries rated a "Good Alternative," based partly on bycatch of depleted species or stocks and on moderate habitat impact.

Table of Conservation Concerns and Overall Recommendations

| Stock | Fishery | Impacts on the Stock Rank (Score) | Impacts on other Species Lowest scoring species Rating, Score | Management Rating Score | Habitat and Ecosystem Rank Score | Overall Recommendation Score |
|--------------|--|--------------------------------------|---|-------------------------------|--|---|
| Striped Bass | US Atlantic Striped Bass Hook and line | Green 3.32 | No other main species caught Green, 5,5 | Green 4 | Green 3.87 | BEST CHOICE 4.004 |
| Striped Bass | US Atlantic Striped Bass Gillnet | Green 3.32 | American Shad Red, 1,1 | Yellow 3 | Yellow 3 | GOOD ALTERNATIVE 2.338 |
| Striped Bass | US Atlantic Striped Bass Pound net | Green 3.32 | River Herring Red, 1.73,1.73 | Yellow 3 | Yellow 3 | GOOD ALTERNATIVE 2.681 |

Scoring Guide

Scores range from zero to five where zero indicates very poor performance and five indicates the fishing operations have no significant impact.

Final Score = geometric mean of the four Scores (Criterion 1, Criterion 2, Criterion 3, Criterion 4).

- **Best Choice/Green** = Final Score >3.2, and either Criterion 1 or Criterion 3 (or both) is Green, and no Red Criteria.
- **Good Alternative/Yellow** = Final score >2.2, and no more than one Red Criterion, and does not meet the criteria for Best Choice/Green (above)
- **Avoid/Red** = Final Score ≤2.2, or two or more Red Criteria, or Management is Critical.

Introduction

Scope of the analysis and ensuing recommendation

The Atlantic striped bass (*Morone saxatilis*) is an anadromous predatory fish that ranges from Florida to the Gulf of St. Lawrence. This report covers the U.S. commercial fishery on the coastal migratory stock harvested with hook and line, pound net, and gillnet. Trawl gear was not included because it makes up less than 3% of the stock commercial landings.

Table 1: Landings in metric tons (MT) by gear type for striped bass caught in the commercial fishery 2010–2014. Data from (<https://www.st.nmfs.noaa.gov/commercial-fisheries/commercial-landings/annual-landings/index>).

| Year | 2010 | 2011 | 2012 | 2013 | 2014 |
|---------------|-------|-------|-------|-------|-------|
| Gillnet | 1,634 | 1,621 | 1,662 | 1,325 | 1,494 |
| Pound net | 376 | 364 | 310 | 304 | 351 |
| Bottom trawl | 135 | 145 | 50 | 65 | 37 |
| Hook and line | 839 | 718 | 780 | 670 | 537 |
| Others | 441 | 443 | 459 | 363 | 389 |
| Total | 3,425 | 3,291 | 3,261 | 2,726 | 2,807 |

Overview of the species and management bodies

Atlantic striped bass is a large-bodied, moderately long-lived predatory fish that ranges from the Gulf of St. Lawrence to Florida along the North American Atlantic coast. It is an anadromous species, spending most of its life in estuaries or coastal ocean waters, but moving into freshwater systems in the spring for spawning.

Atlantic striped bass is an important game and commercial fish (ASMFC 2015a) (ASMFC 2016e). Within the U.S., three large systems produce the bulk of the striped bass caught in the fishery: the Chesapeake Bay, Delaware Bay, and the Hudson River. Although other river systems contribute to a lesser extent, these areas are the principle production areas. Stocks from the Chesapeake Bay, Delaware Bay, and the Hudson River, along with the resident and migratory fish from smaller systems between Maine and North Carolina, are assessed and managed as one stock, which is termed the coastal migratory stock. The Albemarle Sound and Roanoke River stock of Atlantic striped bass is managed separately.

Atlantic striped bass does occur south of North Carolina, but fish south of Pamlico Sound are not considered part of the coastal migratory stock. Total coastwide harvest is predominantly from the recreational sector. Most commercial landings come from the Chesapeake Bay and tributaries.

Striped bass is managed through the Atlantic States Marine Fisheries Commission (ASMFC), a collaborative effort by the states along the U.S. Atlantic Coast. The Commission has representation from all states, the Potomac River Fisheries Commission, and Washington D.C., and it makes decisions on

fishery-related issues affecting all member jurisdictions (ASMFC 2016a). In 1981, the ASMFC implemented the first Fishery Management Plan (FMP) for striped bass. Initially, this FMP only made recommendations, because the decisions made by the ASMFC were not binding. Congress passed the Atlantic Striped Bass Conservation Act (PL 98-613) in 1984, which required states to follow the ASMFC management plan, thereby making the ASMFC decision process binding across all member states.

Production statistics

Atlantic Striped bass is principally a recreational fishery, with only a small commercial component. Recreational removals account for 60%–70% compared to the commercial fishery removals of 30%–40% (ASMFC 2015b). Commercial landings and price by year and state are given in Table 2. Overall landings have remained constant, but value has increased markedly since 2010.

Table 2: Landings in metric tons (MT) and value in USD for striped bass caught in the commercial fishery 2010–2014 by State. Data from (<https://www.st.nmfs.noaa.gov/commercial-fisheries/commercial-landings/annual-landings/index>).

| Year State | Landings | | | | | Value | | | | |
|----------------|--------------|--------------|--------------|--------------|--------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| | 2010 | 2011 | 2012 | 2013 | 2014 | 2010 | 2011 | 2012 | 2013 | 2014 |
| Delaware | 84 | 84 | 86 | 85 | 76 | 400,157 | 411,529 | 469,609 | 765,571 | 497,978 |
| Maryland | 1,139 | 1,063 | 1,153 | 916 | 1,046 | 5,425,011 | 5,622,975 | 6,932,528 | 9,930,965 | 7,912,441 |
| Massachusetts | 554 | 527 | 553 | 456 | 516 | 3,567,426 | 3,183,749 | 3,504,686 | 3,130,000 | 4,834,387 |
| New York | 339 | 388 | 309 | 374 | 136 | - | - | 1,677,878 | 3,393,905 | 896,134 |
| North Carolina | 227 | 186 | 66 | 44 | 44 | 1,227,869 | 1,164,425 | 368,512 | 303,487 | 283,241 |
| Rhode Island | 113 | 104 | 109 | 105 | 98 | 933,885 | 950,441 | 1,014,254 | 1,023,132 | 951,734 |
| Virginia | 970 | 942 | 987 | 762 | 903 | 3,634,966 | 4,496,786 | 5,542,009 | 5,701,502 | 6,372,258 |
| Total | 3,426 | 3,294 | 3,262 | 2,741 | 2,819 | 15,189,314 | 15,829,905 | 19,509,476 | 24,248,562 | 21,748,173 |

Importance to the US/North American market

Striped bass, a popular game and commercial fish, is native to North America. The U.S. does not export striped bass and there are no imports. Thus, all landings are utilized in the U.S. market. There is a growing aquaculture industry for striped bass (NMFS 2015)

Common and market names

It is most commonly referred to as striped bass, but also can be sold as bass, greenhead, linesides, rockfish, and striper. When used for sushi, it is referred to as suzuki.

Primary product forms

Fresh or frozen, either whole or filleted.

Analysis

This section assesses the sustainability of the fishery(s) relative to the Seafood Watch Criteria for Fisheries, available at <http://www.seafoodwatch.org>.

Criterion 1: Impact on the Stock Under Assessment

This criterion evaluates the impact of fishing mortality on the species, given its current abundance or biomass. When abundance is unknown, abundance is scored based on the species' inherent vulnerability, which is calculated using a Productivity-Susceptibility Analysis. The final Criterion 1 score is determined by taking the geometric mean of the abundance and fishing mortality scores. The Criterion 1 rating is determined as follows:

- *Score >3.2=Green or Low Concern*
- *Score >2.2 and <=3.2=Yellow or Moderate Concern*
- *Score <=2.2=Red or High Concern*

Criterion 1 Summary

| Stock | Fishery | Abundance Category (Score) | Fishing Mortality Category (Score) | Criterion 1 Rating Score |
|--------------|--|-------------------------------|---------------------------------------|--------------------------------|
| Striped Bass | US Atlantic Striped Bass Hook and line | Low (3.67) | Moderate (3) | Green 3.32 |
| Striped Bass | US Atlantic Striped Bass Gillnet | Low (3.67) | Moderate (3) | Green 3.32 |
| Striped Bass | US Atlantic Striped Bass Pound net | Low (3.67) | Moderate (3) | Green 3.32 |

Criterion 1 Assessment

ATLANTIC STRIPED BASS

Factor 1.1 Abundance

Scoring Guidelines

- *5 (Very Low Concern)—Strong evidence exists that the population is above an appropriate target abundance level (given the species' ecological role), or near virgin biomass.*
- *3.67 (Low Concern)—Population may be below target abundance level, but is at least 75% of the target level, OR data-limited assessments suggest population is healthy and species is not highly vulnerable.*
- *2.33 (Moderate Concern) —Population is not overfished but may be below 75% of the target abundance level, OR abundance is unknown and the species is not highly vulnerable.*
- *1 (High Concern)—Population is considered overfished/depleted, a species of concern, threatened or endangered, OR abundance is unknown and species is highly vulnerable.*

United States, hook and line, pound net, and gillnet

Low Concern

Key relevant information:

As estimated in the most recent assessment update (ASMFC 2015b), striped bass female spawning stock biomass (SSB) is approximately 10% over the threshold abundance level, indicating that the stock is not overfished and at approximately 90% of the target level. Threshold and target abundance reference points were determined using a historical-based proxy for the spawning stock biomass at maximum sustainable yield (SSB_{MSY} proxy). The value of SSB in 1995 is used as SSB_{MSY} and is equal to the threshold reference point ($SSB_{THRESHOLD}$). Approximately 125% of the $SSB_{THRESHOLD}$ is used as the target (SSB_{TARGET}) (ASMFC 2015b).

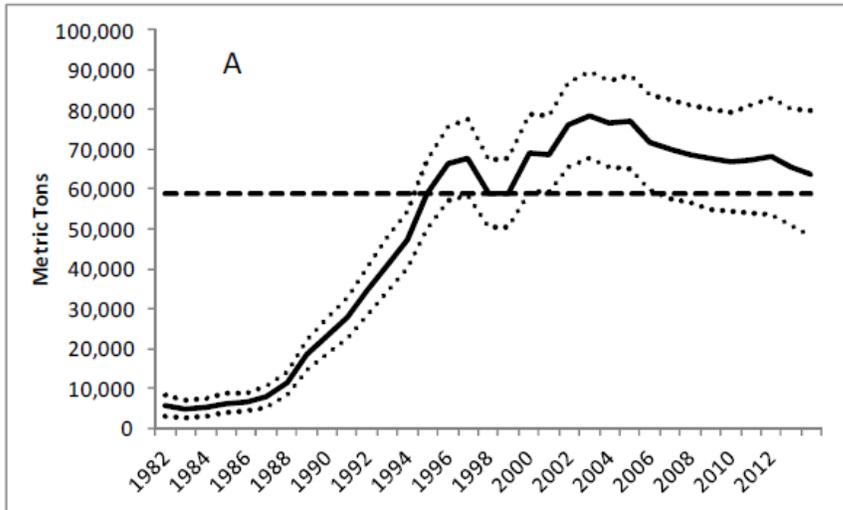


Figure 1: Female spawning stock biomass (SSB) for Atlantic striped bass through 2014. Dotted lines equal 95% confidence intervals. The dashed line is the female spawning stock threshold reference point. From ASMFC 2015b.

Factor 1.2 Fishing mortality

Scoring Guidelines

- *5 (Low Concern) — Probable (>50%) that fishing mortality from all sources is at or below a sustainable level, given the species ecological role, OR fishery does not target species and fishing mortality is low enough to not adversely affect its population.*
- *3 (Moderate Concern)— Fishing mortality is fluctuating around sustainable levels, OR fishing mortality relative to a sustainable level is uncertain.*
- *1 (High Concern)—Probable that fishing mortality from all source is above a sustainable level.*

United States, hook and line, pound net, and gillnet

Moderate Concern

Key relevant information:

The 2009 assessment used F reference points based on $F_{MSY} = 0.34$. The 2015 assessment instead used stochastic projection to link $F_{THRESHOLD}$ to SSB threshold and F_{TARGET} to SSB target. Current fishing mortality is estimated to be at 0.205, which is below the $F_{THRESHOLD}$ of 0.219 but above the F_{TARGET} of 0.180. Thus, the stock is classified by ASMFC as not experiencing overfishing (ASMFC 2015b). But the current fishing mortality is estimated to be close to the threshold and the stock spawning biomass has been in decline since 2006. Therefore, a rating of “moderate” concern was chosen.

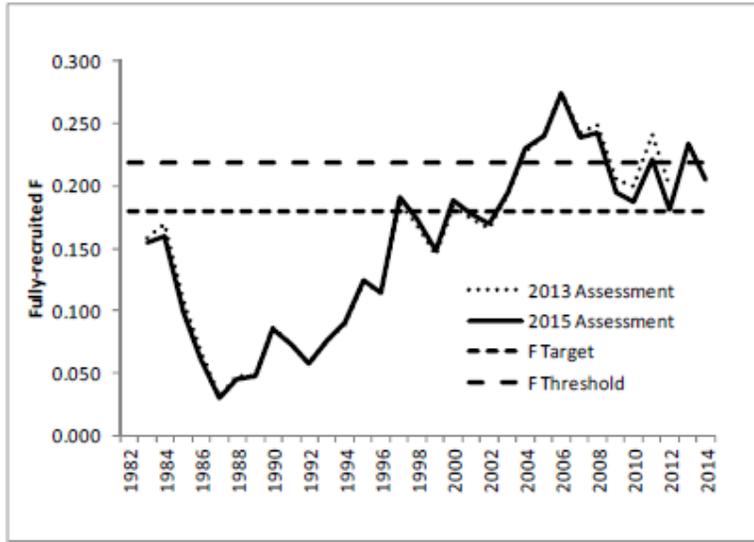


Figure 2: Fully recruited fishing mortality (F) for the 2013 benchmark assessment, and the 2015 update assessment. F_{TARGET} and $F_{THRESHOLD}$ are also shown. From ASMFC 2015b.

Criterion 2: Impacts on Other Species

All main retained and bycatch species in the fishery are evaluated under Criterion 2. Seafood Watch® defines bycatch as all fisheries-related mortality or injury to species other than the retained catch. Examples include discards, endangered or threatened species catch, and ghost fishing. Species are evaluated using the same guidelines as in Criterion 1. When information on other species caught in the fishery is unavailable, the fishery's potential impacts on other species is scored according to the Unknown Bycatch Matrices, which are based on a synthesis of peer-reviewed literature and expert opinion on the bycatch impacts of each gear type. The fishery is also scored for the amount of non-retained catch (discards) and bait use relative to the retained catch. To determine the final Criterion 2 score, the score for the lowest scoring retained/bycatch species is multiplied by the discard/bait score. The Criterion 2 rating is determined as follows:

- *Score >3.2=Green or Low Concern*
- *Score >2.2 and <=3.2=Yellow or Moderate Concern*
- *Score <=2.2=Red or High Concern*

Criterion 2 Summary

For Criterion 2, each gear type that targets striped bass was assessed separately. For presentation purposes, each species or stock is presented with the associated gear types explained in the “Key Information” section for that species or stock. Six species or stocks were evaluated: American shad, Atlantic sturgeon, river herring (both alewife and blueback herring combined), weakfish, and white perch, along with the striped bass.

American shad was included in this report based on its occurrence in the gillnet fishery as well as its uncertain but depleted status. Atlantic sturgeon, an endangered species, was included due to its known interactions with gillnet gear and its overlap in time and space with the gillnet fishery during the spring spawning migrations. River herring, a common term for two species of anadromous clupeids (alewife and blueback herring), was included due to its status as a species of concern as well as its known interactions with both gillnet and pound net gear. Like shad, both species of river herring interact with the striped bass fishery during the upstream spring migration of striped bass, shad, and river herring. Weakfish was included due to its prevalence in gillnet gear landings that were also targeting striped bass. White perch, an anadromous species outside of ASMFC management, was included because it overlaps in time and space with both the gillnet and pound net fisheries for striped bass.

A species that was included in a previous report, summer flounder, was excluded in this report. Examination by the Mid-Atlantic Fishery Management Council (MAFMC 2015) indicates that most of the summer flounder is caught using trawl gear in offshore waters (Table 3 in (MAFMC 2015)), while striped bass is targeted using gillnet gear and pound nets in the winter and spring in bays and estuaries. Although striped bass may be caught in the directed summer flounder fishery during summer and fall, summer flounder is rarely caught in the directed striped bass fishery. Therefore, summer flounder was considered outside the scope of this report.

Two other species groups, dolphins and sea turtles, were considered but ultimately excluded from consideration. Though these two groups were important in the evaluation of summer flounder and

croaker fisheries, the directed striped bass fishery mostly operates in the upper, more freshwater regions of estuaries in the late winter to early spring timeframe. Dolphins and sea turtles are generally absent from those regions, especially during the late winter to spring (NMFS 2013 and Table 5).

Hook and line gear had little interactions with other species other than striped bass because it is quite selective for the species, with minimal bycatch of other species, though occasionally bluefish are encountered. Gillnets scored lower when compared to pound nets. This is partly because of this gear's sizable landings of shad, its known interactions with sturgeon, and its documented removals of weakfish. Pound nets scored low for river herring, partly because of the stocks' status as well as the unknown status of those species. But pound net gear has little removals of these depleted species or stocks, due to the low effort and stationary nature of the gear type.

Hook and Line

| Stock | Abundance Category (Score) | Fishing Mortality Category (Score) | Subscore | Score (subscore* discard modifier) | Rating |
|------------------------------|-------------------------------|---------------------------------------|----------|---|--------|
| Striped Bass | Low (3.67) | Low (5) | 4.28 | 3.21 | Green |
| No other main species caught | | | 5.00 | 3.75 | Green |

Gillnet

| Stock | Abundance Category (Score) | Fishing Mortality Category (Score) | Subscore | Score (subscore *discard modifier) | Rating |
|-------------------|-------------------------------|---------------------------------------|----------|---|--------|
| American shad | High (1) | High (1) | 1.00 | 1.00 | Red |
| Atlantic sturgeon | High (1) | Moderate (3) | 1.73 | 1.73 | Red |
| River herring | High (1) | Moderate (3) | 1.73 | 1.73 | Red |
| Weakfish | High (1) | Moderate (3) | 1.73 | 1.73 | Red |
| White perch | Low (3.67) | Low (5) | 4.28 | 4.28 | Green |
| Striped bass | Low (3.67) | Moderate (3) | 3.32 | 3.32 | Green |

Pound net

| Stock | Abundance Category (Score) | Fishing Mortality Category (Score) | Subscore | Score (subscore*discard modifier) | Rating |
|-------------------|-------------------------------|---------------------------------------|----------|---|--------|
| River herring | High (1) | Moderate (3) | 1.73 | 1.73 | Red |
| Atlantic sturgeon | High (1) | Low (5) | 2.24 | 2.24 | Yellow |
| American shad | High (1) | Low (5) | 2.24 | 2.24 | Yellow |
| Weakfish | High (1) | Low (5) | 2.24 | 2.24 | Yellow |
| Striped bass | Low (3.67) | Low (5) | 4.28 | 4.28 | Green |
| White perch | Low (3.67) | Low (5) | 4.28 | 4.28 | Green |

Criterion 2 Assessment

Factor 2.1 Abundance

Scoring Guidelines (same as Factor 1.1 above)

American shad, Gillnet and Pound net High Concern

Key relevant information:

The most recent assessment was conducted in 2007 (ASMFC 2007). Though estimates of abundance coastwide were not made, abundance trends were estimated on selected river systems. The assessment stated that many American shad stocks were found to be at historically low abundance and not recovering.

Atlantic sturgeon, Gillnet and Pound net High Concern

Key relevant information:

Atlantic sturgeon is listed as both an “Endangered” and “Threatened” species, depending on which discrete population segment is of interest (Federal Register 2012). It is also listed under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES 2014).

River herring, Gillnet and Pound net High Concern

Key relevant information:

River herring, both blueback herring and alewife, are listed as a species of concern by NMFS (Federal Register 2013) because of declining populations throughout most of its range.

Weakfish, Gillnet and Pound net

High Concern

Key relevant information:

According to the 2016 benchmark stock assessment, the Atlantic coast weakfish stock is overfished. The 2014 estimate of SSB was 2,548 MT, well below the SSB threshold ($SSB_{30\%} = 6,880$ MT) (ASMFC 2016d).

White Perch, Gillnet and Pound net

Low Concern

Key relevant information:

Although assessment information across the range of the stock is not available, most landing of white perch occurs in Maryland (<https://www.st.nmfs.noaa.gov/commercial-fisheries/commercial-landings/annual-landings/index>). An analysis conducted by the Maryland Department of Natural Resources (MDDNR 2015) indicates that, in Maryland waters, white perch is above the minimum biomass target (equal to B_{MSY}) and that recent recruitment is higher than average, despite lower abundance in the assessment's terminal year.

Factor 2.2 Fishing Mortality

Scoring Guidelines (same as Factor 1.2 above)

American shad, Gillnet and Pound net

High Concern for Gillnet

Low Concern for Pound net

Key relevant information: Gillnet and Pound net

Sources of mortality include habitat loss, upstream passage, bycatch in oceanic based fisheries, and fishing. The magnitude of removal relative to the coastwide abundance is not known, but fishing removals are considered to be an important source of mortality (ASMFC 2007). The bulk of the landings of American shad are from gillnets, while pound nets make up only a small percentage of the total landings (Table 3). Given the depleted status of American shad, and relative difference in landings between gillnet and pound net gear, the former was of high concern, while the later was of low concern.

Table 3: Percentage of American shad landings by gear type 2010–2014. Data from <https://www.st.nmfs.noaa.gov/commercial-fisheries/>.

| Gear Type | Year | | | | | Average |
|----------------|------|------|------|------|------|---------|
| | 2010 | 2011 | 2012 | 2013 | 2014 | |
| Gillnet | 74.3 | 41.6 | 49.6 | 72.7 | 62.6 | 56.6 |
| Pound net | 0.6 | 0.7 | 3.5 | 2.0 | 0.3 | 1.6 |
| Others/unknown | 26.3 | 59.1 | 53.9 | 29.3 | 37.7 | 45.0 |

Atlantic sturgeon, Gillnet and Pound net

Moderate Concern for Gillnet

Low Concern for Pound net

Key relevant information:

According to the most recent Fishery Management Plan Review (ASMFC 2016b), harvest or possession of Atlantic sturgeon was made illegal in all states in 1997; however, bycatch during other fishing activities continues. The ASMFC indicates that gillnets and pound nets have routine interactions with sturgeon (ASMFC 2015a). Mortality due to those interactions is likely low in the pound net fishery, and moderate to high in gillnet gear, although the total removal due to interactions with the gear is not known. Overall, both gillnet gear and pound net gear are allowed to operate during the February to June migration of adults (Table 5). This activity, coupled with the inability of gillnet gear to usually release sturgeon alive, suggests a rating of “moderate” concern for the gillnet fishery and a rating of “low” concern for the pound net fishery.

River herring, Gillnet and Pound net

Moderate Concern for Gillnet

Moderate Concern for Pound net

Key relevant information:

Landings of river herring are only allowed in Maine, New Hampshire, New York, North Carolina, and South Carolina (ASMFC 2015c). Bycatch is generally not well documented (ASMFC 2012a) but occurs throughout the range (Table 4). Removals by gillnets and pound nets from NY to NC are likely smaller than the removals by Atlantic herring and mackerel fisheries, which have removals similar to the directed river herring harvest in Maine (ASMFC 2015c). Because the bycatch of river herring in both gillnet and pound nets is not well documented, and because this is listed as a species of concern, a score of “moderate” concern was given to both gears.

Table 4: American shad and river herring in-river commercial and ocean bycatch landings (in pounds) provided by states, jurisdictions, and NOAA Fisheries for 2013 (from Table 2, ASMFC 2015c).

| | American Shad | River Herring | Hickory Shad |
|-------------------------|----------------|------------------|---------------|
| Maine ³ | | 1,423,878 | |
| New Hampshire | | 4,420 | |
| Massachusetts | | | |
| Rhode Island | | | |
| Connecticut | 65,679 | | |
| New York ¹ | 932 | 10,349 | |
| New Jersey ² | | | 3,483 |
| Pennsylvania | 2,854 | | |
| Delaware | | | |
| Maryland | | 305 | |
| D.C. | | | |
| PRFC | 3,799 | | |
| Virginia | 4,825 | | 755 |
| North Carolina | 257,869 | 743 | 71,326 |
| South Carolina | 205,368 | 192,454 | 652 |
| Georgia | 62,017 | | 2,162 |
| Florida | | | |
| Total | 608,428 | 1,632,149 | 78,378 |

¹New York American shad landings are from ocean bycatch

²Includes in-river and coastal harvest

³Maine (shad) landings are confidential

Weakfish, Gillnet and Pound net

Moderate Concern for Gillnet

Low Concern for Pound net

Key relevant information:

Although abundance for this stock is very low, natural mortality rather than fishing mortality is thought to be the driving factor in the decline (ASMFC 2016c). Because total mortality (both fishing and natural) is below the threshold abundance and close to the target abundance, the stock is not experiencing overfishing.

The bulk of the landings of this stock come from gillnets in most years. Pound nets make up a small but important component of the landings (10%–20%) (ASMFC 2016d).

Because natural mortality is thought to be the driving force resulting in low abundance, and given that stock is between the total mortality (equal to fishing and natural mortality combined; see Figure 3) target and threshold, a score of “moderate” concern was used for gillnets and a score of “low” concern for pound nets. This scoring difference between the two gear types accounts for the differences in removals between them.

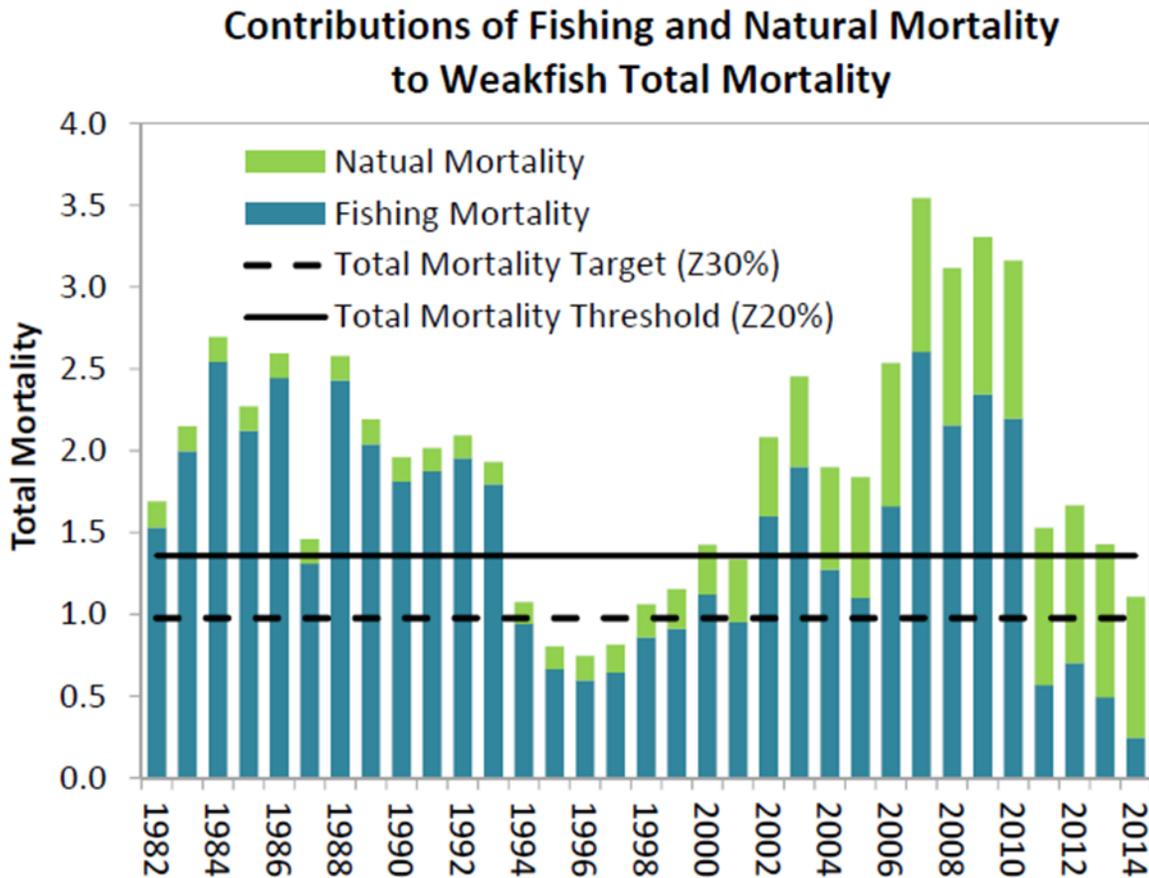


Figure 3: Natural and fishing mortality for weakfish 1982–2014. From (ASMFC 2016c).

White Perch, Gillnet and Pound net

Low Concern for Gillnet

Low Concern for Pound net

Key relevant information:

Fishing mortality is below target levels overall (MDDNR 2015). Because fishing mortality is low, a score of “low” concern was given to both gear types.

Factor 2.3: Discards and Bait Use

Scoring Guidelines

The discard rate is the sum of all dead discards (i.e. non-retained catch) plus bait use divided by the total retained catch.

| Ratio of bait + discards/landings | Factor 2.4 score |
|-----------------------------------|------------------|
| < 100% | 1 |
| ≥ 100 | 0.75 |

Factor 2.3: Discards and Bait Use: All Gears - <100%

Key relevant information:

Hook and line, gillnet, and pound net gear have bycatch and mortality associated with use. Hook and line gear tends to be highly selective for striped bass, but does catch undersized fish that may not be retained (ASMFC 2015a). Gillnet and pound net gear likewise encounter undersized striped bass as well as other main species that are not targeted (ASMFC 2015a) (ASMFC 2016e). For all three gear types, dead discards are less than total poundage landed. Total commercial dead discards are estimated at 22.5% relative to landings in 2014 (ASMFC 2015b).

Criterion 3: Management Effectiveness

Five subfactors are evaluated: Management Strategy and Implementation, Bycatch Strategy, Scientific Research/Monitoring, Enforcement of Regulations, and Inclusion of Stakeholders. Each is scored as either 'highly effective', 'moderately effective', 'ineffective,' or 'critical'. The final criterion 3 score is determined as follows:

- 5 (Very Low Concern)—Meets the standards of 'highly effective' for all five subfactors considered.
- 4 (Low Concern)—Meets the standards of 'highly effective' for management strategy and implementation and at least 'moderately effective' for all other subfactors.
- 3 (Moderate Concern)—Meets the standards for at least 'moderately effective' for all five subfactors.
- 2 (High Concern)—At minimum, meets standards for 'moderately effective' for management strategy and implementation and bycatch strategy, but at least one other subfactor is rated 'ineffective'.
- 1 (Very High Concern)—Management strategy and implementation and/or bycatch management are 'ineffective'.
- 0 (Critical)—Management Strategy and Implementation is 'critical'.

The Criterion 3 rating is determined as follows:

- Score >3.2=Green or Low Concern
- Score >2.2 and <=3.2=Yellow or Moderate Concern
- Score <=2.2 = Red or High Concern

Rating is Critical if Management Strategy and Implementation is Critical.

Criterion 3 Summary

| Fishery | 3.1 Mgmt strategy and implement. | 3.2 Bycatch Strategy | 3.3 Scientific research and monitoring | 3.4 Enforcement | 3.5 Stakeholder Inclusion | Management Effectiveness Category (Score) | C3 Score | C3 Rating |
|--|---|-----------------------------|---|------------------------|----------------------------------|--|-----------------|------------------|
| US Atlantic Striped Bass Hook and line | Highly Effective | Highly Effective | Highly Effective | Moderately Effective | Highly Effective | Low (4) | 4 | Green |
| US Atlantic Striped Bass Gillnet | Highly Effective | Moderately Effective | Moderately Effective | Moderately Effective | Highly Effective | Moderate (3) | 3 | Yellow |
| US Atlantic Striped Bass Pound net | Highly Effective | Moderately Effective | Moderately Effective | Moderately Effective | Highly Effective | Moderate (3) | 3 | Yellow |

Criterion 3 Assessment

Factor 3.1 Management Strategy and Implementation

Considerations: What type of management measures are in place? Are there appropriate management goals, and is there evidence that management goals are being met? Do managers follow scientific

advice? To achieve a highly effective rating, there must be appropriately defined management goals, precautionary policies that are based on scientific advice, and evidence that the measures in place have been successful at maintaining/rebuilding species.

All commercial gears

Highly Effective

Key relevant information:

For hook and line, gillnet, and pound net gears, only a limited number of states allow for commercial fishing of striped bass (ASMFC 2015a) (ASMFC 2016e). In those states that allow a commercial fishery, quotas are in place. In addition, many states have seasonal, gear, and area restrictions (Table 5). Managers gauge the health of the stock based on an analytic assessment (ASMFC 2015b) and take appropriate management action (ASMFC 2006). Since the 1980s, effective management by ASMFC has resulted in the stock rebuilding to historic highs in the mid-2000s, though the stock has since declined.

The current management goals for Atlantic striped bass include:

- Manage striped bass fisheries under a control rule designed to maintain stock size at or above the target female spawning stock biomass level and a level of fishing mortality at or below the target exploitation rate.
- Manage fishing mortality to maintain an age structure that provides adequate spawning potential to sustain long-term abundance of striped bass populations.
- Provide a management plan that strives, to the extent practical, to maintain coastwide consistency of implemented measures, while allowing the states defined flexibility to implement alternative strategies that accomplish the objectives of the fishery management plan (FMP).
- Foster quality and economically viable recreational, for-hire, and commercial fisheries.
- Maximize cost effectiveness of current information gathering and prioritize state obligations in order to minimize costs of monitoring and management.
- Adopt a long-term management regime that minimizes or eliminates the need to make annual changes or modifications to management measures.
- Establish a fishing mortality target that will result in a net increase in the abundance (pounds) of age 15 and older striped bass in the population, relative to the 2000 estimate.

Striped bass female SSB has been above the biomass limit reference point since 1994 and is currently between target and threshold biomass reference points (ASMFC 2015b). It should be noted that exploitation has increased and has been above the target mortality rate (but below the threshold), and the stock has declined since 2006.

Table 5: Summary of Atlantic striped bass commercial regulations in 2015. From ASMFC (Table 10 in ASMFC 2016e).

| STATE | SIZE LIMITS | SEASONAL QUOTA | OPEN SEASON |
|-------|--|--|---|
| ME | Commercial fishing prohibited | | |
| NH | Commercial fishing prohibited | | |
| MA | 34" TL min size | 869,813 lbs. Hook & line only | 6.23 until quota reached; 15 fish/day with commercial boat permit; 2 fish/day with rod and reel permit (striped bass endorsement required for both permits) |
| RI | Floating fish trap: 26" min General category (mostly rod & reel): 34" min. | Total: 181,572 lbs., split 39:61 between trap and general category. Gill netting prohibited. | Trap: 4.1 – 12.31, or until quota reached; unlimited possession limit until quota reached General Category: 6.8-8.31, 9.8-12.31, or until quota reached. Closed Fridays and Saturdays during both seasons. 5 fish/vessel/day possession limit. |
| CT | Commercial fishing prohibited | | |
| NY | 28-38" TL min size Ocean only (Hudson River closed to commercial harvest) | 795,795 lb. Pound nets, gill nets (6-8" stretched mesh), hook & line. | 6.1 – 12.15, or until quota reached. Limited entry permit only. |
| NJ | Commercial fishing prohibited | | |
| PA | Commercial fishing prohibited | | |
| DE | Gillnet: 20" TL min in DE Bay/River during spring season. 28" in all other waters/seasons. Hook and Line: 28" min | Gillnet: 137,831 lbs. Hook and line: 14,509 lbs. | Gillnet: 2.15-5.31 (2.15-3.30 for Nanticoke River) & 11.15-12.31; drift nets only 2.15-28 & 5.1-31; no fixed nets in DE River Hook and Line: 4.1-12.31 |
| MD | Bay and Rivers: 18-36" Ocean: 24" minimum | Bay and River: 1,471,888 lbs. (part of Bay-wide quota). Gear specific quotas and landing limits. Ocean: 90,727 lbs. | Bay Pound Net: 6.1-12.31, Mon-Sat Bay Haul Seine: 6.1-11.27, Mon-Fri Bay Hook & Line: 6.1-11.26, Mon-Thu Bay Drift Gill Net: 1.1-3.13, 12.1-12.31 Ocean Drift Gillnet & Trawl: 1.1-4.30, 11.1-12.31, Mon-Fri |
| STATE | SIZE LIMITS | SEASONAL QUOTA | OPEN SEASON |
| PRFC | 18" min all year 36" max 2.15-3.25 | 583,362 lbs (part of Bay-wide quota). Allocated by gear and season. | Hook & line: 2.15-3.25, 6.1-12.31 Pound Net & Other: 2.15-3.25, 6.1-12.15 Gill Net: 1.1-3.25, 11.9-12.31 |
| DC | Commercial fishing prohibited | | |
| VA | Bay and Rivers: 18" min, and 28" max size limit 3.26-6.15 Ocean: 28" min | Bay and Rivers: 1,064,997 lbs Ocean: 138,640 lbs. (ITQ- system for both areas) | Bay and Rivers: 1.16-12.31 Ocean: 1.16-12.31 |
| NC | Ocean: 28" | 360,360 lbs. (split between gear types). Number of fish allocated to each permit holder. Allocation varies by permit. | Seine fishery was open for 120 days Gill net fisher was open for 45 days Trawl fishery was open for 70 days |

Factor 3.2 Bycatch Strategy

Considerations: What type of management strategy/measures are in place to reduce the impacts of the fishery on bycatch species and when applicable, to minimize ghost fishing? How successful are these management measures? To achieve a Highly Effective rating, the fishery must have no or low bycatch, or if there are bycatch or ghost fishing concerns, there must be effective measures in place to minimize impacts.

Hook and line
Highly effective

Key relevant information:

Hook and line fishing is highly selective for striped bass (ASMFC 2015a) (ASMFC 2015b). Although the fishery does catch smaller fish than the size limit, the discard and discard mortality rates are figured into the stock assessment (ASMFC 2015b) (ASMFC 2015c). This is rated as “highly effective.”

Gillnet and Pound net
Moderately Effective

Key relevant information:

Bycatch and discards of several vulnerable or depleted species that are known to occur in the striped bass fishery and are examined in this report include shad, river herring, and weakfish. The impact on these species is not well known, although these species are managed and can typically be released alive from pound nets. There are some measures in place to protect spawning of striped bass, such as time/area closures and gear restrictions. Also, only a few states allow gillnet and pound net gear to target striped bass (Table 5). These measures may reduce bycatch mortality of some depleted or vulnerable species; however, there is no comprehensive or strategic plan in place to reduce bycatch and discarding in the directed striped bass fishery by ASMFC. This is rated as “moderately effective.”

Factor 3.3 Scientific Research and Monitoring

Considerations: How much and what types of data are collected to evaluate the fishery’s impact on the species? Is there adequate monitoring of bycatch? To achieve a Highly Effective rating, regular, robust population assessments must be conducted for target or retained species, and an adequate bycatch data collection program must be in place to ensure bycatch management goals are met.

Hook and line
Highly Effective

Key relevant information:

Throughout the fishery, comprehensive fishery-dependent and -independent monitoring are in place, which include mandatory catch reporting, mandatory catch sampling, and mandatory fishery independent surveys (ASMFC 2013) (ASMFC 2015a) (ASMFC 2015b) (ASMFC 2016e). Stakeholders also participate in voluntary tagging programs, which have been useful in gauging fishing mortality and fish migration (ASMFC 2013) (ASMFC 2015a) (ASMFC 2015b) (ASMFC 2016e). Commercial discards are estimated through a mandatory self-reporting system, limited at-sea observer data, and a tag-based

recovery system. There has been extensive research on the effects of hook and line release mortality on this stock. Recreational catch estimates are an uncertainty and are by far the largest removals associated with this stock (ASMFC 2013) (ASMFC 2015a) (ASMFC 2015b) (ASMFC 2016e). But removals (including mortality due to catch-and-release fishing) are well estimated, according to the most recent peer-reviewed benchmark assessment (ASMFC 2013).

Atlantic striped bass status is updated every year or every other year, with a benchmark assessment conducted every 5 years. Managers and the Technical Committee review landings, important indices, state-by-state regulations, and fishery performance yearly. This is rated as “highly effective.”

Gillnet and Pound net **Moderately Effective**

Key relevant information:

A comprehensive regime for research and monitoring is in place fishery-wide, but data and monitoring on bycatch in the gillnet and pound net fishery are lacking. Research is underway to better document and reduce these gaps (NMFS 2013). This is rated as “moderately effective.”

Factor 3.4 Enforcement of Management Regulations

Considerations: Do fishermen comply with regulations, and how is this monitored? To achieve a Highly Effective rating, there must be regular enforcement of regulations and verification of compliance.

All commercial gears **Moderately Effective**

Key relevant information:

Commercial harvesters generally comply with regulations, and quotas are mostly adhered to (ASMFC 2016e). Overages by individual states are routine but are paid back the following year. Since implementation of Amendment 6 in 2003, there have been no overall overages of the commercial fishery quota coastwide. States also require commercial landed fish to be tagged, which allows the tracking of caught fish from harvester to dealer and end-user (ASMFC 2015a) (ASMFC 2016e).

Law enforcement not only enforces regulations as needed (see <http://www.asmfc.org/law-enforcement/the-law-enforcement-committee>) but also comments on the enforceability of proposed management actions (ASMFC 2012b). This ensures that management actions are more readily enforceable, thereby ensuring compliance.

But there are numerous reports of catch occurring in the exclusive economic zone (EEZ) beyond state water jurisdiction (Patch 2015) and of directed illegal harvest (MDDNR 2017). Although the magnitude of the illegal activity has not been comprehensively summarized, the number of reports of illegal activity available online, as well as comments from an anonymous reviewer, suggest that a score of “moderately effective” is appropriate.

Factor 3.5 Stakeholder Inclusion

Considerations: Are stakeholders involved/included in the decision-making process? Stakeholders are individuals/groups/organizations that have an interest in the fishery or that may be affected by the management of the fishery (e.g., fishermen, conservation groups, etc.). A Highly Effective rating is given if the management process is transparent, if high participation by all stakeholders is encouraged, and if there a mechanism to effectively address user conflicts.

All commercial gears

Highly Effective

Key relevant information:

ASMFC has a highly transparent process that includes peer review of scientific information, public and stakeholder participation, and notification throughout the process. Stakeholders can comment at management board meetings, at public hearings, and by contacting their representatives on the management boards on the advisor process (ASMFC 2016a). This is rated as “highly effective.”

Criterion 4: Impacts on the Habitat and Ecosystem

This Criterion assesses the impact of the fishery on seafloor habitats, and increases that base score if there are measures in place to mitigate any impacts. The fishery's overall impact on the ecosystem and food web and the use of ecosystem-based fisheries management (EBFM) principles is also evaluated. Ecosystem Based Fisheries Management aims to consider the interconnections among species and all natural and human stressors on the environment.

The final score is the geometric mean of the impact of fishing gear on habitat score and the Ecosystem Based Fishery Management score. The Criterion 4 rating is determined as follows:

- *Score >3.2=Green or Low Concern*
- *Score >2.2 and <=3.2=Yellow or Moderate Concern*
- *Score <=2.2=Red or High Concern*

Criterion 4 Summary

| Fishery | 4.1a Gear type and substrate Score | 4.1b Mitigation of gear impacts Score | 4.2 EBFM Rating (Score) | Criterion 4 Score | Criterion 4 Rating |
|--|---|--|---|--------------------------|---------------------------|
| US Atlantic Striped Bass Hook and line | 5 | 0 | Moderate (3) | 3.87 | Green |
| US Atlantic Striped Bass Gillnet | 3 | 0 | Moderate (3) | 3.00 | Yellow |
| US Atlantic Striped Bass Pound net | 3 | 0 | Moderate (3)  | 3.00 | Yellow |

Criterion 4 Assessment

Factor 4.1a Physical Impact of Fishing Gear on the Habitat/Substrate

Scoring Guidelines

- *5 (None)—Fishing gear does not contact the bottom.*
- *4 (Very Low)—Vertical line gear.*
- *3 (Low)—Gears that contacts the bottom, but is not dragged along the bottom (e.g. gillnet, bottom longline, trap) and is not fished on sensitive habitats. Or bottom seine on resilient mud/sand habitats. Or midwater trawl that is known to contact bottom occasionally. Or purse seine known to commonly contact the bottom.*

- 2 (Moderate)—Bottom dragging gears (dredge, trawl) fished on resilient mud/sand habitats. Or gillnet, trap, or bottom longline fished on sensitive boulder or coral reef habitat. Or bottom seine except on mud/sand. Or there is known trampling of coral reef habitat.
- 1 (High)—Hydraulic clam dredge. Or dredge or trawl gear fished on moderately sensitive habitats (e.g., cobble or boulder)
- 0 (Very High)—Dredge or trawl fished on biogenic habitat, (e.g., deep-sea corals, eelgrass and maerl)

Note: When multiple habitat types are commonly encountered, and/or the habitat classification is uncertain, the score will be based on the most sensitive, plausible habitat type.

Hook and line: 5

Key relevant information:

Hook and line fishing for striped bass occasionally encounters the bottom; however, two of the largest estuaries where fishing occurs, Chesapeake and Delaware Bays, have bottom types that comprise sand, silt, and clay muds (Chesapeake Benthic Habitat Integration 2009).

Gillnet: 3

Key relevant information:

Fuller et al. (2008) list gillnets as a moderate to low impact because they are in contact with the bottom but are stationary. Thus, these gears are rated a “3.”

Pound net: 3

Key relevant information:

Pound nets are stationary nets that are hung on stakes fixed to the substrate, usually by wooden pilings. Impacts by pound net gear are not well documented. Fuller et al. (2008) does not list pound nets or any similar gear, such as a weir. Because pound nets are stationary nets but with an unknown impact, a rating of “3” was chosen.

Factor 4.1b Modifying factor: Mitigation of gear impacts

Scoring Guidelines

- +1 (Strong Mitigation)—>50% of the habitat is protected from fishing with the gear type. Or fishing intensity is very low/limited and for trawled fisheries, expansion of fishery’s footprint is prohibited.

Or gear is specifically modified to reduce damage to seafloor and modifications have been shown to be effective at reducing damage. Or there is an effective combination of 'moderate' mitigation measures.

- *+0.5 (Moderate Mitigation)—At least 20% of all representative habitats are protected from fishing with the gear type and for trawl fisheries, expansion of the fishery's footprint is prohibited. Or gear modification measures or other measures are in place to limit fishing effort, fishing intensity, and spatial footprint of damage caused from fishing that are expected to be effective.*
- *0 (No Mitigation)—No effective measures are in place to limit gear impacts on habitats.*
- *0 (Not Applicable) – Not applicable because gear used is benign and received a score of 5 in 4.1.*

Hook and line - NA (=0)

Key relevant information:

Hook and line gear have little impact, so there is little mitigation.

Gillnet - No Mitigation (=0)

Key relevant information:

Although some areas and even states are closed to gillnet fishing (ASMFC 2015a), such closures are generally to reduce mortality, to reduce bycatch, or because commercial fishing is not allowed (ASMFC 2015a). Overall, these closures do not reach the threshold of moderate mitigation because the bulk of the commercial harvest comes from Chesapeake Bay and its tributaries, which are open to gillnet fishing.

Pound net - No Mitigation (=0)

Key relevant information:

Although some areas and even states are closed to pound net fishing (ASMFC 2015a), such closures are generally to reduce harvest, to reduce bycatch, or because commercial fishing is not allowed (ASMFC 2015a) (ASMFC 2015b). Overall, these closures do not reach the threshold of moderate mitigation because the bulk of the commercial harvest comes from Chesapeake Bay and its tributaries, which are open to gillnet fishing.

Factor 4.2 Ecosystem-based Fisheries Management

Scoring Guidelines

- *5 (Very Low Concern)—Policies that have been shown to be effective are in place to protect species' ecological roles and ecosystem functioning (e.g. catch limits that ensure species' abundance is maintained at sufficient levels to provide food to predators) and effective spatial management is used to protect spawning and foraging areas, and prevent localized depletion. Or it has been scientifically demonstrated that fishing practices do not have negative ecological effects.*
- *4 (Low Concern)—Policies are in place to protect species' ecological roles and ecosystem functioning but have not proven to be effective and at least some spatial management is used.*
- *3 (Moderate Concern)—Policies are not in place to protect species' ecological roles and ecosystem functioning but detrimental food web impacts are not likely.*
- *2 (High Concern)—Policies are not in place to protect species' ecological roles and ecosystem functioning and the likelihood of detrimental food impacts are likely (e.g. trophic cascades, alternate stable states, etc.), but conclusive scientific evidence is not available for this fishery.*
- *1 (Very High Concern)—Scientifically demonstrated trophic cascades, alternate stable states or other detrimental food web impact are resulting from this fishery.*

All commercial gears

Moderate Concern

Key relevant information:

ASMFC has started the process of ecosystem based-management (<http://www.asmfc.org/fisheries-science/stock-assessments>). Of particular concern is the availability of menhaden and other forage fishes to meet the needs of striped bass and other important predators. But ecosystem-based reference points for these forage species are currently not in place. In addition, striped bass can place predation pressure on vulnerable forage stocks such as river herring, shad, and weakfish (Davis et al. 2012) (Hartman and Brant 1995). Currently, no measures are in place that examine the top-down role of striped bass and its potential consumption of these vulnerable stocks; however, it is not expected that the striped bass fishery contributes to detrimental food web impacts, such as trophic cascades. This is partly because similar roles are occupied by other predators, such as bluefish, weakfish, and spiny dogfish (see http://www.asmfc.org/uploads/file/2012MSPVA_Update.pdf). Thus, a score of “moderate” concern was assigned, even though research and management action to address some aspects are underway.

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Scientific review does not constitute an endorsement of the Seafood Watch® program, or its seafood recommendations, on the part of the reviewing scientists. Seafood Watch® is solely responsible for the conclusions reached in this report.

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Appendix A: Review Schedule

A stock assessment update was released in fall of 2016 but did not result in a change in stock status or a rating change for striped bass. Striped bass is scheduled for a full peer-reviewed benchmark stock assessment in 2018.