# Black Sea Bass Commercial State Allocation Amendment

Amendment 23 to the Summer Flounder, Scup, and Black Sea Bass Fishery Management Plan

Environmental Assessment, Regulatory Impact Review, and Regulatory Flexibility Act Analysis

September 2022

Prepared by the
Mid-Atlantic Fishery Management Council
in cooperation with the
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# 1 EXECUTIVE SUMMARY

This management action was developed by the Mid-Atlantic Fishery Management Council (Council) and the Atlantic States Marine Fisheries Commission (Commission). For the Council, this action is a Fishery Management Plan (FMP) amendment. For the Commission, it is an FMP addendum. The amendment and addendum considered the same range of alternatives. Both the Council and the Commission's Summer Flounder, Scup, and Black Sea Bass Management Board (Board) selected the same preferred alternatives.

The purposes of this amendment are to:

1. Consider adjusting the commercial black sea bass state allocations,
2. Consider whether the state allocations should continue to be managed only under the Commission's FMP or whether they should be managed under both the Commission and Council FMPs, and
3. Consider changes to the federal in-season closure regulations for black sea bass.

This action is needed to:

1. Provide fair and equitable access to the commercial black sea bass fishery among states in the management unit, taking into consideration the historical dependence of the states on the fishery, as well as changes in abundance and stock distribution over time;
2. Allow the Council and Commission to determine which management measures are most appropriate for joint management in both FMPs; and
3. Help prevent commercial annual catch limit (ACL) overages while minimizing potential negative socioeconomic impacts of federal in-season closures on states that have not fully harvested their allocations.

State allocations of the coastwide commercial black sea bass quota were first implemented in 2003 through Amendment 13 to the Summer Flounder, Scup, and Black Sea Bass Fishery Management Plan (FMP), which was a joint amendment of the Council and Commission (MAFMC 2002). The Amendment 13 allocations were loosely based on historical landings from 1980-2001.These allocations were extended indefinitely through the Commission's Addendum XIX (2007). This amendment and the Commission's Addendum XXXIII are the first management actions to consider revisions to these allocations.

At the time of final action on Amendment 13 in 2002, the Council expressed a desire that the state allocations be managed at both the state and federal levels and contained in both the Council and Commission's FMPs. However, the National Marine Fisheries Service (NMFS) Regional Administrator at the time said a state quota system at the federal level could not be monitored effectively with the then current monitoring methods due to the anticipated low poundage allocations in some states. As a result, the Council approved a coastwide quota through their FMP, acknowledging that this would facilitate use of state allocations through the Commission's FMP. Concerns regarding monitoring state quotas at the federal level have subsequently been resolved with changes to how commercial landings are reported (e.g., more frequent dealer reporting than in 2002 and requirements for electronic vessel trip reporting). Therefore, consideration was given to adding these allocations to the Council's FMP (alternative set 2) through this action to acknowledge the importance of the commercial black sea bass fishery in federal waters (e.g., see Table 5 in section 6.1) and to bring this aspect of the management program in line with most other measures which are jointly managed by the Council and Commission.

Over the last decade, the distribution of the black sea bass stock has changed, abundance and biomass have significantly increased, and there have been corresponding changes in fishing effort and behavior. According to the most recent stock assessment, which modeled fish north and south of Hudson Canyon as two spatial sub-units (which do not represent separate stocks), spawning stock biomass was higher in the southern sub-unit than in the northern sub-unit from 1989 through 2003 (NEFSC 2021a). Since then, spawning stock biomass in the northern sub-unit has grown considerably. Although the amount of spawning stock biomass in the southern sub-unit has not declined, there has been a higher proportion of total spawning stock biomass in the northern sub-unit than in the southern sub-unit since 2005.

In some cases, expansion of the black sea bass stock into areas with historically low fishing effort has created significant disparities between state allocations and recent black sea bass availability. This prompted the Commission and Council to consider if these allocations should be modified to account for a combination of historical harvest by state and recent biomass distribution (alternative set 1).

The Council and Commission also considered changes to the federal in-season closure regulations, which can have differential impacts on some states based on differences in how each state manages their allocation (alternative set 3).

Note that the alternative numbers used in this document differ in some cases from those presented during the meetings leading up to final action on this amendment. All alternatives are summarized below (Table 1) and described in detail in Section 5. The impacts of each alternative on human communities, black sea bass, non-target species, habitat, and protected species are described in detail in Section 7 and briefly summarized in Table 2.

*Alternatives for State Allocation Percentages (Alternative Set 1)*

Alternative 1A is the no action alternative for the state allocations. Under this alternative, no changes would be made to the state allocations. This was not selected as a preferred alternative.

Alternative set 1B considers options to increase Connecticut and/or New York's allocations first or as the only change to the allocations. These alternatives were considered in acknowledgement of the increase in black sea bass abundance in Long Island Sound since the allocations were first implemented. The Council and the Board selected alternatives 1B-2 (increase Connecticut's initial allocation from 1% to 3%) and 1B-5 (increase New York's initial allocation from 7% to 8%) as preferred alternatives. These alternatives would increase Connecticut and New York's baseline allocations before applying other changes which would impact all states (see below).

Alternative set 1C would use an approach referred to as Dynamic Adjustments to Regional Allocations (DARA) to modify the allocations to partially account for biomass distribution. It also includes a transition period during which the allocations would gradually shift from the starting allocations to allocations that are partially based on biomass distribution. This approach includes many sub-alternatives to define the magnitude and pace of change in the allocations. Under this approach, the allocations would be updated through the specifications process each time new biomass distribution information is available. This was not selected as a preferred alternative.

Alternative set 1D considers options to modify the allocations only when the coastwide quota exceeds a certain level. This is referred to as the trigger approach. Quota up to and including a pre-determined trigger level would be distributed based on the initial allocations and any surplus quota above the trigger would be distributed in a different manner. Many sub-alternatives were considered regarding the trigger level and how surplus quota would be distributed among the states. This was not selected as a preferred alternative.

Under alternative set 1E, a percentage of the coastwide quota would always be based on the initial allocations and the remaining percentage would be divided among states in a different manner. Many sub-alternatives were considered regarding the percentage allocated based on the initial allocations and how the remaining percentage would be distributed among the states. This is the Council and Board's preferred approach.

Many combinations of sub-alternatives under alternative sets 1C through 1E consider updating the state allocations to incorporate regional biomass distribution information. Alternative set 1F considers options for which states would be grouped together as regions for the purposes of allocating a combined regional quota which would then be distributed among the states in each region. Preferred alternative 1F-2 would define three regions: Maine through New York, New Jersey, and Delaware through North Carolina. This alternative acknowledges that New Jersey straddles the border between the northern and southern spatial sub-units defined in the stock assessment.

The combination of preferred alternatives for the state allocations would define a process for calculating allocations based on biomass distribution. They would not implement specific allocation percentages. The allocations would be modified through the specifications process each time new distribution information is available. Specifically, the preferred alternatives would modify the state allocation percentages using the following steps:

1) Connecticut's baseline allocation would increase from 1% to 3% (alternative 1B-2,) and New York's baseline allocation would increase from 7% to 8% (alternative 1B-5, Section 5.1.2.1.1).
2) The state allocations would then be calculated by allocating 75% of the coastwide quota according to the new baseline allocations (i.e., the Amendment 13 allocations modified to account for the initial increases to Connecticut and New York) and 25% to three regions based on the most recent regional biomass distribution information (alternatives 1E-1B and 1E-2B, Section 5.1.5.1).
3) The three regions are: Maine-New York, New Jersey, and Delaware-North Carolina (alternative 1F-2, Section 5.1.7.2). The regional allocations would be distributed among states within a region in proportion to their baseline allocations, except Maine and New Hampshire would each receive 1% of the northern region quota (alternative 1F-3B, Section 5.1.5.2.4).

*Alternatives for Council Management of State Allocations (Alternative Set 2)*

Alternative set 2 considers whether the state allocations should remain only in the Commission's FMP (alternative 2A), or if they should be included in both the Council and Commission's FMP (alternative 2B, preferred). Alternative 2B includes two sub-alternatives. Sub-alternative 2B-1 would make no changes to current practice regarding paybacks of state level quota overages if the state allocations were to be added to the Council's FMP. This is a preferred alternative. States would pay back overages only when the coastwide quota is also exceeded. Under sub-alternative 2B-2, states would always pay back quota overages. This is not a preferred alternative.

*Alternatives for Federal In-Season Closures (Alternative Set 3)*

Alternative set 3 considers three alternatives regarding federal in-season closures. Under alternative 3A, the entire commercial fishery would close in-season for all federally permitted vessels and dealers, regardless of state, once the coastwide quota is projected to be landed, as is currently required under the Council's FMP.

Under alternative 3B (preferred), the entire commercial fishery would close in-season for all federally permitted vessels and dealers, regardless of state, once landings are projected to exceed the coastwide quota plus an additional buffer of up to 5%. The Council and Board would agree to the appropriate buffer for the upcoming year through the specifications process. The Monitoring Committee would provide advice on the appropriate buffer based on considerations such as stock status, the quota level, and recent fishery trends.

Under alternative 3C, the entire commercial fishery would close in-season for all federally permitted vessels and dealers, regardless of state, once the coastwide commercial ACL is projected to be exceeded, as opposed to when the commercial quota is projected to be landed under the current regulations. Discards in weight cannot be monitored in-season using current discard estimation methods. Therefore, in practice, this alternative would require NMFS to make assumptions about discards in the current year.

Table 1: Alternatives considered in this document. All alternatives are described in Section 5. Preferred alternatives are emphasized in bold text.

- Alternative Set 1: Alternatives for State Allocation Percentages
    - Alternative 1A: No Action
    - Alternative Set 1B: Increase Connecticut and/or New York Allocations First or as Only Change
        - Alternative 1B-1: No Action for Connecticut (Connecticut Not Addressed Separately)
        - **Alternative 1B-2: Increase Connecticut's Baseline Allocation By 2% (Preferred)**
        - Alternative 1B-3: Increase Connecticut's Baseline Allocation By 3%
        - Alternative 1B-4: No Action for New York (New York Not Addressed Separately)
        - **Alternative 1B-5: Increase New York's Baseline Allocation by 1% (Preferred)**
        - Alternative 1B-6: Increase New York's Baseline Allocation by 2%
    - Alternative Set 1C: Dynamic Adjustments to Regional Allocations (DARA)
        - Sub-Alternative Set 1C-1: Final Relative Importance of Initial Allocations Vs. Stock Distribution
            - Sub-Alternative 1C-1A: Final Relative Weights of 90% Stock Distribution And 10% Initial Allocations
            - Sub-Alternative 1C-1B: Final Relative Weights of 50% Stock Distribution And 50% Initial Allocations

- Sub-Alternative Set 1C-2: Changes in Relative Weights of Each Factor Per Adjustment
    - Sub-Alternative 1C-2A: 5% Change in Relative Weight Per Adjustment
    - Sub-Alternative 1C-2B: 20% Change in Relative Weight Per Adjustment
- Sub-Alternative Set 1C-3: Frequency of Weight Adjustments
    - Sub-Alternative 1C-3A: Weight Adjustments Every Year
    - Sub-Alternative 1C-3B: Weight Adjustments Every Other Year
- Sub-Alternative Set 1C-4: Regional Allocation Adjustment Cap
    - Sub-Alternative 1C-4A: 3% Regional Allocation Adjustment Cap
    - Sub-Alternative 1C-4B: 10% Regional Allocation Adjustment Cap
    - Sub-Alternative 1C-4C: No Regional Allocation Adjustment Cap

- Alternative Set 1D: Trigger Approach
    - Sub-Alternative Set 1D-1: Trigger Value
        - Sub-Alternative 1D-1A: 3 Million Pound Trigger Value
        - Sub-Alternative 1D-1B: 4.5 Million Pound Trigger Value
    - Sub-Alternative Set 1D-2: Distribution of Surplus Quota
        - Sub-Alternative 1D-2A: Even Distribution of Surplus Quota
        - Sub-Alternative 1D-2B: Distribution of Surplus Quota Based on Regional Biomass
    - Sub-Alternative Set 1D-3: Distribution of Surplus Quota to States Within a Region (Only Applicable Under Sub-Alternative 1D2-B)
        - Sub-Alternative 1D-3A: Even Distribution of Regional Surplus Quota (Only Applicable Under Sub-Alternative 1D2-B)
        - Sub-Alternative 1D-3B: Proportional Distribution of Regional Surplus Quota (Only Applicable Under Sub-Alternative 1D2-B)
    - Sub-Alternative Set 1D-4: Static or Dynamic Base Allocations (Only Applicable Under Sub-Alternative 1D-2B)
        - Sub-Alternative 1D-4A: Static Base Allocations (Only Applicable Under Sub-Alternative 1D-2B)
        - Sub-Alternative 1D-4B: Dynamic Base Allocations (Only Applicable Under Sub-Alternative 1D-2B)
- **Alternative Set 1E: Percentage of Coastwide Quota Distributed Based on Initial Allocations (Preferred)**
    - Sub-Alternative Set 1E-1: Percentage of Quota Allocated Based on Initial Allocations
        - Sub-Alternative 1E-1A: 25% of Coastwide Quota Allocated Among States Using Initial Allocations
        - **Sub-Alternative 1E-1B: 75% of Coastwide Quota Allocated Among States Using Initial Allocations (Preferred)**
    - Sub-Alternative Set 1E-2: Distribution of Remaining Quota
        - Sub-Alternative 1E-2A: Even Distribution of Remaining Quota
        - Sub-Alternative 1E-2B: Distribution of Remaining Quota Based on Regional Biomass (Preferred)

        - Sub-Alternative Set 1E-3: Distribution of Regional Quota Among States Within a Region (Only Applicable Under Sub-Alternative 1E-2B)
            - Sub-Alternative 1E-3A: Even Distribution of Regional Quota (Only Applicable Under Sub-Alternative 1E-2B)
            - **Sub-Alternative 1E-3B: Proportional Distribution of Regional Quota (Only Applicable Under Sub-Alternative 1E-2B; Preferred)**
    - Alternative Set 1F: Regional Configuration Alternatives
        - Sub-Alternative 1F-1: Two Regions
        - **Sub-Alternative 1F-2: Three Regions (Preferred)**
- Alternative Set 2: Alternatives for Council Management of State Allocations
    - Alternative 2A: No Action (State Allocations Remain Only in the Commission FMP)
    - Alternative 2B: State Allocations Included in Both the Commission and Council FMPs (Preferred)
        - **Sub-Alternative 2B-1: Status Quo (States Pay Back Overages Only If Coastwide Quota Exceeded; Preferred)**
        - Sub-Alternative 2B-2: States Always Pay Back Overages
- Alternative Set 3: Alternatives for Federal In-Season Closures
    - Alternative 3A: No Action (Coastwide Federal In-Season Closure When Landings Are Projected to Exceed the Coastwide Quota)
    - **Alternative 3B: Coastwide Federal In-Season Closure When Landings Are Projected to Exceed the Coastwide Quota Plus a Buffer of Up To 5% (Preferred)**
    - Alternative 3C: Coastwide Federal In-Season Closure When the Commercial Annual Catch Limit Is Projected to Be Exceeded

*Socioeconomic Impacts of the Alternatives*

As described in more detail in Section 7.1, the expected socioeconomic impacts of the state allocation alternatives vary by state and based on future quota levels. The state allocations have lesser impacts under higher coastwide quotas than under lower coastwide quotas. Under alternative 1A, the Amendment 13 allocations would remain unchanged. Expected socioeconomic impacts would vary from moderate positive to slight negative, depending on the state and future quota levels. These impacts would not be different from the past impacts of the Amendment 13 allocations, which have been in place since 2003, assuming future quotas do not differ greatly from the historical range. Continued moderate positive socioeconomic impacts would be expected for fishermen[1] and commercial fish dealers that have relied on black sea bass landings for noteworthy amounts of their income in recent years. These continued positive impacts may be greatest for fishermen who land their catch in states with higher allocations, and dealers based in those states, compared to those in states with lower allocations.

Under alternative 1A, some continued negative socioeconomic impacts may be felt by fishermen who operate in states with low allocations but high black sea bass availability, as avoiding or discarding black sea bass may negatively impact the efficiency of their operations. These impacts are expected to be slight negative, as opposed to moderate or high negative, because this would

[1] The term "fishermen" is intended to apply to all individuals who engage in fishing, regardless of gender.

represent a continuation of recent conditions, to which fishermen have already adapted to some extent by necessity.

Alternative sets 1B-1F could all result in a similar range of large or small changes in the state allocation percentages, depending on the sub-alternatives chosen and future biomass distribution. For these reasons, although the approaches used under alternative sets 1B-1F are different, their socioeconomic impacts are considered collectively, rather than separately for discrete alternative sets or combinations of sub-alternatives. Section 7.1.1 provides a more nuanced explanation of the potential impacts of changes to the state allocations; however, in general, positive impacts would be expected for states with increased allocations and negative impacts for states with decreased allocations under alternative sets 1B-1F.

In this document, socioeconomic impacts are primarily evaluated based on potential changes in landings, prices, and revenues for commercial fishermen and dealers. Therefore, the socioeconomic impacts of alternative set 2 mainly derive from differences in the process for quota transfers between states and the potential frequency of state quota overage paybacks. Under alternative 2A, the state allocations would remain only in the Commission's FMP. There would be no changes to how the state quotas are monitored, how transfers of quota between states are processed, and when states are required to pay back quota overages. The Commission would continue to manage quota transfers. The Commission allows transfers to occur at any time up to 45 days after the end of the fishing season. This can help prevent the need for state-level closures. Late in the year quota transfers would be more limited under alternative 2B. Alternative 2A could have slight positive socioeconomic impacts because it would represent a continuation of recent conditions.

Under alternative 2B, the state quota allocations would be added to the Council's FMP. NMFS would monitor the state quotas and would manage quota transfers between states. Transfers in the last two weeks of the year would likely be limited to unforeseen events such as vessel failure or bad weather. Transfers after the end of the fishing season to help states balance quota overages would not be allowed. Fishermen and fish dealers are not expected to see a noticeable difference in any management factors that impact their operations under this alternative compared to alternative 2A. Therefore, this alternative is also expected to have slight positive socioeconomic impacts.

Compared to alternative 2A, alternative 2B has the potential for slightly less positive socioeconomic impacts due to the additional restrictions on late in the year transfers. However, this should have very minor impacts as states will continue to closely monitor their landings throughout the year and take action as necessary to prevent state-level overages and in-season closures, regardless of which agency manages the transfers.

Alternative 2B-1 would continue the current practice of requiring paybacks of state quota overages only if the coastwide quota is also exceeded. Alternative 2B-2 would require paybacks of state quota overages regardless of whether the coastwide quota was also exceeded. Overage paybacks could result in reduced revenues from black sea bass in the year in which the payback is applied, though this could be partially offset by higher revenues in the year in which the overage occurred. For these reasons, alternatives 2B-1 and 2B-2 are both expected to have slight negative socioeconomic impacts in the years when an overage payback is applied. No impacts would be expected when no overages occur and paybacks are not needed. Alternative 2B-2 is expected to have greater negative socioeconomic impacts than alternative 2B-1 as it could require more frequent paybacks.

Alternatives 3A-3C consider the conditions under which a federal in-season closure would occur. Under all alternatives in this alternative set, negative socioeconomic impacts would be expected when an in-season closure occurs, as this could result in reduced revenues from black sea bass landings, especially in any states that have not fully landed their allocations. Therefore, alternatives 3A-3C are all expected to have slight negative socioeconomic impacts when an in-season closure occurs. They are expected to have no impacts when closures are not needed. Given that alternative 3A has a lower threshold for a closure than alternative 3B, it would be expected to result in more frequent closures, and thus a greater potential for negative socioeconomic impacts than alternative 3B. As described in more detail in Section 7.1.3, it is uncertain how alternative 3C would be implemented; therefore, it is not possible to compare the potential frequency of closures under alternative 3C to alternatives 3A and 3B.

*Impacts of the Alternatives on Black Sea Bass, Non-Target Species, Habitat, and Protected Species*

The decision of whether the state allocations should remain in only the Commission's FMP (alternative 2A) or should be included in both the Commission and Council FMPs (alternative 2B) is largely administrative in nature and will have no impacts on black sea bass, non-target species, habitat, or protected species. The impacts of all other alternatives on black sea bass, non-target species, habitat, or protected species are summarized below.

As described in more detail in Section 7, fishing effort for black sea bass is expected to be constrained by the coastwide commercial quota under all alternatives. The alternatives for paybacks of state quota overages (alternative set 2) and federal in-season closures (alternative set 3) may result in slight differences in fishing effort in years when a payback is applied or a closure is implemented; however, these differences are expected to be minor as states take proactive steps to avoid overages and the need for in-season closures. There may be some differences in the distribution of landings across the state allocation alternatives (alternative set 1); however, major differences in the total amount of catch, total fishing effort, the overall spatial distribution of fishing effort, the gear types used, the amount of gear in the water, and the amount of time that gear is in the water are not expected under any of the alternatives.

For these reasons, the impacts of all alternatives on black sea bass, non-target species, habitat, and protected species are all expected to continue to be largely driven by the coastwide quota, rather than the state allocations, the quota overage payback requirements, or the federal in-season closure regulations. Therefore, the impacts of these alternatives are expected to be the same as the impacts of the coastwide quota.

The coastwide quota is based on the best scientific information available and is intended to prevent overfishing. As such, all alternatives are expected to maintain the current positive stock status for black sea bass and result in moderate positive impacts on black sea bass.

None of the alternatives are expected to change the current stock status of any non-target species. As described in Section 6.2.2, the primary non-target species in the commercial black sea bass fishery all have a positive stock status, or, in the case of sea robins, an unknown stock status due to a lack of a stock assessment. By maintaining the current stock status of all non-target species, all alternatives are expected to have slight positive impacts on non-target species.

Slight negative impacts to habitat are expected under all alternatives due to continued impacts of commercial fishing gear on habitat. The degree of these impacts is not expected to vary meaningfully across alternatives because fishing effort will be driven by the coastwide quota under all alternatives and no meaningful differences are expected in the distribution of fishing effort or the gear types used. The impacted areas will continue to be impacted by the black sea bass fishery and many other fisheries which operate in the same areas.

As described in more detail in Section 7.4, continued black sea bass fishing effort using predominantly bottom otter trawl and, to a lesser extent, pot/trap gear is expected to have slight negative to slight positive impacts for non-ESA listed marine mammals and negligible to moderate negative impacts for ESA-listed species, depending on the species and future quota levels. These impacts may vary if future coastwide commercial quotas are notably different than recent levels.

*Cumulative Impacts*

The impacts of all alternatives on the biological environment, habitat, protected species, and human communities have been analyzed (Section 7). When the proposed action (i.e., all preferred alternatives) is considered in conjunction with all other impacts from past, present, and reasonably foreseeable future actions, it is not expected to result in any significant impacts, positive or negative; therefore, no significant cumulative effects on the human environment are associated with the proposed action (section 7.5).

Table 2: Expected impacts of the alternatives on each VEC, relative to current conditions. Bold text indicates preferred alternatives. A minus sign (–) signifies a negative impact and a plus sign (+) signifies a positive impact. "0" indicates no impact. "Mod" refers to a moderate impact and "Sl" refers to a slight impact. None of the impacts are expected to be significant. All expected impacts are described in detail in section 7.

| Alternative | Socio-economic impacts | Impacts on black sea bass | Impacts on non-target species | Impacts on habitat | Impacts on MMPA-protected species | Impacts on ESA-listed species |
|---|---|---|---|---|---|---|
| 1A (no action on state allocations) | Mod+ to Sl-[2] | Mod+ | Sl+ | Sl- | Sl+ to Sl-[3] | Negligible to mod-[3] |
| **1B-1F (modified state allocations, many sub-alts)** | **Mod+ to Sl-[4]** | **Mod+** | **Sl+** | **Sl-** | **Sl+ to Sl-[3]** | **Negligible to mod-[3]** |
| 2A (no action: allocations only in Commission FMP) | Sl+ | 0 | 0 | 0 | 0 | 0 |
| **2B (allocations in Council and Commission FMP)** | **Sl+** | **0** | **0** | **0** | **0** | **0** |
| **2B-1 (status quo payback provisions)** | **Sl-** | **Mod+** | **Sl+** | **Sl-** | **Sl+ to Sl-[3]** | **Negligible to mod-[3]** |
| 2B-2 (states always payback quota overages) | Sl- | Mod+ | Sl+ | Sl- | Sl+ to Sl-[3] | Negligible to mod-[3] |
| 3A (no action on federal in-season closures) | Sl- | Mod+ | Sl+ | Sl- | Sl+ to Sl-[3] | Negligible to mod-[3] |
| **3B (federal in-season closure at quota plus up to 5% buffer)** | **Sl-** | **Mod+** | **Sl+** | **Sl-** | **Sl+ to Sl-[3]** | **Negligible to mod-[3]** |
| 3C (federal in-season closure at ACL) | Sl- | Mod+ | Sl+ | Sl- | Sl+ to Sl-[3] | Negligible to mod-[3] |

[2] Positive or negative depending on the state. The magnitude of impacts will vary based on future quota levels and other factors which influence price.

[3] Depending on the species/stock.

[4] Positive or negative depending on the state. Magnitude of impacts will depend on the specific change in allocation, future biomass distribution (under many alternatives), future quota levels, and other factors which influence price.

## 2 LIST OF ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| ACCSP | Atlantic Coastal Cooperative Statistics Program |
| ACL | Annual Catch Limit |
| ASFMC | Atlantic States Marine Fisheries Commission |
| Board | ASMFC Summer Flounder, Scup, and Black Sea Bass Management Board |
| Commission | Atlantic States Marine Fisheries Commission |
| Council | Mid-Atlantic Fishery Management Council |
| DARA | Dynamic Adjustments to Regional Allocations |
| DPS | Distinct Population Segment |
| EFH | Essential Fish Habitat |
| ESA | Endangered Species Act |
| F | Fishing mortality rate |
| FMP | Fishery Management Plan |
| ITQ | Individual Transferable Quota |
| MAFMC | Mid-Atlantic Fishery Management Council |
| MMPA | Marine Mammal Protection Act |
| MSA | Magnuson-Stevens Fishery Conservation and Management Act |
| MSY | Maximum sustainable yield |
| NEFSC | Northeast Fisheries Science Center |
| NMFS | National Marine Fisheries Service |
| NOAA | National Oceanic and Atmospheric Administration |
| PBR | Potential Biological Removal |
| R | Recruitment |
| SSB | Spawning Stock Biomass |
| VEC | Valued Ecosystem Component |
| VTR | Vessel Trip Report |

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# 4 INTRODUCTION AND BACKGROUND

This management action was jointly developed by the Mid-Atlantic Fishery Management Council (Council) and the Atlantic States Marine Fisheries Commission (Commission). For the Council, these changes were considered through a Fishery Management Plan (FMP) amendment. For the Commission, these changes were considered through Addendum XXXIII to their FMP. Both the Council and the Commission's Summer Flounder, Scup, and Black Sea Bass Management Board (Board) selected the same preferred alternatives.

The management unit for black sea bass is U.S. waters from Cape Hatteras, North Carolina northward to the US-Canadian border. The black sea bass fisheries are managed cooperatively by the states through the Commission in state waters (0-3 miles), and through the Council and the National Marine Fisheries Service (NMFS) in federal waters (3-200 miles).

The purposes of this amendment are to:

1. Consider adjusting the commercial black sea bass state allocations,
2. Consider whether the state allocations should continue to be managed only under the Commission's FMP or whether they should be managed under both the Commission and Council FMPs, and
3. Consider changes to the federal in-season closure regulations for black sea bass.

This action is needed to:

1. Provide fair and equitable access to the commercial black sea bass fishery among the states in the management unit, taking into consideration the historical dependence of the states on the fishery, as well as changes in abundance and stock distribution over time;
2. Allow the Council and Commission to determine which management measures are most appropriate for joint management in both FMPs; and
3. Help prevent commercial annual catch limit (ACL) overages while minimizing potential negative socioeconomic impacts of federal in-season closures on states that have not fully harvested their allocations.

This EA is being prepared using the 2020 CEQ NEPA Regulations. The effective date of the 2020 CEQ NEPA Regulations was September 14, 2020, and reviews begun after this date are required to apply the 2020 regulations unless there is a clear and fundamental conflict with an applicable statute. 85 Fed. Reg. at 43372-73 (§§ 1506.13, 1507.3(a)). This EA began in spring 2021 and accordingly proceeds under the 2020 regulations.

State allocations of the black sea bass quota were first implemented in 2003 through Amendment 13 to the Summer Flounder, Scup, and Black Sea Bass FMP (MAFMC 2002). The Amendment 13 allocations were loosely based on historical landings from 1980-2001. As shown in Table 3, the allocations to New Jersey through North Carolina summed to 67% and the allocations to Maine through New York summed to 33%.

These allocations were extended indefinitely through the Commission's Addendum XIX (2007). This amendment (and the Commission's Addendum XXXIII) is the first management action to consider revisions to these allocations.

Amendment 13 was a joint amendment of the Council and Commission. At the time of final action on Amendment 13, the Council expressed a desire that the state allocations be managed at both the state and federal levels and contained in both the Council and Commission's FMPs.

However, the NMFS Regional Administrator at the time said a state quota system at the federal level could not be monitored effectively with the then current monitoring methods due to the anticipated low allocations in some states. As a result, the Council approved a federal annual coastwide quota, acknowledging that this would facilitate the use of state allocations through the Commission's FMP. The concerns regarding monitoring state quotas at the federal level have subsequently been resolved with changes to how commercial landings are reported (e.g., more frequent dealer reports than in 2002, requirements for electronic vessel trip reporting). Therefore, consideration was given to adding these allocations to the Council's FMP (alternative set 2) through this action to acknowledge the importance of the commercial black sea bass fishery in federal waters (e.g., see Table 5 in section 6.1) and to bring this aspect of the management program in line with most other measures, which are jointly managed by the Council and Commission.

Over the last decade, the distribution of the black sea bass stock has changed, abundance and biomass have increased significantly, and there have been corresponding changes in fishing effort and behavior. According to the most recent stock assessment, which modeled fish north and south of Hudson Canyon as two spatial sub-units (which do not represent separate stocks), spawning stock biomass was higher in the southern sub-unit than in the northern sub-unit from 1989 through 2003 (NEFSC 2021a). Since then, spawning stock biomass in the northern sub-unit has grown considerably. Although the amount of spawning stock biomass in the southern sub-unit has not declined, there has been a higher proportion of total spawning stock biomass in the northern sub-unit than in the southern sub-unit since 2005 (Figure 1). This shift in distribution has also been supported by peer reviewed scientific studies (e.g., Bell et al., 2015).

In some cases, expansion of the black sea bass stock into areas with historically low fishing effort has created significant disparities between state allocations and black sea bass availability.

Table 3: Commercial black sea bass quota allocations implemented through Amendment 13 in 2003.

| State | Allocation |
|---|---|
| Maine | 0.5 % |
| New Hampshire | 0.5 % |
| Massachusetts | 13 % |
| Rhode Island | 11 % |
| Connecticut | 1 % |
| New York | 7 % |
| New Jersey | 20 % |
| Delaware | 5 % |
| Maryland | 11 % |
| Virginia | 20 % |
| North Carolina | 11 % |

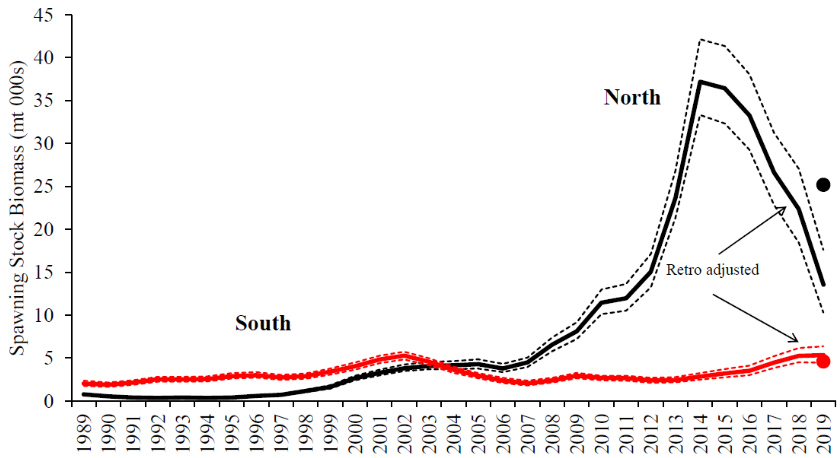


Figure 1: Black sea bass spawning stock biomass by region from the 2021 management track stock assessment. Circles represent the retrospectively adjusted values used to set catch limits. Source: personal communication with the Northeast Fisheries Science Center.

# 5 MANAGEMENT ALTERNATIVES

The Council and the Board considered three sets of alternatives to address the purpose and need of this action. Alternative set 1 considers revisions to the state allocation percentages (Section 5.1). Alternative set 2 considers the Council's role in the state allocations (Section 5.2). Alternative set 3 considers changes to the federal in-season closure regulations (Section 5.3). The alternatives are described in detail in the following sections.

## 5.1 Alternative Set 1: State Allocation Percentages

The Council and Board considered a range of alternatives for the commercial black sea bass state allocation percentages. These alternatives are illustrated in Figure 2 and described in detail in the following sections. The range of alternatives and the alternative numbers differ from those presented during public hearings and the joint Council and Board meetings when final action took place. The alternative structure was modified to allow for analysis of alternatives considered by the Council and Board during final action (including a preferred alternative) that fell within the range of alternatives included in previous documents.

Under all alternatives below, the Council and Board would review the allocations at least once every 10 years to determine whether additional modifications may be warranted (MAFMC 2019). If they determine that modifications may be warranted, both groups will initiate a management action (e.g., an FMP framework and addendum) to revise the allocations.

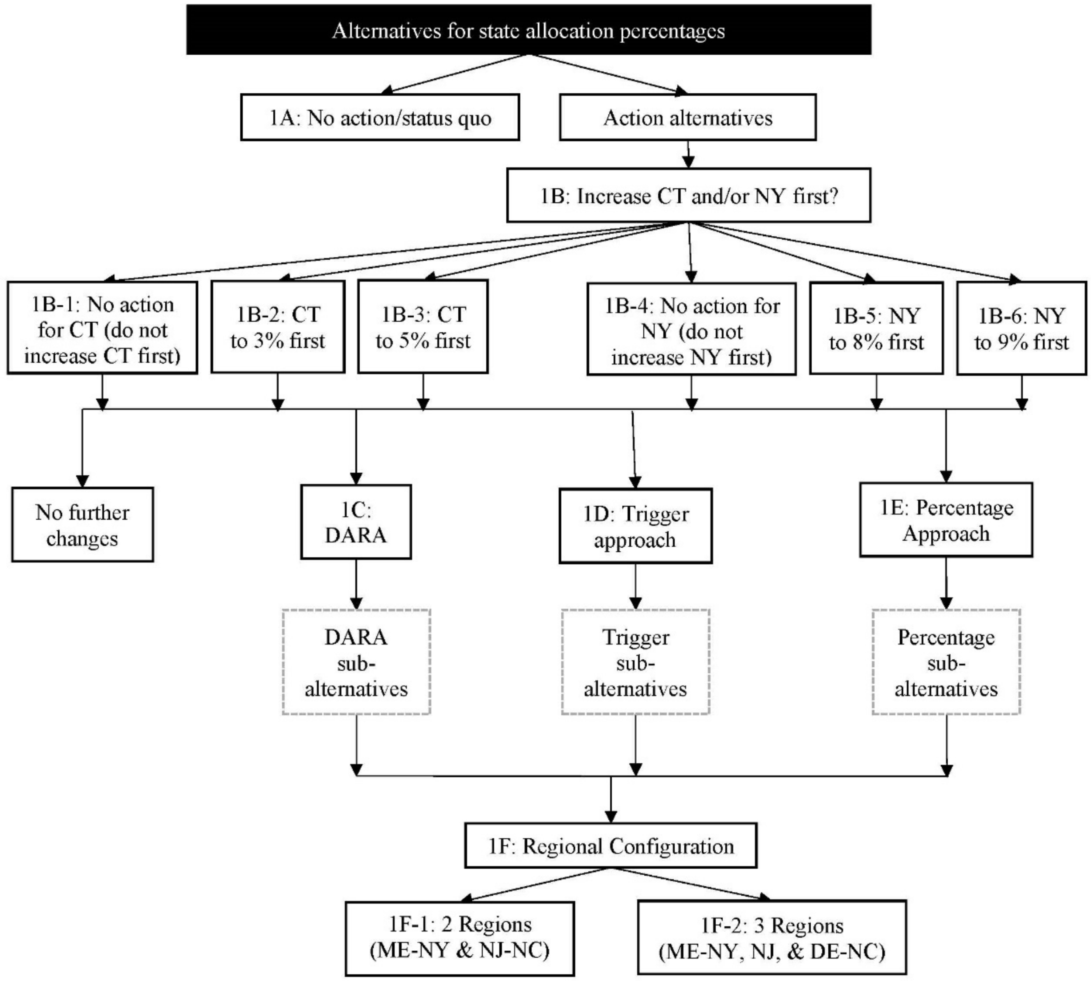


Figure 2: Flowchart summarizing alternatives considered for state allocation percentages.

### 5.1.1 Alternative 1A: No Action

This alternative would maintain the state allocation percentages implemented through Amendment 13 (Table 3). This alternative could not be used in combination with any other alternatives in alternative set 1; however, it could be used in combination with any alternatives in alternative sets 2 and 3.

The Council and Board did not select this as a preferred alternative because they agreed that the allocations should be revised to account for both the historical dependence of the states on the commercial black sea bass fishery and changes in black sea bass distribution over time.

### 5.1.2 Alternative Set 1B: Increase Connecticut and/or New York Allocations First or as Only Change

Black sea bass abundance in Long Island Sound has greatly increased over the last several years (Figure 3). The Council and Board agreed that Connecticut is uniquely disadvantaged by its 1% allocation under Amendment 13 combined with recent black sea bass availability in Connecticut state waters. For this reason, the Council and Board considered alternatives which would address Connecticut's allocation either as a standalone change or prior to applying other adjustments which would impact all states (alternatives 1B-1 - 1B-3). Given that Long Island Sound is shared by Connecticut and New York state waters, similar alternatives were also considered for New York (alternatives 1B-4 - 1B-6). One alternative must be selected for Connecticut (i.e., either alternative 1B-1, 1B-2, or 1B-3), and one for New York (i.e., either alternative 1B-4, 1B-5, or 1B-6).

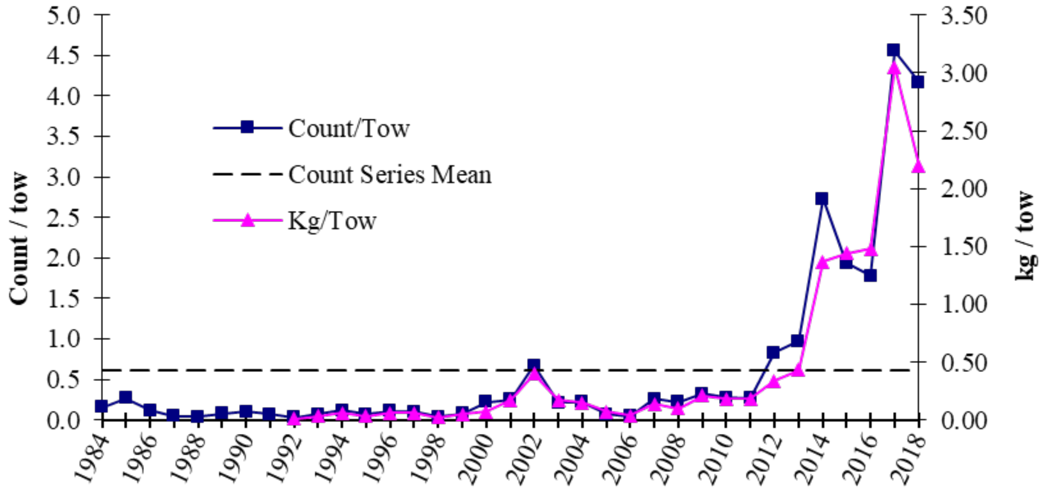


Figure 3: Connecticut Long Island Sound Trawl Survey spring black sea bass index. Source: Personal communication with CT DEEP staff.

#### 5.1.2.1 Alternative 1B-1: No Action for Connecticut (Connecticut Not Addressed Separately)

Under this alternative, Connecticut would not be addressed in a unique manner compared to all other states. Connecticut's allocation could be modified along with those for other states through alternative sets 1C (DARA, Section 5.1.3), 1D (trigger approach, Section 5.1.4), or 1E (percentage approach, Section 5.1.5).

The Council and Board did not select this as a preferred alternative because they agreed that Connecticut is uniquely disadvantaged by their 1% allocation under Amendment 13 combined with increased local abundance of black sea bass.

##### 5.1.2.1.1 Alternative 1B-2: Increase Connecticut's Baseline Allocation by 2% (Preferred)

This alternative would increase Connecticut's 1% allocation to 3% either as a standalone change or prior to applying other changes through alternative sets 1C (DARA, Section 5.1.3), 1D (trigger approach, Section 5.1.4), or 1E (percentage approach, Section 5.1.5).

This alternative would use the following approach to increase Connecticut's allocation to 3%.

1. Leave New York and Delaware allocations unchanged, unless New York's starting allocation is also increased through alternatives 1B-5 or 1B-6.
2. Move half of Maine and New Hampshire allocations to Connecticut. If used in combination with alternatives 1B-5 or 1B-6, half of Maine and New Hampshire's allocations would be moved to New York and Connecticut collectively.
3. Move some allocation from Massachusetts, Rhode Island, New Jersey, Maryland, Virginia, and North Carolina to Connecticut (or to New York and Connecticut if used in

combination with alternatives 1B-5 or 1B-6). The amount moved from each state would be proportional to that state's Amendment 13 allocation.

The rationale for leaving New York's allocation unchanged (unless otherwise modified through alternatives 1B-5 or 1B-6) is that New York and Connecticut state waters share Long Island Sound and therefore have seen similar increases in black sea bass abundance in that region (Figure 3).

This alternative was not included in amendment documents prior to final action in February 2021. It is a modified version of alternative 1B-3 (Section 5.1.2.1.2), which was included in prior amendment documents and would increase Connecticut's allocation to 5%. Delaware's current allocation is 5% and is the next lowest allocation after Connecticut, Maine, and New Hampshire. Alternative 1B-3 sought to bring Connecticut in line with Delaware so that 5% would become a de facto minimum allocation (or starting allocation if this alternative is used in combination with other alternatives) for all states except Maine and New Hampshire. The Council and Board approved this modified version of alternative 1B-3 in February 2021 when they selected this as a preferred alternative. They agreed to bring Connecticut's allocation to 3%, but did not change the calculation methodology compared to what was previously considered (represented by alternative 1B-3); therefore, Delaware's 5% allocation would remain unchanged under this alternative.

Since 2012, neither Maine nor New Hampshire have reported commercial black sea bass landings. For this reason, it was deemed appropriate to move half of their allocations to Connecticut under this alternative.

The increase to 3% as opposed to a different amount is not based on a quantitative analysis. It is based on input from Connecticut Board members regarding the potential harvesting and processing capacity in that state and considerations related to fairness for other states.

The Council and Board selected this as a preferred alternative because they agreed that Connecticut is uniquely disadvantaged by their Amendment 13 allocation compared to other states. They agreed that an increase to 3% under this alternative is a more appropriate compromise for all states than the 5% increase considered under alternative 1B-3.

#### 5.1.2.1.2 Alternative 1B-3: Increase Connecticut's Baseline Allocation by 3%

This alternative would increase Connecticut's 1% allocation to 5% either as a standalone change or prior to applying other changes through alternative sets 1C (DARA, Section 5.1.3), 1D (trigger approach, Section 5.1.4), or 1E (percentage approach, Section 5.1.5).

This alternative would use the following approach to increase Connecticut's allocation to 5%.

1. Leave New York and Delaware allocations unchanged, unless New York's starting allocation is also increased through alternatives 1B-5 or 1B-6.
2. Move half of Maine and New Hampshire allocations to Connecticut. If used in combination with alternatives 1B-5 or 1B-6, half of Maine and New Hampshire's allocations would be moved to New York and Connecticut collectively.
3. Move some allocation from Massachusetts, Rhode Island, New Jersey, Maryland, Virginia, and North Carolina to Connecticut (or to New York and Connecticut if used in combination with alternatives 1B-5 or 1B-6). The amount moved from each state would be proportional to that state's Amendment 13 allocation.

The rationale behind this alternative is the same as that described above for alternative 1B-2. The increase to 5% as opposed to a different amount was not based on a quantitative analysis. It was based on input from Connecticut Board members regarding the potential harvesting and processing capacity in that state and considerations related to fairness for other states.

The Council and Board did not select this as a preferred alternative because they preferred a more moderate increase in Connecticut's allocation to 3% (alternative 1B-2), rather than 5% under this alternative.

#### 5.1.2.2 Alternative 1B-4: No Action for New York (New York Not Addressed Separately)

Under this alternative, New York would not be addressed in a unique manner compared to all other states. New York's allocation could be modified along with those for other states through alternative sets 1C (DARA, Section 5.1.3), 1D (trigger approach, Section 5.1.4), or 1E (percentage approach, Section 5.1.5).

The Council and Board did not select this as a preferred alternative because they agreed that Connecticut is uniquely disadvantaged by their 1% allocation under Amendment 13 combined with increased local abundance of black sea bass. They also agreed that New York should be given similar consideration to that of Connecticut as Long Island Sound is shared by Connecticut and New York State waters.

##### 5.1.2.2.1 Alternative 1B-5: Increase New York's Baseline Allocation by 1% (Preferred)

This alternative would increase New York's 7% allocation to 8% either as a standalone change or prior to applying other changes through alternative sets 1C (DARA, Section 5.1.3), 1D (trigger approach, Section 5.1.4), or 1E (percentage approach, Section 5.1.5).

This alternative would use the following approach to increase New York's allocation to 8%.

1. Leave Connecticut and Delaware allocations unchanged, unless Connecticut's starting allocation is also increased through alternatives 1B-2 or 1B-3.
2. Move half of Maine and New Hampshire allocations to New York. If used in combination with alternatives 1B-2 or 1B-3, half of Maine and New Hampshire's allocations would be moved to New York and Connecticut collectively.
3. Move some allocation from Massachusetts, Rhode Island, New Jersey, Maryland, Virginia, and North Carolina to New York (or to New York and Connecticut if used in combination with alternatives 1B-2 or 1B-3). The amount moved from each state would be proportional to that state's Amendment 13 allocation.

The increase by 1% as opposed to a different amount was not based on a quantitative analysis. It was based on input from New York Council and Board members regarding the potential harvesting and processing capacity in that state and considerations related to fairness for other states.

The Council and Board selected this as a preferred alternative because they agreed that Connecticut is uniquely disadvantaged by their current 1% allocation combined with increased local abundance of black sea bass. They also agreed that New York should be given similar consideration to that of Connecticut as Long Island Sound is shared by Connecticut and New York State waters. They agreed that a 1% increase to New York's baseline quota, as opposed to a greater increase, is fair given concerns about the required decrease in the baseline allocations for other states. In addition, New York's starting 7% allocation was not seen as disadvantageous to the same extent as Connecticut's starting 1% allocation.

##### 5.1.2.2.2 Alternative 1B-6: Increase New York's Baseline Allocation by 2%

This alternative would increase New York's 7% allocation to 9% either as a standalone change or prior to applying other changes through alternative sets 1C (DARA, Section 5.1.3), 1D (trigger approach, Section 5.1.4), or 1E (percentage approach, Section 5.1.5).

This alternative would use the following approach to increase New York's allocation to 9%.

1. Leave Connecticut and Delaware allocations unchanged, unless Connecticut's staring allocation is also increased through alternatives 1B-2 or 1B-3.
2. Move half of Maine and New Hampshire allocations to New York. If used in combination with alternatives 1B-2 or 1B-3, half of Maine and New Hampshire's allocations would be moved to New York and Connecticut collectively.
3. Move some allocation from Massachusetts, Rhode Island, New Jersey, Maryland, Virginia, and North Carolina to New York (or to New York and Connecticut if used in combination with alternatives 1B-2 or 1B-3). The amount moved from each state would be proportional to that state's Amendment 13 allocation.

The increase by 2% as opposed to a different amount was not based on a quantitative analysis. It was based on input from New York Council and Board members regarding the potential harvesting and processing capacity in that state and considerations related to fairness for other states.

The Council and Board did not select this as a preferred alternative because they preferred a more moderate 1% increase in New York's allocation (alternative 1B-5), rather than 2% under this alternative.

### 5.1.3 Alternative Set 1C: Dynamic Adjustments to Regional Allocations (DARA)

The Dynamic Adjustments to Regional Allocations (DARA) approach is a formulaic method that aims to balance economic stability with responsiveness to the changing distribution of the stock. State allocations would be gradually adjusted based on regional shifts in biomass distribution. Stock distribution (defined as proportion of exploitable biomass by assessment sub-area) would be derived from updated stock assessments when possible.[5] Alternative data sources such as coastwide fisheries-independent trawl surveys may be used if future stock assessments do not provide regional distribution estimates. This approach recognizes traditional involvement and investment in the development of the fishery and addresses the changing distribution of the stock and the resulting effects within the fishery.

There are two phases to the DARA approach. The first is the transition phase, during which the initial allocations (either the Amendment 13 allocations, or the baseline allocations as modified through alternative set 1B) would be gradually adjusted to allocations partially based on distribution of the stock. During this phase, the allocations would become less dependent on the initial allocations and more dependent on regional biomass distribution.

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[5] This alternative is modeled after the Transboundary Management Guidance Committee (TMGC) approach, which was developed and used for the management of Georges Bank resources shared by the United States and Canada (TMGC 2002).

After the transition phase is complete, the relative importance of the initial allocations and biomass distribution in determining the allocations would be fixed, but allocations would continue to be adjusted when updated stock distribution information becomes available. The two components (i.e., initial allocations and stock distribution) would be integrated to produce dynamic regional allocations, which would then be subdivided into state-specific allocations.

As described below, there are many sub-alternatives to set the scale and pace of the change in allocations. The DARA approach requires selection of one sub-alternative from each of sub-alternative sets 1C-1 through 1C-4, as well as selection of one sub-alternative from alternative set 1F, which defines the regions.

A more detailed description of the method and examples of the DARA approach applied retrospectively to recent years can be found in Appendix 2 of the Council's Public Hearing Document (MAFMC 2020c).

The Council and Board did not select the DARA approach as a preferred alternative. They instead preferred the percentage approach (alternative 1E, Section 5.1.5) because it offered a simpler way to modify the allocations to partially account for biomass distribution.

#### 5.1.3.1 Sub-Alternative Set 1C-1: Final Relative Importance of Initial Allocations Vs. Stock Distribution Under DARA Approach

These sub-alternatives determine the final relative importance of the initial allocations compared to stock distribution at the end of the transition phase under the DARA approach. Before the transition begins, the allocations would be 100% based on the initial allocations, and 0% based on stock distribution. The weights assigned to initial allocations and stock distribution must always sum to 100%; therefore, if the final weight of the initial allocations is 60%, the final weight of the resource distribution factor is 40%. As the final weight of the distribution factor increases, the weight of the initial allocations decreases, and the regional allocations resulting from the DARA approach become more dependent on the spatial distribution of black sea bass biomass, and less dependent on the initial allocations.

Sub-alternatives 1C-1A and 1C-1B define the minimum and maximum bounds for the final relative weights of the initial allocations and stock distortion. It was intended that the Council and Board could select final relative weights from within this range. The Council and Board did not select the DARA approach as a preferred alternative; therefore, they did not select preferred sub-alternatives.

##### 5.1.3.1.1 Sub-Alternative 1C-1A: Final Relative Weights of 90% Stock Distribution And 10% Initial Allocations Under DARA Approach

Under this sub-alternative, at the end of the transition phase, the state allocations would be based 90% on stock distribution and 10% on the initial allocations.

This sub-alternative defines the maximum bound for the relative importance of stock distribution and, therefore, the minimum bound for the relative importance of the initial allocations.

The Council and Board agreed that 90% was a reasonable maximum final relative importance of stock distribution in the allocations because they wanted the allocations to maintain a partial basis (in this case, 10%) on the initial allocations to recognize the historical dependence of the states on the black sea bass fishery.

This was not selected as a preferred alternative because the Council and Board preferred the percentage approach (alternative 1E, Section 5.1.5) over the DARA approach.

#### 5.1.3.1.2 Sub-Alternative 1C-1B: Final Relative Weights of 50% Stock Distribution And 50% Initial Allocations Under DARA Approach

Under this sub-alternative, at the end of the transition phase, the state allocations would be based 50% on stock distribution and 50% on the initial allocations.

This sub-alternative defines the minimum bound for the relative importance of stock distribution and, therefore, the maximum bound for the relative importance of the initial allocations.

The Council and Board agreed that 50% was a reasonable minimum final relative importance of stock distribution in the allocations because lower percentages may not have adequately met the goal of this amendment (Section 4). In addition, a lesser emphasis on stock distribution may not require the built-in transition period under DARA and could be achieved through other alternatives such as the trigger approach (alternative 1D, Section 5.1.4) or percentage approach (alternative 1E, Section 5.1.5).

This was not selected as a preferred alternative because the Council and Board preferred the percentage approach (alternative 1E, Section 5.1.5) over the DARA approach.

### 5.1.3.2 Sub-Alternative Set 1C-2: Changes in Relative Weights of Each Factor Per Adjustment Under DARA Approach

Under the DARA approach, the transition to allocations based partially on historical allocations and partially on stock distribution would occur through incremental adjustments to the relative importance of each factor. The following sub-alternatives determine the scale of change in relative weights of the initial allocations and stock distribution factors with each adjustment. Larger adjustments could result in a faster transition away from the initial allocations. Smaller adjustments could result in a slower transition.

Sub-alternatives 1C-2A and 1C-2B define the minimum and maximum bounds for the change in the relative weights of the initial allocations and stock distortion per adjustment. It was intended that the Council and Board could select a percent change per adjustment from within this range. The Council and Board did not select the DARA approach as a preferred alternative; therefore, they did not select preferred sub-alternatives from within this range.

#### 5.1.3.2.1 Sub-Alternative 1C-2A: 5% Change in Relative Weight Per Adjustment Under DARA Approach

Under this sub-alternative, the relative weights of each factor (initial allocations and stock distribution) would change by 5% per adjustment. For example, in the first adjustment, the respective weights assigned to the initial allocations and stock distribution would change from 100% and 0% to 95% and 5%. This would result in a slower transition to the final weighting scheme, and a slower change in the allocations compared to sub-alternative 1C-2B.

This sub-alternative defines the minimum change in relative weights per adjustment. The Council and Board agreed that 5% was a reasonable minimum change per adjustment as smaller minimum changes could result in very slow changes in the allocations, which may not adequately meet the goal of this action (Section 4).

This was not selected as a preferred alternative because the Council and Board preferred the percentage approach (alternative 1E, Section 5.1.5) over the DARA approach.

##### 5.1.3.2.2 Sub-Alternative 1C-2B: 20% Change in Relative Weight Per Adjustment Under DARA Approach

Under this sub-alternative, the relative weights of each factor (initial allocations and stock distribution) would change by 20% per adjustment. For example, in the first adjustment, the respective weights assigned to the initial allocations and stock distribution would change from 100% and 0% to 80% and 20%. This would result in a faster transition to the final weighting scheme and a faster change in the allocations compared to sub-alternative 1C-2A.

This sub-alternative defines the maximum change in relative weights per adjustment. The Council and Board agreed that 20% was a reasonable maximum change per adjustment as would require major changes in the allocations to be phased in over multiple years. This could help prevent undesirable disruptions in the fishery.

This was not selected as a preferred alternative because the Council and Board preferred the percentage approach (alternative 1E, Section 5.1.5) over the DARA approach.

#### 5.1.3.3 Sub-Alternative Set 1C-3: Frequency of Weight Adjustments Under DARA Approach

These sub-alternatives determine how often the weights assigned to each factor (initial allocations and stock distribution) would be adjusted during the transition phase. More frequent adjustments to the weights would result in a faster transition to the final weighting scheme.

Under the DARA approach, either sub-alternative 1C-3A or 1C-3B must be selected. The Council and Board did not select the DARA approach as a preferred alternative; therefore, they did not select preferred sub-alternatives from within this range.

##### 5.1.3.3.1 Sub-Alternative 1C-3A: Weight Adjustments Every Year Under DARA Approach

Under this sub-alternative, adjustments to the weights assigned to the initial allocations and stock distribution would occur every year. This would result in a faster transition from the initial weights to the final weights compared to sub-alternative 1C-3B. It could also result in yearly changes in the allocations during the transition period, even if stock distribution information remains unchanged.

This was not selected as a preferred alternative because the Council and Board preferred the percentage approach (alternative 1E, Section 5.1.5) over the DARA approach.

##### 5.1.3.3.2 Sub-Alternative 1C-3B: Weight Adjustments Every Other Year Under DARA Approach

Under this sub-alternative, adjustments to the weights assigned to the initial allocations and stock distribution would occur every other year. This would result in a slower transition from the initial weights to the final weights compared to sub-alternative 1C-3A. It could result in changes to the allocations every other year during the transition period, even if stock distribution information remains unchanged.

Less frequent changes than every other year were not considered. Under this alternative, allocation changes would align with the anticipated timing of future stock assessment updates (and therefore the timing of updated information on stock distribution). If a slower pace of change had been desired, it could have been achieved through other DARA sub-alternatives such as lesser changes in the relative weights of the initial allocation and stock distribution factors per adjustment (alternative set 1C-2, Section 5.1.3.2) or a regional allocation adjustment cap (alternative set 1C-4, next section).

This was not selected as a preferred alternative because the Council and Board preferred the percentage approach (alternative 1E, Section 5.1.5) over the DARA approach.

#### 5.1.3.4 Sub-Alternative Set 1C-4: Regional Allocation Adjustment Cap Under DARA Approach

These sub-alternatives would establish a cap for the maximum percent by which the regional allocations could change at one time. A lower percentage cap would result in smaller incremental changes to the allocations and could increase the total duration of the transition phase.

Under the DARA approach, the Council and Board must choose either no regional allocation adjustment cap (sub-alternative 1C-4C), or they must select a cap from within the range defined by sub-alternatives 1C-4A and 1C-4B. The Council and Board did not select the DARA approach as a preferred alternative; therefore, they did not select preferred sub-alternatives from within this range.

##### 5.1.3.4.1 Sub-Alternative 1C-4A: 3% Regional Allocation Adjustment Cap Under DARA Approach

This sub-alternative would cap the change in regional allocations at a maximum of 3% per adjustment. This sub-alternative defines the minimum regional allocation adjustment cap. The Council and Board agreed that, if a cap is desired, 3% would be a reasonable minimum cap as smaller minimum caps could result in very slow changes in the allocations, which may not adequately meet the goal of this action (Section 4).

This was not selected as a preferred alternative because the Council and Board preferred the percentage approach (alternative 1E, Section 5.1.5) over the DARA approach.

##### 5.1.3.4.2 Sub-Alternative 1C-4B: 10% Regional Allocation Adjustment Cap Under DARA Approach

This sub-alternative would cap the change in regional allocations at a maximum of 10% per adjustment. This sub-alternative defines the maximum regional allocation adjustment cap. The Council and Board agreed that 10% would be a reasonable maximum cap as it would prevent large swings in the regional allocations per adjustment and thus help to minimize the potential for detrimental socioeconomic disruptions. If larger changes were desired, alternative 1C-4C (no allocation adjustment cap) could be selected.

This was not selected as a preferred alternative because the Council and Board preferred the percentage approach (alternative 1E, Section 5.1.5) over the DARA approach.

##### 5.1.3.4.3 Sub-Alternative 1C-4C: No Regional Allocation Adjustment Cap Under DARA Approach

Under this sub-alternative there would be no cap to the change in regional allocations per adjustment. This means the regional allocations would change under the DARA formula based only on changes in the weights assigned to the initial allocations and stock distribution and any changes in resource distribution values.

This was not selected as a preferred alternative because the Council and Board preferred the percentage approach (alternative 1E, Section 5.1.5) over the DARA approach.

### 5.1.4 Alternative Set 1D: Trigger Approach

Under a trigger approach, a minimum level of coastwide quota would be established as a trigger for a change in allocations to the states. If the coastwide quota in a given year is higher than the trigger value, then the coastwide quota would be distributed to the states in two steps:

1) The amount of coastwide quota up to and including the trigger would be distributed to the states according to "base allocations" (dependent on alternative set 1B and sub-alternative set 1D-4); and
2) The amount of quota in excess of the established trigger amount, hereafter referred to as the surplus quota, would be distributed using a different allocation scheme.

This method aims to minimize fishery disruption or instability by allowing changes to state allocations only when the coastwide quota exceeds a predetermined amount.

Under this approach, a trigger value must be selected from within the range defined by sub-alternatives 1D-1A and 1D-1B. In addition, either sub-alternative 1D-2A (even distribution of surplus quota) or 1D-2B (distribution of surplus quota based on regional biomass from stock assessment) must be selected to determine how to distribute the surplus quota.

If sub-alternative 1D-2A were selected, then no other sub-alternatives in this alternative set would be used. If sub-alternative 1D-2B were selected, either sub-alternative 1D-3A or 1D-3B must also be selected to determine how to distribute regional surplus quota among states within a region, and either sub-alternative 1D-4A or 1D-4B must be selected to determine if the base allocations are static or dynamic. All sub-alternatives are described in more detail below.

The Council and Board did not select the trigger approach as a preferred alternative because it would only modify the state allocations when the total coastwide quota exceeds a certain amount (i.e., the trigger). Future quotas are uncertain as they will change in response to updated stock assessment information. In addition, the ongoing Summer Flounder, Scup, and Black Sea Bass Commercial/Recreational Allocation Amendment may result in a revised commercial/ recreational allocation which would impact future quotas. Given these uncertainties, it was challenging to define an appropriate trigger level and the Council and Board agreed that the percentage approach (alternative 1E, Section 5.1.5) would better meet the goal of this amendment.

#### 5.1.4.1 Sub-Alternative Set 1D-1: Trigger Value

Under the trigger approach, a trigger value from within the range defined by sub-alternatives 1D-1A and 1D-1B would be used to determine when the state allocations would be modified. Any trigger value from within this range could be selected.

As previously stated, the Council and Board did not select the trigger approach as a preferred alternative; therefore, they did not select a preferred trigger value.

#### 5.1.4.1.1 Sub-Alternative 1D-1A: 3 Million Pound Trigger Value

Under this sub-alternative, the coastwide quota up to and including 3 million pounds would be distributed according to the base allocations. Any remaining surplus quota would be allocated according to the sub-alternatives selected from sub-alternative set 1D-2.

A 3 million pound trigger represents approximately the average coastwide commercial quota from 2003 through 2018, excluding years when catch and landings limits were based on a constant catch approach (i.e., 2010-2015, Figure 4). This represents the lower bound of the trigger values considered by the Council and Board. They agreed this was an appropriate lower bound for consideration because it would allow for some degree of socioeconomic stability as the state allocations would only change when the quota exceeds the recent average.

As previously stated, the Council and Board did not select the trigger approach as a preferred alternative; therefore, they did not select a preferred trigger value.

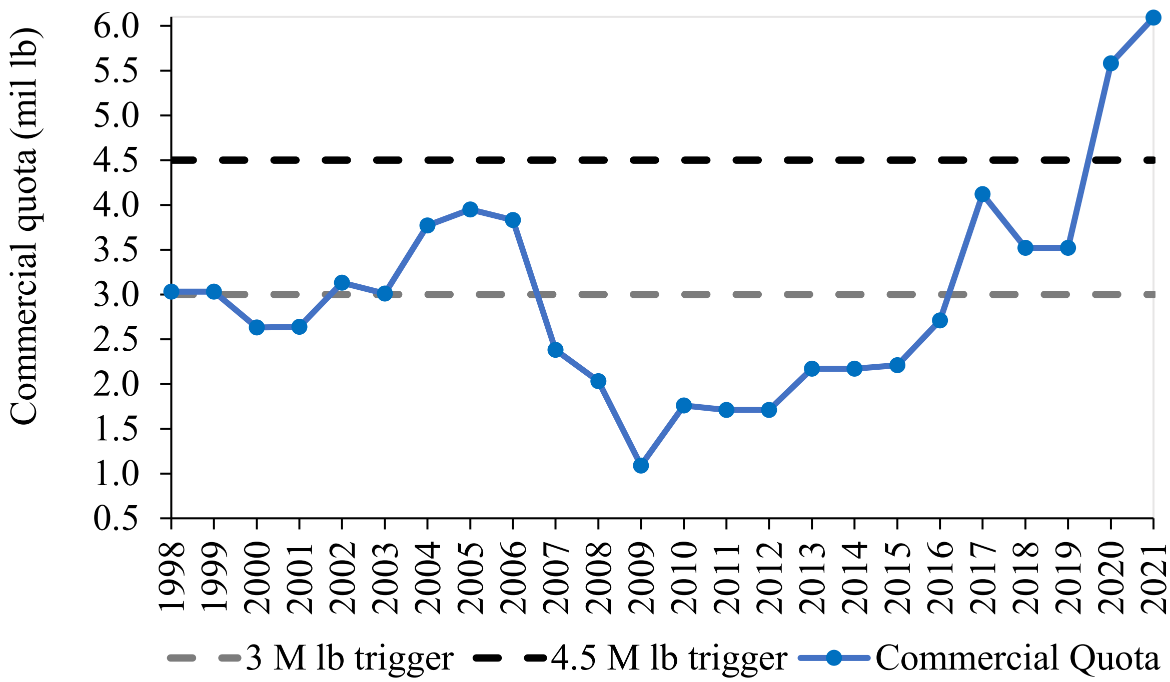


Figure 4: Black sea bass commercial quotas, 1998-2021, compared to 3 million and 4.5 million pound trigger values.

#### 5.1.4.1.2 Sub-Alternative 1D-1B: 4.5 Million Pound Trigger Value

Under this sub-alternative, the coastwide quota up to and including 4.5 million pounds would be distributed according to the base allocations. Any remaining surplus quota would be allocated according to the sub-alternatives selected from sub-alternative set 1D-2. A 4.5 million pound trigger was selected by the Council and Board as the maximum trigger level for consideration under this approach. It is greater than all quotas implemented prior to 2020, but lower than the 2020 quota of 5.58 million pounds and the 2021 quota of 6.09 million pounds (Figure 4).

This represents the upper bound of the trigger values considered by the Council and Board. It would result in less frequent adjustments to the state allocations than alternative 1D-1A. It would provide more socioeconomic stability, but less responsiveness to changing conditions.

As previously stated, the Council and Board did not select the trigger approach as a preferred alternative; therefore, they did not select a preferred trigger value.

#### 5.1.4.2 Sub-Alternative Set 1D-2: Distribution of Surplus Quota Under Trigger Approach

The following alternatives consider how surplus quota above the trigger value (if any) would be distributed among the states. Under the trigger approach, either sub-alternative 1D-2A or 1D-2B must be selected. If alternative 1D-2A is selected, there are no further sub-alternatives. If sub-alternative 1D-2B is selected, further sub-alternatives must be selected, as described below.

As previously stated, the Council and Board did not select the trigger approach as a preferred alternative; therefore, they did not select a preferred method of distribution of surplus quota.

##### 5.1.4.2.1 Sub-Alternative 1D-2A: Even Distribution of Surplus Quota Under Trigger Approach

Under this sub-alternative, any available surplus quota would be distributed equally to the states of Massachusetts through North Carolina. Maine and New Hampshire would each receive 1% of the surplus, based on their historically low participation in the fishery.

This was not selected as a preferred alternative because the Council and Board selected the percentage approach (alternative 1E, Section 5.1.5) as their preferred alternative, not the trigger approach.

##### 5.1.4.2.2 Sub-Alternative 1D-2B: Distribution of Surplus Quota Based on Regional Biomass

This sub-alternative attempts to address the goal of this action (Section 4) by accounting for regional biomass distribution in the state allocations. Under this alternative, any available surplus quota would first be divided among the regions (alternative set 1F, Section 5.1.7) based on regional biomass proportions from the stock assessment.[6] The regional allocation would be further divided among states within a region based on the methodology specified under sub-alternative 1D-3A or 1D-3B. If this alternative is selected, a regional configuration must also be selected under alternative set 1F.

This was not selected as a preferred alternative because the Council and Board selected the percentage approach (alternative 1E, Section 5.1.5) as their preferred alternative, not the trigger approach.

#### 5.1.4.3 Sub-Alternative Set 1D-3: Distribution of Surplus Quota to States Within a Region (Only Applicable Under Sub-Alternative 1D-2B)

The Council and Board considered the following two alternatives for how the regional surplus would be divided amongst states within a region. These two-sub alternatives are only applicable under sub-alternative 1D-2B. They would not be used with sub-alternative 1D-2A (even distribution of surplus quota).

The Council and Board did not select either of the sub-alternatives below as preferred because they chose to use the percentage approach (alternative 1E, Section 5.1.5), rather than the trigger approach.

[6] If this information is not available from the stock assessment (e.g., due to a change in the underlying assessment model), then alternative data sources such as coastwide fisheries-independent trawl surveys may be used.

#### 5.1.4.3.1 Sub-Alternative 1D-3A: Even Distribution of Regional Surplus Quota (Only Applicable Under Sub-Alternative 1D-2B)

This sub-alternative is only applicable if sub-alternative 1D-2B is also selected. Under this sub-alternative, regional surplus quota would be divided equally among the states within each region. Maine and New Hampshire would each receive 1% of the northern region surplus quota given their historically low participation in the fishery.

This was not selected as a preferred alternative because the Council and Board selected the percentage approach (alternative 1E, Section 5.1.5) as their preferred alternative, not the trigger approach.

### 5.1.4.4 Sub-Alternative 1D-3B: Proportional Distribution of Regional Surplus Quota (Only Applicable Under Sub-Alternative 1D-2B)

This sub-alternative is only applicable if sub-alternative 1D-2B is also selected. Under this sub-alternative, regional surplus quota would be divided among the states within each region in proportion to their base allocations (see sub-alternative set 1D-4). Maine and New Hampshire would each receive 1% of the northern region surplus quota given their historically low participation in the fishery.

This was not selected as a preferred alternative because the Council and Board selected the percentage approach (alternative 1E, Section 5.1.5) as their preferred alternative, not the trigger approach.

### 5.1.4.5 Sub-Alternative Set 1D-4: Static or Dynamic Base Allocations (Only Applicable Under Sub-Alternative 1D-2B)

The Council and Board considered two sub-alternatives for how the base allocations would be defined under a trigger approach with surplus quota divided based on stock biomass (alternative 1D-2B). These two sub-alternatives are described below. As previously stated, because the trigger approach was not the preferred alternative, neither of these sub-alternatives were selected as preferred.

#### 5.1.4.5.1 Sub-Alternative 1D-4A: Static Base Allocations (Only Applicable Under Sub-Alternative 1D-2B)

This sub-alternative is only applicable if sub-alternative 1D-2B (trigger approach with surplus divided based on stock biomass) is also selected. Under this sub-alternative, the quota up to and including the trigger amount would be allocated based on the <u>initial</u> base allocations every year (either the Amendment 13 allocations or the modified allocations proposed in alternative set 1B). These base allocations would not change over time.

This was not selected as a preferred alternative because the Council and Board selected the percentage approach (alternative 1E, Section 5.1.5) as their preferred alternative, not the trigger approach.

#### 5.1.4.5.2 Sub-Alternative 1D-4B: Dynamic Base Allocations (Only Applicable Under Sub-Alternative 1D-2B)

This sub-alternative is only applicable if sub-alternative 1D-2B (trigger approach with surplus divided based on stock biomass) is also selected. Under this sub-alternative, the quota up to and including the trigger amount would be allocated according to the previous year’s final state allocations. In this way, the base allocations are dynamic. This sub-alternative has the potential to change allocations more quickly than sub-alternative 1D-4A.

This was not selected as a preferred alternative because the Council and Board selected the percentage approach (alternative 1E, Section 5.1.5) as their preferred alternative, not the trigger approach.

### 5.1.5 Alternative Set 1E: Percentage of Coastwide Quota Distributed Based on Initial Allocations (Preferred)

This approach would allocate a fixed percentage of the annual coastwide quota using the initial allocations (i.e., the Amendment 13 allocations or the modified allocations under alternative set 1B) regardless of the coastwide quota level. This method aims to minimize fishery disruption or instability by always allocating a portion of the total quota based on the initial allocations.

Fluctuations in the coastwide quota would result in similar fluctuations in the number of pounds allocated using the initial allocations. Unlike the trigger approach, this approach would allow a portion of the quota to be allocated differently than the initial allocations each year, regardless of the overall quota level. The sub-alternatives below establish how the remaining quota would be allocated to the states.

The Council and Board selected this as the preferred approach as the revised allocations would account for both the historical dependence of the states on the black sea bass fishery as well as changing stock distribution over time. The preferred sub-alternatives indicated below reflect their preferred balance of these two considerations.

#### 5.1.5.1 Sub-Alternative Set 1E-1: Percentage of Quota Allocated Based on Initial Allocations

The following two sub-alternatives define the proportion of the coastwide quota that would be allocated based on the initial allocations. They were intended to represent a range and any value from within this range could have been selected as the preferred alternative.

##### 5.1.5.1.1 Sub-Alternative 1E-1A: 25% of Coastwide Quota Allocated Using Initial Allocations

Under this sub-alternative, 25% of the annual coastwide quota would be allocated to the states using the initial allocations. The remaining 75% of the coastwide quota would be allocated to the states according to the sub-alternative(s) selected from sub-alternative set 1E-2.

This was not selected as a preferred alternative because it has the potential to result in a greater departure from the historical allocations than alternative 1E-1B (see next section). Alternative 1E-1B was preferred because it allows more socioeconomic stability.

##### 5.1.5.1.2 Sub-Alternative 1E-1B: 75% of Coastwide Quota Allocated Using Initial Allocations (Preferred)

Under this sub-alternative, 75% of the annual coastwide quota would be allocated to the states using the initial allocations. The remaining 25% of the coastwide quota would be allocated to the states according to the sub-alternative(s) selected from sub-alternative set 1E-2.

This was selected by the Council and Board as a preferred alternative because it provides socioeconomic stability while also allowing for some adjustments to account for changing stock distribution.

#### 5.1.5.2 Sub-Alternative Set 1E-2: Distribution of Remaining Quota Under Percentage Approach

Under the percentage approach, either sub-alternative 1E-2A or 1E-2B must be selected to define how the remaining coastwide quota would be distributed among the states. If sub-alternative 1E-2B is selected, either sub-alternative 1E-3A or 1E-3B must also be selected to define how the regional allocation is further divided among the states within a region.

##### 5.1.5.2.1 Sub-Alternative 1E-2A: Even Distribution of Remaining Quota Under Percentage Approach

Under this sub-alternative, remaining quota would be distributed equally among the states of Massachusetts through North Carolina. Maine and New Hampshire would each receive 1% of the remaining quota, based on their historically low participation in the fishery.

The Council and Board did not select this as a preferred alternative because it would not meet the goal of this amendment (Section 4) as the resulting allocations would not account for biomass distribution.

##### 5.1.5.2.2 Sub-Alternative 1E-2B: Distribution of Remaining Quota Based on Regional Biomass from Stock Assessment (Preferred)

Under this sub-alternative, remaining quota would first be allocated to each region based on regional biomass proportions from the stock assessment. If this information is not available from the stock assessment (e.g., due to a change in the underlying assessment model), then alternative data sources such as coastwide fisheries-independent trawl surveys may be used.

The regional quotas would then be further divided among the states within each region based on the methodology specified under sub-alternative 1E-3A or 1E-3B. A regional configuration would also be selected under alternative set 1F.

The Council and Board selected this as a preferred alternative because it would meet the goal of this amendment (Section 4) by defining allocations that are in part based on recent biomass distribution. The allocations would be updated through the annual specifications process each time new distribution information is available, thus helping to ensure that the allocations continue to reflect changing conditions into the future.

##### 5.1.5.2.3 Sub-Alternative Set 1E-3: Distribution of Regional Quota Among States Within a Region (Only Applicable Under Sub-Alternative 1E-2B)

If remaining quota is divided among regions based on biomass distribution (alternative 1E-2B), then one of the following two sub-alternatives must be selected to define how the regional quota is further distributed among states within a region.

##### 5.1.5.2.4 Sub-Alternative 1E-3A: Even Distribution of Regional Quota (Only Applicable Under Sub-Alternative 1E-2B)

Under this sub-alternative, remaining quota would be equally distributed to the states within each region, except Maine and New Hampshire would each receive 1% of the northern region quota based on their historically low participation in the fishery.

The Council and Board did not select this as a preferred alternative because they agreed that sub-alternative 1E-2B, described in the next section, provided a more fair method for distributing the regional portions of the quota among states within a region.

##### 5.1.5.2.5 Sub-Alternative 1E-3B: Proportional Distribution of Regional Quota (Only Applicable Under Sub-Alternative 1E-2B; Preferred)

Under this sub-alternative, remaining quota would be distributed to the states within each region in proportion to their initial allocations (i.e., the Amendment 13 allocations or the allocations as modified through alternative set 1B), except Maine and New Hampshire would each receive 1% of the northern region quota based on their historically low participation in the fishery.

The Council and Board selected this as a preferred alternative because it was deemed an appropriate and fair way to divide the regional allocation among states within a region as it accounts for variations in the historical dependence of the states on the black sea bass fishery.

### 5.1.6 Alternative Set 1F: Regional Configuration Alternatives

Alternatives 1C through 1E consider updating the state allocations to incorporate regional biomass distribution (with the exception of alternatives 1D-3A and 1E-3A which would divide part of the quota evenly among states, rather than in proportion to recent biomass distribution). In order to apply a regional component to the allocations, it is necessary to first define the regions. The following sub-alternatives establish which states would be grouped together as regions for the purposes of allocating a combined regional quota which would then be distributed to the states in each region.

If any combination of alternatives in alternative sets 1C through 1E are selected (with the exception of alternatives 1D-3A and 1E-3A), one of the follow sub-alternatives must also be selected.

#### 5.1.6.1 Sub-Alternative 1F-1: Two Regions

This alternative would establish two regions: 1) Maine through New York, and 2) New Jersey through North Carolina. These regions generally align with those used for the stock assessment, which used Hudson Canyon as the dividing line based on several pieces of evidence that stock dynamics have an important break in this area (NEFSC 2017, NEFSC 2021a).

This was not selected as a preferred alternative because it does not recognize the unique position of New Jersey, which straddles the boundary between the sub-units used in the assessment.

#### 5.1.6.2 Sub-Alternative 1F-2: Three Regions (Preferred)

This alternative would establish three regions: 1) Maine through New York; 2) New Jersey; and 3) Delaware through North Carolina. This alternative attempts to address the unique position of New Jersey as the state straddles the border between the northern and southern spatial sub-units defined in the stock assessment (Figure 5) by treating it as a separate region. Under this alternative, New Jersey’s initial 20% allocation would be treated as follows: 10% would be associated with the northern region, and 10% with the southern region. As the regional allocations change, New Jersey’s “northern” 10% of the coastwide quota would change according to the proportion of biomass in northern region and the “southern” 10% would change according to the proportion of biomass in the southern region. New Jersey’s total allocation would be the sum of the northern and southern components of its allocation. This is consistent with the spatial distribution of black sea bass landings in recent years, which is roughly an even split between north and south of Hudson Canyon (Table 4).

The Council and Board selected this as a preferred alternative in recognition of the unique position of New Jersey as a state that is in both the northern and southern regions.

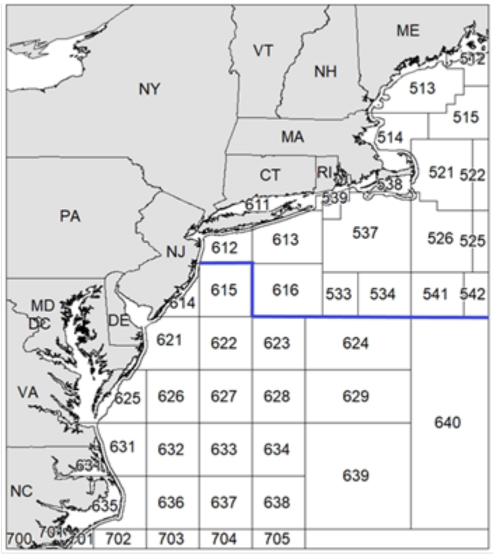


Figure 5: Statistical areas showing the dividing line between the northern and southern regions for the purposes of attributing fisheries data by region in the stock assessment (NEFSC 2017, NEFSC 2021a).

Table 4: Proportion of black sea bass landed by commercial fishermen in New Jersey caught in the northern or southern region statistical areas (Figure 5). Only landings associated with valid statistical area codes were included in the calculations. Data were provided by the ACCSP. Landings by area were estimated by applying vessel trip report (VTR) proportions of landings by area to dealer data.

| | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | **2010-2019 Avg** | **2010-2014 Avg** | **2015-2019 Avg** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| % North | 38% | 28% | 47% | 46% | 54% | 78% | 65% | 74% | 58% | 57% | **54%** | **43%** | **66%** |
| % South | 62% | 72% | 53% | 54% | 46% | 22% | 35% | 26% | 42% | 43% | **46%** | **57%** | **34%** |

## 5.2 Alternative Set 2: Council Management of State Allocations

As described in Section 4, commercial state allocations for black sea bass were first adopted through Amendment 13, which was approved by the Council and Board in 2002 and implemented starting in 2003. This was a joint action of the Council and the Commission.

At the time of final action on Amendment 13, the Council expressed a desire that the state allocations be managed at both the state and federal levels and contained in both the Council and Commission's FMPs. However, the NMFS Regional Administrator at the time said a state quota system at the federal level could not be monitored effectively with the then current monitoring methods due to the anticipated low poundage allocations in some states. As a result, the Council approved a federal annual coastwide quota, acknowledging that this would facilitate the use of state allocations through the Commission's FMP. Many of the concerns with monitoring state quotas at the federal level have subsequently been resolved with changes to how commercial landings are reported (e.g., more frequent dealer reporting and requirements for electronic vessel trip reporting). Therefore, consideration was given to adding these allocations to the Council's FMP through this action to acknowledge the importance of the commercial black sea bass fishery in federal waters (e.g., see Table 5 in section 6.1) and to bring this aspect of the management program in line with most other measures, which are jointly managed by the Council and Commission.

Under alternative 2A the state allocations would remain only in the Commission's FMP. Under alternative 2B they would be managed through both the Council and Commission's FMPs. The implications of each alternative are described below.

Either alternative 2A or 2B must be selected and could be used in combination with any alternatives from alternative sets 1 (state allocation percentages, Section 5.1) or 3 (federal in-season closures, Section 5.3), including the no action alternatives in both sections.

### 5.2.1 Alternative 2A: No Action (State Allocations Remain Only in the Commission FMP)

Under this alternative, the black sea bass commercial state allocations would remain only in the Commission's FMP. Changes to these allocations could be made by the Board alone, without an action by the Council. Quota transfers between states would continue to occur through the Commission process. The Commission allows transfers at any time up to 45 days after the last day of the fishing season. Transfer guidelines and procedures are included in Addendum XX to the Commission's FMP.

This was not selected as a preferred alternative because a majority of Council and Board members preferred that the allocations be managed through both FMPs to acknowledge the importance of the federal waters commercial fishery (e.g., see Table 5 in section 6.1), to bring the allocations in line with other aspects of the joint management program, and to ensure that a thorough and transparent review process is followed whenever future changes are considered.

### 5.2.2 Alternative 2B: State Allocations Included in Both the Commission and Council FMPs (Preferred)

Under this alternative, the state allocations would be added to the Council's FMP. Future changes to the allocations would be considered through a joint action of the Council and Commission. NMFS would monitor landings at the state level. Quota transfers between states would be managed by NMFS, rather than the Commission. This is similar to how the state quotas for summer flounder and bluefish have been managed for many years. No new administrative processes are needed to add the black sea bass allocations to the Council's FMP as all mechanisms are already in place for summer flounder and bluefish and there are many similarities between the summer flounder, bluefish, and black sea bass fisheries. For this reason, the administrative burden on NMFS would not notably increase. In addition, this change would reduce the administrative burden on the Commission as the Commission would no longer monitor state level quotas and manage transfers.

Unlike under the Commission process (see previous section), NMFS would limit transfers in the last two weeks of the year to unforeseeable circumstances such as vessel failure or bad weather. Post-season transfers would not be allowed.

This was selected as a preferred alternative for several reasons. It acknowledges the importance of the commercial black sea bass fishery in both state and federal waters. For example, at least 67% of commercial black sea bass landings were caught in federal waters on average during 2015-2019 (see Table 5 in Section 6.1). It also brings the state allocations in line with most other aspects of the management program, which (except for state specific management measures) are jointly developed and approved by the Council and Commission. It also ensures a thorough and transparent review process is followed when future changes to the allocations are considered as the Council is bound by the requirements of the Magnuson-Stevens Fishery Conservation and Management Act, the National Environmental Policy Act, and other applicable laws (Section 8) which do not apply to the Commission process.

This alternative includes two sub-alternatives regarding payback of state-level overages. Under this alternative, one of the following two sub-alternatives must also be selected.

#### 5.2.2.1 Sub-Alternative 2B-1: Status Quo (States Pay Back Overages Only If Coastwide Quota Exceeded; Preferred)

Under this alternative, states would only pay back overages of their allocations if the entire coastwide quota is exceeded. This is the current process for state-level quota overages under the Commission's FMP (Addendum XX). No other changes would be made to the commercial accountability measures.

This was selected as a preferred alternative. Since the first black sea bass commercial quota was implemented for 1998, it has never been exceeded by more than 11%. In addition, the stock is more than double the target biomass level according to the most recent stock assessment (NEFSC 2021a). Therefore, the Council and Board did not see a need to change these regulations or to make them more conservative (e.g., through sub-alternative 2B-2).

#### 5.2.2.2 Sub-Alternative 2B-2: States Always Pay Back Overages

Under this alternative, the exact amount in pounds by which a state exceeds its allocation would be deducted from their allocation in a following year, regardless of whether the coastwide quota was exceeded. No other changes would be made to the commercial accountability measures.

This was not selected as a preferred alternative because it is more conservative than the process which has been used by the Commission for several years (see previous section). The Council and Board did not see a need to make these regulations more conservative given that there have not been notable coastwide quota overages and stock status is positive (NEFSC 2021a).

## 5.3 Alternative Set 3: Federal In-Season Closures

Three alternatives were considered regarding federal in-season commercial fishery closures. The current regulations for in-season closures require the entire commercial fishery to close in-season for all federally permitted vessels and dealers, regardless of state, once the coastwide quota is projected to be landed. This has not occurred to date; however, concerns have been expressed about the potential for overages in some states to impact all states through a federal in-season closure. For example, Maryland, Delaware, and Virginia use an Individual Transferable Quota (ITQ) system for their commercial black sea bass fisheries. Some ITQ holders prefer to reserve some of their ITQ for late in the year for market reasons; however, they may not be able to harvest their full ITQs if a federal in-season closure occurs before the end of the year. Again, this has not occurred to date, but it is possible under the current regulations.

The following alternatives specify when the commercial fishery would close in-season for all federal vessel and dealer permit holders, regardless of state. Under all alternatives, individual states would close in-season if their allocations are reached prior to the end of the year, as is currently required.

One of the following three alternatives must be selected. Any of these three alternatives could be used in combination with any of the alternatives in alternative sets 1 (state quota allocations, Section 5.1) or 2 (Council management of state allocations, Section 5.2).

### 5.3.1 Alternative 3A: No Action (Coastwide Federal In-Season Closure When Landings Are Projected to Exceed the Coastwide Quota)

Under this alternative, the entire commercial fishery would close in-season for all federally permitted vessels and dealers, regardless of state, once the coastwide quota is projected to be landed, as is currently required under the Council's FMP.

This was not selected as a preferred alternative. The Council and Board instead preferred to modify these regulations to reduce the potential for overages in some states to negatively impact states which have not harvested their full allocations.

### 5.3.2 Alternative 3B: Coastwide Federal In-Season Closure When Landings Are Projected to Exceed the Coastwide Quota Plus a Buffer of Up To 5% (Preferred)

Under this alternative, the entire commercial fishery would close in-season for all federally permitted vessels and dealers, regardless of state, once landings are projected to exceed the coastwide quota plus an additional buffer of up to 5%. The Council and Board would agree to the appropriate buffer for the upcoming year through the specifications process. The Monitoring Committee would provide advice on the appropriate buffer based on considerations such as stock status, the quota level, and recent fishery trends.

The intent behind allowing an additional buffer is to help minimize negative economic impacts of coastwide closures on states that have not fully harvested their allocations. This is not expected to create an incentive for quota overages as states would still be required to close when their state-specific quotas are reached and states would still be required to pay back quota overages (see sub-alternatives 2B-1 and 2B-2).

This was selected as a preferred alternative because it reduces the likelihood of quota overages in some states impacting all states through a federal in-season closure while still ensuring that landings do not exceed the coastwide quota by a notable amount.

### 5.3.3 Alternative 3C: Coastwide Federal In-Season Closure When the Commercial Annual Catch Limit Is Projected to Be Exceeded

Under this alternative, the entire commercial fishery would close in-season for all federally permitted vessels and dealers, regardless of state, once the coastwide commercial ACL is projected to be exceeded, as opposed to when the commercial quota is projected to be landed under the current regulations. This alternative is based on the current regulations for summer flounder (50 CFR 648.103 (b)(2)).

Discards in weight cannot be monitored in-season using current discard estimation methods. Therefore, in practice, this alternative would require NMFS to make assumptions about discards in the current year. This was not selected as a preferred alternative given uncertainty about how it could be put into practice and how the impacts of this alternative would differ from those of alternatives 3A and 3B.

# 6 DESCRIPTION OF THE AFFECTED ENVIRONMENT

The affected environment consists of those physical, biological, and human components of the environment expected to experience impacts if any of the actions considered in this document were to be implemented. This document focuses on four aspects of the affected environment, which are defined as valued ecosystem components (VECs; Beanlands and Duinker 1984).

The VECs include:

- Human communities
- Black sea bass and non-target species
- Physical habitat
- Protected species

The following sections describe the recent condition of the VECs.

## 6.1 Human Communities

The following information is based on commercial fishery dealer data (landings), the 2019 operational stock assessment update (discards; NEFSC 2019), federal VTRs (gear types and area of catch), and input from fishermen and dealers. This section focuses on information through 2019 is presented in this section. Fishery conditions in 2020 were not typical due to impacts of the COVID-19 pandemic on fishery operations and market demand.

As previously stated, commercial landings have been constrained by a coastwide commercial quota since 1998, and state allocations were introduced in 2003. Coastwide landings have closely followed quotas, ranging from a low of 1.16 million pounds in 2009 to a high of 4.21 million pounds in 2020. State landings have also closely followed quotas since they were implemented in 2003. A process for interstate quota transfers was established in 2009, but until 2017 states were constrained by low quotas and thus there were few opportunities for inter-state transfers. More interstate transfers have occurred under higher quotas in recent years. For example, in the last three years, Massachusetts through New Jersey have all received quota transfers from other states to prevent or mitigate overages of their state quotas.

According to NEFSC dealer "AA tables," during 2015-2019, 62% of commercial landings during May through October came from state waters, while 92% of commercial landings during November through April came from federal waters. On average across 2015-2019, most landings in New Jersey through North Carolina were caught in federal waters, while most landings in Massachusetts through New York came from state waters (Table 5).

Since the coastwide quota was implemented in 1998, the proportion of total commercial dead catch attributed to dead discards has generally increased. During 2015-2019, commercial discards averaged 33% of total dead commercial catch. According to observer data, about 43% of observed black sea bass discards by weight during 2015-2019 were due to quota regulations (i.e., quota filled or no quota in area), 46% of discards were due to other regulations (e.g., minimum fish size or closed season), and 17% of discards were due to market reasons (e.g., retaining only a certain size for a better price or no market available for a certain size).

The average price per pound paid to fishermen by dealers for black sea bass (adjusted to 2019 values based on the Gross Domestic Product Price Deflator) appears to show an inverse relationship with landings in New Jersey through North Carolina during 2010-2019 (i.e., price generally decreased with increases in landings, $p=0.002$). There did not appear to be a strong relationship between price and landings in Maine through New York during 2010-2019 (p=0.498, Figure 6).

Some fishermen and dealers have said temporary price drops can occur at both local and regional levels due to increases in the coastwide quota, state-specific seasonal openings, or individual trawl trips with high landings, all of which can be interrelated. They note that these sudden price drops are often temporary and the price usually rises again. This is evident in the coastwide relationship between average price per pound and the coastwide quota, which increased by 52% mid-year in 2017 and then decreased by 15% from 2017 to 2018. The average coastwide price per pound dropped from $3.92 in 2016 to $3.49 in 2017, but increased to $3.82 in 2018 (all prices are adjusted to 2019 values based on the Gross Domestic Product Price Deflator).

Input from fishermen and federal VTR data from 2009-2019 suggest that in years with higher quotas, bottom trawl gear accounted for a greater proportion and pots/traps accounted for a smaller proportion of total commercial landings compared to years with lower quotas. For example, the lowest quotas during 2010-2019 occurred in 2010-2012. During those years, bottom trawl gear accounted for around 39-41% of total commercial black sea bass landings (depending on the year) and pots/traps accounted for about 33-36%. In comparison, the highest quotas occurred in 2016-2019, during which around 52-61% of total commercial black sea bass landings could be attributed to bottom trawl gear and around 21-26% to pot/trap gear. Some fishermen have said trawlers are better able to take advantage of increases in quota as they can land higher volumes than vessels using pot/trap gear. This can be especially beneficial when the price of black sea bass drops (usually temporarily) in response to sudden increases of fish on the market.

Bottom otter trawl gear tended to account for most landings by state during 2017-2019 for all states except Massachusetts (higher landings from pots/traps and handlines), New York (greater landings from unknown gear types, likely an artifact of the data set used, which relies heavily on federal VTR data), and Delaware (higher landings from pots/traps; Table 6). When aggregated based on the regions defined by preferred alternative 1F-2 (Section 5.1.7.2), pots/traps, bottom otter trawls, and handlines contributed to similar amounts of total landings in Massachusetts through New York combined, while bottom otter trawls accounted for the majority of landings in New Jersey and Delaware through North Carolina (Table 6).

According to commercial dealer data for 2010-2019, the average coastwide ex-vessel price per pound for black sea bass caught with bottom trawl gear was $3.90 (adjusted to 2019 values), 6% greater than the average price for black sea bass caught with pots/traps ($3.70). However, some fishermen report that they can get higher prices for black sea bass caught with pots/traps as they can market their fish as fresher and better quality than trawl-caught fish. Pot/trap and hook and line commercial fishermen in some states also sell black sea bass to live markets, which offer even higher prices. Some fishermen and dealers say size has a greater impact on price than gear, though the two are interrelated as fishermen using bottom trawl gear tend to land larger black sea bass than those using pots/traps.

The states have taken different approaches to managing their commercial black sea bass fisheries. Delaware, Maryland, and Virginia use ITQ systems, while other states utilize different combinations of quota periods, closed seasons, and initial or adjustable trip and possession limits to prevent quota overages. For some states like Connecticut, quota availability and resulting management measures have been highly dependent on quota transfers from other states. Some fishermen and dealers say they take these differences in state management measures into account when deciding when to fish, where to sell fish, and what price to offer for fish. For example, the price offered by local dealers may be higher when neighboring states are closed. Alternatively, some fishermen and dealers in comparatively low allocation states say they generally do not make business decisions based on black sea bass. Due to the low allocations in some states, black sea bass provides supplemental income for these fishermen and dealers, but they are not a primary target species. For these reasons, the economic impacts of changes to state quotas can vary in part based on how states adjust their management measures in response to quota changes. For example, an increase in the possession limit could have different impacts than an extension of the open season. ITQ fishermen may be impacted differently than non-ITQ fishermen, and impacts may vary between gear types.

From 2010-2017, commercial black sea bass landings caught north of Hudson Canyon (regardless of state of landing) increased steadily, with the greatest increases occurring during 2015-2017. After 2017, the proportion caught north of Hudson Canyon declined, but remained much higher than the proportion from south of Hudson Canyon. During 2010-2019, the amount of commercial black sea bass landings caught south of Hudson Canyon did not vary greatly (Figure 7).

Table 5: Area of catch (state waters, federal waters, or unknown) for black sea bass commercial landings by state, 2015-2019 according to NEFSC dealer "AA tables."

| State | Federal | State | Unknown |
|---|---|---|---|
| MA | 22% | 24% | 54% |
| RI | 34% | 24% | 42% |
| CT | 18% | 65% | 17% |
| NY | 12% | 53% | 36% |
| NJ | 82% | 18% | 0% |
| DE | 98% | 2% | 0% |
| MD | 90% | 9% | 1% |
| VA | 95% | 4% | 1% |
| NC | 90% | 4% | 6% |
| **ME-NC** | **67%** | **17%** | **16%** |

Table 6: Percent of total commercial black sea bass landings in weight by gear type and state, 2017-2019. Data source: NEFSC dealer AA tables.

| Region | Percent of total landings by gear type, 2017-2019 | | | | |
|---|---|---|---|---|---|
| | **Bottom otter trawl** | **Pot/trap** | **Hook & line** | **Other or unknown** | **Total** |
| MA-NY | 24% | 29% | 27% | 20% | 100% |
| NJ | 75% | 22% | 2% | 0% | 100% |
| DE-NC | 78% | 16% | 2% | 3% | 100% |
| **MA-NC** | **59%** | **22%** | **11%** | **8%** | **100%** |

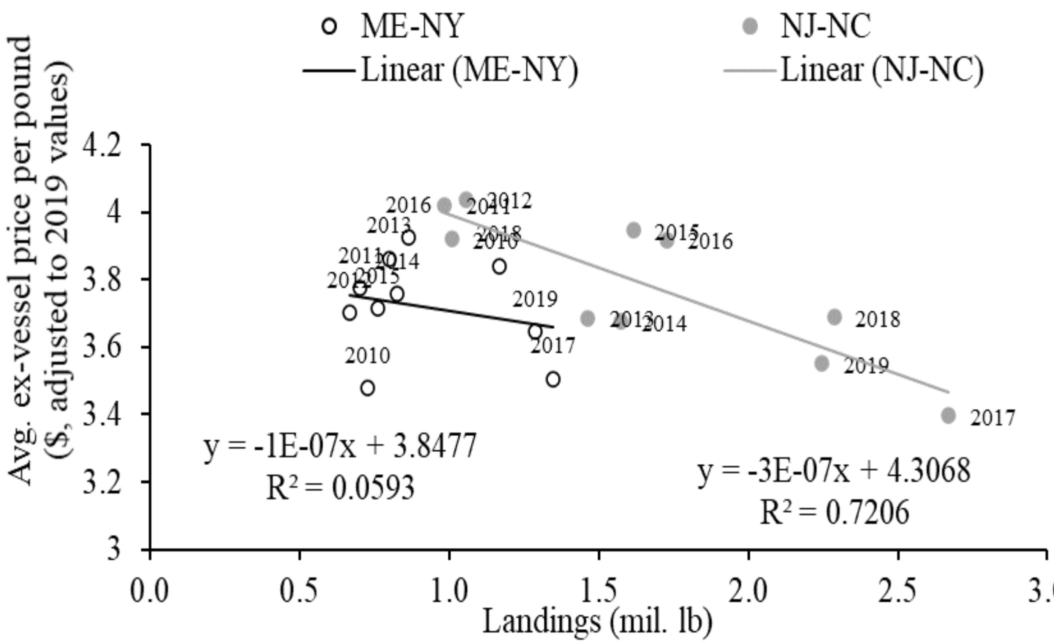


Figure 6: Average annual ex-vessel price per pound compared to annual black sea bass commercial landings by region (ME-NY and NJ-NC), 2010-2019, with associated linear relationship. Prices are adjusted to 2019 values based on the Gross Domestic Product Price Deflator. Data source: NMFS dealer data.

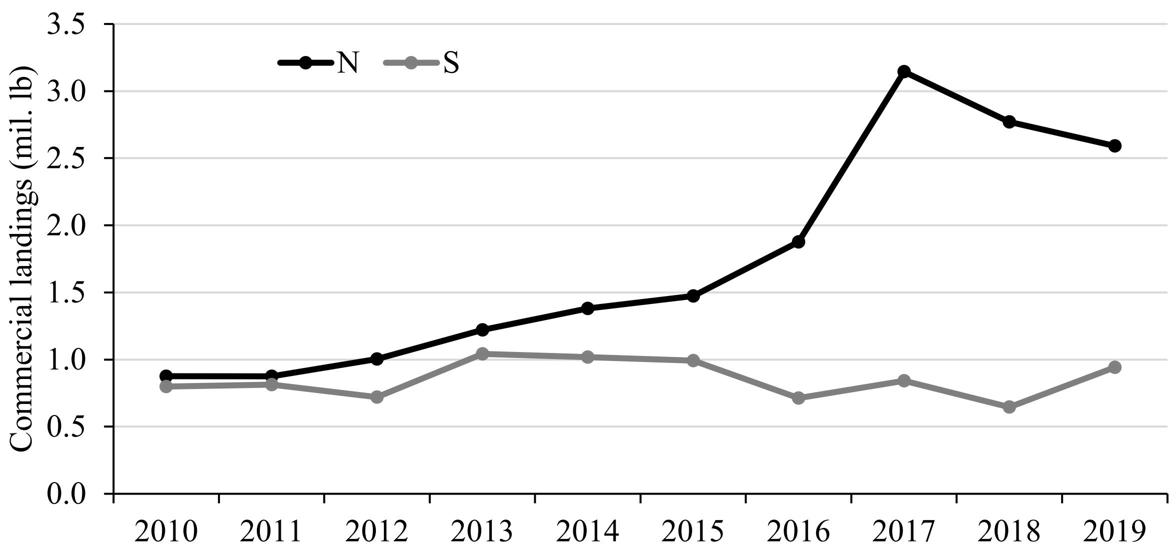


Figure 7: Total commercial black sea bass landings, 2010-2019, Maine through North Carolina, by region of catch location (north or south). Region is assigned based on statistical area of catch using the delineation defined in the stock assessment. Landings with an unknown statistical area were assigned to region based on the state of landing. Data source: dealer AA tables provided by the Northeast Fisheries Science Center.

## 6.2 Black Sea Bass and Non-Target Species

### 6.2.1 Black Sea Bass

Black sea bass are distributed from the Gulf of Maine through the Gulf of Mexico. Genetic studies have identified three stocks within that range. The northern stock is found from the Gulf of Maine through Cape Hatteras, North Carolina and is the focus of this document. The stocks in the South Atlantic and Gulf of Mexico are not managed by the Mid-Atlantic Council.

Adult and juvenile black sea bass are mostly found on the continental shelf. Young of the year (i.e., fish less than one year old) can be found in estuaries. Adults show strong site fidelity during the summer and prefer to be near structures such as rocky reefs, coral patches, cobble and rock fields, mussel beds, and shipwrecks.

Black sea bass migrate to offshore wintering areas starting in the fall. During the winter, young of the year are distributed across the shelf and adults and juveniles are found near the shelf edge. During the fall, adults and juveniles off New York and north move offshore and travel along the shelf edge to as far south as Virginia. Most return to northern inshore areas by May. Black sea bass off New Jersey to Maryland travel southeast to the shelf edge during the late fall. Black sea bass off Virginia and Maryland travel a shorter distance due east to the shelf edge, which is closer to shore than in areas to the north (Drohan et al. 2007, NEFSC 2017).

Black sea bass are protogynous hermaphrodites, meaning they are born female and some later transition to males, usually around 2-5 years of age. Male black sea bass are either of the dominant or subordinate type. Dominant males are larger than subordinate males and develop a bright blue nuccal hump during the spawning season. About 25% of black sea bass are male at 15 cm (about 6 inches), with increasing proportions of males at larger sizes until about 50 cm, when about 70-80% of black sea bass are male. Results from a simulation model highlight the importance of subordinate males in the spawning success of this species. This increases the resiliency of the population to exploitation compared to other species with a more typical protogynous life history. About half of black sea bass are sexually mature by 2 years of age and 21 cm (about 8 inches) in length. Black sea bass reach a maximum size of about 60 cm (about 24 inches) and a maximum age of about 12 years (NEFSC 2017, Blaylock and Shepherd 2016).

Black sea bass in the mid-Atlantic spawn in nearshore continental shelf areas at depths of 20-50 meters. Spawning usually takes place between April and October. During the summer, adult black sea bass share habitats with tautog, hakes, conger eel, sea robins and other migratory fish. Essential fish habitat for black sea bass consists of pelagic waters, structured habitat, rough bottom, shellfish, sand, and shell, from the Gulf of Maine through Cape Hatteras, North Carolina. Juvenile and adult black sea bass mostly feed on crustaceans, small fish, and squid. The NEFSC food habits database lists spiny dogfish, Atlantic angel shark, skates, spotted hake, summer flounder, windowpane flounder, and monkfish as predators of black sea bass (Drohan et al. 2007).

A black sea bass management track stock assessment was peer reviewed and accepted in July 2021. This assessment retained the model structure of the previous benchmark stock assessment, completed in 2016 (NEFSC 2017), and incorporated fishery data and fishery-independent survey data through 2019, including revised recreational data provided by the Marine Recreational Information Program for 1989-2019. The following information is based on the draft report prepared for the peer review and provided to the Council and the Scientific and Statistical Committee (NEFSC 2021a).

As with the 2016 benchmark assessment, the 2021 management track assessment has a regional structure. The stock was modeled as two separate sub-units (north and south) divided at approximately Hudson Canyon. Each sub-unit was modeled separately and the average F and combined biomass and spawning stock biomass (SSB) across sub-units were used to develop stock-wide reference points.

Due to the lack of a stock/recruit relationship, a direct calculation of maximum sustainable yield (MSY) and associated reference points (F and SSB) was not feasible and proxy reference points were used. SSB calculations and SSB reference points account for mature males and females.

A comparison of the 2019 SSB and F estimates to the reference points suggests that the black sea bass stock north of Cape Hatteras, North Carolina was not overfished and overfishing was not occurring in 2019. SSB in 2019 was estimated at 65.63 million pounds (29,769 mt, adjusted for retrospective bias), 2.1 times the updated biomass reference point (i.e., $SSB_{MSY\ proxy} = SSB_{40\%}$=31.84 million pounds/14,441 mt). The average fishing mortality rate on fully selected ages 6-7 fish in 2019 was 0.39 (adjusted for retrospective bias), 85% of the updated fishing mortality threshold reference point (i.e., $F_{MSY\ proxy} = F_{40\%} = 0.46$). The 2019 estimates of F and SSB were adjusted for internal model retrospective error (Figure 8). Figure 9 and Figure 10 show the time series of estimated SSB, recruitment, fishing mortality, and catch.

The 2011 year class was estimated to be the largest in the time series at 170.4 million fish. The 2015 year class was the second largest at 93.8 million fish. Recruitment of the 2017 year class as age 1 in 2018 was estimated at 14.9 million, well below the 1989-2019 average of 39 million fish. However, the 2018 year class was above average at an estimated 46.2 million fish (79.4 million with the retrospective adjustment) at age 1 in 2019 (Figure 9).

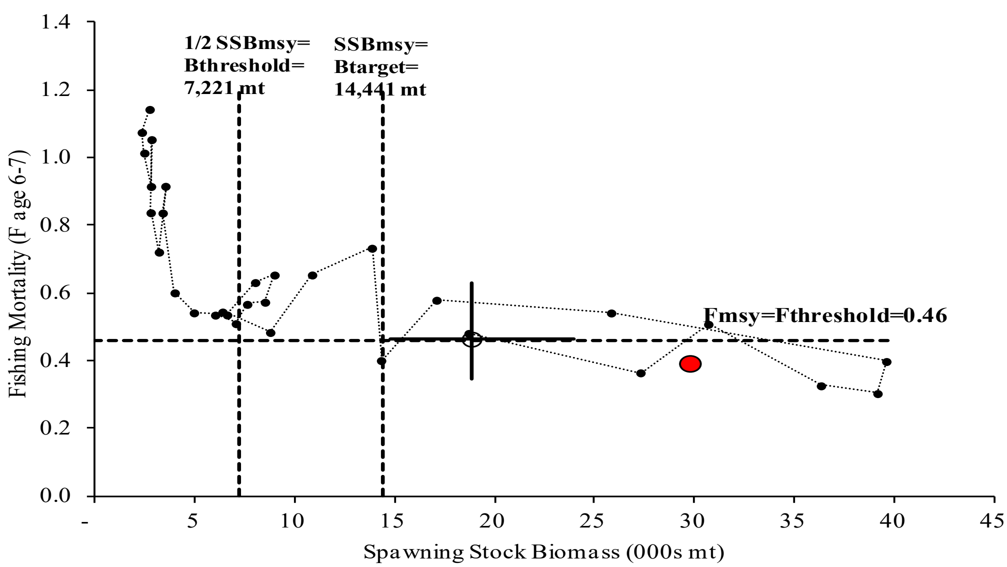


Figure 8: Estimates of black sea bass spawning stock biomass (SSB) and fully-recruited fishing mortality (F, peak at ages 6-7) relative to the updated 2021 biological reference points. The open circle with 90% confidence intervals shows the assessment point estimates for the terminal year (2019). The filled circle shows the retrospectively adjusted estimates for 2019. Source: NEFSC 2021a.

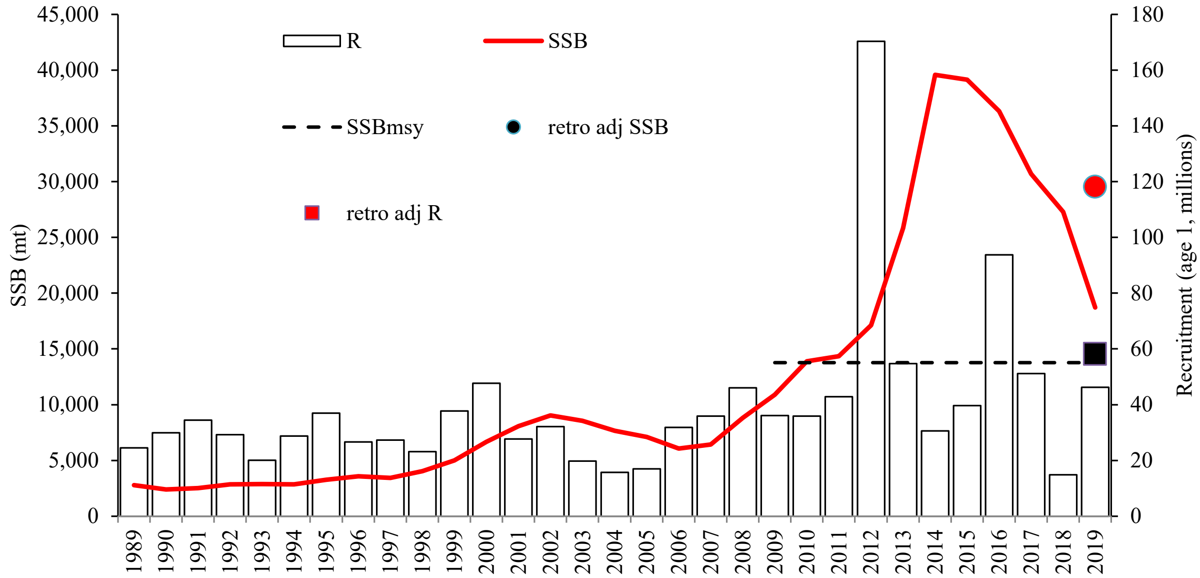


Figure 9: Black sea bass spawning stock biomass (SSB; solid line) and recruitment at age 0 (R; vertical bars) by calendar year. The horizontal dashed line is the updated $SSB_{MSY}$ proxy = $SSB_{40\%}$ =14,441 mt. Note that SSB and recruitment estimates for 2019 were adjusted for a retrospective pattern in the stock assessment. Adjusted values are shown as the circle (SSB) and square (R). Source: NEFSC 2021a.

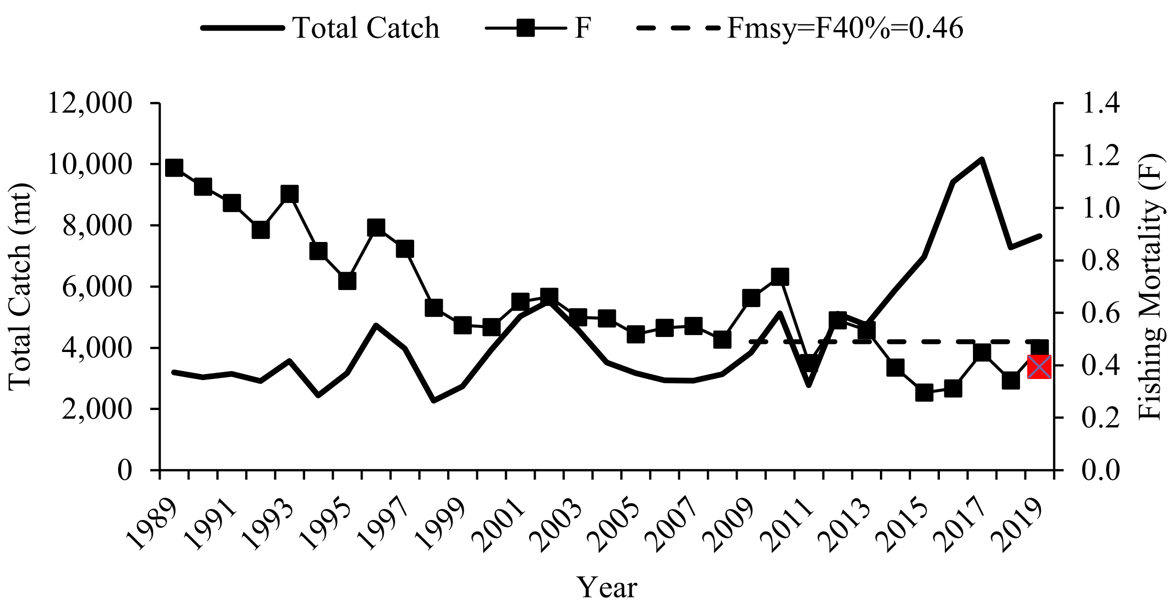


Figure 10: Total fishery catch (metric tons; mt; solid line) and fishing mortality (F, peak at age 6-7; squares) for black sea bass. The horizontal dashed line is the updated $F_{MSY}$ proxy = $F_{40\%}$ = 0.46. The red square Is the retrospectively adjusted fishing mortality value for 2019. Source: NEFSC 2021a.

### 6.2.2 Non-Target Species

Non-target species are those species caught incidentally while targeting other species. Non-target species may be retained or discarded. The following sections describe non-target species in the commercial black sea bass fisheries.

#### 6.2.2.1 Identification of Non-Target Species

It can be difficult to develop accurate quantitative estimates of catch of non-target species. The intended target species for any given tow or set is not always obvious. Fishermen may intend to target one or multiple species and the intended target species may change mid-trip. It is not always clear from the data which species are the primary target, which are secondary targets, and which species are not targeted but are sometimes landed if caught incidentally.

In addition, there are limitations to the data used to examine catch and discards. Observer data may not be representative of all fishing activity due to limited coverage and potential differences in behavior when observers are present. VTR data can be uncertain as they are based on fishermen's self-reported best estimates of catch, which are not intended to be precise measurements. In addition, some fishermen have suggested that discards are under-reported on VTRs for a variety of reasons, including a lack of understanding of the requirement to report discards with the same level of precision as landings and the requirement to report both managed and unmanaged species on VTRs. For these reasons, observer data were used as the basis for identifying non-target species and assumptions were made about which catch is targeted and which is incidental.

Northeast Fisheries Observer Program data from 2015-2019 were analyzed to identify species caught on observed commercial trips for which black sea bass made up at least 75% of the landings (by weight; a proxy for directed trips).[7] Using this definition, the most common non-target species include spiny dogfish, sea robins (striped, northern, and unknown), scup, and little skate (Table 7). This analysis considered catch of these species and did not differentiate between landings and discards. Some amount of these non-target species was landed, but this was not quantified as the purpose of this exercise was only to identify non-target species. Apart from spiny dogfish (14%) and striped sea robin (13%), other non-target species comprised 5% or less of the overall catch in aggregate across these trips. Northern and striped sea robins are not managed. All the other non-target species are managed by the Mid-Atlantic or New England Fishery Management Councils and/or the Atlantic States Marine Fisheries Commission.

[7] Data collection through the commercial fishery observer program was severely impacted by the COVID-19 pandemic; therefore, 2020 data were not analyzed.

Table 7: Percent of non-target species caught in observed hauls where black sea bass made up at least 75% of the observed landings (a proxy for a directed black sea bass trip), 2015-2019. Only those non-target species comprising at least 2% of the total catch on these trips are listed.

| Species | **% of total catch (landings and discards combined)** on observed trips where black sea bass were at least 75% of landings, 2015-2019[a] |
|---|---|
| Black sea bass | 50% |
| Spiny dogfish | 14% |
| Striped sea robin | 13% |
| Scup | 5% |
| Sea robin, NK | 3% |
| Northern sea robin | 3% |
| Little skate | 2% |

[a] Percentages shown are aggregate totals over 2015-2019 and do not reflect the percentages of non-target species caught on individual trips.

### 6.2.2.2 Current Condition of Non-Target Species

Spiny dogfish are jointly managed by the Mid-Atlantic and New England Fishery Management Councils. The Commission also has a complementary FMP for state waters. The 2018 stock assessment update found that the stock was not overfished in 2018 nor subject to overfishing in 2017 (the different years are due to the assessment methods and data availability). Spawning stock biomass was estimated to be 67% of the target level in 2018 (NEFSC 2018).

Scup are jointly managed by the Mid-Atlantic Council and the Commission through the same FMP as black sea bass. The stock assessment was last updated in 2021 and found that the stock was not overfished or subject to overfishing in 2019. Spawning stock biomass was about double the target level and fishing mortality was about 68% of the threshold level that defines overfishing (NEFSC 2021b).

Northern and striped sea robins are not currently managed and have not been assessed, therefore their overfished and overfishing status is unknown (Table 8).

Little skates are managed by the New England Council as part of the northeast skate complex. Skates are mostly harvested incidentally in trawl and gillnet fisheries targeting groundfish, monkfish, and scallops. The fishing mortality reference points for skates are based on changes in biomass indices from the NEFSC bottom trawl survey. If the three-year moving average of the survey biomass index for a skate species declines by more than the average CV of the survey time series, then fishing mortality is assumed to be greater than $F_{MSY}$ and it is concluded that overfishing is occurring (NEFMC 2020). Based on the most recent information, little skates are not overfished or experiencing overfishing (NEFMC 2020).

Table 8: Most recent stock status information for non-target species identified in this action.

| Species | Stock biomass status | Fishing mortality rate status |
|---|---|---|
| Spiny dogfish | Not overfished in 2018; SSB estimated at 67% of biomass target | Overfishing not occurring in 2017; F estimated at 17% below $F_{MSY}$ |
| Scup | Not overfished in 2019; SSB about double target level | Overfishing not occurring in 2019; F estimated at 42% below $F_{MSY}$ |
| Sea robins (northern, striped, and unknown) | Unknown (not assessed) | Unknown (not assessed) |
| Little skate | Not overfished (see text) | Overfishing not occurring (see text) |

## 6.3 Physical Environment and Essential Fish Habitat

The physical, chemical, biological, and geological components of benthic and pelagic environments are important aspects of habitat for marine species and have implications for reproduction, growth, and survival of marine species. The following sections briefly describe key aspects of physical habitats which may be impacted by the alternatives considered in this document. This information is drawn from Stevenson et al. (2004), unless otherwise noted.

### 6.3.1 Physical Environment

Black sea bass inhabit the northeast U.S. shelf ecosystem, which extends from the coast to the edge of the continental shelf from the Gulf of Maine through Cape Hatteras, including the slope sea offshore to the Gulf Stream.

The Gulf of Maine is a semi-enclosed coastal sea, characterized by relatively cold waters and deep basins, with a patchwork of various sediment types.

Georges Bank is a relatively shallow coastal plateau that slopes gently from north to south and has steep submarine canyons on its eastern and southeastern edge. It is characterized by highly productive, well-mixed waters and strong currents.

The Mid-Atlantic Bight is comprised of the sandy, relatively flat, gently sloping continental shelf from southern New England to Cape Hatteras, North Carolina.

The continental slope begins at the continental shelf break and continues eastward with increasing depth until it becomes the continental rise. It is fairly homogenous, with exceptions at the shelf break, some canyons, the Hudson Shelf Valley, and in areas of glacially rafted hard bottom.

The continental shelf in this region was shaped largely by sea level fluctuations caused by past ice ages. The shelf's basic morphology and sediments derive from the retreat of the last ice sheet and the subsequent rise in sea level. Currents and waves have since modified this basic structure.

Shelf and slope waters of the Mid-Atlantic Bight have a slow southwestward flow that is occasionally interrupted by warm core rings or meanders from the Gulf Stream. On average, shelf water moves parallel to bathymetry isobars at speeds of 5 - 10 cm/s at the surface and 2 cm/s or less at the bottom. Storm events can cause much more energetic variations in flow. Tidal currents on the inner shelf have a higher flow rate of 20 cm/s that increases to 100 cm/s near inlets.

The shelf slopes gently from shore out to between 100 and 200 km offshore where it transforms to the slope (100 - 200 m water depth) at the shelf break. Numerous canyons incise the slope and some cut up onto the shelf itself. The primary morphological features of the shelf include shelf valleys and channels, shoal massifs, scarps, and sand ridges and swales. Most of these structures are relic except for some sand ridges and smaller sand-formed features. Shelf valleys and slope canyons were formed by rivers of glacier outwash that deposited sediments on the outer shelf edge as they entered the ocean. Most valleys cut about 10 m into the shelf; however, the Hudson Shelf Valley is about 35 m deep. The valleys were partially filled as the glacier melted and retreated across the shelf. The glacier also left behind a lengthy scarp near the shelf break from Chesapeake Bay north to the eastern end of Long Island. Shoal retreat massifs were produced by extensive deposition at a cape or estuary mouth. Massifs were also formed as estuaries retreated across the shelf.

Some sand ridges are more modern in origin than the shelf's glaciated morphology. Their formation is not well understood; however, they appear to develop from the sediments that erode from the shore face. They maintain their shape, so it is assumed that they are in equilibrium with modern current and storm regimes. They are usually grouped, with heights of about 10 m, lengths of 10 - 50 km and spacing of 2 km. Ridges are usually oriented at a slight angle towards shore, running in length from northeast to southwest. The seaward face usually has the steepest slope. Sand ridges are often covered with smaller similar forms such as sand waves, megaripples, and ripples. Swales occur between sand ridges. Since ridges are higher than the adjacent swales, they are exposed to more energy from water currents and experience more sediment mobility than swales. Ridges tend to contain less fine sand, silt, and clay while relatively sheltered swales contain more of the finer particles. Swales have greater benthic macrofaunal density, species richness and biomass, due in part to the increased abundance of detrital food and the less physically rigorous conditions.

Sand waves are usually found in patches of 5 - 10 with heights of about 2 m, lengths of 50 - 100 m and 1 - 2 km between patches. Sand waves are primarily found on the inner shelf, and often observed on sides of sand ridges. They may remain intact over several seasons. Megaripples occur on sand waves or separately on the inner or central shelf. During the winter storm season, they may cover as much as 15% of the inner shelf. They tend to form in large patches and usually have lengths of 3 - 5 m with heights of 0.5 - 1 m. Megaripples tend to survive for less than a season. They can form during a storm and reshape the upper 50 - 100 cm of the sediments within a few hours. Ripples are also found everywhere on the shelf and appear or disappear within hours or days, depending upon storms and currents. Ripples usually have lengths of about 1 - 150 cm and heights of a few centimeters.

Sediments are uniformly distributed over the shelf in this region. A sheet of sand and gravel varying in thickness from 0 - 10 m covers most of the shelf. The mean bottom flow from the constant southwesterly current is not fast enough to move sand, so sediment transport must be episodic. Net sediment movement is in the same southwesterly direction as the current. The sands are mostly medium to coarse grains, with finer sand in the Hudson Shelf Valley and on the outer shelf. Mud is rare over most of the shelf, but is common in the Hudson Shelf Valley. Occasionally relic estuarine mud deposits are re-exposed in the swales between sand ridges. Fine sediment content increases rapidly at the shelf break, which is sometimes called the "mud line," and sediments are 70 - 100% fine on the slope. On the slope, silty sand, silt, and clay predominate (Stevenson et al. 2004).

Greene et al. (2010) identified and described Ecological Marine Units in New England and the Mid-Atlantic based on sediment type, seabed form (a combination of slope and relative depth), and benthic organisms. According to this classification scheme, the sediment composition off New England and the Mid-Atlantic is about 68% sand, 26% gravel, and 6% silt/mud. The seafloor is classified as about 52% flat, 26% depression, 19% slope, and 3% steep.

Artificial reefs are another significant Mid-Atlantic habitat. These localized areas of hard structure were formed by shipwrecks, lost cargoes, disposed solid materials, shoreline jetties and groins, submerged pipelines, cables, and other materials (Steimle and Zetlin 2000). While some of these materials were deposited specifically for use as fish habitat, most have an alternative primary purpose; however, they have all become an integral part of the coastal and shelf ecosystem. In general, reefs are important for attachment sites, shelter, and food for many species, and fish predators such as tunas may be attracted by prey aggregations, or may be behaviorally attracted to the reef structure.

Like all the world's oceans, the western North Atlantic is experiencing changes to the physical environment due to global climate change. These changes include warming temperatures; sea level rise; ocean acidification; changes in stream flow, ocean circulation, and sediment deposition; and increased frequency, intensity, and duration of extreme climate events. These changes in physical habitat can impact the metabolic rate and other biological processes of marine species. As such, these changes have implications for the distribution and productivity of many marine species. Several studies demonstrate that the distribution and productivity of several species in the Mid-Atlantic have changed over time, likely because of changes in physical habitat conditions such as temperature (e.g., Weinberg 2005, Lucey and Nye 2010, Nye et al. 2011, Pinsky et al. 2013, Gaichas et al. 2015).

### 6.3.2 Essential Fish Habitat

The Magnuson-Stevens Fishery Conservation and Management Act (MSA) defines essential fish habitat (EFH) as "those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity" (MSA section 3). The MSA requires that Councils describe and identify EFH for managed species and "minimize to the extent practicable adverse effects on such habitat caused by fishing, and identify other actions to encourage the conservation and enhancement of such habitat" (MSA section 303 (a)(7)).

The broad definition of EFH has led the Mid-Atlantic and the New England Fishery Management Councils to identify EFH throughout most of the Northeast U.S. Shelf Ecosystem, ranging from areas out to the shelf break to wetlands, streams, and rivers. Table 9 summarizes EFH within the affected area of this action for federally-managed species and life stages that are vulnerable to bottom tending fishing gear. EFH maps and text descriptions for these species and life stages can be found at www.fisheries.noaa.gov/resource/map/essential-fish-habitat-mapper.

Table 9: Geographic distributions and habitat characteristics of EFH designations for benthic fish and shellfish species within the affected environment of the action.

| Species | Life Stage | Geographic Area | Depth (meters) | Habitat Type and Description |
|---|---|---|---|---|
| American plaice | Juveniles | Gulf of Maine and bays and estuaries from Passamaquoddy Bay to Saco Bay, Maine and from Massachusetts Bay to Cape Cod Bay, Massachusetts Bay | 40-180 | Sub-tidal benthic habitats on mud and sand, also found on gravel and sandy substrates bordering bedrock |
| American plaice | Adults | Gulf of Maine, Georges Bank and bays and estuaries from Passamaquoddy Bay to Saco Bay, Maine and from Massachusetts Bay to Cape Cod Bay, Massachusetts Bay | 40-300 | Sub-tidal benthic habitats on mud and sand, also gravel and sandy substrates bordering bedrock |
| Atlantic cod | Juveniles | Gulf of Maine, Georges Bank, and Southern New England, including nearshore waters from eastern Maine to Rhode Island and the following estuaries: Passamaquoddy Bay to Saco Bay; Massachusetts Bay, Boston Harbor, Cape Cod Bay, and Buzzards Bay | Mean high water-120 | Structurally-complex intertidal and sub-tidal habitats, including eelgrass, mixed sand and gravel, and rocky habitats (gravel pavements, cobble, and boulder) with and without attached macroalgae and emergent epifauna |
| Atlantic cod | Adults | Gulf of Maine, Georges Bank, Southern New England, and the Mid-Atlantic to Delaware Bay, including the following estuaries: Passamaquoddy Bay to Saco Bay; Massachusetts Bay, Boston Harbor, Cape Cod Bay, and Buzzards Bay | 30-160 | Structurally complex sub-tidal hard bottom habitats with gravel, cobble, and boulder substrates with and without emergent epifauna and macroalgae, also sandy substrates and along deeper slopes of ledges |
| Atlantic halibut | Juveniles & Adults | Gulf of Maine, Georges Bank, and continental slope south of Georges Bank | 60-140 and 400-700 on slope | Benthic habitats on sand, gravel, or clay substrates |
| Atlantic sea scallop | Eggs | Gulf of Maine coastal waters and offshore banks, Georges Bank, and the Mid-Atlantic, including the following estuaries: Passamaquoddy Bay to Sheepscot River; Casco Bay, Massachusetts Bay, and Cape Cod Bay | 18-110 | Inshore and offshore benthic habitats (see adults) |
| Atlantic sea scallop | Larvae | Gulf of Maine coastal waters and offshore banks, Georges Bank, and the Mid-Atlantic, including the following estuaries: Passamaquoddy Bay to Sheepscot River; Casco Bay, Massachusetts Bay, and Cape Cod Bay | No information | Inshore and offshore pelagic and benthic habitats: pelagic larvae (“spat”), settle on variety of hard surfaces, including shells, pebbles, and gravel and to macroalgae and other benthic organisms such as hydroids |
| Atlantic sea scallop | Juveniles | Gulf of Maine coastal waters and offshore banks, Georges Bank, and the Mid-Atlantic, including the following estuaries: Passamaquoddy Bay to Sheepscot River; Casco Bay, Great Bay, Massachusetts Bay, and Cape Cod Bay | 18-110 | Benthic habitats initially attached to shells, gravel, and small rocks (pebble, cobble), later free-swimming juveniles found in same habitats as adults |
| Atlantic sea scallop | Adults | Gulf of Maine coastal waters and offshore banks, Georges Bank, and the Mid-Atlantic, including the following estuaries: | 18-110 | Benthic habitats with sand and gravel substrates |

| Species | Life Stage | Geographic Area | Depth (meters) | Habitat Type and Description |
|---|---|---|---|---|
| | | Passamaquoddy Bay to Sheepscot River; Casco Bay, Great Bay, Massachusetts Bay, and Cape Cod Bay | | |
| Atlantic surfclams | Juveniles and adults | Continental shelf from southwestern Gulf of Maine to Cape Hatteras, North Carolina | Surf zone to about 61, abundance low >38 | In substrate to depth of 3 ft |
| Atlantic wolffish | Eggs | U.S. waters north of 41˚N latitude and east of 71˚W longitude | <100 | Sub-tidal benthic habitats under rocks and boulders in nests |
| Atlantic wolffish | Juveniles | U.S. waters north of 41˚N latitude and east of 71˚W longitude | 70-184 | Sub-tidal benthic habitats |
| Atlantic wolffish | Adults | U.S. waters north of 41˚N latitude and east of 71˚W longitude | <173 | A wide variety of sub-tidal sand and gravel substrates once they leave rocky spawning habitats, but not on muddy bottom |
| Barndoor skate | Juveniles and adults | Primarily on Georges Bank and in Southern New England and on the continental slope | 40-400 on shelf and to 750 on slope | Sub-tidal benthic habitats on mud, sand, and gravel substrates |
| Black sea bass | Juveniles and adults | Continental shelf and estuarine waters from the southwestern Gulf of Maine and Cape Hatteras, North Carolina | Inshore in summer and spring | Benthic habitats with rough bottom, shellfish and eelgrass beds, man-made structures in sandy-shelly areas, also offshore clam beds and shell patches in winter |
| Clearnose skate | Juveniles | Inner continental shelf from New Jersey to the St. Johns River in Florida and certain bays and certain estuaries including Raritan Bay, inland New Jersey bays, Chesapeake Bay, and Delaware Bays | 0-30 | Sub-tidal benthic habitats on mud and sand, but also on gravelly and rocky bottom |
| Clearnose skate | Adults | Inner continental shelf from New Jersey to the St. Johns River in Florida and certain bays and certain estuaries including Raritan Bay, inland New Jersey bays, Chesapeake Bay, and Delaware Bays | 0-40 | Sub-tidal benthic habitats on mud and sand, but also on gravelly and rocky bottom |
| Golden tilefish | Juveniles and adults | Outer continental shelf and slope from U.S.-Canada boundary to the Virginia-North Carolina boundary | 100-300 | Burrows in semi-lithified clay substrate, may also utilize rocks, boulders, scour depressions beneath boulders, and exposed rock ledges as shelter |
| Haddock | Juveniles | Inshore and offshore waters in the Gulf of Maine, on Georges Bank, and on the continental shelf in the Mid-Atlantic region | 40-140 and as shallow as 20 in coastal Gulf of Maine | Sub-tidal benthic habitats on hard sand (particularly smooth patches between rocks), mixed sand and shell, gravelly sand, and gravel |
| Haddock | Adults | Offshore waters in the Gulf of Maine, on Georges Bank, and on the continental shelf in Southern New England | 50-160 | Sub-tidal benthic habitats on hard sand (particularly smooth patches between rocks), mixed sand and shell, gravelly sand, and gravel and adjacent to boulders and cobbles along the margins of rocky reefs |
| Little skate | Juveniles | Coastal waters in the Gulf of Maine, Georges Bank, and the continental shelf in the Mid-Atlantic region as far south as Delaware Bay, including certain | Mean high water-80 | Intertidal and sub-tidal benthic habitats on sand and gravel, also found on mud |

| Species | Life Stage | Geographic Area | Depth (meters) | Habitat Type and Description |
|---|---|---|---|---|
| | | bays and estuaries in the Gulf of Maine | | |
| Little skate | Adults | Coastal waters in the Gulf of Maine, Georges Bank, and the continental shelf in the Mid-Atlantic region as far south as Delaware Bay, including certain bays and estuaries in the Gulf of Maine | Mean high water-100 | Intertidal and sub-tidal benthic habitats on sand and gravel, also found on mud |
| Longfin inshore squid | Eggs | Inshore and offshore waters from Georges Bank southward to Cape Hatteras | Generally <50 | Bottom habitats attached to variety of hard bottom types, macroalgae, sand, and mud |
| Monkfish | Juveniles | Gulf of Maine, outer continental shelf in the Mid-Atlantic, and the continental slope | 50-400 in the Mid-Atlantic, 20-400 in the Gulf of Maine, and to 1000 on the slope | Sub-tidal benthic habitats on a variety of habitats, including hard sand, pebbles, gravel, broken shells, and soft mud, also seek shelter among rocks with attached algae |
| Monkfish | Adults | Gulf of Maine, outer continental shelf in the Mid-Atlantic, and the continental slope | 50-400 in the Mid-Atlantic, 20-400 in the Gulf of Maine, and to 1000 on the slope | Sub-tidal benthic habitats on hard sand, pebbles, gravel, broken shells, and soft mud, but seem to prefer soft sediments, and, like juveniles, utilize the edges of rocky areas for feeding |
| Ocean pout | Eggs | Georges Bank, Gulf of Maine, and the Mid-Atlantic, including certain bays and estuaries in the Gulf of Maine | <100 | Sub-tidal hard bottom habitats in sheltered nests, holes, or rocky crevices |
| Ocean pout | Juveniles | Gulf of Maine, on the continental shelf north of Cape May, New Jersey, on the southern portion of Georges Bank, and including certain bays and estuaries in the Gulf of Maine | Mean high water-120 | Intertidal and sub-tidal benthic habitats on a wide variety of substrates, including shells, rocks, algae, soft sediments, sand, and gravel |
| Ocean pout | Adults | Gulf of Maine, Georges Bank, on the continental shelf north of Cape May, New Jersey, and including certain bays and estuaries in the Gulf of Maine | 20-140 | Sub-tidal benthic habitats on mud and sand, particularly in association with structure forming habitat types; i.e. shells, gravel, or boulders |
| Ocean quahogs | Juveniles and adults | Continental shelf from southern New England and Georges Bank to Virginia | 9-244 | In substrate to depth of 3 ft |
| Offshore hake | Juveniles | Outer continental shelf and slope from Georges Bank to 34° 40’N | 160-750 | Pelagic and benthic habitats |
| Offshore hake | Adults | Outer continental shelf and slope from Georges Bank to 34° 40’N | 200-750 | Pelagic and benthic habitats |
| Pollock | Juveniles | Inshore and offshore waters in the Gulf of Maine (including bays and estuaries in the Gulf of Maine), the Great South Channel, Long Island Sound, and Narragansett Bay, Rhode Island | Mean high water-180 in Gulf of Maine, Long Island Sound, and Narragansett Bay; 40-180 on Georges Bank | Intertidal and sub-tidal pelagic and benthic rocky bottom habitats with attached macroalgae, small juveniles in eelgrass beds, older juveniles move into deeper water habitats also occupied by adults |
| Pollock | Adults | Offshore Gulf of Maine waters, Massachusetts Bay and Cape Cod Bay, on the southern edge of | 80-300 in Gulf of Maine and on Georges Bank; <80 in Long Island | Pelagic and benthic habitats on the tops and edges of offshore banks and shoals with mixed rocky |

| Species | Life Stage | Geographic Area | Depth (meters) | Habitat Type and Description |
|---|---|---|---|---|
| | | Georges Bank, and in Long Island Sound | Sound, Cape Cod Bay, and Narragansett Bay | substrates, often with attached macro algae |
| Red hake | Juveniles | Gulf of Maine, Georges Bank, and the Mid-Atlantic, including Passamaquoddy Bay to Cape Cod Bay in the Gulf of Maine, Buzzards Bay and Narragansett Bay, Long Island Sound, Raritan Bay and the Hudson River, and lower Chesapeake Bay | Mean high water-80 | Intertidal and sub-tidal soft bottom habitats, esp those that that provide shelter, such as depressions in muddy substrates, eelgrass, macroalgae, shells, anemone and polychaete tubes, on artificial reefs, and in live bivalves (e.g., scallops) |
| Red hake | Adults | In the Gulf of Maine, the Great South Channel, and on the outer continental shelf and slope from Georges Bank to North Carolina , including inshore bays and estuaries as far south as Chesapeake Bay | 50-750 on shelf and slope, as shallow as 20 inshore | Sub-tidal benthic habitats in shell beds, on soft sediments (usually in depressions), also found on gravel and hard bottom and artificial reefs |
| Rosette skate | Juveniles and adults | Outer continental shelf from approximately 40˚N to Cape Hatteras, North Carolina | 80-400 | Benthic habitats with mud and sand substrates |
| Scup | Juveniles | Continental shelf between southwestern Gulf of Maine and Cape Hatteras, North Carolina and in nearshore and estuarine waters between Massachusetts and Virginia | No information | Benthic habitats, in association with inshore sand and mud substrates, mussel and eelgrass beds |
| Scup | Adults | Continental shelf and nearshore and estuarine waters between southwestern Gulf of Maine and Cape Hatteras, North Carolina | No information, generally overwinter offshore | Benthic habitats |
| Silver hake | Juveniles | Gulf of Maine, including certain bays and estuaries, and on the continental shelf as far south as Cape May, New Jersey | 40-400 in Gulf of Maine, >10 in Mid-Atlantic | Pelagic and sandy sub-tidal benthic habitats in association with sand-waves, flat sand with amphipod tubes, shells, and in biogenic depressions |
| Silver hake | Adults | Gulf of Maine, including certain bays and estuaries, the southern portion of Georges Bank, and the outer continental shelf and some shallower coastal locations in the Mid-Atlantic | >35 in Gulf of Maine, 70-400 on Georges Bank and in the Mid-Atlantic | Pelagic and sandy sub-tidal benthic habitats, often in bottom depressions or in association with sand waves and shell fragments, also in mud habitats bordering deep boulder reefs, on over deep boulder reefs in the southwest Gulf of Maine |
| Smooth skate | Juveniles | Offshore Gulf of Maine, some coastal bays in Maine and New Hampshire, and on the continental slope from Georges Bank to North Carolina | 100-400 offshore Gulf of Maine, <100 inshore Gulf of Maine, to 900 on slope | Benthic habitats, mostly on soft mud in deeper areas, but also on sand, broken shells, gravel, and pebbles on offshore banks in the Gulf of Maine |
| Smooth skate | Adults | Offshore Gulf of Maine and the continental slope from Georges Bank to North Carolina | 100-400 offshore Gulf of Maine, to 900 on slope | Benthic habitats, mostly on soft mud in deeper areas, but also on sand, broken shells, gravel, and pebbles on offshore banks in the Gulf of Maine |
| Summer flounder | Juveniles | Continental shelf and estuaries from Cape Cod, Massachusetts, to Cape Canaveral, Florida | To maximum 152 | Benthic habitats, including inshore estuaries, salt marsh creeks, seagrass beds, mudflats, and open bay areas |

| Species | Life Stage | Geographic Area | Depth (meters) | Habitat Type and Description |
|---|---|---|---|---|
| Summer flounder | Adults | Continental shelf from Cape Cod, Massachusetts, to Cape Canaveral, Florida, including shallow coastal and estuarine waters during warmer months | To maximum 152 in colder months | Benthic habitats |
| Spiny dogfish | Juveniles | Primarily the outer continental shelf and slope between Cape Hatteras and Georges Bank and in the Gulf of Maine | Deep water | Pelagic and epibenthic habitats |
| Spiny dogfish | Female sub-adults | Throughout the region | Wide depth range | Pelagic and epibenthic habitats |
| Spiny dogfish | Male sub-adults | Primarily in the Gulf of Maine and on the outer continental shelf from Georges Bank to Cape Hatteras | Wide depth range | Pelagic and epibenthic habitats |
| Spiny dogfish | Female adults | Throughout the region | Wide depth range | Pelagic and epibenthic habitats |
| Spiny dogfish | Male adults | Throughout the region | Wide depth range | Pelagic and epibenthic habitats |
| Thorny skate | Juveniles | Offshore Gulf of Maine, some coastal bays in the Gulf of Maine, and on the continental slope from Georges Bank to North Carolina | 35-400 offshore Gulf of Maine, <35 inshore Gulf of Maine, to 900 om slope | Benthic habitats on a wide variety of bottom types, including sand, gravel, broken shells, pebbles, and soft mud |
| Thorny skate | Adults | Offshore Gulf of Maine and on the continental slope from Georges Bank to North Carolina | 35-400 offshore Gulf of Maine, <35 inshore Gulf of Maine, to 900 om slope | Benthic habitats on a wide variety of bottom types, including sand, gravel, broken shells, pebbles, and soft mud |
| White hake | Juveniles | Gulf of Maine, Georges Bank, and Southern New England, including bays and estuaries in the Gulf of Maine | Mean high water - 300 | Intertidal and sub-tidal estuarine and marine habitats on fine-grained, sandy substrates in eelgrass, macroalgae, and un-vegetated habitats |
| White hake | Adults | Gulf of Maine, including coastal bays and estuaries, and the outer continental shelf and slope | 100-400 offshore Gulf of Maine, >25 inshore Gulf of Maine, to 900 on slope | Sub-tidal benthic habitats on fine-grained, muddy substrates and in mixed soft and rocky habitats |
| Windowpane flounder | Juveniles | Estuarine, coastal, and continental shelf waters from the Gulf of Maine to northern Florida, including bays and estuaries from Maine to Maryland | Mean high water - 60 | Intertidal and sub-tidal benthic habitats on mud and sand substrates |
| Windowpane flounder | Adults | Estuarine, coastal, and continental shelf waters from the Gulf of Maine to Cape Hatteras, North Carolina, including bays and estuaries from Maine to Maryland | Mean high water - 70 | Intertidal and sub-tidal benthic habitats on mud and sand substrates |
| Winter flounder | Eggs | Eastern Maine to Absecon Inlet, New Jersey (39° 22´N) and Georges Bank | 0-5 south of Cape Cod, 0-70 Gulf of Maine and Georges Bank | Sub-tidal estuarine and coastal benthic habitats on mud, muddy sand, sand, gravel, submerged aquatic vegetation, and macroalgae |
| Winter flounder | Juveniles | Coastal Gulf of Maine, Georges Bank, and continental shelf in Southern New England and Mid-Atlantic to Absecon Inlet, New Jersey, including bays and | Mean high water - 60 | Intertidal and sub-tidal benthic habitats on a variety of bottom types, such as mud, sand, rocky substrates with attached macro algae, tidal wetlands, and eelgrass; |

| Species | Life Stage | Geographic Area | Depth (meters) | Habitat Type and Description |
|---|---|---|---|---|
| | | estuaries from eastern Maine to northern New Jersey | | young-of-the-year juveniles on muddy and sandy sediments in and adjacent to eelgrass and macroalgae, in bottom debris, and in marsh creeks |
| Winter flounder | Adults | Coastal Gulf of Maine, Georges Bank, and continental shelf in Southern New England and Mid-Atlantic to Absecon Inlet, New Jersey, including bays and estuaries from eastern Maine to northern New Jersey | Mean high water - 70 | Intertidal and sub-tidal benthic habitats on muddy and sandy substrates, and on hard bottom on offshore banks; for spawning adults, also see eggs |
| Winter skate | Juveniles | Coastal waters from eastern Maine to Delaware Bay, including certain bays and estuaries from eastern Maine to Chincoteague Bay, Virginia, and on Georges Bank and the continental shelf in Southern New England and the Mid-Atlantic | 0-90 | Sub-tidal benthic habitats on sand and gravel substrates, are also found on mud |
| Winter skate | Adults | Coastal waters from eastern Maine to Delaware Bay, including certain bays and estuaries in Maine and New Hampshire, and on Georges Bank and the continental shelf in Southern New England and the Mid-Atlantic | 0-80 | Sub-tidal benthic habitats on sand and gravel substrates, are also found on mud |
| Witch flounder | Juveniles | Gulf of Maine and outer continental shelf and slope | 50-400 and to 1500 on slope | Sub-tidal benthic habitats with mud and muddy sand substrates |
| Witch flounder | Adults | Gulf of Maine and outer continental shelf and slope | 35-400 and to 1500 on slope | Sub-tidal benthic habitats with mud and muddy sand substrates |
| Yellowtail flounder | Juveniles | Gulf of Maine, Georges Bank, and the Mid-Atlantic, including certain bays and estuaries in the Gulf of Maine | 20-80 | Sub-tidal benthic habitats on sand and muddy sand |
| Yellowtail flounder | Adults | Gulf of Maine, Georges Bank, and the Mid-Atlantic, including certain bays and estuaries in the Gulf of Maine | 25-90 | Sub-tidal benthic habitats on sand and sand with mud, shell hash, gravel, and rocks |

### 6.3.3 Fishery Impact Considerations

As described in more detail in Section 6.1, most commercial landings of black sea bass during 2017-2019 were caught with bottom otter trawl gear, followed by pots/traps, and handline gear. Only those gear types which contact the bottom impact physical habitat. Weighted hook and line gear can contact the bottom, but the magnitude and footprint of any impacts resulting from this contact is likely minimal.

Stevenson et al. (2004) compiled a detailed summary of several studies on the impacts of a variety of gear types on marine habitats. Conclusions relevant for this action are briefly summarized below with a focus on bottom trawl gear since this is the predominant gear type in the commercial black sea bass fishery (Table 6 in Section 6.1).

Otter trawl doors can create furrows in sand, mud, and gravel/rocky substrates. Studies have found furrow depths that range from 2 to 10 cm. Bottom trawl gear can also re-suspend and disperse surface sediments and can smooth topographic features. It can also result in reduced abundance, and in some cases reduced diversity, of benthic species such as nematodes, polychaetes, and bivalves. It can also have short-term positive ecological impacts such as increased food value and increased chlorophyll production in surface sediments. The duration of these impacts varies by sediment type, depth, and frequency of the impact (e.g., a single trawl tow vs. repeated tows). Some studies documented effects that lasted only a few months. Other studies found effects that lasted up to 18 months. Impacts tend to have shorter durations in dynamic environments with less structured bottom composition compared to less dynamic environments with structured bottom. Shallower water, stronger bottom currents, more wave action, finer-grained sediments, and higher frequencies of natural disturbance are characteristics that make environments more dynamic (Stevenson et al. 2004).

Compared to otter trawls and dredges, Stevenson et al. (2004) summarized fewer studies on other bottom tending gears such as traps. Morgan and Chuenpagdee (2003) found that the impacts of bottom gill nets, traps, and longlines were generally limited to warm or shallow-water environments with rooted aquatic vegetation or “live bottom” environments (e.g., coral reefs). These impacts were of a lesser degree than those from bottom trawls and dredges. Eno et al. (2001) found that traps can bend, smother, and uproot sea pens in soft sediments; however, sea pen communities were largely able to recover within a few days of the impact.

The Mid-Atlantic Council developed some fishery management actions with the sole intent of protecting marine habitats. For example, in Amendment 9 to the Mackerel, Squids, and Butterfish FMP, the Council determined that bottom trawls used in Atlantic mackerel, longfin and *Illex* squid, and butterfish fisheries have the potential to adversely affect EFH for some federally-managed fisheries (MAFMC 2008). As a result of Amendment 9, closures to squid trawling were developed for portions of Lydonia and Oceanographer Canyons. Subsequent closures were implemented in these and Veatch and Norfolk Canyons to protect tilefish EFH by prohibiting all bottom trawling activity. In addition, amendment 16 to the Mackerel, Squid, and Butterfish FMP prohibits the use of all bottom-tending gear in fifteen discrete zones and one broad zone where deep sea corals are known or highly likely to occur (81 *Federal Register* 90246, December 14, 2016).

Actions implemented in the Summer Flounder, Scup, and Black Sea Bass FMP that affected species with overlapping EFH were considered Amendment 13 (MAFMC 2002). The analysis in Amendment 13 indicated that no management measures were needed to minimize impacts to EFH because the trawl fisheries for summer flounder, scup, and black sea bass in federal waters are conducted primarily in high energy mobile sand and bottom habitat where gear impacts are minimal and/or temporary in nature.

## 6.4 ESA and MMPA Protected Species

Numerous protected species occur in the affected environment of the Summer Flounder, Scup, and Black Sea Bass FMP and have the potential to be impacted by the proposed action (i.e., there have been observed/documented interactions in the fisheries or with gear types similar to those used in the fisheries (bottom trawl, pot/trap, and hook and line gear). These species are under NMFS jurisdiction and are afforded protection under the Endangered Species Act (ESA) of 1973 and/or the Marine Mammal Protection Act (MMPA) of 1972.

Cusk are a NMFS "candidate species" under the ESA. Candidate species are those petitioned species for which NMFS has determined that listing may be warranted under the ESA and those species for which NMFS has initiated an ESA status review through an announcement in the Federal Register. If a species is proposed for listing the conference provisions under Section 7 of

the ESA apply (see 50 CFR 402.10); however, candidate species receive no substantive or procedural protection under the ESA. As a result, cusk will not be discussed further in this and the following sections; however, NMFS recommends that project proponents consider implementing conservation actions to limit the potential for adverse effects on candidate species from any proposed action. Additional information on cusk can be found at:
https://www.fisheries.noaa.gov/species/cusk.

A summary of protected species and critical habitat that may occur in the affected environment is provided in Table 10, followed by sections detailing which species and critical habitat are not likely to be impacted by the proposed action (Section 6.4.1) and which species may be potentially impacted by the proposed action (i.e., there have been observed/documented interactions in the fishery or with gear types similar to those used in the fishery; Section 6.4.2).

Table 10: Species Protected Under the ESA and/or MMPA that may occur in the affected environment of the black sea bass fishery. Marine mammal species italicized and in bold are considered MMPA strategic stocks.[8]

| Species | Status | Potentially impacted by this action? |
|---|---|---|
| **Cetaceans** | | |
| ***North Atlantic right whale (Eubalaena glacialis)*** | ***Endangered*** | ***Yes*** |
| Humpback whale, West Indies DPS *(Megaptera novaeangliae)* | Protected (MMPA) | Yes |
| ***Fin whale (Balaenoptera physalus)*** | ***Endangered*** | ***Yes*** |
| ***Sei whale (Balaenoptera borealis)*** | ***Endangered*** | ***Yes*** |
| ***Blue whale (Balaenoptera musculus)*** | ***Endangered*** | ***No*** |
| ***Sperm whale (Physeter macrocephalus*** | ***Endangered*** | ***Yes*** |
| Minke whale (*Balaenoptera acutorostrata*) | Protected (MMPA) | Yes |
| Pilot whale *(Globicephala spp.)*[9] | Protected (MMPA) | Yes |
| Pygmy sperm whale (*Kogia breviceps*) | Protected (MMPA) | No |
| Dwarf sperm whale (*Kogia sima*) | Protected (MMPA) | No |
| Risso's dolphin (*Grampus griseus*) | Protected (MMPA) | Yes |
| Atlantic white-sided dolphin (*Lagenorhynchus acutus*) | Protected (MMPA) | Yes |
| Short Beaked Common dolphin (*Delphinus delphis*) | Protected (MMPA) | Yes |
| Atlantic Spotted dolphin (*Stenella frontalis*) | Protected (MMPA) | No |
| Striped dolphin (*Stenella coeruleoalba*) | Protected (MMPA) | No |
| ***Bottlenose dolphin (Tursiops truncatus)***[10] | ***Protected (MMPA)*** | ***Yes*** |
| Harbor porpoise (*Phocoena phocoena*) | Protected (MMPA) | Yes |
| **Sea Turtles** | | |
| Leatherback sea turtle (*Dermochelys coriacea*) | Endangered | Yes |

[8] A strategic stock is defined under the MMPA as a marine mammal stock for which: (1) the level of direct human-caused mortality exceeds the potential biological removal level; (2) based on the best available scientific information, is declining and is likely to be listed as a threatened species under the ESA within the foreseeable future; and/or (3) is listed as a threatened or endangered species under the ESA, or is designated as depleted under the MMPA (Section 3 of the MMPA of 1972).

[9] There are 2 species of pilot whales: short finned (*G. melas melas*) and long finned (*G. macrorhynchus*). Due to the difficulties in identifying the species at sea, they are often just referred to as *Globicephala spp*.

[10] This includes the Western North Atlantic Offshore, Northern Migratory Coastal, and Southern Migratory Coastal Stocks of Bottlenose Dolphins. See https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region for further details.

| Species | Status | Potentially impacted by this action? |
|---|---|---|
| Kemp's ridley sea turtle (*Lepidochelys kempii*) | Endangered | Yes |
| Green sea turtle, North Atlantic DPS (*Chelonia mydas*) | Threatened | Yes |
| Loggerhead sea turtle (*Caretta caretta*), NW Atlantic Ocean DPS | Threatened | Yes |
| Hawksbill sea turtle (*Eretmochelys imbricate*) | Endangered | No |
| **Fish** | | |
| Shortnose sturgeon (*Acipenser brevirostrum*) | Endangered | No |
| Giant manta ray (*Manta birostris)* | Threatened | Yes |
| Oceanic whitetip shark (*Carcharhinus longimanus*) | Threatened | No |
| Atlantic salmon (*Salmo salar*) | Endangered | Yes |
| Atlantic sturgeon *(Acipenser oxyrinchus)* | | |
| *Gulf of Maine DPS* | Threatened | Yes |
| *New York Bight DPS, Chesapeake Bay DPS, Carolina DPS & South Atlantic DPS* | Endangered | Yes |
| Cusk (*Brosme brosme)* | Candidate | Yes |
| **Pinnipeds** | | |
| Harbor seal (*Phoca vitulina*) | Protected (MMPA) | Yes |
| Gray seal (*Halichoerus grypus*) | Protected (MMPA) | Yes |
| Harp seal (*Phoca groenlandicus*) | Protected (MMPA) | Yes |
| Hooded seal (*Cystophora cristata*) | Protected (MMPA) | Yes |
| **Critical Habitat** | | |
| North Atlantic Right Whale | ESA (Protected) | No |
| Northwest Atlantic DPS of Loggerhead Sea Turtle | ESA (Protected) | No |

### 6.4.1 Species and Critical Habitat Not Likely to be Affected by the Proposed Action

Based on available information, it has been determined that this action is not likely to impact multiple ESA listed and/or MMPA protected species or any designated critical habitat (Table 10). This determination has been made because either the occurrence of the species is not known to overlap with the area primarily affected by the action and/or based on the most recent 10 years of observer, stranding, and/or marine mammal serious injury and mortality reports, there have been no observed or documented interactions between the species and the primary gear type (i.e., bottom trawl, trap/pot, and hook and line gear) used to prosecute the summer flounder, scup, and black sea bass fisheries (Greater Atlantic Region Marine Animal Incident Database, unpublished data; NMFS Marine Mammal Stock Assessment Reports for the Atlantic Region; NMFS NEFSC observer/sea sampling database, unpublished data; NMFS NEFSC marine mammal (small cetacean, pinniped, baleen whale) serious injury and mortality Reference Documents or Technical Memoranda; MMPA List of Fisheries (LOF); NMFS 2021a).[11] In the case of critical habitat, this determination has been made because the action will not affect the essential physical and biological features of critical habitat identified in Table 10 and therefore, will not result in the destruction or adverse modification of any species critical habitat (NMFS 2021a).

### 6.4.2 Species Potentially Affected by The Proposed Action

Table 10 provides a list of protected species of sea turtle, marine mammal, and fish present in the affected environment of the summer flounder, scup, and black sea bass fisheries, and that may

[11] For small cetaceans and pinnipeds protected under the MMPA, the most recent 10 years of observer, stranding, and/or marine mammal serious injury and mortality reports are from 2009-2018; however, the most recent 10 years of large whale serious injury, mortality, and entanglement reports are from 2010-2019. For ESA listed species, information on observer or documented interactions with fishing gear is from 2010-2019.

also be impacted by the operation of these fisheries; that is, have the potential to become entangled or bycaught in the fishing gear used to prosecute the fisheries. To aid in the identification of MMPA protected species potentially impacted by the action, NMFS Marine Mammal SARs for the Atlantic Region, MMPA List of Fisheries (LOF), NMFS (2021b), NMFS NEFSC observer/sea sampling database (unpublished data), and NMFS NEFSC marine mammal (small cetacean, pinniped, baleen whale) serious injury and mortality Reference Documents or Technical Memoranda were referenced.

To help identify ESA listed species potentially impacted by the action, we queried the NMFS NEFSC observer/sea sampling (2010-2019), Sea Turtle Disentanglement Network (2010-2019), and the Greater Atlantic Region Marine Animal Incident (2010-2019) databases for interactions, as well as reviewed the May 27, 2021, Biological Opinion (Opinion)[12] issued by NMFS. The 2021 Opinion considered the effects of the NMFS' authorization of ten FMPs,[13] including the Summer Flounder, Scup, and Black Sea Bass FMP, NMFS' North Atlantic Right Whale Conservation Framework, and the New England Fishery Management Council's Omnibus Essential Fish Habitat Amendment 2, on ESA-listed species and designated critical habitat. The Opinion determined that the proposed action may adversely affect, but is not likely to jeopardize, the continued existence of North Atlantic right, fin, sei, or sperm whales; the Northwest Atlantic Ocean distinct population segment (DPS) of loggerhead, leatherback, Kemp's ridley, or North Atlantic DPS of green sea turtles; any of the five DPSs of Atlantic sturgeon; GOM DPS Atlantic salmon; or giant manta rays. The Opinion also concluded that the proposed action is not likely to adversely affect designated critical habitat for North Atlantic right whales, the Northwest Atlantic Ocean DPS of loggerhead sea turtles, U.S. DPS of smalltooth sawfish, Johnson's seagrass, or elkhorn and staghorn corals. An Incidental Take Statement was issued in the Opinion. The Incidental Take Statement includes reasonable and prudent measures and their implementing terms and conditions, which NMFS determined are necessary or appropriate to minimize impacts of the incidental take in the fisheries assessed in this Opinion.

As the primary concern for both MMPA protected and ESA listed species is the potential for the fishery to interact (e.g., bycatch, entanglement) with these species it is necessary to consider (1) species occurrence in the affected environment of the fishery and how the fishery will overlap in time and space with this occurrence; and (2) data and observed records of protected species interaction with particular fishing gear types, in order to understand the potential risk of an interaction. Information on species occurrence in the affected environment of the summer flounder, scup, and black sea bass fisheries and on protected species interactions with specific fishery gear is provided below.

#### 6.4.2.1 Sea Turtles

This section contains s a brief summary of the status and trends, as well as the occurrence and distribution of sea turtles in the affected environment of the summer flounder, scup, and black sea bass fisheries. Additional background information on the range-wide status of affected sea turtles species, as well as a description and life history of each of these species, can be found in a

[12] NMFS' May 27, 2021, Biological Opinion on the 10 FMPs is found at: https://www.fisheries.noaa.gov/resource/document/biological-opinion-10-fishery-management-plans

[13] The ten FMPs considered in the May 27, 2021, Biological Opinion include the: (1) American Lobster; (2) Atlantic Bluefish; (3) Atlantic Deep-Sea Red Crab; (4) Mackerel/Squid/Butterfish; (5) Monkfish; (6) Northeast Multispecies; (7) Northeast Skate Complex; (8) Spiny Dogfish; (9) Summer Flounder/Scup/Black Sea Bass; and (10) Jonah Crab FMPs.

number of published documents, including NMFS (2021a); sea turtle status reviews and biological reports (NMFS and USFWS 1995; Hirth 1997; Turtle Expert Working Group [TEWG] 1998, 2000, 2007, 2009; NMFS and USFWS 2007a, 2007b; Conant et al. 2009; NMFS and USFWS 2013), and recovery plans for the loggerhead (Northwest Atlantic DPS) sea turtle (NMFS and USFWS 2008), leatherback sea turtle (NMFS and USFWS 1992, 1998a, 2020), Kemp's ridley sea turtle (NMFS et al. 2011), and green sea turtle (NMFS and USFWS 1991, 1998b).

***Status and Trends***

Four sea turtle species have the potential to be impacted by the proposed action: Northwest Atlantic Ocean DPS of loggerhead, Kemp's ridley, North Atlantic DPS of green, and leatherback sea turtles (Table 10). Although stock assessments and similar reviews have been completed for sea turtles, none have been able to develop a reliable estimate of absolute population size. As a result, nest counts are used to inform population trends for sea turtle species.

For the Northwest Atlantic Ocean DPS of loggerhead sea turtles, there are five unique recovery units that comprise the DPS. Nesting trends for each of these recovery units are variable; however, Florida index nesting beaches comprise most of the nesting in the DPS (https://myfwc.com/research/wildlife/sea-turtles/nesting/beach-survey-totals/). Overall, short-term trends for loggerhead sea turtles (Northwest Atlantic Ocean DPS) have shown increases; however, over the long-term the DPS is considered stable (NMFS 2021a).

For Kemp's ridley sea turtles, from 1980 through 2003, the number of nests at three primary nesting beaches (Rancho Nuevo, Tepehuajes, and Playa Dos) increased 15 percent annually (Heppell et al. 2005); however, due to recent declines in nest counts, decreased survival of immature and adult sea turtles, and updated population modeling, this rate is not expected to continue and therefore, the overall trend is unclear (NMFS and USFWS 2015; Caillouett et al. 2018). In 2019, there were 11,090 nests, a 37.61% decrease from 2018 and a 54.89% decrease from 2017, which had the highest number (24,587) of nests; the reason for this recent decline is uncertain (see NMFS 2021a). Given this and continued anthropogenic threats to the species, according to NMFS (2021a), the species resilience to future perturbation is low.

The North Atlantic DPS of green sea turtle, overall, is showing a positive trend in nesting; however, increases in nester abundance for the North Atlantic DPS in recent years must be viewed cautiously as the datasets represent a fraction of a green sea turtle generation which is between 30 and 40 years (Seminoff et al. 2015). While anthropogenic threats to this species continue, taking into consideration the best available information on the species, NMFS (2021a), concluded that the North Atlantic DPS appears to be somewhat resilient to future perturbations.

Leatherback turtle nesting in the Northwest Atlantic is showing an overall negative trend, with the most notable decrease occurring during the most recent time frame of 2008 to 2017 (NW Atlantic Leatherback Working Group 2018). The leatherback status review in 2020 concluded that leatherbacks are exhibiting an overall decreasing trend in annual nesting activity (NMFS and USFWS, 2020). Given continued anthropogenic threats to the species, according to NMFS (2021a), the species' resilience to additional perturbation both within the Northwest Atlantic and worldwide is low.

***Occurrence and Distribution***

**Hard-shelled sea turtles -** In U.S. Northwest Atlantic waters, hard-shelled turtles commonly occur throughout the continental shelf from Florida to Cape Cod, MA, although their presence varies with the seasons due to changes in water temperature (Braun-McNeill et al. 2008; Braun & Epperly 1996; Epperly et al. 1995a,b; Mitchell et al. 2003; Shoop & Kenney 1992; TEWG 2009; Blumenthal et al. 2006; Braun-McNeill & Epperly 2002; Griffin et al. 2013; Hawkes et al. 2006; Hawkes et al. 2011; Mansfield et al. 2009; McClellan & Read 2007; Mitchell et al. 2003; Morreale & Standora 2005). As coastal water temperatures warm in the spring, loggerheads begin to migrate to inshore waters of the southeast United States and also move up the Atlantic Coast (Braun-McNeill & Epperly 2004; Epperly et al. 1995a,b,c; Griffin et al. 2013; Morreale & Standora 2005), occurring in Virginia foraging areas as early as late April and on the most northern foraging grounds in the GOM in June (Shoop & Kenney 1992). The trend is reversed in the fall as water temperatures cool. The large majority leave the GOM by September, but some remain in Mid-Atlantic and Northeast areas until late fall (i.e., November). By December, sea turtles have migrated south to waters offshore of North Carolina, particularly south of Cape Hatteras, and further south, although it should be noted that hard-shelled sea turtles can occur year-round in waters off Cape Hatteras and south (Epperly et al. 1995b; Griffin et al. 2013; Hawkes et al. 2011; Shoop & Kenney 1992).

***Leatherback sea turtles -*** Leatherbacks, a pelagic species, are known to use coastal waters of the U.S. continental shelf and to have a greater tolerance for colder water than hard-shelled sea turtles (James *et al.* 2005; Eckert *et al.* 2006; Murphy *et al.* 2006; NMFS and USFWS 2013b; Dodge *et al.* 2014). Leatherback sea turtles engage in routine migrations between northern temperate and tropical waters (NMFS and USFWS 1992; James *et al.* 2005; James *et al*. 2006; Dodge *et al.* 2014). They are found in more northern waters (i.e., GOM) later in the year (i.e., similar time frame as hard-shelled sea turtles), with most leaving the Northwest Atlantic shelves by mid-November (James *et al.* 2005; James *et al*. 2006; Dodge *et al.* 2014).

#### 6.4.2.2 Large Whales

***Status and Trends***

Six large whale species have the potential to be impacted by the proposed action: humpback, North Atlantic right, fin, sei, sperm, and minke whales (Table 10). Review of large whale stock assessment reports covering the period of 2009 through 2018 indicate a decreasing trend for the North Atlantic right whale population. The population trajectory for fin, humpback, minke, sperm, and sei whales is unknown as a trend analysis has not been conducted (Hayes et al. 2017; Hayes et al. 2018; Hayes et al. 2019; Hayes et al. 2020; Hayes et al. 2021; Waring et al. 2016; Waring et al. 2015). For additional information on the status of humpback, North Atlantic right, fin, sei, sperm, and minke whales, refer to the NMFS Marine Mammal SARs for the Atlantic Region.

***Occurrence and Distribution***

Humpback, North Atlantic right, fin, sei, sperm, and minke whales occur in the Northwest Atlantic. Generally speaking, large whales follow an annual pattern of migration between low latitude (south of 35ºN) wintering/calving grounds and high latitude spring/summer/fall foraging grounds (primarily north of 41ºN; NMFS Marine Mammal SARs for the Atlantic Region). This is a simplification of whale movements, particularly as it relates to winter movements. It is unknown if all individuals of a population migrate to low latitudes in the winter, although increasing evidence suggests that for some species, some portion of the population remains in higher latitudes throughout the winter (Clapham et al. 1993; Davis et at. 2017; Davis et al. 2020; Swingle et al. 1993; Vu et al. 2012; NMFS Marine Mammal SARs for the Atlantic Region). Although further research is needed to provide a clearer understanding of large whale movements and distribution in the winter, the occurrence of large whales in low latitude foraging grounds in the spring/summer/fall is well understood. Large whales consistently return to these foraging areas each year, therefore these areas can be considered important areas for whales (Davis et al. 2017; Davis et al. 2020; Payne et al. 1986; Payne et al. 1990; Schilling et al. 1992; NMFS Marine Mammal SARs for the Atlantic Region). For additional information on the biology and range wide distribution of humpback, North Atlantic right, fin, sei, sperm, and minke whales, refer to the NMFS Marine Mammal SARs for the Atlantic Region.

#### 6.4.2.3 Small Cetaceans and Pinnipeds

***Status and Trends***

Table 10 lists the small cetaceans and pinniped species that may be impacted by the proposed action. The population trajectory for most small cetaceans and pinniped populations is unknown as a trend analysis has not been conducted for these populations (NMFS Marine Mammal SARs for the Atlantic Region). However, review of stock assessment reports covering the period of 2009 through 2018, analysis of trends in abundance were provided for several common bottlenose dolphin stocks that occur in the affected environment of the summer flounder, scup, and black sea bass fisheries (i.e., Western North Atlantic: Northern and Southern Migratory Coastal stocks, S. Carolina, Georgia Coastal stock, Northern Florida Coastal stock, and Central Florida Coastal stock) and gray seals (Hayes et al. 2017; Hayes et al. 2018; Hayes et al. 2019; Hayes et al. 2020; Hayes et al. 2021; Waring et al. 2016). The analysis suggested a possible decline in stock abundance for the common bottlenose dolphin stocks and an increasing trend for the gray seal population, respectively (Hayes et al. 2017; Hayes et al. 2018; Hayes et al. 2019; Hayes et al. 2020; Hayes et al. 2020; Waring et al. 2016). For additional information on the status of each species of small cetacean and pinniped, refer to the NMFS Marine Mammal SARs for the Atlantic Region.

***Occurrence and Distribution***

Small cetaceans can be found throughout the year in the Northwest Atlantic Ocean (Maine to Florida); however, within this range, there are seasonal shifts in species distribution and abundance. Pinnipeds are primarily found throughout the year or seasonally from New Jersey to Maine; however, increasing evidence indicates that some species (e.g., harbor seals) may be extending their range seasonally into waters as far south as Cape Hatteras, North Carolina (35° N). For additional information on the biology and range wide distribution of each species of small cetacean and pinniped, refer to the NMFS Marine Mammal SARs for the Atlantic Region.

#### 6.4.2.4 Atlantic Sturgeon

***Status and Trends***

All five DPSs of Atlantic sturgeon have the potential to be impacted by the proposed action. Population trends for Atlantic sturgeon are difficult to discern; however, the most recent stock assessment report concludes that Atlantic sturgeon, at both coastwide and DPS level, are depleted relative to historical levels (ASSRT 2007; ASMFC 2017; NMFS 2021a).

***Occurrence and Distribution***

The marine range of U.S. Atlantic sturgeon extends from Labrador, Canada, to Cape Canaveral, Florida. All five DPSs of Atlantic sturgeon have the potential to be located anywhere in this marine range (ASSRT 2007; Dovel and Berggren 1983; Dadswell et al. 1984; Kynard et al. 2000; Stein et al. 2004a; Dadswell 2006; Laney et al. 2007; Dunton et al. 2010, 2015; Erickson et al. 2011; Wirgin et al. 2012; Waldman et al. 2013; O'Leary et al. 2014; Wirgin et al. 2015a,b; ASMFC 2017b).

Based on fishery-independent and dependent data, as well as data collected from tracking and tagging studies, in the marine environment, Atlantic sturgeon appear to primarily occur inshore of the 50 meter depth contour (Stein et al. 2004a,b; Erickson et al. 2011; Dunton et al. 2010); however, Atlantic sturgeon are not restricted to these depths, as excursions into deeper continental shelf waters have been documented (Timoshkin 1968; Collins and Smith 1997; Stein et al. 2004a,b; Dunton et al. 2010; Erickson et al. 2011). Data from fishery-independent surveys and tagging and tracking studies also indicate that Atlantic sturgeon may undertake seasonal movements along the coast (Dunton et al. 2010; Erickson et al. 2011; Wipplehauser 2012); however, there is no evidence to date that all Atlantic sturgeon make these seasonal movements and therefore, may be present throughout the marine environment throughout the year.

For additional information on the biology and range wide distribution of each DPS of Atlantic sturgeon refer to: 77 FR 5880 and 77 FR 5914, the Atlantic Sturgeon Status Review Team's (ASSRT) 2007 status review of Atlantic sturgeon (ASSRT 2007); the ASMFC 2017 Atlantic Sturgeon Benchmark Stock Assessment and Peer Review Report (ASMFC 2017), and NMFS (2021a).

#### 6.4.2.5 Atlantic Salmon

***Status and Trends***

The Gulf of Maine DPS of Atlantic salmon has the potential to be impacted by the proposed action. There is no population growth rate available for this DPS; however, the consensus is that the DPS exhibits a continuing declining trend (NOAA 2016; USFWS and NMFS 2018; NMFS 2021a).

***Occurrence and Distribution***

The wild populations of Atlantic salmon are listed as endangered under the ESA. Their freshwater range occurs in the watersheds from the Androscoggin River northward along the Maine coast to the Dennys River, while the marine range of the GOM DPS extends from the Gulf of Maine (primarily northern portion of the Gulf of Maine), to the coast of Greenland (NMFS and USFWS 2005, 2016; Fay et al. 2006). In general, smolts, post-smolts, and adult Atlantic salmon may be present in the Gulf of Maine and coastal waters of Maine in the spring (beginning in April), and adults may be present throughout the summer and fall months (Baum 1997; Fay et al. 2006; USASAC 2013; Hyvarinen et al. 2006; Lacroix and McCurdy 1996; Lacroix et al. 2004, 2005; Reddin 1985; Reddin and Short 1991; Reddin and Friedland 1993; Sheehan et al. 2012; NMFS and USFWS 2005, 2016; Fay et al. 2006). For additional information on the on the biology and range wide distribution of the Gulf of Maine DPS of Atlantic salmon, refer to NMFS and USFWS (2005, 2016); Fay et al. (2006); and NMFS (2021a).

#### 6.4.2.6 Giant Manta Ray

***Status and Trends***

Giant manta rays have the potential to be impacted by the proposed action. While there is considerable uncertainty regarding the giant manta ray's current abundance throughout its range, the best available information indicates that in areas where the species is not subject to fishing, populations may be stable (NMFS 2021a). However, in regions where giant manta rays are (or were) actively targeted or caught as bycatch populations appear to be decreasing (Miller and Klimovich 2017).

***Occurrence and Distribution***

Giant manta rays may occur in coastal, nearshore, and pelagic waters off the U.S. east coast (Miller and Klimovich 2017). Along the U.S. East Coast, giant manta rays are usually found in water temperatures between 19 and 22°C (Miller and Klimovich 2017) and have been observed as far north as New Jersey. Given that the species is rarely identified in the fisheries data in the Atlantic, it may be assumed that populations within the Atlantic are small and sparsely distributed (Miller and Klimovich 2017).

### 6.4.3 Gear Interactions with Protected Species

Protected species are at risk of interacting with various types of fishing gear, with interaction risks associated with gear type, quantity, soak or tow duration, and degree of overlap between gear and protected species. Information on observed or documented interactions between gear and protected species is available from as early as 1989 (NMFS Marine Mammal SARs for the Atlantic Region; NMFS NEFSC observer/sea sampling database, unpublished data). As the distribution and occurrence of protected species and the operation of fisheries (and, thus, risk to protected species) have changed over the last 30 years, we use the most recent 10 years of available information to best capture the current risk to protected species from fishing gear. For small cetaceans and pinnipeds protected under the MMPA, this primarily covers the period from 2009-2018[14]; however, for large whales, serious injury, mortality, and entanglements reports are from 2010-2019[15]. For ESA listed species, the most recent 10 years of data on observed or documented interactions is available from 2010-2019[16]. Available information on gear interactions with a given species (or species group) is provided in the sections below. The sections to follow are not a comprehensive review of all fishing gear types known to interact with a given species; emphasis is only being placed on the primary gear types used to prosecute the commercial black sea bass fisheries.

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[14] Waring et al. 2016; Hayes et al. 2017; Hayes et al. 2018; Hayes et al. 2019; Hayes et al. 2020; Hayes et al. 2021; MMPA List of Fisheries (LOF):NMFS NEFSC reference documents (marine mammal serious injury and mortality reports).

[15] GAR Marine Animal Incident Database, unpublished data; Waring et al. 2016; Hayes et al. 2017; Hayes et al. 2018; Hayes et al. 2019; Hayes et al. 2020; Hayes et al. 2021; Cole and Henry 2013; Henry et al. 2016; Henry et al. 2017; Henry et al. 2019; Henry et al. 2020; Henry et al. 2021; Henry et al. 2022.

[16] ASMFC 2017; GAR Marine Animal Incident Database, unpublished data; Kocik et al. 2014; NMFS Marine Mammal SARs for the Atlantic Region: https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-stock-assessment-reports-region; NMFS 2021a; NMFS NEFSC reference documents (marine mammal serious injury and mortality reports): https://nefsc.noaa.gov/publications/crd/; NMFS; NEFSC observer/sea sampling database, unpublished data; GAR Sea Turtle and Disentanglement Network, unpublished data; NMFS Sea Turtle Stranding and Salvage Network, unpublished data.

The commercial black sea bass fishery is primarily prosecuted with bottom otter trawl and pots/traps. For example, about 65% of commercial black sea bass landings reported on federal VTRs in 2021 were caught with bottom otter trawl gear, 32% with pots/traps, and 3% with hand lines.

Available information on gear interactions with a given species (or species group) is provided below. These sections are not a comprehensive review of all fishing gear types known to interact with a given species; emphasis is only being placed on the primary gear types used in the commercial black sea bass fisheries and their associated interaction risk to the species under consideration.

#### 6.4.3.1 Gear Interactions with Sea Turtles

***Bottom Trawl Gear***

Bottom trawl gear poses an injury and mortality risk to sea turtles (Sasso and Epperly 2006; NMFS Observer Program, unpublished data). Since 1989, the date of earliest observer records for federally managed fisheries, sea turtle interactions with trawl gear have been observed in the Gulf of Maine, Georges Bank, and/or the Mid-Atlantic; however, most of the observed interactions have been observed south of the Gulf of Maine (Murray 2008; Murray 2015; Murray 2020; NMFS NEFSC observer/sea sampling database, unpublished data; NMFS 2021a; Warden 2011a,b). As few sea turtle interactions have been observed in the Gulf of Maine, there are insufficient data to conduct a robust model-based analysis and bycatch estimate of sea turtle interactions with trawl gear in this region. As a result, the bycatch estimates and discussion below are for trawl gear in the Mid-Atlantic and Georges Bank.

Murray (2015) estimated that from 2009-2013, the total average annual loggerhead interactions in bottom trawl gear in the Mid-Atlantic was 231 (CV=0.13, 95% CI=182-298); this equates to approximately 33 adult equivalents (Murray 2015). Most recently, Murray (2020) provided information on sea turtle interaction rates from 2014-2018 (the most recent five-year period that has been statistically analyzed for trawls). Interaction rates were stratified by region, latitude zone, season, and depth. The highest loggerhead interaction rate (0.43 turtles/day fished) was in waters south of 37º N during November to June in waters greater than 50 meters deep. The greatest number of estimated interactions occurred in the Mid-Atlantic region north of 39º N, during July to October in waters less than 50 meters deep. Within each stratum, interaction rates for non-loggerhead species were lower than rates for loggerheads (Murray 2020).

Based on Murray (2020)[17], from 2014-2018, 571 loggerhead (CV=0.29, 95% CI=318-997), 46 Kemp's ridley (CV=0.45, 95% CI=10-88), 20 leatherback (CV=0.72, 95% CI=0-50), and 16 green (CV=0.73, 95% CI=0-44) sea turtle interactions were estimated to have occurred in bottom trawl gear in the Mid-Atlantic region over the five-year period. On Georges Bank, 12 loggerheads (CV=0.70, 95% CI=0-31) and 6 leatherback (CV=1.0, 95% CI=0-20) interactions were estimated to have occurred from 2014-2018. An estimated 272 loggerhead, 23 Kemp's

[17] Murray (2020) estimated interaction rates for each sea turtle species with stratified ratio estimators. This method differs from previous approaches (Murray 2008; Murray 2015; Warden 2011a,b), where rates were estimated using generalized additive models (GAMs). Ratio estimator results may be similar to those using GAM or generalized linear models (GLM) if ratio estimators are stratified based on the same explanatory variables in a GAM or GLM model (Murray 2007, Murray and Orphanides 2013, Orphanides 2010).

ridley, 13 leatherback, and 8 green sea turtle interactions resulted in mortality over this period (Murray 2020).

***Pot/Trap Gear***

Leatherback, loggerhead, green, and kemp's ridley sea turtles are at risk of interacting with trap/pot gear; however, review of data provided by the NEFSC Observer Program, VTR, and the NMFS Greater Atlantic Region Sea Turtle Disentanglement Network, indicate that interactions between trap/pot gear and Kemp's ridley and green sea turtles are rare in the Greater Atlantic Region (NMFS 2021a). Sea turtle interactions with pot/trap gear are primarily associated with entanglement in vertical lines associated with this gear type; however, sea turtles can also become entangled in groundlines or surface system lines of pot/trap gear (Sea Turtle Disentanglement Network, unpublished data). Records of stranded or entangled sea turtles indicate that fishing gear can wrap around the neck, flipper, or body of the sea turtle and severely restrict swimming or feeding (Balazs 1985; Sea Turtle Disentanglement Network, unpublished data). As a result, sea turtles can incur serious injuries and in some case, mortality immediately or at a later time.

Given few trap/pot trips have been observed by the NEFSC Observer Program over the last 10 years, and VTR reporting of incidences of interactions with sea turtles are limited, most reports of sea turtle entanglements in trap/pot gear are documented by the Sea Turtle Disentanglement Network. Based on this, the Sea Turtle Disentanglement Network database, a component of the Sea Turtle Stranding and Salvage Network, provides the most complete and best available dataset on sea entanglements in the Greater Atlantic Region. Confirmed and probable entanglement cases in the Sea Turtle Disentanglement Network database from 2010-2019 were reviewed. Over this timeframe, 270 sea turtle entanglements in vertical line gear (known and unknown fishery) in the Greater Atlantic Region (Maine through Virginia) were reported and classified with a probable or confirmed, high confidence rating. Of the 270 cases assessed, 255 involved leatherback sea turtles and 15 involved loggerhead sea turtles (NMFS 2021a).

#### 6.4.3.2 Gear Interactions with Atlantic Sturgeon

***Bottom Trawl Gear***

Since 1989, Atlantic sturgeon interactions (i.e., bycatch) with bottom trawl gear have frequently been observed in the Greater Atlantic Region, with most sturgeon observed captured falling within the 100 to 200 cm total length range; however, both larger and small individuals have been observed (ASMFC 2007; ASMFC 2017; Miller and Shepard 2011; NMFS NEFSC observer/sea sampling database, unpublished data; NMFS 2021a; Stein et al. 2004). For otter trawl fisheries, the highest incidence of Atlantic sturgeon bycatch have been associated with depths less than 30 meters (ASMFC 2007). More recently, over all gears and observer programs that have encountered Atlantic sturgeon, the distribution of haul depths on observed hauls that caught Atlantic sturgeon was significantly different from those that did not encounter Atlantic surgeon, with Atlantic sturgeon encountered primarily at depths less than 20 meters (ASMFC 2017).

Review of NMFS (2021a), as well as the most recent 10 years of NMFS observer data (i.e., 2010-2019; NMFS NEFSC observer/sea sampling database, unpublished data) show that there have been observed interactions between Atlantic sturgeon and bottom trawl gear in the Greater Atlantic Region. The ASMFC (2017) Atlantic sturgeon benchmark stock assessment represents the most accurate predictor of annual Atlantic sturgeon interactions in fishing gear (e.g., otter trawl). The stock assessment analyzes fishery observer and VTR data to estimate Atlantic sturgeon interactions in fishing gear in the Mid-Atlantic and New England regions from 2000-2015, the timeframe which included the most recent, complete data at the time of the report. The total bycatch of Atlantic sturgeon from bottom otter trawls ranged between 624-1,518 fish over the 2000-2015 time series. Focusing on the most recent five-year period of data provided in the stock assessment report,[18] the estimated average annual bycatch during 2011-2015 of Atlantic sturgeon in bottom otter trawl gear is 777.4 individuals.

***Pot/Trap Gear***

To date, there have been no documented pot/trap interactions with Atlantic sturgeon (NMFS NEFSC observer/sea sampling database, unpublished data; NMFS 2021a).

#### 6.4.3.3 Gear Interactions with Atlantic Salmon

***Bottom Trawl Gear***

Atlantic salmon are at risk of interacting with bottom trawl gear (NEFSC observer/sea sampling database, unpublished data; Kocik *et al*. 2014; NMFS 2021a). Northeast Fisheries Observer Program (NEFOP) data from 1989-2019 show records of incidental bycatch of Atlantic salmon in seven of the 31 years, with a total of 15 individuals caught, nearly half of which (seven) occurred in 1992 (NMFS NEFSC observer/sea sampling database, unpublished data).[19] Of the observed incidentally caught Atlantic salmon, ten were listed as “discarded,” which is assumed to be a live discard (Kocik, pers comm.; February 11, 2013). Out of the 15 salmon bycaught, four were observed in bottom trawl gear.,with the remainder observed in gillnet gear. Given the very low number of observed Atlantic salmon interactions in bottom trawl gear, interaction with this gear type is believed to be rare in the Greater Atlantic Region.

***Pot/Trap Gear***

To date, there have been no documented pot/trap interactions with Atlantic salmon (NMFS NEFSC observer/sea sampling database, unpublished data; NMFS 2021a).

#### 6.4.3.4 Gear Interactions with Giant Manta Ray

***Bottom Trawl Gear***

Giant manta rays are potentially susceptible to capture by bottom trawl gear based on records of their capture in fisheries using these gear types (NMFS NEFSC observer/sea sampling database, unpublished data; NMFS 2021a). Review of the most recent 10 years of NEFOP data showed that between 2010-2019, two (unidentified) giant manta rays were observed in bottom trawl gear (NMFS NEFSC observer/sea sampling database, unpublished data). All giant manta ray interactions in trawl gear recorded in the NEFOP database indicate the animals were encountered alive and released alive.

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[18] The period of 2011-2015 was chosen as it is the period within the stock assessment that most accurately resembles the current trawl fisheries in the region.

[19] There is no information available on the genetics of these bycaught Atlantic salmon, so it is not known how many of them were part of the Gulf of Maine DPS. It is likely that some of these salmon, particularly those caught south of Cape Cod, may have originated from the stocking program in the Connecticut River. Those Atlantic salmon caught north of Cape Cod and/or in the Gulf of Maine are more likely to be from the Gulf of Maine DPS.

***Pot/Trap Gear***

To date, there have been no documented pot/trap interactions with giant manta rays (NMFS NEFSC observer/sea sampling database, unpublished data; NMFS 2021a).

### 6.4.3.5 Gear Interactions with Marine Mammals

Depending on species, marine mammals have been observed seriously injured or killed in bottom trawl and/or pot/trap gear. Pursuant to the MMPA, NMFS publishes a List of Fisheries annually, classifying U.S. commercial fisheries into one of three categories based on the relative frequency of incidental serious injuries and/or mortalities of marine mammals in each fishery (i.e., Category I=frequent; Category II=occasional; Category III=remote likelihood or no known interactions). In the Northwest Atlantic, the 2022 List of Fisheries (87 FR 23122, April 19, 2022) categorizes commercial bottom trawl fisheries (Northeast or Mid-Atlantic), and the Atlantic mixed species trap/pot fishery (e.g., black sea bass) as Category II fisheries.

#### 6.4.3.5.1 Gear Interactions with Large Whales

***Bottom Trawl Gear***

Review of the most recent 10 years of observer, stranding, and/or baleen whale serious injury and mortality determinations from 2010-2019 and querying the Greater Atlantic Region Marine Animal Incident database (which contains data for 2019) showed no observed or confirmed documented interactions with large whales and bottom trawl gear.[20] Based on this information, large whale interactions with bottom trawl gear are not expected.

***Pot/Trap Gear***

Large whale interactions (entanglements) with fishing gear have been observed and documented in the waters of the Northwest Atlantic.[21] Information available on all interactions (e.g., entanglement, vessel strike, unknown cause) with large whales comes from reports documented in the GARFO Marine Animal Incident Database (unpublished data). The level of information collected for each case varies, but may include details on the animal, gear, and any other information about the interaction (e.g., location, description, etc.). Each case is evaluated using defined criteria to assign the case to an injury/information category using all available information and scientific judgement. In this way, the injury severity and cause of injury/death for the event is evaluated, with serious injury and mortality determinations issued by the NEFSC.21F22

[20] Greater Atlantic Region Marine Animal Incident Database (unpublished data); NMFS Marine Mammal Stock Assessment Reports for the Atlantic Region; NMFS NEFSC observer/sea sampling database, unpublished data ; MMPA List of Fisheries; Cole and Henry 2013;Henry et al. 2016; Henry et al. 2017; Henry et al. 2019; Henry et al. 2020; Henry et al. 2021; Henry et al. 2022.

[21] NMFS Atlantic Large Whale Entanglement Reports: For years prior to 2014, contact David Morin, Large Whale Disentanglement Coordinator, David.Morin@NOAA.gov; Greater Atlantic Region Marine Animal Incident Database (unpublished data); NMFS Marine Mammal Stock Assessment Reports for the Atlantic Region; NMFS NEFSC Baleen Whale Serious Injury and Morality Determinations Reference Documents or Technical Memoranda; MMPA List of Fisheries; NMFS 2021a,b.

[22] Serious Injury and Mortality Determinations for Baleen Whale Stocks along the Gulf of Mexico, United States East Coast, and Atlantic Canadian Provinces can be found at: https://apps-nefsc.fisheries.noaa.gov/rcb/publications/technical-memoranda.html or https://apps-nefsc.fisheries.noaa.gov/rcb/publications/center-reference-documents.html

Based on the best available information, the greatest entanglement risk to large whales is posed by fixed gear used in trap/pot or sink gillnet fisheries (Angliss and Demaster 1998; Cassoff et al. 2011; Cole and Henry 2013; Kenney and Hartley 2001; Knowlton and Kraus 2001; Hartley et al. 2003; Johnson et al. 2005;Whittingham et al. 2005a,b; Knowlton et al. 2012; NMFS 2021a,b; Hamilton and Kraus 2019; Henry et al. 2014; Henry et al. 2015; Henry et al. 2016; Henry et al. 2017; Henry et al. 2019; Henry et al. 2020; Henry et al. 2021; Henry et al. 2022; Sharp et al. 2019; Pace et al. 2021; see NMFS Marine Mammal SARs for the Atlantic Region). Specifically, while foraging or transiting, large whales are at risk of becoming entangled in vertical endlines, buoy lines, or groundlines of gillnet and pot/trap gear, as well as the net panels of gillnet gear that rise into the water column (Baumgartner et al. 2017; Cassoff et al. 2011; Cole and Henry 2013; Hamilton and Kraus 2019; Hartley et al. 2003; Henry et al. 2014; Henry et al. 2015; Henry et al. 2016; Henry et al. 2017; Henry et al. 2019; Henry et al. 2020; Henry et al. 2021; Henry et al. 2022; Johnson et al. 2005; Kenney and Hartley 2001; Knowlton and Kraus 2001; Knowlton et al. 2012; NMFS 2021a,b; Whittingham et al. 2005a,b; see NMFS Marine Mammal SARs for the Atlantic Region).[23] Large whale interactions (entanglements) with these features of trap/pot and/or sink gillnet gear often result in the serious injury or mortality to the whale (Angliss and Demaster 1998; Cassoff et al. 2011; Cole and Henry 2013; Henry et al. 2014, Henry et al. 2015, Henry et al. 2016; Henry et al. 2017; Henry et al. 2019; Henry et al. 2020; Henry et al. 2021; Henry et al. 2022; Knowlton and Kraus 2001, Knowlton et al. 2012; Moore and Van der Hoop 2012; NMFS 2014; NMFS 2021a,b; Pettis et al. 2021; Sharp et al. 2019; van der Hoop et al. 2016; van der Hoop et al. 2017). In fact, review of Atlantic coast-wide causes of large whale human interaction incidents between 2010 and 2019 shows that entanglement is the highest cause of mortality and serious injury for North Atlantic right, humpback, fin, and minke whales in those instances when cause of death could be determined (NMFS 2021b). As many entanglements, and therefore, serious injury or mortality events, go unobserved, and because the gear type, fishery, and/or country of origin for reported entanglement events are often not traceable, the rate of large whale entanglement, and thus, rate of serious injury and mortality due to entanglement, are likely underestimated (Hamilton et al. 2018; Hamilton et al. 2019; Knowlton et al. 2012; NMFS 2021a,b; Pace et al. 2017; Robbins 2009).

As noted above, pursuant to the MMPA, NMFS publishes a List of Fisheries annually, classifying U.S. commercial fisheries into one of three categories based on the relative frequency of incidental serious injurious and mortalities of marine mammals in each fishery. Large whales, in particular, humpback, fin, minke, and North Atlantic right whales, are known to interact with Category I and II fisheries in the Northwest Atlantic Ocean. As fin, and North Atlantic right whales are listed as endangered under the ESA, these species are considered strategic stocks under the MMPA.[24] Section 118(f)(1) of the MMPA requires the preparation and implementation of a Take Reduction Plan for any strategic marine mammal stock that interacts with Category I or II fisheries. In response to its obligations under the MMPA, in 1996, NMFS

[23] Through the ALWTRP, regulations have been implemented to reduce the risk of entanglement in in vertical endlines, buoy lines, or groundlines of gillnet and pot/trap gear, as well as the net panels of gillnet gear. ALWTRP regulations currently in effect are summarized online.

[24] A strategic stock is defined under the MMPA as a marine mammal stock: for which the level of direct human-caused mortality exceeds the potential biological removal level; which, based on the best available scientific information, is declining and is likely to be listed as a threatened species under the ESA within the foreseeable future; or which is listed as a threatened or endangered species under the ESA, or is designated as depleted under the MMPA.

established the Atlantic Large Whale Take Reduction Team (ALWTRT) to develop a plan (Atlantic Large Whale Take Reduction Plan (ALWTRP)) to reduce serious injury to, or mortality of large whales, specifically, humpback, fin, and North Atlantic right whales, due to incidental entanglement in U.S. commercial fishing gear.[25] In 1997, the ALWTRP was implemented; however, since 1997, it has been modified as NMFS and the ALWTRT learn more about why whales become entangled and how fishing practices might be modified to reduce the risk of entanglement. In 2021, adjustments to Plan were implemented and are summarized online.

The ALWTRP consists of regulatory (e.g., universal gear requirements, modifications, and requirements; area-and season- specific gear modification requirements and restrictions; time/area closures) and non-regulatory measures (e.g., gear research and development, disentanglement, education and outreach) that, in combination, seek to assist in the recovery of North Atlantic right, humpback, and fin whales by addressing and mitigating the risk of entanglement in gear employed by commercial fisheries, specifically trap/pot and gillnet fisheries. The ALWTRP recognizes trap/pot and gillnet Management Areas in Northeast, Mid-Atlantic, and Southeast regions of the U.S, and identifies gear modification requirements and restrictions for Category I and II gillnet and trap/pot fisheries in these regions; these Category I and II fisheries must comply with all regulations of the Plan.[26]. For further details on the Plan, please refer to the ALWTRP.

#### 6.4.3.5.2 Gear Interactions with Small Cetaceans and Pinnipeds

***Bottom Trawl Gear***

Small cetaceans and pinnipeds are vulnerable to interactions with bottom trawl gear.[27] Reviewing marine mammal stock assessment and serious injury reports that cover the most recent 10 years of data (i.e., 2009-2018), as well as the MMPA List of Fisheries's covering this time frame (i.e., issued between 2017 and 2022), Table 11 provides a list of species that have been observed (incidentally) seriously injured and/or killed by MMPA List of Fisheries Category II (occasional interactions) bottom trawl fisheries that operate in the affected environment of the summer flounder, scup, and black sea bass fisheries. Of the species in Table 11, short-beaked common dolphins, Risso's dolphins, and Atlantic white-sided dolphins are the most frequently observed bycaught marine mammal species in bottom trawl gear in the Greater Atlantic Region, followed by gray seals, long-finned pilot whales, bottlenose dolphin (offshore), harbor porpoise, harbor seals, and harp seals (Chavez-Rosales *et al.* 2017; Lyssikatos 2015; Lyssikatos et al. 2020; Lyssikatos et al. 2021).

[25] The measures identified in the ALWTRP are also beneficial to the survival of the minke whale, which are also known to be incidentally taken in commercial fishing gear.
[26] The fisheries currently regulated under the ALWTRP include: Northeast/Mid-Atlantic American lobster trap/pot; Atlantic blue crab trap/pot; Atlantic mixed species trap/pot; Northeast sink gillnet; Northeast anchored float gillnet; Northeast drift gillnet; Mid-Atlantic gillnet; Southeastern U.S. Atlantic shark gillnet; and Southeast Atlantic gillnet.
[27] For additional information on small cetacean and pinniped interactions, see: NEFSC Reference documents (serious injury and mortality reports); NMFS Marine Mammal SARs for the Atlantic Region; MMPA List of Fisheries (LOF).

Table 11. Small cetacean and pinniped species observed seriously injured and/or killed by Category bottom trawl fisheries in the affected environment of the summer flounder, scup, and black sea bass fisheries.

| Fishery | Category | Species Observed or reported Injured/Killed |
|---|---|---|
| **Northeast Bottom Trawl** | II | Harp seal |
| | | Harbor seal |
| | | Gray seal |
| | | Long-finned pilot whales |
| | | Short-beaked common dolphin |
| | | Atlantic white-sided dolphin |
| | | Harbor porpoise |
| | | Bottlenose dolphin (offshore) |
| | | Risso's dolphin |
| **Mid-Atlantic Bottom Trawl** | II | White-sided dolphin |
| | | Short-beaked common dolphin |
| | | Risso's dolphin |
| | | Bottlenose dolphin (offshore) |
| | | Gray seal |
| | | Harbor seal |
| Source: MMPA 2017-2022 LOFs at: https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-protection-act-list-fisheries | | |

In 2006, the Atlantic Trawl Gear Take Reduction Team was convened to address the incidental mortality and serious injury of long-finned pilot whales, short-finned pilot whales, common dolphins, and white-sided dolphins incidental to bottom and mid-water trawl fisheries operating in both the Northeast and Mid-Atlantic regions. Because none of the marine mammal stocks of concern to the Team are classified as a "strategic stock," nor do they currently interact with a Category I fishery, a take reduction plan was not necessary.[28]

In lieu of a take reduction plan, the Team agreed to develop an Atlantic Trawl Gear Take Reduction Strategy. The Strategy identifies informational and research tasks, as well as education and outreach needs the Team believes are necessary, to decrease mortalities and serious injuries of marine mammals to insignificant levels approaching zero. The Strategy also identifies several voluntary measures that can be adopted by certain trawl fishing sectors to potentially reduce the incidental capture of marine mammals. For additional details on the Strategy, please visit: http://www.greateratlantic.fisheries.noaa.gov/Protected/mmp/atgtrp/

### *Pot/Trap Gear*

Over the past several years, observer coverage has been limited for fisheries prosecuted with trap/pot gear. In the absence of extensive observer data for these fisheries, stranding data

[28] A strategic stock is defined under the MMPA as a marine mammal stock: for which the level of direct human-caused mortality exceeds the potential biological removal level; which, based on the best available scientific information, is declining and is likely to be listed as a threatened species under the ESA within the foreseeable future; or which is listed as a threatened or endangered species under the ESA, or is designated as depleted under the MMPA.

provides the next best source of information on species interactions with trap pot gear. It is important to note that stranding data underestimates the extent of human-related mortality and serious injury because not all marine mammals that die or are seriously injured in human interactions are discovered, reported, or show signs of entanglement. Additionally, if gear is present, it is often difficult to definitively attribute the animal's death or serious injury to the gear interaction, or to a specific fishery. The conclusions below should be taken with these considerations in mind, and with an understanding that interactions may occur more frequently than what we are able to detect at this time.

Table 10 provides the list of small cetacean and pinniped species that may occur and be affected by the summer flounder, scup, and black sea bass fisheries. Of these species, only several bottlenose dolphin stocks have been identified as species at risk of becoming seriously injured or killed by trap/pot gear. Stranded bottlenose dolphin entangled in trap/pot gear have been documented (see NMFS Marine Mammal SARs for the Atlantic Region). Although the trap/pot gear involved in these cases were identified to the blue crab fishery, given the general similarities between the gear (e.g., traps and vertical buoy lines); there is the potential for these small cetaceans to interact with pot/trap gear used in this fishery. Reviewing the most recent 10 years (2009-2018) of stranding data provided in the NMFS Marine Mammal SARs for the Atlantic Region, estimated mean annual mortality for each stock due to interactions with trap/pot gear was no more than approximately one animal. Based on this and the best available information, interactions with trap/pot gear, resulting in the serious injury or mortality to small cetaceans or pinnipeds are believed to be infrequent (for bottlenose dolphin stocks) to non-existent (for all other small cetacean and pinniped species).

# 7 ENVIRONMENTAL CONSEQUENCES OF THE ALTERNATIVES

This EA analyzes the expected impacts of the alternatives on each VEC. The alternatives are compared to the current conditions of the VECs and to each other. They are compared to each other within each alternative set (e.g., the state allocation percentage alternatives are compared to the other state allocation percentage alternatives and the in-season closure alternatives are compared to the other in-season closure alternatives). The alternatives are not compared to a theoretical condition where the commercial black sea bass fishery is not operating. This fishery has occurred for many decades and will continue into the foreseeable future. The nature and extent of the management program for this fishery have been examined in detail in EAs and Environmental Impact Statements prepared for previously implemented management actions.

The current conditions of the VECs are summarized in Table 12 and described in more detail in Section 6. Impacts are described both in terms of their direction (negative, positive, or no impact) and magnitude (slight, moderate, or high) based on the guidelines shown in Table 13.

The recent conditions of the VECs include recent fishing practices and levels of fishing effort, catch, and landings in commercial black sea bass fisheries, as well as the economic characteristics of the fisheries (Section 6.1). Recent conditions of the VECs also include the biological conditions of black sea bass, non-target species, and protected species (Sections 6.2 and 6.4), and recent levels of habitat availability and quality (Section 6.3).

Socioeconomic impacts are considered in relation to potential changes in landings, prices, and revenues. Increased landings are generally considered to have positive socioeconomic impacts because they could result in increased revenues; however, if an increase in landings leads to a decrease in price or a decrease in future availability for any landed species, then negative socioeconomic impacts could also occur.

Alternatives which may result in overfishing or an overfished status for target or non-target species are considered to have negative impacts for those species. Conversely, alternatives which may result in decreased fishing mortality, ending overfishing, rebuilding to target biomass level, maintaining biomass above the target level, or maintaining fishing mortality below the threshold level are considered to have positive impacts (Table 13).

Alternatives that improve the quality or quantity of habitat are expected to have positive impacts on habitat. Alternatives that degrade the quality or quantity, or increase disturbance, of habitat are expected to have negative impacts. Continued fishing effort, even at reduced levels, can have negative impacts on habitat, due to continued impacts of fishing gear on physical habitat, even at reduced levels (Table 13). A reduction in fishing effort is likely to decrease the time that fishing gear is in the water, thus reducing the potential for interactions between fishing gear and habitat. However, most areas where black sea bass are fished have been fished by multiple fishing fleets over many decades and are unlikely to see a measurable improvement in their condition in response to a decrease in effort for an individual fishery. Only alternatives which are expected to result in improved habitat quality or increased quantity of habitat are expected to have positive impacts on habitat.

The impacts of the alternatives on protected species take into account impacts to ESA-listed species, as well as impacts to non-ESA listed MMPA protected species in good condition (i.e., marine mammal stocks whose Potential Biological Removal, or PBR, levels have not been exceeded) or poor condition (i.e., marine mammal stocks that have exceeded or are near exceeding their PBR levels). For ESA-listed species, any action that results in interactions or take is expected to have negative impacts, including actions that reduce interactions. Actions expected to result in positive impacts on ESA-listed species include only those that contain specific measures to ensure no interactions (i.e., no take). None of the alternatives in this document ensure no interactions with ESA-listed species. By definition, all ESA-listed species are in poor condition and any take can negatively impact their recovery. The stock conditions for marine mammals not listed under the ESA varies by species; however, all are in need of protection. For non-ESA listed marine mammal stocks that have their PBR level reached or exceeded, negative impacts would be expected from alternatives that result in the potential for interactions between fisheries and those stocks. For species that are at more sustainable levels (i.e., PBR levels have not been exceeded), alternatives not expected to change fishing behavior or effort may have positive impacts by maintaining takes below the PBR level and approaching the zero mortality rate goal (Table 13).

Table 12: Recent conditions of VECs (described in more detail in Section 6).

| VEC | | Condition |
|---|---|---|
| Human communities (Section 6.1) | | Commercial black sea bass landings averaged 3.19 million pounds during 2015-2019, with $11.11 million average ex-vessel value for an average ex-vessel price of $3.73 per pound (2019 dollars). |
| Black sea bass (Section 6.2.1) | | Not overfished. Overfishing not occurring. |
| Non-target species (Section 6.2.2) | Spiny dogfish | Not overfished. Overfishing not occurring. |
| | Scup | Not overfished. Overfishing not occurring. |
| | Sea robins (northern, striped, and unknown) | Unknown (not assessed). |
| | Little skate | Not overfished. Overfishing not occurring. |
| Physical environment and EFH (Section 6.3) | | Commercial fishing impacts are typically adverse. Non-fishing activities had historically negative but site-specific effects on habitat quality. |
| Protected species (Section 6.4) | Sea turtles | Leatherback and Kemp's ridley sea turtles are endangered; loggerhead (NW Atlantic DPS) and green (North Atlantic DPS) sea turtles are threatened. |
| | Fish | Atlantic salmon, shortnose sturgeon, and the New York Bight, Chesapeake, Carolina, and South Atlantic DPSs of Atlantic sturgeon are endangered. Atlantic sturgeon Gulf of Maine DPS threatened. Cusk are a candidate species. |
| | Large whales | All large whales in the Northwest Atlantic are protected under the MMPA. North Atlantic right, fin, blue, sei, and sperm whales are also listed as endangered under the ESA. The Atlantic Large Whale Take Reduction Plan was implemented to reduce humpback, North Atlantic right, and fin whale entanglement in vertical lines associated with fixed fishing gear (sink gillnet and trap/pot) and sinking groundlines. |
| | Small cetaceans | Pilot whales, dolphins, and harbor porpoise are protected under the MMPA. The Atlantic Trawl Gear Take Reduction Strategy was developed to identify measures to reduce the mortality and serious injury of small cetaceans in trawl gear. |
| | Pinnipeds | Gray, harbor, hooded, and harp seals are protected under the MMPA. |

Table 13: Guidelines for defining the direction and magnitude of the impacts of alternatives on the VECs.

| General Definitions | | | | |
|---|---|---|---|---|
| VEC | Resource Condition | Direction of Impact | | |
| | | Positive (+) | Negative (-) | No Impact (0) |
| Target and non-target species | Overfished status defined by the MSA | Alternatives that would maintain or are projected to result in a stock status above an overfished condition* | Alternatives that would maintain or are projected to result in a stock status below an overfished condition* | Alternatives that do not impact stock status |
| ESA-listed protected species (endangered or threatened) | Populations at risk of extinction (endangered) or endangerment (threatened) | Alternatives that contain specific measures to ensure no interactions with protected species (i.e., no take) | Alternatives that result in interactions/take of listed species, including actions that reduce interactions | Alternatives that do not impact ESA listed species |
| MMPA protected species (not also ESA listed) | Condition varies by stock, but populations remain impacted | Alternatives that maintain takes below PBR and approaching the Zero Mortality Rate Goal | Alternatives that result in interactions with/take of marine mammals that could result in takes above PBR | Alternatives that do not impact marine mammals |
| Physical environment/ EFH | Many habitats degraded from historical fishing effort | Alternatives that improve the quality or quantity of habitat | Alternatives that degrade the quality, quantity or increase disturbance of habitat | Alternatives that do not impact habitat quality |
| Human communities (socio-economic) | Variable but generally stable in recent years | Alternatives that increase revenue and social well-being of fishermen and/or communities | Alternatives that decrease revenue and social well-being of fishermen and/or communities | Alternatives that do not impact revenue and social well-being of fishermen and/or communities |

| Magnitude of Impact | | |
|---|---|---|
| A range of impact qualifiers is used to indicate any existing uncertainty | Negligible | To such a small degree to be indistinguishable from no impact |
| | Slight positive or negative | To a lesser degree / minor |
| | Moderately positive or negative | To an average degree (i.e., more than “slight”, but not “high”) |
| | High positive or negative | To a substantial degree (not significant unless stated) |
| | Significant | Affecting the resource condition to a great degree, see 40 CFR 1508.27. |
| | Likely | Some degree of uncertainty associated with the impact |

*Actions that will substantially increase or decrease stock size, but do not change a stock status may have different impacts depending on the particular action and stock. Meaningful differences between alternatives may be illustrated by using another attribute aside from the MSA status, but this must be justified within the impact analysis.

## 7.1 Socioeconomic Impacts of The Alternatives

The following sections describe the expected socioeconomic impacts of the alternatives. Impacts are based on potential changes in landings, prices, and revenues.

### 7.1.1 Socioeconomic Impacts of Alternative Set 1 (State Allocation Percentages)

The alternatives for the state allocation percentages are described in detail in Section 5.1. Alternative 1A (no action) would maintain the current allocation percentages which have been in place since 2003. Alternative sets 1B-1F would modify the allocation percentages. These alternative sets contain many sub-alternatives which allow for considerable flexibility in defining the preferred allocation approach and could result in a wide range of outcomes. Most possible combinations of sub-alternatives would result in state allocation percentages that are partially based on biomass distribution. The resulting allocation percentages would be modified through the specifications process whenever new biomass distribution information is available. As such, most combinations of sub-alternatives, including the preferred alternatives, would define a process for setting allocations rather than defining specific allocation percentages.

Alternative sets 1B-1F could all result in a similar range of large or small changes in the state allocations, depending on the sub-alternatives chosen and future biomass distribution. For these reasons, although the approaches used under these alternative sets are different, their socioeconomic impacts are considered collectively, rather than separately for discrete alternative sets or combinations of sub-alternatives. The socioeconomic impacts of the preferred combination of alternatives are not explicitly addressed in this section; however, they are considered in Section 8.10.

Unless otherwise noted, socioeconomic impacts are evaluated with regards to potential future revenues for fishermen, commercial fish dealers, and fishery support businesses. These impacts are generally considered at the state level as the state allocations primarily impact the relative amounts of landings and revenues by state. Coastwide landings will continue to be driven by the overall coastwide quota. The alternatives in alternative set 1 will not change the coastwide quota; rather, they consider changes to how the coastwide quota is divided among states.

Actual revenues will be impacted by many factors in addition to the state allocations, including, but not limited to, the overall quota level, prices, and market demand. In this document, the state allocations are generally considered in isolation and it is assumed for the sake of analysis that these other factors will remain constant. It is also assumed that the commercial fishery will operate in similar ways as it has under the historical range of quotas.

Under all alternatives in alternative set 1, the state allocations may have different impacts under different coastwide quota levels. For example, under high coastwide quotas, the state allocations will be less impactful than under low coastwide quotas.

The state allocations restrict the amount of landings in each state each year. They have a much lesser impact on where fish are caught. Fishermen with federal moratorium permits can fish anywhere in federal waters and can land their catch in any state for which they have the appropriate permits, subject to the regulations in that state (e.g., closed seasons and possession limits). Many fishermen hold commercial federal moratorium permits and permits for multiple states. This can provide considerable flexibility in where they can fish and where they can land their fish. Fishermen decide where to fish and where to land their catch based on factors such as regulations, availability of one or more target species, availability of species they wish to avoid, regional differences in prices and market demand, distance from port, other efficiency costs, weather, and other factors. The state allocations are just one factor in this decision making. To a large extent, fishermen catch black sea bass where it is most efficient to do so (conditional on the factors previously noted) and land them where it makes the most economic sense to do so. For these reasons, changes in the state allocations can result in changes in where black sea bass are landed, but they are not expected to have the same degree of impacts on where black sea bass are caught.

Fishermen who are permitted to fish only in the state waters of a single state may see greater positive or negative impacts from the state allocations as they have less flexibility in where they can fish and where they can land their fish compared to fishermen with federal moratorium permits and/or permits in multiple states. There is no single database of permit holders for all states to allow for a grouping of state and federal permits by vessel to quantitatively assess the degree of this type of flexibility that already exists in the commercial black sea bass fleet. Therefore, impacts on vessels, states, and locations of catch and harvest were considered qualitatively for this analysis.

#### 7.1.1.1 Socioeconomic Impacts of Alternative 1A (No Action on State Allocation Percentages)

Under alternative 1A, the current state allocations would remain unchanged. Socioeconomic impacts would be expected to vary from moderate positive to slight negative, depending on the state and future quota levels. These impacts would not be different from the past impacts of the Amendment 13 allocations, which have been in place since 2003, assuming future quotas are not notably different than the historical range. As previously stated, coastwide quotas that are notably higher than recent quotas would result in a lesser magnitude of positive and negative impacts from the state allocations as the allocations would be less constraining compared to under lower quotas.

Under the no action alternative, continued moderate positive socioeconomic impacts would be expected for fishermen and commercial fish dealers that have relied on black sea bass landings for noteworthy amounts of their income in recent years. These continued positive impacts may be greatest for fishermen who land their catch in states with higher allocations, and dealers based in those states, compared to those in states with lower allocations.

Some continued negative socioeconomic impacts may be felt by fishermen who operate in states with currently low allocations but high black sea bass availability, as avoiding or discarding black sea bass may negatively impact the efficiency of their operations. These impacts are expected to be slight negative, as opposed to moderate or high negative, because this would represent a continuation of current conditions, to which, to some extent, fishermen have already adapted by necessity.

In all cases, the impacts of this alternative would not be different than the recent impacts of the Amendment 13 allocations, which have been in place since 2003. This would represent a continuation of the current positive impacts for some fishermen and dealers and negative impacts for others.

#### 7.1.1.2 Socioeconomic Impacts of Alternative Sets 1B-1F (Modified State Allocation Percentages)

In general, under all alternatives which would modify the state allocation percentages, positive socioeconomic impacts would be expected for states with increased allocation percentages compared to the Amendment 13 allocations, and negative impacts would be expected for states with reduced allocation percentages. These positive and negative impacts would mostly derive from increased or decreased potential revenues for commercial fishermen, dealers, and other commercial fishery support businesses. The magnitude of both the positive and negative impacts is likely to range from slight to moderate depending on a number of factors including the magnitude of the change in allocation, which could vary considerably depending on the sub-alternatives used, future biomass distribution, future coastwide quota levels, and other factors which influence revenues (e.g., price, costs). More details are provided below; however, in general, positive impacts would be expected for states with increased allocations and negative impacts for states with decreased allocations under alternative sets 1B-1F.

As described in Section 4, black sea bass spawning stock biomass north of Hudson Canyon has greatly increased since the Amendment 13 allocations were first implemented in 2003. Biomass south of Hudson Canyon has not decreased. Although spawning stock biomass north of Hudson Canyon has been declining from a peak in recent years, it still accounts for a high proportion of total spawning stock biomass (Figure 1). Therefore, under recent biomass distribution, any combinations of sub-alternatives which would revise the allocations so they partially account for recent biomass distribution (i.e., all alternatives in alternative set 1 except alternative 1A, alternative set 1B if not used in combination with other alternatives, alternative 1D-2A, and alternative 1E-2A) would result in a shift in some amount of allocation from southern states to northern states (with the regions defined based on alternative set 1F; Section 5.1.7). However, this would not result in a permanent south to north shift in allocation. Any allocations which account for biomass distribution would be revised through the specifications process each time updated biomass distribution information is available. Therefore, allocation could shift back to the southern states if the proportion of biomass increases in that region. The scale of the regional shifts in allocation would depend on the specific sub-alternatives used and future changes in distribution.

Price data from 2010-2019 (adjusted to account for inflation)[29] suggest that higher landings can be associated with lower prices paid by dealers to fishermen in New Jersey through North Carolina (Figure 6). Therefore, the positive socioeconomic impacts of increased landings in those states could be partially, though not entirely, offset by a decrease in price. Price data show no strong relationship between price and landings in Maine through New York (Figure 6); therefore, an increase in landings in those states may not impact price. The relationship between price and landings in either region may change if future landings are much different (higher or lower) than in the past, or if changes in other factors besides landings impact price.

It is worth noting that the coastwide quota is regularly updated based on the best scientific information available. Commercial fishermen, dealers, and support businesses already experience year to year variation in revenues from black sea bass due to fluctuations in the annual coastwide quota, variations in price and market demand, and other factors. Changes in the

[29] Price data from 2020 were not analyzed for this section of the document as the market was heavily impacted by the COVID-19 pandemic in 2020 and 2020 prices are therefore not reflective of typical conditions.

state allocations may not have major impacts on revenues unless they result in changes outside the range of recent revenue fluctuations based on variations in the annual coastwide quota, prices, and other factors.

Although commercial fishermen and dealers must always make business decisions under uncertain future conditions, the state allocations provide some level of predictability. The allocations ensure that each state receives a certain percentage of the annual coastwide quota. Alternatives which use fixed allocation percentages (i.e., alternative set 1B if not used in combination with other alternatives) would provide a greater degree of predictability than alternatives which use variable or dynamic allocations (i.e., alternative sets 1C-1E). However, it is worth noting that all alternatives allow for some degree of stability and predictability as the allocations under all alternatives would always be at least partially based on the Amendment 13 allocations. The details vary by alternative, as described in Sections 5.1.2 - 5.1.7.

Predictability and stability in the allocations can be considered positive socioeconomic impacts. However, this could come at the cost of disparity between the allocations and local black sea bass availability, which can impact fisheries efficiency and therefore net revenues. Many of the alternatives allow for explicit consideration of these tradeoffs. Allocations which partially account for recent biomass distribution (i.e., all alternatives in alternative set 1 except alternative 1A, alternative set 1B if not used in combination with other alternatives, alternative 1D-2A, and alternative 1E-2A) could allow the commercial fishery to better take advantage of locally available fish, which could lead to increased efficiency and increased net revenues for some fishermen, compared to alternatives which do not account for biomass distribution.

It is worth noting that there are time lags between actual distribution changes, availability of data to measure those changes, and a management response to the data. Therefore, dynamic or variable allocations which take distribution information into account will not account for current distribution, as this is always unknown due to data lags. Rather, they would account for recent distribution.

Some combinations of sub-alternatives allow for a faster pace of change in the allocations than others. For example, a faster pace of change could occur under certain combinations of DARA sub-alternatives (alternative set 1C; Section 5.1.3), a lower trigger value under the trigger approach (alternative set 1D; Section 5.1.4), and a lower percentage value under the percentage approach (alternative set 1E; Section 5.1.5). A slower pace of change could occur under other combinations of sub-alternatives. The socioeconomic impacts of allocation changes could be lesser in magnitude under a slower pace of change compared to a faster pace of change. Depending on the scale of the change in allocations, a faster pace of change could result in short-term negative socioeconomic impacts in the form of fishery disruptions. For example, it could be challenging for commercial fishermen and dealers in states which quickly lose allocation to adapt to a sudden loss in revenue from black sea bass landings. In contrast, fishermen in dealers in states that quickly gain allocation may not be able to immediately take full advantage of the sudden increase if they do not have sufficient time to adapt their business practices. If the scale of the change is minor, then the pace of the change will have less of an impact. As previously stated, these impacts will vary based on the overall coastwide quota level. A large change in the allocations will have greater impacts under lower coastwide quotas than under higher coastwide quotas.

Large changes in the amount of quota allocated to a state may have different impacts for fishermen based on the gear type they use. Input from fishermen and federal VTR data from 2010-2019 suggest that in years with higher coastwide quotas, bottom trawl gear accounted for a greater proportion and pots/traps accounted for a smaller proportion of total commercial landings compared to years with lower quotas. Trawl fishermen may be better able to take advantage of large increases in quota than pot/trap fishermen. For example, their ability to land higher volumes may allow them to counteract the impacts of any reductions in price by landing more fish. Pot/trap gear does not allow for as high a volume of landings as trawl gear; therefore, pot/trap fishermen may not be able to adapt their fishing practices in the same way to mitigate for any reductions in price that may occur as a result of increased local black sea bass landings. For this reason, if changes to the state allocations allow for a notable increase in landings in a given state, trawl fishermen in that state may experience greater benefits than pot/trap fishermen.

Each state uses a different approach to managing their commercial fishery to ensure that landings will meet but not exceed their allocations. The economic impacts of changes to state allocations may vary in part based on how states adjust their management measures in response to these changes. For example, an increase in the possession limit could have different impacts than an extension of the open season. Fishermen in states that use ITQs may be impacted differently than non-ITQ fishermen, and impacts may vary between gear types.

Under all alternatives, negligible socioeconomic impacts are expected for Maine and New Hampshire as neither state has reported commercial black sea bass landings since 2012.

The alternatives for regional configurations (i.e., alternatives 1F-1 and 1F-2) would only define the regions used under alternatives 1C through 1E. They do not define the resulting allocation percentages. They are expected to have negligible socioeconomic impacts on all states except for New Jersey. Under alternative 1F-1, New Jersey would be part of the southern region. Under alternative 1F-2, New Jersey would be its own region. To calculate New Jersey's regional allocation under alternatives which account for biomass distribution, half its allocation would be associated with the northern component of biomass from the stock assessment, and half from the southern component of the biomass (Section 5.1.7.2). In this way, under alternative 1F-2, New Jersey would see minimal impacts from allocations that change based on biomass as any changes to the half of New Jersey's allocation that is associated with the southern region would be directly offset by changes to the other half of their allocation that is associated with the northern region. In this way, New Jersey would have a more stable allocation under alternative 1F-2 than under alternative 1F-1. Under recent biomass distribution (Figure 1), this also means that New Jersey would be less likely to see a reduced allocation under alternative 1F-2, compared to alternative 1F-1. For these reasons, alternative 1F-2 is expected to have greater positive socioeconomic impacts for New Jersey compared to alternative 1F-1. The impacts of alternatives 1F-1 and 1F-2 on other states are expected to be much lesser in magnitude and would vary based on the combination of other sub-alternatives used.

In summary, alternative sets 1B through 1F are expected to have moderate negative to moderate positive socioeconomic impacts, depending on the specific combinations of sub-alternatives, the state, future quota levels, and other factors which impact revenues. As previously stated, each alternative set could allow for a similar magnitude of allocation changes, depending on the sub-alternatives chosen, future coastwide quotas, and future stock distribution; therefore, these alternatives have not been ranked in terms of their relative impacts.

### 7.1.2 Socioeconomic Impacts of Alternative Set 2 (Council Management of State Allocations)

The alternatives for Council management of state allocations are described in detail in section 5.2. These alternatives consider whether the state allocations should remain only in the Commission's FMP (alternative 2A) or whether they should be included in both the Council and Commission FMPs (alternative 2B). Alternative 2B includes sub-alternatives regarding paybacks of state quota overages if the allocations are added to the Council's FMP. Under alternative 2A, no changes would be made to the quota overage payback requirements.

#### 7.1.2.1 Socioeconomic Impacts of Alternative 2A (No Action: State Allocations Remain Only in Commission's FMP)

Under alternative 2A, the state allocations would remain only in the Commission's FMP. There would be no changes to how the state quotas are monitored, how transfers of quota between states are processed, and when states are required to pay back quota overages.

Under alternative 2A, the Commission would continue to manage quota transfers. The Commission allows transfers to occur at any time up to 45 days after the last day of the fishing season. This can help prevent the need for state-level closures.

This alternative could have slight positive socioeconomic impacts because it would represent a continuation of recent conditions. The impacts of this alternative may be slightly more positive than alternative 2B because the greater flexibility for quota transfers late in the year and after the end of the fishing year can help prevent the need for state-level closures and paybacks of state quota overages. These differences are expected to be minor as states will closely monitor their landings throughout the year and take action as necessary to prevent state-level overages and in-season closures, regardless of which agency manages the transfers.

#### 7.1.2.2 Socioeconomic Impacts of Alternative 2B (State Allocations Included in Both Commission and Council FMPs; Preferred)

Under alternative 2B, the state quota allocations would be added to the Council's FMP. NMFS would monitor the state quotas and would manage quota transfers between states. Transfers in the last two weeks of the year would likely be limited to unforeseen events such as vessel failure or bad weather. Fishermen and fish dealers are not expected to see a noticeable difference in any management factors that impact their operations under this alternative compared to alternative 2A. Therefore, this alternative is expected to have slight positive socioeconomic impacts.

The additional restrictions on late in the year transfers under this alternative could result in a lesser magnitude of slight positive socioeconomic impacts compared to alternative 2A. However, these differences should be minor as states will closely monitor their landings throughout the year and take action as necessary to prevent state-level overages and in-season closures, regardless of which agency manages the transfers.

This section focuses on potential changes in revenues for commercial fishermen and fish dealers. The Council selected alternative 2B as a preferred alternative for reasons that go beyond revenues. Those reasons are described in detail in Section 5.2.2 and are not repeated here.

##### 7.1.2.2.1 Socioeconomic Impacts of Alternative 2B-1 (Status Quo: States Pay Back Overages Only If Coastwide Quota Exceeded; Preferred)

Alternative 2B-1 would continue the current practice of requiring paybacks of state quota overages only if the coastwide quota has also been exceeded. Overage paybacks would result in a reduction in potential revenues from black sea bass in the year in which the payback is applied. This can be considered a negative socioeconomic impact; however, it could be partially offset by higher revenues in the year in which the overage occurred. For these reasons, this alternative is expected to have slight negative socioeconomic impacts in the year when an overage payback is applied. No impacts would be expected when there are no overages and paybacks are not needed.

Alternative 2B-1 is expected to have lesser negative socioeconomic impacts than alternative 2B-2, which would require paybacks of state-level overages regardless of if the coastwide quota is exceeded, as it could require less frequent paybacks.

##### 7.1.2.2.2 Socioeconomic Impacts of Alternative 2B-2 (States Always Pay Back Overages)

Alternative 2B-2 would require paybacks of state quota overages regardless of whether the coastwide quota was also exceeded. Overage paybacks would result in a reduction in potential revenues from black sea bass in the year in which the payback is applied. This can be considered a negative socioeconomic impact, though it could be partially offset by higher revenues in the year in which the overage occurred. For these reasons, this alternative is expected to have slight negative socioeconomic impacts in the years when an overage payback is applied. No impacts would be expected when there are no overages and paybacks are not needed.

Alternative 2B-2 is expected to have greater negative socioeconomic impacts than alternative 2B-1, which would require paybacks of state-level overages only if the coastwide quota was exceeded, as it could require more frequent paybacks.

### 7.1.3 Socioeconomic Impacts of Alternative Set 3 (Federal In-Season Closures)

The alternatives for federal in-season closures are described in detail in section 5.3. Under alternative 3A the entire commercial fishery would close in-season for all federally permitted vessels and dealers, regardless of state, once the coastwide quota is projected to be landed, as is currently required under the Council’s FMP. Under alternative 3B this closure would occur when the coastwide quota plus an additional buffer of up to 5% is projected to be landed. The buffer amount would be determined each year through the specifications process. Under alternative 3C this closure would occur when the ACL is projected to be fully caught. It is uncertain how alternative 3C would be implemented in practice as, unlike landings, discards are not monitored in-season.

Under all alternatives in this alternative set, negative socioeconomic impacts would be expected when an in-season closure occurs, as this would result in the potential for reduced revenues from black sea bass landings, especially in states that have not fully landed their allocations. Therefore, all alternatives in this alternative set are all expected to have slight negative socioeconomic impacts in years when an in-season closure occurs. They are expected to have no impacts in years when a closure is not needed.

Given that alternative 3A has a lower threshold for a closure than alternative 3B, it would be expected to result in more frequent closures, and thus a greater potential for negative socioeconomic impacts than alternative 3B.

It is challenging to predict if alternative 3C could result in more or less frequent in-season closures than alternatives 3A or 3B given the uncertainties about how it would be implemented. It could have less predictability than alternatives 3A and 3B, which could be considered a negative socioeconomic impact. For example, states monitor their landings in-season, but assumptions about discards would need to be made by NMFS, which may be more challenging for states to track in-season.

It is important to note that the commercial fishery has not closed in-season to date. States have effectively monitored and controlled their harvest and used transfers to address minor state-level overages while preventing an overage of the coastwide quota. Therefore, any differences between these three alternatives in terms of their impacts on the fishery are theoretical.

## 7.2 Impacts of the Alternatives on Black Sea Bass and Non-Target Species

The following sections describe the expected impacts of the alternatives on black sea bass and the primary non-target species in the commercial black sea bass fishery (Section 6.2.2). Impacts are based on expected changes in fishing effort and fishing mortality.

### 7.2.1 Impacts of Alternative Set 1 (State Allocation Percentages) on Black Sea Bass and Non-Target Species

The state allocation alternatives are described in detail in section 5.1. Alternative 1A (no action) would maintain the current allocation percentages which have been in place since 2003. Alternative sets 1B-1F would modify the state allocations. These alternative sets contain many sub-alternatives which allow for considerable flexibility in the allocation approach and could result in a wide range of outcomes. Most possible combinations of these sub-alternatives would result in state allocation percentages that are partially based on biomass distribution. The resulting allocation percentages would be modified through the specifications process whenever new biomass distribution information is available. As such, these alternatives would not result in a permanent shift in allocation from one region to another. Most combinations of sub-alternatives, including the preferred alternatives, would define a process for setting allocations rather than defining specific allocation percentages.

Alternative sets 1B-1F could all result in a similar range of large or small changes in the state allocations compared to the no action alternative (alternative 1A), depending on the sub-alternatives chosen and future biomass distribution. In addition, commercial black sea bass fishing effort is expected to continue to be driven by the coastwide quota under all alternatives, including the no action alternative (alternative 1A). For these reasons, although different allocation approaches are considered in alternative set 1, the impacts of all alternatives on black sea bass and non-target species are considered collectively, rather than separately for discrete alternative sets or combinations of sub-alternatives.

As described in more detail in Section 7.1.1, all alternatives in alternative set 1 could impact the spatial distribution of landings and discards; however, they are not expected to have notable impacts on the overall amount of effort in the commercial black sea bass fishery, which will continue to be primarily driven by the coastwide quota. The impacts of the coastwide quota are analyzed separately through the annual specifications process. The alternatives in alternative set 1 consider only how to allocate the quota among states.

*Impacts of Alternative Set 1 (State Allocation Percentages) on Black Sea Bass*

As described in more detail below, all the state quota allocation alternatives, including the no action alternative, are expected to result in moderate positive impacts on the black sea bass stock because they are all expected to maintain the currently positive stock status (i.e., not overfished, overfishing not occurring). Any differences in impacts on black sea bass stock status between the alternatives are expected to be negligible. Under all alternatives in alternative set 1, fishing effort, and therefore fishing mortality, will continue to be driven by the coastwide commercial quota, which is based on the best scientific information available and intended to prevent overfishing. The current positive stock status of black sea bass would not be expected to change under any of these alternatives.

The greatest impacts of the fishery management program on the black sea bass stock derive from the total amount of dead catch that is removed from the population each year. This is primarily driven by the coastwide annual catch and landings limits. The state allocations determine how the annual coastwide commercial quota is divided among the states. The commercial quota accounts for landings only. Coastwide commercial landings have been very close to the quota for several years; therefore, any changes to the state allocations are not likely to impact coastwide landings. Any changes in the distribution of these landings among the states, without a change in the overall amount of landings, are not expected to change the currently positive status of the black sea bass stock.

The alternatives consider whether the allocations should be modified to partially account for distribution of the stock. None of the alternatives are expected to shift landings in such a way that fishing pressure is too high in one region compared to another such that negative impacts to the stock result. In fact, the opposite should occur under the alternatives which account for biomass distribution (i.e., all alternatives in alternative set 1 except alternative 1A, alternative set 1B if not used in combination with other alternatives, alternative 1D-2A, and alternative 1E-2A) as any changes in the distribution of fishing effort would be expected to bring it more in line with the distribution of the stock. For the reasons described below, any changes in the distribution of fishing effort under any alternatives are expected to be minor.

Any impacts on dead discards resulting from changes in the state quota allocations are expected to mostly occur in fisheries that operate in state waters as opposed to federal waters. These impacts will be challenging to accurately predict. The commercial dead discard estimates used in the stock assessment and in management are derived from the federal observer program and from federal VTRs. These data are only collected from vessels with federal permits. Although they are not collected from vessels which do not have federal permits and operate only in state waters, it is assumed that they are representative of the entire commercial fishery.

Fishermen with federal permits have much more flexibility in where they can catch and sell their fish compared to fishermen who are only permitted to operate in state waters. For these reasons, changes to the state allocations may not have notable impacts on where black sea bass are caught in federal waters, though they may impact where they are landed. Many commercial black sea bass fishermen hold permits to land their fish in multiple states, in addition to a federal permit. This provides flexibility in both where they can catch and where they can land their fish. Fishermen decide where to fish based on multiple factors including expected availability of black sea bass and other target species, as well as non-target species they may wish to avoid. In some cases, black sea bass may not be the primary target species and fishermen may choose their fishing location based on other considerations, such as availability of a different primary species (e.g., summer flounder; MAFMC 2020b). Other factors such as state waters possession limits and open/closed seasons, variations in the price paid by commercial fish dealers, weather, and other factors also influence where fishermen fish and where they land their catch.

Fishermen who are only permitted to fish in state waters have less flexibility in where they can fish compared to those with federal permits. Therefore, it may be more challenging for state waters fishermen to avoid catching black sea bass and minimize discards of fish that cannot be landed, compared to federally permitted fishermen. An increase in the allocation to a state with high availability of black sea bass in state waters but a currently low allocation (e.g., Connecticut) might result in decreased discards in state waters as fishermen would be able to land more of the fish they previously would have discarded. However, the degree of this change is challenging to accurately predict based on available data and because an increased allocation may result in changes in fishing behavior. For example, if a higher allocation allows for a higher commercial possession limit or a longer open season in state waters, fishermen may target black sea bass to a greater extent, which may change patterns in discards and may not simply result in discards "turning into landings." In addition, an increase in the allocation in one state would require a decrease in allocation in one or more other states. Therefore, any decrease in discarding in one state may be at least partially offset by an increase in discards in another state, depending on the scale of the change in each state and other factors such as fishing behavior and differences in black sea bass availability in all impacted states.

In summary, changes in the state commercial quota allocations may result in changes in discards, mostly in state waters fisheries, and they may result in changes in the distribution of landings. However, they are not expected to change the overall amount of landings. None of these changes are expected to impact the stock status of black sea bass. The most recent stock assessment update indicates that the black sea bass stock was more than double the target biomass level and overfishing was not occurring in 2019 (NEFSC 2021a). This positive stock status is expected to be maintained under all alternatives in alternative set 1 because the fishery will continue to be constrained based on catch and landings limits which are designed to prevent overfishing based on the best available science. Therefore, all alternatives in alternative set 1 are expected to have generally moderate positive impacts on the black sea bass stock.

The magnitude of these moderate positive impacts are not expected to be meaningfully different among the alternatives in alternative set 1 as in all cases total fishing effort would continue to be driven by the coastwide quota.

*Impacts of Alternative Set 1 (State Allocation Percentages) on Non-Target Species*

As described in more detail in Section 7.1.1, none of the alternatives in alternative set 1 are expected to have a major impact on the distribution of fishing effort as many commercial fishermen already have considerable flexibility in where they catch and land their fish. Changes to the state allocations may change the distribution of landings; however, they are expected to have a lesser impact on the distribution of catch and fishing effort. The greatest impacts on the spatial distribution of fishing effort may occur for fishermen who are only permitted to fish in the state waters of one or a few states.

As previously described, the alternatives are also not expected to have notable impacts on the overall amount of effort in the commercial black sea bass fishery, which will continue to be primarily driven by the coastwide quota. The impacts of the coastwide quota are analyzed separately through the annual specifications process. The alternatives in alternative set 1 consider only how to allocate the quota among states.

As described in Section 6.1, most commercial black sea bass landings in all states but Massachusetts, New York, and Delaware during 2017-2019 were harvested with bottom otter trawl gear. As previously noted, trawl vessels may be better able to take advantage of higher quotas than pot/trap vessels as they can land higher volumes. Therefore, an increase in allocation in most states could result in a higher proportion of landings from trawl vessels, depending on future quota levels and how those states adjust their management measures (e.g., trip limits, open seasons) in response to an increased allocation. Changes in state-specific management measures could result in individual vessels spending more time targeting black sea bass; however, these changes cannot be accurately predicted as it is unknown how each state may modify their management measures in response to a change in allocation and how fishermen may change their behaviors in response to those changes. In addition, an increase in allocation in one state would require a decrease in allocation in one or more other states; therefore, major changes in the contributions of different gear types to overall catch at the coastwide level are not expected under any of the alternatives. Under all alternatives, bottom otter trawl gear is expected to continue to be the dominant gear type.

For these reasons, none of the alternatives in alternative set 1 are expected to the impacts of the commercial black sea bass fishery on non-target species in a manner that would influence the stock status of any non-target species. As such, the current stock status of all non-target species is expected to be maintained under all alternatives in alternative set 1. As described in Section 6.2.2, the most common non-target species in the commercial black sea bass fishery have a positive or unknown stock status. Therefore, alternative set 1 is expected to have slight positive impacts on non-target species by maintaining their current stock status. Any differences between the alternatives in alternative set 1 in terms of their impacts on non-target species are not expected to be meaningful as total fishing effort will be similar across all alternatives and the stock status of all non-target species is expected to be the same across all alternatives.

### 7.2.2 Impacts of Alternative Set 2 (Council Management of State Allocations) on Black Sea Bass and Non-Target Species

The alternatives for Council management of state allocations are described in detail in section 5.2. These alternatives consider whether the state allocations should remain only in the Commission's FMP (alternative 2A) or whether they should be included in both the Council and Commission FMPs (alternative 2B). Alternative 2B includes sub-alternatives regarding paybacks of state quota overages if the allocations are added to the Council's FMP.

The decision of whether to include the state allocations in one or both FMPs is administrative in nature and will have no impacts on the stock status of black sea bass or non-target species.

The sub-alternatives regarding paybacks of state quota overages have the potential to result in very slight differences in fishing effort in years when a payback is necessary. Sub alternative 2B-1 would require paybacks of state quota overages only when the coastwide quota is exceeded. Sub-alternative 2B-2 would require paybacks of state quota overages regardless of whether the coastwide quota was exceeded. Therefore, sub-alternative 2B-2 has the potential to result in more frequent overage paybacks compared to sub-alternative 2B-1. A reduction in fishing effort would be expected in the year when the payback is applied. The scale of the reduction would depend on the magnitude of the payback. There are mechanisms in place (e.g., federal in-season closures) to prevent major quota overages; therefore, any reductions in fishing effort in years when an overage is applied, compared to if the overage were not applied, are expected to be minor. Under both sub-alternatives, commercial fishing effort for black sea bass would continue to be driven largely by the coastwide quota, which is set based on the best scientific information available and is expected to prevent overfishing. As such, both sub alternatives 2B-1 and 2-B2 are expected to maintain the current stock status of black sea bass and non-target species. The black sea bass stock is currently not overfished or experiencing overfishing (Section 6.2.1); therefore, sub-alternatives 2B-1 and 2B-2 are both expected to have moderate positive impacts on the black sea bass stock by maintaining this positive stock status. As described in Section 6.2.2, the most common non-target species in the commercial black sea bass fishery have a positive or unknown stock status. Therefore, sub-alternatives 2B-1 and 2B-2 are both expected to have slight positive impacts on non-target species by maintaining their current stock status.

Sub-alternative 2B-2 has the potential for a greater magnitude of positive impacts on black sea bass and non-target species, compared to sub-alternative 2B-1, as it has the potential to result in more frequent overage paybacks and thus slightly reduced fishing effort in the year when a payback is applied, compared to sub-alternative 2B-1. However, these differences are not expected to be great enough to result in meaningful differences in stock status for black sea bass or non-target species under either sub-alternative. As stated above, the current positive stock status is expected to be maintained under both sub-alternatives.

### 7.2.3 Impacts of Alternative Set 3 (Federal In-Season Closures) on Black Sea Bass and Non-Target Species

The alternatives for federal in-season closures are described in detail in section 5.3. Under alternative 3A the entire commercial fishery would close in-season for all federally permitted vessels and dealers, regardless of state, once the coastwide quota is projected to be landed, as is currently required under the Council's FMP. Under alternative 3B this closure would occur when the coastwide quota plus an additional buffer of up to 5% is projected to be landed. The buffer amount would be determined each year through the specifications process. Under alternative 3C this closure would occur when the ACL is projected to be fully caught. It is uncertain how alternative 3C would be implemented in practice as, unlike landings, discards are not monitored in-season. It is also uncertain how alternative 3C would compare to alternatives 3A and 3B in terms of the potential frequency of overage paybacks. Given that alternative 3A has a lower threshold for a closure than alternative 3B, it would be expected to result in more frequent closures than alternative 3B. However, it is important to note that the commercial fishery has not closed in-season to date. States have effectively monitored and controlled their harvest and used transfers to address minor state-level overages while preventing an overage of the coastwide quota. Therefore, any differences between these three alternatives in terms of their impacts on the fishery, and therefore on black sea bass and non-target species, are theoretical.

*Impacts to Black Sea Bass*

Moderate positive impacts to the black sea bass stock are expected under alternative 3A as this alternative would not change the regulations regarding federal in-season closures, which have been in place for many years. This would not be expected to result in a change in stock status; the currently positive stock status would be expected to be maintained.

Alternative 3B would allow quota overages; however, the additional risk of overfishing is expected to be minimal as states would still close their commercial black sea bass fisheries when their quotas are reached and states would still be required to pay back overages. In addition, the overall coastwide quota overage amount would be limited to 5% before an in-season closure occurred. Therefore, a change in stock status is not expected and this alternative is expected to have moderate positive impacts on the stock (though of a slightly lesser magnitude than alternative 3A) by maintaining the currently positive stock status.

As previously described, it is unclear how alternative 3C would be put into practice as discards in weight are not monitored in-season. Given this uncertainty, it is unknown how this alternative would compare to alternatives 3A and 3B in terms of the potential for and the possible magnitude of ACL and quota overages. Notable negative impacts on the stock would not be expected as states would still close when their quotas are reached and states would still be required to pay back overages; therefore, major ACL overages would not be expected. For this reason, alternative 3C could have moderate positive impacts on the black sea bass stock by maintaining the current positive stock status; however, the degree of these moderate positive impacts compared to alternatives 3A and 3B is uncertain for the reasons described above.

*Impacts to Non-Target Species*

As described above, commercial fishing effort would continue to be driven by the coastwide quota under all alternatives in alternative set 3. Slight differences in fishing effort would be expected in years when an in-season closure is implemented. These differences are expected to be slight because, as described above, states have effectively monitored their landings, adjusted their measures as needed, and used transfers of quota from other states to avoid the need for federal in-season closures to date. If similar practices continue in the future, federal in-season closures would likely be rare events. When needed, these closures would likely occur late in the year, resulting in a minor reduction in annual, coastwide fishing effort.

For these reasons, none of the alternatives for federal in-season closures are expected to have meaningfully different impacts on non-target species than the impacts of the overall coastwide quota. As previously stated, under recent quota levels, the primary non-target species in the commercial black sea bass fishery have either maintained a positive stock status, or in the case of sea robins, have an unknown stock status due to a lack of a stock assessment (Section 6.2.2). For these reasons, alternatives 3A-3C are all expected to have continued slight positive impacts on non-target species by maintaining their current stock status. Any differences in the magnitude of these slight positive impacts between these three alternatives is theoretical as the fishery has not closed in-season to date. However, alternative 3A has the potential for greater positive impacts on non-target species than alternative 3B because it could result in more frequent in-season closures, and thus has the potential for slightly lower fishing effort than alternative 3A in years when a closure is implemented. It is unknown how the magnitude of impacts under alternative 3C compares to the impacts of alternatives 3A and 3B for the reasons described above.

## 7.3 Impacts of the Alternatives on Habitat

The following sections describe the expected impacts of the alternatives on physical habitat. Impacts are based on expected changes in the amount and spatial distribution of fishing effort with different gear types.

### 7.3.1 Impacts of Alternative Set 1 (State Allocation Percentages) on Habitat

The state allocation alternatives are described in detail in section 5.1. Alternative 1A (no action) would maintain the allocation percentages implemented through Amendment 13, which have been in place since 2003. Alternative sets 1B-1F would modify the state allocations. These alternative sets contain many sub-alternatives which allow for considerable flexibility in the allocation approach and could result in a wide range of outcomes. Most possible combinations of these sub-alternatives would result in state allocation percentages that are partially based on biomass distribution. The resulting allocation percentages would be modified through the specifications process whenever new biomass distribution information is available. As such, these alternatives would not result in a permanent shift in allocation from one region to another. Most combinations of sub-alternatives, including the preferred alternatives, would define a process for setting allocations rather than defining specific allocation percentages.

Alternative sets 1B-1F could all result in a similar range of large or small changes in the state allocations compared to the no action alternative (alternative 1A), depending on the sub-alternatives chosen and future biomass distribution. In addition, commercial black sea bass fishing effort is expected to continue to be driven by the coastwide quota under all alternatives, including the no action alternative (alternative 1A). For these reasons, although different allocation approaches are considered in alternative set 1, the impacts of all alternatives on habitat are considered collectively, rather than separately for discrete alternative sets or combinations of sub-alternatives.

As described in more detail in Section 7.1.1, all alternatives in alternative set 1 could have minor impacts on the spatial distribution of landings and discards; however, they are not expected to have notable impacts on the overall amount of effort in the commercial black sea bass fishery, which will continue to be primarily driven by the coastwide quota. The impacts of the coastwide quota are analyzed separately through the annual specifications process. The alternatives in alternative set 1 consider only how to allocate the quota among states.

As described in Section 6.1, most commercial black sea bass landings in all states but Massachusetts, New York, and Delaware during 2017-2019 were harvested with bottom otter trawl gear. As previously noted, trawl vessels may be better able to take advantage of higher quotas than pot/trap vessels as they can land higher volumes. Therefore, an increase in allocation in most states could result in a higher proportion of landings from trawl vessels, depending on future quota levels and how those states adjust their management measures (e.g., trip limits, open seasons) in response to an increased allocation. Changes in state-specific management measures could result in individual vessels spending more time targeting black sea bass; however, these changes cannot be accurately predicted as it is unknown how each state would modify their management measures in response to a change in allocation and how fishermen would change their behaviors in response to those changes. In addition, an increase in allocation in one state would require a decrease in allocation in one or more other states; therefore, major changes in the contributions of different gear types to overall catch at the coastwide level are not expected under any of the alternatives. Under all alternatives, bottom otter trawl gear is expected to continue to be the dominant gear type.

Any changes in the total amount of fishing effort, the distribution of fishing effort, or the relative contribution of different gear types to total fishing effort under any of the alternatives in alternative set 1 (including the no action alternative) are not expected to result in any notable changes beyond what has historically taken place in the fishery. The habitats impacted by the commercial black sea bass fishery have been impacted by many fisheries using many gear types over many years. Any changes in black sea bass fishing effort as a result of changes to the state allocation percentages are not expected to result in any meaningful improvement to or further deterioration of the impacted habitats, given that this action will not impact the overall amount of commercial fishing effort (which will continue to be driven by the coastwide quota), and the impacted areas will continue to be impacted by the black sea bass fishery, as well as many other fisheries. For these reasons, under all alternatives in alternative set 1, including the no action alternative, slight negative impacts to habitat are expected due to continued black sea bass fishing effort throughout the management unit. These impacts are not expected to vary meaningfully across the alternatives as total fishing effort is not expected to vary across the alternatives and major changes in the relative contributions of different gear types (namely bottom otter trawls and pots/traps) are not expected to vary beyond historical variations.

### 7.3.2 Impacts of Alternative Set 2 (Council Management of State Allocations) on Habitat

The alternatives for Council management of state allocations are described in section 5.2. These alternatives consider whether the state allocations should remain only in the Commission's FMP (alternative 2A) or whether they should be included in both the Council and Commission FMPs (alternative 2B). Alternative 2B includes sub-alternatives regarding paybacks of state quota overages if the allocations are added to the Council's FMP.

The decision of whether to include the state allocations in one or both FMPs is administrative in nature and will have no impacts on habitat as it will have no impact on fishing effort.

The sub-alternatives regarding paybacks of state quota overages have the potential to result in very slight differences in fishing effort in years when a payback is necessary. Sub alternative 2B-1 would require paybacks of state quota overages only when the coastwide quota is exceeded. Sub-alternative 2B-2 would require paybacks of state quota overages regardless of whether the coastwide quota is exceeded. Therefore, sub-alternative 2B-2 has the potential to result in more frequent overage paybacks compared to sub-alternative 2B-1. A reduction in fishing effort would be expected in the year when the payback is applied. The scale of the reduction would depend on the magnitude of the payback. There are mechanisms in place (e.g., federal in-season closures) to prevent major quota overages; therefore, any reductions in fishing effort in years when an overage is applied, compared to if the overage were not applied, are expected to be minor. Under both sub-alternatives, commercial fishing effort for black sea bass would continue to be driven by the coastwide quota. As such, both sub alternatives 2B-1 and 2-B2 are expected to have slight negative impacts on habitat due to continued interactions between fishing gear and physical habitat (see Sections 7.3.1 and 6.3.3 for more details). These impacts are not expected to be greater than the historical impacts of the black sea bass fishery and the many other fisheries which operate in the same areas. Sub-alternative 2B-2 would have less negative impacts on habitat than sub-alternative 2B-1 because it has the potential to result in more frequent overage paybacks; however, for the reasons described above, these differences are not expected to be meaningful in terms of their impacts on habitat.

### 7.3.3 Impacts of Alternative Set 3 (Federal In-Season Closures) on Habitat

The alternatives for federal in-season closures are described in section 5.3. Under alternative 3A the entire commercial fishery would close in-season for all federally permitted vessels and dealers, regardless of state, once the coastwide quota is projected to be landed, as is currently required under the Council's FMP. Under alternative 3B this closure would occur when the coastwide quota plus an additional buffer of up to 5% is projected to be landed. The buffer amount would be determined each year through the specifications process. Under alternative 3C this closure would occur when the ACL is projected to be fully caught. It is uncertain how alternative 3C would be implemented in practice as, unlike landings, discards are not monitored in-season. It is also uncertain how alternative 3C would compare to alternatives 3A and 3B in terms of the potential frequency of overage paybacks. Given that alternative 3A has a lower threshold for a closure than alternative 3B, it would be expected to result in more frequent closures than alternative 3B. However, it is important to note that the commercial fishery has not closed in-season to date. States have effectively monitored and controlled their harvest and used transfers to address minor state-level overages while preventing an overage of the coastwide quota. Therefore, any differences between these three alternatives in terms of their impacts on the fishery are theoretical.

Under all alternatives in this alternative set, commercial fishing effort would continue to be driven by the coastwide quota. For the reasons described in Sections 7.3.1 and 6.3.3, this is expected to result in slight negative impacts to habitat under all alternatives in alternative set 3. The differences in the magnitude of slight negative impacts between these three alternatives are theoretical as the fishery has not closed in-season to date. However, the slight negative impacts under alternative 3B could be slightly greater in magnitude than under alternative 3A because alternative 3B could result in less frequent in-season closures, and thus has the potential for very slightly higher fishing effort than alternative 3A. It is unknown how the magnitude of slight negative impacts under alternative 3C compares to the slight negative impacts of alternatives 3A and 3B for the reasons described above.

## 7.4 Impacts of the Alternatives on Protected Species

The following sections describe the expected impacts of the alternatives on species protected under the ESA or the MMPA. Impacts are based on expected changes in the amount and spatial distribution of fishing effort with different gear types.

The impacts considerations described below take into account impacts on ESA-listed species, impacts on marine mammal stocks in good condition (i.e., PBR level has not been exceeded), and marine mammal stocks that have reached or exceeded their PBR level. Any action that could result in take of ESA-listed species is expected to have some negative impacts, including actions that reduce interactions. The expected impacts of the alternatives on MMPA protected species vary based on the stock condition of each species and the potential for each alternative to impact fishing effort. For marine mammal stocks/species that have their PBR level reached or exceeded, some negative impacts would be expected from any alternative that has the potential to interact with these species or stocks. For marine mammal species that are at more sustainable levels (i.e., PBR levels have not been exceeded), any action not expected to change fishing behavior or effort such that interaction risks increase relative to what has been seen in the fishery previously, may have positive impacts by maintaining takes below the PBR level and approaching the Zero Mortality Rate Goal (Table 13).

### 7.4.1 Impacts of Alternative Set 1 (State Allocation Percentages) on Protected Species

The state allocation alternatives are described in detail in section 5.1. Alternative 1A (no action) would maintain the current allocation percentages which have been in place since 2003. Alternative sets 1B-1F would modify the state allocations. These alternative sets contain many sub-alternatives which allow considerable flexibility in the allocation approach and could result in a wide range of outcomes. Most possible combinations of these sub-alternatives would result in state allocation percentages that are partially based on biomass distribution. The resulting allocation percentages would be modified through the specifications process whenever new biomass distribution information is available. As such, these alternatives would not result in a permanent shift in allocation from one region to another. Most combinations of sub-alternatives, including the preferred alternatives, would define a process for setting allocations rather than defining specific allocation percentages.

Alternative sets 1B-1F could all result in a similar range of large or small changes in the state allocations compared to the no action alternative (alternative 1A), depending on the sub-alternatives chosen and future biomass distribution. In addition, commercial black sea bass fishing effort is expected to continue to be driven by the coastwide quota under all alternatives, including the no action alternative (alternative 1A). For these reasons, although different allocation approaches are considered in alternative set 1, the impacts of all alternatives on protected species are considered collectively, rather than separately for discrete alternative sets or combinations of sub-alternatives.

As described in more detail in Section 7.1.1, none of the alternatives in alternative set 1 are expected to have notable impacts on the overall amount of effort in the commercial black sea bass fishery, which will continue to be primarily driven by the coastwide quota. The impacts of the coastwide quota are analyzed separately through the annual specifications process. The alternatives in alternative set 1 consider only how to allocate the quota among states.

The alternatives could result in slight changes in the distribution of fishing effort, especially for fishermen only permitted to fish for black sea bass in state waters and who therefore have less flexibility in where they can target black sea bass compared to those who are permitted to fish in federal waters and/or in multiple states. Changes in the distribution of fishing effort can change interaction risks for protected species. However, none of the alternatives would result in a permanent shift of a notable amount of allocation from one state to another and overall fishing effort would continue to be constrained by the coastwide quota. In addition, an increase in allocation in one state would require a decrease in allocation in one or more other states and therefore may have minimal, if any, impacts on overall fishing effort. None of the alternatives would shift fishing effort into areas that are not currently fished for black sea bass.

Changes in state allocations may have slight impacts on fishing effort using different gear types in states that gain or lose allocation; however, major changes in effort using different gear types are not expected under any alternative. Under all alternatives, bottom otter trawl gear is expected to continue to be the dominant gear type coastwide. As described in Section 6.1, most commercial black sea bass landings in all states but Massachusetts, New York, and Delaware during 2017-2019 were harvested with bottom otter trawl gear. As previously noted, trawl vessels may be better able to take advantage of higher quotas than pot/trap vessels as they can land higher volumes. Therefore, an increase in allocation in most states could result in a higher proportion of landings from trawl vessels, depending on future quota levels and how those states adjust their management measures (e.g., trip limits, open seasons) in response to an increased allocation. Changes in state-specific management measures could result in individual vessels spending more time targeting black sea bass in states that gain allocation; however, these changes cannot be accurately predicted as it is unknown how each state would modify their management measures in response to a change in allocation and how fishermen would subsequently modify their behavior, if at all. In addition, as previously stated, increases in fishing effort in some states may be offset by a decrease in fishing effort in states that lose allocation.

For these reasons, none of the alternatives are expected to change the distribution of fishing effort to the extent that interaction risks with protected species are notably different than current conditions.

*Impacts to MMPA (Non-ESA Listed) Species*

As previously stated, overall fishing effort under all alternatives in alternative set 1 will continue to be driven by primarily by the coastwide quota. As described in Section 6.4, many non-ESA listed marine mammals are maintaining optimum sustainable levels (i.e., PBR levels have not been exceeded) over the last several years, even with continued fishery interactions. For these stocks/species, it appears that the fishery management measures that have been in place over this timeframe have resulted in levels of effort that result in interaction levels that are not expected to impair the stocks/species ability to remain at an optimum sustainable level. These fishery management measures, therefore, have resulted in indirect slight positive impacts to these non-ESA listed marine mammal species/stocks. Should future fishery management actions maintain similar operating conditions, it is expected that these slight positive impacts would remain under all state allocation alternatives. Therefore, all alternatives in alternative set 1 are expected to result in slight positive impacts on non-ESA listed species of marine mammals with positive stock conditions (i.e., continuation of current operating conditions is not expected to result in exceedance of any of these stocks/species PBR level).

As provided in Section 6.4, some bottlenose dolphin stocks are experiencing levels of interactions that have resulted in exceedance of their PBR levels. These stocks/populations are not at an optimum sustainable level and therefore, the continued existence of these stocks/species is at risk. As a result, any potential for an interaction is a detriment to the species/stocks ability to recover from this condition. As previously stated, the risk of an interaction is strongly associated with the amount of gear in the water, the time the gear is in the water (e.g., soak or tow time), and the presence of protected species in the same area and time as the gear, with risk of an interaction increasing with increases in of any of these factors. As interactions with bottlenose dolphin stocks are possible under all alternatives in alternative set 1, this is likely to result in slight negative impacts to these stocks.

Based on this information, all alternatives in alternative set 1 are expected to have slight negative to slight positive impacts on MMPA (non-ESA listed) protected species of marine mammals; with slight negative impacts expected for MMPA species in poor condition (i.e., PBR levels have been exceeded) and slight positive impacts for MMPA protected species in good condition (i.e., PBR levels have not been exceeded).

*Impacts to ESA Listed Species*

The commercial black sea bass fishery is prosecuted primarily with bottom otter trawl and pot/trap gear. For example, as described in Section 6.1, during 2016-2019, 52-61% of total commercial black sea bass landings were attributed to bottom trawl gear each year and around 21-26% to pot/trap gear. As described in Section 6.4.3, interactions between bottom trawl gear and ESA listed species of large whales have never been observed or documented and therefore, are not expected to pose an interaction risk to these species. However, ESA listed species of sea turtles, Atlantic sturgeon, and Atlantic salmon are vulnerable to interactions with bottom trawls, with interactions often resulting in the serious injury or mortality. In addition, fixed gear (e.g., pots/traps) pose an entanglement risk to large whales. Therefore, the black sea bass fishery has the potential to interact with and result in some level of negative impacts to these species.

Interaction risks are strongly associated with the amount of gear in the water, gear soak or tow time, as well as the area of overlap, either in space or time, of the gear and the species (with risk of an interaction increasing with increases in of any or all these factors).

As described above, none of the alternatives are expected to impact overall fishing effort, which will continue to be driven by the coastwide quota. Alternative set 1 considers only how the quota is allocated among states. Under all alternatives, the fishery is expected to continue to be predominantly a bottom otter trawl fishery, with lesser amounts of landings from pots/traps and other gear types. For these reasons, when considered independently from the annual coastwide quota (which is determined through a separate decision making process than this action and analyzed in separate documents), none of the alternatives are expected to increase or decrease interaction rates with ESA listed species compared to recent levels. Taking into consideration this, and the fact that all trap/pot fisheries must comply with the Atlantic Large Whale Take Reduction Plan under all alternatives, the impacts to ESA listed species are expected to range from negligible (for species which have not had observed or documented interactions with bottom otter trawl or pot/trap gear) to slight to moderate negative (for species which are vulnerable to interactions with these commercial gear types).

*Overall Impacts*

For the reasons described above, all alternatives in alternative set 1 are expected to have moderate negative to slight positive impacts on protected species, depending on the species, with slight negative to slight positive impacts possible for non-ESA listed marine mammals and negligible to moderate negative impacts possible for ESA-listed species. These impacts could vary depending on future quota levels, which will be analyzed in future specifications documents.

All alternatives in alternative set 1 are expected to have a similar magnitude of impacts on protected species given that fishing effort will continue to be driven by the coastwide quota under all alternatives. Any differences in the state allocations under the different possible combinations of alternatives and sub-alternatives in alternative set 1 are not expected to have meaningfully different impacts on protected species.

### 7.4.2 Impacts of Alternative Set 2 (Council Management of State Allocations) on Protected Species

The alternatives for Council management of state allocations are described in detail in section 5.2. These alternatives consider whether the state allocations should remain only in the Commission's FMP (alternative 2A) or whether they should be included in both the Council and Commission FMPs (alternative 2B). Alternative 2B includes sub-alternatives regarding paybacks of state quota overages if the allocations are added to the Council's FMP.

The decision of whether to include the state allocations in one or both FMPs is administrative in nature. Specifically, the measures considered are procedural and therefore, in and of themselves, will not cause the operation of the fishery (e.g., effort, behavior, area fished, gear quantity) to change relative to current operating conditions. Therefore, alternatives 2A and 2B are expected to have no impacts on protected species. However, the sub-alternatives under 2B will have some impacts, as described below.

The sub-alternatives regarding paybacks of state quota overages have the potential to result in very slight differences in fishing effort in years when a payback is necessary. Sub alternative 2B-

1 would require paybacks of state quota overages only when the coastwide quota is exceeded. Sub-alternative 2B-2 would require paybacks of state quota overages regardless of whether the coastwide quota was exceeded. Therefore, sub-alternative 2B-2 has the potential to result in more frequent overage paybacks than sub-alternative 2B-1. A reduction in fishing effort would be expected in the year when the payback is applied. The scale of the reduction would depend on the magnitude of the payback. There are mechanisms in place (e.g., federal in-season closures) to prevent major quota overages; therefore, any reductions in fishing effort in years when an overage is applied, compared to if the overage were not applied, are expected to be minor and may not result in meaningfully different impacts on protected species.

Under both sub-alternatives 2B-1 and 2B-2, commercial fishing effort for black sea bass would continue to be driven by the coastwide quota. The differences in fishing effort in years when an overage payback is applied under either sub-alternative 2B-1 or 2B-2 are not expected to have meaningfully different impacts on protected species than the impacts of the overall coastwide quota. Based on the rationale included in Section 7.4.1 for alternative set 1 and not repeated here, sub-alternatives 2B-1 and 2B-2 are both expected to have moderate negative to slight positive impacts on protected species, depending on the species, with slight negative to slight positive impacts possible for non-ESA listed marine mammals and negligible to moderate negative impacts possible for ESA-listed species. These impacts may vary depending on future quota levels, which will be analyzed in future specifications documents.

### 7.4.3 Impacts of Alternative Set 3 (Federal In-Season Closures) on Protected Species

The alternatives for federal in-season closures are described in detail in Section 5.3. Under alternative 3A the entire commercial fishery would close in-season for all federally permitted vessels and dealers, regardless of state, once the coastwide quota is projected to be landed. Under alternative 3B (preferred) this closure would occur when the coastwide quota plus an additional buffer of up to 5% is projected to be landed. Under alternative 3C this closure would occur when the ACL is projected to be fully caught. It is uncertain how alternative 3C would be implemented in practice as, unlike landings, discards are not monitored in-season. As such, it is also uncertain how alternative 3C would compare to alternatives 3A and 3B in terms of the potential frequency of in-season closures. Given that alternative 3A has a lower threshold for a closure than alternative 3B, it would be expected to result in more frequent and earlier closures than alternative 3B.

It is important to note that the commercial fishery has not closed in-season to date. States have effectively monitored and controlled their landings and used transfers to address minor state-level overages while preventing an overage of the coastwide quota. For example, some states may adjust the commercial possession limit throughout the year to control the pace of landings and prevent overages of their allocated quota. These practices are expected to continue under all alternatives in this alternative set. When in-season closures are needed, they may occur more frequently and/or slightly earlier in the year under alternative 3A compared to alternative 3B. However, under all alternatives, in-season closures are expected to be rare and to occur late in the year, if at all, and will therefore result in very minor differences in fishing effort across the three alternatives. Under all alternatives in this alternative set, commercial fishing effort would continue to be primarily driven by the annual coastwide quota. Therefore, based on the rationale included in Section 7.4.1 for alternative set 1 and not repeated here, all alternatives in alternative set 3 are expected to have moderate negative to slight positive impacts on protected species, depending on the species, with slight negative to slight positive impacts possible for non-ESA listed marine mammals and negligible to moderate negative impacts possible for ESA-listed species.

Because alternative 3B would allow an up to 5% overage of the commercial quota before an in-season closure is triggered, it could allow for slightly higher commercial fishing effort than alternative 3A, which would close the fishery in-season at 100% of the quota. Therefore, in years when an in-season closure is triggered, alternative 3B could result in very slightly higher interaction risks for protected species compared to alternative 3A. As previously stated, alternative 3C cannot be compared to alternatives 3A and 3B in this regard given uncertainties in how it would be implemented.

## 7.5 Cumulative Effects Analysis

### 7.5.1 Introduction

A cumulative effects analysis is required by the Council on Environmental Quality (40 CFR part 1508.7) and NOAA policy and procedures in NOAA Administrative Order 216-6A (Companion Manual, January 13, 2017). The purpose of the cumulative effects analysis is to consider the combined effects of many actions on the human environment over time that would be missed if each action were evaluated separately. Council on Environmental Quality guidelines recognize that it is not practical to analyze the cumulative effects of an action from every conceivable perspective. Rather, the intent is to focus on those effects that are truly meaningful. The following remarks address the significance of the expected cumulative impacts as they relate to the federally managed commercial black sea bass fishery.

A cumulative effects assessment makes effect determinations based on a combination of: 1) impacts from past, present, and reasonably foreseeable future actions; 2) the baseline conditions of the VECs (the combined effects from past, present, and reasonably foreseeable future actions plus the present condition of the VEC); and 3) impacts of the alternatives under consideration for this action.

#### 7.5.1.1 Consideration of the VECs

The valued ecosystem components for the commercial black sea bass fishery are generally the "place" where the impacts of management actions occur and are identified in section 6.

- Human communities
- Black sea bass and non-target species
- Physical habitat
- ESA and MMPA protected species

The cumulative effects analysis identifies and characterizes the impacts on the VECs by the alternatives under consideration when analyzed in the context of other past, present, and reasonably foreseeable future actions.

#### 7.5.1.2 Geographic Boundaries

The impacts analysis focuses on actions related to the commercial harvest of black sea bass. The Western Atlantic Ocean is the core geographic scope for each of the VECs. For human communities, the core geographic boundaries are defined as those U.S. fishing communities in coastal states from Maine through North Carolina directly involved in the commercial harvest or processing of black sea bass (Section 6.1). The core geographic scope for black sea bass is the management unit (i.e., Maine through Cape Hatteras, North Carolina). The geographic scope for non-target species is based on the range of each species in the Western Atlantic Ocean. The core geographic scope for habitat is focused on EFH within the Exclusive Economic Zone but includes all habitat utilized by black sea bass, and non-target species in the Western Atlantic Ocean. The core geographic scope for protected species is their range in the Western Atlantic Ocean.

#### 7.5.1.3 Temporal Boundaries

The temporal scope of past and present actions for human communities, black sea bass, non-target species, and habitat, is primarily focused on actions that occurred after FMP implementation in 1997. An assessment using this timeframe demonstrates the changes that have resulted through management under the Council process and through U.S. prosecution of the fishery. For protected species, the scope of past and present actions is focused on the 1980s and 1990s (when NMFS began generating stock assessments for marine mammals and sea turtles that inhabit waters of the U.S. Exclusive Economic Zone) through the present.

The temporal scope of future actions for all VECs extends to 2028, five years beyond the earliest potential implementation of this action. The dynamic nature of resource management for black sea bass and lack of information on projects that may occur in the future make it difficult to predict impacts beyond this timeframe with any certainty. The impacts discussed in Section 7.5.5 are focused on the cumulative effects of the proposed action (i.e., the suite of preferred alternatives) in combination with the relevant past, present, and reasonably foreseeable future actions over these time scales.

### 7.5.2 Relevant Actions Other Than Those Proposed in this Document

This section summarizes the past, present, and reasonably foreseeable future actions and effects that are relevant for this cumulative effects assessment. Some past actions are still relevant to the present and/or future actions.

#### 7.5.2.1 Fishery Management Actions

##### 7.5.2.1.1 Fishery Management Actions Impacting Human Communities

<u>*Past and Present Actions:*</u>

Actions taken under the Summer Flounder, Scup, and Black Sea Bass FMP have had impacted human communities. Many actions have included measures designed to improve flexibility and efficiency. In general, actions that prevent overfishing have long-term economic benefits on businesses and communities that depend on those resources; however, many actions may lead to short-term negative economic impacts by reducing effort and revenues.

Amendments 9 (1996) and 13 (2002) had major implications for human communities, by limiting participation in the black sea bass fisheries, imposing gear and permitting requirements, and allocating the total commercial quota among states. These actions resulted in mixed impacts to human communities. They imposed costs and eliminated some participants, but they also improved the ability to control harvest and maintain a positive stock status.

Amendment 15 in 2011 established ACLs and accountability measures to bring the FMP into compliance with the new requirements of the MSA. This action and associated annual specifications have resulted in constraints on effort and revenues in the fishery. However, ACLs and other measures have resulted in positive impacts on the stock that in turn positively impact human communities.

Amendment 17 established a process and provisions for allocating observer coverage across all federally managed fisheries, including bycatch reporting and monitoring mechanisms, analytical techniques and allocation of at-sea fisheries observers, a standardized bycatch reporting method performance standard, a review and reporting process, framework adjustment and annual specifications provisions, a prioritization process, and provisions for industry-funded observers and observer set-aside programs. These measures became effective in mid-2015.

The Summer Flounder, Scup, and Black Sea Bass Commercial/Recreational Allocation Amendment (Amendment 22, pending approval and implementation) is expected to directly impact human communities in the commercial and recreational sectors. Some negative impacts are expected for communities that rely more heavily on the commercial sector, due to declines in commercial quotas compared to recent levels under reduced allocations, especially for black sea bass and scup. Impacts to the recreational sector may range from slight positive to high negative, depending on the species, as although the recreational allocations will increase, the increase may not be great enough to liberalize measures or to prevent the need for further restrictions.

The Recreational Harvest Control Rule Framework/Addenda proposes modifications to the process used for setting recreational bag, size, and season limits for summer flounder, scup, black sea bass, and bluefish. This action is undergoing review and, if approved, is intended to be implemented for use in setting 2023 recreational management measures.

*Reasonably Foreseeable Future Actions*

The Council and Commission have also initiated an amendment to consider options for managing for-hire recreational fisheries separately from other recreational fishing modes (referred to as sector separation) and options related to recreational catch accounting, such as private angler reporting and enhanced vessel trip report requirements. These management actions aim to increase stability in recreational measures while continuing sustainable management of the fishery, which should benefit the recreational community. Sector separation could allow management measures to be tailored to the unique needs of the party/charter sector and private recreational fishing sectors.

Over the temporal scope of the future effects of this action (5 years), the Council will continue to implement annual specifications to manage the stocks for sustainability. This is expected to have moderate negative to moderate positive impacts on fishing communities depending on the total catch limits and resulting allocations.

#### 7.5.2.1.2 Fishery Management Actions Impacting Black Sea Bass

*Past and Present Actions*

Past, present, and reasonably foreseeable future actions for black sea bass management include the establishment of the original FMP, all subsequent amendments and frameworks, and the setting of annual specifications (annual catch limits and measures to constrain catch and harvest).

Amendments 9 (1996) added black sea bass to the Summer Flounder FMP with commercial quotas, RHLs, minimum fish size limits, gear restrictions, permits, and reporting requirements.

Additional amendments and framework actions have allowed for or required reduced fishing mortality rates for these species, commercial quota transfers, research set-aside, gear restrictions, protection of the spawning classes, and reducing discards.

Amendment 15 established ACLs and accountability measures consistent with the 2007 revisions to the MSA. Related to this requirement, the Council annually implements or reviews catch and landings limits for each species consistent with the recommendations of the Scientific and Statistical Committee, and reviews other management measures as necessary to prevent catch limits from being exceeded and to meet the objectives of the FMP. The recreational accountability measures were modified in 2014 through Amendment 19 and the commercial accountability measures were modified in 2018 through Framework 13.

Standardized Bycatch Reporting Methodology amendments, which cover federal waters fisheries managed by the New England and/or Mid-Atlantic Councils, have updated the monitoring programs for federally managed species. The first of these amendments became effective in 2008, and an update to these measures was finalized in June 2015 (Amendment 17 to the Summer Flounder, Scup, and Black Sea Bass FMP; 80 Federal Register 37182). The updated regulations modified the prioritization process for allocation of observers, established bycatch reporting and monitoring mechanisms, and established an acceptable level of precision and accuracy for monitoring bycatch in fisheries, which have had indirect positive impacts on black sea bass by improving monitoring for total black sea bass removals.

The Council's Unmanaged Forage Omnibus Amendment, implemented in 2017, established a commercial possession limit for over 50 forage species which were previously unmanaged in federal waters. This action has ongoing positive impacts to target, non-target, and protected species by protecting many forage species and limiting the expansion of any existing fishing effort on forage stocks.

Amendment 22 (pending approval and implementation, expected to be implemented by the end of 2022) revised the allocations between the commercial and recreational sectors to reflect the most recent data on the years used to set the original allocations, and to establish catch-based allocations for summer flounder, scup, and black sea bass. This action is expected to have positive impacts on black sea bass by continuing to prevent overfishing based on the best scientific information available.

Framework 17 (pending approval and implementation, expected to be implemented for 2023) modified the process for setting recreational bag, size, and season limits for summer flounder, scup, black sea bass, and bluefish. The preferred alternative is expected to have long-term positive impacts on the stocks as accountability measures will aim to maintain positive stock status over the long term. However, some temporary negative impacts may occur in some years as the preferred alternative would not always constrain the recreational fisheries to the recreational harvest limit, which could risk exceeding the recreational ACL, the ABC, and the OFL and therefore could result in overfishing in some years.

*Reasonably Foreseeable Future Actions*

The Council and the Commission's Policy Board initiated an amendment to consider options for managing for-hire recreational fisheries separately from other recreational fishing modes (referred to as sector separation) and options related to recreational catch accounting, such as private angler reporting and enhanced vessel trip report requirements. These management actions aim to increase stability in recreational measures while continuing sustainable management of the fishery, which should benefit the target stocks.

The past, present, and reasonably foreseeable future management measures listed above are expected to prevent overfishing and prevent the black sea bass stock from becoming overfished. The cumulative impacts of past and present management actions have resulted in overall positive impacts to the black sea bass stock. As described in more detail in Section 6.2.1, the black sea bass stock is not overfished, overfishing is not occurring, and spawning stock biomass was more than double the target level according to the most recent stock assessment (NEFSC 2021a).

#### 7.5.2.1.3 Fishery Management Actions Impacting Non-Target Species

*Past and Present Actions*

Summer Flounder, Scup, and Black Sea Bass FMP actions have had mostly positive impacts on non-target species. Specific gear and area restrictions have reduced bycatch of various non-target species. Effort controls and increased efficiency of the fleet have also likely reduced impacts on non-target species. As described in Section 6.2.2, the primary non-target species in the commercial black sea bass fishery have a positive stock condition, with the exceptions of sea robins, which have an unknown stock status due to a lack of an assessment. With the exception of sea robins, which are unmanaged, all primary non-target species are managed by the Mid-Atlantic and/or the New England Fishery Management Councils and are managed under their own ACLs and accountability measures, which will continue to promote the health of each stock.

The Unmanaged Forage Omnibus Amendment implemented in 2017 has had positive impacts on non-target species by limiting the amount of fishing mortality for many prey species. In addition, habitat protections and effort reductions implemented through various fisheries actions described in this section have had generally positive impacts on the non-target species. These measures support the sustainability of non-target stocks by maintaining habitat for these stocks and by reducing fishing mortality, contributing toward positive stock status for non-target species.

Continued implementation of the Omnibus Standardized Bycatch Reporting Amendment is expected to continue to provide data to manage bycatch.

The past and present actions listed above have mixed, partially offsetting positive effects on non-target species through fishery effort reduction or gear modifications. They should reduce the magnitude of the negative impacts of fishing in general.

*Reasonably Foreseeable Future Actions*

Future actions which will serve to constrain fishing effort for target species to sustainable levels (e.g., annual specifications) will have indirect positive impacts on non-target species by also constraining fishing mortality for those species.

#### 7.5.2.1.4 Fishery Management Actions Impacting Physical Habitat

*Past and Present Actions*

Section 6.3.3 describes the impacts of bottom otter trawl and pot/trap gear (the predominant gear types in the commercial black sea bass fishery) on habitat. As described in Section 7.3, continued operation of the commercial black sea bass fishery is expected to result in continued slight negative impacts on habitat. The principal gears used in the recreational fishery for black sea bass are rod and reel and handline. These gears have minimal adverse impacts on EFH in the region (Stevenson et al. 2004).

EFH for black sea bass was designated in Amendment 9 (1996), which resulted in indirect positive impacts on habitat and black sea bass via the ability to identify, monitor, and protect important habitats for black sea bass.

Actions implemented in the Summer Flounder, Scup, and Black Sea Bass FMP that affected species with overlapping EFH were considered Amendment 13 (MAFMC 2002). The analysis in Amendment 13 indicated that no management measures were needed to minimize impacts to EFH because the trawl fisheries for summer flounder, scup, and black sea bass in federal waters are conducted primarily in high energy mobile sand and bottom habitat where gear impacts are minimal and/or temporary in nature.

The Mid-Atlantic Council developed some fishery management actions with the sole intent of protecting marine habitats. For example, in Amendment 9 to the Mackerel, Squids, and Butterfish FMP, the Council determined that bottom trawls used in Atlantic mackerel, longfin and *Illex* squid, and butterfish fisheries have the potential to adversely affect EFH for some federally-managed fisheries (MAFMC 2008). As a result of Amendment 9, closures to squid trawling were developed for portions of Lydonia and Oceanographer Canyons. Subsequent closures were implemented in these and Veatch and Norfolk Canyons to protect tilefish EFH by prohibiting all bottom trawling activity.

In addition, amendment 16 to the Mackerel, Squid, and Butterfish FMP prohibits the use of all bottom-tending gear in fifteen discrete zones and one broad zone where deep sea corals are known or highly likely to occur (81 Federal Register 90246, December 14, 2016). The New England Council's Omnibus Deep Sea Coral Amendment, adopted in 2019, included similar protected areas for deep sea coral habitat in New England, provisions to encourage further research on deep-sea corals and fisheries, and measures to facilitate future updates to coral management approaches. The New England Council's Omnibus Habitat Amendment (effective 2018) revised EFH and Habitat Area of Particular Concern designations for New England Council-managed species; revised or created habitat management areas, including gear restrictions to protect vulnerable habitat from fishing gear impacts; and established dedicated habitat research areas. These actions are expected to have overall positive impacts on habitat and EFH.

Overall, the combination of past and present actions is expected to provide some protection for vulnerable benthic habitats, and continue to promote efficiency in the harvest of fishery resources, thereby reducing adverse effects of fishing on EFH. Such consultations aim to reduce the negative habitat impacts associated with various activities occurring in the marine environment.

*Reasonably Foreseeable Future Actions*

The Mid-Atlantic Fishery Management Council has multiple ongoing habitat initiatives that are likely to positively impact habitat in the reasonably foreseeable future. The Northeast Regional Marine Fish Habitat Assessment will describe and characterize estuarine, coastal, and offshore fish habitat distribution and quality in the Northeast. The project aims to align habitat science goals and priorities with human and financial resources to develop habitat science products that support an assessment. The Council is also currently reviewing EFH designations and scientific information on habitat for Council-managed species. Based on this review, the Council may choose to modify its FMPs (e.g., revise EFH descriptions, designate Habitat Areas of Particular Concern, or implement other habitat management measures). These initiatives are expected to have positive impacts on habitat by improving the Council's ability to monitor and prioritize protections for important habitat areas.

Offshore wind energy development is expected to have a variety of impacts on marine habitats in the foreseeable future. These impacts are described in Section 7.5.2.2.1.

#### 7.5.2.1.5 Fishery Management Actions Impacting Protected Species

*Past and Present Actions*

As previously stated, bottom otter trawls and pots/traps are the predominant gear types in the commercial black sea bass fishery. These gear types pose an interaction risk to some protected species. Section 6.4 lists the protected species that may be impacted by this action.

NMFS has implemented specific recommendations or regulatory measures to reduce serious injuries and mortalities to marine mammals from gear interactions. An Atlantic Trawl Gear Take Reduction Strategy for long-finned pilot whales, short-finned pilot whales, white-sided dolphins, and common dolphins has been developed and is described in Section 6.4. In addition, NMFS has also implemented regulations, pursuant to the Atlantic Large Whale Take Reduction Plan, to reduce serious injury and mortality of large whale species in commercial trap/pot fisheries (Section 6.4). These measures have had positive impacts on these protected species by reducing the number of interactions with fishing gear.

Past fishery management actions taken through the respective FMPs and annual specifications process have also had a positive cumulative effect on protected species through the reduction of fishing effort (and thus reduction in potential interactions) and implementation of gear requirements.

*Reasonably Foreseeable Future Actions*

The Atlantic Large Whale Take Reduction Plan recently completed their scoping process for phase two of the plan focusing on risk reduction in U.S. East Coast gillnet, Atlantic mixed species trap/pot (which the black seabass fishery is part of), and Mid-Atlantic lobster/Jonah crab trap/pot fisheries. This is part of ongoing efforts to reduce the risk of entanglement to right, humpback, and fin whales in U.S. East Coast waters. For additional information the Atlantic Large Whale Take Reduction Plan and future actions, refer to NMFS Atlantic Large Whale Take Reduction Plan website.[30]. Mitigation measures from this action may impact black sea bass fishery.

These future measures would likely have some degree of positive impacts on these protected species by reducing the number of interactions with fishing gear, and therefore, reducing the level of injury and mortality to these protected species.

[30] https://www.fisheries.noaa.gov/new-england-mid-atlantic/marine-mammal-protection/atlantic-large-whale-take-reduction-plan

#### 7.5.2.1.6 Summary of Fishery Management Actions

The Council has taken many actions to manage the commercial black sea bass fishery. The MSA is the statutory basis for federal fisheries management. The cumulative impacts on the VECs of past, present, and reasonably foreseeable future federal fishery management actions under the MSA should generally be associated with positive long-term outcomes because they constrain fishing effort and manage stocks at sustainable levels. Constraining fishing effort through regulatory actions can have negative short-term socioeconomic impacts. These impacts are sometimes necessary to bring about long-term sustainability of a resource, and as such should promote positive effects on human communities in the long-term. A summary of the cumulative impacts of past, present, and reasonably foreseeable future actions on each VEC is provided in Table 14.

Table 14: Summary of expected impacts of combined past, present, and reasonably foreseeable future actions on each VEC.

| VEC | Past actions | Present actions | Reasonably foreseeable future actions | Combined effects of past, present, and future actions | Combined cumulative effects analysis baseline conditions |
|---|---|---|---|---|---|
| Human communities | **Mixed** Mgmt. actions have reduced short-term revenues and increased costs; however, stock improvements have led to long term community benefits. | **Mixed** Mgmt. actions continue to constrain effort, at times reducing short-term revenues; however, stock improvements continue to benefit human communities in the long term. | **Mixed** Future regulations will constrain landings, but long-term maintenance of sustainable stock will lead to long-term benefits to human communities. | **Mixed** Fisheries mgmt. may reduce short-term revenues or increase costs; however, sustainable management should lead to long-term community benefits. | **Positive** Short term negative impacts from effort limitations, but long-term positive impacts from a sustainable fishery. |
| Black sea bass and non-target species | **Positive** Past actions have decreased effort, protected habitat, and reduced bycatch. | **Positive** Regulations manage for a sustainable stock, control effort, and limit bycatch. | **Positive** Future actions will maintain a sustainable stock, improve monitoring, and control effort and bycatch. | **Positive** Stocks are managed sustainably; effort and bycatch are controlled. | **Positive** Stocks are managed sustainably. Effort and bycatch are controlled. |
| Habitat | **Mixed** Effort reductions and better control of non-fishing activities have been positive; fishing and non-fishing activities continue to reduce habitat quality. | **Mixed** Effort reductions and better control of non-fishing activities have been positive; fishing and non-fishing activities continue to reduce habitat quality. | **Mixed** Future regulations will control effort and habitat impacts. | **Mixed** Continued fisheries mgmt. will control effort and thus habitat impacts, but fishery and non-fishery related activities will continue to impact habitats. | **Slight positive** Continued fisheries mgmt. will control effort and thus habitat impacts. Overall knowledge of and protection of key habitats continues to improve. |

| | | | | | |
|---|---|---|---|---|---|
| **Protected species** | **Negligible to Slight Positive** Combined effects of past fishery actions have reduced effort and thus interactions with protected species. | **Negligible to Slight Positive** Current regulations continue to control effort, thus reducing opportunities for interactions. | **Mixed** Future regulations will control effort and thus protected species interactions. | **Negligible to Slight Positive** Continued effort controls will help stabilize protected species interactions. | **Negligible to Slight Positive** Continued catch and effort controls are likely to reduce gear encounters. Additional mgmt. actions taken under ESA/MMPA should also mitigate risk of gear interactions. |

#### 7.5.2.2 Non-Fishing Impacts

##### 7.5.2.2.1 Other Human Activities

Non-fishing activities that occur in the marine nearshore and offshore environments and connected watersheds can cause the loss or degradation of habitat and/or affect the species that utilize those areas. The impacts of most nearshore, human-induced, non-fishing activities tend to be localized in the areas where they occur, although effects on highly mobile species could be felt throughout their populations. For offshore projects, some impacts may be localized while others may have regional influence, especially for larger projects. The following discussion of impacts is based on past assessments of activities and assumes these activities will continue as projects are proposed.

Examples of non-fishing activities include point source and non-point source pollution, shipping, dredging/deepening, wind energy development, oil and gas development, construction, and other activities. Specific examples include at-sea disposal areas, oil and mineral resource exploration, aquaculture, construction of offshore wind farms, and bulk transportation of petrochemicals. Episodic storm events and the restoration activities that follow can also cause impacts. The impacts from these activities primarily stem from habitat loss due to human interaction and alteration or natural disturbances. These activities are widespread and can have localized impacts on habitat related to accretion of sediments, pollutants, habitat conversion, and shifting currents and thermoclines. For protected species, primary concerns associated with non-fishing activities include vessel strikes, dredge interactions (especially for sea turtles and sturgeon), and underwater noise. These activities have both direct and indirect impacts on protected species. Wherever these activities co-occur, they are likely to work additively or synergistically to decrease habitat quality and as such may indirectly constrain the productivity of managed species, non-target species, and protected species. Decreased habitat suitability tends to reduce the tolerance of these VECs to the impacts of fishing effort. Non-fishing activities can cause target, non-target, and protected species to shift their distributions away from preferred areas and may also lead to decreased reproductive ability and success (from current changes, spawning disruptions, and behavior changes), disrupted or modified food web interactions, and increased disease. While localized impacts may be more severe, the overall impact on the affected species and their habitats on a population level is unknown, but likely to have impacts that mostly range from no impact to slight negative, depending on the species and activity.

Non-fishing activities permitted by other federal agencies (e.g., beach nourishment, offshore wind facilities) require examinations of potential impacts on the VECs. The MSA imposes an obligation on other federal agencies to consult with the Secretary of Commerce on actions that may adversely affect EFH (50 CFR 600.930). NMFS and the eight regional fishery management councils engage in this review process by making comments and recommendations on federal or state actions that may affect habitat for their managed species. Agencies need to respond to, but do not necessarily need to adopt these recommendations. Habitat conservation measures serve to potentially minimize the extent and magnitude of indirect negative impacts federally-permitted activities could have on resources under NMFS' jurisdiction. In addition to guidelines mandated by the MSA, NMFS evaluates non-fishing effects during the review processes required by Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act for certain activities that are regulated by federal, state, and local authorities. Non-fishing activities must also meet the mandates under the ESA, specifically Section 7(a)(2),[31] which ensures that agency actions do not jeopardize the continued existence of endangered species and their critical habitat.

In recent years, offshore wind energy and oil and gas exploration have become more relevant activities in the Greater Atlantic region. They are expected to impact all VECs, as described below.

*Impacts of Offshore Wind Energy Development on Target, Non-target, and Protected Species and the Physical Environment*

Offshore wind energy construction activities may have both direct and indirect impacts on marine species, ranging from temporary changes in distribution to behavior changes, injury, or mortality. Impacts could occur from changes to habitat in the areas of wind turbines, offshore substations, and cable corridors and increased vessel traffic to and from these areas. Species that reside in affected areas year round may experience different impacts than species that seasonally reside in or migrate through these areas. Some species that typically reside in areas where wind energy structures are installed may return to the area and adapt to habitat changes after construction is complete. Inter-array and export cables will generate electromagnetic fields, which can affect patterns of movement, spawning, and recruitment success for various species. Effects will depend on cable type, transmission capacity, burial depth, and proximity to other cables. Substantial structural changes in habitats associated with cables are not expected unless cables are left unburied (see below). However, the cable burial process may alter sediment composition along the corridor, thereby affecting infauna and emergent biota. Taormina et al. (2018) provide a review of various cable impacts, and Hutchinson et al. (2020) and Taormina et al. (2020) examine the effects of electromagnetic fields.

The full build out of offshore wind projects in currently leased areas will result in broad habitat alteration. For example, wind turbine and offshore substation foundations may alter hydrodynamics of the area, which may affect primary productivity and physically change the distribution of prey and larvae. It is not clear how these changes will affect the reproductive success of marine species. Scour and sedimentation could have negative effects on egg masses that attach to the bottom. Benthic habitat will be altered due to the placement of scour protection at wind turbine and offshore substation foundations and over cables that are not buried to target depth in the sediment, converting soft substrates into hard substrates. This could alter species composition and predator/prey relationships by increasing favorable habitat for some species and decreasing habitat for others. The placement of wind turbines and offshore substations will also

[31] "Each Federal agency shall, in consultation with and with the assistance of the Secretary, insure that any action authorized, funded, or carried out by such agency (hereinafter in this section referred to as an "agency action") is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of critical habitat."

establish new vertical structure in the water column, which could serve as artificial reefs for bottom species, fish aggregating devices for pelagic species, and substrate for the colonization of other species (e.g., mussels). Various authors have studied these types of effects (e.g., Bergström et al. 2013, Dannheim et al. 2019, Degraer et al. 2019, Langhamer 2012, Methratta and Dardick 2019, Stenberg et al. 2015).

Elevated levels of sound produced during site assessment activities, construction, and operation of offshore wind facilities will impact the soundscape.[32] Temporary acute noise impacts from construction activity could impact reproductive behavior and migration patterns for some species. The long-term impact of operational noise from turbines may also affect behavior of fish and prey species, through both vibrations in the immediate area surrounding them in the water column, and through the foundation into the substrate. Depending on the sound frequency and source level, noise impacts to species may be direct or indirect (Finneran 2015, Finneran 2016, Nowacek et al. 2007, NRC 2000, NRC 2003, NRC 2005, Madsen et al. 2006, Piniak 2012, Popper et al. 2014, Richardson et al. 1995, Thomsen et al. 2006). Exposure to underwater noise can directly affect species through behavioral modification (avoidance, startle, spawning) or injury (sound exposure resulting in internal damage to hearing structures or internal organs; Bailey et al. 2010, Bailey et al. 2014, Bergström et al. 2014, Ellison et al. 2011, Ellison et al. 2018, Forney et al. 2017, Madsen et al. 2006, Nowacek et al. 2007, NRC 2003, NRC 2005, Richardson et al. 1995, Romano et al. 2004, Slabbekoorn et al. 2010, Thomsen et al. 2006, Wright et al. 2007). Indirect effects are likely to result from changes to the acoustic environment, which may affect the completion of essential life functions for some species (e.g., migrating, breeding, communicating, resting, foraging; Forney et al. 2017, Richardson et al. 1995, Slabbekoorn et al. 2010, Thomsen et al. 2006).[33]

Wind energy survey and construction activities, as well as operations throughout the life of the projects will substantially affect NMFS scientific research surveys, including stock assessment surveys for fisheries and protected species and ecological monitoring surveys. Disruption of these surveys could increase scientific uncertainty in survey results and may significantly affect NMFS' ability to monitor the health, status, and behavior of marine species (including protected species) and their habitat use within this region. Based on existing regional Fishery Management Councils' ABC control rule processes and risk policies (e.g., 50 CFR §§ 648.20 and 21), increased assessment uncertainty could result in lower commercial quotas and RHLs that may reduce the likelihood of overharvesting and mitigate associated biological impacts on fish stocks. However, this would also result in lower fishing revenues and reduced recreational fishing opportunities, which could result in indirect negative impacts on fishing communities.

*Socioeconomic Impacts of Offshore Wind Energy Development*

One offshore wind pilot project off Virginia installed two turbines in federal waters in 2020**.** Two more projects were approved in 2021. More than 20 leases have been issued for future wind energy development in federal waters from Massachusetts to North Carolina (Figure 11). The Biden administration has a goal of deploying 30 gigawatts of wind energy production capacity in Federal waters by 2030. Currently, the majority of that proposed development is reasonably

[32] See NMFS Ocean Noise Strategy Roadmap: https://cetsound.noaa.gov/Assets/cetsound/documents/Roadmap/ONS_Roadmap_Final_Complete.pdf

[33] See previous footnote.

foreseeable along the Atlantic coast. As the number of wind projects increases, so too would the level and scope of impacts to affected habitats, marine species, and human communities.

All wind lease areas shown in Figure 11 overlap with the black sea bass stock and fisheries (Section 6.1 and 6.2). The socioeconomic impacts of offshore wind energy on commercial fisheries could be generally negative due to the overlap of wind energy areas with productive fishing grounds. Fishing effort will be temporarily displaced during construction of wind projects. Restricted fishing access is not anticipated during the operational phase of any planned projects; however, some fishermen may choose not to operate within the project areas due to safety concerns. Any reduced fishing access (either due to restrictions or safety concerns) as a result of offshore wind energy development would result in a negative overall effect to the fishery. In some cases, effort could be displaced to another area, which could partially compensate for potential economic losses if vessel operators choose not to operate in the wind energy areas.

Turbine structures could increase the presence of and fishing for structure affiliated species, including black sea bass. Many recreational fishing trips in this region target a combination of species. For example, recreational trips which catch black sea bass often also catch tautog, scup, summer flounder, and Atlantic croaker (NEFSC 2017). For this reason, increased recreational fishing effort for species such as black sea bass near wind turbine foundations could also lead to increased recreational catches of other species. This could lead to socioeconomic benefits in terms of increased for-hire fishing revenues and angler satisfaction in certain wind project areas.

There could also be social and economic benefits in the form of jobs associated with construction and maintenance, and replacement of some electricity generated using fossil fuels with renewable sources (AWEA 2020).

It remains unclear how fishing or transiting to and from fishing grounds will be affected by the presence of a wind energy project. While no offshore wind developers have expressed an intent to exclude fishing vessels from project areas once construction is complete, it could be difficult for operators to tow bottom-tending mobile gear or transit amongst the wind turbines, depending on the spacing and orientation of the array and weather conditions.[34] If vessel operators choose to avoid fishing or transiting within wind project areas, effort displacement and additional steaming time could result in negative socioeconomic impacts to affected communities, including increased user conflicts, decreased catch and associated revenue, safety concerns, and increased fuel costs. If vessels elect to fish within wind project areas, effects could be both positive and negative due to increased catch rates for some species with some gear types (e.g., recreational catches of structure orienting species such as black sea bass) and reduced catches and associated revenues for other species and gear types (e.g., mobile bottom tending gear), user conflicts, gear damage/loss, and increased risk of allision or collision.

34 The United States Coast Guard has considered transit and safety issues related to the Massachusetts and Rhode Island lease areas in a recent port access route study, and has recommended uniform 1 mile spacing in east-west and north-south directions between turbines to facilitate access for fishing, transit, and search and rescue operations. Future studies in other regions could result in different spacing recommendations (USCG 2020).

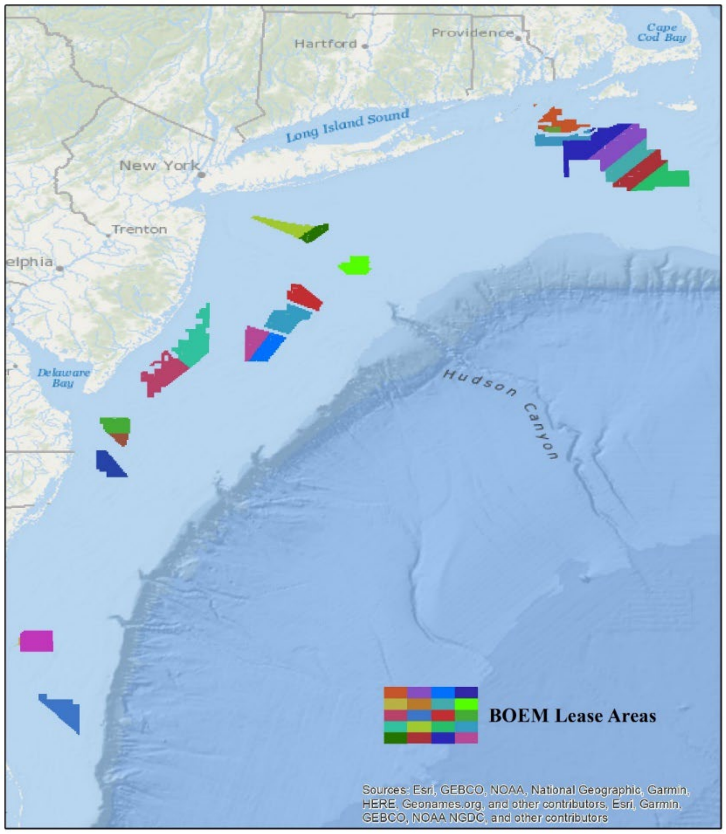


Figure 11. Offshore wind lease areas off New England and the Mid-Atlantic as of April 2022. Additional areas offshore of Delaware through North Carolina and in the Gulf of Maine are in the planning stages for lease sales which may occur over the next few years.

*Impacts of Oil and Gas Development on Biological and Socioeconomic Resources*

Compared to offshore wind energy, fewer offshore oil and gas development activities are anticipated in this region; therefore, fewer details on the non-fishing impacts from oil and gas development are provided here.

The timeframe for potential impacts from oil and gas development activities considered in this document includes leasing and possible surveys, depending on the direction of the Bureau of Ocean Energy Management's 5-year planning process in the North and Mid-Atlantic regions. Seismic surveys to detect and quantify mineral resources in the seabed impact marine species and the acoustic environment within which marine species live. These surveys have uncertain impacts on fish behaviors that could cumulatively lead to negative population level impacts. For protected species (sea turtle, fish, small cetacean, pinniped, large whale), the severity of these behavioral or physiological impacts is based on the species' hearing threshold, the overlap of this threshold with the frequencies emitted by the survey, as well as the duration of time the surveys would operate, as these factors influence exposure rate (Ellison et al. 2011, Ellison et al. 2018, Finneran 2015, Finneran 2016, Madsen et al. 2006, Nelms et al. 2016, Nowacek et al. 2007, Nowacek et al. 2015, NRC 2000, NRC 2003, NRC 2005, Piniak 2012, Popper et al. 2014, Richardson et al. 1995, Thomsen et al. 2006, Weilgart 2013). If marine species are affected by seismic surveys, then so in turn the fishermen targeting these species would be affected.

However, such surveys could increase jobs, which may provide some positive effects on human communities (BOEM 2020b). It is important to understand that seismic surveys for mineral resources are different from surveys used to characterize submarine geology for offshore wind installations, and thus these two types of activities are expected to have different impacts on marine species.

*Offshore Energy Summary*

The overall impact of offshore wind energy and oil and gas exploration on the affected species and their habitats at a population level is unknown, but likely to range from moderate positive to moderate negative, depending on the species and the number and locations of projects that occur. The individual project phases (site assessment, construction, operation, and decommissioning) as well as different aspects of the technology (foundation types, cables/pipelines, turbines) will have varying impacts on resources. Mitigation efforts, such as habitat conservation measures, time of year construction restrictions, layout modifications, and fishery compensation funds could lessen the magnitude of negative impacts. The overall socioeconomic impacts are likely slight positive to moderate negative (i.e., potentially positive due to a potential increase in jobs and recreational fishing opportunities, but negative due to displacement and disruption of commercial fishing effort).

#### 7.5.2.2.2 Global Climate Change

Global climate change affects all components of marine ecosystems, including human communities. Physical changes that are occurring and will continue to occur to these systems include sea-level rise, changes in sediment deposition; changes in ocean circulation; increased frequency, intensity, and duration of extreme climate events; changing ocean chemistry; and warming ocean temperatures. The rates of physical and chemical changes in marine ecosystems have been most rapid in recent decades (Johnson et al. 2019). Emerging evidence demonstrates that these physical changes are resulting in direct and indirect ecological responses within marine ecosystems, which may alter the fundamental production characteristics of marine systems (Stenseth et al. 2002). The general trend of changes can be explained by warming causing increased ocean stratification, which reduces primary production, lowering energy supply for higher trophic levels and changing metabolic rates. Different responses to warming can lead to altered food-web structures and ecosystem-level changes. Shifts in spatial distribution are generally to higher latitudes (i.e., poleward) and to deeper waters as species seek cooler waters within their normal temperature preferences. Climate change will also potentially exacerbate the stresses imposed by fishing and other non-fishing human activities and stressors. Survival of marine species under a changing climate depends on their ability to adapt to change, but also how and to what degree those other human activities influence their natural adaptive capacity.

Results from the Northeast Fisheries Climate Vulnerability Assessment indicate that climate change could have impacts on Council-managed species that range from negative to positive, depending on the adaptability of each species to the changing environment (Hare et al. 2016).

Black sea bass had a high overall vulnerability to climate change. The exposure of black sea bass to the effects of climate change was determined to be "very high" due to the impacts of ocean surface temperature, ocean acidification, and air temperature. Exposure to all three factors occurs during all life stages. Black sea bass occur in coastal areas during warm months and migrate offshore in cold months and thus are exposed to changes occurring both in offshore and inshore waters. The distributional vulnerability for black sea bass was also rated as "high." The biological sensitivity of black sea bass to climate change was ranked as "moderate" (Hare et al. 2016).[35]

Overall vulnerability results for additional Greater Atlantic species, including most of the non-target species identified in this action, are shown in Figure 12 (Hare et al. 2016). While the effects of climate change may benefit some habitats and the populations of species through increased availability of food and nutrients, reduced energetic costs, or decreased competition and predation, a shift in environmental conditions outside the normal range can result in negative impacts for those habitats and species unable to adapt. This, in turn, may lead to higher mortality, reduced growth, smaller size, and reduced reproduction or populations. Thus, already stressed populations are expected to be less resilient and more vulnerable to climate impacts. Climate change is expected to have impacts that range from positive to negative depending on the species. However, future mitigation and adaptation strategies to climate change may mitigate some of these impacts. The science of predicting, evaluating, monitoring and categorizing these changes continues to evolve. The social and economic impacts of climate change will depend on stakeholder and community dependence on fisheries, and their capacity to adapt to change. Commercial and recreational fisheries may adapt in different ways, and methods of adaptation will differ among regions. In addition to added scientific uncertainty, climate change will introduce implementation uncertainty and other challenges to effective conservation and management.

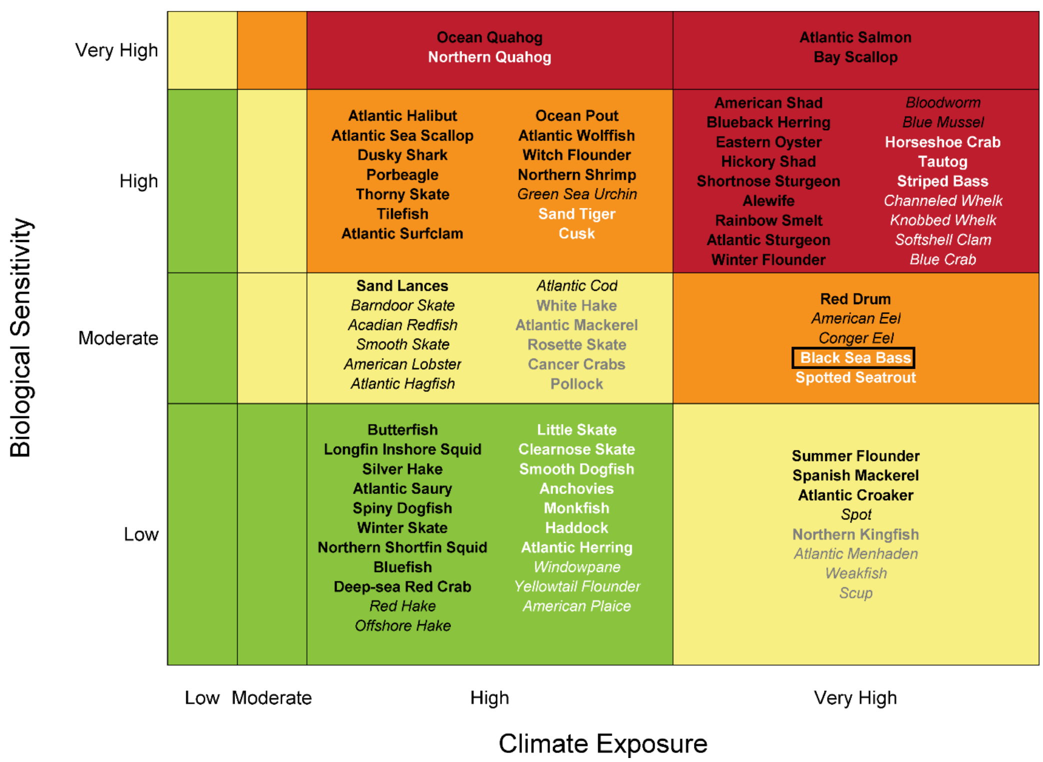


Figure 12: Overall climate vulnerability scores for Greater Atlantic Region species, with black sea bass highlighted with a black box. Overall climate vulnerability is denoted by color: low

[35] Climate vulnerability profiles for individual species are available at: https://www.st.nmfs.noaa.gov/ecosystems/climate/northeast-fish-and-shellfish-climate-vulnerability/index

(green), moderate (yellow), high (orange), and very high (red). Certainty in score is denoted by text font and text color: very high certainty (>95%, black, bold font), high certainty (90–95%, black, italic font), moderate certainty (66–90%, white or gray, bold font), low certainty (<66%, white or gray, italic font). Figure source: Hare et al. 2016.

### 7.5.3 Baseline Condition for the Resources, Ecosystems, and Human Communities

For the purposes of this cumulative effects analysis, the baseline condition is the present condition of the VECs plus the combined effects of the past, present, and reasonably foreseeable future actions.

The baseline conditions of the VECs are summarized in Table 12 in Section 7. The combined effect of the past, present, and reasonably foreseeable future actions, as well as the resulting cumulative effects analysis baseline, are listed in Table 14.

### 7.5.4 Summary of Effects of the Proposed Actions

The combination of preferred alternatives for the state allocations (i.e., alternatives 1B-2, 1E-1B, 1E-2B, 1E-3B, and 1F-2) would define a process for calculating allocations based on the most recent biomass distribution information. They would not implement specific allocation percentages. The allocations would be modified through the specifications process each time new distribution information is available. Other preferred alternatives would add the state allocations to the Council's FMP (alternative 2B), would make no changes to the current requirements for paybacks of state quota overages (alternative 2B-1), and would modify the federal in-season closure regulations such that a closure would occur when the coastwide quota plus a buffer of up to 5% is projected to be landed (alternative 3B).

As described in more detail in Section 7, the impacts of all alternatives on black sea bass, non-target species, habitat, and protected species are all expected to continue to be driven by the coastwide quota. As described in more detail in Section 7, this is expected to result in moderate positive impacts for the black sea bass stock and slight positive impacts for non-target species by resulting in no change to the current positive stock status for those species. Slight negative impacts are expected for habitat due to continued interactions between fishing gear and habitats. Assuming that future quotas remain similar to recent levels, this is expected to result in slight negative to slight positive impacts for non-ESA listed marine mammals and negligible to moderate negative impacts for ESA-listed species, depending on the species. The impacts of the coastwide quotas are analyzed each time the quotas are revised through the specifications process.

### 7.5.5 Magnitude and Significance of Cumulative Effects

In determining the magnitude and significance of the cumulative impacts of the preferred alternatives, the incremental impacts of the direct and indirect impacts should be considered, on a VEC-by-VEC basis, in addition to the effects of all actions (those identified and discussed relative to the past, present, and reasonably foreseeable future actions of both fishing and non-fishing actions). The following sections summarize the magnitude and significance of cumulative effects on each VEC.

#### 7.5.5.1 Magnitude and Significance of Cumulative Effects on Human Communities (Socioeconomic Impacts)

Past fishery management actions taken through this FMP and annual specifications process have had both positive and negative cumulative effects on human communities. They have benefitted domestic fisheries through sustainable fishery management, but have also reduced participation in fisheries and imposed management measures such as catch limits and gear restrictions which have limited potential revenues and impacted efficiency and costs.

It is anticipated that future fishery management actions will result in positive effects for human communities due to sustainable management practices, although additional indirect negative effects on some human communities could occur if management actions result in reduced revenues. Overall, the past, present, and reasonably foreseeable future actions have had overall positive cumulative effects for human communities. Despite the potential for negative short-term effects due to reduced revenues, positive long-term effects are expected due to the long-term sustainability of the managed stocks.

By providing revenues and contributing to the overall functioning of and employment in coastal communities, the black sea bass fishery has both direct and indirect positive social impacts. As previously described, the preferred alternatives are unlikely to result in substantial changes to levels of fishing effort or the character of that effort relative to current conditions.

When the direct and indirect effects of the preferred alternatives are considered in combination with all other actions (i.e., past, present, and reasonably foreseeable future actions), the cumulative effects are expected to yield non-significant slight positive impacts.

#### 7.5.5.2 Magnitude and Significance of Cumulative Effects on Black Sea Bass and Non-Target Species

As described in Section 6.2, black sea bass and all primary non-target species except sea robins are managed by the Mid-Atlantic or New England Fishery Management Councils. Sea robins are unmanaged. Past fishery management actions taken through the respective FMPs and the annual specifications process ensure that stocks are managed sustainably and that measures are consistent with the objectives of the FMP under the guidance of the MSA. These actions have generally had a positive cumulative effect on these species. It is anticipated that future management actions will have additional indirect positive effects on the target species through actions which reduce and monitor bycatch, protect habitat, and protect the ecosystem services on which the productivity of these species depend.

As noted previously, none of the preferred alternatives are expected to result in changes in fishing effort relative to current conditions. Therefore, impacts of the fisheries on black sea bass and non-target species are not expected to change relative to current conditions under the preferred alternatives. The preferred alternatives would positively reinforce the past and anticipated positive cumulative effects on black sea bass and non-target species by achieving the objectives specified in the FMPs.

When the direct and indirect effects of the preferred alternatives are considered in combination with all other actions (i.e., past, present, and reasonably foreseeable future actions), the cumulative effects are expected to yield non-significant positive impacts on black sea bass and non-target species.

#### 7.5.5.3 Magnitude and Significance of Cumulative Effects on Habitat

Past fishery management actions and annual specifications process have had positive cumulative effects on habitat. The actions have constrained fishing effort at both local and larger scales and have implemented gear requirements which reduce impacts on habitat. EFH and Habitat Areas of Particular Concern were designated for the managed species. It is anticipated that future management actions will result in additional direct or indirect positive effects on habitat through actions which protect EFH and protect ecosystem services on which these species' productivity depends.

As previously described, many additional non-fishing activities are concentrated near-shore and likely work either additively or synergistically to decrease habitat quality. The effects of these actions, combined with impacts resulting from years of commercial fishing activity, have negatively affected habitat. These impacts could be broad in scope. All the VECs are interrelated; therefore, the linkages among habitat quality, target and non-target species productivity, and associated fishery yields should be considered. Some actions, such as coastal population growth and climate change may indirectly impact habitat and ecosystem productivity; however, these actions are beyond the scope of NMFS and Council management. Reductions in overall fishing effort and protection of sensitive habitats have mitigated some negative effects.

As previously noted, none of the preferred alternatives are expected to result in significantly increased levels of fishing effort or changes to the character of that effort relative to current conditions. Although the impacted areas have been fished for many years with many different gear types and therefore will not likely be further impacted by these measures, continued fishing effort will continue to impact habitats. Therefore, the slight negative impacts of the fishery on the physical environment are not expected to change relative to the current condition under the preferred alternatives.

When the direct and indirect effects of the preferred alternatives are considered in combination with all other actions (i.e., past, present, and reasonably foreseeable future actions), the cumulative effects are expected to yield non-significant slight negative impacts on the physical environment and EFH.

#### 7.5.5.4 Magnitude and Significance of Cumulative Effects on Protected Species

Section 6.4 describes the protected species which may be impacted by this action.

Taking into consideration the above information, past fishery management actions taken through the respective FMPs and annual specifications process have had slight indirect positive cumulative effects on protected species. The actions have constrained fishing effort both at a large scale and locally, and have implemented, pursuant to the ESA, MMPA, or MSA, gear modifications, requirements, and management areas. These measures and/or actions have served to reduce interactions between protected species and fishing gear. It is anticipated that future management actions will result in additional indirect positive effects on protected species. These impacts could be broad in scope.

The preferred alternatives would not substantially modify current levels of fishing effort in terms of the overall amount of effort, timing, and location. They would allow existing fishing effort to continue. As described in more detail in Section 7, assuming that future quotas remain similar to recent levels, this is expected to result in slight negative to slight positive impacts for non-ESA listed marine mammals and negligible to moderate negative impacts for ESA-listed species, depending on the species.

When the direct and indirect effects of the preferred alternatives are considered in combination with all other actions (i.e., past, present, and reasonably foreseeable future actions), the cumulative effects are expected to yield non-significant slight negative impacts to slight positive impacts.

### 7.5.6 Proposed Action on all VECs

As described in more detail in Section 5, the preferred alternatives would modify the commercial black sea bass state allocations such that they will be based on a combination of the Amendment 13 allocations and recent stock distribution information. The preferred alternatives would also add these allocations to the Council's FMP and would modify the trigger for in-season closures. As described in more detail in Sections 7.1- 7.4, the preferred alternatives are expected to have moderate positive to slight negative socioeconomic impacts, moderate positive impacts on black sea bass, slight positive impacts on non-target species, slight negative impacts on habitat, and moderate negative to slight positive impacts on protected species, depending on the species.

The magnitude and significance of the cumulative effects, including additive and synergistic effects of the proposed action, as well as past, present, and future actions, have been taken into account (Section 7.5.5). In summary, the information in these sections indicates that when considered in conjunction with all other relevant past, present, and reasonably foreseeable future actions, the preferred alternatives are not expected to result in any significant impacts, positive or negative.

The preferred alternatives are consistent with other management measures that have been implemented in the past for the black sea bass fishery. These measures are part of a broader management scheme for the black sea bass fishery. This management scheme has helped to rebuild stocks and ensure long-term sustainability, while minimizing environmental impacts.

The regulatory atmosphere within which federal fishery management operates requires that management actions be taken in a manner that will optimize the conditions of managed species, habitat, and human communities. Consistent with NEPA, the MSA requires that management actions be taken only after consideration of impacts to the biological, physical, economic, and social dimensions of the human environment. Given this regulatory environment, and because fishery management actions must strive to create and maintain sustainable resources, impacts on all VECs from past, present and reasonably foreseeable future actions have generally been positive and are expected to continue in that manner for the foreseeable future. This is not to say that some aspects of the VECs are not experiencing negative impacts, but rather that when considered as a whole and as a result of the management measure implemented in these fisheries, the overall long-term trend is positive.

There are no significant cumulative effects associated with the preferred alternatives based on the information and analyses presented in this document and in past FMP documents. It is anticipated that the cumulative effects will range from positive to slight negative, depending on the VEC (Table 15).

Table 15: Summary of cumulative effects of preferred alternatives.

| | **Human communities** | **Black sea bass** | **Non-target species** | **Habitat** | **Protected species** |
|---|---|---|---|---|---|
| **Impacts of preferred alternatives** | Moderate positive to slight negative (Section 7.1)[36] | Moderate positive (Section 7.2) | Slight positive (Section 7.2) | Slight negative (Section 7.3) | Slight positive to moderate negative (Section 7.4)[37] |
| **Combined cumulative effects assessment baseline conditions** (Table 14) | Positive | Positive | Positive | Slight positive | Negligible to slight positive |
| **Cumulative Effects** (all non-significant) | Slight positive (Section 7.5.5.1) | Positive (Section 7.5.5.2) | Positive (Section 7.5.5.2) | Slight negative (Section 7.5.5.3) | Slight negative to slight positive (Section 7.5.5.4) |

# 8 OTHER APPLICABLE LAWS

## 8.1 Magnuson-Stevens Fishery Conservation and Management Act

### 8.1.1 National Standards

Section 301 of the MSA requires that FMPs contain conservation and management measures that are consistent with ten National Standards. The Council continues to meet the obligations of National Standard 1 by adopting and implementing conservation and management measures that will continue to prevent overfishing while achieving, on a continuing basis, optimum yield for black sea bass and the U.S. fishing industry. To achieve optimum yield, both scientific and management uncertainty are addressed when establishing catch limits. The Council develops recommendations that do not exceed the ABC recommendations of the Scientific and Statistical Committee, which explicitly address scientific uncertainty. The Council considers management uncertainty and other social, economic, and ecological factors, when recommending Annual Catch Targets. The Council uses the best scientific information available (National Standard 2) and manages black sea bass throughout their range (National Standard 3). These management measures do not discriminate among residents of different states (National Standard 4) and they do not have economic allocation as their sole purpose (National Standard 5). The measures account for variations in the fisheries (National Standard 6) and avoid unnecessary duplication (National Standard 7). They take into account the fishing communities (National Standard 8) and they promote safety at sea (National Standard 10). The proposed actions are consistent with National Standard 9, which addresses bycatch in fisheries. The Council has implemented many

[36] Positive or negative depending on the state. The magnitude of impacts will vary based on future quota levels and other factors which influence price.

[37] Depending on the species/stock. Future quotas may have different impacts if they are notably higher or lower than recent quotas.

regulations that have indirectly reduced fishing gear impacts on EFH (Section 6.3.3). By continuing to meet the National Standards requirements of the MSA through future FMP amendments, framework actions, and the annual specification setting process, the Council will ensure that cumulative impacts of these actions will remain positive overall for the managed species, the ports and communities that depend on these fisheries, and the Nation as a whole.

### 8.1.2 Essential Fish Habitat Assessment

EFH assessments are required for any action that is expected to have an adverse impact on EFH, even if the impact is only minimal and/or temporary in nature (50 CFR Part 600.920 (e) (1-5)).

*Description of Action*

As described in more detail in section 5, the preferred alternatives would modify the state allocation percentages using the following steps:

1) Connecticut's baseline allocation would increase from 1% to 3% of the coastwide quota (alternative 1B-2) and New York's baseline allocation would increase from 7% to 8% of the coastwide quota (alternative 1B-5; Section 5.1.2.1.1).
2) The state allocations would then be calculated by allocating 75% of the coastwide quota according to the new baseline allocations (as defined above) and 25% to three regions based on the most recent regional biomass distribution information from the stock assessment (alternatives 1E-1B and 1E-2B, Section 5.1.5.1).
3) The three regions are: Maine-New York, New Jersey, and Delaware-North Carolina (alternative 1F-2, Section 5.1.7.2). The regional allocations would be distributed among states within a region in proportion to their baseline allocations, except Maine and New Hampshire would each receive 1% of the northern region quota (alternative 1E-3B, Section 5.1.5.2.4). Because the allocations would be based in part on the regional biomass distribution from the stock assessment, they would be adjusted through the specifications process each time a new assessment indicates a change to the biomass distribution.

The preferred alternatives would also add the state allocations to the Council's FMP (alternative 2B, Section 5.2.2), would make no changes to the current requirements for paybacks of state quota overages (alternative 2B-1, Section 5.2.2.1), and would modify the federal in-season closure regulations such that a closure would occur when the coastwide quota plus a buffer of up to 5% is projected to be landed (alternative 3B, Section 5.3.2).

*Potential Adverse Effects of the Action on EFH*

As previously stated, the commercial black sea bass fisheries predominantly use bottom otter trawl and pot/trap gear. The types of habitat impacts caused by these gears are summarized in Section 6.3.3.

Under the preferred alternatives, fishing effort for black sea bass will continue to be driven by the coastwide quota. The preferred alternatives for the state allocations would change how the coastwide quota is allocated among states. This may impact the distribution of landings among states; however, notable impacts on total fishing effort are not expected, including the locations of fishing effort and the gear types used (Section 7.3.1). The preferred alternative for paybacks of state quotas would make no change to current practice under the Commission process and are therefore not expected to result in a change to the impacts on habitat (Section 7.3.2). The preferred alternative for federal in-season closures would only impact fishing effort in years when an in-season closure is implemented. As described in more detail in Section 7.3.3, this is expected to be a rare occurrence and is expected to have a minor impact on total fishing effort in the years when a closure is implemented.

The preferred alternatives are not expected to meaningfully change the locations of fishing effort, the amount of gear in the water, or the duration of time that gear is in the water. Increased negative impacts on habitat beyond historical levels are not expected. The habitats that are impacted by the black sea bass fisheries have been impacted by many fisheries over many years. The levels of fishing effort expected under the preferred alternatives are not expected to cause additional habitat damage beyond that generated by these fisheries in the past and by other fisheries that operate in the same areas. Thus, the proposed action is expected to have slight negative impacts on habitat and EFH.

*Proposed Measures to Avoid, Minimize, or Mitigate Adverse Impacts of This Action*

Amendment 13 considered measures in the Summer Flounder, Scup, and Black Sea Bass FMP which impact EFH (MAFMC 2002). The analysis in Amendment 13 indicated that no management measures were needed to minimize impacts to EFH because the trawl fisheries for summer flounder, scup, and black sea bass in federal waters are conducted primarily in high energy mobile sand habitat where gear impacts are minimal and/or temporary in nature. Hook and line are the principal gears used in the recreational fishery for all three species. These gears have minimal adverse impacts on EFH in the region (Stevenson et al. 2004). These characteristics of the fisheries have not changed since Amendment 13. None of the alternatives included in this document were designed to avoid, minimize, or mitigate adverse impacts on EFH.

Section 6.3.3 lists examples of management measures previously implemented by the Council with the intent of minimizing the impacts of various fisheries on habitat. None of these measures substantially restrict the summer flounder, scup, or black sea bass fisheries.

*Conclusions*

Overall, the preferred alternatives are expected to have slight negative impacts on EFH; therefore, an EFH consultation is required.

## 8.2 Endangered Species Act

Section 7 of the ESA requires federal agencies conducting, authorizing, or funding activities that affect threatened or endangered species to ensure that those effects do not jeopardize the continued existence of listed species.

Pursuant to section 7 of the ESA, NMFS issued a Biological Opinion (Opinion) on May 27, 2021, that considered the effects of the NMFS' authorization of ten FMPs, NMFS' North Atlantic Right Whale Conservation Framework, and the NEFMC's Omnibus Essential Fish Habitat Amendment 2, on ESA-listed species and designated critical habitat. The ten FMPs considered in the Opinion include the: (1) American Lobster; (2) Atlantic Bluefish; (3) Atlantic Deep-Sea Red Crab; (4) Mackerel/Squid/Butterfish; (5) Monkfish; (6) Northeast Multispecies; (7) Northeast Skate Complex; (8) Spiny Dogfish; (9) Summer Flounder/Scup/Black Sea Bass; and (10) Jonah Crab FMPs. The American Lobster and Jonah Crab FMPs are permitted and operated through implementing regulations compatible with the interstate fishery management plans (ISFMP) issued under the authority of the Atlantic Coastal Fisheries Cooperative Management Act (ACA), the other eight FMPs are issued under the authority of the MSA.

The 2021 Opinion determined that the NMFS' authorization of ten FMPs, NMFS' North Atlantic Right Whale Conservation Framework, and the New England Fishery Management Council's Omnibus Essential Fish Habitat Amendment 2: (1) may adversely affect, but is not likely to jeopardize, the continued existence of North Atlantic right, fin, sei, or sperm whales; the Northwest Atlantic Ocean DPS of loggerhead, leatherback, Kemp's ridley, or North Atlantic DPS of green sea turtles; any of the five DPSs of Atlantic sturgeon; Gulf of Maine DPS Atlantic salmon; or giant manta rays; and (2) is not likely to adversely affect designated critical habitat for North Atlantic right whales, the Northwest Atlantic Ocean DPS of loggerhead sea turtles, U.S. DPS of smalltooth sawfish, Johnson's seagrass, or elkhorn and staghorn corals. An Incidental Take Statement (ITS) was issued in the Opinion. The ITS includes reasonable and prudent measures and their implementing terms and conditions, which NMFS determined are necessary or appropriate to minimize impacts of the incidental take in the fisheries assessed in this Opinion.

NMFS has recently received information that the estimated incidental bycatch rate of Atlantic sturgeon in gillnet gear through 2021 may be higher than what was expected and authorized in the Opinion. NMFS is reviewing this information in order to fully understand the implications on Atlantic sturgeon and is considering if reinitiation of consultation is required. However, as provided in the analyses above, the proposed action does not entail making any changes to the black sea bass fishery that would cause an increase in interactions with or effects to ESA-listed species or their critical habitat. Further, gillnet gear is not used to target black sea bass. Given this, new or elevated interaction risks with listed species are not expected to occur under the proposed action, and therefore, we do not expect the proposed action to jeopardize the continued existence of any ESA-listed species or adversely modify their designated critical habitat.

Given the information provided above, it has been determined that the proposed action is within the scope of the Summer Flounder/Scup/Black Sea Bass FMP considered in the 2021 Opinion and will not create impacts to ESA-listed species or critical habitat that go above and beyond those considered in the 2021 Opinion completed by NMFS.

## 8.3 Marine Mammal Protection Act

Section 6.4 lists and describes the marine mammal species which inhabit the affected environment of this action. As described in section 6.4, various marine mammal species have the potential to interact with the gear types used in the commercial black sea bass fisheries (predominately bottom trawl and pots/traps). The impacts of the proposed measures on marine mammals (Section 7.4) are consistent with the provisions of the MMPA. The preferred alternatives would not alter existing measures to protect marine mammals.

A final determination of consistency with the MMPA will be made by NMFS during rulemaking for this action.

## 8.4 Coastal Zone Management Act

The Coastal Zone Management Act of 1972, as amended, provides measures for ensuring productive fishery habitat while striving to balance development pressures with social, economic, cultural, and other impacts on the coastal zone. The Council will submit this document to NMFS. NMFS will determine whether the proposed actions are consistent to the maximum extent practicable with the coastal zone management programs for each state (Maine through North Carolina).

## 8.5 Administrative Procedure Act

Sections 551-553 of the Federal Administrative Procedure Act establish procedural requirements applicable to informal rulemaking by federal agencies. The purpose of these requirements is to ensure public access to the Federal rulemaking process and to give the public notice and opportunity to comment before the agency promulgates new regulations.

The Administrative Procedure Act requires solicitation and review of public comments on actions taken in development of an FMP and subsequent amendments and framework adjustments. There were many opportunities for public review, input, and access to the rulemaking process during the development of the proposed management measures described in this document, and during development of this document. This action was developed through a multi-stage process that was open to review by affected members of the public. The public had the opportunity to review and comment on development of the preferred alternatives during the following meetings:

- August 8, 2018 Board meeting in Arlington, VA.
- February 5, 2019 Board meeting in Arlington, VA.
- March 7, 2019 joint Council and Board meeting in Virginia Beach, VA.
- April 2, 2019 joint Advisory Panel meeting via webinar.
- May 1, 2019 Board meeting in Arlington, VA.
- August 7, 2019 Board meeting in Arlington, VA.
- August 14, 2019 Council meeting in Philadelphia, PA.
- October 9, 2019 joint Council and Board meeting in Durham, NC.
- December 11, 2019 joint Council and Board meeting in Annapolis, MD.
- February 13, 2020 Council meeting in Duck, NC.
- April 7, 2020 Council meeting via webinar.
- May 11 and 14, 2020 scoping hearings via webinar.
- June 16, 2020 Council and Board meeting via webinar.
- August 6, 2020 joint Council and Board meeting via webinar.
- October 8, 13, 14, 15, 27, 28, and 29, 2020 public hearings via webinar.
- November 19, 2020 joint Advisory Panel meeting via webinar.
- December 16, 2020 joint Council and Board meeting via webinar.
- February 1, 2021 joint Council and Board meeting via webinar.
- May 6, 2021 Commission Interstate Fishery Management Program Policy Board meeting via webinar.
- June 10, 2021 Council meeting via webinar.
- August 4, 2021 joint Council and Board meeting via webinar.

The public will have further opportunity to comment on this document and the proposed management measures once NMFS publishes a request for comments notice in the Federal Register.

## 8.6 Section 515 (Data Quality Act)

### *Utility of Information Product*

This document includes a description of the alternatives considered, the preferred actions and rationale for selection, and any changes to the implementing regulations of the FMP. As such, this document enables the implementing agency (NMFS) to make a decision on implementation of the changes proposed through this document serves as a supporting document for the proposed rule.

The preferred alternatives were developed consistent with the FMP, MSA, and other applicable laws. They were developed through a multi-stage process that was open to review by affected members of the public. The public had the opportunity to review and comment on management measures during a number of public meetings (Section 8.6). The public will have further opportunity to comment on this action once NMFS publishes a request for comments notice in the Federal Register.

***Integrity of Information Product***

This information product meets the standards for integrity under the following types of documents: Other/Discussion (e.g. Confidentiality of Statistics of the MSA; NOAA Administrative Order 216-100, Protection of Confidential Fisheries Statistics; 50 CFR 229.11, Confidentiality of information collected under the Marine Mammal Protection Act).

***Objectivity of Information Product***

The category of information product that applies here is “Natural Resource Plans.” Section 8 describes how this document was developed to be consistent with any applicable laws, including the MSA. The analyses used to develop the alternatives (i.e., policy choices) are based upon the best scientific information available. The most up to date information was used to develop this EA which evaluates the impacts of those alternatives (section 7). The specialists who worked with these core data sets and population assessment models are familiar with the most recent analytical techniques and are familiar with the available data and information relevant to the black sea bass fisheries.

The review process for this specifications document involves Council, NEFSC, GARFO, and NMFS headquarters. The NEFSC technical review is conducted by senior level scientists with specialties in fisheries ecology, population dynamics, biology, economics, and social anthropology. The Council review process involves public meetings at which affected stakeholders can comment on proposed management measures. Review by GARFO is conducted by those with expertise in fisheries management and policy, habitat conservation, protected resources, and applicable laws. Final approval of this document and clearance of the rule is conducted by staff at NMFS Headquarters, the Department of Commerce, and the U.S. Office of Management and Budget.

## 8.7 Paperwork Reduction Act

The Paperwork Reduction Act concerns the collection of information. The intent of the Paperwork Reduction Act is to minimize the federal paperwork burden for individuals, small businesses, state and local governments, and other persons, as well as to maximize the usefulness of information collected by the federal government. There are no changes to the existing reporting requirements previously approved under this FMP for vessel permits, dealer reporting, or vessel logbooks. This action does not contain a collection-of-information requirement for purposes of the Paperwork Reduction Act.

## 8.8 Federalism/Executive Order 13132

Executive Order 13131 established nine fundamental federalism principles for federal agencies to follow when developing and implementing actions with federalism implications. It also lists a series of policy making criteria to which federal agencies must adhere when formulating and implementing policies that have federalism implications. This document does not contain policies with federalism implications sufficient to warrant preparation of a federalism assessment under Executive Order 13132. The affected states have been closely involved in the development of the proposed fishery specifications through their representation on the Council and/or the Commission.

## 8.9 Executive Order 12898 (Environmental Justice)

Executive Order 12898 (Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations) provides guidelines to ensure that potential impacts on these populations are identified and mitigated, and that these populations can participate effectively in the NEPA process. NOAA guidance NAO 216-6A, Companion Manual, Section 10(A) requires the consideration of Executive Order 12898 in NEPA documents. Agencies should also encourage public participation, especially by affected communities, during scoping, as part of a broader strategy to address environmental justice issues. Minority and low-income individuals or populations must not be excluded from participation in, denied the benefits of, or subjected to discrimination because of their race, color, or national origin.

Although the impacts of this action may affect communities with environmental justice concerns, the proposed actions should not have disproportionately high effects on low income or minority populations. The proposed actions would apply to all participants in the affected area, regardless of minority status or income level. There is insufficient demographic data on participants in the black sea bass fisheries (e.g., vessel owners, crew, dealers, processors, employees of supporting industries) to quantify the income and minority status of potentially affected fishery participants. However, it is qualitatively known that people of racial or ethnic minorities constitute a substantial portion of the employees in the seafood processing sector. Without more data, it is difficult to fully determine how this action may impact various population segments. The public comment process is an opportunity to identify issues that may be related to environmental justice, but none have been raised relative to this action. The public has never requested translations of documents pertinent to the black sea bass fisheries.

Table 17 shows counties with ports with the highest commercial black sea bass landings in recent years. For these counties, county level minority rates are similar to or below the state averages with the exception of Hampton, VA, Newport News, VA, and Norfolk, VA (which are independent cities as opposed to counties). Poverty rates are below or within 5% of state averages for most counties with the exception of Accomack County, VA and the cities of Newport News and Norfolk, VA (Table 17).

The NOAA Fisheries Community Social Vulnerability Indices [38] can help identify the communities where environmental justice may be of concern. Vulnerability indices include labor force structure, housing characteristics, poverty, population composition, and personal disruption. Gentrification pressure is also measured through indices for housing disruption, urban

[38] Available at https://www.fisheries.noaa.gov/national/socioeconomics/social-indicators-coastal-communities

sprawl, and retiree migration. Ocean City, MD; Point Judith, RI; New Bedford, MA; Newport News, VA; Beaufort, NC; Cape May, NJ; Montauk, NY; and Chincoteague, VA each had at least 100,000 pounds of commercial black sea bass landings and also ranked high or medium high on at least one of these vulnerability indices in 2019, the most recent year for which the indices are available.

Federal agencies are required to collect, maintain, and analyze information on the consumption patterns of populations who principally rely on fish and (or) wildlife for subsistence. GARFO tracks these issues, but there are no federally recognized tribal agreements for subsistence fishing in Mid-Atlantic or New England federal waters.

Table 16. Demographic data (minority rate and poverty rate) for black sea bass commercial fishing communities (counties).

| State | County | Minority Rate[a] | Poverty Rate |
|---|---|---|---|
| *Massachusetts*<br>Minority rate: 28.9%<br>Poverty rate: 9.4% | Bristol | 18.2% | 10.1% |
| *Rhode Island*<br>Minority rate: 28.6%<br>Poverty rate: 10.6% | Washington | 9.2% | 7.8% |
| *New York*<br>Minority rate: 44.7%<br>Poverty rate: 12.7% | Suffolk | 33.4% | 6.1% |
| *New Jersey*<br>Minority rate: 45.4%<br>Poverty rate: 9.4% | Cape May | 15.0% | 9.6% |
| | Ocean | 15.7% | 10.5% |
| *Delaware*<br>Minority rate: 38.3%<br>Poverty rate: 10.9% | Sussex | 24.6% | 11.0% |
| *Maryland*<br>Minority rate: 50.0%<br>Poverty rate: 9.0% | Worcester | 20.0% | 11.7% |
| *Virginia*<br>Minority rate: 38.8%<br>Poverty rate: 9.2% | Accomack | 40.1% | 17.6% |
| | Hampton[b] | 62.6% | 13.4% |
| | Newport News[b] | 57.7% | 14.5% |
| | Norfolk[b] | 56.8% | 17.6% |
| *North Carolina*<br>Minority rate: 37.4%<br>Poverty rate: 12.9% | Carteret | 13.5% | 9.3% |

Source: U.S. Census Bureau, 2021: https://www.census.gov/quickfacts/fact/table/US/PST045221
[a] Persons other than those who report as "White alone, not Hispanic or Latino."
[b] Hampton, VA, Newport News, and Norfolk, VA are independent cities without an associated county.

## 8.10 Regulatory Flexibility Act

The Regulatory Flexibility Act, enacted in 1980 and codified at 5 U.S.C. 600-611, was designed to place the burden on the government to review all new regulations to ensure that, while accomplishing their intended purposes, they do not unduly inhibit the ability of small entities to compete. The Regulatory Flexibility Act recognizes that the size of a business, unit of government, or nonprofit organization can have a bearing on its ability to comply with federal regulations. Major goals of the Regulatory Flexibility Act are to: 1) increase agency awareness and understanding of the impact of their regulations on small business; 2) require that agencies communicate and explain their findings to the public; and 3) encourage agencies to use flexibility and to provide regulatory relief to small entities.

The Regulatory Flexibility Act emphasizes predicting significant adverse impacts on small entities as a group distinct from other entities, as well as consideration of alternatives that may minimize negative impacts to small entities, while still achieving the objective of the action (Section 8.10.4). When an agency publishes a proposed rule, it must either, (1) certify that the action will not have a significant adverse impact on a substantial number of small entities, and support such a certification with a factual basis demonstrating this outcome, or (2) if such a certification cannot be supported by a factual basis, prepare and make available for public review an Initial Regulatory Flexibility Analysis that describes the impact of the proposed rule on small entities.

The sections below provide supporting analysis to assess whether the proposed regulations will have a "significant impact on a substantial number of small entities."

### 8.10.1 Basis and Purpose of the Rule and Summary of Preferred Alternatives

This action is taken under the authority of the MSA and regulations at 50 CFR part 648. Section 4.1 includes the NEPA purpose and need for this action. As described in more detail in section 5, the preferred alternatives would modify the state allocation percentages using the following steps:

1) Connecticut's baseline allocation would increase from 1% to 3% of the coastwide quota (alternative 1B-2) and New York's baseline allocation would increase from 7% to 8% (alternative 1B-5; Section 5.1.2.1.1).
2) The state allocations would then be calculated by allocating 75% of the coastwide quota according to the new baseline allocations (see above) and 25% to three regions based on the most recent regional biomass distribution information from the stock assessment (alternatives 1E-1B and 1E-2B, Section 5.1.5.1).
3) The three regions would be: Maine-New York, New Jersey, and Delaware-North Carolina (alternative 1F-2, Section 5.1.7.2). The regional allocations would be distributed among states within a region in proportion to their baseline allocations, except Maine and New Hampshire would each receive 1% of the northern region quota (alternative 1E-3B, Section 5.1.5.2.4). Because the allocations would be based in part on the regional biomass distribution from the stock assessment, they would be adjusted through the specifications process each time a new assessment indicates a change to the biomass distribution.

The preferred alternatives would also add the state allocations to the Council's FMP (alternative 2B, Section 5.2.2), would make no changes to the current requirements for paybacks of state quota overages (alternative 2B-1, Section 5.2.2.1), and would modify the federal in-season closure regulations such that a closure would occur when the coastwide quota plus a buffer of up to 5% is projected to be landed (alternative 3B, Section 5.3.2).

Additional non-preferred alternatives were also considered. All alternatives are described in detail in section 5. For the purposes of the Regulatory Flexibility Act, only the preferred alternatives and those non-preferred alternatives which would minimize negative impacts to small businesses are considered (Section 8.10.4).

### 8.10.2 Description and Number of Entities to Which the Rule Applies

The entities (i.e., the small and large businesses) that may be affected/regulated by this action include fishing operations with federal moratorium (commercial) black sea bass permits. Fishermen who are only permitted to fish in state waters and do not have a federal moratorium permit will also be impacted by this action; however, they are not considered in this section.

Vessel ownership data[39] were used to identify all individuals who own fishing vessels. Vessels were then grouped according to common owners. The resulting groupings were then treated as entities, or affiliates, for purposes of identifying small and large businesses which may be regulated by this action. A total of **421 affiliates** were identified as being potentially impacted by this vessel due to possession of a federal black sea bass moratorium permit.

For Regulatory Flexibility Act purposes only, NMFS established a small business size standard for businesses, including their affiliates, whose primary industry is fishing (50 CFR §200.2). A business primarily engaged in fishing is classified as a small business if it is independently owned and operated, is not dominant in its field of operation (including its affiliates), and has combined annual receipts not in excess of $11 million for all its affiliated operations worldwide. Of the 421 potentially impacted affiliates, **412 (98%)** were classified as small businesses and **9 (2%)** were classified as large businesses based on their average revenues during 2019-2021.

### 8.10.3 Economic Impacts on Regulated Entities

The expected impacts of the proposed action were analyzed by employing quantitative approaches to the extent possible. Effects on profitability associated with the preferred alternatives should be evaluated by looking at the impact of the measures on individual business entities' costs and revenues. However, in the absence of cost data for the commercial black sea bass fishery, changes in gross revenues were used as a proxy for profitability. Where quantitative data were not available, qualitative considerations are included.

The 9 potentially impacted large businesses had average total annual revenues of around $8.35 million and $54,290 on average in annual revenues from black sea bass during 2019-2021. On average, black sea bass accounted for 0.65% of total revenues for these 9 large businesses.

The 412 potentially impacted small businesses had average total annual revenues of $684,390 and $16,572 on average in annual revenues from commercial black sea bass landings during 2019-2021. On average, black sea bass accounted for 2% of the total revenues for each of these small businesses during 2019-2021 (Table 17).

As shown in Table 17, the smaller of the small business affiliates had, on average, a higher dependence on black sea bass revenues than those with higher average annual total revenues. Therefore, these smaller of the small businesses may feel the positive and/or negative impacts of this action to a greater extent than the larger small businesses.

Some individual businesses had a much higher dependence on black sea bass than the averages listed above. For example, 34 of the 412 small businesses (8%) received at least 50% of their average total annual revenues from black sea bass landings during 2019-2021. The affiliates with a higher dependence on black sea bass will experience both the positive and negative effects of this action to a greater extent than those with a lower dependence on this species.

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[39] Affiliate data for 2019-2021 were provided by the NMFS NEFSC Social Science Branch.

As previously described, this action will primarily impact the distribution of landings by state; it will have a much lesser impact on total landings and total revenues. Through ownership in one or more vessels, each of which may have permits to land in one or more states, some affiliates have a greater degree of flexibility in where they can land black sea bass than affiliates with permits to land only in one state. There is no central database of permit holders by state to allow for an examination of which vessels or affiliates hold permits in which states; therefore, the true degree of this type of flexibility among affiliates is unknown.

The preferred alternatives propose a process for changing the state allocations. They do not propose specific allocation percentages. The allocations would be based partially on biomass distribution and would be updated through the specifications process whenever new biomass distribution information is available. Therefore, they would not represent a permanent shift in allocation away from some states and towards other states.

The resulting allocations based on distribution of the stock in 2019 (NEFSC 2021a) are shown in Table 18. Table 18 illustrates that if future biomass distribution remains similar to 2019, no state would lose more than 4.12% of the annual coastwide quota and no state would gain more than 2.79%. Massachusetts through New York would be expected to gain allocation while Maine, New Hampshire, and New Jersey through North Carolina would be expected to lose allocation. The degree of these increases and decreases vary by state. These changes may not be great enough to notably impact prices in each state. As previously stated, in past years there was not a strong relationship between average ex-vessel price for black sea bass and landings in Massachusetts through New York. On average, there was a negative relationship between landings and price in New Jersey through North Carolina (Section 6.1). Given that the preferred alternatives would not result in a major change in allocations, total revenues are likely to be driven mostly by the coastwide quota and other factors (see section 7.1).

The preferred alternatives are expected to have impacts that vary by state and community based on which states gain and lose allocation, and the degree of the change. Slight negative to moderate positive impacts are expected for both the small and large business affiliates identified above, depending on the state of landing, future biomass distribution, future quota levels, and other factors which influence revenues (e.g., availability of and other management measures for black sea bass and other landed species, market factors, weather).

Table 17: Average annual total revenues during 2019-2021 for the small business affiliates potentially impacted by the proposed action, as well as average annual revenues from commercial fishery landings of black sea bass.

| **Avg. annual total revenue** | **Count of affiliates** | **Avg. total annual revenues** | **Avg. annual revenues from black sea bass** | **Black sea bass revenues as proportion of gross revenues** |
|---|---|---|---|---|
| <0.5 | 271 | $117,593 | $9,008 | 8% |
| 0.5 to <1 | 46 | $739,607 | $21,893 | 3% |
| 1 to <2 | 53 | $1,500,203 | $27,042 | 2% |
| 2 to <5 | 39 | $2,950,545 | $45,429 | 2% |
| 5 to <11 | 3 | $7,165,580 | $58,133 | 1% |
| 11+ | 0 | -- | -- | -- |
| **All** | 412 | $684,390 | $16,572 | 2% |

Table 18: Revised state allocation percentages under the preferred alternatives and biomass distribution information from NEFSC 2021a.

| State | Allocations under Amendment 13 | New Allocations Using Most Recent Biomass Distribution* | Difference from Amendment 13 to New Allocations |
|---|---|---|---|
| **ME** | 0.50% | 0.40% | -0.10% |
| **NH** | 0.50% | 0.40% | -0.10% |
| **MA** | 13.00% | 15.44% | +2.44% |
| **RI** | 11.00% | 13.06% | +2.06% |
| **CT** | 1.00% | 3.67% | +2.67% |
| **NY** | 7.00% | 9.79% | +2.79% |
| **NJ** | 20.00% | 19.81% | -0.19% |
| **DE** | 5.00% | 4.09% | -0.91% |
| **MD** | 11.00% | 8.73% | -2.27% |
| **VA** | 20.00% | 15.88% | -4.12% |
| **NC** | 11.00% | 8.73% | -2.27% |
| **Total** | **100.00%** | **100.00%** | |

*These allocations are based on the results of the 2021 management track stock assessment and will be updated if future assessments indicate a change to the biomass distribution.

### 8.10.4 Analysis of Non-Preferred Alternatives

When considering the economic impacts of the alternatives under the Regulatory Flexibility Act, consideration should also be given to those non-preferred alternatives which would result in higher net benefits or lower costs to small entities while still achieving the stated objective of the action.

As described throughout this document, total commercial landings, and therefore associated revenues, will continue to be driven by the annual coastwide quota under all alternatives. The preferred alternatives for the state allocations would not implement specific allocations; rather, they would implement a process for defining allocations partially based on recent biomass distribution information. The allocations would be updated through the specifications process whenever new distribution information is available. As such, the preferred allocation alternatives would not represent a permanent shift in allocation away from some states and to other states. For all these reasons, it would not be appropriate to say that any of the non-preferred allocation alternatives will likely result in higher net benefits or lower costs to small entities compared to the preferred alternatives. The benefits and costs of the preferred allocation alternatives compared to the non-preferred alternatives will depend on future quota levels, future biomass distribution, and the many other factors which impact costs and revenues.

The non-preferred alternative for payback of state quota overages (alternative 2B-2) has the potential to result in more frequent paybacks than the preferred alternative (alternative 2B-1). The non-preferred alternatives for federal in-season closures have the potential for reduced commercial revenues in some years (alternative 3A) or will have an unknown impact (alternative 3C) compared to the preferred alternative for federal in-season closures (alternative 3B). For these reasons, none of the non-preferred alternatives are further considered here because none are expected to have higher net benefits or lower costs to small entities than the preferred alternatives.

## 8.11 Regulatory Impact Review

Executive Order 12866 requires a Regulatory Impact Review in order to enhance planning and coordination with respect to new and existing regulations. This Executive Order requires the Office of Management and Budget to review regulatory programs that are considered to be "significant."

Executive Order 12866 requires a review of proposed regulations to determine whether or not the expected effects would be significant. A significant regulatory action is one that may:

- Have an annual effect on the economy of $100 million or more,
- Adversely affect in a material way the economy, a sector of the economy, productivity, jobs, the environment, public health or safety, or State, local, or tribal governments or communities,
- Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency,
- Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof, or
- Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.

During 2011-2020, total annual ex-vessel values from black sea bass landings ranged from a high of $13.01 million in 2017 to a low of $6.38 million in 2011 (all values adjusted to 2020 based on the GDPDEF). As noted throughout this document, the preferred alternatives are not expected to have a major impact on commercial landings and revenues, which will continue to be driven by the annual coastwide quota. It is extremely unlikely that future quotas would have an annual impact on the economy of $100 million or more given the historical scale of the black sea bass fishery.

This action is consistent with previous actions by the Council, NMFS, and the Commission. There is no known conflict with other agencies. There are no known impacts on any entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof. There are no known conflicts with other legal mandates, the President's priorities, or the principles set forth in Executive Order 12866. The preferred alternatives are largely based on measures previously implemented for other Council managed species and are not precedent-setting or novel.

# 9 LITERATURE CITED


Angliss, R.P. and D. P. DeMaster. 1998. Differentiating Serious and Non-Serious Injury of Marine Mammals Taken Incidental to Commercial Fishing Operations: Report of the Serious Injury Workshop 2 April 1997, Silver Spring, Maryland. NOAA Technical Memorandum NMFS-OPR-13, January 1998.

ASMFC (Atlantic States Marine Fisheries Commission). 2007. Special report to the Atlantic Sturgeon Management Board: Estimation of Atlantic sturgeon bycatch in coastal Atlantic commercial fisheries of New England and the Mid-Atlantic. August 2007. 95 p.

ASMFC (Atlantic States Marine Fisheries Commission). 2017. 2017 Atlantic sturgeon benchmark stock assessment and peer review report. October 18, 2017. 456 pp.

ASSRT (Atlantic Sturgeon Status Review Team). 2007. Status review of Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*). Report to National Marine Fisheries Service, Northeast Regional Office. February 23, 2007. 174 p.

AWEA (American Wind Energy Association). 2020. U.S. Offshore Wind Power Economic Impact Assessment. https://supportoffshorewind.org/wp-content/uploads/sites/6/2020/03/AWEA_Offshore-Wind-Economic-ImpactsV3.pdf

Bailey, H., B. Senior, D. Simmons, J. Rusin, G. Picken, and P. M. Thompson. 2010. Assessing underwater noise levels during pile-driving at an offshore windfarm and its potential effects on marine mammals. *Marine Pollution Bulletin* 60: 888–897.

Bailey, H., K. L Brookes, and P. M. Thompson. 2014. Assessing environmental impacts of offshore wind farms: lessons learned and recommendations for the future. *Aquatic Biosystems* 10(8): 1-13.

Balazs, G.H. 1985. Impact of ocean debris on marine turtles: entanglement and ingestion. NOAA Technical Memorandum NMFS-SWFSC-54:387-429.

Baum, E.T. 1997. Maine Atlantic Salmon - A National Treasure. Atlantic Salmon Unlimited. Hermon, Maine.

Baumgartner, M.F., T.V.N. Cole, R.G. Campbell, G.J. Teegarden and E.G. Durbin. 2003. Associations between North Atlantic right whales and their prey, *Calanus finmarchicus*, over diel and tidal time scales. *Marine Ecological Progress Series*. 264: 155–166.

Baumgartner, M.F. and B.R. Mate. 2003. Summertime foraging ecology of North Atlantic right whales. *Marine Ecological Progress Series*. 264: 123–135.

Beanlands, G.E., and P. N. Duinker. 1984. Ecological framework adjustment for environmental impact assessment. *Journal of Environmental Management*. 8:3.

Bell, R. J., Richardson, D. E., Hare, J. A., Lynch, P. D., and Fratantoni, P. S. 2014. Disentangling the effects of climate, abundance, and size on the distribution of marine fish: an example based on four stocks from the Northeast US shelf. ICES Journal of Marine Science, doi: 10.1093/icesjms/fsu217

Bergström, L., L. Kautsky, T. Malm, R. Rosenberg, M. Wahlberg, N. Å. Capetillo, and D. Wilhelmsson. 2014. Effects of offshore wind farms on marine wildlife—a generalized impact assessment. *Environmental Research Letters* 9(3): 1-12.

Bergström, L., F. Sundqvist and U. Bergström (2013). Effects of an offshore wind farm on temporal and spatial patterns in the demersal fish community. *Marine Ecology Progress Series* 485: 199-210.

BOEM (Bureau of Ocean and Energy Management). 2020a. Vineyard Wind 1 Offshore Wind Energy Project Supplement to the Draft Environmental Impact Statement. Appendix A.

BOEM (Bureau of Ocean and Energy Management). 2020b. Oil and Gas Energy Fact Sheet. https://www.boem.gov/sites/default/files/documents/oil-gas-energy/BOEM_FactSheet-Oil%26amp%3BGas-2-26-2020.pdf.

Braun, J., and S.P. Epperly. 1996. Aerial surveys for sea turtles in southern Georgia waters, June 1991. *Gulf of Mexico Science*. 1996(1):39-44.

Braun-McNeill, J., and S.P. Epperly. 2002. Spatial and temporal distribution of sea turtles in the western North Atlantic and the U.S. Gulf of Mexico from Marine Recreational Fishery Statistics Survey (MRFSS). *Marine Fisheries Review*. 64(4):50-56.

Braun-McNeill, J., C.R. Sasso, S.P.Epperly, C. Rivero. 2008. Feasibility of using sea surface temperature imagery to mitigate cheloniid sea turtle–fishery interactions off the coast of northeastern USA. *Endangered Species Research*. 5: 257–266.

Brown, M.B., O.C. Nichols, M.K. Marx, and J.N. Ciano. 2002. Surveillance of North Atlantic right whales in Cape Cod Bay and adjacent waters. Final report to the Division of Marine Fisheries, Commonwealth of Massachusetts. September 2002. 29 p.

Caillouet, C.W., S.W. Raborn, D.J. Shaver, N.F. Putman, B.J. Gallaway, and K.L. Mansfield (2018). Did declining carrying capacity for the Kemp's ridley sea turtle population within the Gulf of Mexico contribute to the nesting setback in 2010-2017? Chelonian Concervation and Biology 17(1): 123-133.

Chavez-Rosales S, Lyssikatos MC, Hatch J. 2017. Estimates of cetacean and pinniped bycatch in Northeast and Mid-Atlantic bottom trawl fisheries, 2011-2015. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 17-16; 18 p. Available from: http://www.nefsc.noaa.gov/publications/.

Clapham, P.J., L.S. Baraff, C.A. Carlson, M.A. Christian, D.K. Mattila, C.A. Mayo, M.A. Murphy and S. Pittman. 1993. Seasonal occurrence and annual return of humpback whales, *Megaptera novaeangliae*, in the southern Gulf of Maine. *Canadian Journal of Zoology*. 71: 440-443.

Cole, T. V. N., P. Hamilton, A. G. Henry, P. Duley, R. M. Pace III, B. N. White, T. Frasier. 2013. Evidence of a North Atlantic right whale *Eubalaena glacialis* mating ground. *Endangered Species Research*. 21: 55–64.

Collins, M. R. and T. I. J. Smith. 1997. Distribution of shortnose and Atlantic sturgeons in South Carolina. *North American Journal of Fisheries Management*. 17: 995-1000.

Conant, T.A., P.H. Dutton, T. Eguchi, S.P. Epperly, C.C. Fahy, M.H. Godfrey, S.L. MacPherson, E.E. Possardt, B.A. Schroeder, J.A. Seminoff, M.L. Snover, C.M. Upite, and B.E. Witherington. 2009. Loggerhead sea turtle (*Caretta caretta*) 2009 status review under the U.S. Endangered Species Act. Report of the Loggerhead Biological Review Team to the National Marine Fisheries Service, August 2009. 222 p.

Dadswell, M. 2006. A review of the status of Atlantic sturgeon in Canada, with comparisons to populations in the United States and Europe. *Fisheries*. 31: 218-229.

Dadswell, M. J., B. D. Taubert, T. S. Squiers, D. Marchette, and J. Buckley. 1984. Synopsis of Biological Data on Shortnose Sturgeon, *Acipenser brevirostrum*, LeSuer 1818. NOAA Technical Report NMFS 14.

Dannheim, J., L. Bergström, S. N. R. Birchenough, R. Brzana, A. R. Boon, J. W. P. Coolen, J.-C. Dauvin, I. De Mesel, J. Derweduwen, A. B. Gill, Z. L. Hutchison, A. C. Jackson, U. Janas, G. Martin, A. Raoux, J. Reubens, L. Rostin, J. Vanaverbeke, T. A. Wilding, D. Wilhelmsson, S. Degraer and J. Norkko (2019). Benthic effects of offshore renewables: identification of knowledge gaps and urgently needed research. *ICES Journal of Marine Science.*

Degraer, S., R. Brabant, B. Rumes and L. Vigin (2019). Environmental Impacts of Offshore Wind Farms in the Belgian Part of the North Sea: Marking a Decade of Monitoring, Research, and Innovation. Memoirs on the Marine Environment, Royal Belgian Institute of Natural Sciences, OD Natural Environment, Marine Ecology and Management: 134.

Dodge, K.L., B. Galuardi, T. J. Miller, and M. E. Lutcavage. 2014. Leatherback turtle movements, dive behavior, and habitat characteristics in ecoregions of the northwest Atlantic Ocean. *PLOS ONE*. 9 (3) e91726: 1-17.

Dovel, W.L. and T.J. Berggren. 1983. Atlantic sturgeon of the Hudson River Estuary, New York. *New York Fish and Game Journal*. 30: 140-172.

Dunton, K.J., A. Jordaan, K.A. McKown, D.O. Conover, and M.J. Frisk. 2010. Abundance and distribution of Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) within the northwest Atlantic Ocean, determined from five fishery-independent surveys. *Fishery Bulletin*. 108:450-465.

Dunton, K.J., A. Jordaan, D. O. Conover, K.A. McKown, L. A. Bonacci, and M. G. Frisk. 2015. Marine Distribution and Habitat Use of Atlantic Sturgeon in New York Lead to Fisheries Interactions and Bycatch. Marine and Coastal Fisheries: Dynamics, Management, and Ecosystem Science 7:18–32.

Drohan, A.F., J. P. Manderson, D. B. Packer. 2007. Essential fish habitat source document: black sea bass, *Centropristis striata*, life history and habitat characteristics, 2nd edition. NOAA Technical Memorandum NMFS NE 200; 68 p.

Eckert, S.A., D. Bagley, S. Kubis, L. Ehrhart, C. Johnson, K. Stewart, and D. DeFreese. 2006. Internesting and postnesting movements of foraging habitats of leatherback sea turtles (*Dermochelys coriacea*) nesting in Florida. *Chelonian Conservation and Biology*. 5(2): 239-248.

Ellison, W.T., B.L. Southall, C.W. Clark, and A.S. Frankel. 2011. A new context-based approach to assess marine mammal behavioral responses to anthropogenic sounds. *Conservation Biology* 26: 21-28.

Ellison, W.T., B. L. Southall, A. S. Frankel, K. Vigness-Raposa, and C. W. Clark. 2018. Short Note: An Acoustic Scene Perspective on Spatial, Temporal, and Spectral Aspects of Marine Mammal Behavioral Responses to Noise. *Aquatic Mammals* 44(3): 239-243.

Eno, N.C., D.S MacDonald, J.A.M. Kinnear, S.C Amos, C.J. Chapman, R.A Clark, F.P.D Bunker, Munro, C. 2001. Effects of crustacean traps on benthic fauna. *ICES Journal of Marine Science*. 58:11-20.

Epperly, S.P., J. Braun, and A.J. Chester. 1995a. Aerial surveys for sea turtles in North Carolina inshore waters. *Fishery Bulletin*. 93: 254-261.

Epperly, S.P., J. Braun, A.J. Chester, F.A. Cross, J.V. Merriner, and P.A. Tester. 1995b.Winter distribution of sea turtles in the vicinity of Cape Hatteras and their interactions with the summer flounder trawl fishery. *Bulletin of Marine Science*. 56(2): 547-568.

Erickson, D. L., A. Kahnle, M. J. Millard, E. A. Mora, M. Bryja, A. Higgs, J. Mohler, M. DuFour, G. Kenney, J. Sweka, and E. K. Pikitch. 2011. Use of pop-up satellite archival tags to identify oceanic-migratory patterns for adult Atlantic Sturgeon, *Acipenser oxyrinchus oxyrinchus* Mitchell, 1815. *Journal of Applied Ichthyology*. 27: 356–365.

Fay, C., M. Bartron, S. Craig, A. Hecht, J. Pruden, R. Saunders, T. Sheehan, and J. Trial. 2006. Status review for anadromous Atlantic salmon (*Salmo salar*) in the United States. Report to the National Marine Fisheries Service and U.S. Fish and Wildlife Service. 294 pages.

Finneran, J. J. 2015. Noise-induced hearing loss in marine mammals: a review of temporary threshold shift studies from 1996 to 2015. *J. Acoust. Soc. Am.* 138, 1702–1726. doi: 10.1121/1.4927418

Finneran, J.J. 2016. Auditory Weighting Functions and TTS/PTS Exposure Functions for Marine Mammals Exposed to Underwater Noise, Technical Report 3026, December 2016. San Diego: Systems Center Pacific.

Forney, K.A., B. L. Southall, E. Slooten, S. Dawson, A. J. Read, R. W. Baird, and R. L. Brownell Jr. 2017. Nowhere to go: noise impact assessments for marine mammal populations with high site fidelity. *Endang. Species. Res.* 32: 391–413

Gaichas, S., J. Hare, M. Pinsky, G. DePiper, O. Jensen, T. Lederhouse, J. Link, D. Lipton, R. Seagraves, J. Manderson, and M. Clark. 2015. Climate change and variability: a white paper to inform the Mid-Atlantic Fishery Management Council on the impact of climate change on fishery science and management. Second draft. Available at: http://www.mafmc.org/eafm/

Greene, J.K., M.G. Anderson, J. Odell, and N. Steinberg, eds. 2010. The Northwest Atlantic Marine Ecoregional Assessment: Species, Habitats and Ecosystems. Phase One. The Nature Conservancy, Eastern U.S. Division, Boston, MA. Available at: www.conservationgateway.org

Griffin, D.B., S. R. Murphy, M. G. Frick, A. C. Broderick, J. W. Coker, M. S. Coyne, M. G. Dodd, M. H. Godfrey, B. J. Godley, L. A. Hawkes, T. M. Murphy, K. L. Williams, and M. J. Witt. 2013. Foraging habitats and migration corridors utilized by a recovering subpopulation of adult female loggerhead sea turtles: implications for conservation. *Marine Biology.* 160: 3071–3086.

Hare, J.A., W.E. Morrison, M.W. Nelson, M.M. Stachura, E.J. Teeters, R.B. Griffis, et al. 2016. A Vulnerability Assessment of Fish and Invertebrates to Climate Change on the Northeast U.S. Continental Shelf. PLoS ONE 11(2). Available at: http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0146756.

Hartley, D., A. Whittingham, J. Kenney, T. Cole, and E. Pomfret. 2003. Large Whale Entanglement Report 2001. Report to the National Marine Fisheries Service, updated February 2003.

Hawkes, L.A., A.C. Broderick, M.S. Coyne, M.H. Godfrey, L.-F. Lopez-Jurado, P. Lopez Suarez, S.E. Merino, N. Varo-Cruz, and B.J. Godley. 2006. Phenotypically linked dichotomy in sea turtle foraging requires multiple conservation approaches. *Current Biology*. 16: 990-995.

Hawkes, L.A., M.J. Witt, A.C. Broderick, J.W. Coker, M.S. Coyne, M. Dodd, M.G. Frick, M.H. Godfrey, D.B. Griffin, S.R. Murphy, T.M. Murphy, K.L. Williams, and B.J. Godley. 2011. Home on the range: spatial ecology of loggerhead turtles in Atlantic waters of the USA. *Diversity and Distributions*. 17: 624–640.

Hayes, S.A., E. Josephson , K. Maze-Foley , and P. E. Rosel. 2017. U.S. Atlantic and Gulf of Mexico marine mammal stock assessments 2016. NOAA Technical Memorandum NMFS-NE-241.

Hayes, S.A, E. Josephson, K. Maze-Foley, and P. Rosel. 2018. US Atlantic and Gulf of Mexico Marine Mammal Stock Assessment-2017. NOAA Technical Memorandum NMFS-NE-245.

Hayes, S.A., E. Josephson, K. Maze-Foley, and P. E. Rosel. 2019. US Atlantic and Gulf of Mexico Marine Mammal Stock Assessments – 2018. NOAA Technical Memorandum NMFS-NE-258.

Henry, A.G., T.V.N. Cole, L. Hall, W. Ledwell, D. Morin, and A. Reid. 2016. Serious injury and mortality and determinations for baleen whale stocks along the Gulf of Mexico, United States east coast and Atlantic Canadian provinces, 2010-2014. U.S. Dept Commer, Northeast Fish Sci Cent Ref Doc. 16-10; 51 p.

Henry, A.G., T.V.N. Cole, M. Garron, W. Ledwell, D. Morin, and A. Reid. 2017. Serious injury and mortality and determinations for baleen whale stocks along the Gulf of Mexico, United States east coast and Atlantic Canadian provinces, 2011-2015. U.S. Dept Commer, Northeast Fish Sci Cent Ref Doc. 17-19; 57 p.

Henry, A., M. Garron, A. Reid, D. Morin, W. Ledwell, and T.V.N. Cole. 2019. Serious injury and mortality and determinations for baleen whale stocks along the Gulf of Mexico, United States east coast and Atlantic Canadian provinces, 2012-2016. U.S. Dept Commer, Northeast Fish Sci Cent Ref Doc. 19-13; 54 p.

Heppell, S.S., D.T. Crouse, L.B. Crowder, S.P. Epperly, W. Gabriel, T. Henwood, R. Marquez, and N.B. Thompson (2005). A population model to estimate recovery time, population size, and management impacts on Kemp's ridley sea turtles. Chelonian Concervation and Biology 4(4): 767-773.

Hirth, H.F. 1997. Synopsis of the biological data of the green turtle, *Chelonia mydas* (Linnaeus 1758). USFWS Biological Report 97(1): 1-120.

Hutchison, Z.L., A.B. Gill, P. Sigray, H. He, and J.W. King. 2020. Anthropogenic Electromagnetic Fields (EMF) Influence the Behaviour of Bottom-Dwelling Marine Species. Scientific Reports 10 (1): 4219.

Hyvarinen, P., P. Suuronen and T. Laaksonen. 2006. Short-term movement of wild and reared Atlantic salmon smolts in brackish water estuary – preliminary study. *Fisheries Management and Ecology*. 13(6): 399 -401.

James, M.C., R.A. Myers, and C.A. Ottenmeyer. 2005. Behaviour of leatherback sea turtles, *Dermochelys coriacea*, during the migratory cycle. *Proceedings of the Royal Society B*. 272: 1547-1555.

James, M.C., S.A. Sherrill-Mix, K. Martin, and R. A. Myers. 2006. Canadian waters provide critical foraging habitat for leatherback sea turtles. *Biological Conservation*. 133: 347-357.

Johnson, A. J., G. S. Salvador, J. F. Kenney, J. Robbins, S. D. Kraus, S. C. Landry, and P. J. Clapham. 2005. Fishing gear involved in entanglements of right and humpback whales*, Marine Mammal Science* 21(4): 635-645.

Kenney, J., and D. Hartley. 2001. Draft large whale entanglement summary 1997-2001. Report to the National Marine Fisheries Service, updated October.

Kenney, R.D., M.A.M. Hyman, R.E. Owen, G.P. Scott and H.E. Winn. 1986. Estimation of prey densities required by western North Atlantic right whales. *Marine Mammal Science*. 2: 1–13.

Kenney, R.D., H.E. Winn and M.C. Macaulay 1995. Cetaceans in the Great South Channel, 1979-1989: right whale (*Eubalaena glacialis*). *Continental Shelf Research*. 15: 385–414.

Khan, C., T.V.N. Cole, P. Duley, A. Glass, M. Niemeyer, and C. Christman. 2009. North Atlantic Right Whale Sighting Survey (NARWSS) and Right Whale Sighting Advisory System (RWSAS) 2008 Results Summary. NEFSC Reference Document 09-05. 7 p.

Khan, C., T. Cole, P. Duley, A. Glass, and J. Gatzke. 2010. North Atlantic Right Whale Sighting Survey (NARWSS) and Right Whale Sighting Advisory System (RWSAS) 2009 Results Summary. NEFSC Reference Document 10-07. 7 p.

Khan, C., T. Cole, P. Duley, A. Glass, and J. Gatzke. 2011. North Atlantic Right Whale Sighting Survey (NARWSS) and Right Whale Sighting Advisory System (RWSAS) 2010 Results Summary. NEFSC Reference Document 11-05. 6 p.

Khan C., T. Cole, P. Duley, A. Glass, and J. Gatzke, J. Corkeron. 2012. North Atlantic Right Whale Sighting Survey (NARWSS) and Right Whale Sighting Advisory System (RWSAS) 2011 Results Summary. NEFSC Reference Document 12-09; 6 p.

Knowlton, A.R., P.K. Hamilton, M.K. Marx, H.M. Pettis, and S.D. Kraus. 2012. Monitoring North Atlantic right whale (*Eubalaena glacialis*) entanglement rates: a 30 yr retrospective. Marine Ecology Progress Series 466:293-302.

Kocik. J.F., S.E. Wigley, and D. Kircheis. 2014. Annual bycatch update Atlantic salmon 2013. U.S. Atlantic Salmon Assessment Committee Working Paper 2014:05. Old Lyme, CT. 6 p. (cited with permission of authors).

Kynard, B., M. Horgan, M. Kieffer, and D. Seibel. 2000. Habitat used by shortnose sturgeon in two Massachusetts rivers, with notes on estuarine Atlantic sturgeon: a hierarchical approach. *Transactions of the American Fisheries Society*. 129: 487-503.

Lacroix, G.L. and P. McCurdy. 1996. Migratory behavior of post-smolt Atlantic salmon during initial stages of seaward migration. *Journal of Fish Biology*. 49: 1086-1101.

Lacroix, G. L, P. McCurdy, and D. Knox. 2004. Migration of Atlantic salmon post smolts in relation to habitat use in a coastal system. *Transactions of the American Fisheries Society*. 133(6):1455-1471.

Lacroix, G.L. and D. Knox. 2005. Distribution of Atlantic salmon (*Salmo salar*) postsmolts of different origins in the Bay of Fundy and Gulf of Maine and evaluation of factors affecting migration, growth, and survival. *Canadian Journal of Fisheries and Aquatic Science*. 62: 1363–1376.

Laney, R.W., J.E. Hightower, B.R. Versak, M.F. Mangold, W.W. Cole Jr., and S.E. Winslow 2007. Distribution, habitat use, and size of Atlantic sturgeon captured during cooperative winter tagging cruises, 1988–2006. Pages 167-182. In: J. Munro, D. Hatin, J. E. Hightower, K. McKown, K. J. Sulak, A. W. Kahnle, and F. Caron, (editors), Anadromous sturgeons: Habitats, threats, and management. American Fisheries Society Symposium 56, Bethesda, MD.

Langhamer, O. (2012). Artificial Reef Effect in relation to Offshore Renewable Energy Conversion: State of the Art. *The Scientific World Journal*: 8.

Lucey, S. M. and J. A. Nye. 2010. Shifting species assemblages in the northeast US continental shelf large marine ecosystem. *Marine Ecology Progress Series*. 415: 23-33.

Lyssikatos, M.C. 2015. Estimates of cetacean and pinniped bycatch in Northeast and mid-Atlantic bottom trawl fisheries, 2008-2013. Northeast Fisheries Science Center Reference Document 15-19; 20 p.

Madsen, P.T., M. Wahlberg, J. Tougaard, K. Lucke, and P. Tyack. 2006. Wind turbine underwater noise and marine mammals: implications of current knowledge and data needs. *Mar. Ecol. Prog. Ser.* 309: 279–295.

MAFMC (Mid-Atlantic Fishery Management Council). 2002. Amendment 13 to the Summer Flounder, Scup, and Black Sea Bass Fishery Management Plan. 552 p. + append. Available at: http://www.mafmc.org/fisheries/fmp/sf-s-bsb

MAFMC (Mid-Atlantic Fishery Management Council). 2008. Amendment 9 to the Atlantic Mackerel, Squid, and Butterfish Fishery Management Plan. 461 p. Available at: http://www.mafmc.org/s/SMB_Amend_9_Vol_1.pdf.

MAFMC (Mid-Atlantic Fishery Management Council). 2019. Fishery Allocation Review Policy. Available at: https://www.mafmc.org/s/MAFMC-Fishery-Allocation-Review-Policy_2019-08.pdf

MAFMC (Mid-Atlantic Fishery Management Council). 2020a. 2020-2021 Scup and Black Sea Bass Specifications Environmental Assessment, Regulatory Impact Review, and Regulatory Flexibility Act Analysis. Available at: https://www.mafmc.org/supporting-documents.

MAFMC (Mid-Atlantic Fishery Management Council). 2020b. Summer Flounder, Scup, and Black Sea Bass Fishery Performance Report. Available at: https://www.mafmc.org/sf-s-bsb.

MAFMC (Mid-Atlantic Fishery Management Council). 2020c. Black Sea Bass Commercial State Allocation Amendment Public Hearing Document. Available at: https://www.mafmc.org/s/BSB_com_state_allocation_PHD.pdf.

Mansfield, K.L., V.S. Saba, J. Keinath, and J.A. Musick. 2009. Satellite telemetry reveals adichotomy in migration strategies among juvenile loggerhead sea turtles in the northwest Atlantic. *Marine Biology*. 156:2555-2570.

Mayo, C.A., and M.K. Marx. 1990. Surface foraging behaviour of the North Atlantic right whale, *Eubalaena glacialis*, and associated zooplankton characteristics. *Canadian Journal of Zoology*. 68: 2214–2220.

McClellan, C.M., and A.J. Read. 2007. Complexity and variation in loggerhead sea turtle life history. *Biology Letters.* 3:592-594

Methratta, E. and W. Dardick (2019). Meta-Analysis of Finfish Abundance at Offshore Wind Farms. *Reviews in Fisheries Science and Aquaculture* 27(2): 242-260.

Miller, T. and G. Shepard. 2011. Summary of discard estimates for Atlantic sturgeon. Northeast Fisheries Science Center, Population Dynamics Branch, August 2011.

Mitchell, G.H., R.D. Kenney, A.M. Farak, and R.J. Campbell. 2003. Evaluation of occurrence of endangered and threatened marine species in naval ship trial areas and transit lanes in the Gulf of Maine and offshore of Georges Bank. NUWC-NPT Technical Memo 02-121A. 113 p.

Morgan, L. E. and R. Chuenpagdee. 2003. Shifting gears: addressing the collateral impacts of fishing methods in U.S. Waters. Pew Science Series. Available at: http://www.pewtrusts.org/en/research-and-analysis/reports/2003/05/01/shifting-gears-addressing-the-collateral-impacts-of-fishing-methods-in-us-waters

Moore, M.J. and J. M. van der Hoop. 2012. The Painful Side of Trap and Fixed Net Fisheries: Chronic Entanglement of Large Whales. Journal of Marine Biology, Volume 2012, Article ID 230653, 4 pages

Morreale, S.J. and E.A. Standora. 2005. Western North Atlantic waters: Crucial developmental habitat for Kemp's ridley and loggerhead sea turtles. *Chelonian Conservation Biology*. 4(4):872-882.

Murphy, T.M., S.R. Murphy, D.B. Griffin, and C. P. Hope. 2006. Recent occurrence, spatial distribution and temporal variability of leatherback turtles (*Dermochelys coriacea*) in nearshore waters of South Carolina, USA. *Chelonian Conservation Biology*. 5(2): 216-224.

Murray, K.T., 2008. Estimated average annual bycatch of loggerhead sea turtles (*Caretta caretta*) in US Mid-Atlantic bottom otter trawl gear, 1996–2004, second ed. Northeast Fisheries Science Center Reference Document 08-20, p. 32. Available at: http://www.nefsc.noaa.gov/publications/crd/crd0820

Murray, K.T. 2013. Estimated loggerhead and unidentified hard-shelled turtle interactions in mid-Atlantic gillnet gear, 2007-2011. NOAA Technical Memorandum. NMFS-NM-225. 20 p. Available at: http://www.nefsc.noaa.gov/publications/tm/

Murray, K.T. 2015. The importance of location and operational fishing factors in estimating and reducing loggerhead turtle (*Caretta caretta*) interactions in U.S. bottom trawl gear. *Fisheries Research*. 172: 440–451.

NEFMC (New England Fishery Management Council). 2020. Northeast Skate Complex Fishery Management Plan Annual Monitoring Report for Fishing Year 2019. Available at: https://s3.amazonaws.com/nefmc.org/2020-Skate-Annual-Monitoring-Report_200921_100052.pdf.

NEFSC (Northeast Fisheries Science Center). 2017. 62nd Northeast Regional Stock Assessment Workshop (62nd SAW) Assessment Report. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 17-03; 822 p. Available from: National Marine Fisheries Service, 166 Water Street, Woods Hole, MA 02543-1026, or online at http://nefsc.noaa.gov/publications/.

NEFSC (Northeast Fisheries Science Center). 2018. Update on the Status of Spiny Dogfish in 2018 and Projected Harvests at the Fmsy Proxy and Pstar of 40%. Report to the Mid-Atlantic Scientific and Statistical Committee. 82 p. Available at: http://www.mafmc.org/s/2018-Status-Report-for-spiny-dogfish.pdf

NEFSC (Northeast Fisheries Science Center). 2019. Operational Assessment of the Black Sea Bass, Scup, Bluefish, and Monkfish Stocks, Updated Through 2018. Prepublication copy prepared for use by Fishery Management Council staff and SSC. 164 p. Available at: http://www.mafmc.org/s/Operational-Assessments-for-Black-Sea-Bass_Scup_Bluefish.pdf.

NEFSC (Northeast Fisheries Science Center). 2021a. Black Sea Bass Operational Assessment for 2021. Draft report for peer review and provided to the Mid-Atlantic Fishery Management Council's Scientific and Statistical Committee. Available at: https://www.mafmc.org/s/c_BSB_Management-Track-Assessment_2021.pdf. Additional information, including additional tables, figures, and analysis can be found in the presentation and other files available at: https://apps-nefsc.fisheries.noaa.gov/saw/sasi/sasi_report_options.php.

NEFSC (Northeast Fisheries Science Center). 2021b. Scup Management Track Assessment for 2021. Draft report for peer review and provided to the Mid-Atlantic Fishery Management Council's Scientific and Statistical Committee. Available at: https://www.mafmc.org/s/c_2021_scup_MTA_report.pdf.

Nelms, S. E., Piniak, W. E., Weir, C. R., and Godley, B. J. 2016. Seismic surveys and marine turtles: an underestimated global threat? *Biol. Conserv.* 193, 49–65. doi: 10.1016/j.biocon.2015.10.020

NMFS (National Marine Fisheries Service). 1991. Final recovery plan for the humpback whale (*Megaptera novaeangliae*). Prepared by the Humpback Whale Recovery Team for the National Marine Fisheries Service, Silver Spring, MD. 105 p.

NMFS (National Marine Fisheries Service). 2005. Revision- recovery plan for the North Atlantic right whale (*Eubalaena glacialis*). Prepared by the Office of Protected Resources National Marine Fisheries Service, Silver Spring, MD. 137 p.

NMFS (National Marine Fisheries Service). 2010. Final recovery plan for the fin whale (*Balaenoptera physalus*). Prepared by the Office of Protected Resources National Marine Fisheries Service, Silver Spring, MD. 121 p.

NMFS (National Marine Fisheries Service). 2011a. Final recovery plan for the sei whale (*Balaenoptera borealis*). Prepared by the Office of Protected Resources National Marine Fisheries Service, Silver Spring, MD. 108 p.

NMFS (National Marine Fisheries Service). 2011b. Bycatch Working Group Discussion Notes. NMFS Sturgeon Workshop, Alexandria, VA. February 11, 2011.

NMFS (National Marine Fisheries Service). 2013. Endangered Species Act Section 7 Consultation on the Continued Implementation of Management Measures for the Northeast Multispecies, Monkfish, Spiny Dogfish, Atlantic Bluefish, Northeast Skate Complex, Mackerel/Squid/Butterfish, and Summer Flounder/Scup/Black Sea Bass Fisheries. Available at:

http://www.greateratlantic.fisheries.noaa.gov/protected/section7/bo/actbiops/batchedfisheriesopinionfinal121613.pdf

NMFS (National Marine Fisheries Service). 2014a. NMFS-Greater Atlantic Region (GARFO) Memo to the record: Determination regarding reinitiation of Endangered Species Act section 7 consultation on 12 GARFO fisheries and two Northeast Fisheries Science Center funded fisheries research surveys due to critical habitat designation for loggerhead sea turtles. Memo issued September 17, 2014.

NMFS (National Marine Fisheries Service). 2014b. Final Environmental Impact Statement for Amending the Atlantic Large Whale Take Reduction Plan: Vertical Line Rule. National Marine Fisheries Service. May 2014.

NMFS (National Marine Fisheries Service). 2015a. Endangered Species Act Section 4(b)(2) Report: Critical Habitat for the North Atlantic Right Whale (*Eubalaena glacialis*). Prepared by National Marine Fisheries Service Greater Atlantic Regional Fisheries Office and Southeast Regional Office, December 2015. http://www.greateratlantic.fisheries.noaa.gov/regs/2016/January/16narwchsection4_b__2_report012616.pdf

NMFS (National Marine Fisheries Service). 2015b. North Atlantic Right Whale (*Eubalaena glacialis*). Source Document for the Critical Habitat Designation: A review of information pertaining to the definition of "critical habitat" Prepared by National Marine Fisheries Service Greater Atlantic Regional Fisheries Office and Southeast Regional Office, July 2015.

NMFS (National Marine Fisheries Service). 2021a. Endangered Species Act Section 7 Consultation on the: (a) Authorization of the American Lobster, Atlantic Bluefish, Atlantic, Deep-Sea Red Crab, Mackerel/Squid/Butterfish, Monkfish, Northeast Multispecies, Northeast Skate Complex, Spiny Dogfish, Summer Flounder/Scup/Black Sea Bass, and Jonah Crab Fisheries and (b) Implementation of the New England Fishery Management Council's Omnibus Essential Fish Habitat Amendment 2. National Marine Fisheries Service, Greater Atlantic Regional Fisheries Office, Gloucester, Massachusetts; May 2021.

NMFS (National Marine Fisheries Service). 2021b. Final Environmental Impact Statement, Regulatory Impact Review, and Final Regulatory Flexibility Analysis for Amending the Atlantic Large Whale Take Reduction Plan: Risk Reduction Rule. Prepared by: NOAA's National Marine Fisheries Service and Industrial Economics, Incorporated; June 2021. https://www.fisheries.noaa.gov/new-england-mid-atlantic/marine-mammal-protection/atlantic-large-whale-take-reduction-plan

NMFS and USFWS (National Marine Fisheries Service and U.S. Fish and Wildlife Service). 1991. Recovery plan for U.S. population of Atlantic green turtle (*Chelonia mydas*). National Marine Fisheries Service, Washington, D.C. 58 p.

NMFS and USFWS (National Marine Fisheries Service and U.S. Fish and Wildlife Service). 1992. Recovery plan for leatherback turtles (*Dermochelys coriacea*) in the U.S. Caribbean, Atlantic, and Gulf of Mexico. National Marine Fisheries Service, Washington, D.C. 65 p.

NMFS and USFWS (National Marine Fisheries Service and U.S. Fish and Wildlife Service). 1995. Status reviews for sea turtles listed under the Endangered Species Act of 1973. Silver Spring, Maryland: National Marine Fisheries Service. 139 p.

NMFS and USFWS (National Marine Fisheries Service and U.S. Fish and Wildlife Service). 1998a. Recovery Plan for U.S. Pacific Populations of the Leatherback Turtle (*Dermochelys coriacea*). Silver Spring, Maryland: National Marine Fisheries Service. 65 p.

NMFS and USFWS (National Marine Fisheries Service and U.S. Fish and Wildlife Service). 1998b. Recovery Plan for U.S. Pacific Populations of the Green Turtle (*Chelonia mydas*). Silver Spring, Maryland: National Marine Fisheries Service. 84 p.

NMFS and USFWS (National Marine Fisheries Service and U.S. Fish and Wildlife Service). 2005. Recovery plan for the Gulf of Maine distinct population segment of the Atlantic salmon (*Salmo salar*). National Marine Fisheries Service, Silver Spring, MD.

NMFS and USFWS (National Marine Fisheries Service and U.S. Fish and Wildlife Service). 2007a. Kemp's ridley sea turtle (*Lepidochelys kempii*) 5 year review: summary and evaluation. Silver Spring, Maryland: National Marine Fisheries Service. 50 p.

NMFS and USFWS (National Marine Fisheries Service and U.S. Fish and Wildlife Service). 2007b. Green sea turtle (*Chelonia mydas*) 5 year review: summary and evaluation. Silver Spring, Maryland: National Marine Fisheries Service. 102 p.

NMFS and USFWS (National Marine Fisheries Service and U.S. Fish and Wildlife Service). 2008. Recovery plan for the Northwest Atlantic population of the loggerhead turtle (*Caretta caretta*), Second revision. Washington, D.C.: National Marine Fisheries Service. 325 p.

NMFS and USFWS (National Marine Fisheries Service and U.S. Fish and Wildlife Service). 2013. Leatherback sea turtle (*Dermochelys coriacea*) 5 year review: summary and evaluation. Silver Spring, Maryland: National Marine Fisheries Service. 91 p.

NMFS and USFWS (National Marine Fisheries Service and U.S. Fish and Wildlife Service). 2015. Kemp's Ridley Sea Turtle (Lepidochelys kempii) 5-year Review: Summary and Evaluation. National Marine Fisheries Service and United States Fish and Wildlife Service, Silver Spring, Maryland.

NMFS and USFWS (National Marine Fisheries Service and U.S. Fish and Wildlife Service). 2016. Draft Recovery Plan for the Gulf of Maine Distinct Population Segment of Atlantic Salmon (*Salmo salar*).

NMFS, USFWS, and SEMARNAT. 2011. Bi-National Recovery Plan for the Kemp's Ridley Sea Turtle (*Lepidochelys kempii*), Second Revision. National Marine Fisheries Service. Silver Spring, MD. 156 p. + appendices.

NMFS NEFSC FSB (Northeast Fisheries Science Center, Fisheries Sampling Branch). 2019. Northeast Fisheries Observer Program: Incidental Take Reports. Omnibus data request + supplemental data for 2018.

NOAA (National Oceanic and Atmospheric Administration). 2008. High numbers of right whales seen in Gulf of Maine: NOAA researchers identify wintering ground and potential breeding ground. NOAA press release. December 31, 2008.

NOAA. 2016. Species in the Spotlight Priority Actions: 2016-2020 Atlantic Salmon (*Salmo salar*). Atlantic Salmon Five Year Action Plan.

NW Atlantic Leatherback Working Group (2018). Northwest Atlantic Leatherback Turtle (*Dermochelys coriacea*) Status Assessment (Bryan Wallace and Karen Eckert, Compilers and Editors). Conservation Science Partners and the Wider Caribbean Sea Turtle Conservation Network (WIDECAST). WIDECAST Technical Report No. 16. Godfrey, Illinois. 36 pp.

Nowacek, D. P., Thorne, L. H., Johnston, D. W., and Tyack, P. L. 2007. Responses of cetaceans to anthropogenic noise. *Mamm. Rev.* 37, 81–115. doi: 10.1111/j.1365-2907.2007.00104.x

Nowacek, D.P., C. W. Clark, D. Mann, P. JO. Miller, H. C. Rosenbaum, J. S. Golden, M. Jasny, J. Kraska, and B. L. Southall. 2015. Marine seismic surveys and ocean noise: time for coordinated and prudent planning. *Front. Ecol. Environ*. 13(7): 378–386. doi:10.1890/130286

NRC (National Research Council). 2000. *Marine Mammals and Low-Frequency Sound: Progress Since 1994*. Washington, DC: National Academies Press.

NRC (National Research Council). 2003. *Ocean Noise and Marine Mammals*. Washington, DC: National Academies Press.

NRC (National Research Council). 2005. *Marine Mammal Populations and Ocean Noise: Determining When Noise Causes Biologically Significant Effects*. Washington, DC: National Academies Press.

Nye, J. A., T. M. Joyce, Y.O. Kwon, and J.S. Link. 2011. Silver hake tracks changes in Northwest Atlantic circulation. *Nature Communications*. 2:412.

O'Leary, S.J., K. J. Dunton, T. L. King, M. G. Frisk, and D.D. Chapman. 2014. Genetic diversity and effective size of Atlantic sturgeon, *Acipenser oxyrhinchus oxyrhinchus*, river spawning populations estimated from the microsatellite genotypes of marine-captured juveniles. *Conservation Genetics*. 15(5):1173-1181.

Pace, R.M., Corkeron, P.J., Kraus, S.D. (2017). State–space mark–recapture estimates reveal a recent decline in abundance of North Atlantic right whales. Ecol. Evo. 1-12.

Payne, P.M., J.R. Nicholas, L. O'Brien and K.D. Powers. 1986. The distribution of the humpback whale, *Megaptera novaeangliae*, on Georges Bank and in the Gulf of Maine in relation to densities of the sand eel, *Ammodytes americanus*. *Fishery Bulletin.* 84: 271-277.

Payne, P.M., D.N. Wiley, S.B. Young, S. Pittman, P.J. Clapham, and J.W. Jossi. 1990. Recent fluctuations in the abundance of baleen whales in the southern Gulf of Maine in relation to changes in selected prey. *Fishery Bulletin.* 88: 687-696.

Pettis, H.M., Pace, R.M., Hamilton, P.K. (2018). North Atlantic Right Whale Consortium 2018 Annual Report Card. Report to the North Atlantic Right Whale Consortium. www.narwc.org.

Piniak, W. E. D. 2012. *Acoustic Ecology of Sea Turtles: Implications for Conservation*. Ph.D., Duke University.

Pinsky, M.L., B. Worm, M.J. Fogarty, J.L. Sarmiento, and S.A. Levin. 2013. Marine taxa track local climate velocities. *Science*. 341(6151): 1239-1242.

Popper, A., Hawkins, A., Fay, R., Mann, D., Bartol, S., Carlson, T., et al. 2014. Sound exposure guidelines for fishes and sea turtles: a technical report prepared by ANSI-accredited standards committee S3/SC1 and registered with ANSI. *ASA S3/SC1* 4.

Reddin, D.G. 1985. Atlantic salmon (*Salmo salar*) on and east of the Grand Bank. *Journal of Northwest Atlantic Fisheries Science*. 6(2):157-164.

Reddin, D.G and P.B. Short. 1991. Postsmolt Atlantic salmon (*Salmo salar*) in the Labrador Sea. *Canadian Journal of Fisheries and Aquatic Science*. 48:2-6.

Reddin, D.G and K.D. Friedland. 1993. Marine environmental factors influencing the movement and survival of Atlantic salmon. 4th Int. Atlantic Salmon Symposium. St. Andrews, N.B. Canada.

Richardson, W. J., Greene, C. R. Jr., Malme, C. I., and Thomson, D. H. 1995. *Marine Mammals and Noise*. San Diego, CA: Academic Press.

Robbins, J. 2009. Scar-based inference into the Gulf of Maine humpback whale entanglement: 2003-2006. Report to National Marine Fisheries Service, Northeast Fisheries Science Center, Woods Hole, MA. NOAA Contract #EA133F04SE0998.

Romano, T., Keogh, M., Kelly, C., Feng, P., Berk, L., Schlundt, C., et al. 2004. Anthropogenic sound and marine mammal health: measures of the nervous and immune systems before and after intense sound exposure. *Can. J. Fish. Aquat. Sci.* 61, 1124–1134. doi: 10.1139/f04-055

Schilling, M. R., I. Seipt, M. T. Weinrich, S. E. Frohock, A. E. Kuhlberg, and P. J. Clapham. 1992. Behavior of individually-identified sei whales *Balaenoptera borealis* during an episodic influx into the southern Gulf of Maine in 1986. *Fishery Bulletin*. 90:749–755.

Seminoff, J.A., C.D. Allen, G.H. Balazs, P.H. Dutton, T. Eguchi, H.L. Hass, S.A. Hargrove, M. Jensen, D.L. Klemm, A.M. Lauritsen, S.L. MacPherson, P. Opay, E.E. Possardt, S. Pultz, E. Seney, K.S. Van Houtan, and R.S. Waples. 2015. Status Review of the Green Turtle (*Chelonia mydas*) Under the Endangered Species Act. NOAA Technical Memorandum: NOAA-TM-NMFS-SWFSC-539. NMFS Southwest Fisheries Science Center, March 2015.

Sheehan, T.F., D.G. Reddin, G. Chaput and M.D. Renkawitz. 2012. SALSEA North America: Apelagic ecosystem survey targeting Atlantic salmon in the Northwest Atlantic. *ICES Journal of Marine Science*. 69(9):1580-1588.

Shoop, C.R., and R.D. Kenney. 1992. Seasonal distributions and abundance of loggerhead and leatherback sea turtles in waters of the northeastern United States. *Herpetological Monographs*. 6:43-67.

Slabbekoorn, H., Bouton, N., van Opzeeland, I., Coers, A., ten Cate, C., and Popper, A. N. 2010. A noisy spring: the impact of globally rising underwater sound levels on fish. *Trends Ecol. Evol. (Amst).* 25, 419–427. doi: 10.1016/j.tree.2010.04.005

STDN (Sea Turtle Disentanglement Network). 2019. Northeast Region Sea Turtle Disentanglement Network Summary of Entanglement/Disentanglement Data from 2002-2018. Unpublished report compiled by NMFS Greater Atlantic Region's Protected Resources Division.

Steimle, FW, and CA Zetlin. 2000. Reef habitats in the middle Atlantic bight: abundance, distribution, associated biological communities, and fishery resource use. *Marine Fisheries Review*. 62: 24-42.. 62: 24-42.

Stein, A. B., K. D. Friedland, and M. Sutherland. 2004a. Atlantic sturgeon marine distribution and habitat use along the northeastern coast of the United States. *Transactions of the American Fisheries Society*. 133: 527-537.

Stein, A. B., K. D. Friedland, and M. Sutherland. 2004b. Atlantic sturgeon marine bycatch and mortality on the continental shelf of the Northeast United States. *North American Journal of Fisheries Management*. 24: 171-183.

Stenberg, C., J. G. Støttrup, M. van Deurs, C. W. Berg, G. E. Dinesen, H. Mosegaard, T. M. Grome and S. B. Leonhard (2015). Long-term effects of an offshore wind farm in the North Sea on fish communities. *Marine Ecology Progress Series* 528: 257-265.

Stenseth, N.C, Mysterud, A., Otterson, G., Hurrell, J.W., Chan, K., and M. Lima. 2002 Ecological Effects of Climate Fluctuations. Science 297(5585); 1292-1296.

Stevenson, D., L. Chiarella, D. Stephan, R. Reid, K. Wilhelm, J. McCarthy, M. Pentony. 2004. Characterization of the fishing practices and marine benthic ecosystems of the Northeast U.S. Shelf, and an evaluation of the potential effects of fishing on Essential Fish Habitat. NOAA Technical Memorandum NMFS-NE-181; 179 p.

Swingle, W.M., S.G. Barco, T.D. Pitchford, W.A. McLellan, and D.A. Pabst. 1993. Appearance of juvenile humpback whales feeding in the nearshore waters of Virginia. *Marine Mammal Science.*. 9: 309-315.

Taormina, B., J. Bald, A. Want, G. Thouzeau, M. Lejart, N. Desroy, and A. Carlier. 2018. A Review of Potential Impacts of Submarine Power Cables on the Marine Environment: Knowledge Gaps, Recommendations and Future Directions. Renewable and Sustainable Energy Reviews 96: 380–91.

Taormina, B., C. Di Poi, A. Agnalt, A. Carlier, N. Desroy, R. H. Escobar-Lux, J. D'eu, F. Freytet, and C.M.F. Durif. 2020. Impact of Magnetic Fields Generated by AC/DC Submarine Power Cables on the Behavior of Juvenile European Lobster (*Homarus Gammarus*). Aquatic Toxicology 220: 105401.

TEWG (Turtle Expert Working Group). 1998. An assessment of the Kemp's ridley (*Lepidochelys kempii*) and loggerhead (*Caretta caretta*) sea turtle populations in the Western North Atlantic. NOAA Technical Memorandum NMFS-SEFSC-409:1-96.

TEWG (Turtle Expert Working Group). 2000. Assessment update for the Kemp's ridley and loggerhead sea turtle populations in the western North Atlantic. NOAA Technical Memorandum NMFS-SEFSC-444: 1-115.

TEWG (Turtle Expert Working Group). 2007. An assessment of the leatherback turtle population in the Atlantic Ocean. NOAA Technical Memorandum NMFS-SEFSC-555: 1-116.

TEWG (Turtle Expert Working Group). 2009. An assessment of the loggerhead turtle population in the Western North Atlantic Ocean. NOAA Technical Memorandum NMFS-SEFSC-575: 1-131.

Timoshkin, V. P. 1968. Atlantic sturgeon (*Acipenser sturio L.*) caught at sea. *Journal of Ichthyol.* 8(4): 598.

TMGC. 2002. Development of a Sharing Allocation Proposal for Transboundary Resources of Cod, Haddock and Yellowtail Flounder on Georges Bank. DFO Maritimes Region, Fisheries Management Regional Report 2002/01: 59 p.

USASAC (U.S. Atlantic Salmon Assessment Committee). 2013. Annual reports 2001 through 2012. Annual Report of the U.S. Atlantic Salmon Assessment Committee.

USFWS and NMFS (United States Fisheries Service and National Marine Fisheries Service). 2018. Recovery plan for the Gulf of Maine Distinct Population Segment of Atlantic salmon (*Salmo salar*). 74 pp.

USCG (United States Coast Guard). 2020. *The Areas Offshore of Massachusetts and Rhode Island Port Access Route Study.* https://www.navcen.uscg.gov/pdf/PARS/FINAL_REPORT_PARS_May_14_2020.pdf. 199 pp.

Vu, E., D. Risch, C. Clark, S. Gaylord, L. Hatch, M. Thompson, D. Wiley, and S. Van Parijs. 2012. Humpback whale song occurs extensively on feeding grounds in the western North Atlantic Ocean. *Aquatic Biology*.14(2):175–183.

Waldman, J.R., T. King, T. Savoy, L. Maceda, C. Grunwald, and I. Wirgin. 2013. Stock origins of subadult and adult Atlantic sturgeon, *Acipenser oxyrinchus*, in a non-natal estuary, Long Island Sound. *Estuaries and Coasts*. 36:257–267.

Warden, M.L. 2011a. Modeling loggerhead sea turtle (*Caretta caretta*) interactions with US Mid-Atlantic bottom trawl gear for fish and scallops, 2005–2008. *Biological Conservation*. 144: 2202–2212.

Warden, M.L. 2011b. Proration of loggerhead sea turtle (*Caretta caretta*) interactions in US Mid-Atlantic bottom otter trawls for fish and scallops, 2005-2008, by managed species landed. NEFSC Reference Document 11-04; 8 p. Available at: http://www.nefsc.noaa.gov/publications/crd/

Waring, G.T., E. Josephson, C.P. Fairfield, and K. Maze-Foley. 2007. US Atlantic and Gulf of Mexico Marine Mammal Stock Assessments – 2006. NOAA Technical Memorandum NMFS-NE-201.

Waring, G.T., E. Josephson, K. Maze-Foley, and P.E. Rosel, editors. 2014. U.S. Atlantic and Gulf of Mexico marine mammal stock assessments—2013. NOAA Tech Memo NMFS- NE-228. 475 p.

Waring, G.T., E. Josephson, K. Maze-Foley, and P.E. Rosel, editors. 2015. U.S. Atlantic and Gulf of Mexico marine mammal stock assessments 2014. Available at: http://www.nmfs.noaa.gov/pr/sars/pdf/atl2014_final.pdf

Waring, G.T., E. Josephson , K. Maze-Foley , and P. E. Rosel. 2016. U.S. Atlantic and Gulf of Mexico marine mammal stock assessments 2015. NOAA Technical Memorandum NMFS-NE-238. http://www.nmfs.noaa.gov/pr/sars/pdf/atlantic2015_final.pdf

Weilgart, L. 2013. A review of the impacts of seismic airgun surveys on marine life. Submitted to the CBD Expert Workshop on Underwater Noise and its Impacts on Marine and Coastal Biodiversity, 25-27 February 2014, London, UK. Available at: http://www.cbd.int/doc/?meeting=MCBEM-2014-01

Weinberg, J. R. 2005. Bathymetric shift in the distribution of Atlantic surfclams: response to warmer ocean temperature. *ICES Journal of Marine Science*. 62(7): 1444-1453.

Whittingham, A., D. Hartley, J. Kenney, T. Cole, and E. Pomfret. 2005a. Large Whale Entanglement Report 2002. Report to the National Marine Fisheries Service, updated March 2005.

Whittingham, A., M. Garron, J. Kenney, and D. Hartley. 2005b. Large Whale Entanglement Report 2003. Report to the National Marine Fisheries Service, updated June 2005.

Wippelhauser, G.S. 2012. A Regional Conservation Plan For Atlantic Sturgeon in the U. S. Gulf of Maine. Prepared on behalf of Maine Department of Marine Resources, Bureau of Science. NOAA Species of Concern Grant Program Award #NA06NMF4720249A.

Wirgin, I., L. Maceda, J.R. Waldman, S. Wehrell, M. Dadswell, and T. King. 2012. Stock origin of migratory Atlantic sturgeon in the Minas Basin, Inner Bay of Fundy, Canada, determined by microsatellite and mitochondrial DNA analyses. *Transactions of the American Fisheries Society.* 141(5): 1389-1398.

Wirgin, I., M. W. Breece , D. A. Fox , L. Maceda , K. W. Wark, and T. King. 2015a. Origin of Atlantic sturgeon collected off the Delaware coast during spring months. North American *Journal of Fisheries Management*. 35: 20–30.

Wirgin, I., L. Maceda, C. Grunwald, and T. L. King. 2015b. Population origin of Atlantic sturgeon *Acipenser oxyrinchus oxyrinchus* by-catch in U.S. Atlantic coast fisheries. Journal of Fish Biology 86(4):1251–1270.

Wright, A. J., Soto, N. A., Baldwin, A. L., Bateson, M., Beale, C. M., Clark, C., et al. 2007. Do Marine mammals experience stress related to anthropogenic noise? *Int. J. Comp. Psychol.* 20, 274–316.

# 10 LIST OF AGENCIES AND PERSONS CONSULTED

In preparing this document, the Council consulted with NMFS, the New England and South Atlantic Fishery Management Councils, USFWS, and the states of Maine through North Carolina through their membership on the Mid-Atlantic and New England Fishery Management Councils. The advice of NMFS GARFO personnel was sought to ensure compliance with NMFS formatting requirements.

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