SUMMER FLOUNDER COMMERCIAL ISSUES AND GOALS AND OBJECTIVES AMENDMENT

TO THE SUMMER FLOUNDER, SCUP, AND BLACK SEA BASS FISHERY MANAGEMENT PLAN

Draft Environmental Impact Statement

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Prepared by the Mid-Atlantic Fishery Management Council in cooperation with the Atlantic States Marine Fisheries Commission and the National Marine Fisheries Service (NMFS)

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ABSTRACT

The Mid-Atlantic Fishery Management Council and the Atlantic States Marine Fisheries Commission, in consultation with NOAA's National Marine Fisheries Service, proposes to adopt and implement a Commercial Issues Amendment[1] to the Summer Flounder, Scup, and Black Sea Bass Fishery Management Plan (FMP) pursuant to the Magnuson-Stevens Fishery Conservation and Management Act (MSA). This Draft Environmental Impact Statement (DEIS) presents a range of alternatives under consideration in this amendment, which address the amendment purposes outlined in the document. The proposed alternatives are applicable only to the commercial summer flounder fishery, and are focused on measures related to federal commercial moratorium permit qualification criteria for summer flounder, allocation of summer flounder commercial quota, and the list of framework provisions within the FMP. In addition to these alternatives, this document also describes proposed changes to the FMP objectives for summer flounder (applicable to both the recreational and commercial summer flounder fisheries). This document also includes a detailed description of the affected environment and valued ecosystem components, and analyses of the impacts of the measures under consideration on the affected environment. It addresses the requirements of the National Environmental Policy Act (NEPA), the MSA, the Regulatory Flexibility Act (RFA), and other applicable laws.

1.0 EXECUTIVE SUMMARY

The summer flounder, scup and black sea bass fisheries are managed under the Summer Flounder (*Paralichthys dentatus*), Scup (*Stenotomus chrysops*) and Black Sea Bass (*Centropristis striata*) FMP developed cooperatively by the Mid-Atlantic Fishery Management Council (Council) and the Atlantic States Marine Fisheries Commission (Commission).

This amendment to the Summer Flounder, Scup and Black Sea Bass FMP is applicable only to the summer flounder fisheries and could: 1) implement requalifying criteria for federal commercial moratorium permits, 2) modify the allocation of commercial summer flounder quota, and 3) add framework provisions to the FMP that would allow for commercial landings flexibility policies for summer flounder to be developed through later framework actions.

This document includes the draft amendment as well as its Draft Environmental Impact Statement (DEIS). This document provides the background and context for the amendment (sections 4.0 and 6.0), describes in detail all of the management alternatives under consideration in the amendment (section 5.0), evaluates the potential impacts of the management alternatives under consideration (section 7.0), addresses the alternatives under consideration with respect to the MSA and other applicable laws (sections 8.0 and 9.0), and provides the public and the Council and Commission with adequate information about the measures and their impacts to ultimately inform decision-making following the public comment period.

In this executive summary, the purpose of the action is described in section 1.1, a summary of the alternatives is presented is section 1.2, and a brief overview of the impacts of these alternatives is described in section 1.3.

[1] Amendment number to be added after final action.

1.1 PURPOSE OF THE ACTION

The purpose of this action is to consider modifications to the FMP that would impact the **commercial summer flounder fishery as well as the existing FMP objectives for summer flounder**. The three specific purposes and needs associated with the three alternative sets in this action are described in detail in section 4.1 of this document, and briefly summarized here:

1. ***Purpose:*** Consider implementing requalifying criteria for federal commercial moratorium permits. ***Need for Action:*** Federal permit qualification criteria have not changed since establishment in 1993. Stakeholders believe lenient original qualifications criteria resulted in more permits than the fishery could profitably support in the long term. Recent lower quotas and concerns about inactive vessels re-entering the fishery led to a perceived need to adjust fleet size to more closely reflect current stock and fishery conditions. The purpose of alternative set 1 is to consider whether a reduction in the number of commercial moratorium permits for summer flounder is appropriate, and if so, how qualifying criteria should be revised.

2. ***Purpose:*** Consider modifications to commercial quota allocation.
   Need for Action: Current commercial allocation was last modified in 1993 and is perceived by many as outdated given its basis in 1980-1989 landings data. Summer flounder distribution, biomass, and fishing effort have changed since then, and some believe initial allocations may not have been equitable or were based on flawed data; therefore, stakeholders requested evaluation of alternative allocation systems. The purpose of alternative set 2 is to consider whether modifications to the commercial quota allocation are appropriate, and if so, how the quota should be re-allocated.

3. ***Purpose:*** Consider adding commercial landings flexibility as a frameworkable issue in the Council's FMP.
   Need for Action: Landings flexibility policies would give commercial vessels greater freedom to land or possess summer flounder in the state(s) of their choice. Although such policies may be more effectively developed by state level agreements, the Council and Board are interested in having the option to pursue these policies via framework action/addenda in the future if necessary. This action **does not** consider implementing landings flexibility policies at this time but **does** consider adding landings flexibility policies as a frameworkable item in the Council's FMP, which would allow a future landings flexibility action to be completed through a framework action instead of a full amendment. The Board likely already has the ability to implement these policies via an addendum to the Commission's FMP, and thus this alternative set is applicable only to the Council's FMP. The purpose of alternative set 3 is to consider adding landings flexibility policies to the list of management measures in the Council's FMP that could be modified via framework action.

In addition, ***this action proposes revisions to the FMP objectives for summer flounder***, although these revisions are not proposed as an explicit alternative set in this amendment. These proposed revisions are described in section 4.2.

1.2 SUMMARY OF ALTERNATIVES CONSIDERED

1.2.1 Alternative Set 1: Federal Moratorium Permit Requalification

These alternatives consider revisions to the requalification criteria for federal summer flounder commercial moratorium permits. These alternatives are fully described in section 5.1.

Alternative 1A: No Action/Status Quo

Alternative 1A would make no changes to the current eligibility criteria for commercial moratorium permits for summer flounder. Summer flounder moratorium permits were established via Amendment 2 to the FMP (1993) and issued to the owner or operator of a vessel that landed and sold summer flounder in the management unit between January 26, 1985 and January 26, 1990, OR the vessel was under construction for, or was being re-rigged for, use in the directed fishery for summer flounder on January 26, 1990. Permit holders must renew their permit each year by the last day of the fishing year for which the permit is required, unless a Confirmation of Permit History (CPH) has been issued.[2] There are currently 940 existing moratorium rights for summer flounder.

Alternative 1B: Requalifying Criteria for Federal Commercial Moratorium Permits

Alternative 1B would impose requalification criteria on current federal summer flounder moratorium permits, including permits in CPH if they qualify. Permits not meeting the requalification criteria would be cancelled and could not be renewed. This alternative would **not** allow new entrants to qualify for a moratorium permit and has no impact on state level permits.

Alternative 1B has seven sub-alternatives with various combinations of qualification time periods and landings thresholds as described in Table 1. Each of the sub-alternatives uses the revised control date for the commercial summer flounder fishery of August 1, 2014, which was published on that date by NMFS at the request of the Council (79 FR 44737).

[2] A CPH may be issued when a vessel that has been issued a limited access permit has sunk, been destroyed, or has been sold to another person without its permit history. Possession of a CPH will allow the permit holder to maintain landings history of the permit without owning a vessel.

Table 1: Summary of federal permit requalification alternatives 1A and 1B (one of seven sub-alternatives must be selected if 1B is preferred). Landings thresholds refer to commercial landings of summer flounder associated with each individual moratorium right ID number.

Alternative	Time Period	Landings Threshold	#MRIs eliminated (%)
Alternative 1A (No Action/ *Status Quo*)	January 26, 1985 - January 26, 1990 (5 yrs)	At least 1 pound in any year over this time period	0 (0%)
Alternative 1B-1	August 1, 2009-July 31, 2014 (5 yrs)	≥1,000 pounds cumulative over this time period	516 (55%)
Alternative 1B-2	August 1, 2009-July 31, 2014 (5 yrs)	At least 1 pound in any year over this time period	448 (48%)
Alternative 1B-3	August 1, 2004-July 31, 2014 (10 yrs)	≥1,000 pounds cumulative over this time period	389 (41%)
Alternative 1B-4	August 1, 2004-July 31, 2014 (10 yrs)	At least 1 pound in any year over this time period	306 (33%)
Alternative 1B-5	August 1, 1999-July 31, 2014 (15 yrs)	≥1,000 pounds cumulative over this time period	295 (31%)
Alternative 1B-6	August 1, 1994-July 31, 2014 (20 yrs)	At least 1 pound in 20% of years in time period (i.e., in at least 4 years over this 20-year period)	271 (29%)
Alternative 1B-7	August 1, 1994-July 31, 2014 (20 yrs)	≥1,000 pounds cumulative over this time period	233 (25%)

1.2.2 Alternative Set 2: Commercial Quota Allocation

Alternative set 2 considers modifications to the allocation of commercial quota (currently allocated on a state-by-state basis). These alternatives are fully described in section 5.2.

Alternative 2A: No Action/Status Quo

This alternative would make no changes to the current state-specific commercial allocations, which were established via Amendment 2 to the FMP on the basis of 1980-1989 landings history (see section 5.2.1).

Alternative 2B: Adjust State Quotas Based on Recent Biomass Distribution

This alternative would modify state-by-state allocations based on a shift in relative exploitable biomass by region between 1980-1989 and 2007-2016, calculated using NEFSC trawl survey data for summer flounder above 14 inches length. The relative exploitable biomass and allocations are evaluated on a regional basis, with a Northern and Southern region split approximately at Hudson Canyon, meaning the states of New York and north and the states of New Jersey and south. The concept behind this alternative is taking the current state quotas, which are not based on biomass distribution but instead based on 1980-1989 landings by state, and adjusting them so that they have some basis in recent biomass distribution by region. There are two sub-options for calculating the change in relative exploitable biomass and applying this change to revised allocations; one of these options must be selected if the Council and Board choose alternative 2B. Both options would shift allocation from the Southern region (states of New Jersey through North Carolina) to the Northern region (states of New York through Maine).

- **Alternative 2B-1:** calculates the shift in regional exploitable biomass as a percent change relative to the Northern region starting biomass, and applies this as a percentage change to the combined

Northern regional allocation. This results in a shift of 6% of the coastwide quota from the Southern region to the Northern region (see section 5.2.2.1).

- **Alternative 2B-2:** calculates the shift in regional exploitable biomass as an absolute shift relative to the coast and applies this as a 13% shift in regional allocation. This results in a shift of 13% of the coastwide quota from the Southern region to the Northern region (see section 5.2.2.2).

Alternative 2C: Revise State Allocations Above a Commercial Quota Trigger Point

This alternative would create state allocations that vary with overall stock abundance and resulting commercial quotas. For all years when the annual commercial quota is at or below a specified annual commercial quota trigger level, the state allocations would remain *status quo*. In years when the annual coastwide quota exceeded the specified trigger, the trigger amount would be distributed according to *status quo* allocations, and the additional quota beyond that trigger would be distributed by equal shares (with the exception of Maine, New Hampshire, and Delaware, which would split 1% of the additional quota). Alternative 2C has two sub-alternatives for different annual coastwide quota triggers; one of these options must be selected if the Council and Board choose alternative 2C.

- **Alternative 2C-1**: 8.40-million-pound trigger based on the recent five-year average of commercial quotas (2014-2018; see section 5.2.3.1)
- **Alternative 2C-2**: 10.71-million-pound trigger based on the recent ten-year average of commercial quotas (2009-2018; see section 5.2.3.2).

Under both sub-alternatives, the final state allocation percentages would vary in each year depending on the annual coastwide quota and how much "additional" quota is available to be distributed. In years where the quota was at or below the trigger, the allocation percentages would be *status quo* (equivalent to alternative 2A). A range of likely example allocations is described in section 5.2.3 and in Table 2 below.

Alternative 2D ("Scup Model" Quota System for Summer Flounder)

This alternative would allocate quota into three unequal seasonal periods, as is done for scup. During the two winter periods, January-April ("Winter I") and November-December ("Winter II"), a coastwide quota system would be implemented in conjunction with a system of coastwide possession limits and other measures. In a "Summer" period, May-October, a state-by-state quota system would be implemented by the Commission, and state-specific measures would be set to constrain landings to the summer state quotas. Alternative 2D has two sub-alternatives for either exempting or not exempting the state of Maryland; one of these options must be selected if the Council and Board choose alternative 2D.

- **Alternative 2D-1**: Exempt the state of Maryland from this management program due to their Individual Fishing Quota (IFQ) management for summer flounder; Maryland retains their current year-round allocation of 2.03910% of the coastwide quota (see section 5.2.4.1).
- **Alternative 2D-2**: Do not exempt Maryland; Maryland must participate in coastwide management during the Winter quota periods and state-specific management during the Summer period (see section 5.2.4.2).

A summary of the resulting allocations to each state under each of the alternatives above is provided in Table 2. Additional details on the configuration of each alternative is provided in section 5.0 of this document.

Table 2: Summary of allocation outcomes (percent allocated to each state) under alternative set 2. Alternative 2C provides a range under historic high and low quotas since future allocations would vary annually. Alternative 2D provides Summer period allocations only.

	Alt 2A	Alt 2B-1	Alt 2B-2	Alt 2C-1[a]		Alt 2C-2[a]		Alt 2D-1	Alt 2D-2
State				Under low quota (5.66 m. lb)	Under high quota (17.9 m. lb)	Under low quota (5.66 m. lb)	Under high quota (17.9 m. lb)	**Summer** quotas only (May-Oct), except Maryland	**Summer** quotas only (May-Oct), all states
ME	0.04756	0.05660	0.06661	0.04756	0.19923	0.04756	0.16235	0.015	0.015
NH	0.00046	0.00055	0.00064	0.00046	0.17712	0.00046	0.13417	0.000	0.000
MA	6.82046	8.11635	9.55238	6.82046	9.76840	6.82046	9.05159	19.332	18.525
RI	15.68298	18.66275	21.96477	15.68298	13.92735	15.68298	14.35424	22.476	21.538
CT	2.25708	2.68593	3.16115	2.25708	7.62693	2.25708	6.32121	3.566	3.417
NY	7.64699	9.09992	10.70998	7.64699	10.15627	7.64699	9.54612	18.553	17.779
NJ	16.72499	15.19806	13.50600	16.72499	14.41634	16.72499	14.97770	29.667	28.429
DE	0.01779	0.01617	0.01437	0.01779	0.18526	0.01779	0.14453	0.045	0.043
MD	2.03910	1.85294	1.64664	2.0391	7.52463	2.0391	6.19078	--[b]	4.171
VA	21.31676	19.37062	17.21401	21.31676	16.57113	21.31676	17.72507	5.648	5.412
NC	27.44584	24.94014	22.16345	27.44584	19.44735	27.44584	21.39225	0.699	0.670

[a] Allocation varies with annual quota; range provided covers historic commercial quotas, 1993-2018. Allocations may vary from this range if future coastwide quotas exceed historic high quota of 17.9 million lb. Annual quotas below the historic low would result in *status quo* allocations.

[b] Under Alternative 2D-1, Maryland would be exempt from the scup model system and would have an annual allocation of 2.03910% of the coastwide quota (and thus no specific seasonal allocation for the summer period quota).

1.2.3 Alternative Set 3: Landings Flexibility Framework Provisions

This alternative set considers whether to add "landings flexibility" policies to the list of issues in the Council's FMP that can be modified through a framework action. Framework actions are modifications to the Council's FMP that are typically (though not always) more efficient than a full amendment. Framework actions can only modify existing measures and/or those that have been previously considered in an FMP amendment. Landings flexibility policies, depending on their configuration, may allow for commercial summer flounder vessels to land and/or possess summer flounder in states where they are not permitted at the state level.

Alternative 3A: No Action /Status Quo

This alternative would make no changes to the list of framework provisions in the Council's FMP, meaning that any future action to implement landings flexibility policies would likely have to be done through an amendment to the FMP. States would remain free to develop landings flexibility agreements through state-level agreements, provided that such agreements are consistent with other Council and Commission FMP requirements and would not require modification to the federal management measures.

Alternative 3B: Alternative 3B: Add Landings Flexibility as a Frameworkable Issue in the Council's FMP

This action would not implement any landings flexibility policies at this time, but instead would simply allow these policies to be implemented via a future framework action (for the Council; with corresponding addendum from the Commission) rather than through an amendment process. The impacts of any future framework action related to landings flexibility would be analyzed through a separate action, which would include public comment opportunities and documentation of compliance with all applicable laws. Depending on the proposed configuration of landings flexibility in a future action, the level of analysis required may vary and an Environmental Impact Statement (EIS) may be required if impacts are expected to be significant.

1.3 SUMMARY OF ENVIRONMENTAL IMPACTS

The environmental impacts of each alternative are described in section 7.0 of this DEIS. Environmental impacts are analyzed with respect to five valued ecosystem components (VECs):

1. The **managed resources,** i.e., summer flounder, the managed species potentially affected by the measures under consideration (impacts described in sections 7.1.1 and 7.2.1);
2. **Non-target species**, including the primary species or species groups that interact with summer flounder, summer flounder habitat, and/or commercial summer flounder fishing gear (impacts described in sections 7.1.2 and 7.2.2);
3. The **physical environment and habitat**, including Essential Fish Habitat (EFH; impacts described in sections 7.1.3 and 7.2.3);
4. **Protected resources**, including Endangered Species Act (ESA)-listed and Marine Mammal Protection Act (MMPA)-protected large and small cetaceans, pinnipeds, sea turtles, fish, and critical habitat occurring in the affected area (impacts described in sections 7.1.4 and 7.2.4);

5. The **human environment**, including socioeconomic aspects of the fisheries (especially commercial fisheries) targeting summer flounder and the communities associated with those fisheries (impacts described in sections 7.1.5 and 7.2.5).

Impacts are described both in terms of their direction (negative, positive, or no impact) and their magnitude (slight, moderate, or high). In section 7.0, the alternatives are compared to the current condition of the VEC and also compared to each other. The recent conditions of the VECs include the biological conditions of the target stock, non-target stocks, and protected species over the most recent five years, as well as the characteristics of the commercial fishery and associated human communities over the same time frame. The guidelines used to determine impacts to each VEC are described in section 7.0 (see especially Table 47). A brief summary of the expected impacts of each alternative set is described below. Additional detail can be found in section 7.0 of this DEIS.

1.3.1 Impacts Summary for Alternative Set 1: Federal Moratorium Permit Requalification

Under alternative 1A and all sub-alternatives under 1B, overall annual summer flounder catch and landings will still be constrained by the annual catch limits and commercial quotas, which should remain the primary driving factor for overall fishery effort in a given year. While requalification of moratorium permits theoretically could result in a redistribution of effort among a different pool of vessels, the MRIs that would be eliminated under each sub-alternative of 1B are associated with little to no activity for summer flounder in recent years; therefore, the impacts of reducing permit capacity under alternative 1B may be minimal, as described in section 7.1.

From August 2009 through July 2014, the summer flounder landings associated with all eliminated permits under alternative 1B range over the various sub-alternatives from 0 pounds to 181,302 pounds (for all eliminated permits combined over the entire time period). Relative to coastwide summer flounder landings, this represents a range of 0%-0.32% of the coastwide landings and 0%-0.28% of the coastwide revenue. The same analysis over the fishing years 2013-2017 shows that eliminated MRIs under these alternatives are associated with slightly higher summer flounder landings and revenues, though they are still a relatively small portion of coastwide landings and revenues (ranging from 0.14% to 3.04% of landings and from 0.18% to 3.19% of revenues). This appears to indicate that there was a small influx of effort for summer flounder after the publication of the control date on August 1, 2014.

Even though a substantial portion of summer flounder permits may be eliminated under some alternatives (ranging from 25% to 55% of current MRIs), the overall portion of summer flounder landings and revenues that would be eliminated under any 1B sub-alternative is low and is spread among a few hundred vessels. This indicates that the magnitude of overall impacts is likely to be low, although impacts may vary at the vessel level based on each vessel's recent activity.

Thus, the practical changes in the fishery resulting from any of the permit requalification alternatives are likely to be negligible to small, and the impacts of these alternatives would generally be to maintain the current condition of each VEC, as detailed in section 7.0 and summarized below. This means that while the alternatives may have some effect on the VEC, overall they are not likely to change its current baseline condition.

Summer Flounder and Non-Target Species

Because overall fishery effort is not expected to be heavily influenced by these alternatives, and catch and landings will remain driven by annual limits, permit requalification alternatives in general are expected to contribute to an overall management strategy designed to prevent the stock from becoming overfished, leading to moderate positive overall impacts on the target resource for all federal permit requalification alternatives. Similarly, for non-target species, the permit requalification alternatives are not expected to result in changes in effort that would meaningfully impact the stock status of these species. All federal permit requalification alternatives under alternative set 1 would thus result similar moderate positive impacts to summer flounder and non-target species by maintaining their overall positive stock status.

Habitat

Overall fishery effort, and spatial patterns of fishing effort impacting habitat, are not expected to be altered by the alternatives related to federal permits. Fishing effort for summer flounder will continue in areas that have been fished by many gear types over many years. This continued effort impedes recovery of any degraded habitats within this footprint, leading to slight negative indirect impacts on habitat. All alternatives under alternative set 1 will have a similar magnitude of slight negative impacts to habitat.

Protected Resources

As described above, protected resources are evaluated with respect to both ESA-listed species and MMPA-protected species. None of the alternatives for permit requalification are expected to have substantial impacts on effort or interaction rates with protected resources, thus, they are expected to maintain the current status of each protected species. Because any action that results in interactions with or take of ESA-listed resources is expected to have negative impacts, the federal permit qualification alternatives described in this action would result in slight to moderative negative impacts to ESA-listed species by maintaining access to the fishery and resulting in continued interactions. For MMPA-protected species, the impacts of a proposed action vary by stock condition of each species. For marine mammal stocks/species that have their PBR level reached or exceeded, slight negative impacts would be expected from all permit requalification alternatives. For species that are at more sustainable levels (i.e., PBR levels have not been exceeded), actions not expected to change fishing behavior or effort such that interaction risks increase relative to what has been in the fishery previously, may have positive impacts by maintaining takes below the PBR level and approaching the Zero Mortality Rate Goal. Overall considering all protected resources, federal permit requalification alternatives are expected to result in slight negative to slight positive impacts to protected resources under all alternatives.

Human Communities

Socioeconomic impacts are possible resulting from modified access to the fishery at the vessel level, as described in section 7.1.5. Alternative 1A is likely to result in no changes no current socioeconomic conditions unless incentives change that cause latent effort to re-enter the fishery. In this case, alternative 1A may have slight negative impacts to some vessels if effort is spread between more participants, but will have slight positive impacts to low activity vessels that would otherwise be eliminated from the fishery. Alternative 1B, which would eliminate low or no activity permits to varying degrees under different sub-alternatives, would have impacts to remaining fishery participants ranging from no impacts to slight positive impacts, due to the prevention of latent effort from re-entering the fishery. On permit holders that are eliminated from the fishery, impacts would range from no impacts to moderate negative, depending on their current and planned activity for summer flounder.

Given the very small magnitude of recent summer flounder landings and revenues from eliminated permits under requalification alternatives, any of the socioeconomic impacts described above are likely to be small or negligible. However, there is some uncertainty associated with the socioeconomic impacts depending on the realistic potential for latent effort to re-enter the fishery, as described in section 7.1.

A summary of impacts to each VEC is provided in Table 3.

Table 3: Summary of impacts of Alternative Set 1: requalification of existing commercial moratorium permits. + = positive, - = negative.

Alt.	Description	Expected Impacts				
		Summer flounder	*Non-target species*	*Habitat*	*Protected Resources*	*Human communities*[a]
1A	No action/*status quo*	Moderate +	Moderate +	Indirect slight -	Slight - to slight +	No impact if conditions remain similar; slight - if incentives to re-enter fishery change; slight + to latent permit holders due to flexibility
1B-1	Requalify at ≥1,000 pounds cumulatively over 8/1/09-7/31/14 (5 yrs)	Moderate +	Moderate +	Indirect slight -	Slight - to slight +	No impact to moderate - (for eliminated permit holders), no impact to slight + (for remaining permit holders)
1B-2	Requalify at ≥1 pound in any year from 8/1/09-7/31/14 (5 yrs)	Moderate +	Moderate +	Indirect slight -	Slight - to slight +	No impact to moderate - (for eliminated permit holders), no impact to slight + (for remaining permit holders)
1B-3	Requalify at ≥1,000 pounds cumulatively over 8/1/04-7/31/14 (10 yrs)	Moderate +	Moderate +	Indirect slight -	Slight - to slight +	No impact to moderate - (for eliminated permit holders), no impact to slight + (for remaining permit holders)
1B-4	Requalify at ≥1 pound of summer flounder in any one year from 8/1/04-7/31/14 (10 yrs).	Moderate +	Moderate +	Indirect slight -	Slight - to slight +	No impact to moderate - (for eliminated permit holders), no impact to slight + (for remaining permit holders)
1B-5	Requalify at ≥1,000 pounds cumulatively over 8/1/99-7/31/14 (15 yrs)	Moderate +	Moderate +	Indirect slight -	Slight - to slight +	No impact to moderate - (for eliminated permit holders), no impact to slight + (for remaining permit holders)
1B-6	Requalify at ≥1 lb in 20% of years 8/1/94-7/31/14 (20 yrs; i.e., at least 1 lb of landings is required in any 4 years over this time period).	Moderate +	Moderate +	Indirect slight -	Slight - to slight +	No impact to moderate - (for eliminated permit holders), no impact to slight + (for remaining permit holders)
1B-7	Requalify at ≥1,000 pounds cumulatively over 8/1/94-7/31/14 (20 yrs).	Moderate +	Moderate +	Indirect slight -	Slight - to slight +	No impact to moderate - (for eliminated permit holders), no impact to slight + (for remaining permit holders)

[a] All impacts to human communities are uncertain and likely mixed depending on the stakeholder/community affected, as described in section 7.1.5.

1.3.2 Impacts Summary for Alternative Set 2: Commercial Quota Allocation

The quota reallocation alternatives under alternative set 2 are not expected to impact overall fishing effort in terms of annual catch and landings (i.e., total removals of summer flounder from the commercial fishery), which will remain driven by annual catch and landings limits. The allocation alternatives will primarily affect access to the resource at the state/and or individual fishing vessel level within the management unit, depending on the allocation option selected. This could result in a somewhat modified distribution of fishing effort in space and time, although the extent to which this would occur is difficult to predict. In general, the commercial fishery for summer flounder is typically prosecuted by larger trawl vessels fishing offshore in federal waters in the winter months (approximately late October through April), while summer effort (approximately May through early October) takes place primarily in state waters from a mix of gear types and vessels sizes. These patterns correspond with the seasonal inshore-offshore migrations of summer flounder (see section 6.1.3.1.)

Under reallocation alternatives, offshore winter fishing effort is not expected to change substantially in terms of location, as the larger vessels that typically participate in this season have historically been more mobile vessels that target prime summer flounder fishing locations offshore even when long travel distances are required to do so. For this fleet, footprints of fishing effort do not necessarily closely correlate with distance from state of landing. However, it is also possible that there could be a shift in the balance of offshore winter vs. inshore summer effort under some reallocation alternatives, due to changes in the allocation for states that are dominant in the winter fishery, which could impact the overall distribution of effort.

Nearshore effort observed mainly in the summer months (prosecuted by a variety of vessel types with more representation from smaller day boats) may see a small to moderate shift in location under some reallocation alternatives, as discussed below; however, the extent to which this may occur is difficult to predict and would depend on other factors such as management response to increased or decreased quotas.

The reallocation alternatives are expected to modify the distribution of landings (and thus revenues) by state and port, resulting in impacts to vessels, shoreside businesses, and communities/states. Changes in access could also possibly impact effort changes related to the total number and duration of trips and hauls for summer flounder, if modified allocations resulted in modified participation in terms of vessel types, vessel sizes, or gear types; however, in general these changes are not expected to be substantial.

Summer Flounder

Because the overall catch will remain driven by annual catch limits, reallocation alternatives in general are expected to contribute to an overall management strategy designed to prevent the stock from becoming overfished, leading to positive overall impacts on the target resource. Changes in effort resulting from reallocation are not expected to result in biological consequences to the summer flounder stock that would lead to a negative stock condition. Similar to the impacts described for permit requalification alternatives, all commercial allocation alternatives are expected to result in moderate positive impacts to the summer flounder stock.

Non-Target Species

For non-target species, under **alternative 2A**, no allocation changes would be made and thus this alternative would be expected to have moderate positive impacts on non-target species by maintaining their current overall positive stock status. Any changes in distribution of fishing effort (as discussed above) resulting from reallocation **alternatives 2B-2D** could possibly lead to changes in interaction rates that may influence non-target stock status, although these effects are highly uncertain. The distributions of most relevant non-target species overlap heavily with that of summer flounder (e.g., scup, black sea bass, and spiny dogfish). For Northeast skate complex, it is possible that a northward shift in effort, in particular under **alternatives 2B-1 and 2B-2**, could result in a change in interaction rates with these species, but it is unclear whether this would realistically influence stock status if it did occur. For all species, any shifts in effort toward areas where non-target species are more heavily concentrated in terms of biomass could influence non-target stock status, although the likelihood of this happening is unknown. If little or no changes in effort are observed, or if interaction rates do not substantially change, **alternatives 2B-2D** would have moderate positive impacts on non-target species similar to alternative 2A. If reallocation resulted in increased interaction rates with non-target species, it is possible that slight negative impacts could result. Overall, **alternatives 2A-2D** are likely to result in a range of impacts from slight negative to moderate positive.

Habitat

Similar to the impacts described above for permit requalification, overall fishery effort, and spatial and temporal patterns of fishing effort impacting habitat, are not expected to be altered by the allocation alternatives. Fishing effort for summer flounder will continue in areas that have been fished by many gear types over many years. This continued effort impedes recovery of any degraded habitats within this footprint, leading to slight negative indirect impacts on habitat. All alternatives under alternative set 2 will have a similar magnitude of slight negative impacts to habitat.

Protected Resources

For **alternative 2A**, no changes in the prosecution of the fishery or distribution of effort are expected, and thus this alternative is expected to result in impacts similar to those described above for alternative 1A: slight negative to moderate positive overall. For **alternatives 2B-2D**, impacts are similar to those described above for federal permit requalification, except that reallocation alternatives are more likely to influence the actual distribution of commercial effort, resulting in a wider range of possible impacts. Interactions with protected resources are difficult to predict and can vary based on many environmental and behavioral factors (behavior of both fishermen and protected resources), making conclusions regarding impacts uncertain. In addition, it is unclear how and to what extent effort is expected to shift under these reallocation alternatives, making any changes in interaction rates very difficult to predict.

Alternatives under alternative set 2 thus could result in slight to moderative negative impacts to ESA-listed species by resulting in continued interactions. Interactions with ESA-listed species could increase or decrease under **alternatives 2B-2D**, depending on resulting behavior and effort changes, however, for ESA-listed species, any action that results in any interactions with or take of ESA-listed resources is expected to have negative impacts. For MMPA-protected species, the impacts will vary by the stock condition of each species and the actual changes in the prosecution of the fishery resulting from reallocation. For marine mammal stocks/species that have their PBR level reached or exceeded, slight to moderate negative impacts would be expected from all reallocation **alternatives 2B-2D**. For species that are at more sustainable levels (i.e., PBR levels have not been exceeded), reallocation actions may have impacts ranging from moderate negative to moderate positive, depending on how interaction risks increase relative to what has been in the fishery previously and whether takes are maintained below the PBR level and approaching the Zero Mortality Rate Goal. Overall considering all protected resources, reallocation alternatives are highly uncertain but could range from moderate negative to moderate positive impacts to protected resources under across all alternatives.

Human Communities

The impacts of reallocation alternatives are primarily socioeconomic impacts on states and their fishing communities, including revenues and jobs for vessel owners and crew, shoreside operations, and other associated businesses. **Alternatives 2A, 2B, and 2C** can be generally described in terms of impacts to states, since they either maintain the *status quo* (**2A**) or propose modified state-by-state quotas (**2B and 2C**). The socioeconomic impacts from all reallocation alternatives are somewhat uncertain and would vary depending on which sub-alternative is selected. Generally, the magnitude of impacts will vary with the change in allocation relative to a state's existing quota.

Alternative 2A would result in no changes in the current allocation, and therefore would maintain the current condition of the human communities involved in the commercial summer flounder fishery (i.e., would not change the baseline condition of this VEC). This condition varies by state and community, with states experiencing varying impacts generally ranging from moderate negative to moderate positive. Generally, sates with more allocation currently experience more positive socioeconomic benefits; however, socioeconomic benefits also vary depending on the management approaches used to achieve each allocation, and with external economic and community factors. Overall, the *status quo* socioeconomic condition relative to commercial allocations has resulted in a range of impacts on human communities from moderate negative to moderate positive.

Alternative 2B is expected to result in a range of socioeconomic impacts from high negative to high positive, variable by state, with increased revenues in states New York and north and decreased revenues in states New Jersey and south. However, the distribution of positive or negative economic impacts among individual participants and businesses could be highly variable by state depending on restrictions on the overall number of participants and other measures used to manage the fishery in each state. Distribution of economic benefits or costs is also likely to depend on price variations by state and port and other market conditions.

Alternative 2B-2 would be expected to have greater positive socioeconomic benefits to the Northern states compared to alternative 2B-1, as this sub-alternative presents a more substantial shift in allocation from the southern states to the northern states. Likewise, alternative 2B-2 would have more negative socioeconomic impacts on southern states. Under alternative 2B-1, the total amount of allocation shifted from the South to the North would be 6% (with Northern states increasing their relative allocations by 19% and southern states decreasing their relative allocations by 9%), while under alternative 2B-2, allocation shifted to the North from the South would 13% of the coastwide allocation (with the Northern states increasing their allocations by 40% and the Southern states decreasing theirs by 19%). In both cases, allocation shifts of this magnitude could have substantial impacts on some states. Thus, overall, alternative 2B is likely to result in a range of impacts from high negative to high positive depending on the state, with alternative 2B-2 having impacts on the more extreme ends of that range.

Under **alternative 2C**, final state percentage allocations would vary in each year depending on the overall coastwide quota, because the overall allocation percentages vary depending on how much additional quota there is to be distributed. For quotas up to the trigger point, allocations remain *status quo*. In years when the allocation is below the trigger, allocations would be *status quo* and would result in the same socioeconomic impacts as described under alternative 2A.

As the annual commercial quota level grows beyond the quota trigger, the state quota allocation percentages get closer together, i.e., with increasing quotas above the trigger, quota is distributed more evenly among the states. Under both sub-alternatives, states with current allocations above 12.375% of the coastwide quota (NC, VA, RI, and NJ) will lose allocation percentage as the quota grows beyond the trigger point, likely leading to negative economic impacts for these states. In years when the annual quota was above the trigger, the impacts to each state would vary depending on the final quota and thus the final allocation, with more extreme changes to allocation occurring in years where the quota is well above average. Under annual quotas close to the trigger amount, slight negative impacts (to NC, VA, RI, and NJ) and slight positive impacts (to all other states) are possible; in years where the annual quota is well above the trigger, the impacts have the potential to be high in magnitude due to substantial modifications to the coastwide allocation.

States that currently have allocations between 2% and 12.5% (MD, CT, NY, and MA) are likely to strongly benefit from these alternatives in years where the annual quota is moderately to substantially above the trigger, whereas the states of North Carolina and Virginia may lose a substantial portion of their quota in years where the annual quota is relatively high. The potential negative economic impacts associated with states that lose share of the overall quota could be somewhat mitigated by the fact that this loss would only happen in relatively higher quota years, meaning average revenues for these states may be more stable than what would be expected under a permanent reallocation. For all states, the annual variability in allocation under this alternative could lead to reduced predictability in revenues and a reduced ability to plan for business and infrastructure needs.

The difference between alternative 2C-1 and 2C-2 is the annual quota trigger, which would impact in how many future years the allocation is modified. Alternative 2C-1 is likely to have a higher magnitude of impacts (positive or negative depending on the state) in the long-term compared to alternative 2C-2 given that the trigger is lower and thus allocations would be modified in more years under this alternative compared to 2C-2.

Overall, alternatives 2C-1 and 2C-2 are expected to result in a range of socioeconomic impacts from high negative to high positive, depending on the state and the annual quota in each year.

Alternative 2D (the "scup model" allocation) is the most extreme departure from current management given that it opens the winter fishery to any permitted vessel. Because this quota system eliminates the historical year-round state-by-state quota system, the expected impacts of this alternative are highly uncertain, more so than the impacts of the other allocation options.

It is impossible to predict what the socioeconomic impacts of this alternative may be on any given state due to the uncertainty regarding how many vessels would participate in the winter fishery, and what specific management measures would be implemented under each quota period. In addition, alternative 2D could lead to high fishing effort toward the beginning of each winter period, which could lead to increased competition for fishing grounds and market share, and market effects such as price fluctuations and discontinuous supply.

Some vessels would likely be unsuccessful in maintaining stable revenues under this management system, if they are unable to remain competitive during coastwide fishing periods, particularly if an influx of effort increased competition. However, some vessels are highly likely to benefit from a scup model management system. In particular, large vessels that are capable of remaining competitive in the offshore winter fishery, as well as smaller vessels that participate primarily in the summer in states with moderate to high summer allocations are likely to benefit.

Shoreside communities would also be impacted by alternative 2D. Many states have invested heavily in shoreside infrastructure to support their state's vessels. Under alternative 2D, the distribution of landings in the winter would be driven more by vessel preference and market factors, which would positively impact some shoreside businesses and negatively impact others.

Overall, alternative 2D is likely to have impacts to human communities ranging from high negative to high positive, and would vary by individual vessel and shoreside community.

The difference between alternative 2D-1 and 2D-2 is whether or not the state of Maryland is exempt from the three-period quota system. Under alternative 2D-1, Maryland will maintain their existing state allocation and continue managing under their IFQ system. In this case, for Maryland, the socioeconomic impacts are likely to be moderate positive, since under this option, Maryland would retain the ability to manage their fishery under a system that has provided positive economic benefits to Maryland permit holders and fishing communities. Under alternative 2D-2, the state of Maryland has indicated that high negative socioeconomic impacts are possible given that the "scup model" system is incompatible with their IFQ management. For all other states, there would likely be a negligible difference between these two sub-alternatives.

A summary of impacts to each VEC is provided in Table 4.

Table 4: Summary of impacts of Alternative Set 2: requalification of existing commercial moratorium permits. + = positive, - = negative.

Alt.	Description	Expected Impacts				
		Summer flounder	***Non-target species***	***Habitat***	***Protected Resources***	***Human communities***[a]
2A	No action/*status quo*	Moderate +	Moderate +	Indirect slight negative	Slight - to Slight +	Mixed; Moderate + to Moderate - depending on state
2B-1	Adjust State Quotas Based on Recent Biomass Distribution; as a percent change relative to Northern region	Moderate +	Uncertain; Slight - to Moderate +	Indirect slight negative	Uncertain; Moderate - to Moderate +	Mixed; High - to High+ depending on state
2B-2	Adjust State Quotas Based on Recent Biomass Distribution; as an absolute shift relative to coast	Moderate +	Uncertain; Slight - to Moderate +	Indirect slight negative	Uncertain; Moderate - to Moderate +	Mixed; High - to High+ depending on state
2C-1	Revise state allocations above annual quota trigger point of 8.40 mil lb	Moderate +	Uncertain; Slight - to Moderate +	Indirect slight negative	Uncertain; Moderate - to Moderate +	High - to High + depending on state, variable with annual quota
2C-2	Revise state allocations above annual quota trigger point of 10.71 mil lb	Moderate +	Uncertain; Slight - to Moderate +	Indirect slight negative	Uncertain; Moderate - to Moderate +	High - to High + depending on state, variable with annual quota
2D-1	"Scup model" with coastwide winter periods and state-by-state summer period, Maryland exempt	Moderate +	Uncertain; Slight - to Moderate +	Indirect slight negative	Uncertain; Moderate - to Moderate +	Uncertain; High - to High +; variable by state and vessel
2D-2	"Scup model" with coastwide winter periods and state-by-state summer period, Maryland NOT exempt	Moderate +	Uncertain; Slight - to Moderate +	Indirect slight negative	Uncertain; Moderate - to Moderate +	Uncertain; High - to High+; variable by state and vessel

[a] All impacts to human communities are uncertain and likely mixed depending on the stakeholder/community affected, as described in section 7.2.5.

1.3.3 Impacts Summary for Alternative Set 3: Landings Flexibility Framework Provisions

The framework provision alternatives proposed in this action are administrative and intended to simplify and improve the efficiency of future landings flexibility actions to the extent possible. Under this alternative set, the Council and Board would either take no action, or modify the list of framework provisions in the FMP, which would have no effect on summer flounder management until a future framework action was developed and implemented through a separate process.

Because these alternatives are administrative, they are expected to have no impacts on any of the VECs. The impacts of any future framework action relevant to landings flexibility would be analyzed through a separate process, including additional opportunities for public comment. It is not possible to predict the magnitude and direction of impacts of any future landings flexibility framework actions, because impacts will depend on the configuration of landings flexibility. Future actions would need to define how landings flexibility would work, including resolving questions related to who would be allowed to or required to participate in landings flexibility programs, how such policies should be enforced, and how quota would need to be transferred to maintain the underlying state-by-state quota system (if quota remains allocated by state). Given these issues, depending on how landings flexibility is configured, the social and economic impacts associated with a future framework action may be significant and require substantial analysis. Although the timeline for Magnuson Stevens Act requirements could be shortened by completing a framework instead of an amendment, an EIS may still be required for NEPA analysis depending on the expected impacts of future management options, extending the timeline of a typical framework and possibly eliminating time savings entirely.

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3.0 LIST OF ACRONYMS AND ABBREVIATIONS

ABC	Acceptable Biological Catch
ACFCMA	Atlantic Coastal Fisheries Cooperative Management Act
ALB	Albatross (NOAA vessel)
ALWTRP	Atlantic Large Whale Take Reduction Plan
ALWTRT	Atlantic Large Whale Take Reduction Team
ASM	At-sea monitoring
ASMFC	Atlantic States Marine Fisheries Commission (Commission)
ASSRT	Atlantic Sturgeon Status Review Team
ATGTRS	Atlantic Trawl Gear Take Reduction Strategy
ATGTRT	Atlantic Trawl Gear Take Reduction Team
BDTRP	Bottlenose Dolphin Take Reduction Plan
BMSY	Biomass at maximum sustainable yield
BTG	Bottom-tending gear
C.F.R.	Code of Federal Regulations
CEA	Cumulative Effects Assessment
CeTAP	Cetacean and Turtle Assessment Program
CEQ	Council on Environmental Quality
CPH	Confirmation of Permit History
CPUE	Catch per unit effort
CV	Coefficient of Variation

DEIS	Draft Environmental Impact Statement
DOC	Department of Commerce
DPS	Distinct Population Segment
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
EFP	Exempted Fishing Permit
EIS	Environmental Impact Statement
E.O.	Executive Order
ESA	Endangered Species Act
F	Fishing mortality rate
FMAT	Fishery Management Action Team
F_{MAX}	Fishing mortality rate that maximizes equilibrium yield per recruit
FMP	Fishery Management Plan
FR	Federal Register
GAR	Greater Atlantic Region
GARFO	Greater Atlantic Regional Fisheries Office (formerly Northeast Regional Office/NERO)
GB	Georges Bank
GOM	Gulf of Maine
GRA	Gear restricted area
GRT	Gross registered tonnage
HAPC	Habitat Area of Particular Concern
HCD	Habitat Conservation Division (GARFO)
HPTRP	Harbor Porpoise Take Reduction Plan
IFQ	Individual Fishing Quota
ITQ	Individual Transferrable Quota
ITS	Incidental Take Statement
LOA	Letter of Acknowledgement
LOF	List of Fisheries
MAB	Mid-Atlantic Bight
MADMF	Massachusetts Division of Marine Fisheries
MAFMC	Mid-Atlantic Fishery Management Council (Council)
MARMAP	Mid-Atlantic Region Monitoring and Assessment Program
MBTG	Mobile bottom-tending gear
MFMT	Maximum Fishing Mortality Threshold
MMPA	Marine Mammal Protection Act
MOU	Memorandum of Understanding
MRI	Moratorium Rights ID
MSA	Magnuson-Stevens Fishery Conservation and Management Act (as currently amended)
MSY	Maximum Sustainable Yield
MT	Metric tons
NCDMF	North Carolina Division of Marine Fisheries
NEFMC	New England Fishery Management Council
NEFOP	Northeast Fisheries Observer Program
NEFSC	Northeast Fisheries Science Center
NEPA	National Environmental Policy Act
NGO	Non-governmental organization
NM	Nautical mile
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NS	National Standard
NWA	Northwest Atlantic

OY	Optimum Yield
P, Pr, RFF	Past, Present, Reasonably Foreseeable Future
PBR	Potential Biological Removal
PS	Producer surplus
RFA	Regulatory Flexibility Act
RIR	Regulatory Impact Review
SARC	Stock Assessment Review Committee
SAW	Stock Assessment Workshop
SBRM	Standardized Bycatch Reporting Methodology
SDWG	Southern Demersal Working Group
SNE	Southern New England
SSB	Spawning Stock Biomass
SSC	Scientific and Statistical Committee
SST	Sea surface temperature
TAL	Total Allowable Landings
TED	Turtle Excluder Device
TRP	Take Reduction Plan
US	United States
USD	U.S. Dollars
USFWS	U.S. Fish and Wildlife Service
VEC	Valued Ecosystem Component
VIMS	Virginia Institute of Marine Science
VMS	Vessel Monitoring System
VTR	Vessel Trip Report
YPR	Yield per recruit

4.0 BACKGROUND AND PURPOSE

4.1 PURPOSE AND NEED FOR ACTION

Table 5 summarizes the needs for action and the corresponding purposes. The "Need for Action" describes "Why are the Council and Board taking a given action?" For each "Need for Action" there is a "Corresponding Purpose," which is how the Council and Board propose to address the Need for Action. Additional details on the needs and purposes are provided after the table. The alternatives described in this document provide a reasonable range of specific tools to address each purpose, i.e. solve the problem.

Table 5: Summary of purposes and needs for this action.

Need for Action	Corresponding Purpose	Alternatives That Address This Purpose
1. Federal permit qualification criteria have not changed since establishment in 1993. Stakeholders believe lenient original qualifications criteria resulted in more permits than the fishery could profitably support in the long term. Recent lower quotas and concerns about inactive vessels reentering the fishery led to a perceived need to adjust fleet size to more closely reflect current stock and fishery conditions.	Consider reducing federal commercial moratorium permit capacity	• 1A • 1B-1 • 1B-2 • 1B-3 • 1B-4 • 1B-5 • 1B-6 • 1B-7
2. Current commercial allocation was last modified in 1993. Summer flounder distribution, biomass, and fishing effort have changed since then, and some believe initial allocations may not have been equitable or were based on flawed data; therefore, stakeholders requested evaluation of alternative allocation systems.	Consider modifications to commercial quota allocation (revised basis for state-by-state allocations or other modified allocation system)	• 2A • 2B-1 • 2B-2 • 2C-1 • 2C-2 • 2D-1 • 2D-2
3. Council and Board members would like the ability to address landings flexibility through a simpler and more efficient action in the future if necessary (i.e., if this issue is not addressed by the states or through the Commission process).	Consider adding commercial landings flexibility as a frameworkable issue in the Council's FMP	• 3A • 3B

4.1.1 Purpose and Need 1: Consider Reducing Federal Permit Capacity

Qualifying criteria for federal commercial moratorium permits for summer flounder were determined in Amendment 2 to the Summer Flounder, Scup, and Black Sea Bass FMP (1993), and have not been modified since that time. Stakeholders have raised concerns that the qualifying criteria chosen at that time (landed any summer flounder between January 26, 1985 and January 26, 1990) may have been too lenient, resulting in more federal permits than the fishery could profitably support long-term. Many stakeholders believe that the current qualification criteria are thus outdated and should be re-evaluated based on more recent participation data and more comprehensive and accurate ladings data that have been collected in recent decades.

In addition, as both the understanding of summer flounder stock status and the Council and Board's approaches to quota setting have changed, overall quotas have been reduced from historic levels on average. There is some concern that the current number of federal permits is too high relative to recent stock size estimates and resulting quotas. Given restrictions and trends in other fisheries, there is concern about a potential increase in inactive permits re-entering the fishery for summer flounder, putting further economic strain on participating vessels under recent lower quota levels. Some stakeholder have requested that the Council and Board consider reductions in fleet capacity to ensure access to the resource for those who have actively participated in the fishery either in recent years or consistently over the many years since implementation of Amendment 2. Thus, the purpose associated with alternative set 1 is to consider whether a reduction in federal permit fleet capacity (i.e., the number of commercial moratorium permits for summer flounder) is appropriate, and if so, how qualifying criteria should be revised.

4.1.2 Purpose and Need 2: Consider Modifications to Current Commercial Quota Allocation

The current commercial allocation is perceived by many stakeholders as outdated given that it was last modified in 1993 and is based on landings data from 1980-1989. Evidence suggests that summer flounder distribution, center of biomass, and location of fishing effort has changed over time, likely due to a combination of stock rebuilding and climate related impacts. As changing environmental conditions have resulted in an apparent shift in the average distribution of biomass for summer flounder, there have been requests to incorporate current distribution information to quota allocations. The intention of incorporating this information is to improve efficiency in the fisheries by providing more access to the resource for states with higher concentrations of summer flounder off their coast.

In addition, many stakeholders believe the initial allocations were not equitable or were developed based on flawed data, for example asserting that historical data for some states is incomplete or inaccurate, in part because data collection methods and requirements during 1980-1989 were not necessarily consistent among states. Some support eliminating state-specific quotas for the winter fishery to increase flexibility in landing location for the commercial fishery. Stakeholders have requested evaluation of alternative systems of allocation that may take these factors into account.

Given the need described above, the purpose associated with alternative set 2 is to consider whether modifications to the commercial quota allocation are appropriate, and if so, how the quota should be re-allocated.

4.1.3 Purpose and Need 3: Consider Adding Landings Flexibility as an FMP Framework Provision

The Council and Board are interested in exploring added flexibility in the commercial fishery in the form of landings flexibility policies, which would give commercial vessels greater freedom to land or possess summer flounder in the state(s) of their choice. The groups determined that such policies may be more effectively developed by state level agreements, which may involve fewer enforcement questions than implementing a coastwide landings flexibility policy. The Council and Board thus moved to send a letter to the states requesting the development of partnerships between states toward increased flexibility in state of landing, including policies that may allow vessels to have multiple state possession limits on board for offloading in multiple states. Because it was uncertain how much progress would be made on these state level policies, the Council and Board are also considering, through this action, adding landings flexibility policies as a frameworkable item in the Council's FMP, which would allow a future landings flexibility action to be completed more efficiently. The Board likely already has the ability to implement these policies via an addendum to the Commission's FMP. The purpose associated with alternative set 3 is to consider adding landings flexibility policies to the list of management measures in the Council's FMP that could be modified via framework action.

4.2 FMP OBJECTIVES

4.2.1 Current FMP Objectives

The original FMP objectives were adopted via Amendment 2 to the Summer Flounder FMP in 1993 and have remained unchanged since that time. The current FMP objectives are:

1. Reduce fishing mortality in the summer flounder, scup and black sea bass fishery to assure that overfishing does not occur.
2. Reduce fishing mortality on immature summer flounder, scup and black sea bass to increase spawning stock biomass.
3. Improve the yield from these fisheries.
4. Promote compatible management regulations between state and federal jurisdictions.
5. Promote uniform and effective enforcement of regulations.
6. Minimize regulations to achieve the management objectives stated above.

4.2.2 Proposed Revisions to FMP Objectives

The Council and Board are proposing revisions to the current FMP objectives for summer flounder through this amendment. Revisions are proposed because many managers and stakeholders believe that the current objectives have become outdated and could provide more meaningful guidance if updated. Changes in stock abundance, fishing mortality rates, and the management framework have made the existing objectives less relevant than they could be.

While the current FMP contains only management *objectives*, the proposed revisions contain both broader *goals* as well as objectives. *Goals* are broad, big picture, and aspirational. They can help communicate high-level values and priorities for summer flounder management. *Objectives* are more specific and actionable. They can help describe important steps toward accomplishing goals. *Strategies* refer to specific processes, decision points, and actions the Council and Board may take to achieve objectives and support goals. The current and proposed revisions to FMP objectives do not address specific management strategies, as these are laid out through specific management measures within the FMP.

In the fall of 2015, the Council contracted the Fisheries Leadership & Sustainability Forum (Fisheries Forum)[3] to solicit feedback from the Council's Demersal Committee, the Commission's Summer Flounder, Scup, and Black Sea Bass Board, and members of both bodies' Advisory Panels on the structure, content, and use of FMP goals and objectives. Fisheries Forum staff also reviewed feedback on goals and objectives obtained from the amendment scoping process and the Council's 2012 Visioning and Strategic Planning Project Stakeholder Input Report. Fisheries Forum distilled this feedback into a synthesis of ideas, perspectives, and themes of discussion, integrated with

[3] http://www.fisheriesforum.org/

subsequent recommendations from the Summer Flounder Amendment Fishery Management Action Team (FMAT).[4]

In December 2015, the Council and Board held a workshop on summer flounder FMP goals and objectives, where the groups reviewed the Fisheries Forum synthesis of input on goals and objectives and provided additional feedback and direction for revisions. The feedback from this workshop was incorporated into revised draft goals and objectives that were reviewed by the Demersal Committee in November 2017 and, after slight modifications, approved for public hearings by the Council and Board in December 2017.

The proposed revised FMP Goals and Objectives for summer flounder include three goal statements, each with one or more associated management objectives. **The proposed revisions are as follows:**

Goal 1: Ensure the biological sustainability of the summer flounder resource in order to maintain a sustainable summer flounder fishery.

> **Objective 1.1:** Prevent overfishing, and achieve and maintain sustainable spawning stock biomass levels that promote optimum yield in the fishery.

Goal 2: Support and enhance the development and implementation of effective management measures.

> **Objective 2.1:** Maintain and enhance effective partnership and coordination among the Council, Commission, Federal partners, and member states.
>
> **Objective 2.2:** Promote understanding, compliance, and the effective enforcement of regulations.
>
> **Objective 2.3:** Promote monitoring, data collection, and the development of ecosystem-based science that support and enhance effective management of the summer flounder resource.

Goal 3 (combined previous Goals 3 and 4): Optimize economic and social benefits from the utilization of the summer flounder resource, balancing the needs and priorities of different user groups to achieve the greatest overall benefit to the nation.

> **Objective 3.1:** Provide reasonable access to the fishery throughout the management unit. Fishery allocations and other management measures should balance responsiveness to changing social, economic, and ecological conditions with historic and current importance to various user groups and communities.

PLEASE NOTE: While these revisions are not included as an explicit alternative set within this amendment, **the proposed revisions above would not be final until approved by the Council and Board through final action within this amendment.** The Council and Board are seeking feedback from the public on the proposed revisions during the public hearing process.

[4] This synthesis document is available at: http://www.mafmc.org/s/Tab10_SF-goals-and-objectives.pdf.

4.3 MANAGEMENT UNIT

The management unit for summer flounder (*Paralichthys dentatus*) consists of the U.S. waters in the western Atlantic Ocean from the southern border of North Carolina northward to the U.S.-Canadian border.

4.4 FMP HISTORY AND CURRENT MANAGEMENT

4.4.1 Joint Management Overview

The Mid-Atlantic Fishery Management Council (MAFMC or Council) and the Atlantic States Marine Fisheries Commission (ASMFC or Commission) work cooperatively to develop fishery regulations for summer flounder off the east coast of the United States. The Commission manages summer flounder through their Summer Flounder, Scup, and Black Sea Bass Board (Board). The Council and Board work in conjunction with the National Marine Fisheries Service (NMFS), which serves as the federal implementation and enforcement entity. This cooperative management endeavor was developed because a significant portion of the catch is taken from both state (0-3 miles offshore) and federal waters (3-200 miles offshore, also known as the Exclusive Economic Zone, or EEZ).

The Commission has primary authority for development of FMPs for state waters under the authority of the Atlantic Coastal Fisheries Cooperative Management Act (ACFCMA) of 1993. All Atlantic coast states that are included in a Commission fishery management plan must implement required conservation provisions of the plan or the Secretary of Commerce may impose a moratorium for fishing in the noncompliant state's waters. The Council, under the MSA, has primary authority for developing federal FMPs for Council managed species. The Council and Board meet jointly at least twice a year to approve management measures for the fishery for the upcoming year or years. State fishery departments implement FMP measures under the ACFCMA, while NMFS issues rules to implemented approved FMPs prepared by the Councils.

The joint FMP for summer flounder became effective in 1988 (see section 4.4.2), establishing measures to ensure effective management of summer flounder fisheries. Current required measures include catch and landings limits, commercial quotas, recreational harvest limits, minimum fish sizes, gear regulations, permit requirements, and other provisions as prescribed by the FMP. The large commercial and recreational fisheries for summer flounder are managed primarily using output controls (catch and landings limits), with 60 percent of the landings being allocated to the commercial fishery as a commercial quota and 40 percent allocated to the recreational fishery as a recreational harvest limit. Management also uses minimum fish sizes, gear regulations, permit requirements, and other provisions as prescribed by the FMP.

State regulations apply to vessels fishing in state waters; however, vessels with federal summer flounder permits must abide by the federal regulations regardless of where they are fishing. If state and federal measures differ, the vessel must abide by whichever measure is more restrictive. Approved regulations are enforced through cooperative actions of the U.S. Coast Guard, NMFS Law Enforcement, and state authorities.

The Secretary of Commerce has the ultimate responsibility for summer flounder measures. The Council's proposed FMPs and amendments are submitted to the Secretary of Commerce for approval, which in most cases is delegated to NMFS. NMFS typically prepares specifications and implementing federal regulations for the summer flounder fishery based on the recommendations of the Council and Commission, if such recommendations are deemed to be consistent with the MSA and other applicable law. NMFS publishes proposed rules in the *Federal Register* for public comment. As mentioned above, the Secretary of Commerce also has ultimate responsibility for determining whether individual state measures are consistent with the Commission's FMP. If the Commission finds a state out of compliance and is unable to rectify this issue, the Commission may notify the Secretary. Within 30 days of receiving the Commission's notice, the Secretary must decide whether the state is out of compliance, and if so, whether the noncompliance compromises the conservation of the fishery. If it does, the Secretary can impose a moratorium on all summer flounder fishing (commercial and recreational), until the Commission and the Secretary determine that the noncompliance has ceased.

4.4.2 Original FMP

The Council first considered the development of an FMP for summer flounder in late 1977. It was determined that the initial plan would be prepared by the Commission, and New Jersey was designated as the state with lead responsibility for the plan. The state/federal draft was adopted by the Commission at its annual meeting in October 1982. The original management measure recommendations in the Commission's plan included a 14-inch total length minimum fish size or a 5.5" minimum net mesh for mobile fishing gear; seasonal measures were not included.

The original Council Summer Flounder FMP (MAFMC 1988) was based on the Commission's management plan and was approved by NMFS in 1988. At the time of Council adoption of the FMP, most states had not implemented the Commission plan. Massachusetts, Rhode Island, Connecticut, New York, and Delaware had 14-inch minimum size limits. New Jersey had a 13-inch limit, while Maryland and Virginia had 12-inch limits and North Carolina had an 11-inch limit. Minimum mesh regulations were in effect for some or all of the waters and/or gear in New Jersey (4.5"), Maryland (2.5" gill net), Virginia (4.5"), and North Carolina (4.5").

The Council's original FMP adopted for public hearings in October 1987 included a minimum fish size and a minimum otter trawl mesh size. In light of industry opposition and negative comments on the enforceability of minimum net mesh rules by NMFS and the Coast Guard, the mesh provision was dropped by the Council in the final version of the FMP (and taken up later in Amendments 1 and 2, as described below). The final version of the original Council FMP did include a 13-inch minimum size requirement (for both recreational and commercial possession), permit requirements, and a plan to begin annually reviewing fishing mortality estimates and the performance of management measures after the third year of FMP implementation.

4.4.3 Amendments and Other FMP Modifications

Amendment 1 to the FMP (1990) added an overfishing definition to the FMP and proposed a minimum net mesh size to protect the 1989 and 1990 year classes. NMFS approved the overfishing definition, but disapproved the minimum net mesh provision because the mesh size along with the existing minimum fish size would not allow the overfished resource to rebuild.

Amendment 2 (1993) was a comprehensive amendment designed to rebuild a severely depleted summer flounder stock. Amendment 2 contained a number of management measures to regulate the commercial and recreational fisheries for summer flounder, including a rebuilding schedule, commercial quotas, recreational harvest limits, size limits, gear restrictions including minimum mesh sizes, and permit and reporting requirements. Amendment 2 established a mesh size exemption for the flynet fishery, as well as the small mesh exemption area, an offshore area where fishermen participating in the winter trawl fishery may obtain an authorized exemption from the minimum mesh size regulations. Amendment 2 also established the Summer Flounder Monitoring Committee, which meets annually to review the best available biological and fisheries data and make recommendations regarding the commercial quota and other management measures.

Amendment 3 (1993) modified the demarcation line for the small mesh exempted fishery area, and increased the large mesh net possession threshold (established in Amendment 2) to 200 pounds during the winter fishery (November 1-April 30). Amendment 3 also stipulated that otter trawl vessels fishing from 1 May through 31 October could only retain up to 100 pounds of summer flounder before using the large mesh net.

Amendment 4 (1993) adjusted Connecticut's commercial landings of summer flounder and revised the state-specific shares of the coastwide commercial summer flounder quota as requested by the Commission. **Amendment 5** (1993) allowed states to transfer or combine portions of their commercial quota. **Amendment 6** (1994) allowed multiple nets on board if they were properly stowed and changed the deadline for publishing the overall catch limits and commercial management measures to 15 October and the recreational management measures to 15 February. **Amendment 7** (1995) revised the fishing mortality rate reduction schedule for summer flounder.

In 1996, NMFS requested that the black sea bass and scup regulations be incorporated into another existing FMP to reduce the number of separate fisheries regulations issued by the federal government. As a result, the Scup FMP and the Black Sea Bass FMP were incorporated into the summer flounder regulations as **Amendments 8 and 9** (1996) to the Council's Summer Flounder FMP, respectively. There are no Amendments 8 or 9 in the Commission's FMP; the Board opted at the time to manage Scup and Black Sea Bass under separate FMPs. The Council's Amendments 8 and 9 were major amendments that implemented a number of management measures for scup and black sea bass including commercial quotas, commercial gear requirements, minimum size limits, recreational harvest limits, and permit and reporting requirements.

Amendment 10 (1997) made several changes to the summer flounder regulations implemented by Amendment 2 and later amendments to the Summer Flounder, Scup and Black Sea Bass FMP. Specifically, this amendment modified the commercial minimum mesh regulations, continued the moratorium on entry of additional commercial vessels, removed provisions pertaining to the expiration of the moratorium permit, prohibited the transfer of summer flounder at sea, and established a special permit for party/charter vessels to allow the possession of summer flounder parts smaller than the minimum size.

Amendment 11 (1999) was implemented to achieve consistency among Mid-Atlantic and New England FMPs regarding vessel replacement and upgrade provisions, permit history transfer, splitting, and renewal regulations for fishing vessels issued Northeast Limited Access federal fishery permits.

Amendment 12 (1999) brought the FMP into compliance with the new and revised National Standards and other required provisions of SFA. Specifically, the amendment revised the overfishing definitions (National Standard 1) for summer flounder, scup, and black sea bass and addressed the new and revised National Standards (National Standard 8 - consider effects on fishing communities; National Standard 9 - reduce bycatch; and National Standard 10 - promote safety at sea) relative to the existing management measures. The amendment also identified essential habitat for summer flounder, scup and black sea bass. In addition, Amendment 12 added a framework adjustment procedure that allows the Council to add or modify management measures through a streamlined public review process. Amendment 12 was partially approved on 28 April 1999.

Framework 1 (2001) established quota set-aside for research for summer flounder, scup, and black sea bass. **Framework 2** (2001) established state-specific conservation equivalency measures for the recreational fishery. **Framework 3** (2003) allowed for rollover of winter scup quota, and revised the star data for the summer quota period for the scup fishery. **Framework 4** (2003) established a system to allow for transfer of scup at sea.

Amendment 13 (2003) addressed the disapproved sections of Amendment 12, revised the black sea bass commercial quota system, and addressed other black sea bass management measures. Although there were some alternatives included in public hearing drafts of the document that could have resulted in changes to summer flounder or scup management measures, none were preferred alternatives or approved for implementation. As a result, Amendment 13 has no impact on summer flounder or scup.

Framework 5 (2004) established the ability to implement multi-year specification of quota (for up to three years at a time) for all three plan species. **Framework 6** (2006) established the option of region-specific conservation equivalency measures for the summer flounder recreational fishery. **Framework 7** (2007) built flexibility into the process to define and update stock status determination criteria for each plan species.

Amendment 14 (2007) established a rebuilding schedule for scup and made the Scup Gear Restricted Areas (GRAs) modifiable through the framework adjustment process. **Amendment 16** (2007) implemented Standardized Bycatch Reporting Methodology (SBRM). **Amendment 15** (2011) Established Annual Catch Limits (ACLs) and Accountability Measures (AMs), as required by the 2007 reauthorization of the MSA. **Amendment 19** (2013) modified the AMs for the Council's recreational fisheries. **Amendment 17** (2015) implemented a revised version of the Standardized Bycatch Reporting Methodology (SBRM).

Framework 8 (2015) modified the opening date of the black sea bass recreational fishery to May 15, starting in 2015. **Amendment 18** (2015) eliminated the requirement for vessel owners to submit "did not fish" reports for the months or weeks when their vessel was not fishing, and removed some of the restrictions for upgrading vessels listed on Federal fishing permits. **Framework 9** (2016) modified the southern and eastern boundaries of the Southern Scup Gear Restricted Area (GRA). **Framework 10** (2017) modified the dates of the scup commercial quota periods, such that the month of October was moved to the Winter II quota period.

The Commission's Summer Flounder, Scup, and Black Sea Bass Board has also modified their FMP through several Board-only actions, mostly through their addendum process. These actions are available on the Commission's website at www.ASMFC.org.

4.4.4 Annual Specifications

Summer flounder catch limits and other management measures established under the FMP are annually reviewed and may be revised through a process known as "specifications." This primarily concerns the setting of annual catch and landings limits, which typically fluctuate from year to year based on biological trends in the stock as well as performance of the fisheries. The Council and Board may also modify certain commercial or recreational management measures during the specifications process, such as minimum size limits, possession limits, seasons, gear requirements and restrictions, and exemption programs.

The Council's Scientific and Statistical Committee (SSC) and Monitoring Committee (MC) recommend annual Acceptable Biological Catch (ABC) levels and Annual Catch Limits (ACLs) for summer flounder, which are then approved by the Council and Commission and submitted to NMFS for final approval and implementation. Amendment 2 (1992) set the allocation of 60% of the total allowable landings (TAL) to the commercial sector as a commercial quota, with the other 40% of the TAL allocated to the recreational sector as a recreational harvest limit. Projected discards are apportioned between the commercial and recreational sectors based on a three-year moving average of discards by sector, and combined with the landings limits to derive the sector-specific ACLs.

The Council first implemented recreational and commercial ACLs, with a system of overage accountability, in 2012 (MAFMC 2011). Prior to this time, the fishery was managed based on total allowable landings. Both the ABC and the ACLs are catch limits (i.e., include both projected landings and discards), while the commercial quota and the recreational harvest limit are landing limits.

The recreational measures are considered later in each year because recreational data from the Marine Recreational Information Program (MRIP) becomes available in two-month "waves." The Council and Board want to consider the most up-to-date recreational data possible when making recommendations for the upcoming year.

4.4.5 Commercial Fishery Management

The coastwide annual commercial quota (60% of the TAL for the overall fishery as described above) is currently allocated on a percentage basis to each of the states in the management unit (Maine-North Carolina) based on historical landings from the period 1980-1989.[5] State-by-state allocations were developed to allow each state to develop specific management programs that were designed for the commercial fishery in their state.

The commercial quota is divided among the states based on the allocation percentages given in Table 6 and each state sets measures to achieve their state-specific commercial quotas. These allocations are included in both the Council and the Commission FMPs. When a state's quota has been landed, fishing for and/or landing summer flounder is prohibited in that state. Any quota overages by a state during the year are subtracted from the state's quota the following year.

[5] Estimated landings by state and year for 1980-1989, as of the time of Amendment 2 development, can be found in Table 2 (pounds) and Table 72 (percentage) of the Amendment 2 document, available at: http://www.mafmc.org/s/SFSCBSB_Amend_2.pdf.

Table 6: State-by-state percent share of commercial summer flounder allocation.

State	Allocation (%)
ME	0.04756
NH	0.00046
MA	6.82046
RI	15.68298
CT	2.25708
NY	7.64699
NJ	16.72499
DE	0.01779
MD	2.03910
VA	21.31676
NC	27.44584
Total	100

These state-by-state shares reflect a revision made later in 1993, after the state of Connecticut argued that during the early and mid-1980s, the state did not have the authority to collect landings data from offshore fishermen, nor did NMFS provide a port agent to the state. Thus, the state contended that their commercial landings during the allocation base years were underreported and that its quota share was too small. Amendment 4 (1993) increased Connecticut's quota share from 0.95% to 2.26%.[6]

States are required to adopt appropriate measures to manage their quota shares, and employ a variety of quota periods, trip limits, and other such measures to do so. Quota periods and other quota management measures vary from state to state (Table 7).

[6] Revised 1980-1989 landings by state and year, and the resulting quota shares from Amendment 4 can be found in Table 1 of that document, at: http://www.mafmc.org/s/SFSCBSB_Amend_4.pdf.

Table 7: State-specific commercial quota management summary as of April 2017. States may manage their quota as they see fit each year and some states revise their management strategy frequently.

State	Commercial Quota Management Summary
Massachusetts	Two quota periods (30% allocated to January 1-April 22; 70% to April 23-December 31). Landings or possession of fluke by commercial fishermen allowed from 6 AM to 8 PM daily only. Gear-specific season, open days and possession limits.
Rhode Island	Three quota periods (54% of quota allocated to January 1-April 30; 35% to May 1-October 31; 11% from November 1-December 31). Possession limits vary by period.
Connecticut	The harvest strategy is reassessed each year and modified based on annual quota and industry input. Currently, there are four quota periods: Winter I (January 1-March 31), April, Summer (May 1-October 31), Winter II (November 1-December 31). Quota period year-to-date targets include 25% through Winter I; 95% through April and Summer, and 100% through Winter II. Possession limits vary by period and may be adjusted if period target quota is projected to be landed.
New York	Seven quota periods: January-March (25%); April (10%; May (14%); June-July (27%); August-September (14%); October (5%); December (5%). Initial daily trip limit is 70 lb in period 1 and 50 lb in all other periods. Over/under harvest from period 1 rolls into period 7; over/under harvest from period 2 into period 6; over/under harvest from periods 3 through 5 are rolled into the next period.
New Jersey	Six landings periods with differing daily and/or weekly possession limits: January-February; March-April; May-June; July-August; September-October; November-December. Over/under harvest from any of the first five periods is added or deducted from the following period. 10%, but no more than 200,000 pounds, is allocated to bycatch landings when the directed fishery in a given period is closed. The bycatch allocation is divided between the six seasons at the same percentage as for the directed fishery.
Delaware	Delaware qualifies for *de minimis* status for the commercial summer flounder fishery; the fishery operates under a 200 pound trip limit year round.
Maryland	Managed under an IFQ system, where permit holders may land their allocation year-round with no possession limits. Non-permitted harvesters are subject to the relevant daily possession limits (100 lb per day from the Atlantic Ocean and 50 lb per day from the Chesapeake Bay and tributaries).
Virginia	Two landings periods and a separate allocation for tidal waters. Summer flounder harvest from Virginia tidal waters is limited to 300,000 pounds, 142,114 pounds of which is set aside for the Chesapeake Bay. Period 1 includes the first Monday in January-October 31 (70.7% of the quota after deducting tidal allocation). The second period (November 1-December 31) is allocated 29.3% of the quota, after the tidal allocation. Over/under harvest from the first period may be deducted or added to the second. Possession limits vary by period.
North Carolina	The North Carolina season for landing ocean-caught flounder opens January 1 each year. If 80 percent of the quota is projected to be taken, North Carolina ports are closed to landing of flounder taken from the ocean. The season reopens November 1 if there is remaining quota. If after reopening, if 100 percent of the quota is projected to be taken prior to the end of the year, the fishery is closed.

Amendment 5 (1993) allowed two or more states, with the consent of NMFS, to transfer or combine their summer flounder commercial quota under mutual agreement and with the approval of the NMFS Regional Administrator. These transfers do not permanently affect the state specific share of the coastwide quota that each state receives each year. The ability to transfer or combine quota allows states the flexibility to respond to variations in the resource, short term emergency situations, often called "safe harbor" requests (e.g., when it is unsafe for a vessel to return to its intended port because of weather, mechanical breakdown of vessel, injured crew member, etc.), or other factors affecting the distribution of catch. A quota transfer may take place after the Regional Administrator receives a request from two or more states, considers the requirements of the quota transfer regulations, and makes a determination to transfer the quota. Approved quota transfers are published in the Federal Register.

Currently, both the Council and Commission's FMPs require a 14-inch total length minimum fish size in the commercial fishery. Trawl nets are required to have 5.5-inch diamond or 6-inch square minimum mesh in the entire net for vessels possessing more than the threshold amount of summer flounder (i.e., 200 lb from November 1-April 30 and 100 lb from May 1-October 31). These requirements are in place in the federal regulations for federal waters and federal permit holders, and each state within the management unit is required to implement these measures as a condition of compliance with the Commission's FMP. A thorough review of summer flounder commercial management measures that can be modified through specifications was conducted in the fall of 2015. The report on those measures can be found at: http://www.mafmc.org/s/Tab11_SF-S-BSB-Commercial-Measures.pdf.

Commercial landings relative to the commercial quotas has varied over the years since quotas were implemented. Reporting and in-season monitoring have improved, meaning that generally the commercial fishery is able to achieve landings very close to the commercial quota in any given year (Figure 1).

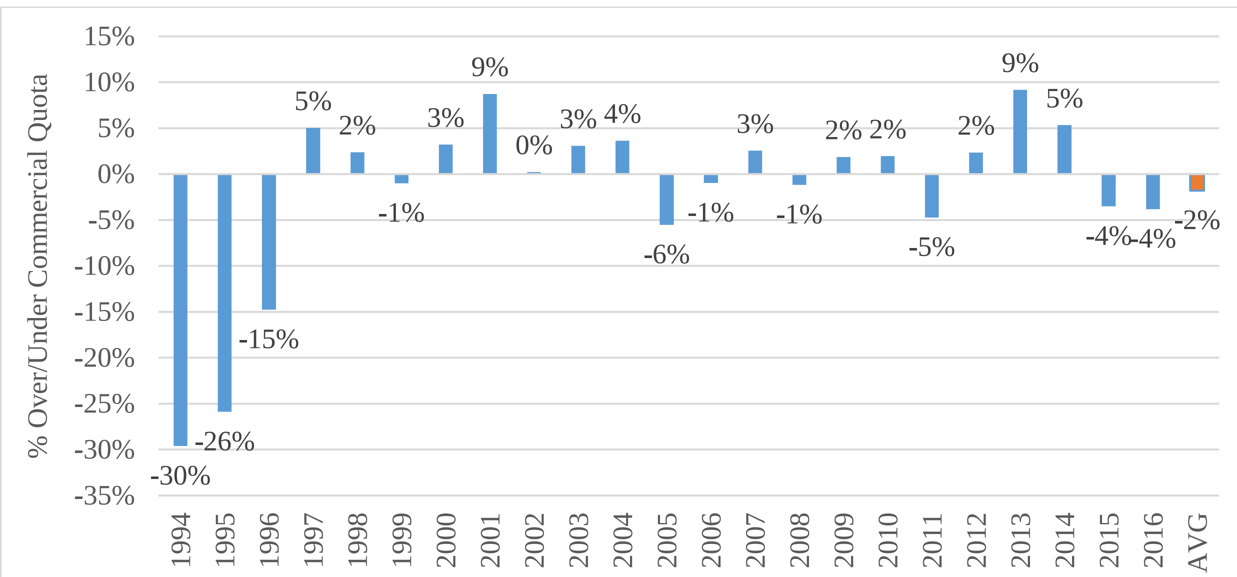

Figure 1: Percent overage/underage relative to summer flounder commercial quota since 1994. Data source: NMFS dealer data as of May 2017.

4.4.6 Recreational Fishery Management

There is a significant recreational fishery for summer flounder, primarily in state waters when the fish migrate inshore during the warm summer months. Each year the Council and Board approve a recreational harvest limit in pounds (landings only) as well as a recreational ACL (landings and discards). The Council and Board also determine annually whether to manage the recreational fishery under coastwide measures or conservation equivalency, as specified under Addendum

IV/Framework 2 (2001) and Addendum VIII/Framework 6 (2003) to the FMPs. Under conservation equivalency, state- or region- specific measures are developed through the Commission’s management process and submitted to NMFS. The combined state or regional measures must achieve the same level of conservation as would a set of coastwide measures developed to adhere to the overall recreational harvest limit. If NMFS considers the combination of the state- or region- specific measures to be "equivalent" to the coastwide measures, they may then waive the coastwide regulation in federal waters. Anglers fishing in federal waters are then subject to the measures of the state in which they land summer flounder. The recreational fishery has been managed using conservation equivalency each year since 2001 (state-specific conservation equivalency through 2013, and regional conservation equivalency since 2014). Recreational measures for 2018 are shown in Table 8.

Table 8: 2017 regional measures for summer flounder and preliminary landings (in thousands of fish) by state and region (regions shaded), 2018.

State	Minimum Size (inches)	Possession Limit	Open Season
Massachusetts	17	5 fish	May 23-October 9
Rhode Island	19	6 fish	May 1-December 31
Connecticut	19	4 fish	May 4- September 30
CT Shore Program (45 designed shore sites)	17		
New York	19	4 fish	May 4- September 30
New Jersey	18	3 fish	May 25-September 22
NJ Shore program site (Island Beach State Park)[a]	16	2 fish	
New Jersey/Delaware Bay COLREGS	17	3 fish	
Delaware	16.5	4 fish	January 1- December 31
Maryland	16.5	4 fish	January 1- December 31
PRFC	16.5	4 fish	January 1- December 31
Virginia	16.5	4 fish	January 1- December 31
North Carolina	15	4 fish	January 1- December 31

4.4.7 History of This Action

In the years leading up to the initiation of this action in December 2013, a number of issues and concerns relative to summer flounder management were raised by Council and Commission members, advisors, and other interested stakeholders. The Council received significant input on summer flounder management during the Council's Visioning and Strategic Planning process, conducted from 2011-2013. During this process, input gathered from surveys, port meetings, and other comment opportunities indicated there was significant stakeholder interest in re-examining and updating summer flounder management strategies.

The Council and Commission proposed this action to evaluate the need for management response to changing conditions in the summer flounder fishery. This includes addressing apparent shifts in the distribution and center of biomass for the summer flounder stock (possibly related to the effects of rebuilding and/or climate change), as well as changing social and economic drivers for these fisheries. This action was proposed so that the FMP goals, objectives, and management strategies could be assessed in light of these changing fishery conditions, and can be better aligned with stakeholder priorities.

In December 2013, the Council moved:

> "…that the Council, pursuant to its strategic plan, develop an amendment to the FMP for summer flounder that will review & update the goals and objectives of the plan and re-examine the fishery management strategies for the commercial & recreational fisheries."

In June 2014, the Council moved to request that NMFS revise the control date for the commercial summer flounder fishery, for potential use in development of federal permit requalification alternatives. In August, NMFS published an advanced notice of proposed rulemaking, establishing August 1, 2014 as the new control date for the commercial summer flounder fishery (79 FR 44737).

A notice of intent to prepare an EIS was published in the Federal Register on September 16, 2014 (79 FR 55432). NEPA requires that the Council conduct one or more scoping meetings to inform interested parties of the proposed action and alternatives, and to solicit comments on the range and type of analysis to be included in the EIS. A scoping process was conducted from September 16, 2014 through October 31, 2014. Fourteen public scoping hearings were held from Massachusetts through North Carolina.[7] Hearings were attended by approximately 200 people in total. In addition, a total of 100 written comments were received via email (49), web form (31), mail (17), or fax (3).

Based on the scoping comments received, in December 2014 the Council and Board identified general categories of issues to be explored through the amendment process as possible alternative sets, including 1) FMP goals and objectives, 2) the allocation between the commercial and recreational fisheries, 3) recreational management measures and strategies, and 4) commercial measures and strategies.

However, later in the amendment process, the Council and Board opted to split the action to delay development of FMP modifications involving recreational fishery issues. This decision was due to changes in the Marine Recreational Information Program (MRIP) that were expected to substantially change the time series of recreational catch and harvest. Because this data would be relied upon for analysis of recreational issues, the Council and Board eventually determined that it was problematic to pursue major changes to recreational FMP elements until the MRIP revisions were finalized and the new datasets were publicly available. Thus, the Council and Board chose to delay action on any issues that would rely heavily on recreational data, including: 1) quota allocation between the commercial and recreational sectors and 2) recreational management measures and strategies.

In 2017, the Council and Board identified the following priority issues for development within this action:

1. Fishery Management Plan (FMP) goals and objectives for summer flounder (section 4.2)
2. Commercial management measures and strategies, including:
    1. Federal commercial moratorium permit requalification (section 5.1)

[7] Scoping documents, including schedule and scoping comment summary, are available at: http://www.mafmc.org/actions/summer-flounder-amendment.

2. Commercial allocation (section 5.2)
3. Landings flexibility framework provisions (section 5.3).

Draft options for the above issues were developed by staff and FMAT and refined by the Demersal Committee through several meetings in 2017. The Council and Board approved a range of alternatives for public hearings, based on the Demersal Committee recommendations, at the December 2017 meeting, and approved a public hearing document in April 2018.

5.0 MANAGEMENT ALTERNATIVES

This amendment considers revisions to the commercial summer flounder moratorium permit qualifications, revisions to the commercial allocation formula for summer flounder, and the addition of framework provisions to the FMP that would allow for future framework actions to establish commercial landings flexibility policies.

In recognition of the diversity of potential solutions to these goals, a range of possible options for management measures ("alternatives") were developed for consideration in terms of their effectiveness and practicability. This approach also complies with the statutory requirements of the National Environmental Policy Act (NEPA) for a consideration of a "range of alternatives" in evaluating the environmental impacts of federal actions. The range of alternatives is presented below. Section 5.1 describes the commercial moratorium permit requalification options, section 5.2 describes the commercial allocation options, and section 5.3 describes the framework provision options for landings flexibility. In addition, several alternatives were considered by the Council and Board and rejected for further analysis. These "considered but rejected" alternatives are described in section 5.4. The complete analyses of the biological, economic, and social impacts of the alternatives presented in sections 5.1-5.3 are presented in section 7.0 of this document.

Note: The Council and Board have not yet identified preferred alternatives.

5.1 Alternative Set 1: Federal Moratorium Permit Requalification

This action considers revision to the requalification criteria for federal summer flounder commercial moratorium permits. The permit requalification alternatives (sub-alternatives under alternative 1B) consider various combinations of landings thresholds and time periods over which those landings thresholds must have been achieved. Only current moratorium rights holders could requalify, and this action **would not allow new entrants to obtain a permit** based on the qualifying criteria. **This action does not consider permit qualification at the state level.**

5.1.1 Alternative 1A: No Action/*Status Quo*

This alternative would make no changes to the current eligibility for commercial moratorium permits for summer flounder. There is a single limited access federal permit category for the summer flounder commercial fishery: summer flounder moratorium permits. There is no commercial open access permit category for summer flounder nor are there separate permits for incidental catch. A moratorium permit is required to fish commercially for summer flounder in federal waters, and to sell any amount of summer flounder to a federally permitted dealer.

Moratorium permits were established via Amendment 2 to the FMP (1993) and were issued to the owner or operator of a vessel that landed and sold summer flounder in the management unit between January 26, 1985 and January 26, 1990, OR the vessel was under construction for, or was being re-rigged for, use in the directed fishery for summer flounder on January 26, 1990 (provided the vessel had landed summer flounder for sale prior to implementation of Amendment 2).

All moratorium permits must be reissued on an annual basis by the last day of the fishing year for which the permit is required, unless a Confirmation of Permit History (CPH) has been issued (as described below). To be eligible for a moratorium permit, a vessel must have been issued a moratorium permit in the previous year or be replacing a vessel that was issued a moratorium permit after the owner retires the vessel from the fishery.

The fishing and permit history of a vessel is presumed to transfer with the vessel whenever it is bought, sold, or otherwise transferred, unless there is a written agreement verifying that the transferor/seller is retaining the vessel's fishing and permit history for purposes of replacing the vessel. A limited access permit cannot be "split" from another limited access permit; generally, this means if two or more different limited access permits are on one boat they may not be divided and put on two or more boats.

Confirmation of Permit History

A CPH may be issued when a vessel that has been issued a limited access permit has sunk, been destroyed, or has been sold to another person without its permit history. Possession of a CPH will allow the permit holder to maintain landings history of the permit without owning a vessel. A CPH preserves the eligibility of an individual to apply for a limited access permit for a replacement vessel based on the previous qualifying vessel's fishing and permit history at a subsequent time, subject to the replacement provisions specified in the federal regulations at §648.4. The CPH remains valid until the fishing and permit history preserved by the CPH is used to qualify a replacement vessel for a limited access permit.

Vessel Replacements and Upgrades

A permit holder can submit documentation of a replacement of one vessel or CPH with another vessel and the transfer of fishing histories and limited access permit eligibility from the old vessel or CPH to the new vessel. The qualifying vessel or CPH must be under the identical ownership as the replacement vessel. The vessel length and engine horsepower may be increased either through an upgrade or a replacement. A 10% increase in length overall and a 20% increase in engine horsepower are allowed.

Moratorium Right IDs

A moratorium right ID (MRI) is a unique number associated with a specific fishing right for summer flounder, used by GARFO to track where a particular permit history has been transferred in a vessel replacement and over time. This number is created through the original qualification process for a moratorium program.

A single vessel, regardless of its unique vessel permit number, may have multiple different MRIs (e.g., one MRI for its summer flounder permit, one for its scup permit, one for its scallop permit). If permit history has been transferred from Vessel A to Vessel B (i.e., the vessels via a vessel replacement move their fishing permits from one vessel to the other), the MRIs associated with those three permits of Vessel A would be transferred to Vessel B, even though the vessel permit numbers would stay the same for each vessel and would not transfer. For this reason, a single vessel (identified through its permit number) may be associated with multiple MRIs for summer flounder over time. The fishing permit history and associated landings would be captured through a review at the MRI level, rather than the vessel permit.

5.1.2 Alternative 1B: Requalifying Criteria for Federal Commercial Moratorium Permits

Alternative 1B would impose requalification criteria on current federal summer flounder moratorium permits. Permits not meeting the requalification criteria would be cancelled and could not be renewed. Permits in CPH could requalify if they meet the requalifying criteria. This alternative would **not** allow new entrants to qualify for a moratorium permit.

Alternative 1B has seven sub-alternatives with various combinations of qualification time periods and landings thresholds. Each of the sub-alternatives uses the revised control date for the commercial summer flounder fishery of August 1, 2014, which was published on that date by NMFS at the request of the Council (79 FR 44737). The establishment of the control date notified the public that the Council was considering future limitations on the number of federally permitted participants in the fishery. The control date was intended to help the Council and Board to identify latent effort in the summer flounder fishery. All time frame criteria within all seven sub-alternatives below use requalifying time periods for summer flounder landings *prior to* August 1, 2014.

As described above, eligibility for moratorium permits is tracked by NMFS using a unique moratorium right ID (MRI) number associated with a specific fishing right. This allows permit history tracking where permit history has been transferred in a vessel replacement and over time. Permit history can transfer between vessels through a vessel replacement, and the MRIs associated with those permits transfer as well, even though the vessel permit numbers remain the same for each vessel. For this reason, a single vessel permit number may be associated with multiple MRIs for summer flounder over time. **In this action, any requalification would be done on the basis of landings associated with the MRI, and not the vessel permit number**, since a single MRI could be associated with multiple vessels over time.

If the Council and Board select alternative 1B, one of the sub-options below in Table 9 would need to be selected. The time periods listed below are inclusive of the start and end dates (e.g., option 1B-1 would include qualifying landings dated August 1, 2009 through July 31, 2014). The data used for re-qualification would include commercial summer flounder landings as maintained in NMFS dealer records.

Table 9: Sub-alternatives under Alternative 1B, with comparison to Alternative 1A (*status quo*) and associated number of moratorium rights retained and eliminated. Landings thresholds refer to commercial landings of summer flounder associated with each MRI.

Comparison to *Status Quo*	**Time Period**	**Landings Threshold**	**# Current MRIs**	**% MRIs Requalifying**	**# MRIs Eliminated**	**% MRIs Eliminated**
Alternative 1A (No Action)	*January 26, 1985 - January 26, 1990 (5 yrs)*	*At least 1 pound in any year over this time period*	*940*	*100%*	*N/A*	*N/A*
Sub-alternative under 1B	**Time Period**	**Landings Threshold**	**# MRIs Requalifying**	**% MRIs Requalifying**	**# MRIs Eliminated**	**% MRIs Eliminated**
Alternative 1B-1	August 1, 2009-July 31, 2014 (5 yrs)	≥1,000 pounds cumulative over this time period	425	45%	516	55%
Alternative 1B-2	August 1, 2009-July 31, 2014 (5 yrs)	At least 1 pound in any year over this time period	493	52%	448	48%
Alternative 1B-3	August 1, 2004-July 31, 2014 (10 yrs)	≥1,000 pounds cumulative over this time period	552	59%	389	41%
Alternative 1B-4	August 1, 2004-July 31, 2014 (10 yrs)	At least 1 pound in any year over this time period	635	67%	306	33%
Alternative 1B-5	August 1, 1999-July 31, 2014 (15 yrs)	≥1,000 pounds cumulative over this time period	646	69%	295	31%
Alternative 1B-6	August 1, 1994-July 31, 2014 (20 yrs)	At least 1 pound in 20% of years in time period (i.e., in at least 4 years over this 20-year period)	670	71%	271	29%
Alternative 1B-7	August 1, 1994-July 31, 2014 (20 yrs)	≥1,000 pounds cumulative over this time period	708	75%	233	25%

5.2 Alternative Set 2: Commercial Quota Allocation

Alternative set 2 contains options for modifying the current state-by-state commercial allocation. All of the alternatives below assume the retention of the current process of subtracting projected commercial discards from the commercial ACL to arrive at a given year's commercial quota. The alternatives below relate to how that commercial quota is distributed by state and throughout the fishing year. GARFO would remain responsible for final landings and overage accounting for each state (where applicable) and for coastwide accounting within the management unit.

Allocation changes through any of the alternatives in this action would be considered a one-time indefinite change. However, **the Council and Board intend to review any selected allocation in not more than 10 years from implementation of this action, to determine whether additional modifications may be warranted**. Following this planned review, the Council and Board may or may not initiate a future action to further revise commercial allocations in this fishery.

5.2.1 Alternative 2A: No Action/*Status Quo*

This alternative would make no changes to the current state allocation percentages. Currently, the coastwide quota is divided on a percentage basis to each of the states in the management unit (Maine-North Carolina) based on historical commercial landings from the period 1980-1989 (Table 1). Each state then sets measures to achieve, but not exceed, their annual state-specific commercial quotas. These allocations are included in both the Council and the Commission FMPs. When a state's quota has been landed in a given year, commercially targeting and/or landing summer flounder is prohibited in that state. Any quota overages by a state during the year are subtracted from that state's quota the following year.

State-by-state allocations based on 1980-1989 data were developed via Amendment 2 (1993)[8] to allow each state to develop specific management programs that were designed for the commercial fishery in their state. A simple annual coastwide system was determined to be infeasible because of the migratory patterns of summer flounder. Without some mitigating measures, fishermen at the southern end of the range could possibly catch all the quota before fishermen at the northern end of the range had access to the summer flounder.

In 1993, the state of Connecticut argued that during the early and mid-1980s, the state did not have the authority to collect landings data from offshore fishermen, nor did NMFS provide a port agent to the state. Thus, the state contended that their commercial landings during the allocation base years were underreported and that its quota share was too small. Amendment 4 (1993) increased Connecticut's quota share from 0.95% to 2.26%.[9] Amendment 5 (1993) allowed two or more states, with the consent of NMFS, to transfer or combine their summer flounder commercial quota. These transfers do not permanently affect the state specific share of the coastwide quota that each state receives each year.

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[8] Estimated landings by state and year for 1980-1989, as of the time of Amendment 2 development, can be found in Table 2 (pounds) and Table 72 (percentage) of the Amendment 2 document, available at: http://www.mafmc.org/s/SFSCBSB_Amend_2.pdf.

[9] Revised 1980-1989 landings by state and year, and the resulting quota shares from Amendment 4 can be found in Table 1 of that document, at: http://www.mafmc.org/s/SFSCBSB_Amend_4.pdf.

States are required to adopt appropriate measures to manage their quota shares, and employ a variety of quota periods, trip limits, and other such measures to do so. Quota periods and other quota management measures vary from state to state (see section 6.5.2, Table 7).

Table 10: Alternative 2A: No Action/Status Quo; current allocations based on 1980-1989 landings. Quota percentages are taken out to five decimal places in the FMPs and federal regulations.

State	Allocation (%)
ME	0.04756
NH	0.00046
MA	6.82046
RI	15.68298
CT	2.25708
NY	7.64699
NJ	16.72499
DE	0.01779
MD	2.03910
VA	21.31676
NC	27.44584
Total	100

5.2.2 Alternative 2B: Adjust State Quotas Based on Recent Biomass Distribution

Alternative 2B would adjust the current state-by-state quota allocations based on a regional shift in exploitable biomass derived from Northeast Fisheries Science Center (NEFSC) trawl survey data. This would create a basis for state allocations that combines both *status quo* allocations (based solely on landings history) and distribution of biomass (which was not used in development of the current allocations).

A 2017 NEFSC analysis calculated an approximate shift in the percentage of exploitable biomass in a Northern vs. Southern region within the management unit (divided approximately at Hudson Canyon), compared across the ten-year time periods of 1980-1989 and 2007-2016. Calculations were based on NEFSC spring and fall trawl survey catches, length-calibrated to R/V Albatross IV (ALB) equivalents. NEFSC trawl survey data was used because they represent the only data sets spatially and temporally comprehensive enough to describe changes in geographic distribution of the stock over time.

To focus on allocation of commercial landings, length cutoffs were used for summer flounder caught in the survey to identify biomass retainable by the commercial fishery. Given that the commercial minimum size has remained at either 13 or 14 inches over the entire time series, the commercial size frequency has not shifted substantially over the time series. Thus, a 14 inch = 36 cm length cut-off was used for both time periods to capture virtually all of the commercial landings length range in both periods (and some commercial discards), to derive an index of exploitable biomass.

Survey strata were grouped into two regions divided approximately at Hudson Canyon: a Northern region with waters approximately off the states New York and north, and a Southern region with waters approximately off the states New Jersey and south. Based on recommendations of the

Demersal Committee in November 2017, the analysis was revised to include additional survey strata in the Gulf of Maine and Georges Bank. A more detailed description of the analysis methods, including details of the survey strata divisions, can be found in **APPENDIX B** of this document.

North and South indices were weighted by the area surveyed (NM^2) to provide seasonal total indices to express the Northern percentage of the total exploitable biomass for each season and period. The seasonal (spring and fall) exploitable biomass was then summed for each region to calculate total relative biomass for each region and period. Figure 2 shows the results for trends in spring relative biomass for 1980-1989 and 2007-2016 and Figure 3 shows the fall relative biomass over the same time periods.

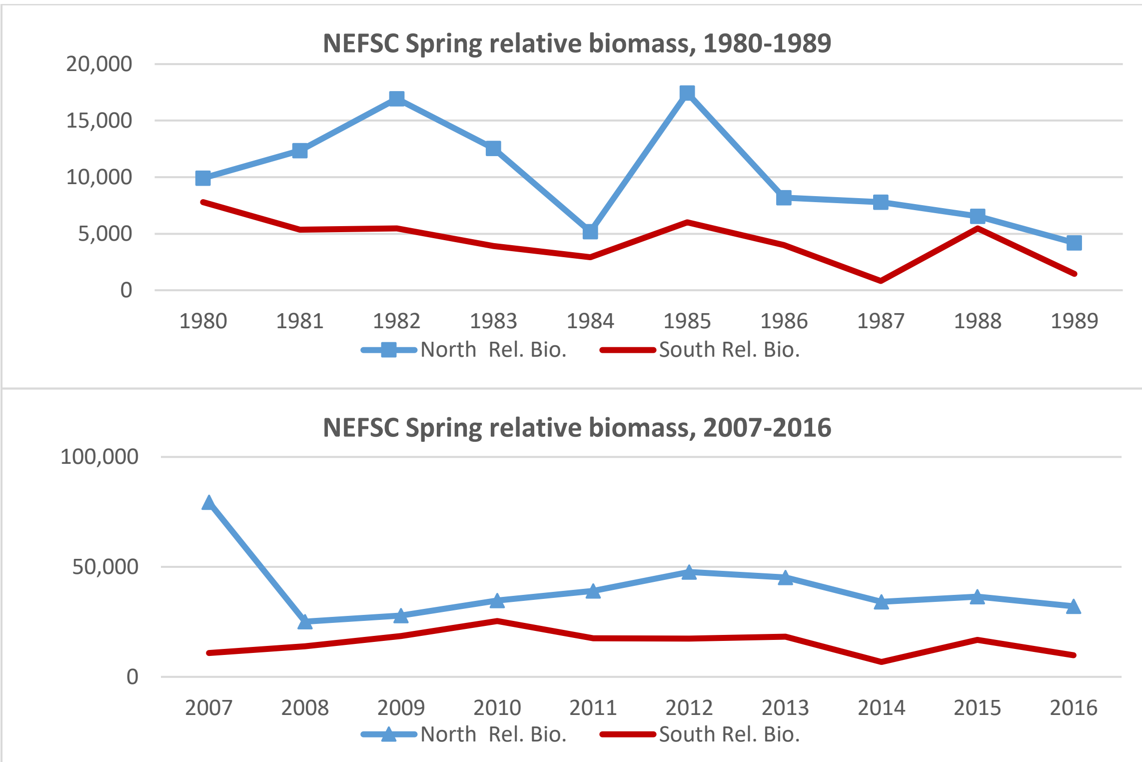

Figure 2: NEFSC spring survey relative biomass for 1980-1989 and 2007-2016; relative to area surveyed.

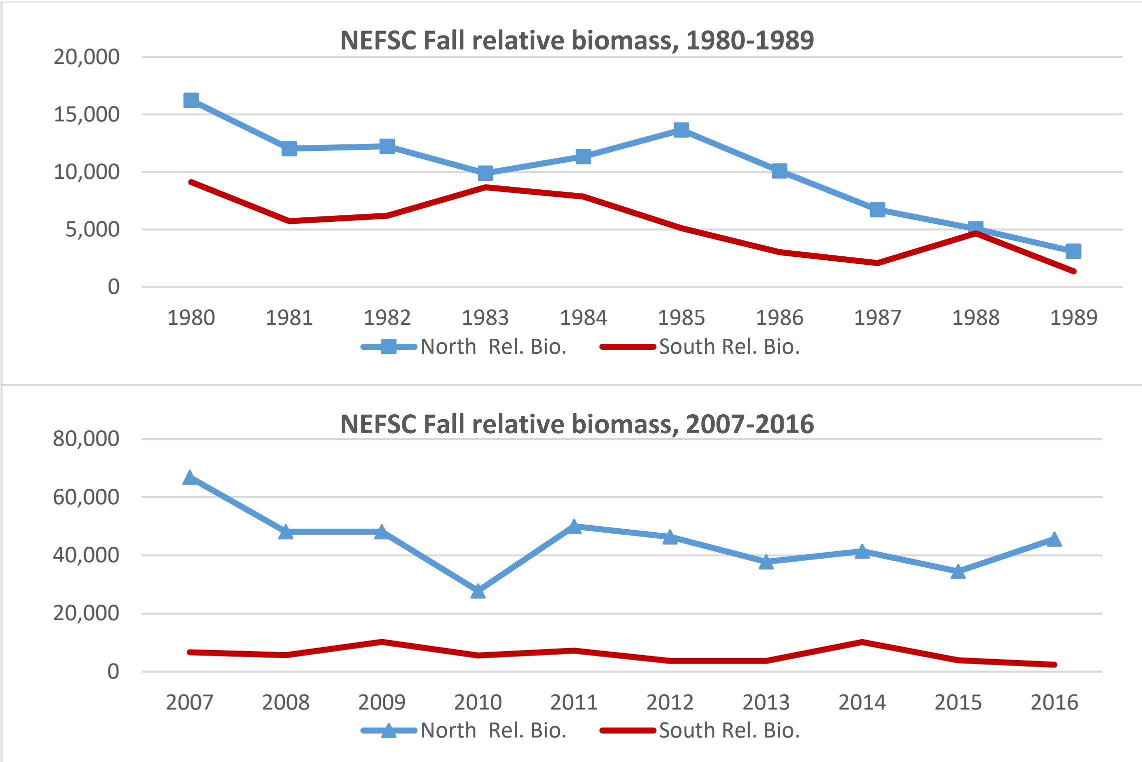

Figure 3: NEFSC fall survey relative biomass for 1980-1989 and 2007-2016; relative to area surveyed.

For relative exploitable biomass averaged over each period, the Northern region percentage increased from 67% on average during 1980-1989 to 80% on average during 2007-2017 (Figure 4) an absolute increase of 13% relative to the coast (+13% in the Northern region, -13% in the Southern region).

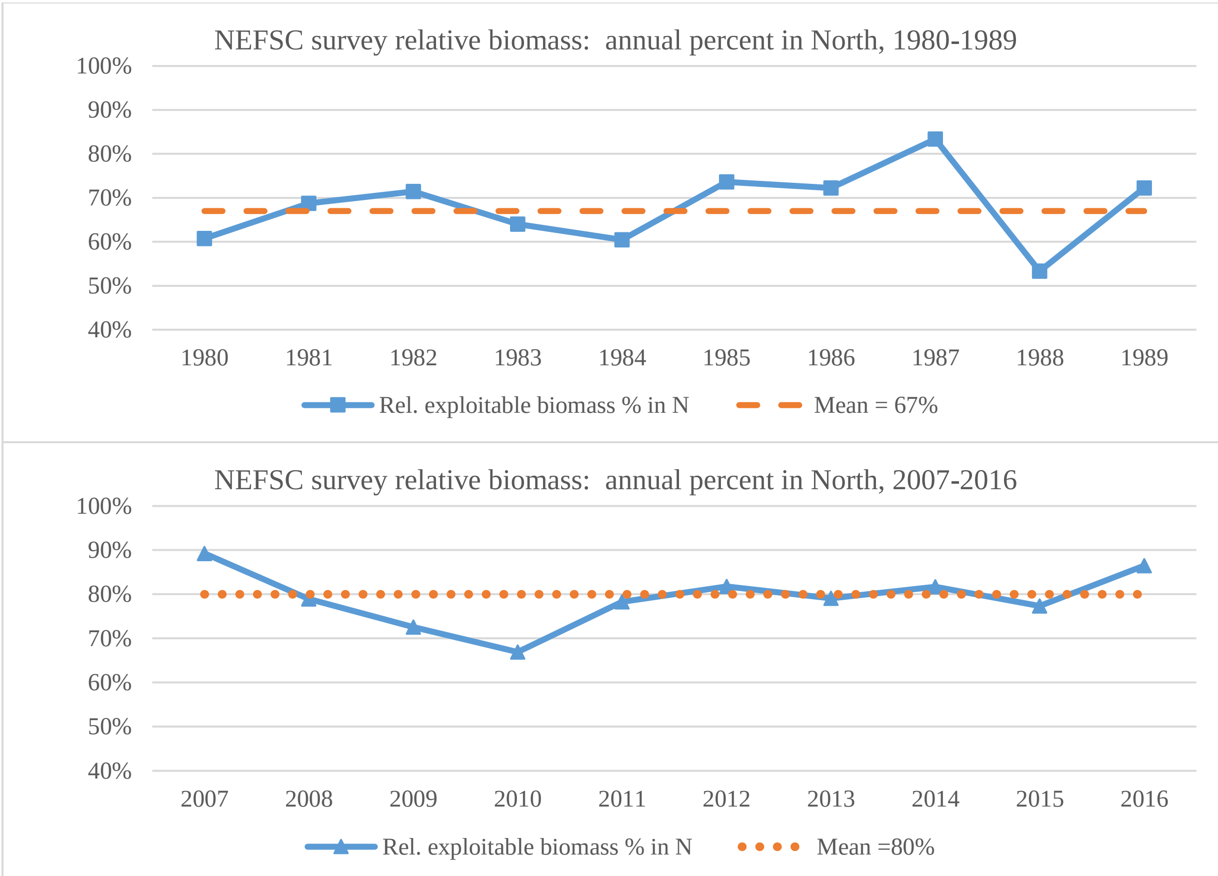

Figure 4: NEFSC survey relative biomass annual percent in Northern region, 1980-1989 and 2007-2016. The remaining relative biomass is attributable to the Southern region.

Under alternative 2B, the change in Northern region relative exploitable biomass would serve as the basis for adjustments to the current state-by-state allocation percentages. Two mathematical methods are proposed as **two sub-alternatives under alternative 2B**, to translate the change in regional exploitable biomass into changes in allocation. These two different approaches, sub-alternatives 2B-1 and 2B-2 described below, are both mathematically justified but have a slightly different emphasis on how much of the revised allocation should be based on recent (2007-2016) exploitable biomass distribution.

The key difference in the sub-alternatives below is whether changes in biomass and allocation are calculated as an absolute shift relative to the coast, or as a percent change relative to the Northern region. For reference, **absolute change or shift** describes the simple difference between the proportions attributable to the Northern and Southern regions in each time period. (e.g., 67% relative exploitable biomass in the North on average from 1980-1989 grew to 80% relative exploitable biomass on average from 2007-2016, an absolute increase in the North of 13%). This describes how the proportions change in the North and South **relative to the coastwide total**.

Percent change expresses the change (percent increase or decrease) **relative to the original regional value**.[10] Because this is an expression of the change between two values relative to the regional starting value, this needs to be calculated using either the Northern or Southern region as the "starting value," with a subsequent adjustment to the other region to make the total allocations equal to 100%.

Regardless of the method, absolute change between the North and South, relative to the coastwide total allocation, will always be equivalent in magnitude (+ to the North, - to the South), since the total coastwide allocation is always 100%. However, the percentage change (% increase or decrease) in state/regional quotas relative to the previous state/regional quotas will never be equivalent in magnitude regardless of the method, because regional starting allocations are different (i.e., starting allocations are not 50/50). If allocations are adjusted using percent changes, a decision needs to be made to start with either the North or the South, and adjust the other region so that final allocations add to 100%.

5.2.2.1 *Sub-Alternative 2B-1: Revised Allocation based on Northern Region Percent Change in Exploitable Biomass*

The method under alternative 2B-1 translates the change in regional exploitable biomass into a relative change in allocation by taking the percentage change in biomass in the Northern region over the two time periods and applying this as a percentage change to the current Northern regional allocation.

Between 1980-1989 and 2007-2016, as a percent change, the Northern region relative exploitable biomass increased by 19% relative to the 1980-1989 average value ((80-67)/67)*100=+19%). This percentage is then applied to the current Northern regional allocation (combination of state allocations ME-NY) as a percent increase: (32.45%*1.19 = 38.62% revised allocation to the Northern region). The Southern region's allocation is then calculated as the remainder of the coastwide allocation, (i.e., 100%-38.62%=61.38%). Each regional allocation is divided into state shares based on each state's current proportion of the regional allocation (e.g., Rhode Island currently has 48.32% of the Northern region allocation; this percentage is applied to the revised regional quota allocation of 38.62%).

Alternative 2B-1 is designed to shift current regional allocations in proportion to the regional change in relative exploitable biomass, and maintains more of a connection to the *status quo* allocation compared to alternative 2B-2 while still accounting for how the regional exploitable biomass has shifted over time. The results of this approach produce a modest shift in allocation relative to the coast, shifting 6% of the coastwide allocation from the South to the North. Relative to the existing regional allocations as a percent change, this constitutes a 19% increase in the Northern region's allocation (relative to their starting allocation of ~32.5%), and a 9% decrease in the Southern region allocation (relative to their starting allocation of ~67.5%; again, these percent changes are not equivalent in magnitude because the starting allocation in each region is different). A summary of the resulting regional and state allocations, as well as the changes relative to the coast and relative to the starting regional allocations, are shown in Table 11. Revised allocations are taken to five decimal places to be consistent with the current state level allocations.

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[10] Percent change is calculated by taking the increase or decrease between the two values, divided by the starting value, using the formula: Percent change = (New value-Old value)/Old Value x 100. Positive values indicate a percentage increase; negative values indicate a percentage decrease.

Table 11: Alternative 2B-1: adjustment based on Northern region percent change in exploitable biomass. This option expresses the shift in relative exploitable biomass in the North as the percent change between 67 and 80% (=19%) and applies this change as a percent change to the Northern allocation. Southern allocations are calculated from this basis such that total allocations add to 100%. Example state quotas are provided based on an 8.12 million lb coastwide quota with comparison to status quo distribution under the same quota.

State	A) Status quo state allocation (%)	B) Status quo % of regional allocation	C) Status quo state % of regional total (N or S)	D) Revised regional allocation with 19% increase to N states (% change)	E) Revised state allocation under Alt 2B-1 (%)[a]	F) Percent change relative to existing state allocation	G) Change in share of total coastwide quota	H) Example allocation (lbs) based on 8.12 million lb quota	I) *Status Quo* allocation (lbs) based on 8.12 million lb quota
ME	0.04756	32.45553	0.14654	38.62208	**0.05660**	+19.0%	+0.00904	4,596	3,862
NH	0.00046		0.00142		**0.00055**	+19.0%	+0.00009	44	37
MA	6.82046		21.01479		**8.11635**	+19.0%	+1.29589	659,047	553,821
RI	15.68298		48.32144		**18.66275**	+19.0%	+2.97977	1,515,415	1,273,458
CT	2.25708		6.95438		**2.68593**	+19.0%	+0.42885	218,097	183,275
NY	7.64699		23.56144		**9.09992**	+19.0%	+1.45293	738,913	620,936
NJ	16.72499	67.54448	24.76145	61.37792	**15.19806**	-9.1%	-1.52693	1,234,083	1,358,069
DE	0.01779		0.02634		**0.01617**	-9.1%	-0.00162	1,313	1,445
MD	2.0391		3.01890		**1.85294**	-9.1%	-0.18616	150,459	165,575
VA	21.31676		31.55959		**19.37062**	-9.1%	-1.94614	1,572,894	1,730,921
NC	27.44584		40.63373		**24.94014**	-9.1%	-2.50570	2,025,139	2,228,602
Total	100	100	--	100	**100**	--	0	8,120,000	8,120,001

[a] Column E calculated by applying the *status quo* state percentage of regional allocation (column C) to the revised regional allocation with a 19% increase to the Northern region, as a percent change relative to the existing Northern region allocation (column D).

5.2.2.2 Sub-Alternative 2B-2: Revised Allocation based on Absolute Change in Regional Proportions

The method under alternative 2B-2 would calculate the change in proportion of relative exploitable biomass relative to the coast (+13% to the Northern region and -13% to the Southern region) and apply this change as an absolute shift in regional allocation. In other words, 13% of the coastwide quota (derived from the absolute shift in exploitable biomass) would be subtracted from the Southern region's quota and added to the Northern region's quota:

- (Existing Northern region allocation) + 13% = (New Northern region allocation), i.e.: (32.46% + 13%) = 45.46%
- (Existing Southern region allocation) - 13% = (New Southern region allocation), i.e.: (67.54% - 13%) = 54.54%

As with sub-alternative 2B-1 above, each regional allocation is then divided into state shares based on each state's current proportion of the regional allocation (e.g., Rhode Island currently has 48.32% of the Northern region allocation; this percentage is applied to the revised regional quota allocation of 45.46%).

Alternative 2B-2 creates a basis for allocation that is more based on recent relative exploitable biomass than alternative 2B-1, by more heavily factoring in recent biomass by region into the allocation. This option simply takes the change in regional exploitable biomass relative to the coast over the two time periods (13% shift) and applies this as additional quota in the Northern region. This creates an allocation with more of a basis in recent distribution by region, and less of a basis in *status quo* allocations/historical landings.

The results of this approach produce a more substantial shift in allocation relative to the coast, shifting 13% of the coastwide allocation to the Northern region and reducing the Southern region allocation by 13%. Relative to the existing regional allocations as a percent change, this constitutes a 40% increase in the Northern region's allocation (relative to their starting allocation of ~32.5%), and a 19% decrease in the Southern region allocation (relative to their starting allocation of ~67.5%; again, these percent changes are not equivalent in magnitude because the starting allocation in each region is different). A summary of the resulting regional and state allocations, as well as the changes relative to the coast and relative to the starting regional allocations, are shown in Table 12.

Table 12: Allocation modification under Alternative 2B -2 described above. This option uses the 13% absolute shift (67% to 80%) in relative exploitable biomass and applies this change additively to the existing regional allocations. Example state quotas are provided based on an 8.12 million lb coastwide quota with comparison to status quo distribution under the same quota.

State	A) Status quo state allocation (%)	B) Status quo % of regional allocation	C) Status quo state % of regional total (N or S)	D) Revised regional allocation with 13% additive increase to N region	E) Revised state allocation under Alt 2B-2[a]	F) Percent change relative to existing state allocation	G) Change in share of total coastwide quota	H) Example allocation (lbs) based on 8.12 million lb quota	I) *Status Quo* allocation (lbs) based on 8.12 million lb quota
ME	0.04756	32.45553	0.14654	45.45553	**0.06661**	+40.1%	+0.01905	5,409	3,862
NH	0.00046		0.00142		**0.00064**	+40.1%	+0.00018	52	37
MA	6.82046		21.01479		**9.55238**	+40.1%	+2.73192	775,653	553,821
RI	15.68298		48.32144		**21.96477**	+40.1%	+6.28179	1,783,539	1,273,458
CT	2.25708		6.95438		**3.16115**	+40.1%	+0.90407	256,685	183,275
NY	7.64699		23.56144		**10.70998**	+40.1%	+3.06299	869,650	620,936
NJ	16.72499	67.54448	24.76145	54.54447	**13.50600**	-19.2%	-3.21899	1,096,687	1,358,069
DE	0.01779		0.02634		**0.01437**	-19.2%	-0.00342	1,167	1,445
MD	2.0391		3.01890		**1.64664**	-19.2%	-0.39246	133,707	165,575
VA	21.31676		31.55959		**17.21401**	-19.2%	-4.10275	1,397,778	1,730,921
NC	27.44584		40.63373		**22.16345**	-19.2%	-5.28239	1,799,672	2,228,602
Total	100	100	--	100	100	--	0	8,120,000	8,120,001

[a] Column E calculated by applying the *status quo* state percentage of regional allocation (column C) to the revised regional allocation with a 13% shift from the Southern to the Northern states (column D).

5.2.3 Alternative 2C: Revise State Allocations Above a Commercial Quota Trigger Point

This alternative would create state allocations that vary with overall stock abundance and resulting commercial quotas. For all years when the annual commercial quota is at or below a specified annual commercial quota trigger level, the state allocations would remain *status quo*. In years when the annual coastwide quota exceeded the specified trigger, the trigger amount would be distributed according to *status quo* allocations, and the additional quota beyond that trigger would be distributed differently, as described below. There are two sub-alternatives for commercial quota triggers under this alternative:

- **Alternative 2C-1**: 8.40-million-pound trigger based on the recent five-year average of commercial quotas (2014-2018) and;
- **Alternative 2C-2**: 10.71-million-pound trigger based on the recent ten-year average of commercial quotas (2009-2018).

The distribution of additional quota is the same under each sub-alternative; only the specified commercial coastwide quota trigger that determines the additional quota differs. Other options for triggers were considered but rejected from further analysis, as described in section 5.4. The two sub-alternatives above were chosen to strike a balance between the trigger being unrealistically high relative to expected quota levels (and thus having no practical impact in the near future under the current quota regime), and being so low that the allocations would be modified very substantially in most future years.

For both sub-alternatives, the commercial quota up to the trigger amount would be distributed according to *status quo* allocations. The additional quota above the trigger amount would be distributed as follows: states that currently have less than 1% of the current commercial quota allocation (Delaware, New Hampshire, and Maine) would evenly split 1% of the total additional quota (resulting in 0.333% each of the additional quota). The remaining states (Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Maryland, Virginia, and North Carolina) would evenly split the remaining additional quota (resulting in each of these states getting 12.375% each of the additional quota beyond the trigger amount, on top of their current quota share of the base trigger amount). It is important to note that when the quota trigger is exceeded, it is only the additional quota that gets distributed differently, not the entire quota.

Under either sub-alternative, the commercial quota in each year would still be developed based on the recommendations of the SSC and Monitoring Committee, and approved by the Council and Board based on the Council's risk policy. The "new" total allocation percentages by state under both sub-alternatives could not be calculated until the annual commercial quota was known (typically considered in August of any given year), since the state percentages of the coastwide allocation would vary depending on how much "additional" quota was available to be distributed. If in future years the specified quota were at or below this trigger point, the quota allocation would revert to *status quo* (1980-1989 basis as shown in Table 10).

Given that state allocations would vary with the annual coastwide quota, the final state allocations in any given year are unknown; however, a range of reasonably expected allocations can be derived based on past annual quotas assuming future quotas do not change substantially from what has been implemented in the past. Table 13 below shows how often each of these triggers would have been exceeded if applied to historical quotas (1993-2018), and the resulting percent allocation for each state under the time series low coastwide quota (5.66 million pounds; 2017) and time series high quota (17.90 million pounds; 2005). For NC, VA, RI, and NJ, the highest allocation received within this range would be that under *status quo* conditions (i.e., when the trigger is not exceeded). For all other states, the highest allocation percentage corresponds with the highest annual coastwide quota within the range considered (Table 13).

Table 13: Summary of expected range of allocation outcomes of alternatives 2C-1 and 2C-2 given historical quotas.

	Alternative 2C-1		**Alternative 2C-2**	
Annual commercial quota trigger	8.40 million lb		10.71 million lb	
Frequency of historical quotas at or below trigger (1993-2018)	4 of 26		9 of 26	
Frequency of historical quotas exceeding trigger (1993-2018)	22 of 26		17 of 26	
State allocation under high and low quotas	**Alloc. % under low quota (5.66 m. lb) = *Status quo allocation***	**Alloc. % under high quota (17.9 m. lb) = revised allocation**	**Alloc. % under low quota (5.66 m. lb) = *Status quo allocation***	**Alloc. % under high quota (17.9 m. lb) = revised allocation**
ME	0.04756	0.19923	0.04756	0.16235
NH	0.00046	0.17712	0.00046	0.13417
MA	6.82046	9.76840	6.82046	9.05159
RI	15.68298	13.92735	15.68298	14.35424
CT	2.25708	7.62693	2.25708	6.32121
NY	7.64699	10.15627	7.64699	9.54612
NJ	16.72499	14.41634	16.72499	14.97770
DE	0.01779	0.18526	0.01779	0.14453
MD	2.0391	7.52463	2.0391	6.19078
VA	21.31676	16.57113	21.31676	17.72507
NC	27.44584	19.44735	27.44584	21.39225

The main difference between sub-alternatives 2C-1 and 2C-2 is how often the quota is expected to exceed each trigger, and the amount of "additional quota" that would be available under likely future coastwide quota scenarios. Figure 5 shows the time series of commercial quotas since 1993, compared to the quota triggers under 2C-1 (8.40 million pounds) and 2C-2 (10.71 million pounds). Additional details specific to the configuration of alternatives 2C-1 and 2C-2 are provided in sections 5.2.3.1 and 5.2.3.2 below.

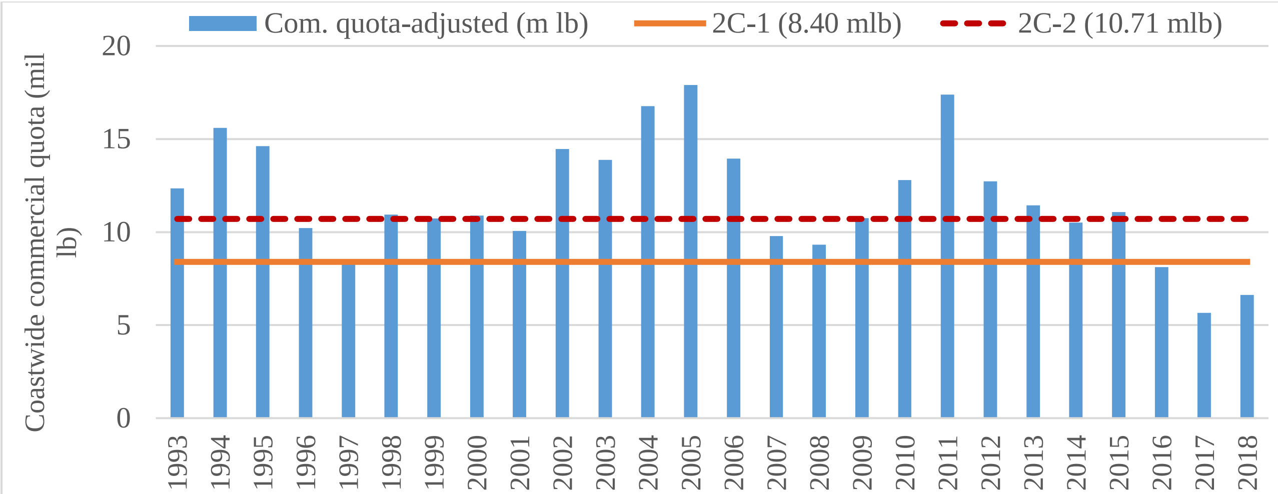


Figure 5: Time series of annual commercial quotas for summer flounder 1993-2018 and proposed commercial quota triggers under alternatives 2C-1 and 2C-2.

5.2.3.1 Sub-Alternative 2C-1: 5-year average commercial quota trigger (8.40 million pounds)

Under alternative 2C-1, quota up to and including 8.40 million pounds would be distributed according to the current (*status quo*) allocation, and the **additional** quota above 8.40 million pounds would be distributed differently. This trigger is based on the 5-year average commercial quota over the years 2014-2018.[11]

For the additional quota, states that currently have less than 1% of the current commercial quota allocation (Delaware, New Hampshire, and Maine) would evenly split 1% of the total additional quota (resulting in 0.333% each of the additional quota). The remaining states (Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Maryland, Virginia, and North Carolina) would evenly split the remaining additional quota (resulting in each of these states getting 12.375% each of the **additional** quota beyond 8.40 million pounds, on top of their current quota share of the baseline quota of 8.40 million pounds).

In the hypothetical example in Table 14 below, if an 8.12 million pound coastwide annual quota were adopted, the quota would be distributed the same way it is currently (*status quo*; Alternative 2A) since the coastwide quota is below the allocation revision trigger in this sub-option (8.40 million pounds). Under a hypothetical 14.00 million pound coastwide quota, the additional quota would be 5.60 million pounds (14.00-8.40 = 5.60). In this case, the first 8.40 million pounds would be distributed based on *status quo* allocations, and the additional 5.60 million pounds would be distributed such that the states of NC, VA, MD, NJ, NY, CT, RI, and MA would each receive an additional 693,000 pounds of quota that year (each receiving 12.375% of 5.60 million pounds) and DE, NH, and ME would each receive an additional 18,666 pounds (each receiving 0.3333% of 5.60 million pounds; Table 14).

Figure 6 shows that for quotas up to the 8.40 million pound trigger point under alternative 2C-1, allocations remain *status quo*. As the annual commercial quota level grows beyond the quota trigger, the state quota allocation percentages get closer together, i.e., with increasing quotas above the trigger, quota is distributed more evenly among the states.

[11] After Research Set-Aside in years when it was deducted from the commercial quota.

Table 14: Alternative 2C-1: modified distribution of additional commercial quota beyond 8.40 million pounds (5-yr commercial quota trigger). Hypothetical quota examples represent initial quotas prior to any transfers or deductions for overages.

State	Allocation of baseline quota ≤ 8.40 mil lb	Allocation of additional quota beyond 8.40 mil lb	Example allocation (lb) under 8.12 mil lb quota (same as *status quo*)[a]	Example allocation (lb) under 14.00 million lb quota[b]				Comparison to *status quo* under 14.00 million lb quota	
				Status quo distribution of 8.40 mil lb base quota	New distribution of 5.60 mil lb additional quota	Total quota under 14.00 mil lb CQ	Total new allocation percentage under 14.00 mil lb CQ[c]	*Status quo* allocation (lb) under a 14.00 mil lb quota	*Status quo* allocation (%) under a 14.00 mil lb quota
ME	0.04756%	0.333%	3,862	3,995	18,666	22,662	0.16187%	6,658	0.04756%
NH	0.00046%	0.333%	37	39	18,666	18,705	0.13361%	64	0.00046%
MA	6.82046%	12.375%	553,821	572,919	693,000	1,265,919	9.04228%	954,864	6.82046%
RI	15.68298%	12.375%	1,273,458	1,317,370	693,000	2,010,370	14.35979%	2,195,617	15.68298%
CT	2.25708%	12.375%	183,275	189,595	693,000	882,595	6.30425%	315,991	2.25708%
NY	7.64699%	12.375%	620,936	642,347	693,000	1,335,347	9.53819%	1,070,579	7.64699%
NJ	16.72499%	12.375%	1,358,069	1,404,899	693,000	2,097,899	14.98499%	2,341,499	16.72499%
DE	0.01779%	0.333%	1,445	1,494	18,666	20,161	0.14401%	2,491	0.01779%
MD	2.03910%	12.375%	165,575	171,284	693,000	864,284	6.17346%	285,474	2.03910%
VA	21.31676%	12.375%	1,730,921	1,790,608	693,000	2,483,608	17.74006%	2,984,346	21.31676%
NC	27.44584%	12.375%	2,228,602	2,305,451	693,000	2,998,451	21.41750%	3,842,418	27.44584%
Total	100%	100%	8,120,001	8,400,000	5,600,000	14,000,000	100%	14,000,000	100%

[a] Under this hypothetical quota, allocation is divided based on *status quo* allocation percentages due to coastwide quota being lower than 8.40 million pounds. **This hypothetical quota results in the same quota distribution as in Alternative 2A and 2C-2.**

[b] Allocation of first 8.40 million pounds is divided based on *status quo* allocation percentages. Additional 5.60 million pounds (14.00-8.40) is divided evenly between all remaining states after the states of NH, DE, and ME split 1% of the coastwide quota.

[c] Note that total revised state allocation percentages will vary with varying coastwide quotas, depending on how much "additional" quota is available.

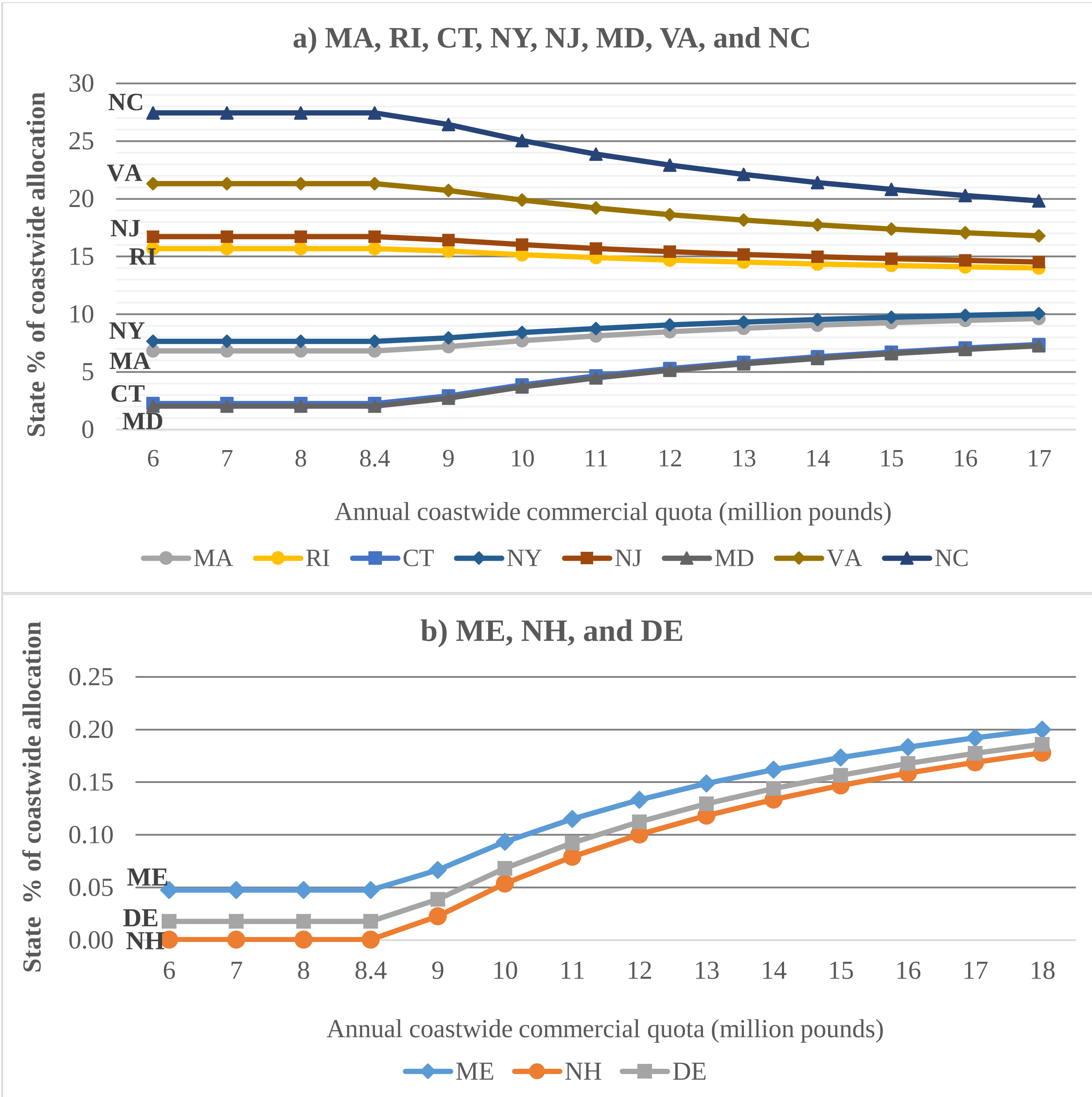


Figure 6: State quota allocation percentage with varying annual coastwide quotas under alternative 2C-1 (8.40 million pound trigger) for a) States with over 1% of the current allocation, and b) Maine, Delaware, and New Hampshire.

5.2.3.2 Sub-Alternative 2C-2: 10-year average commercial quota trigger (10.71 million lb)

Under alternative 2C-2, quota up to and including **10.71 million pounds** would be distributed according to the current (*status quo*) allocation, and the **additional** quota above 10.71 million pounds would be distributed differently. This trigger is based on the 10-year average commercial quota over the years 2009-2018.[12]

As with alternative 2C-1, for the additional quota, states that currently have less than 1% of the current commercial quota allocation (Delaware, New Hampshire, and Maine) would evenly split 1% of the total additional quota (resulting in 0.3333% each of the additional quota). The remaining states (Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Maryland, Virginia, and North Carolina) would evenly split the remaining additional quota (resulting in each of these states getting 12.375% each of the **additional** quota beyond 10.71 million pounds, on top of their current quota share of the baseline quota of 10.71 million pounds).

In the hypothetical example in Table 15 below, with an 8.12 million pound coastwide quota, the quota would be distributed the same way it is currently (*status quo*; Alternative 2A) since the coastwide quota is below the allocation revision trigger (10.71 million pounds). Under a hypothetical 14.00 million pound coastwide quota, the additional quota would be 5.60 million pounds (14.00-10.71 = 3.29). In this case, the first 10.71 million pounds would be distributed based on *status quo* allocations, and the additional 3.29 million pounds would be distributed such that the states of North Carolina, Virginia, Maryland, New Jersey, New York, Connecticut, Rhode Island, and Massachusetts would each receive an additional 407,138 pounds of quota that year (each receiving 12.375% of 3.29 million pounds) and Delaware, New Hampshire, and Maine would each receive an additional 10,967 pounds (each receiving 0.3333% of 3.29 million pounds; Table 15).

Figure 7 shows that for quotas up to the 10.71 million pound trigger point under alternative 2C-2, allocations remain *status quo*. As the annual commercial quota level grows beyond the quota trigger, the state quota allocation percentages get closer together, i.e., with increasing quotas above the trigger, quota is distributed more evenly among the states. As with alternative 2C-1, states with current allocations above 12.375% of the coastwide quota (NC, VA, RI, and NJ) will lose allocation percentage as the quota grows beyond the trigger point.

[12] After Research Set-Aside in years when it was deducted from the commercial quota.

Table 15: Alternative 2C-2: modified distribution of additional commercial quota beyond 10.71 million pounds (10-yr commercial quota trigger). Hypothetical quota examples represent initial quotas prior to any transfers or deductions for overages.

State	Allocation of baseline quota ≤ 10.71 mil lb	Allocation of additional quota beyond 10.71 mil lb	Example allocation (lb) under 8.12 mil lb quota (same as *status quo*)[a]	Example allocation (lb) under 14.00 million lb quota[b]				Comparison to *status quo* under 14.000 million lb quota	
				Status quo distribution of 10.71 mil lb base quota	New distribution of 3.29 mil lb additional quota	Total quota under 14.00 mil lb CQ	Total new allocation percentage under 14.00 mil lb CQ c	*Status quo* allocation under a 14.00 million lb quota	*Status quo* allocation (%) under a 14.00 mil lb quota
ME	0.04756%	0.333%	3,862	5,094	10,967	16,060	0.115%	6,658	0.04756%
NH	0.00046%	0.333%	37	49	10,967	11,016	0.079%	64	0.00046%
MA	6.82046%	12.375%	553,821	730,471	407,138	1,137,609	8.126%	954,864	6.82046%
RI	15.68298%	12.375%	1,273,458	1,679,647	407,138	2,086,785	14.906%	2,195,617	15.68298%
CT	2.25708%	12.375%	183,275	241,733	407,138	648,871	4.635%	315,991	2.25708%
NY	7.64699%	12.375%	620,936	818,993	407,138	1,226,130	8.758%	1,070,579	7.64699%
NJ	16.72499%	12.375%	1,358,069	1,791,246	407,138	2,198,384	15.703%	2,341,499	16.72499%
DE	0.01779%	0.333%	1,445	1,905	10,967	12,872	0.092%	2,491	0.01779%
MD	2.03910%	12.375%	165,575	218,388	407,138	625,525	4.468%	285,474	2.03910%
VA	21.31676%	12.375%	1,730,921	2,283,025	407,138	2,690,162	19.215%	2,984,346	21.31676%
NC	27.44584%	12.375%	2,228,602	2,939,449	407,138	3,346,587	23.904%	3,842,418	27.44584%
Total	100	100%	8,120,001	10,710,000	3,290,000	14,000,000	100%	14,000,000	100

[a] Under this hypothetical quota, allocation is divided based on *status quo* allocation percentages due to coastwide quota being lower than 10.71 million pounds. **This hypothetical quota results in the same quota distribution as in Alternative 2A and 2C-1.**

[b] Allocation of first 10.71 million pounds is divided based on *status quo* allocation percentages. Additional 3.29 million pounds (14.00-10.71) is divided evenly between all remaining states after the states of NH, DE, and ME split 1% of the coastwide quota.

[c] Note that total revised state allocation percentages will vary with varying coastwide quotas, depending on how much "additional" quota is available.

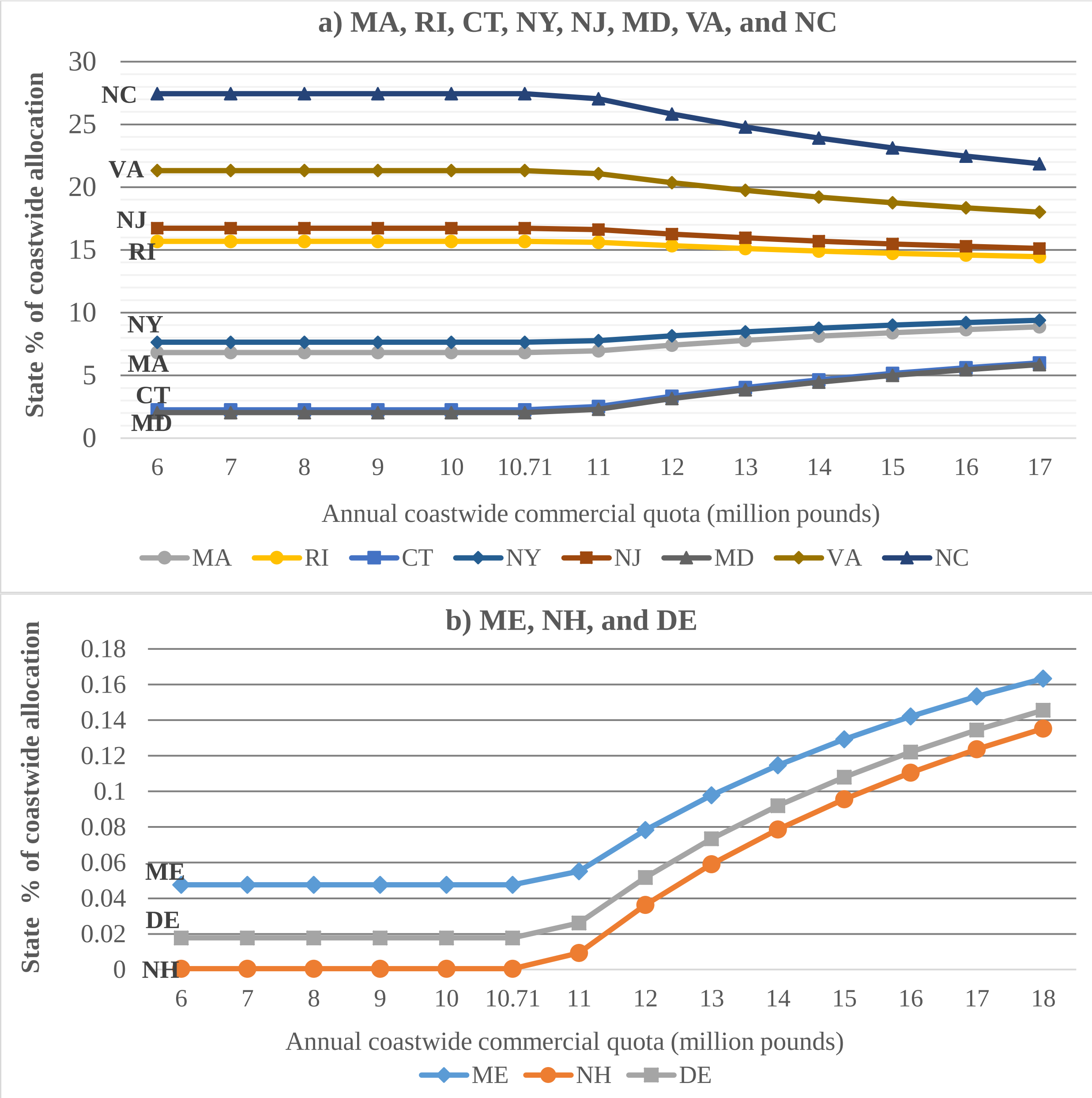


Figure 7: State quota allocation percentage with varying annual coastwide quotas under alternative 2C-2 (10.71 million pound trigger) for a) States with over 1% of the current allocation, and b) Maine, Delaware, and New Hampshire.

5.2.4 Alternative 2D: Implement "Scup Model" Quota System for Summer Flounder

This alternative would allocate the annual summer flounder commercial quota into three unequal periods, similar to the way the commercial scup fishery is currently managed (hence the "scup model" descriptor; this alternative is modeled after the scup fishery but has no impact on scup management). In the two winter periods, January-April (Winter I) and November-December (Winter II), a coastwide quota system would be implemented in conjunction with a system of coastwide landings limits and other measures to constrain landings to the seasonal allocation.

During the winter periods, measures would apply throughout the management unit (i.e., no state-specific measures would be implemented), and vessels could land in any port along the coast provided they have the appropriate state specific permits. All commercial landings during the winter period would count toward the quota for that period. When the period quota has been landed, fishing for and/or landing summer flounder would be prohibited for the remainder of the period. Landings in excess of the allocation for the period would be subtracted from the following year's quota for the same period.

In the Summer period, May-October, the quota would continue to be managed on a coastwide basis in federal waters, but a state-by-state quota system would be implemented by the Commission, but with different state allocations compared to *status quo* given that they would only apply during the summer. Summer quota shares would be managed by individual states, which would be responsible for implementing appropriate possession limits and other management measures during the summer period. As is done for scup, any overall summer period quota overages would be subtracted from the next year's overall summer period quota, and the Commission would work out the appropriate reductions in state quotas according to which states contributed to the overage. States would be allowed to transfer or combine summer quotas through the Commission's process.

For this alternative, there are **two sub-alternatives for consideration that relate to how the state of Maryland would be dealt with in this system**. The state of Maryland has indicated that coastwide management during the winter periods would conflict with their current system of managing commercial summer flounder quota under an Individual Fishing Quota (IFQ) program. **Sub-alternative 2D-1**, described below, would exempt the state of Maryland from this management system and allow them to retain their current state allocation. **Sub-alternative 2D-2** would implement this quota system without an exemption for Maryland. These sub-options are described in detail below, in sections 5.2.4.1 and 5.2.4.2.

5.2.4.1 Sub-Alternative 2D-1: Exemption/Status Quo Management for Maryland

This sub-alternative would implement the “scup model” system for commercial summer flounder with an exemption for the state of Maryland, which manages their commercial summer flounder fishery under an IFQ program. This strategy allows the small number of participants in Maryland's fishery (currently seven IFQ holders) to manage their own allocation as they wish throughout the year. This type of management would not integrate well with coastwide management periods. If Maryland had no state-specific quota during the winter periods, IFQ holders could not be allowed an individual allocation to manage during this time.

Sub-alternative 2D-1 proposes that Maryland's existing state commercial quota percentage for summer flounder (2.03910%) be maintained as a separate state-specific allocation outside of the seasonal period allocation system. Maryland could continue to manage their fishery under an IFQ year-round, and landings from Maryland IFQ vessels during the winter periods would count only toward the annual MD-specific quota rather than the coastwide winter quota. Vessels not licensed to participate in the Maryland fishery would remain unable to land summer flounder commercially in Maryland, except in circumstances related to safe harbor or other inter-state agreements involving the state of Maryland. Similarly, Maryland vessels would be required to land their summer flounder in the state of Maryland rather than anywhere along the coast.

The proposed configuration of sub-alternative 2D-1 is summarized in Table 17, and described below.

- **Quota period dates** are proposed to be Winter I: January 1-April 30; Summer: May 1-October 31, and Winter II: November 1-December 31. These are the same dates as previously used for scup, prior to the recent modification of quota period dates (83 FR 17314; April 19, 2018). October is proposed to be in the Summer period based on feedback from advisors as well as initial analysis indicating that the characteristics of the October summer flounder fishery generally align more with the summer fishery in terms of area fished (state vs. federal waters), vessel tonnage, and gear types used. Additional information on this conclusion is provided in **Appendix B**. **The Council and Board have requested specific comments from the public on the proposed quota period dates, especially the month of October.**
- **Allocation between quota periods** under alternative 2D-1 is based on summer flounder landings by period over the past 20 years (1997-2016), for all states in the management unit except Maryland.[13] 55.26% of the annual quota would be allocated to Winter I, 27.65% to Summer, and 17.10% to Winter II (Table 16). The commercial fishery would close coastwide (in federal and state waters) when the allocation for a given Winter period is projected to be reached. The Regional Administrator would close the EEZ to fishing for summer flounder by commercial vessels when the quota has been landed, and states would be responsible for state waters closures.
- **Quota rollover provisions** would be similar to those in place for the scup fishery. If the full Winter I quota is not harvested, unused quota would be added to the quota for the Winter II period in the same fishing year. Quota is unable to be rolled over from one fishing year to the next under the current FMP.[14]
- **Coastwide possession limits** would be needed during the two winter periods. Specific possession limits are not proposed through this action but would need to be developed and reviewed annually by the Summer Flounder, Scup, and Black Sea Bass Monitoring Committee (MC), accounting for changes in the fishery and the annual quota. These recommendations would then be adopted by the Council and Board during the annual specifications process
- **Summer period state allocations** under 2D-1 are based on the percentage contribution of each state's summer period (May-October) landings from 1997-2016 (Table 17).

[13] Past state-level seasonal regulations (e.g., closures, possession limits) are not explicitly accounted for in this analysis.
[14] For additional discussion of this issue, see page 19 of http://www.mafmc.org/s/Commercial-Range-of-Alts-Discussion-Doc-4-May-2017.pdf

Table 16: Percentage of commercial summer flounder landings by proposed quota periods, 1997-2016. EXCLUDES landings from the state of Maryland. Data source: NMFS dealer data (AA tables) as of May 2017.

	Winter I (Jan 1-Apr 30)	Summer (May 1-Oct 31)	Winter II (Nov 1 -Dec)	Total
1997	58.97%	40.04%	0.99%	100.00%
1998	51.23%	27.29%	21.48%	100.00%
1999	56.97%	28.14%	14.89%	100.00%
2000	57.89%	25.82%	16.28%	100.00%
2001	51.07%	25.24%	23.69%	100.00%
2002	54.06%	26.49%	19.45%	100.00%
2003	53.59%	26.01%	20.40%	100.00%
2004	52.63%	25.11%	22.26%	100.00%
2005	58.93%	24.68%	16.39%	100.00%
2006	57.13%	26.14%	16.73%	100.00%
2007	61.24%	30.14%	8.63%	100.00%
2008	56.64%	27.82%	15.54%	100.00%
2009	51.85%	29.34%	18.81%	100.00%
2010	50.51%	29.00%	20.49%	100.00%
2011	57.45%	27.38%	15.16%	100.00%
2012	53.85%	29.68%	16.47%	100.00%
2013	58.49%	25.56%	15.95%	100.00%
2014	54.43%	28.39%	17.18%	100.00%
2015	52.27%	29.42%	18.32%	100.00%
2016	57.76%	28.83%	13.41%	100.00%
Average	55.26%	27.65%	17.10%	100.00%

Table 17: Summary of proposed allocation configuration of Alternative 2D-1 (Maryland exemption), with examples using hypothetical coastwide quotas at 8.12 million lb and 14.00 million lb.

Quota Period	Allocation % (of annual coastwide commercial quota LESS 2.03910% allocated to Maryland)		Measures	Example allocation (lbs) based on 8.12 million lb quota		Example allocation (lbs) based on 14.00 million lb quota	
Winter I (January 1-April 30)	**55.26%**		Coastwide (except MD)	4,486,850		7,735,948	
Summer (May 1-October 31)	**27.65%**		State-specific	2,244,955		3,870,612	
State-specific summer allocations	**ME**	0.015%		**ME**	347	**ME**	598
	NH	0.000%		**NH**	0	**NH**	2
	MA	19.332%		**MA**	433,988	**MA**	748,255
	RI	22.476%		**RI**	504,568	**RI**	869,945
	CT	3.566%		**CT**	80,052	**CT**	138,021
	NY	18.553%		**NY**	416,495	**NY**	718,095
	NJ	29.667%		**NJ**	666,004	**NJ**	1,148,283
	DE	0.045%		**DE**	1,013	**DE**	1,746
	MD	--[a]		**MD**	--	**MD**	--
	VA	5.648%		**VA**	126,785	**VA**	218,594
	NC	0.699%		**NC**	15,702	**NC**	27,072
Winter II (November 1 - December 31)	**17.10%**		Coastwide (except MD)	1,388,195		2,393,440	
Total	**100%**		--	8,120,000		14,000,000	

[a] Under Alternative 2D-1, Maryland would have an annual allocation of 2.03910% of the coastwide quota (and thus no specific seasonal allocation for the summer period quota).

5.2.4.2 *Sub-Alternative 2D-2: No Exemption for Maryland*

Sub-alternative 2D-2 is similar to alternative 2D-1 except that it would not provide an exemption for Maryland. Maryland IFQ holders would not be able to preserve their current year-round management of their own allocation; instead they would be subject to coastwide measures and closures during the winter periods and state measures during the summer period.

The proposed configuration of sub-alternative 2D-2 is summarized in Table 19, and described below.

- **Allocation between quota periods** for alternative 2D-2 is based on average summer flounder landings in each proposed period from 1997-2016, in all states Maine through North Carolina. 58.68% would be allocated to the Winter I period, 28.28% to Summer, and 17.04% to Winter II (Table 18).
- **Quota rollover provisions and coastwide possession limit processes** are the same as those described above for alternative 2D-1.
- **Summer period state allocations** under 2D-2 are based on the percentage contribution of each state's summer period (May-October) landings over the period 1997-2016 (Table 19).

Table 18: Percentage of commercial summer flounder landings by proposed quota periods, 1997-2016. Includes all states ME-NC. Data source: NMFS dealer data (AA tables) as of May 2017.

	Winter I (Jan 1-Apr 30)	Summer (May 1-Oct 31)	Winter II (Nov 1 -Dec)	Total
1997	58.50%	40.54%	0.97%	100.0%
1998	50.80%	28.08%	21.12%	100.0%
1999	56.26%	28.92%	14.82%	100.0%
2000	56.96%	26.65%	16.39%	100.0%
2001	51.00%	25.57%	23.43%	100.0%
2002	53.35%	27.24%	19.41%	100.0%
2003	52.89%	26.95%	20.16%	100.0%
2004	52.14%	25.85%	22.02%	100.0%
2005	58.19%	25.64%	16.16%	100.0%
2006	56.56%	26.70%	16.74%	100.0%
2007	59.76%	31.72%	8.52%	100.0%
2008	55.51%	28.49%	16.00%	100.0%
2009	51.48%	29.83%	18.68%	100.0%
2010	50.05%	29.36%	20.59%	100.0%
2011	56.98%	27.94%	15.09%	100.0%
2012	53.62%	29.94%	16.44%	100.0%
2013	58.05%	25.70%	16.24%	100.0%
2014	54.03%	29.04%	16.93%	100.0%
2015	52.08%	29.53%	18.40%	100.0%
2016	56.90%	29.21%	13.89%	100.0%
Average	**54.68%**	**28.28%**	**17.04%**	**100.0%**

Table 19: Summary of proposed allocation configuration of Alternative 2D-2 (includes Maryland), with examples using hypothetical coastwide quotas at 8.12 million lb and 14.00 million lb.

Quota Period	Allocation % (of annual coastwide commercial quota)		Measures	Example allocation (lbs) based on 8.12 million lb quota		Example allocation (lbs) based on 14.00 million lb quota	
Winter I (January 1-April 30)	**54.68%**		Coastwide	4,440,145		7,655,422	
Summer (May 1-October 31)	**28.28%**		State-specific	2,296,255		3,959,060	
State-specific summer allocations	**ME**	0.015%		**ME**	340	**ME**	586
	NH	0.000%		**NH**	0	**NH**	2
	MA	18.525%		**MA**	425,389	**MA**	733,429
	RI	21.538%		**RI**	494,571	**RI**	852,708
	CT	3.417%		**CT**	78,466	**CT**	135,287
	NY	17.779%		**NY**	408,243	**NY**	703,867
	NJ	28.429%		**NJ**	652,808	**NJ**	1,125,531
	DE	0.043%		**DE**	993	**DE**	1,711
	MD	4.171%		**MD**	95,782	**MD**	165,141
	VA	5.412%		**VA**	124,272	**VA**	214,263
	NC	0.670%		**NC**	15,391	**NC**	26,536
Winter II (November 1 - December 31)	**17.04%**		Coastwide	1,383,599		2,385,516	
Total	**100%**		--	8,120,000		14,000,000	

Between sub-alternatives 2D-1 and 2D-2, the timing of the seasonal quota periods is proposed to be the same. In addition, seasonal quota rollover provisions and the process for setting coastwide management measures is proposed to be the same. What would differ between the two options, based on whether or not Maryland was exempted, are the seasonal quota allocations and the state-by-state summer allocations. Since these are based on landings history from 1997-2016, the proposed sub-alternatives are based on analysis with (2D-2) and without (2D-1) data from the state of Maryland. Table 20 compares the differences in seasonal quota period and state summer period allocations under the two sub-options.

Table 20: Comparison of allocation differences between sub-alternatives 2D-1 and 2D-2.

	Alt. 2D-1: based on 1997-2016 landings without Maryland	Alt. 2D-2: based on 1997-2016 landings with Maryland	Absolute Difference
Quota Period Allocations			
Winter I	55.26%	54.68%	**0.58%**
Summer	27.65%	28.28%	**0.63%**
Winter II	17.10%	17.04%	**0.06%**
State Summer Period Allocations			
ME	0.02%	0.01%	**0.01%**
NH	0.00%	0.00%	**0.00%**
MA	19.33%	18.53%	**0.80%**
RI	22.48%	21.54%	**0.94%**
CT	3.57%	3.42%	**0.15%**
NY	18.55%	17.78%	**0.77%**
NJ	29.67%	28.43%	**1.24%**
DE	0.05%	0.04%	**0.01%**
MD	--[a]	4.17%	**--**
VA	5.65%	5.41%	**0.24%**
NC	0.70%	0.67%	**0.03%**

[a] Maryland would have an annual allocation of 2.03910% of the coastwide quota (and thus no specific seasonal allocation for the summer period quota).

5.3 Alternative Set 3: Landings Flexibility Framework Provisions

This alternative set considers whether to add "landings flexibility" policies to the list of issues in the Council's FMP that can be modified through a framework action. Framework actions are modifications to the Council's FMP that are typically (though not always) more efficient than a full amendment. While amendments may take several years to complete and address a variety of issues, frameworks can often be completed in 5-8 months and address one or a few issues in a fishery. Framework actions can only modify existing measures and/or those that have been previously considered in an FMP amendment. Because the Commission does not do framework actions and instead can address issues of this scope through FMP addenda, this alternative set does not apply to the Commission's FMP.

Landings flexibility, as described below, may allow for commercial vessels to land or possess summer flounder in states where they are not permitted at the state level. Landings flexibility differs from “safe harbor” agreements between some states, which are based on state level agreements and allow a state to accept landings from a vessel on a temporary basis under certain emergency situations (e.g., weather, mechanical breakdown, injured crew member). Landings flexibility, on the other hand, would be a broader policy that would require a state to accept vessels that do not necessarily meet state level permitting or landing license criteria, as described under alternative 3B below.

This action would not implement any landings flexibility policies at this time, but instead would simply allow these policies to be implemented via a future framework action (for the Council; with corresponding addendum from the Commission) rather than through an amendment process. **The impacts of any future framework action related to landings flexibility would be analyzed through a separate action**, which would include public comment opportunities and documentation of compliance with all applicable laws. Depending on the proposed configuration of landings flexibility in a future action, **the level of analysis required may vary and an EIS may be required if impacts are expected to be significant.**

5.3.1 Alternative 3A: No Action/*Status Quo*

Under this alternative, no changes would be made to the framework provisions of the FMP. Broad coastwide landings flexibility would remain unauthorized under the current FMP, and any future programs of this type would likely have to be implemented through an amendment to the FMP. While the Commission may be able to implement coastwide landings flexibility through an addendum, doing so could create inconsistencies between the two FMPs. States would remain free to develop landings flexibility agreements through state-level agreements, provided that such agreements are consistent with other Council and Commission FMP requirements and would not require modification to the federal management measures.

5.3.2 Alternative 3B: Add Landings Flexibility as a Frameworkable Issue in the FMP

Under alternative 3B, “landings flexibility” policies for the commercial summer flounder fishery would be added to the list of frameworkable items in the summer flounder, scup, and black sea bass FMP. This would allow for landings flexibilities policies to be implemented through future framework actions (for the Council) and FMP addenda (for the Commission), rather than through a more complex amendment process. **This alternative is primarily administrative in that it does not implement any landings flexibility policies, but simply modifies the way that landings flexibility policies may be implemented in the future.** A brief overview of what may be considered in a future framework action for these types of policies is provided here.

"Landings flexibility" means the ability to land or possess summer flounder in any state (or, in some configurations, any participating state) without requiring that vessel to be permitted in that state. The Council and Board's intent is to allow for consideration of multiple possible configurations of landings flexibility through future framework actions, including allowing vessels to land in any port/state, developing multi-state landings agreements, and/or allowing vessels to possess multiple state possession limits at one time for separate offloading. The specific details of how landings flexibility would work in practice would be determined at the time of a future framework action. No specific proposals for framework actions have been put forward at this time.

In its most commonly discussed form, landings flexibility would allow vessels with a federal summer flounder moratorium permit to commercially land summer flounder in any port of their choosing within the management unit, in any state, regardless of state level permits. This has been suggested as a means of addressing rising fishing costs, fuel use (for both environmental impact and cost reasons), increasing adaptability to market conditions, addressing safety concerns, adapting to a changing distribution of fish, and improving efficiency. It has been suggested that landings flexibility would reduce long steam times and operating costs associated with strict requirements to land fish in a specific state or states. With more flexibility in where they can offload fish, fishermen that fish farther from their home state could make multiple fishing trips before making the trip home.

Landings flexibility as previously discussed by the Council and Board is intended to work within the existing state-by-state quota system, as landings flexibility would not be necessary under a coastwide system (or "scup model" under alternative 2D). Some questions remain about how state quotas could be effectively managed if landings were open to any state/port. Quota transfers would likely be required to properly attribute landed summer flounder amounts to the permit state rather than the state of landing. GARFO has indicated that it would likely be impossible to track landings at the individual permit/vessel level and attribute them to the correct state without a quota transfer, at least with the level of timeliness and accuracy required of in-season commercial management. Thus, properly assigning landings to the appropriate state would require quota transfers between states each time a vessel landed in a non-permitted state. If a vessel is permitted in multiple states, there would need to be a clear process to specify against which state's quota the landings should be counted (i.e., which state needs to participate in a quota transfer). Under a broad coastwide landings flexibility policy, **each state would be required to accept commercial vessels desiring to land summer flounder in that state**, and would likely be required to participate in the associated quota transfer.

Additional analysis under any future framework action would be needed to determine how state level trip limits and other state-specific measures would be enforced if any vessel could land in any state. Specifically, the Council and Board would need to specify if a vessel would be subject to the possession/trip limits and seasons of the state in which they land, or to those of the state in which they are permitted (the vessel's "home state").

5.4 Considered but Rejected Alternatives

Since the initiation of this amendment, the Council and Board have considered a range of different modifications to commercial fishery management for summer flounder. A broad initial range of issues was progressively narrowed until the Council and Board agreed on a targeted list of issues to focus on through this action, corresponding to the purpose and need statements described in section 4.1. To address these need statements, many approaches were considered. Concepts or options that were substantially discussed by the Council and Board, but rejected from further consideration, are described below for federal permit requalification (section 5.4.1), commercial allocation (section 5.4.2), and landings flexibility (section 5.4.3).

5.4.1 Rejected Permit Requalification Options

The Council and Board originally approved a broader range of sub-alternatives under alternative 1B, but ultimately narrowed the range to the seven presented in section 5.1.2. As of August 2017, the Council and Board had proposed a wider range of twenty sub-options based on a combination of four different time period options and five different landings thresholds. The four time period options and five landings thresholds options were recommended by the Demersal Committee at their July 2017 meeting, based on an initial staff analysis, with some modifications discussed at the meeting. The intent of the original range was to provide a wide variety of time frame options (options for focusing on recent years and options with a focus on the longer time series since permits were required) and a variety of landings threshold options (focusing on eliminating only rarely-used permits vs. more broadly defining latent effort).

However, when the Council and Board first considered this range of options in August 2017, analysis was not available at the time that accurately identified how many moratorium rights holders would be impacted by each of these combinations. In December 2017, after reviewing subsequent analysis showing the number of MRIs that would be impacted, they narrowed the range to the seven sub-options identified in section 5.1.2 of this document, in order to simplify the public hearing process and amendment analysis by eliminating options that would be largely redundant in terms of their impacts. Each sub-option is described in Table 21 with an indication of whether it was retained in Alternative 1B, or rejected from further analysis.

Table 21: Federal moratorium permit requalification options (landings threshold and time period combinations) considered by the Council and Board, with December 2017 outcomes of narrowing the range of alternatives.

		Re-Qualification Time Periods			
		Period 1 (August 1, 1994-July 31, 2014; 20 years)	**Period 2 (August 1, 1999-July 31, 2014; 15 years)**	**Period 3 (August 1, 2004-July 31, 2014; 10 years)**	**Period 4 (August 1, 2009-July 31, 2014; 5 years)**
Landings Thresholds	**≥1 lb in any one year**	Eliminated	Eliminated	Retained: Alt. 1B-4	Retained: Alt. 1B-2
	≥1 lb in 20% of years in time period	Retained: Alt. 1B-6	Eliminated	Eliminated	Eliminated
	≥1 lb in 40% of years in time period	Eliminated	Eliminated	Eliminated	Eliminated
	≥1 lb in 60% of years in time period	Eliminated	Eliminated	Eliminated	Eliminated
	>1000 lbs Total	Retained: Alt. 1B-7	Retained: Alt. 1B-5	Retained: Alt. 1B-3	Retained: Alt. 1B-1

More information about how the range was narrowed can be found the October 2017 staff memo for the Demersal Committee available at: http://www.mafmc.org/s/Demersal-Cttee-Permits-and-Landings-Flex-Memo-Oct-2017.pdf.

In addition, the Demersal Committee considered two conceptual options for revising the moratorium permit system that were not selected for further analysis: creating a tiered permit system based on landings and/or effort criteria, and creating a tiered permit system based on gear types. It was thought that tiered systems could help the Council and Board tailor management approaches to different components of the fishery (e.g., those vessels heavily relying on the directed fishery vs. vessels that participate on a more incidental or infrequent basis). At their July 2017 meeting, the Committee moved to classify these options as "considered but rejected," which was supported by the full Council and Board at their August 2017 meeting. The Council and Board chose to eliminate gear-based permits due to the overwhelming majority of the fishery using trawl gear, and chose to eliminate other tiered permit options due to the complications that could arise from trying to define and delineate different tiers of the commercial summer flounder fishery. Requalification of the existing single tier permits was deemed to be the most appropriate route for achieving the purpose and need for this issue.

5.4.2 Rejected Commercial Allocation Options

For commercial allocation issues, the Council and Board considered several conceptual ideas that were not adopted as amendment alternatives, as well as some alternate configurations of ideas that became the alternatives listed in section 5.2 of this document.

Conceptual allocation policies that were not approved in the range of alternatives were proposed at various stages of initial amendment development by scoping commenters, staff, individual Council and Board members, and/or management partners. Most of these ideas did not yet have a clearly developed rationale or proposed configuration, as they were proposed for discussion of feasibility and for consideration of whether they would address the purpose and need of the amendment. The main ideas considered in initial stages of amendment development included:

- A simple revised base year period for commercial landings to revise existing state by state quotas. This alternative was not selected due how highly correlated landings in any given recent year are likely to be with the existing state allocations. The percentage of annual landings by state are typically very close to the state allocation in most states and years; thus, almost any base year range since implementation of Amendment 2 (1993) would result in very similar allocations to those currently implemented. Many Council and Board members wanted to pursue options that were more of a departure from the current 1980-1989 landings basis.
- A "best years" system based on a state's highest landings years over a certain time period to revise existing state by state quotas. This option was rejected for similar reasons to the one above. Best years are likely to reflect that state's allocation. In addition there would likely need to be stipulations regarding not using years in which overages occurred, to avoid rewarding states for years where they exceeded their quota. A best years system would thus not result in much of a change from the current allocation, similar to the revised base year period idea above.
- Coastwide quota with seasonal periods (trimester or bimonthly). This idea was rejected because the Council and Board identified alternative 2D (the "scup model") as a similar option that is preferable to a year-round coastwide system due to the ability of states to manage their own quota when summer flounder are inshore in the summer. A year-round coastwide system would likely require dividing the quota into many short periods to ensure access to the resource throughout the year and for different fishery participants.
- Regional coastwide quota systems were considered but rejected due to a lack of clear basis for dividing the management unit into commercial regions. In addition, management would likely still need to be at the state level, but instead of individual states, measures and quota monitoring would be cooperatively handled by multiple states working together. This could present an administrative burden and require increased time and resources spent coordinating stakeholder preferences, data, and enforcement across multiple states.
- Quota allocations by permit category were considered but would have required that the Council and Board implement tiered permit systems through alternative set 1. The tiered permit was rejected from further consideration; therefore, allocations by permit category are not possible.

Within the existing range of alternatives, several configurations of options were not adopted in the final version:

- The Demersal Committee considered other quota triggers for modified commercial allocation under alternative 2C (Figure 8). Primarily this included the staff-recommended time series average quota (1993-2018) of 11.80 million pounds, but other triggers were raised during the November 2017 Demersal Committee discussion. The Committee recommended rejecting the staff-recommended time series average quota of 11.80 million pounds, as this was less likely to have any near-term impact on the quotas under this alternative, and the Committee wanted to pursue a slightly lower trigger that was more likely to be reached in the coming fishing years. The Committee recommended, and the Council and Board approved, the two sub-options described in section 5.2.3.

- Also for alternative 2C, the Committee considered a proposed version of the alternative that would have the states of Maine, Delaware, and New Hampshire splitting an entire "state share" of additional quota beyond the quota trigger. The Committee determined that this introduced a risk of speculator behavior in these states, which do not currently have directed fisheries for summer flounder. If the quota were raised substantially in these states, new effort may be introduced, which is not the intention of this alternative set.
- As described in section 5.2.4, for the "scup model" (alternative 2D), the Council and Board reviewed versions of the alternative's configuration that included the month of October in the Winter II period instead of the summer period. As described in section 5.2.4, this configuration was not adopted in the range of options due to advisory panel comments and initial analysis describing the characteristics of the fishery in the month of October compared to the surrounding months. Additional information on this decision can be found in APPENDIX B.

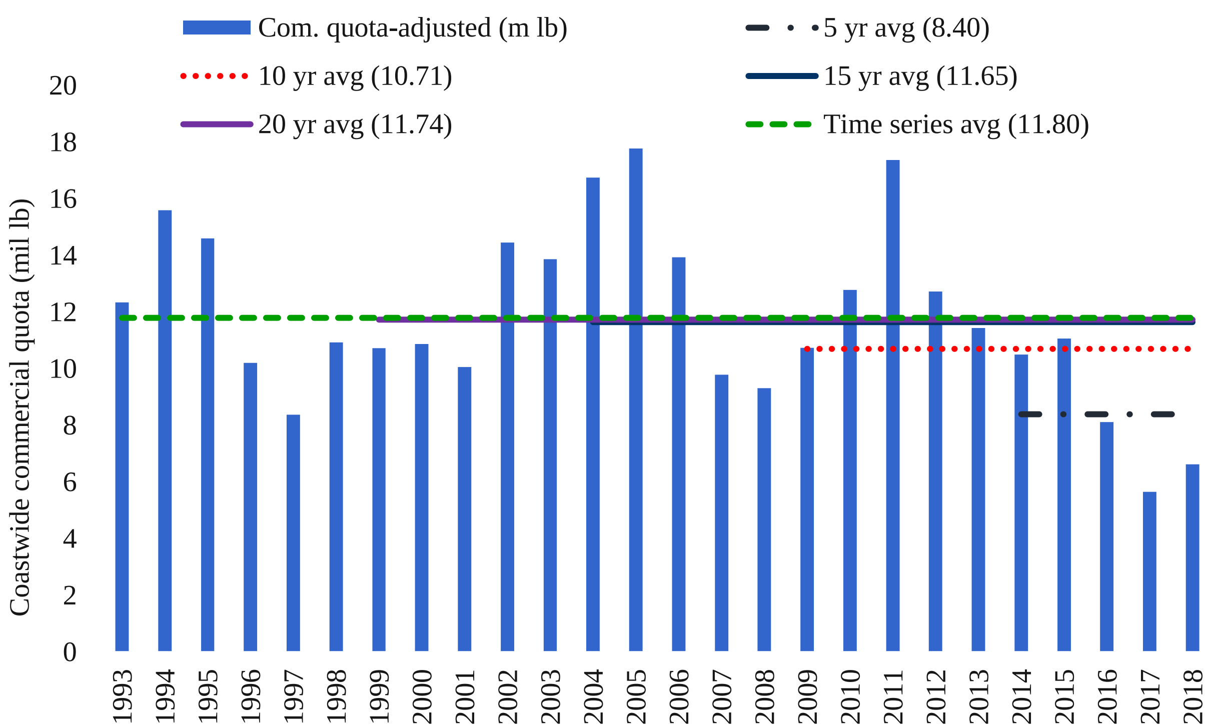


Figure 8: Options for commercial quota triggers considered by the Demersal Committee.

5.4.3 Rejected Near-Term Options for Landings Flexibility Policies

The Council and Board originally considered landings flexibility policies for implementation directly through this action (rather than specifying that these policies could be implemented through a future framework action, as alternative 3B proposes to do). In August 2017, the Council and Board approved a Demersal Committee motion to: "recommend that the Council remove landings flexibility as an option but include landings flexibility as a frameworkable option in the FMP, and send a letter to the states encouraging further development of landings flexibility policies and agreements at the state level including allowing multiple state possession limits with appropriate permits."

The rationale behind this recommendation was to encourage individual states to come up with their own landings flexibility agreements, which should be more flexible and customizable than a mandatory coastwide landings flexibility policy. However, the Council and Board wanted to maintain the option to develop coastwide landings flexibility in the future, in the event that state agreements are not pursued or are not effective. Thus, they moved to pursue an alternative to add landings flexibility to the list of frameworkable issues in the FMP.

6.0 DESCRIPTION OF THE AFFECTED ENVIRONMENT

The affected environment consists of those resources expected to experience environmental impacts if the actions under consideration in this amendment are implemented. The affected environment consists of several Valued Ecosystem Components (VECs), including components of the environment that could be affected by the management measures being considered in this amendment. These following VECs are described in the sections below:

1. The **managed resources** (summer flounder; section 6.1),
2. **Non-target species** (including black sea bass, scup, and other managed species that may interact with the summer flounder fishery; section 6.2),
3. The **physical environment**, including Essential Fish Habitat (EFH; section 6.3),
4. **Protected resources**, including species and habitats protected under the Marine Mammal Protection Act (MMPA) and the Endangered Species Act (ESA; section 6.4), and
5. The **human (socioeconomic) environment**, including commercial fisheries likely to be impacted by this action (section 6.5).

6.1 TARGET SPECIES (SUMMER FLOUNDER)

This section describes the fishery resource managed under this FMP that is the focus of this action, i.e., the summer flounder resource. Although scup and black sea bass are managed under the same FMP as summer flounder, these species would not be affected by the proposed measures in this action, and therefore are described in section 6.2 as non-target species, along with other species that are commonly caught or targeted alongside summer flounder.

This section describes summer flounder stock definition (section 6.1.1), stock status (section 6.1.2), biological characteristics and ecological relationships (section 6.1.3), and stock distribution and center of biomass (section 6.1.4).

6.1.1 Stock Definition

Summer flounder, *Paralichthys dentatus*, is a demersal flatfish that occurs in the western North Atlantic from the southern Gulf of Maine to South Carolina. The geographical range of the summer flounder encompasses the shallow estuarine waters and outer continental shelf from Nova Scotia to Florida. The center of abundance of the stock lies within the Middle Atlantic Bight from Cape Cod, Massachusetts, to Cape Hatteras, North Carolina (Packer et al. 1999).

Summer flounder is managed and assessed as a single stock. In the past, there have been several attempts to identify separate stocks of summer flounder that may exist throughout its range. The stock definition provided by Wilk et al. (1980) of a unit stock extending from Cape Hatteras north to New England was used in the most recent benchmark assessment (NEFSC 2013), as well as in previous assessments. A consideration of summer flounder stock structure incorporating tagging data concluded that most evidence supported the existence of stocks north and south of Cape Hatteras, with the stock north of Cape Hatteras possibly composed of two distinct spawning aggregations, off New Jersey and Virginia-North Carolina (Kraus and Musick 2001).

The current assessment stock unit is consistent with the conclusions of Kraus and Musick (2001). The management unit within the FMP is summer flounder in US waters in the western Atlantic Ocean from the US-Canadian border southward to the southern border of North Carolina. The management unit is consistent with the conclusions a summer flounder genetics study that revealed no population subdivision at Cape Hatteras (Jones and Quattro 1999).

6.1.2 Stock Status

Summer flounder was under a rebuilding plan from 1993 through 2011. An F-reduction schedule was first put in place in 1993 through Amendment 2, and this schedule was modified via Amendment 7. After the MSA was reauthorized in 1996 with time certain rebuilding requirements and required rebuilding plans, Amendment 12 (1999) started the ten-year rebuilding clock for summer flounder for 2000-2010. Following the 2007 reauthorization of the MSA, which required the implementation of ACLs and AMs, the rebuilding deadline was extended to 2013. However, the summer flounder stock was declared rebuilt in the fall of 2011, based on the most recently modeled year, 2010.

The last peer-reviewed benchmark stock assessment was conducted in the summer of 2013 at the Stock Assessment Workshop/Stock Assessment Review Committee (SAW/SARC 57). The details of the revised biological reference points for summer flounder are described in that assessment report (NEFSC 2013). Overfishing for summer flounder is defined to occur when the fishing mortality rate (F) exceeds the threshold fishing mortality rate of $F_{MSY\ PROXY}$ = $F_{35\%}$ = 0.309 (CV=15%). The summer flounder stock is overfished when the biomass falls below the minimum biomass threshold, identified in SARC 57 as ½ SSB_{MSY} = 31,197 mt (68.8 million lbs; CV = 13%; NEFSC 2013).

The most recent update to the SARC 57 model was completed in June 2016, using data through 2015 (Terceiro 2016). Results from the 2016 assessment update indicate that the summer flounder stock was not overfished, but overfishing was occurring in 2015 relative to the SSB and F biological reference points from the 2013 benchmark assessment. Fishing mortality on fully selected age 4 fish was estimated to be 0.390 in 2015, 26% above the 2013 SAW 57 F_{MSY} proxy = $F_{35\%}$ = 0.309 (Figure 9). Spawning stock biomass (SSB) was estimated to be 79.90 million lb (36,240 mt) in 2015, about 58% of SSB_{MSY} = 137.6 million lb (62,394 mt), and 16% above the overfished threshold of ½ SSB_{MSY} proxy = ½ $SSB_{35\%}$ = 68.78 million lb (31,197 mt; Figure 10).

The 2016 update shows that recruitment of age 0 fish was below the time series average (41 million fish at age 0; 1982-2015) each year from 2010 through 2015. Recruitment has also been overestimated in several of the most recent years. For example, in the 2015 update, 2014 recruitment appeared average, but has since been adjusted downward with the most recent update. Recruitment in 2015 is also estimated to be below average at 23 million fish.

The 2016 assessment update indicates that while catch in recent years has not been substantially over the ABCs, the projected fishing mortality rates have been exceeded and projected spawning stock biomass has not been achieved. For the past several years the assessment has shown retrospective patterns in fishing mortality rates, spawning stock biomass, and recruitment. In this case, the assessment in recent years has been underestimating fishing mortality rates, overestimating spawning stock biomass, and overestimating recruitment. In other words, when the assessment is updated, it reveals that past projections of fishing mortality rates have been exceeded, while projections of spawning stock biomass and recruitment have not been reached. This result is likely in part due to below-average recruitment to the stock for year classes from 2010-2015, and could also be due to mortality that is not being properly accounted for the assessment. Nearly all fishery-independent federal and state survey indices (including recruitment indices) have been decreasing from their most recent peaks over the 5-7 years prior to the 2016 update, some substantially.

Reports on stock status, including annual assessment and reference point update reports, Stock Assessment Workshop (SAW) reports, Stock Assessment Review Committee (SARC) reports, are available online at the Northeast Fisheries Science Center (NEFSC) website:
http://www.nefsc.noaa.gov/. A description of the history of past summer flounder stock assessments can be found in Terceiro (2001) and Terceiro (2011).

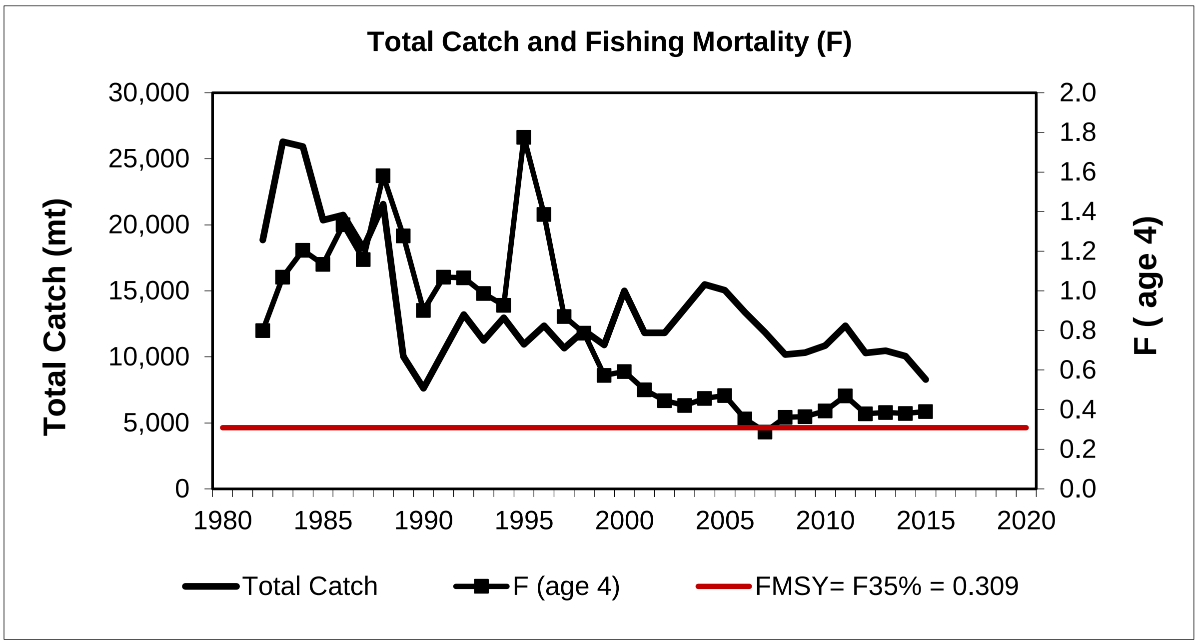


Figure 9: Total fishery catch and fully-recruited fishing mortality (F, peak at age 4) of summer flounder, 1982-2015. The horizontal dashed red line is the 2013 SAW 57 fishing mortality threshold reference point proxy.[4]

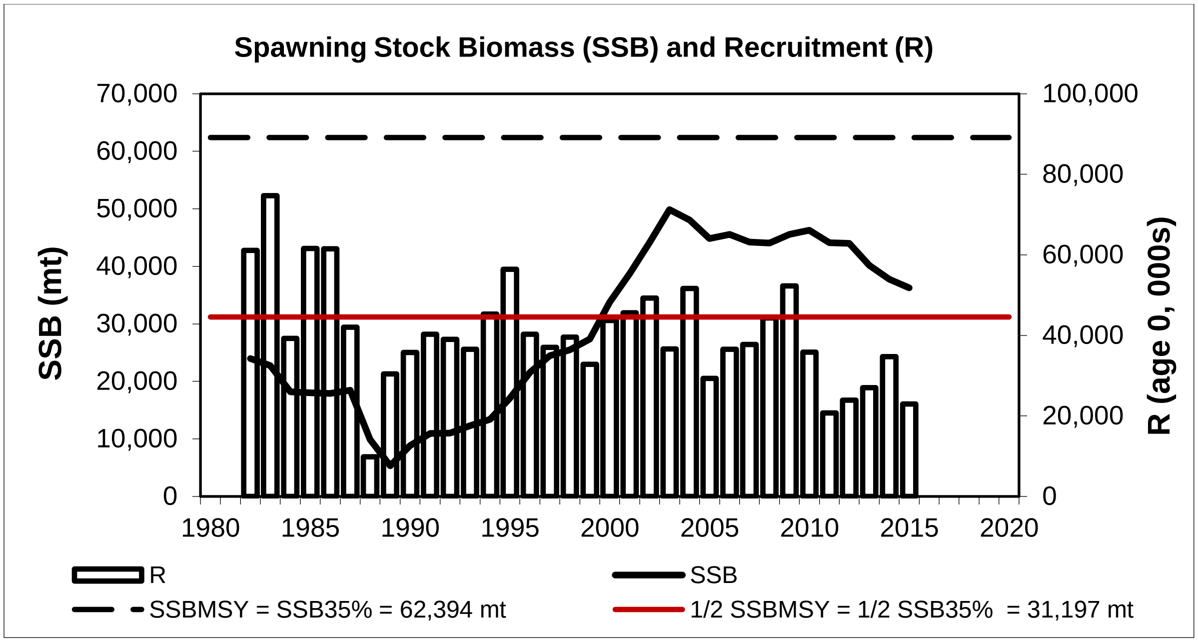


Figure 10: Summer flounder spawning stock biomass (SSB; solid line) and recruitment at age 0 (R; vertical bars) by calendar year, 1982-2015. The horizontal dashed line is the 2013 SAW 57 biomass target reference point proxy, the horizontal red line is the biomass threshold reference point proxy.[4]

6.1.3 Biological Characteristics and Ecological Relationships

6.1.3.1 Seasonal Migrations

Summer flounder exhibit strong seasonal inshore-offshore movements. Adult and juvenile summer flounder normally inhabit shallow coastal and estuarine waters during the warmer months of the year and remain offshore during the fall and winter.

While information on finer-scale migration patterns is generally unavailable, historical tagging studies suggest that depending on the season and release location, general patterns of "north-south," "east-west," and "inshore-offshore" movements are possible. Murawski (1970) reported that fish tagged from New Jersey in in the 1960s moved from inshore waters to offshore wintering grounds, with dispersion to both the south toward Virginia and to the north-east toward southern New England. Lux and Nichy's (1980) tagging results from the 1960s indicated that fish from inshore Southern New England (SNE) waters tagged in September had a broad range of movement, including east and offshore to Veatch Canyon south of Massachusetts, south and offshore to Block and Hudson canyons, and offshore as far southwest as Cape May NJ. Finally, Monaghan's tagging work (1992) on North Carolina fish in the early 1990s showed that fish tagged north of Hatteras mostly moved offshore and north as far as northern New Jersey. Fish tagged south of Hatteras moved to the southwest as far as the North Carolina-South Carolina border.

6.1.3.2 Spawning, Fecundity, and Reproductive Strategy

Summer flounder spawn during the fall and winter as they migrate offshore or are at their wintering grounds. Smith (1973) found that spawning starts in mid-September between southern New England and New Jersey. As the season progresses spawning moves southward, and by October spawning takes place nearly as far south as Chesapeake Bay. Spawning has been reported to continue into March (Morse 1981). Spawning habitat occurs over the entire shelf between Cape Cod, Massachusetts, and Cape Lookout, North Carolina.

Morse (1981) documented that summer flounder are serial spawners and that egg batches are continuously matured and shed during a protracted spawning season. Morse (1981) also reported a mean maturity index that increased rapidly from August to September, peaked in October- November, then gradually decreased to a low in July. The wide range in the maturity indices during the spawning season indicates nonsynchronous maturation of females and a relatively extended spawning season.

Fecundity of summer flounder is relatively high, ranging from 463,000 to 4,188,000 eggs for fish between 14 inches and 27 inches (Morse 1981). Fertilized eggs are buoyant, floating at or near the surface. Smith (1973) reported that the heaviest concentrations of eggs and larvae were found between Long Island and Cape Hatteras; most eggs were taken within 17 miles of shore and larvae were most abundant 12 to 45 miles from shore. Larvae were found in the northern part of the Middle Atlantic Bight from September to February, and in the southern part from November to May. Mid-Atlantic Region Monitoring and Assessment Program (MARMAP) survey data (Able *et al*. 1990) indicate that peak egg abundance occurs in October through December with October and November being the two months when most eggs were collected.

The reproductive strategy of summer flounder tends to maximize reproductive potential and avoid catastrophe. The strategy is a combination of extended spawning season with variable duration, early maturation (age 1 or 2), high fecundity, serial spawning, and extensive migrations across the continental shelf during spawning. The half year spawning season reduces larval crowding and decreases the impact of predators and adverse environmental conditions on egg and larval survival. The migration pattern disperses the eggs over large areas of the shelf and probably aids in maintaining spawning fish in areas where bottom temperatures are between 54^{o} and 66^{o} F (Smith 1973). The October/November spawning peak coincides with the breakdown of thermal stratification on the continental shelf and the maximum production of autumn plankton which is characteristic of temperate ocean waters of the northern hemisphere. Thus, the timing of peak spawning assures a high probability of adequate larval food supplies (Morse 1981).

6.1.3.3 Age Structure, Growth, and Maturity

Historical studies of summer flounder age and growth include those of Poole (1961), Eldridge (1962), Powell (1974), Smith and Daiber (1977), Henderson (1979), and Shepherd (1980). Multiple summer flounder ageing workshops have been held over the years (1980, 1990, 1999, 2014, and 2017) to reconcile different methods of ageing, parts for ageing (scales vs. otoliths), and evaluate agreement between ageing methods and readers, as described in NEFSC 2013. Both NEFSC survey and commercial samples were completely transitioned to otoliths beginning in 2015.

For the 2013 benchmark assessment, total Northeast Region commercial fishery landings and discards at age, North Carolina winter trawl fishery landings and discards at age, and MRFSS/MRIP recreational fishery landings and discards at age totals were summed to provide a total fishery catch at age matrix for 1982-2012 (Figure 11). The percentage of age 3 and older fish in the total catch in numbers has increased during the last several decades from only 4% in 1993 to 72% in 2008, 68% in 2009, 69% in 2010, and 80% in 2011.

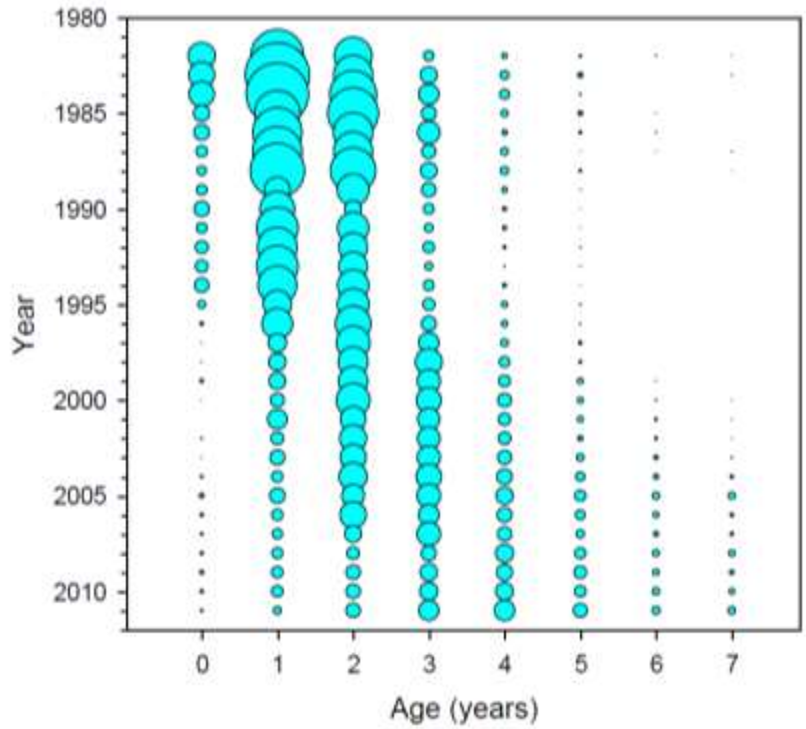


Figure 11: Total fishery catch at age for summer flounder, 1982-2012, from the 2013 benchmark stock assessment (NEFSC 2013).

The length-weight relationship for summer flounder was described by Lux and Porter (1966), Wigley et al. (2003), and various benchmark assessments for summer flounder over the years. These studies have shown that there are both seasonal and sexual differences in the length-weight relationship. This difference between the sexes was also noted by Smith and Daiber (1977), Eldridge (1962), and Wilk et al. (1978).

NEFSC trawl survey data for 1976-2016 for males, females, and sexes combined indicates that female summer flounder attain a significantly larger asymptotic size than males (Figure 12).

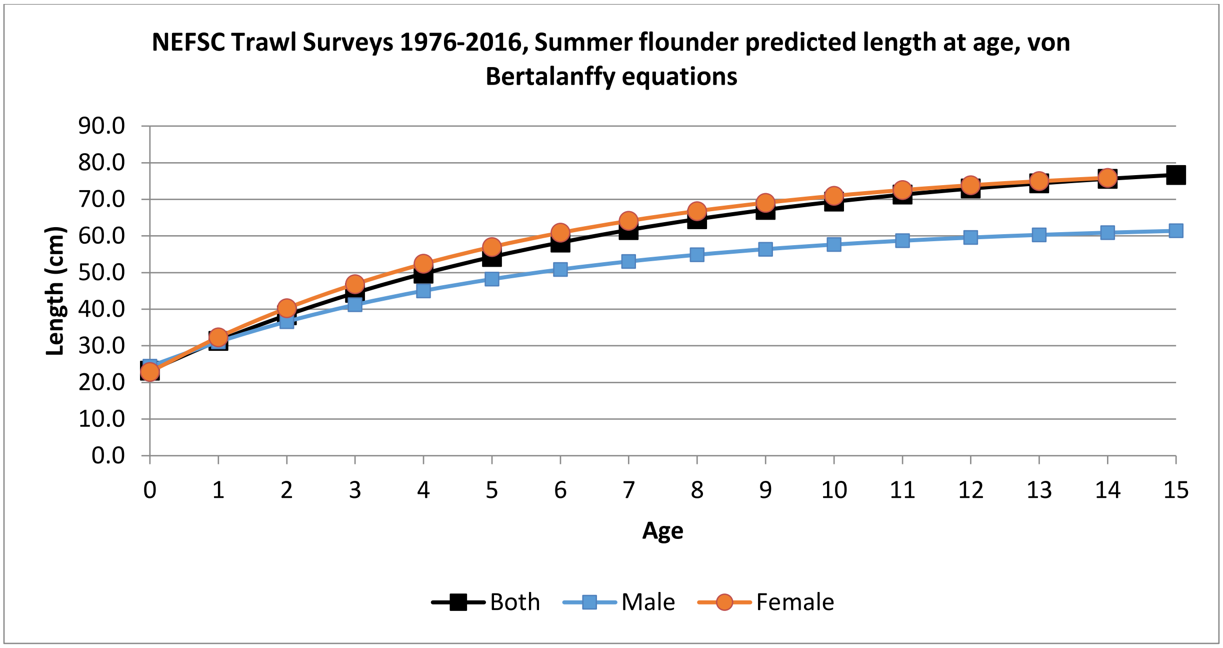


Figure 12: Predicted length at age from von Bertalanffy equations parameters estimated from NEFSC trawl survey data for 1976-2016. Maximum observed age for males is age 15; for females is age 14.

Preliminary work for the 2018 benchmark assessment examined NEFSC winter, spring and fall trawl survey sample data for trends in mean length and weight by sex and age. The winter and spring series indicate no strong trend in the mean lengths of ages 1-2 for sexes combined. For ages 3-6, there is an increasing trend in mean length from 1976 to about 1990, and a decreasing trend since then. In the fall series, there is no obvious trend for ages 0-1, but there are relatively strong decreasing trends in mean length for combined sexes for ages 2 and older since the mid-1990s. In general, similar trends are observed for mean weight, with a decreasing trend evident for ages 3 and older. Trends in the mean weights at age in the total, combined sexes fishery catch (landings plus discards) exhibit a comparable pattern, with strongest declining trends since the 1990s for ages 3 and older.

Also for preliminary 2018 benchmark assessment work, the median length at maturity was estimated as 26.1 cm (10.3 inches) for male summer flounder, 29.8 cm (11.7 inches) for female summer flounder, and 27.0 cm (10.6 inches) for the sexes combined.

The median age of maturity for summer flounder was determined to be 1.13 years for males, 1.42 years for females, and 1.23 years for both sexes combined (i.e., fish about 13-17 months old). These estimates are comparable to those in previous assessments. Most fish are sexually mature by age 2, and fish of age 3 and older are generally all very close to 100% mature. Estimated maturity ogives by year and sex suggest a long term, decreasing trend in proportion mature at ages 0 and 1 for males and females, and for females at age 2 (NEFSC 2013). The 1982-2016 mean percent observed maturities at age (unweighted, simple arithmetic average of annual values at age) are 42% at age 0, 95% at age 1, 99% at age 2, and 100% at ages 3 and older for males; 26% at age 0, 83% at age 1, 96% at age 2, and 100% at ages 3 and older for females; and 36% at age 0, 90%

at age 1, 98% at age 2, and 100% at ages 3 and older for sexes combined (M. Terceiro, pers. comm., Nov. 2017).

6.1.3.4 Sex Ratio

Work for the 2018 benchmark assessment examined NEFSC winter, spring and fall trawl survey raw sample data for trends in sex ratio by season and age, expressed as the proportion of females at age. The spring and fall series have sufficient data for the compilation beginning in 1976; the winter survey was conducted from 1992-2007. In general, the data show no or minimal trends in the proportion female over time for ages 0 and 1, but show a generally decreasing trend in the proportion female for ages 2 and older. In addition to the raw survey data, the NEFSC stratified mean abundance indices (numbers per tow) were calculated for the winter (1992-2007), spring and fall (1976-2016) series. As in the raw sample data, the sex ratio in the NEFSC stratified indices has changed over the last decade, with generally decreasing proportions of females at ages 2 and older (M. Terceiro, pers. comm., Nov. 2017).

6.1.3.5 Feeding, Prey, and Predators

Summer flounder are opportunistic feeders; their prey includes a variety of fish and crustaceans. The NEFSC trawl survey foods habits database contains information from 18,862 summer flounder stomachs sampled on 5,365 tows, over 70% of which were found to be empty. 'Other fish' (fish which could not be identified to family) were found in about 10% of the stomachs, followed by squids (6%), decapod shrimp (4%), 'animal remains' (3%; partially digested stomach contents), anchovies (2%), and other gadids, porgies, mysids, and other small crustaceans. The data were summarized into 4 multi-year blocks to look for temporal patterns. The frequency of 'Other fish' and decapod shrimp consumption by summer flounder decreased by about 50% over the time series, while the frequency of consumption of squid slightly increased. The frequency of consumption of anchovies peaked in the 1980s. The calculation of total absolute consumption of prey by summer flounder has not been attempted (NEFSC 2013).

Previous studies have inferred that larval and postlarval summer flounder initially feed on zooplankton and small crustaceans (Peters and Angelovic 1971, Powell 1974, Morse 1981, Timmons 1995). Food habits studies on late larval and juvenile estuarine summer flounder reveal that while they are opportunistic feeders and differences in diet are often related to the availability of prey, there also appears to be ontogenetic changes in diet. Smaller flounder (usually less than 4 inches; 100 mm) seem to focus on crustaceans and polychaetes while fish become a little more important in the diets of the larger juveniles (MAFMC 2002).

Adult flounder are most active during daylight hours and may be found well up in the water column as well as on the bottom (Olla et al. 1972). Included in their diet are: windowpane, winter flounder, northern pipefish, Atlantic menhaden, bay anchovy, red hake, silver hake, scup, Atlantic silverside, American sand lance, bluefish, weakfish, mummichog, rock crabs, squids, shrimps, small bivalve and gastropod molluscs, small crustaceans, marine worms and sand dollars (NEFSC 2013; Packer et al. 1999, MAFMC 2002).

The NEFSC trawl survey foods habits database includes summer flounder as a prey item in 65 predator stomachs over the period 1973-2011. Spiny dogfish was the predator in 35 cases (54%), followed by monkfish (11 cases, 17%), winter skate (7 cases, 11%). and bluefish (4 cases, 6%), with other fish species accounting for the other 9 cases and 12%, including 1 case (2%) of summer flounder cannibalism. All of the natural predators of adult summer flounder are not fully documented, and these data are insufficient to calculate total absolute predator consumption of summer flounder (NEFSC 2013).

6.1.3.6 Mortality

The 2008 SAW 47 assessment assumed a natural mortality rate (M) of 0.20 for females and 0.30 for males. A combined sex M-schedule at age was developed by assuming these initial M rates by sex, an initial proportion of females at age 0 of 40% derived from the NEFSC Fall survey indices by age and sex, and population abundance decline over time at the sex specific M rates. The final abundance weighted combined sex M-schedule at age ranged from 0.26 at age 0 to 0.24 at age 7+, with a mean of 0.25 (NEFSC 2008). This M-schedule was retained in the subsequent 2009-2016 benchmark and updated assessments (NEFSC 2013; Terceiro 2012, 2015, 2016).

Fishing mortality (F) on fully selected age 4 summer flounder ranged between 0.799 and 1.775 during 1982-1996 and then decreased from 0.871 in 1997 to 0.288 in 2007. Since 2007 the fishing mortality rate has increased and was 0.390 in 2015, 26% above the 2013 SAW 57 FMSY proxy = F35% = 0.309 (see Figure 9). The 90% confidence interval for F in 2015 was 0.292 to 0.490 (Terceiro 2016).

6.1.4 Summer Flounder Distribution and Center of Biomass

As described in section 6.1.1, the geographical range of the summer flounder encompasses the shallow estuarine waters and outer continental shelf from Nova Scotia to Florida, with the center of abundance lying within the Middle Atlantic Bight from Cape Cod, Massachusetts, to Cape Hatteras, North Carolina. The management unit is summer flounder in US waters in the western Atlantic Ocean from the US-Canadian border southward to the southern border of North Carolina.

In recent years, emerging evidence has indicated that summer flounder have experienced changes in distribution and/or center of biomass relative to recent decades, with the changes generally described as a northward/eastward shift in biomass. Describing distribution shifts is complicated, as multiple studies have used different methods to evaluate summer flounder distribution changes and each have characterized these changes somewhat differently, as described below. In addition, it can be difficult to determine the driving factors behind distribution changes, given the challenge in distinguishing between the effects of climate change related drivers, stock rebuilding, and/or other factors such as regional fishing pressure or habitat impacts. Bell et al. (2015) notes that understanding the mechanisms regulating species distribution should be considered as part of any potential change to the quota allocation system. An overview of information on summer flounder distribution changes and potential explanatory factors is provided below.

Nye et al. (2009) evaluated summer flounder distributional changes and concluded that there has been a significant change in the maximum latitude for summer flounder. This study analyzed trends from 1968 to 2007 in mean center of biomass, mean depth, mean temperature of occurrence, maximum latitude, minimum latitude, and area occupied for 36 fish stocks in the Greater Atlantic region. Overall, 24 of the 36 stocks showed statistically significant changes in at least one of these metrics, many of them exhibiting a poleward shift in the center of biomass. For summer flounder, no significant changes were found in the center of biomass or area occupied, but there was an observed significant change in maximum latitude (0.029 degrees latitude per year). Nye et al. conclude that this provides “preliminary evidence that the range of summer flounder, also termed a ‘sedentary’ species, has expanded over time, that its abundance increased, and that the center of biomass was displaced poleward within the survey area.”

Nye et al. (2009) did not, however, investigate the effects of size structure or fishing mortality on distributional response; thus, the extent that these results are confounded with or explained by fishing mortality decreases from the late 1980s to the early 2010s is not addressed. The authors did find a close relationship between species abundance and area occupied, hypothesizing that changes in abundance may manifest more in the total area occupied by each species, while changes in the center of biomass may be more in response to changes in environmental conditions.

Bell et al. (2015) examined the distributions of summer flounder using NEFSC trawl data to determine if the center of biomass along-the continental shelf had changed over time and if these changes were attributed to temperature changes or fishing pressure (via changes in overall abundance and/or fishing related changes in length structure of the stock). The authors note that shifts in distribution can be driven by habitat and environmental factors, when fish attempting to remain within the best possible habitat conditions by migrating to more optimal environments and/or declining in numbers in less idea environments. Range shifts can also be caused by simple changes in overall abundance, in that when there are less individuals of a particular species, those fish tend to occupy the highest value habitat. Population increases can lead to expansion into inferior habitat to avoid increased competition in ideal habitats. Finally, fishing mortality can affect distribution through changes in length-age structure of a population, by removing larger individuals which may tend to be located at higher latitudes.

Bell et al. (2015) used NEFSC bottom trawl survey data to examine changes in along-shelf biomass from 1972-2008, finding that summer flounder showed a significant northward trend in the fall, but no change in distribution in the spring. Interannual changes in the along-shelf center of biomass for summer flounder for both the spring and the fall showed a significant relationship with the interannual changes in mean length, but not with temperature or overall abundance. The authors provide evidence that larger summer flounder tend to occupy habitat further north, meaning that as the age structure of the population has expanded, the proportion of larger fish in the population has increased and the center of stock biomass in weight has thus shifted north.

The trends noted are particularly pronounced since the early 1990s, shortly after the population reached historic lows and had a severely truncated age structure. While evidence for other species (e.g., black sea bass and scup) suggests that temperature is a significant driver of distribution shifts, this study did not support this conclusion for summer flounder. This study also found no significant change in along-shelf distance occupied, suggesting that a range expansion does not appear to provide a strong explanation for distribution changes. Bell et al. suggest that a change in the length-age structure, driven by population recovery caused by reduced fishing mortality rates over time (see Figure 9, section 6.1.2), is the main driver of interannual shifts in summer flounder distribution.

The 2013 summer flounder benchmark assessment (SAW/SARC 57) describes similar conclusions. The assessment report notes that a progressive northward shift in distribution is evident with increases in length. Both spring and fall NEFSC trawl surveys show an increase in the average along-shelf position of summer flounder with increasing size. The average annual along-shelf center of biomass increased from the late 1960s to mid-1980s, then declined to the mid-1990s before reaching high levels again around 2007. Length-predicted along-shelf center of biomass declined from the 1960s to early 1990s, then increased until around 2008 and subsequently declined slightly. Larval distribution changed little throughout the time series, while mature adult distributions substantially shifted northward.

The OceanAdapt web portal, a collaboration between NMFS and the Pinsky Lab of Rutgers University, also provides information about the impacts of changing climate and other factors on species distribution. This website hosts an annually updated database of scientific surveys in the United States and provides tools for exploring changes in marine fish and invertebrate distributions. For the indicators displayed on this website, a mean location (the centroid) is calculated for each species in each year of each survey, after the surveys have been standardized to a consistent spatial footprint through time. The centroid is the mean latitude and mean depth of catch in the survey, weighted by biomass. Figure 13 shows the centroid latitude for summer flounder over time based on NEFSC trawl survey data, indicating that the center of survey biomass for summer flounder has shifted northward over time (see Pinsky et al. 2013 and http://oceanadapt.rutgers.edu/).

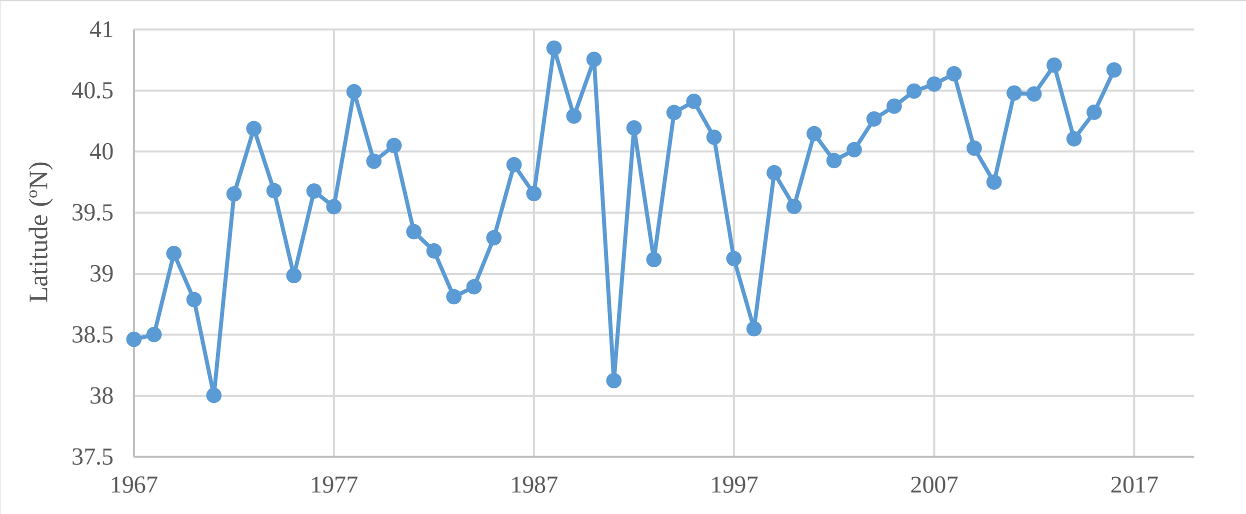


Figure 13: Mean biomass-weighted centroid latitude for summer flounder, 1967-2016, based on NEFSC trawl survey data. Data source: OceanAdapt portal, http://oceanadapt.rutgers.edu/.

An animation of summer flounder distribution changes over time from the NEFSC spring trawl survey from 1968 to 2014 can be viewed at: https://www.nefsc.noaa.gov/ecosys/climate-change/summer-flounder.html.

While observations of summer flounder north of Cape Cod have historically been rare, this may be changing as the stock distribution changes over time. In June 2012, scientists reported the first observations of young of the year (YOY) summer flounder in a southern Maine estuary, capturing two YOY individuals at the mouth of the Saco River estuary. Because YOY specimens have not previously been recorded at the northern extent of the summer flounder range, a northward range expansion is a possible explanation for this observation (Rudnicky et al. 2016).

Both changes in environmental conditions and changes in fishing mortality, along with other factors, are likely to be important mechanisms affecting the distribution of summer flounder. The exact mechanism causing a distributional shift in any given species is not always clear and is likely to differ by species. Furthermore, as noted above, multiple mechanisms may be contributing to changes in distribution, confounding efforts to attribute changes in abundance and distribution to only one cause.

6.2 NON-TARGET SPECIES

Non-target species are those species caught incidentally while targeting other species, in this case, while targeting summer flounder. Some non-target species are occasionally retained, others are commonly discarded. This section describes the non-target species commonly caught in the commercial summer flounder fishery and summarizes their management status and stock status.

6.2.1 Identification of Major Non-Target Species

For many species, including summer flounder, associated non-target species can be difficult to identify and can change from year to year or over longer time series, based on many factors such as changing regulations, fluctuations in stock conditions, shifting species distributions, and changing economic conditions.

Northeast Fisheries Observer Program (NEFOP) data were used to identify the major species caught incidentally on commercial trawl trips where summer flounder comprised over 50% of the landings (by weight; a proxy for directed summer flounder trips). Those non-target species making up 2% or percentage of total catch weight over that time period include little skate, spiny dogfish, clearnose skate, winter skate, unknown skate, Northern sea robin, barndoor skate, and black sea bass (Figure 14). Scup composed slightly less than 2% of the total catch weight; however, they are included as non-target species in this analysis given their management under the same FMP as summer flounder and black sea bass.

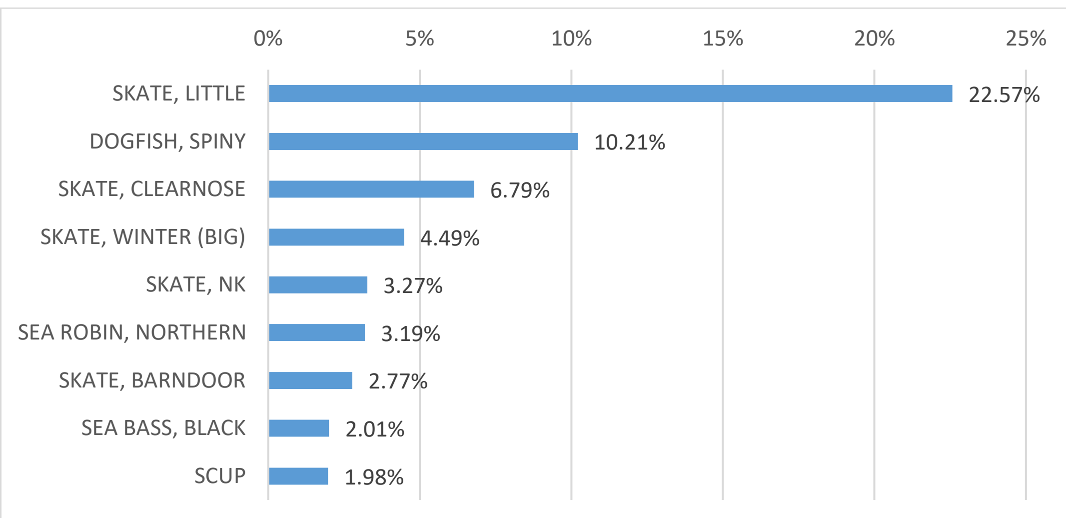


Figure 14: Most commonly caught fish species on observed hauls where summer flounder >50% of catch by weight, 2012-2016. Source: NEFOP data as of July 2016.

6.2.2 Description and Status of Major Non-Target Species

The stock status and management status of the non-target species identified above are briefly described below. More information is provided for scup and black sea bass relative to other non-target species due to their management under the same FMP as summer flounder. Management measures for the Mid-Atlantic and New England Fishery Management Council-managed species (skates, spiny dogfish, black sea bass, and scup) include AMs to address ACL overages through reductions in landings limits in following years. AMs for all these species take discards into account. These measures help to mitigate negative impacts from discards in these recreational fisheries, and other fisheries.

6.2.2.1 Northeast Skate Complex

The following information is taken from NEFMC 2018. The Northeast skate complex fishery in the Greater Atlantic Region includes seven skate species and operates from Maine to Cape Hatteras, North Carolina, and from inshore to offshore waters on the edge of the continental shelf. Skate is mostly harvested incidentally in trawl and gillnet fisheries targeting groundfish, monkfish, and sometimes scallops. The Northeast skate complex fishery consists of seven species: *Leucoraja ocellata* (winter skate); *Dipturis laevis* (barndoor skate); *Amblyraja radiata* (thorny skate); *Malacoraja senta* (smooth skate); *Leucoraja erinacea* (little skate); *Raja eglanteria* (clearnose skate); and *Leucoraja garmani* (rosette skate). Given that most of these species were identified as non-target catch in the commercial summer flounder fishery, along with "unknown skates," all of these species are briefly summarized here.

The primary target species in the skate fishery are winter and little skates. Winter skates are harvested for their wings for human consumption, and little skates are harvested as bait for lobster fisheries. Thorny skate and barndoor skate are currently prohibited species.

The stock status relies for each skate species entirely on the annual NMFS trawl survey. The fishing mortality reference points are based on changes in survey biomass indices. 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 for that species (NEFSC 2007). The average CVs of the indices are given by species in Table 22. Except for little skates, the abundance and biomass trends are best represented by the fall survey, which has been updated through 2014. Little skate abundance and biomass trends are best represented by the spring survey, which has been updated through 2015. Based on survey data updated through fall 2014/spring 2015, only thorny skate remained in an overfished condition (Table 22).

For barndoor skate, the 2014-2016 NEFSC autumn average survey biomass index of 1.60 kg/tow is above the biomass threshold reference point (0.78 kg/tow) and the BMSY proxy (1.57 kg/tow) (Table 22). The 2014-2016 average index is above the 2013-2015 index by 0.5%. It is recommended that this stock is not overfished and overfishing is not occurring.

For clearnose skate, the 2014-2016 NEFSC autumn average biomass index of 0.59 kg/tow is above the biomass threshold reference point (0.33 kg/tow) but below the BMSY proxy (0.66 kg/tow) (Table 22). The 2014-2016 index is below the 2013-2015 index by 19.5% which is less than the threshold percent change of 40%. It is recommended that this stock is not overfished and overfishing is not occurring.

For little skate, the 2015-2017 NEFSC spring average biomass index of 5.49 kg/tow is above the biomass threshold reference point (3.07 kg/tow) but below the BMSY proxy (6.15 kg/tow) (Table 22). The 2015-2017 average index is below the 2014-2016 average by 2.6% which is less than the threshold percent change of 20%. It is recommended that this stock is not overfished and overfishing is not occurring.

For rosette skate, the 2014-2016 NEFSC autumn average biomass index of 0.047 kg/tow is above the biomass threshold reference point (0.024 kg/tow) but below the BMSY proxy (0.048 kg/tow)

(Table 22). The 2014-2016 index is below the 2013-2015 index by 7.9% which is less than the threshold percent change of 60%. It is recommended that this stock is not overfished and overfishing is not occurring.

For smooth skate, the 2014-2016 NEFSC autumn average biomass index of 0.25 kg/tow is above the biomass threshold reference point (0.134 kg/tow) but below the BMSY proxy (0.27 kg/tow) (Table 22). The 2014-2016 index is above the 2013-2015 index by 21.4%. It is recommended that this stock is not overfished and overfishing is not occurring.

For thorny skate, the 2014-2016 NEFSC autumn average biomass index of 0.18 kg/tow is well below the biomass threshold reference point (2.06 kg/tow) [Table 2]. The 2014-2016 index is higher than the 2013- 2015 index by 3.7%. It is recommended that this stock is overfished but overfishing is not occurring.

For winter skate, the 2014-2016 NEFSC autumn average biomass index of 6.65 kg/tow is above the biomass threshold reference point (2.83 kg/tow) and above the BMSY proxy (5.66 kg/tow) (Table 22). The 2014-2016 average index is above the 2013-2015 index by 24.2%. It is recommended that this stock is not overfished and overfishing is not occurring.

Table 22: Summary by species of recent survey indices, survey strata used and biomass reference points for the Northeast Skate Complex. Source: NEFMC 2018.

	BARNDOOR	CLEARNOSE	LITTLE	ROSETTE	SMOOTH	THORNY	WINTER
Survey (kg/tow)	**Autumn**	**Autumn**	**Spring**	**Autumn**	**Autumn**	**Autumn**	**Autumn**
Time Series Basis	1963-1966	1975-2007	1982-2008	1967-2007	1963-2007	1963-2007	1967-2007
Strata Set	Offshore 1-30, 34-40	Offshore 61-76, Inshore 17,20,23,26,29,32,35,38,41,44	Offshore 1-30, 34-40, 61-76, Inshore 2,5,8,11,14,17,20,23,26,29,32,35,38,41,44-46,56,59-61,64-66	Offshore 61-76	Offshore 1-30, 34-40	Offshore 1-30, 34-40	Offshore 1-30, 34-40, 61-76
2010	1.10	0.68	10.63	0.028	0.18	0.28	8.09
2011	1.02	1.32	6.88	0.034	0.30	0.18	6.65
2012	1.54	0.93	7.54	0.040	0.21	0.08	5.29
2013	1.07	0.77	6.90	0.056	0.14	0.11	2.95
2014	1.62	0.61	6.54[a]	0.053	0.22	0.21	6.95
2015	2.08	0.82	6.82	0.045	0.25	0.19	6.15
2016	1.09	.339	3.56[b]	0.044	0.27	0.13	6.84
2017			6.09				
2010-2012 3-year average	1.22	0.97	8.35	0.033	0.23	0.18	6.68
2011-2013 3-year average	1.21	1.01	7.11	0.042	0.22	0.12	4.96
2012-2014 3-year average	1.41	0.77	6.99[a]	0.048	0.19	0.13	5.06
2013-2015 3-year average	1.59	0.73	6.75[a]	0.051	0.21	0.17	5.35
2014-2016 3-year average	1.60	0.59	5.64[b]	0.047	0.25	0.18	6.65
2015-2017 3-year average			5.49				
Percent change 2011-2013 compared to 2010-2012	-1.0	+3.1	-14.9	+28.8	-5.0	-31.9	-25.7
Percent change 2012-2014 compared to 2011-2013	+16.5	-23.3	-1.6	+14.6	-12.5	+8.7	+2.0
Percent change 2013-2015 compared to 2012-2014	+12.9	-4.8	-3.4	+6.0	+6.8	+26.3	+5.7
Percent change 2014-2016 compared to 2013-2015	+0.5	-19.5	-16.8	-7.9	+21.4	+3.7	+24.2
Percent change 2015-2017 compared to 2014-2016			-2.6				
Percent change for overfishing status determination in FMP	-30	-40	-20	-60	-30	-20	-20
Biomass Target	1.57	0.66	6.15	0.048	0.27	4.13	5.66
Biomass Threshold	0.78	0.33	3.07	0.024	0.13	2.06	2.83

[a] No survey tows completed south of Delaware in spring 2014. Values for 2014 were adjusted for missing strata (i.e., Offshore 61-68, Inshore 32,35, 38, 41, 44) but may not be fully comparable to other surveys which sampled all strata.

6.2.2.2 Spiny Dogfish

Spiny dogfish (*Squalus acanthias*) is a coastal shark with populations on the continental shelves of northern and southern temperate zones throughout the world. It is the most abundant shark in the western north Atlantic and ranges from Labrador to Florida, but is most abundant from Nova Scotia to Cape Hatteras, North Carolina. Its major migrations on the northwest Atlantic shelf are north and south, but it also migrates inshore and offshore seasonally in response to changes in water temperature. Spiny dogfish are jointly managed by the MAFMC and the NEFMC; the Commission also has a complementary FMP for state waters.

Spiny dogfish have a long life, late maturation, a long gestation period, and relatively low fecundity, making them generally vulnerable to depletion. Fish, squid, and ctenophores dominate the stomach contents of spiny dogfish collected during the NEFSC bottom trawl surveys but they are opportunistic and have been found to consume a wide variety of prey. More detailed life history information can be found in the EFH source document for spiny dogfish at:
http://www.nefsc.noaa.gov/publications/tm/tm203/tm203.pdf.

The most recent assessment update was in 2015, which found that the stock is not overfished nor subject to overfishing. Spawning Stock Biomass (SSB) was estimated to be 106% of the target B_{MSY} proxy in 2015 (MAFMC 2016).

6.2.2.3 Northern Sea Robin

Northern sea robins *(Prionotus carolinus)* have not been assessed, therefore their overfished and overfishing status is unknown. Sea robins are not managed directly at the federal or state level.

Northern sea robins are distributed from Nova Scotia to central Florida, and are most common between Cape Cod, MA and Cape Hatteras, NC. Sea robins typically inhabit coastal waters over open sand or mud from near shore to depths of about 170 meters, and undertake southerly/offshore migrations in the winter (Gilbert and Williams 2002).

6.2.2.4 Black Sea Bass

Black sea bass are protogynous hermaphrodites, meaning the majority are born females and some individuals later transition to males. Black sea bass are commonly associated with physical structures such as reefs, although they utilize a variety of habitats including open bottom. Both their protogynous life history and structure-orienting behavior have posed challenges for prior analytical assessments of this species. The 2016 benchmark stock assessment working group (NEFSC 2017) spent a great deal of time analyzing and simulating various datasets to gain a better understanding on how these life history characteristics impact the assessment and the black sea bass population.

Regarding the protogynous life history, results indicate the stock is more robust to exploitation than previously thought due to factors such as a sex ratio that is not highly skewed and the contribution of secondary males to spawning success. Typical protogynous hermaphrodites start as nearly all females and transition with age and size to nearly all males. This makes these species highly susceptible to overexploitation as a fishery selectively removes the larger males, therefore increasing sex change rates and reducing productivity. Age data from the NEFSC winter and spring trawl survey indicates sex ratios within the north Atlantic black sea bass stock (Cape Hatteras, NC to Canada) are not as highly skewed with a female to male ratio of 70/30 at the youngest and smallest sea bass and a 45/65 ratio at the largest and oldest sea bass. A simulation model was also developed (Blaylock and Shepherd 2016) that evaluated black sea bass vulnerability to fisheries exploitation given its unique life history characteristics. Results from this analysis highlight the importance of secondary males, and therefore less reliance on dominant males, in the spawning success of sea bass. This spawning characteristic of north Atlantic black sea bass is more similar to a typical gonochoristic species (e.g., summer flounder or scup) and therefore improves its resiliency to exploitation compared to other species with a typical protogynous life history. As a result of this information, SSB calculations were defined as combined male and female mature biomass. Most stock assessments of mid-Atlantic species rely heavily on data collected during the NEFSC's biannual bottom trawl survey and other state conducted fishery independent trawl surveys. A closer examination of trawl catches from these surveys shows there is no significant difference in the number or length frequency of sea bass caught right near physical habitat (e.g. reefs) or up to distances 11 miles from the physical habitat, indicating trawl surveys are viable surveys that can be appropriately used as tuning indices in the stock assessment.

The northern stock of black sea bass (i.e., black sea bass north of Cape Hatteras, North Carolina) was under a rebuilding plan from 2000 until 2009. Black sea bass were declared rebuilt based on the findings of the Data Poor Stocks Working Group (DPSWG), which performed a benchmark stock assessment for black sea bass in 2008 (DPSWG 2009).

The most recent benchmark stock assessment for black sea bass was completed in December 2016. This assessment indicated that the black sea bass stock north of Cape Hatteras, NC was not overfished and overfishing was not occurring in 2015. SSB averaged around 6 million pounds from the late 1980's and early 1990's and then steadily increased from 1997 to 2002 when it reached 18.7 million pounds. There was then a decline in SSB until 2007(8.9 million pounds), followed by a steady increase through 2015 with SSB at its highest level estimated (Figure 15). The model-estimated SSB in 2015 was 48.89 million pounds (22,176 mt), 2.3 times SSB at maximum sustainable yield, SSB_{MSY} = 21.31 million pounds (9,667 mt).

The fishing mortality rate (F) in 2015 was 0.27, below the fishing mortality threshold reference point ($F_{MSY\ PROXY}$ = F40%) of 0.36 (NEFSC 2017). Fishing mortality was very high in the early 1990's, typically greater than 1.0, but declined and stabilized after 1997 once black sea bass was added to the summer flounder and scup management plan. Fishing mortality has been below the $FMSY_{PROXY}$ reference point for the last five years (Figure 16). Model estimated recruitment was relatively constant throughout the time series except for large peaks from the 1999 and 2011 year classes. Average recruitment from 1989 – 2015 equaled 24.3 million fish with the 1999 year class estimated at 37.3 fish and the 2011 year class estimated at 68.9 million fish. Since 2012, recruitment has been average with the latest cohort (2014 year class) estimated to be 24.9 million fish.

A data update (i.e. updated catch, landings, and survey indices through 2016) was conducted in 2017 and indicates that black sea bass biomass continues to be high, and the 2015 year class appears to be above average.

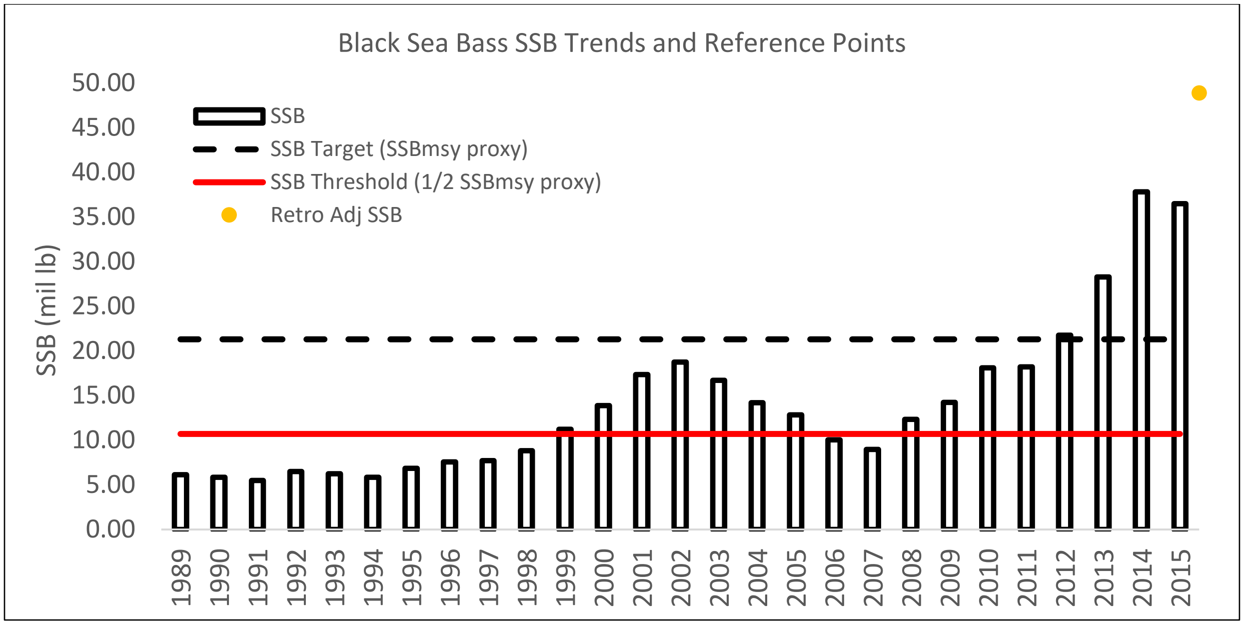


Figure 15: Spawning stock biomass, both mature male and female biomass, of black sea bass from 1989 to 2015 and biomass reference points from the 2016 benchmark stock assessment (NEFSC 2017). The 2015 retro-adjusted spawning stock biomass value was generated to correct for the retrospective bias present in the assessment model and is used as the estimate to compare to the reference points.

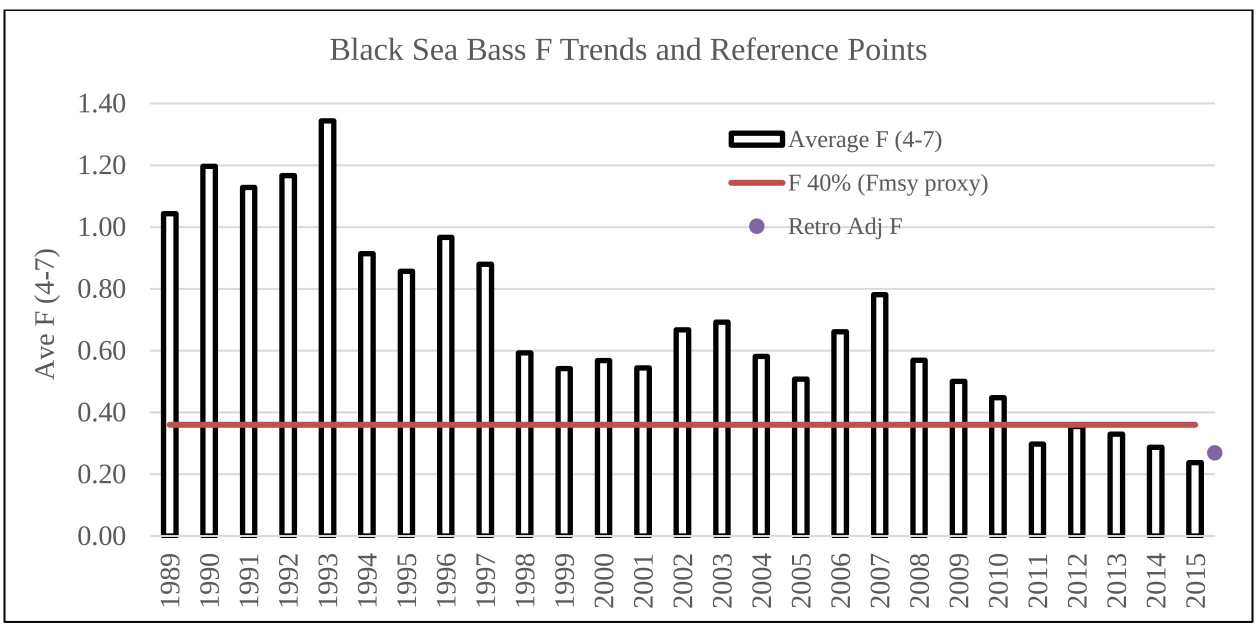


Figure 16: Fishing mortality rate on black sea bass ages 4-7 and the $F_{MSY\ PROXY}$ reference point from the 2016 benchmark stock assessment (NEFSC 2017). The 2015 retro-adjusted fishing mortality rate value was generated to correct for the retrospective bias present in the assessment model and is used as the estimate to compare to the reference points.

6.2.2.5 Scup

The most recent benchmark stock assessment for scup took place in 2015 as part of the 60th Stock Assessment Work Group and Stock Assessment Review Committee (SAW/SARC 60) and included data through 2014 (NEFSC 2015). A stock assessment update was conducted in 2017 with catch and survey data through 2016. The update assessment found that scup was not overfished and overfishing was not occurring in 2016 relative to the biological reference points from the benchmark assessment (Terceiro 2017b). SSB was very low and averaged around 19.38 million pounds from the early 1980's and late 1990's and then steadily increased from 2000 to a peak in 2011 when it reached 513.80 million pounds. SSB has declined since its peak in 2011 but remains very high and increased slightly in 2016 (Figure 3). The model-estimated SSB in 2016 was 396.60 million pounds (179,898 mt), 2.1 times SSB at maximum sustainable yield, SSB_{MSY} = 192.47 million pounds (87,302 mt).

The fishing mortality rate (F) in 2016 was 0.139, which is 37% below the fishing mortality threshold reference point ($F_{MSY\ PROXY}$ = F40%) of 0.220 (Terceiro 2017b). Fishing mortality was very high in the 1980's and mid-1990's, typically greater than 1.0, but declined in 1995 and has stabilized since 2001 (Figure 17). Fishing mortality has been below the $F_{MSY\ PROXY}$ reference point for the last 17 years. The average recruitment from 1984 to 2016 is 121 million fish at age 0. The 2015 year class is currently estimated to be large at 252 million fish, while the 2016 year class is currently estimated to be below average at 65 million fish (Figure 18).

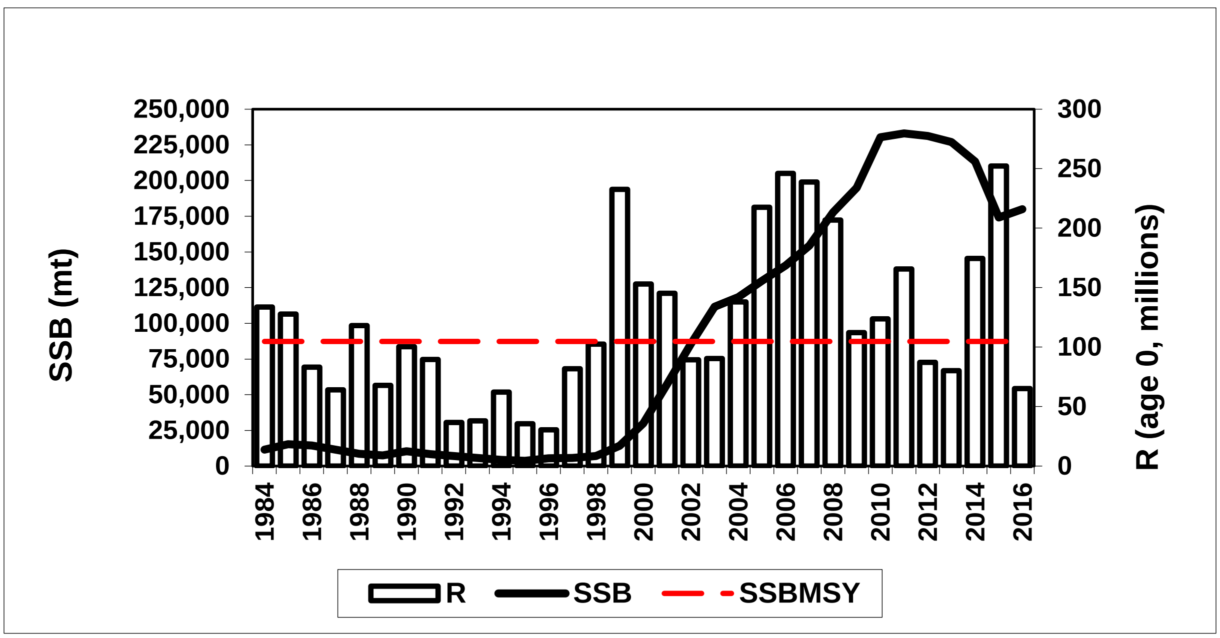


Figure 17: Spawning Stock Biomass (SSB; solid line) and Recruitment (R at age 0; vertical bars) for scup from the 2017 update stock assessment (Terceiro 2017b). The horizontal dashed line is the SSB_{MSY} proxy = $SSB_{40\%}$ = 87,302 mt (NEFSC 2015).

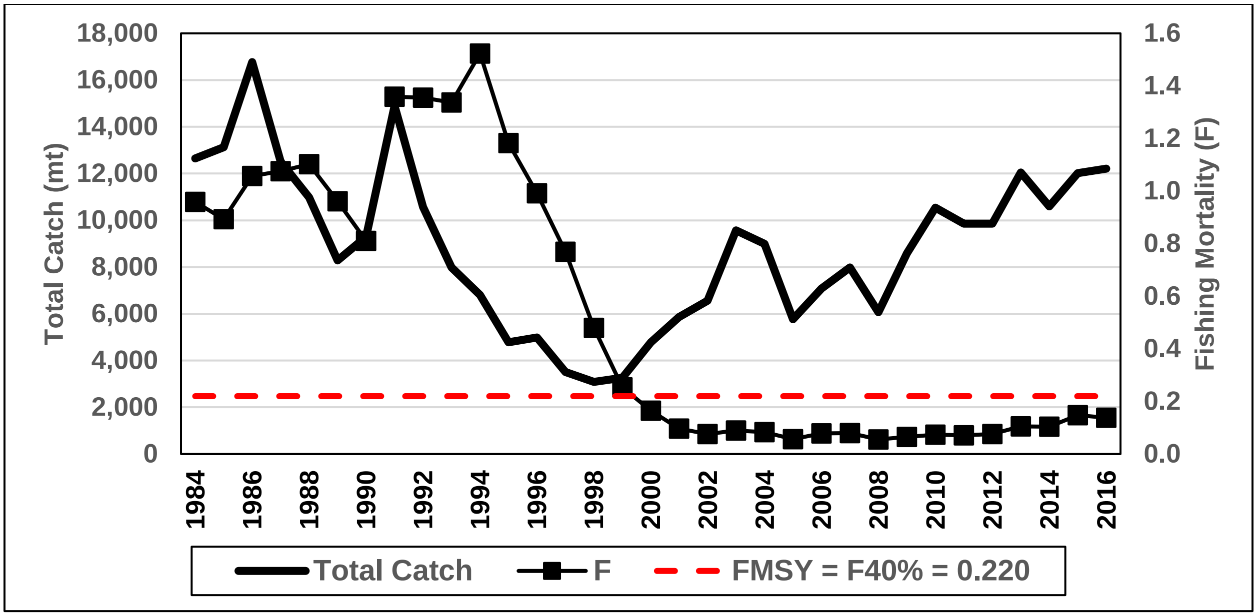


Figure 18: Total fishery catch and fishing mortality (F at age 3) for scup from the 2017 stock assessment update (Terceiro 2017b). The horizontal dashed line is the F_{MSY} proxy = $F_{40\%}$ = 0.220 (NEFSC 2015).

6.3 PHYSICAL ENVIRONMENT AND ESSENTIAL FISH HABITAT

This section describes the physical environment and habitat within the affected environment for summer flounder, including a description of the broader physical environment within the management unit (section 6.3.1), summer flounder general habitat preferences, EFH, and Habitat Areas of Particular Concern (HAPCs) as well as EFH for other species within the core footprint of the summer flounder fishery (section 6.3.2), and fishery impact considerations (section 6.3.3).

6.3.1 Physical Environment

Summer flounder inhabit the northeast U.S. shelf ecosystem, which includes the area from the Gulf of Maine south to Cape Hatteras, extending seaward from the coast to the edge of the continental shelf, including the slope sea offshore to the Gulf Stream. The northeast shelf ecosystem includes the Gulf of Maine, Georges Bank, the Mid-Atlantic Bight, and the continental slope (Figure 19). Pertinent physical characteristics of the three sub-regions that could potentially be affected by this action are described in this section. Emphasis is given to the Mid-Atlantic Bight since the fishery is concentrated in this portion of the northeast shelf ecosystem. Information included in this document was extracted from Stevenson et al. (2004) and up-dated with additional information, as cited.

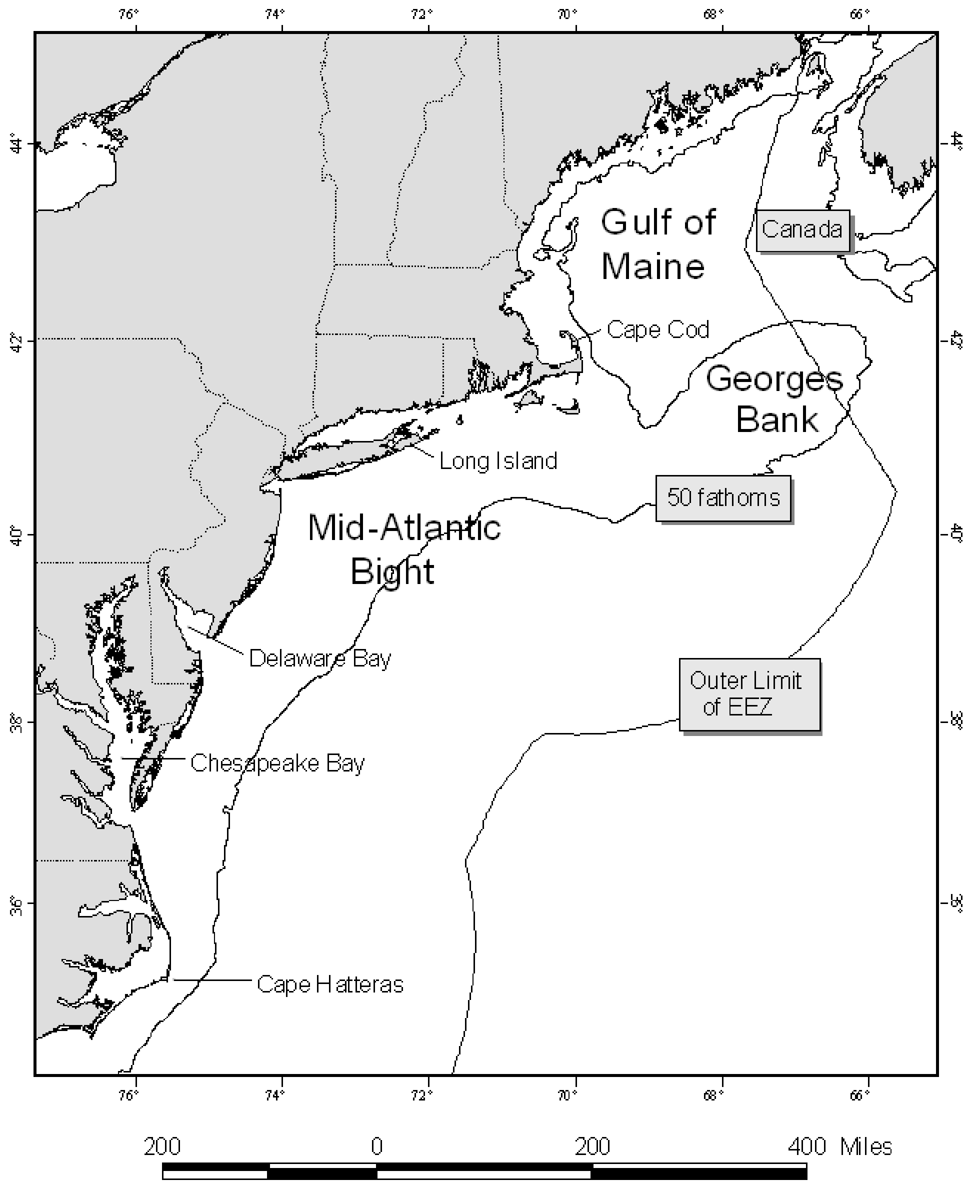


Figure 19: Northeast U.S. Shelf Ecosystem.

Greene et al. (2010) identified and described Ecological Marine Units (EMUs) in New England and the Mid-Atlantic based on sediment type, seabed form (a combination of slope and relative depth)[15], and benthic organisms.[16] 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 (Table 23).

[15] Seabed form contains the categories of depression, mid flat, high flat, low slope, side slope, high slope, and steep slope.

[16] See Greene et al. 2010 for a description of the methodology used to define EMUs.

Like all the world's oceans, the western North Atlantic is experiencing changes to the physical environment as a result of 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).

Table 23: Composition of Ecological Marine Units (EMUs) off New England and the Mid-Atlantic (Greene et al. 2010). EMUs which account for less than 1% of the surface area of these regions are not shown.

Ecological Marine Unit	Percent Coverage
High Flat Sand	13%
Moderate Flat Sand	10%
High Flat Gravel	8%
Side Slope Sand	6%
Somewhat Deep Flat Sand	5%
Low Slope Sand	5%
Moderate Depression Sand	4%
Very Shallow Flat Sand	4%
Side Slope Silt/Mud	4%
Moderate Flat Gravel	4%
Deeper Depression Sand	4%
Shallow Depression Sand	3%
Very Shallow Depression Sand	3%
Deeper Depression Gravel	3%
Shallow Flat Sand	3%
Steep Sand	3%
Side Slope Gravel	3%
High Flat Silt/Mud	2%
Shallow Depression Gravel	2%
Low Slope Gravel	2%
Moderate Depression Gravel	2%
Somewhat Deep Depression Sand	2%
Deeper Flat Sand	1%
Shallow Flat Gravel	1%
Deep Depression Gravel	1%
Deepest Depression Sand	1%
Very Shallow Depression Gravel	1%

Gulf of Maine

Although not obvious in appearance, the Gulf of Maine (GOM) is actually an enclosed coastal sea, bounded on the east by Browns Bank, on the north by the Nova Scotian (Scotian) Shelf, on the west by the New England states, and on the south by Cape Cod and Georges Bank. The GOM was glacially derived, and is characterized by a system of deep basins, moraines and rocky protrusions with limited access to the open ocean. This geomorphology influences complex oceanographic processes that result in a rich biological community.

The GOM is topographically unlike any other part of the continental border along the U.S. Atlantic coast. The GOM's geologic features, when coupled with the vertical variation in water properties, result in a great diversity of habitat types. It contains twenty-one distinct basins separated by ridges, banks, and swells. The three largest basins are Wilkinson, Georges, and Jordan. Depths in the basins exceed 250 meters (m), with a maximum depth of 350 m in Georges Basin, just north of Georges Bank. The Northeast Channel between Georges Bank and Browns Bank leads into Georges Basin, and is one of the primary avenues for exchange of water between the GOM and the North Atlantic Ocean.

High points within the Gulf include irregular ridges, such as Cashes Ledge, which peaks at 9 m below the surface, as well as lower flat topped banks and gentle swells. Some of these rises are remnants of the sedimentary shelf that was left after most of it was removed by the glaciers. Others are glacial moraines and a few, like Cashes Ledge, are outcroppings of bedrock. Very fine sediment particles created and eroded by the glaciers have collected in thick deposits over much of the GOM, particularly in its deep basins. These mud deposits blanket and obscure the irregularities of the underlying bedrock, forming topographically smooth terrains. Some shallower basins are covered with mud as well, including some in coastal waters. In the rises between the basins, other materials are usually at the surface. Unsorted glacial till covers some morainal areas, as on Sewell Ridge to the north of Georges Basin and on Truxton Swell to the south of Jordan Basin. Sand predominates on some high areas and gravel, sometimes with boulders, predominates on others.

Coastal sediments exhibit a high degree of small-scale variability. Bedrock is the predominant substrate along the western edge of the GOM north of Cape Cod in a narrow band out to a depth of about 60 m. Rocky areas become less common with increasing depth, but some rock outcrops poke through the mud covering the deeper sea floor. Mud is the second most common substrate on the inner continental shelf. Mud predominates in coastal valleys and basins that often abruptly border rocky substrates. Many of these basins extend without interruption into deeper water. Gravel, often mixed with shell, is common adjacent to bedrock outcrops and in fractures in the rock. Large expanses of gravel are not common, but do occur near reworked glacial moraines and in areas where the seabed has been scoured by bottom currents. Gravel is most abundant at depths of 20 - 40 m, except in eastern Maine where a gravel-covered plain exists to depths of at least 100 m. Bottom currents are stronger in eastern Maine where the mean tidal range exceeds 5 m. Sandy areas are relatively rare along the inner shelf of the western GOM, but are more common south of Casco Bay, especially offshore of sandy beaches.

Georges Bank

Georges Bank is a shallow (3 - 150 m depth), elongate (161 km wide by 322 km long) extension of the continental shelf that was formed by the Wisconsinian glacial episode. It is characterized by a steep slope on its northern edge and a broad, flat, gently sloping southern flank. The Great South Channel lies to the west. Natural processes continue to erode and rework the sediments on Georges Bank. It is anticipated that erosion and reworking of sediments will reduce the amount of sand available to the sand sheets, and cause an overall coarsening of the bottom sediments (Valentine and Lough 1991).

Glacial retreat during the late Pleistocene deposited the bottom sediments currently observed on the eastern section of Georges Bank, and the sediments have been continuously reworked and redistributed by the action of rising sea level, and by tidal, storm and other currents. The strong, erosive currents affect the character of the biological community. Bottom topography on eastern Georges Bank is characterized by linear ridges in the western shoal areas; a relatively smooth, gently dipping sea floor on the deeper, easternmost part; a highly energetic peak in the north with sand ridges up to 30 m high and extensive gravel pavement; and steeper and smoother topography incised by submarine canyons on the southeastern margin.

The central region of the Bank is shallow, and the bottom is characterized by shoals and troughs, with sand dunes superimposed upon them. The two most prominent elevations on the ridge and trough area are Cultivator and Georges Shoals. This shoal and trough area is a region of strong currents, with average flood and ebb tidal currents greater than 4 km/h, and as high as 7 km/h. The dunes migrate at variable rates, and the ridges may also move. In an area that lies between the central part and Northeast Peak, there are high-energy areas as between 35 - 65 m deep, where sand is transported on a daily basis by tidal currents, and a low-energy area at depths > 65 m that is affected only by storm currents.

The area west of the Great South Channel, known as Nantucket Shoals, is similar in nature to the central region of the Bank. Currents in these areas are strongest where water depth is shallower than 50 m. This type of traveling dune and swale morphology is also found in the Mid-Atlantic Bight, and further described in that section below. The Great South Channel separates the main part of Georges Bank from Nantucket Shoals. Sediments in this region include gravel pavement and mounds, some scattered boulders, sand with storm generated ripples, and scattered shell and mussel beds. Tidal and storm currents range from moderate to strong, depending upon location and storm activity.

Mid-Atlantic Bight

The Mid-Atlantic Bight includes the shelf and slope waters from Georges Bank south to Cape Hatteras, and east to the Gulf Stream. 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. Like the rest of the continental shelf, the topography of the Mid-Atlantic Bight 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. Since that time, currents and waves have 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. Slope water tends to be warmer than shelf water because of its proximity to the Gulf Stream, and tends to be more saline. The abrupt gradient where these two water masses meet is called the shelf-slope front. This front is usually located at the edge of the shelf. The position of the front is highly variable, and can be influenced by many physical factors. Vertical structure of temperature and salinity within the front can develop complex patterns because of the interleaving of shelf and slope waters; *e.g.*, cold shelf waters can protrude offshore, or warmer slope water can intrude up onto the shelf. The seasonal effects of warming and cooling increase in shallower, nearshore waters. Stratification of the water column occurs over the shelf and the top layer of slope water during the spring-summer and is usually established by early June. Fall mixing results in homogenous shelf and upper slope waters by October in most years.

The “cold pool” is an annual phenomenon particularly important to the Mid-Atlantic Bight. It stretches from the Gulf of Maine along the outer edge of Georges Bank and then southwest to Cape Hatteras. It becomes identifiable with the onset of thermal stratification in the spring and lasts into early fall until normal seasonal mixing occurs. It usually exists along the bottom between the 40 and 100 m isobaths and extends up into the water column for about 35 m, to the bottom of the seasonal thermocline. The cold pool usually represents about 30% of the volume of shelf water. Minimum temperatures for the cold pool occur in early spring and summer, and range from 1.1 - 4.7ºC.

The primary morphological features of the shelf include shelf valleys and channels, shoal massifs, scarps, and sand ridges and swales. Except for some sand ridges and smaller sand-formed features, most of these structures are of glacial origin, including the end moraines that formed Long Island and Cape Cod. The formation of the more modern sand ridges is not well understood; however, they appear to develop from the sediments that erode from the shore face. 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.

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.

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.

6.3.2 Summer Flounder Habitat and Other Essential Fish Habitat

The information in this section is summarized primarily from Packer et al. 1999 (the most recent EFH Source Document for summer flounder), except where noted otherwise. EFH Source

Documents, which include details on stock characteristics and ecological relationships, are available at: http://www.nefsc.noaa.gov/nefsc/habitat/efh/.

6.3.2.1 Summer Flounder General Habitat Description

Summer flounder (*Paralichthys dentatus*) range from Nova Scotia to Florida and inhabit the continental shelf and shallow estuarine waters, including saltmarsh creeks, seagrass beds, mudflats, and open bay areas. The center of their abundance lies within the Middle Atlantic Bight from Cape Cod, Massachusetts, to Cape Hatteras, North Carolina. Summer flounder exhibit strong seasonal inshore-offshore movements, although their movements are often not as extensive as compared to other highly migratory species. Adult and juvenile summer flounder normally inhabit shallow coastal and estuarine waters during the warmer months of the year and remain offshore during the fall and winter.

Juvenile summer flounder have been shown to make use of several substrate types, including sand, shell, oyster bars, and mud, as well as transition areas between sand to silt/clay. Substrate preferences of juvenile summer flounder may be correlated to presence and types of predators and prey. Juveniles make extensive use of marsh creeks and other estuarine habitats. Other studies have shown that juvenile summer flounder also make use of vegetated habitats such as sea grass beds, as well as aggregations of macroalgae.

Adult summer flounder generally prefer sandy habitats, including areas of quartz sand, coarse sand, and shell, but can be found in a variety of habitats with both mud and sand substrates including marsh creeks, seagrass beds, and sand flats. As with juvenile summer flounder, adults are also known to utilize vegetation such as seagrass beds, where they are able to ambush prey and avoid predation.

6.3.2.2 Summer Flounder Essential Fish Habitat (EFH)

EFH for summer flounder was designated in Amendment 12 to the Summer Flounder, Scup, and Black Sea Bass FMP (MAFMC 1998). EFH designations for each life stage are described below and pictured in Figure 20.

Eggs: 1) North of Cape Hatteras, EFH is the pelagic waters found over the Continental Shelf (from the coast out to the limits of the EEZ), from the Gulf of Maine to Cape Hatteras, North Carolina, in the highest 90% of the all the ranked ten-minute squares for the area where summer flounder eggs are collected in the MARMAP survey. 2) South of Cape Hatteras, EFH is the waters over the Continental Shelf (from the coast out to the limits of the EEZ), from Cape Hatteras, North Carolina to Cape Canaveral, Florida, to depths of 360 ft. In general, summer flounder eggs are found between October and May, being most abundant between Cape Cod and Cape Hatteras, with the heaviest concentrations within 9 miles of shore off New Jersey and New York. Eggs are most commonly collected at depths of 30 to 360 ft.

Larvae: 1) North of Cape Hatteras, EFH is the pelagic waters found over the Continental Shelf (from the coast out to the limits of the EEZ), from the Gulf of Maine to Cape Hatteras, North Carolina, in the highest 90% of all the ranked ten-minute squares for the area where summer flounder larvae are collected in the MARMAP survey. 2) South of Cape Hatteras, EFH is the nearshore waters of the Continental Shelf (from the coast out to the limits of the EEZ), from Cape Hatteras, North Carolina to Cape Canaveral Florida, in nearshore waters (out to 50 miles from shore). 3) Inshore, EFH is all the estuaries where summer flounder were identified as being present (rare, common, abundant, or highly abundant) in the ELMR database, in the "mixing" (defined in

ELMR as 0.5 to 25.0 ppt) and "seawater" (defined in ELMR as greater than 25 ppt) salinity zones. In general, summer flounder larvae are most abundant nearshore (12-50 miles from shore) at depths between 30 to 230 ft. They are most frequently found in the northern part of the Mid-Atlantic Bight from September to February, and in the southern part from November to May.

Juveniles: 1) North of Cape Hatteras, EFH is the demersal waters over the Continental Shelf (from the coast out to the limits of the EEZ), from the Gulf of Maine to Cape Hatteras, North Carolina, in the highest 90% of all the ranked ten-minute squares for the area where juvenile summer flounder are collected in the NEFSC trawl survey. 2) South of Cape Hatteras, EFH is the waters over the Continental Shelf (from the coast out to the limits of the EEZ) to depths of 500 ft, from Cape Hatteras, North Carolina to Cape Canaveral, Florida. 3) Inshore, EFH is all of the estuaries where summer flounder were identified as being present (rare, common, abundant, or highly abundant) in the ELMR database for the "mixing" and "seawater" salinity zones. In general, juveniles use several estuarine habitats as nursery areas, including salt marsh creeks, seagrass beds, mudflats, and open bay areas in water temperatures greater than 37 ^{o}F and salinities from 10 to 30 ppt range.

Adults: 1) North of Cape Hatteras, EFH is the demersal waters over the Continental Shelf (from the coast out to the limits of the EEZ), from the Gulf of Maine to Cape Hatteras, North Carolina, in the highest 90% of all the ranked ten-minute squares for the area where adult summer flounder are collected in the NEFSC trawl survey. 2) South of Cape Hatteras, EFH is the waters over the Continental Shelf (from the coast out to the limits of the EEZ) to depths of 500 ft, from Cape Hatteras, North Carolina to Cape Canaveral, Florida. 3) Inshore, EFH is the estuaries where summer flounder were identified as being common, abundant, or highly abundant in the ELMR database for the "mixing" and "seawater" salinity zones. Generally summer flounder inhabit shallow coastal and estuarine waters during warmer months and move offshore on the outer Continental Shelf at depths of 500 ft in colder months.

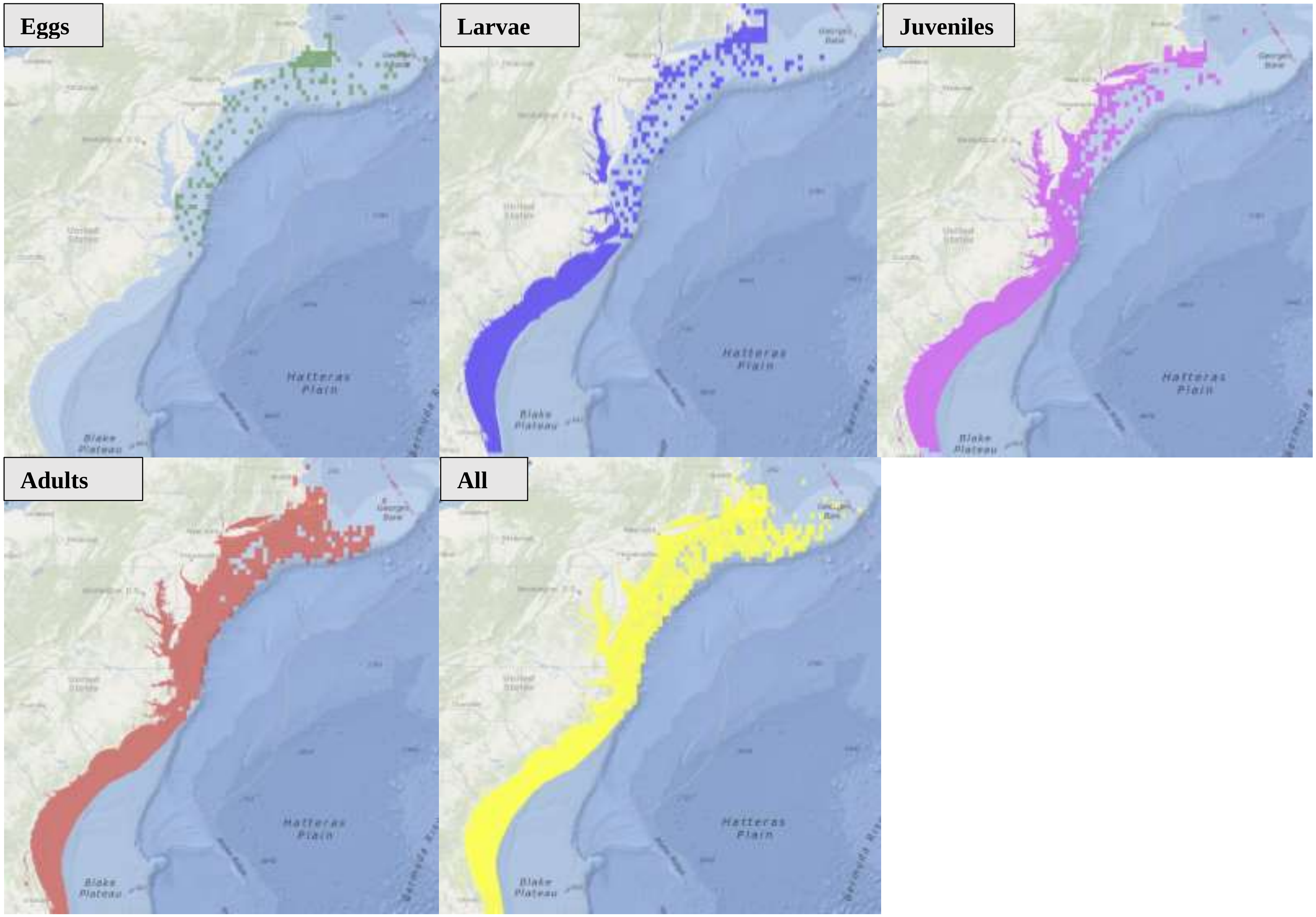


Figure 20: Designated EFH for summer flounder at various life stages. Image source: NOAA Office of Habitat Conservation EFH Mapper.

6.3.2.3 Summer Flounder Habitat Areas of Particular Concern (HAPCs)

Habitat Areas of Particular Concern (HAPCs) are a subset of EFH designations that include habitat types and/or geographic areas identified by the regional fishery management councils and NOAA Fisheries as priorities for habitat conservation, management, and research. The Council identified HAPC for summer flounder in Amendment 12 to the Summer Flounder, Scup, and Black Seabass FMP in 1998. HAPC is identified on the basis of its ecological importance for shelter and feeding, and is not mapped but defined in text as follows (MAFMC 1998):

"All native species of macroalgae, seagrasses, and freshwater and tidal macrophytes in any size bed, as well as loose aggregations, within adult and juvenile summer flounder EFH is HAPC. If native species of submerged aquatic vegetation (SAV) are eliminated then exotic species should be protected because of functional value, however, all efforts should be made to restore native species."

Without accompanying regulations that restrict fishing activity in a HAPC, they are not subject to protections that minimize the adverse effects of fishing. Furthermore, the councils do not have the authority to regulate fishing activity in state waters where most SAV occurs. However, the NMFS, acting through its authority to consult on any proposed development activity proposed or permitted by a federal agency in state or federal waters, does routinely make conservation recommendations aimed at protecting eelgrass and other types of aquatic vegetation from the effects of a range of anthropogenic activities. In doing so, extra scrutiny is given to any habitat type designated by the councils as a HAPC, including fishing.

6.3.2.4 Other Relevant EFH Designations

In addition to summer flounder, there are other species in the Greater Atlantic region with life stages whose habitat could be impacted by bottom-tending gear types. Table 24 summarizes EFH in the northeast shelf ecosystem 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 24: Geographic distributions and habitat characteristics of Essential Fish Habitat designations for benthic fish and shellfish species managed by the New England and Mid-Atlantic fishery management councils within the core footprint of the commercial summer flounder fishery.

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	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

Species	Life Stage	Geographic Area	Depth (meters)	Habitat Type and Description
		Harbor, Cape Cod Bay, and Buzzards Bay		
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 herring	Eggs	Coastal Gulf of Maine, Georges Bank, and Southern New England	5-90	Sub-tidal benthic habitats on coarse sand, pebbles, cobbles, and boulders and/or macroalgae
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: Passamaquoddy Bay to Sheepscot River; Casco Bay, Great Bay, Massachusetts Bay, and Cape Cod Bay	18-110	Benthic habitats with sand and gravel substrates
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

Species	Life Stage	Geographic Area	Depth (meters)	Habitat Type and Description
				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 bays and estuaries in the Gulf of Maine	Mean high water-80	Intertidal and sub-tidal benthic habitats on sand and gravel, also found on mud
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

Species	Life Stage	Geographic Area	Depth (meters)	Habitat Type and Description
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 Georges Bank, and in Long Island Sound	80-300 in Gulf of Maine and on Georges Bank; <80 in Long Island Sound, Cape Cod Bay, and Narragansett Bay	Pelagic and benthic habitats on the tops and edges of offshore banks and shoals with mixed rocky 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

Species	Life Stage	Geographic Area	Depth (meters)	Habitat Type and Description
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
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	Benthic habitats on a wide variety of bottom types, including sand, gravel, broken shells, pebbles, and soft mud

Species	Life Stage	Geographic Area	Depth (meters)	Habitat Type and Description
			inshore Gulf of Maine, to 900 om slope	
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 estuaries from eastern Maine to northern New Jersey	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; 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

Species	Life Stage	Geographic Area	Depth (meters)	Habitat Type and Description
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

6.3.3.1 Description of Fishing Gear

The principal gear used in commercial fishing for summer flounder is the otter trawl, which historically has accounted for over 90% of the landings. According to federal Vessel Trip Report data, otter trawls accounted for about 98% of all commercial landings over 2012-2016 (Table 25). Smaller amounts were caught with sink gill nets, scallop trawls, and hand lines (less than 1% each according to VTR data).

A disadvantage of analyzing landings by gear type using federal VTR data is that it does not include state-only permitted vessels submitting only state level VTRs. However, a weakness of the dealer data is the relatively large proportion of missing or unknown "gear type" entries. Thus, there are advantages and disadvantages of both data types and they are shown for comparison in Table 25 for years 2012-2016.

Table 25: Gear type breakdown for summer flounder landings, 2012-2016 combined, from dealer data and VTR data. Gear types accounting for less than 0.5% of landings are not shown.

Gear Type: VTR Data (2012-2016)	% of Summer Flounder Landings
TRAWL, OTTER, BOTTOM, FISH	97.76
BEAM TRAWL, OTHER	1.2%
GILL NET, SINK, OTHER	0.9%
TRAWL, OTTER, BOTTOM, SCALLOP	0.8%
HAND LINE, OTHER	0.7%
Gear Type: Dealer Data (2012-2016)	**% of Summer Flounder Landings**
TRAWL, OTTER, BOTTOM, FISH	89.8%
UNKNOWN	3.5%
HAND LINE, OTHER	2.4%
GILL NET, SINK, OTHER	0.9%
TRAWL, OTTER, BOTTOM, SCALLOP	0.7%
BEAM TRAWL, OTHER	0.6%

6.3.3.2 Fishing Impacts to EFH

Only those gear types which contact the bottom impact physical habitat. These gears have a variety of impacts on habitat. Stevenson et al. (2004) compiled a detailed summary of several studies of 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 used to harvest summer flounder.

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 have 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. Due to the very small percentage of non-trawl gear types used in the commercial summer flounder fishery, the impacts of the alternatives in this document (section 7.0) are primarily focused on the bottom trawl fishery rather than on other gear types. The principal gears used in the recreational fisheries for summer flounder are rod and reel and handline. These gears have minimal adverse impacts on EFH in the region (Stevenson et al. 2004).

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). Areas on the outer continental shelf closed to the use of mobile, bottom-tending gears in these management plans apply to bottom trawls used in all federally-managed fisheries, including the summer flounder, scup, and black sea bass fishery.

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.[17]

6.4 PROTECTED RESOURCES

Numerous protected species inhabit the affected environment of the summer flounder fishery (Table 26). 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, alewife, and blueback herring are 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, these species 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, alewife, and blueback herring can be found at: http://www.nmfs.noaa.gov/pr/species/esa/candidate.htm.

A summary of protected resources and critical habitat that may occur in the affected environment is provided in Table 26, followed by sections detailing which species and critical habitat are not likely to be affected by the proposed action (section 6.4.1) and which species would be potentially affected by the proposed action (i.e., there have been observed/documented interactions in the fishery or with gear type(s) similar to those used in the fishery; section 6.4.2).

[17] This section only provides general information regarding the habitat impacts of bottom trawls used in the summer flounder, black sea bass, and scup fishery on EFH for federally-managed species in the geographic range of the fishery. It does not constitute a complete evaluation of the EFH effects of the fishery as required by the regulations that implement the EFH protection provisions of the MSA, which call for an update of all the EFH provisions of the law, including EFH and HAPC regulations and fishing effects on EFH, every five years. These provisions are currently undergoing review.

Table 26: Species Protected Under the ESA and/or MMPA that may occur in the Affected Environment of the summer flounder fishery. Marine mammal species (cetaceans and pinnipeds) italicized and in bold are considered MMPA strategic stocks.[1]

Species	Status	Potentially affected by this action?
Cetaceans		
North Atlantic right whale (Eubalaena glacialis)	***Endangered***	***No***
Humpback whale, West Indies DPS (*Megaptera novaeangliae*)	Protected (MMPA)	No
Fin whale (Balaenoptera physalus)	***Endangered***	***No***
Sei whale (Balaenoptera borealis)	***Endangered***	***No***
Blue whale (Balaenoptera musculus)	***Endangered***	***No***
Sperm whale (Physeter macrocephalus	***Endangered***	***No***
Minke whale (*Balaenoptera acutorostrata*)	Protected (MMPA)	Yes
Pilot whale (Globicephala spp.)[2]	***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)[3]	***Protected (MMPA)***	***Yes***
Harbor porpoise (*Phocoena phocoena*)	Protected (MMPA)	Yes
Sea Turtles		
Leatherback sea turtle (*Dermochelys coriacea*)	Endangered	Yes
Kemp's ridley sea turtle (*Lepidochelys kempii*)	Endangered	Yes
Green sea turtle, North Atlantic DPS (*Chelonia mydas*)	Threatened	Yes
Loggerhead sea turtle (*Caretta caretta*), Northwest Atlantic Ocean DPS	Threatened	Yes
Hawksbill sea turtle (*Eretmochelys imbricate*)	Endangered	No
Fish		
Shortnose sturgeon (*Acipenser brevirostrum*)	Endangered	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
Alewife *(Alosa pseudoharengus)*	Candidate	Yes
Blueback herring *(Alosa aestivalis)*	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

[1] 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).

[2] 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*.
[3] This includes the Western North Atlantic Offshore, Northern Migratory Coastal, and Southern Migratory Coastal Stocks of Bottlenose Dolphins. See Waring *et al*. (2016) and Hayes et al. (2017) for further details.

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 the action being proposed in the summer flounder fishery is not likely to affect North Atlantic right whales, humpback whales, fin whales, sei whales, blue whales, sperm whales, shortnose sturgeon, Atlantic spotted dolphins, striped dolphins, pygmy sperm whales, dwarf sperm whales, or hawksbill sea turtles. This determination was made because either the occurrence of the species is not known to overlap with the summer flounder fisheries and/or there have never been documented interactions between the species and the primary gear type (i.e., bottom trawl) used to prosecute the summer flounder fishery (NMFS 2013; NMFS NEFSC FSB 2015, 2016, 2017; Palmer 2017; see: http://www.nefsc.noaa.gov/fsb/take_reports/nefop.html and http://www.nmfs.noaa.gov/pr/sars/region.htm). Critical habitats not likely to be affected include the Northwest Atlantic DPS of loggerhead sea turtle and the North Atlantic right whale. The following sections provide information to support this rationale.

6.4.1.1 Shortnose Sturgeon

Shortnose sturgeon are benthic fish that mainly occupy the deep channel sections of large rivers. They occupy rivers along the western Atlantic coast from St. Johns River in Florida to the Saint John River in New Brunswick, Canada. The species is anadromous in the southern portion of its range (i.e., south of Chesapeake Bay), while some northern populations are amphidromous (NMFS 2010a). Given the range of the species (remaining mostly in the river systems, with some coastal migrations between rivers), and the fact that the summer flounder fishery does not operate in or near the rivers where concentrations of shortnose sturgeon are most likely found, direct (e.g., interaction with gear) and indirect (e.g., prey removal, habitat modification) impacts to shortnose sturgeon from the summer flounder fishery are not expected.

6.4.1.2 Hawksbill Sea Turtle

Hawksbill sea turtles are uncommon in the northern waters of the continental United States (U.S.), but are widely distributed throughout the Caribbean Sea, off the coasts of Florida and Texas in the continental U.S., in the Greater and Lesser Antilles, and along the mainland of Central America south to Brazil (Lund 1985; Plotkin and Amos 1988; Amos 1989; Groombridge and Luxmoore 1989; Plotkin and Amos 1990; NMFS and USFWS 2013a; Meylan and Donnelly 1999). Hawksbills prefer tropical coral reefs, such as those found in the Caribbean and Central America. Nesting areas in the western North Atlantic include Puerto Rico and the Virgin Islands. There are accounts of hawksbills in South Florida and, although individuals have been sighted along the East Coast as far north as Massachusetts,[18] sightings north of Florida are rare. Thus, the summer flounder fishery does not occur in waters typically used by hawksbill sea turtles.

[18] Hawksbills have been found stranded as far north as Cape Cod, Massachusetts; however, these strandings were observed after hurricanes or offshore storms.

6.4.1.3 Large Whales

Blue whales do not regularly occur in waters of the U.S. EEZ (Waring *et al*. 2010). Calving for the species occurs in low latitude waters and therefore, outside of the area where the summer flounder fishery operates. Blue whales feed on euphausiids (krill) which are too small to be captured in fishing gear (Sears 2002) and therefore, it is unlikely that the forage base of blue whales will be removed by the operation of the fishery. Based on this information, the summer flounder fishery will not overlap with blue whale occurrence or habitat, and therefore, direct (e.g., interaction with gear) or indirect (e.g., prey removal, habitat modification) impacts to blue whales from the operation of the summer flounder fishery are not expected. This conclusion is supported further by the fact that there have been no observed U.S. Atlantic fishery-related mortalities or serious injuries to blue whales to date (Waring *et al*. 2010; http://www.nefsc.noaa.gov/fsb/take_reports/nefop.html).

Sperm whales regularly occur in waters of the U.S. EEZ, but primarily are found on the continental shelf edge, over the continental slope, and into mid-ocean regions (Waring *et al.* 2015). The average depth at which sperm whales were observed during the Cetacean and Turtle Assessment Program (CeTAP) surveys of the Mid- and North Atlantic areas was 1,792 meters (CeTAP 1982). Female sperm whales and young males almost always inhabit waters deeper than 1,000 meters and at latitudes less than 40° N (Whitehead 2002). Fishing effort for summer flounder generally occurs outside of the preferred depths of sperm whales. In addition, as the prey base of sperm whales is located in deep ocean regions (Whitehead 2002), any overlap in prey distribution and the summer flounder fishery is not expected and therefore, it is unlikely that the forage base of sperm whales will be removed by the operation of the fishery. Calving for the species also occurs in low latitude waters and therefore, outside of the area where the summer flounder fishery operates. Based on this information, the summer flounder fishery is not expected to overlap with sperm whale occurrence or habitat, and therefore, direct (e.g., interaction with gear) or indirect (e.g., prey removal, habitat modification) effects to sperm whales from the operation of any of the Greater Atlantic Region fisheries are not expected. This conclusion is supported further by the fact that there have been no observed U.S. Atlantic fishery-related interactions with sperm whales to date (http://www.nefsc.noaa.gov/fsb/take_reports/nefop.html; Waring *et al*. 2014a, 2015).

Right, humpback, fin, sei, and minke whales are found throughout the waters of the Northwest Atlantic Ocean. In general, these species follow an annual pattern of migration between low latitude (south of 35ºN) wintering/calving grounds and high latitude spring/summer foraging grounds (primarily north of 41ºN; Hayes et al. 2017; NMFS 1991, 2005, 2010b, 2011a, 2012). However, there are no observed or documented interactions between these species and the primary gear type used in the commercial summer flounder fishery, i.e., bottom otter trawls. Therefore, the proposed action is not expected to impact these large whale species.

6.4.1.4 Pygmy Sperm Whale, Dwarf Sperm Whale, Striped Dolphin, Atlantic Spotted Dolphin, and Beaked Whales

Pygmy and dwarf sperm whales occur primarily in oceanic waters (≥1,000 meters), with some incursions in continental shelf waters (Mullin and Fulling 2003; Waring *et al*. 2014a; Hayes et al. 2017). Striped dolphins are distributed along the continental shelf edge from Cape Hatteras to the southern margin of Georges Bank, and also occur offshore over the continental slope and rise in the mid-Atlantic region (CETAP 1982; Mullin and Fulling 2003; Waring *et al*. 2014a). Striped dolphins were observed during the CeTAP surveys along the 1,000 m depth contour in all seasons (CETAP 1982). Atlantic spotted dolphins regularly occur in continental shelf waters south of Cape

Hatteras; however, in waters north of Cape Hatteras, this species of dolphin occurs in continental shelf edge and continental slope waters (≥ 1,000 meters; Payne *et al.* 1984; Mullin and Fulling 2003; Waring *et al*. 2014a).Beaked whale sightings in the Greater Atlantic Region have occurred principally along the continental shelf edge and deeper oceanic waters (CETAP 1982; Waring *et al.* 2014a; Waring *et al*. 2015; Hamazaki 2002; Palka 2006).

Taking into consideration the above information, it is evident that these dolphin and whale species are primarily deep water (≥ 1,000 meters), continental shelf edge, and/or slope inhabitants. The summer flounder fishery occurs in waters less than 800 meters and is therefore outside of the preferred depths of these cetacean species. In addition, interactions with these cetacean species have only been observed in fisheries prosecuted by pelagic longline and/or pelagic drift gillnet; these gear types are not used in the summer flounder fishery. None of the predominant summer flounder gear types (i.e., bottom trawl) are expected pose an interaction risk to these species. Based on this information, and the fact that there is a low co-occurrence between the summer flounder fishery and the cetacean species noted above, direct (e.g., interaction with gear) or indirect (e.g., prey removal, habitat modification) effects to these species are not expected.

6.4.1.5 North Atlantic Right Whale Critical Habitat

On January 27, 2016 (81 FR 4837) critical habitat for North Atlantic right whales was expanded to encompass approximately 29,763 square nautical miles of marine habitat in the Gulf of Maine and Georges Bank region (Unit1: foraging habitat) and off the Southeast U.S. coast (Unit 2: calving habitat). In the final rule to expand North Atlantic right whale critical habitat (81 FR 4837), as well as in the ESA section 4(b)(2) report issued by NMFS in December 2015 (NMFS 2015a), it was determined that the continued operation of any Greater Atlantic Region fishery will not affect the physical or biological features that are essential to the conservation of North Atlantic right whales. Specifically, in Unit 1, the essential biological and physical features include physical oceanographic conditions and structures of the Gulf of Maine and Georges Bank regions (e.g., currents, circulation patterns, bathymetric features, and temperature), low flow velocities in Jordan, Wilkinson, and Georges Basins, and dense aggregations of *Calanus finmarchicus* (i.e., late stage in Gulf of Maine and Georges Bank region; diapause phase in Jordan, Wilkinson, and Georges Basins) (NMFS 2015b). In Unit 2, the essential biological and physical features include calm sea surface conditions, sea surface temperatures between 7^{o}c to 17^{o}C, and depths between 6 to 28 meters (NMFS 2015b). As summer flounder fisheries will not destroy or affect the availability of copepods, and will not modify or destroy any physical features identified as essential in Unit 1 or 2 (e.g., temperature, depth, physical oceanographic conditions, currents), the continued operation of the summer flounder fishery will not destroy or adversely modify North Atlantic right whale critical habitat (NMFS 2015a; NMFS 2015b; 81 FR 4837 (January 27, 2016)).

6.4.1.6 Northwest Atlantic Distinct Population Segment (NWA DPS) of Loggerhead Sea Turtle DPS Critical Habitat

NMFS issued a final rule to designate critical habitat for the Northwest Atlantic Ocean DPS of the loggerhead sea turtle within the Atlantic Ocean and the Gulf of Mexico on July 10, 2014 (79 FR 39856). Specific areas designated include 38 occupied marine areas within the range of the Northwest Atlantic Ocean DPS. These areas contain one or a combination of five habitat types:

nearshore reproductive habitat, overwintering habitat, breeding habitat, migratory habitat (i.e., constricted migratory corridor), and/or *Sargassum* habitat.[19]

The area of operation of the 13 Greater Atlantic Region fisheries overlaps with one or more of the five types of marine areas identified as critical habitat for the NWA DPS of loggerhead sea turtles. However, since the vast majority of fishing activities for summer flounder occur north of Cape Hatteras, North Carolina, there is very little overlap with more than just the northernmost portions of the *Sargassum* and migratory habitat areas. The summer flounder fishery expends little effort in areas identified as overwintering, breeding, and nearshore reproductive critical habitat (NMFS 2013; NMFS 2014b).

The summer flounder fishery is primarily prosecuted with bottom trawls, with a small portion of commercial effort coming from sink gillnets, handlines, and other very minor gear types. While these gears are known to be deployed within certain areas of the critical habitat for NWA DPS loggerheads, the occasional placement and wide-ranging operation of these gear types within these fisheries is not expected to prevent the passage of loggerheads through the critical habitat areas or inhibit their usage of those areas. While commercial fishing gear (mainly trawls and gillnets) may have some interactions with pelagic *Sargassum* during deployment and retrieval, these effects will be temporary and isolated in nature and, because of the fluid nature of the pelagic environment, recovery time is expected to be rapid. In regards to effects on benthic habitat in the other four marine areas, there is no evidence that bottom trawls or any other types of gears used by the summer flounder fishery will adversely affect sandy, muddy, or hard bottom habitats where NWA DPS loggerheads routinely forage and rest (NREFHSC 2002). Fishing vessel movements are not expected to significantly alter the physical or biological features of the critical habitat areas to levels that would affect life history patterns of individual turtles or the health of prey species found in these habitats. Additionally, there is no evidence that the fishery is likely to impact water depth, water temperature, or any other physical or biological features identified as essential for the conservation of critical habitat for the NWA DPS of loggerhead sea turtles in these regions. Based on this information, the summer flounder fishery is not expected to affect the essential physical or biological features of any marine area designated as critical habitat for the NWA DPS of loggerhead sea turtles. Thus, none of the Greater Atlantic Region fisheries are likely to adversely modify or destroy designated critical habitat for the NWA DPS of loggerhead sea turtles (NMFS 2014b; 79 FR 39856 (July 10, 2014)).

6.4.2 Species Potentially Affected by the Proposed Action

Table 26 provides a list of protected species of sea turtle, marine mammal, and fish species present in the affected environment of the summer flounder, scup, and black seabass fisheries, and that may also be affected by the proposed action; that is, have the potential to become entangled or bycaught in the primary fishing gear used to prosecute the fishery, i.e., bottom otter trawls. To aid in the identification of MMPA protected species potentially affected by the action, the MMPA List of Fisheries and marine mammal stock assessment reports for the Atlantic Region were referenced (http://www.nmfs.noaa.gov/pr/sars/region.htm;
http://www.nmfs.noaa.gov/pr/interactions/fisheries/lof.html). To aid in identifying ESA listed species potentially affected by the action, the 2013 Biological Opinion issued by NMFS on the operation of seven commercial fisheries, including the summer flounder, scup, and black seabass

[19] Detailed maps of the marine critical habitat are available online at: http://www.nmfs.noaa.gov/pr/species/turtles/criticalhabitat_loggerhead.htm

fisheries, and its impact on ESA listed species was referenced (NMFS 2013). The 2013 Opinion, which considered the best available information on ESA listed species and observed or documented ESA listed species interactions with gear types used to prosecute the 7 FMPs (e.g., gillnet, bottom trawl, and pot/trap), concluded that the seven fisheries may adversely affect, but was not likely to jeopardize the continued existence of any ESA listed species. The Opinion included an incidental take statement (ITS) authorizing the take of specific numbers of ESA listed species of sea turtles, Atlantic salmon, and Atlantic sturgeon. Reasonable and prudent measures and terms and conditions were also issued with the ITS to minimize impacts of any incidental take.

Up until recently, the 2013 Opinion remained in effect; however, new information on North Atlantic right whales has been made available that may reveal effects of the fisheries analyzed in the 2013 Opinion that may not have been previously considered. As a result, per an October 17, 2017, ESA 7(a)(2)/7(d) memo issued by NMFS, the 2013 Opinion has been reinitiated. However, the October 17, 2017, memo concludes that allowing these fisheries to continue during the reinitiation period will not increase the likelihood of interactions with ESA listed species above the amount that would otherwise occur if consultation had not been reinitiated, and therefore, the continuation of these fisheries during the reinitiation period would not be likely to jeopardize the continued existence of any ESA listed species. Until replaced, the summer flounder, scup, and black seabass FMP is currently covered by the incidental take statement authorized in NMFS 2013 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 seabass FMP is provided below, while information on protected species interactions with specific fishery gear that is likely to be used in the proposed action (i.e., summer flounder gear types) is provided in section 6.4.3.

6.4.2.1 Sea Turtles

Kemp's ridley, leatherback, the North Atlantic DPS of green and the Northwest Atlantic DPS of loggerhead sea turtle are the four ESA-listed species of sea turtles that occur in the area of operation for the summer flounder fishery. Three of the four species are hard-shelled turtles (i.e., green, loggerhead, and Kemp's ridley). Additional background information on the range-wide status, descriptions, and life histories of these four species can be found in a number of published documents, including 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 2013b;NMFS and USFWS 2015; Seminoff et al. 2015), and recovery plans for the loggerhead sea turtle (Northwest Atlantic DPS; NMFS and USFWS 2008), leatherback sea turtle (NMFS and USFWS 1992, 1998a), Kemp's ridley sea turtle (NMFS *et al.* 2011), and green sea turtle (NMFS and USFWS 1991, 1998b).

A general overview of sea turtle occurrence and distribution in waters of the Northwest Atlantic Ocean is provided below to assist in understanding how the summer flounder fishery may overlap in time and space with sea turtles. Maps depicting the range wide distribution and occurrence of sea turtles in the Greater Atlantic Region can be found at the following websites:

https://www.greateratlantic.fisheries.noaa.gov/protected/section7/listing/index.html; http://marinecadastre.gov/; and, http://seamap.env.duke.edu/.

Hard-shelled Sea Turtles

In U.S. Northwest Atlantic waters, hard-shelled turtles commonly occur throughout the continental shelf from Florida to Cape Cod, Massachusetts, although their presence varies with the seasons due to changes in water temperature (Shoop and Kenney 1992; Epperly *et al.* 1995a, 1995b; Braun and Epperly 1996; Mitchell *et al.* 2003; Braun-McNeill *et al.* 2008; TEWG 2009). While hard-shelled turtles are most common south of Cape Cod, MA, they are known to occur in the Gulf of Maine. Loggerheads, the most common hard-shelled sea turtle in the Greater Atlantic Region, feed as far north as southern Canada. Loggerheads have been observed in waters with surface temperatures of 7 °C to 30 °C, but water temperatures ≥11 °C are most favorable (Shoop and Kenney 1992; Epperly *et al.* 1995b). Sea turtle presence in U.S. Atlantic waters is also influenced by water depth. While hard-shelled turtles occur in waters from the beach to beyond the continental shelf, they are most commonly found in neritic waters of the inner continental shelf (Mitchell *et al.* 2003; Braun-McNeill and Epperly 2002; Morreale and Standora 2005; Blumenthal *et al.* 2006; Hawkes *et al.* 2006; McClellan and Read 2007; Mansfield *et al.* 2009; Hawkes *et al.* 2011; Griffin *et al.* 2013).

Hard-shelled sea turtles occur year-round in waters off Cape Hatteras, North Carolina and south. 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 (Epperly *et al.* 1995a, 1995b, 1995c; Braun-McNeill and Epperly 2002; Morreale and Standora 2005; Griffin *et al.* 2013), occurring in Virginia foraging areas as early as late April and on the most northern foraging grounds in the Gulf of Maine in June (Shoop and Kenney 1992). The trend is reversed in the fall as water temperatures cool. The large majority leave the Gulf of Maine by September, but some remain in Mid-Atlantic and Northeast areas until late fall. By December, sea turtles have migrated south to waters offshore of NC, particularly south of Cape Hatteras, and further south (Shoop and Kenney 1992; Epperly *et al.* 1995b; Hawkes *et al.* 2011; Griffin *et al.* 2013).

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., Gulf of Maine) 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

Multiple species of whales occur in the Northwest Atlantic, with the minke whale being the only whale species potentially affected by the proposed action (**Error! Reference source not found.**). In general, large whales, such as minke whales, follow an annual pattern of migration between low latitude (south of 35oN) wintering/calving grounds and high latitude spring/summer foraging grounds (primarily north of 41^{o}N; Hayes *et al.* 2017; NMFS 1991, 2005, 2010b, 2011a, 2012b). This, however, is a simplification of whale movements, particularly as it relates to winter movements. It remains unknown if all individuals of a population migrate to low latitudes in the winter, although, increasing evidence suggests that for some species (e.g. right and humpback whales), some portion of the population remains in higher latitudes throughout the winter (Hayes *et al.* 2017; Khan *et al.* 2009, 2010, 2011, 2012; Brown *et al.* 2002; NOAA 2008; Cole *et al.* 2013; Clapham *et al.* 1993; Swingle *et al.* 1993; Vu *et al.* 2012). Although further research is needed to provide a clearer understanding of large whale movements and distribution in the winter, the distribution and movements of large whales to foraging grounds in the spring/summer is well understood. Movements of whales into higher latitudes coincide with peak productivity in these waters. As a result, the distribution of large whales in higher latitudes is strongly governed by prey availability and distribution, with large numbers of whales coinciding with dense patches of preferred forage (Mayo and Marx 1990; Kenney *et al.* 1986, 1995; Baumgartner *et al.* 2003; Baumgartner and Mate 2003; Payne *et al.*1986, 1990; Brown *et al.* 2002; Kenney and Hartley 2001; Schilling *et al.* 1992). For additional information on the biology, status, and range wide distribution of whale species, such as the minke whale, please refer to marine mammal stock assessment reports provided at: http://www.nmfs.noaa.gov/pr/sars/region.htm.

To further assist in understanding how the small-mesh multispecies fishery may overlap in time and space with the occurrence of minke whales, a general overview on species occurrence and distribution in the area of operation for the summer flounder fishery is provided in the following table (Table 27).

Table 27. Minke whale occurrence in the affected environment of the summer flounder fishery.

Species	Prevalence and Approximate Months of Occurrence
Minke	• Widely distributed throughout continental shelf waters (<100m deep) of the Mid-Atlantic (Southern New England included), Gulf of Maine, and Georges Bank. • Most common in the EEZ from spring through fall, with greatest abundance found in New England waters; fall through spring widespread and common in deep-ocean waters.
Source**:** Hayes *et al*. 2017.	

6.4.2.3 Small Cetaceans

Table 28 provides the species of small cetaceans that occur in the area of operation for the summer flounder commercial fishery.

Table 28: Small cetacean species that occur in the area of operation for the summer flounder fishery. Animals in bold are MMPA strategic stocks.

Species	Listed Under the ESA	Protected Under the MMPA	MMPA Strategic Stock
Atlantic White-Sided Dolphin	No	Yes	No
Short-Finned Pilot Whale	**No**	**Yes**	**Yes**
Long-Finned Pilot Whale	**No**	**Yes**	**Yes**
Risso's Dolphin	No	Yes	No
Short-Beaked Common Dolphin	No	Yes	No
Harbor Porpoise	No	Yes	No
Bottlenose Dolphin (*Western North Atlantic Offshore Stock*)	No	Yes	No
Bottlenose Dolphin (*Western North Atlantic Northern Migratory Coastal Stock*)	**No**	**Yes**	**Yes**[1]
Bottlenose Dolphin (*Western North Atlantic Southern Migratory Coastal Stock*)	**No**	**Yes**	**Yes**[1]

Notes:
[1] **Considered a strategic stock as stocks are designated as depleted under the MMPA**. Depleted is defined by the MMPA as any stock in which: (1) the Secretary, after consultation with the Marine Mammal Commission and the Committee of Scientific Advisors on Marine Mammals, determines that a species or population stock is below its optimum sustainable population; (2) a State, to which authority for the conservation and management of a species or population stock is transferred under section 109, determines that such species or stock is below its optimum sustainable population; or (3) a species or population stock is listed as an endangered species or a threatened species under the ESA.
Source**:** Waring *et al*. 2016; Hayes et al. 2017.

Small cetaceans can be found throughout the year in waters of the Northwest Atlantic Ocean (Waring et al. 2016; Hayes et al. 2017). Within this range, however, there are seasonal shifts in species distribution and abundance. To further assist in understanding how fisheries may overlap in time and space with the occurrence of small cetaceans, a general overview of species occurrence and distribution in the area of operation for the summer flounder fishery is provided in Table 29. For additional information on the biology, status, and range-wide distribution of each species please refer to Waring et al. (2016) and Hayes et al. 2017.

Table 29: Small cetacean occurrence in the area of operation for the summer flounder fishery.

Species	Prevalence and Approximate Months of Occurrence
Atlantic White-Sided Dolphin	• Distributed throughout the continental shelf waters (primarily to 100 meter isobath) of the Mid-Atlantic (north of 35ºN), Southern New England, Georges Bank, and Gulf of Maine; however, most common in continental shelf waters from Hudson Canyon (~ 39ºN) to Georges Bank, and into the Gulf of Maine. • **January-May**: low densities found from Georges Bank to Jeffreys Ledge. • **June-September**: large densities found from Georges Bank through the Gulf of Maine. • **October-December**: intermediate densities found from southern Georges Bank to southern Gulf of Maine. • South of Georges Bank (Southern New England and Mid-Atlantic), low densities found year round, with waters off Virginia and NC representing southern extent of species range during winter months.
Short-Beaked Common Dolphin	• Regularly found throughout the continental shelf-edge-slope waters (primarily between the 100-2,000 meter isobaths) of the Mid-Atlantic, Southern New England, and Georges Bank (esp. in Oceanographer, Hydrographer, Block, and Hudson Canyons). • Less common south of Cape Hatteras, NC, although schools have been reported as far south as the Georgia /South Carolina border. • **January-May**: occur from waters off Cape Hatteras, NC, to Georges Bank (35º to 42ºN). • **Mid-summer-fall**: occur primarily on Georges Bank with small numbers present in the Gulf of Maine; Peak abundance found on Georges Bank in the autumn.
Risso's Dolphin	• **Spring through fall**: Distributed along the continental shelf edge from Cape Hatteras, NC, to Georges Bank. • **Winter**: distributed in the Mid-Atlantic Bight, extending into oceanic waters. • Rarely seen in the Gulf of Maine; primarily a Mid-Atlantic continental shelf edge species (can be found year round).
Harbor Porpoise	• Distributed throughout the continental shelf waters of the Mid-Atlantic (north of 35ºN), Southern New England, Georges Bank, and Gulf of Maine. • **July-September**: concentrated in the northern Gulf of Maine (waters < 150 meters); low numbers can be found on Georges Bank. • **October-December**: widely dispersed in waters from NJ to Maine; seen from the coastline to deep waters (>1,800 meters). • **January-March**: intermediate densities in waters off NJ to NC; low densities found in waters off NY to Gulf of Maine. • **April-June**: widely dispersed from NJ to ME; seen from the coastline to deep waters (>1,800 meters).
Bottlenose Dolphin	**Western North Atlantic Offshore Stock** • Distributed primarily along the outer continental shelf and continental slope in the Northwest Atlantic from Georges Bank to FL. • Depths of occurrence: ≥40 meters **Western North Atlantic Northern Migratory Coastal Stock** • Warm water months (e.g., July-August): distributed from the coastal waters from the shoreline to approximately the 25-meter isobaths between the Chesapeake Bay mouth and Long Island, NY.

Species	Prevalence and Approximate Months of Occurrence
	• Cold water months (e.g., January-March): stock occupies coastal waters from Cape Lookout, NC, to the NC/VA border. **Western North Atlantic Southern Migratory Coastal Stock** • **October-December**: stock occupies waters of southern NC (south of Cape Lookout) • **January-March**: stock moves as far south as northern FL. • **April-June**: stock moves north to waters of NC. • **July-August**: stock is presumed to occupy coastal waters north of Cape Lookout, NC, to the eastern shore of VA.
Pilot Whales: ***Short- and Long-Finned***	**Short-Finned Pilot Whales** • Except for area of overlap (see below), primarily occur south of 40°N (Mid-Atlantic and Southern New England waters); although low numbers have been found along the southern flank of Georges Bank, but no further than 41°N. • May through December (approximately): distributed primarily near the continental shelf break of the Mid-Atlantic and Southern New England; individuals begin shifting to southern waters (i.e., 35°N and south) beginning in the fall. **Long-Finned Pilot Whales** • Except for area of overlap (see below), primarily occur north of 42°N. • Winter to early spring (November through April): primarily distributed along the continental shelf edge-slope of the Mid-Atlantic, Southern New England, and Georges Bank. • Late spring through fall (May through October): movements and distribution shift onto/within Georges Bank, the Great South Channel, and Gulf of Maine. **Area of Species Overlap:** between approximately 38°N and 41°N.
Notes: [1] **Information presented in table is representative of small cetacean occurrence in the Northwest Atlantic continental shelf waters out to the 2,000 meter isobath.** ***Sources*: Waring *et al*. 2016; Hayes et al. 2017, Payne and Heinemann 1993; Payne *et al.* 1984; Jefferson *et al*. 2009.**	

6.4.2.4 Pinnipeds

Table 30 provides the species of pinnipeds that occur in the area of operation for the summer flounder fishery.

Table 30: Pinniped species that occur in in the area of operation for the summer flounder fishery.

Species	Listed Under the ESA	Protected Under the MMPA	MMPA Strategic Stock
Harbor Seal	No	Yes	No
Gray Seal	No	Yes	No
Harp Seal	No	Yes	No
Hooded Seal	No	Yes	No
***Source*: Waring *et al*. 2007; Waring *et al*. 2014a, Hayes et al. 2017.**			

Pinnipeds are found in the nearshore, coastal waters of the Northwest Atlantic Ocean. They 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 (35ºN) (Waring *et al*. 2007, 2014a; Hayes *et al*. 2017). To further assist in understanding how fisheries may overlap in time and space with the occurrence of pinnipeds, a general overview of species occurrence and distribution in the area of operation for the summer flounder fishery is provided in the following table (Table 31). For additional information on the biology, status, and range-wide distribution of each species of pinniped please refer to Waring *et al*. (2007), Waring *et al*. (2014a), and Hayes *et al*. 2017.

Table 31: Pinniped occurrence in the area of operation for the summer flounder fishery.

Species	Prevalence
Harbor Seal	• Primarily distributed in waters from NJ to ME; however, increasing evidence indicates that their range is extending into waters as far south as Cape Hatteras, NC (35ºN). • **Year Round**: waters of ME • **September-May**: waters from New England to NJ.
Gray Seal	• Distributed in waters from NJ to ME. • **Year Round**: waters from ME to MA. • **September-May**: waters from Rhode Island to NJ.
Harp Seal	• Winter-Spring (approximately January-May): waters from ME to NJ.
Hooded Seal	• Winter-Spring (approximately January-May): waters of New England.
***Sources*: Waring *et al*. 2007 (for hooded seals); Waring *et al*. 2014a; Hayes et al. 2017.**	

6.4.2.5 Atlantic Sturgeon

Table 32 lists the five DPSs of Atlantic sturgeon likely to occur in the Greater Atlantic Region. For additional information on the biology, status, and range-wide distribution of each distinct population segment please refer to 77 FR 5880 and 77 FR 5914 (finalized February 6, 2012), as well as the Atlantic Sturgeon Status Review Team's (ASSRT) 2007 status review of Atlantic sturgeon.

Table 32: Atlantic Sturgeon DPSs that occur in the area of operation for the summer flounder fishery.

Species	Listed Under the ESA
Gulf of Maine (GOM) DPS	threatened
New York Bight (NYB) DPS	endangered
Chesapeake Bay (CB) DPS	endangered
Carolina DPS	endangered
South Atlantic (SA) DPS	endangered

The marine range of U.S. Atlantic sturgeon extends from Labrador, Canada, to Cape Canaveral, Florida. Atlantic sturgeon from all five DPSs have the potential to be located anywhere in this marine range (See Figure 21; 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; Dunton *et al*. 2012; Dunton *et al*. 2015; Erickson *et al*. 2011; Wirgin *et al*. 2012; O'Leary *et al*. 2014; Waldman *et al*. 2013; Wirgin *et al*. 2015a,b).

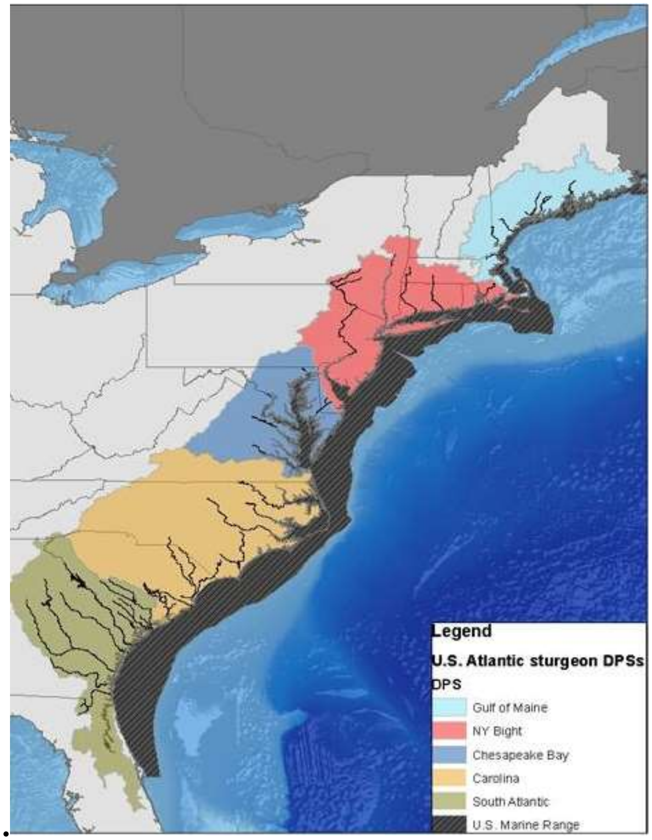


Figure 21: Geographic Locations for the Five ESA-listed DPSs of Atlantic Sturgeon (NMFS 2013).

Based on fishery-independent and -dependent data, as well as data collected from tracking and tagging studies Atlantic sturgeon appear to primarily occur inshore of the 50-meter depth contour (Stein *et al*. 2004 a,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 undertake seasonal movements along the coast. For instance, satellite-tagged adult sturgeon from the Hudson River are found to have concentrated in the southern part of the Mid-Atlantic Bight, at depths greater than 20 meters, during winter and spring, while in the summer and fall, Atlantic sturgeon concentrations shifted to the northern portion of the Mid-Atlantic Bight at depths less than 20 meters (Erickson *et al.* 2011). A similar seasonal trend was found by Dunton *et al*. 2010. Analysis of fishery-independent survey data indicated a coastwide distribution of Atlantic sturgeon during the spring and fall; a southerly (e.g., North Carolina, Virginia) distribution during the winter; and a centrally located (e.g., Long Island to Delaware) distribution during the summer. Although studies such as Erickson *et al*. (2011) and Dunton *et al*. (2010) provide some indication that Atlantic sturgeon are undertaking seasonal movements horizontally and vertically along the U.S. eastern coastline, there is no evidence to date that all Atlantic sturgeon make these seasonal movements. For instance, during inshore surveys conducted by the Northeast Fisheries Science Center in the Gulf of Maine, Atlantic sturgeon have been caught in the fall, winter, and spring between the Saco and Kennebec Rivers (Dunton *et al*. 2010; Wipplehauser 2012).

Within the marine range of Atlantic sturgeon, several marine aggregation areas have been identified adjacent to estuaries and/or coastal features formed by bay mouths and inlets along the U.S. eastern seaboard. Depths in these areas are generally no greater than 25 meters (Stein *et al*. 2004a; Laney *et al*. 2007; Dunton *et al*. 2010; Erickson *et al*. 2011). Although additional studies are still needed to clarify why these particular sites are chosen by Atlantic sturgeon, there is some indication that they may serve as thermal refuges, wintering sites, or marine foraging areas (Stein *et al*. 2004a; Dunton *et al*. 2010; Erickson *et al*. 2011). The following are the currently known marine aggregation sites located within the operational range of Greater Atlantic Region fisheries:

- Waters off North Carolina, including Virginia/North Carolina border (Laney *et al*. 2007);
- Waters off the Chesapeake and Delaware Bays (Stein *et al*. 2004a; Dunton *et al*. 2010; Erickson *et al*. 2011; Oliver *et al*. 2013);
- New York Bight (e.g., waters off Sandy Hook, New Jersey, and Rockaway Peninsula, New York; Stein *et al*. 2004a; Dunton *et al.* 2010; Erickson *et al*. 2011; O'Leary *et al*. 2014;);
- Massachusetts Bay (Stein *et al.* 2004a);
- Long Island Sound (Bain *et al.* 2000; Savoy and Pacileo 2003; Waldman *et al.* 2013);
- Connecticut River Estuary (Waldman *et al.* 2013);
- Kennebec River Estuary (Wipplehauser 2012; Whipplehauser and Squiers 2015).

In addition, since listing of the five Atlantic sturgeon DPSs, numerous genetic studies have addressed DPS distribution and composition in marine waters of the Northwest Atlantic (e.g., Wirgin *et al*. 2012; Wirgin *et al*. 2015a,b; Waldman *et al*. 2013; O'Leary *et al*. 2014; Dunton et al. 2012).[20] These studies show that Atlantic sturgeon from multiple DPSs can be found at any single locaton along the Northwest Atlantic coast, with the Mid-Atlantic locations consistently comprised of all five DPSs (Wirgin *et al*. 2012; Wirgin *et al*. 2015a,b;Waldman *et al*. 2013; O'Leary *et al*. 2014; Dunton *et al*. 2012; Damon-Randall *et al*. 2013). Although additional studies are needed to further clarify the DPS distribution and composition in non-natal estuaries and coastal locations, these studies provide some initial insight on DPS distribution and co-occurrence in particular areas along the U.S. eastern seaboard.

6.4.2.6 Atlantic Salmon (Gulf of Maine DPS)

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 Gulf of Maine 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 2004; 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

[20] Genetic studies did not sample Atlantic sturgeon south of North Carolina.

and USFWS 2005, 2016; Fay *et al*. 2006). For additional information on the on the biology, status, and range-wide distribution of the Gulf of Maine DPS of Atlantic salmon please refer to NMFS and USFWS 2005, 2016; Fay *et al*. 2006.

6.4.3 Fishing Gear and Interactions with Protected Resources

To understand the potential risk of an interaction, it is necessary to consider (1) species presence in the affected environment of the fishery and the overlap with fishing effort (see section 6.4.2); and (2) the potential for interaction with particular fishing gear types based on the available data. Information on species occurrence in the operational range of the summer flounder fishery has been provided in section 6.4.2, and therefore, this section will focus on information related to protected species interactions with fishery gear types.

Protected species described in Section 6.4.2 are all known to be vulnerable to interactions with various types of fishing gear. As this action only effects the commercial summer flounder fishery, only those primary gear types used to target summer flounder are described here. The summer flounder commercial fishery primarily uses bottom trawl gear; see Table 25 in section 6.3.3.1. In the following sections, available information on protected species interactions with this gear type is provided. Please note, these sections are not a comprehensive review of all fishing gear types known to interact with a given species. The focus of this descriptions below is on bottom trawl gear given that the overwhelming majority (typically at least 90%) of landings originate from this gear type.

6.4.3.1 Sea Turtles

As described in Section 6.4.2.1, sea turtles are widely distributed in the waters of the Northwest Atlantic and often occupy many of the same ocean areas utilized for fishing. As a result, interactions with fishing gear are possible, with interactions having the potential to result in injury or mortality to the sea turtle. Below we provide the best available information on sea turtle interaction risks with bottom trawl gear.

Sea turtle interactions with bottom trawl gear have been observed in the Gulf of Maine, Georges Bank, and the Mid-Atlantic; however, most of the observed interactions have occurred in the Mid-Atlantic (see Murray 2011; Warden 2011a, b; Murray 2015a, Murray 2015b). As few sea turtle interactions have been observed in the Gulf of Maine and Georges Bank regions of the Northwest Atlantic, there is insufficient data available to conduct a robust model-based analysis on sea turtle interactions with trawl gear in these regions or produce a bycatch estimate for these regions. As a result, the bycatch estimates and discussion below are for trawl gear in the Mid-Atlantic.

Bottom trawl gear poses an injury and mortality risk to sea turtles, specifically due to forced submergence (Sasso and Epperly 2006). Green, Kemp's ridley, leatherback, loggerhead, and unidentified sea turtles have been documented interacting (e.g., bycaught) with bottom trawl gear. However, estimates are available only for loggerhead sea turtles. Warden (2011a,b) estimated that from 2005-2008, the average annual loggerhead interactions in bottom trawl gear in the Mid-Atlantic[21] was 292 (CV=0.13, 95% CI=221-369), with an additional 61 loggerheads (CV=0.17,

[21] Warden (2011a) defined the Mid-Atlantic as south of Cape Cod, Massachusetts, to approximately the North Carolina/South Carolina border.

95% CI=41-83) interacting with trawls, but released through a Turtle Excluder Device (TED; see below for details on TEDs). The 292 average annual observable loggerhead interactions equates to approximately 44 adult equivalents (Warden 2011a,b). Most recently, Murray (2015b) estimated that from 2009-2013, the total average annual loggerhead interactions in bottom trawl gear in the Mid-Atlantic[22] was 231 (CV=0.13, 95% CI=182-298); this equates to approximately 33 adult equivalents (Murray 2015b). Bycatch estimates provided in Warden (2011a) and Murray (2015b) are a decrease from the average annual loggerhead bycatch in bottom otter trawls during 1996-2004, which Murray (2008) estimated at 616 sea turtles (CV=0.23, 95% CI over the nine-year period: 367-890). This decrease is likely due to decreased fishing effort in high-interaction areas (Warden 2011a, b).

TEDs allow sea turtles to escape the trawl net, reducing injury and mortality resulting from capture in the net. In the Greater Atlantic Region, TEDs are required for summer flounder trawlers in the summer flounder fishery-sea turtle protection area. This area is bounded on the north by a line extending along 37°05'N (Cape Charles, VA) and on the south by a line extending out from the North Carolina-South Carolina border (Figure 22). Vessels north of Oregon Inlet, NC, are exempt from the TED requirement from January 15 through March 15 each year (50 CFR 223.206); vessels operating south of Oregon Inlet, NC are required to have TEDS year round.

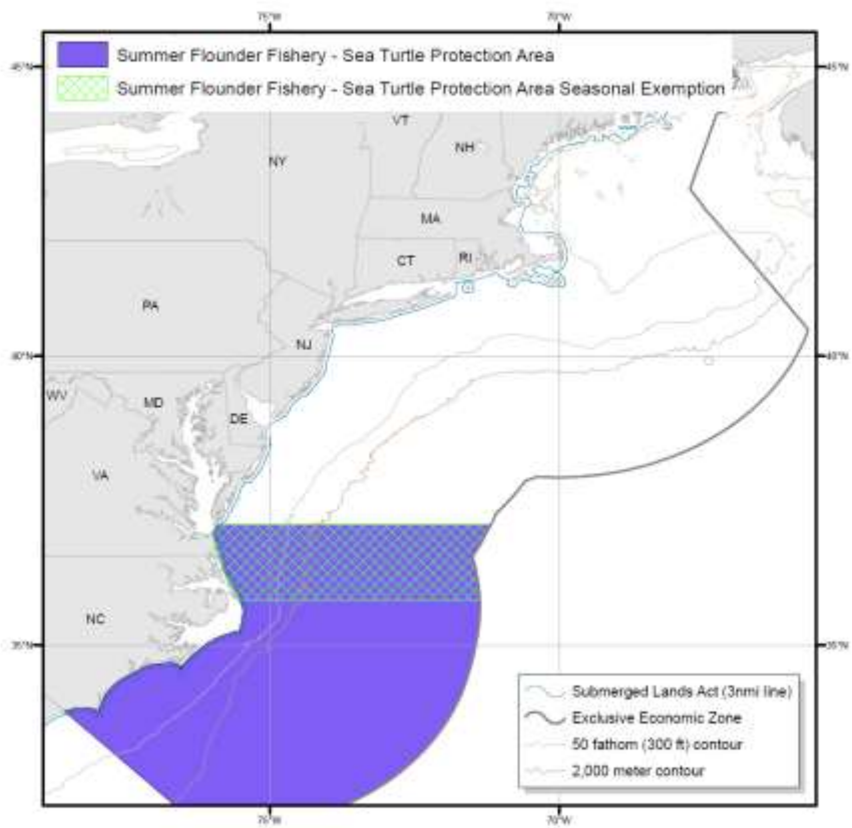


Figure 22: Summer Flounder Fishery Sea Turtle Protection Area.

[22] Murray 2015b defined the Mid-Atlantic as the boundaries of the Mid-Atlantic Ecological Production; roughly waters west of 71°W to the North Carolina/South Carolina border)

Summary of Observed Locations of Turtle Interactions with Bottom Tending Gear

Figure 23 shows the observed locations of sea turtle interactions with bottom tending gear (i.e., gillnet, dredge and bottom trawl gear) in the Greater Atlantic Region from 1989 to 2015.

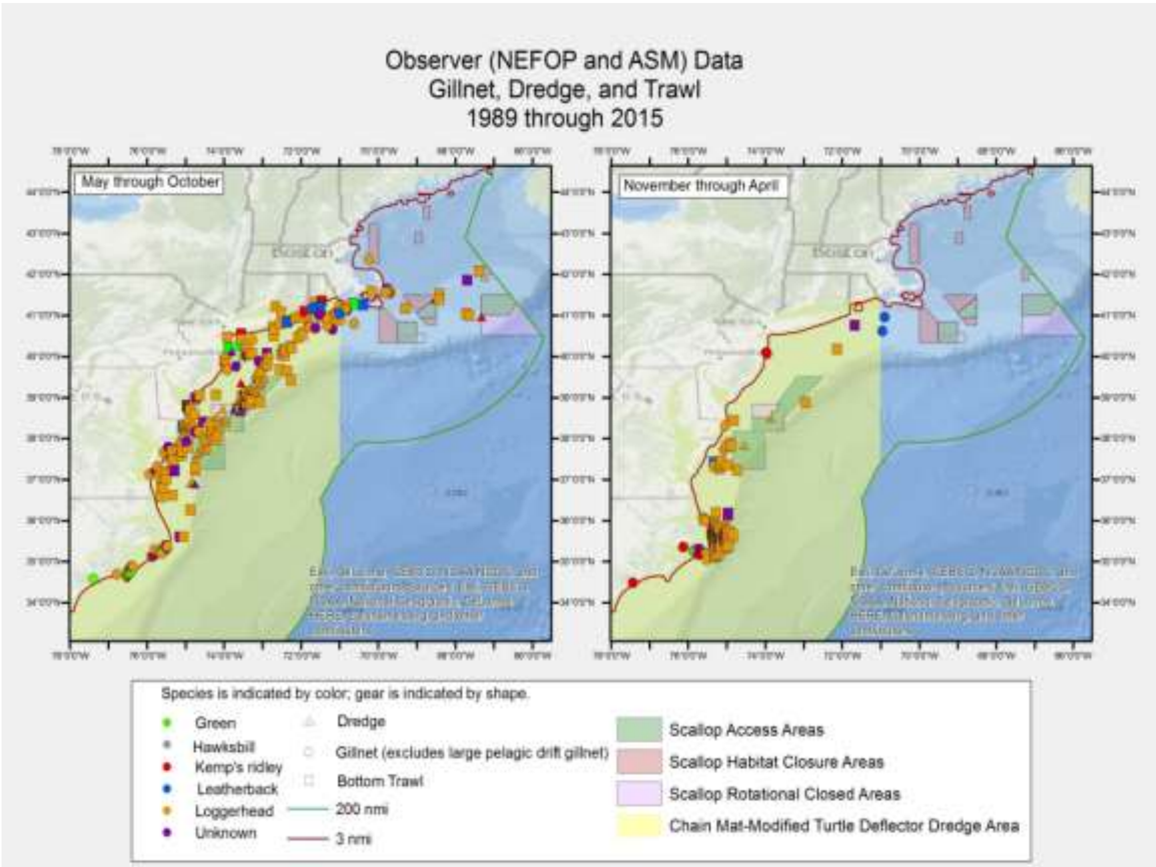


Figure 23: Observed Location of Turtle Interactions in Bottom Tending Gears in the Greater Atlantic Region 1989-2015.

Factors Affecting Sea Turtle Interactions

The risk of a gear interaction is affected by multiple factors, including where and when fishing effort is focused, the type of gear being used, environmental conditions, and sea turtle occurrence and distribution. Murray and Orphanides (2013) recently evaluated fishery-independent and fishery-dependent data to identify environmental conditions associated with turtle presence and the subsequent risk of a bycatch encounter if fishing effort is present. They concluded that encounter rates were a function of latitude, sea surface temperature (SST), depth, and salinity, when looking at fishery-independent data. When the model was fit to fishery-dependent data (gillnet, bottom trawl, and scallop dredge), Murray and Orphanides (2013) found a decreasing trend in encounter rates as latitude increased; an increasing trend as SST increased; a bimodal relationship between encounter rates and salinity; and higher encounter rates in depths between 25 and 50 m. Similar findings were found in Warden (2011a), Murray (2013), and Murray (2015a, b).

6.4.3.2 Marine Mammals

Pursuant to the MMPA, NMFS publishes a List of Fisheries (LOF) 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.[23] The categorization in the LOF determines whether participants in that fishery are subject to certain provisions of the MMPA, such as registration under the Marine Mammal Authorization Program, observer coverage, and take reduction plan requirements. Individuals fishing in Category I or II fisheries must comply with requirements of any applicable take reduction plan.

Categorization of fisheries is based on the following two-tiered, stock-specific approach:

- **Tier 1** considers the cumulative fishery mortality and serious injury for a particular stock. If the total annual mortality and serious injury rates within a stock resulting from all fisheries are less than or equal to 10 percent of the stock's Potential Biological Removal (PBR), all fisheries associated with this stock fall into Category III. If mortality and serious injury rates are greater than 10 percent of PBR, the following Tier 2 analysis occurs.
- **Tier 2** considers fishery-specific mortality and serious injury for a particular stock. Specifically, this analysis compares fishery-specific annual mortality and serious injury rates to a stock's PBR to designate the fishery as a Category I, II, or III fishery (see Table 33).

Table 33: Descriptions of the Tier 2 fishery classification categories (50 CFR 229.2).

Category	Level of incidental mortality or serious injury of marine mammals	Annual mortality and serious injury of a stock in a given fishery is…
Category I	frequent	≥50% of the PBR level
Category II	occasional	between 1% and 50% of the PBR level
Category III	remote likelihood, or no known	≤1% of the PBR level

Please note, in this document the following discussion on fishery interactions with marine mammals (large whales, small cetaceans and pinnipeds) are in reference to the Tier 2 classifications of fisheries in Table 33.

6.4.3.2.1 Large Whales

Atlantic large whales are at risk of becoming entangled in fishing gear because the whales feed, travel, and breed in many of the same ocean areas used for fishing. Below we provide the best available information on large whale interaction risks with the gear type primarily used in the commercial summer flounder fishery, i.e., bottom trawls.

With the exception of one species, there have been no observed interactions with large whales and trawl gear. The one exception is minke whales, which have been observed seriously injured and

[23] The most recent LOF was issued February 7, 2018 (83 FR 5349).

killed in bottom trawl gear. In bottom trawl gear, to date, interactions have only been observed in the northeast bottom trawl fisheries. From the period of 2008-2012, the estimated annual mortality attributed to this fishery was 7.8 minke whales for 2008 and zero minke whales from 2009-2012; no serious injuries were reported during this time (Waring *et al*. 2015). Based on this information, from 2008-2012, the estimated annual average minke whale mortality and serious injury attributed to the northeast bottom trawl fishery was 1.6 (CV=0.69) whales (Waring *et al*. 2015). Lyssikatos (2015) estimated that from 2008-2013, mean annual serious injuries and mortalities from the northeast bottom trawl fishery were 1.40 (CV=0.58) minke whales. Serious injury and mortality records for minke whales in U.S. waters from 2010-2015 showed zero interactions with bottom trawl (Northeast or Mid-Atlantic) gear (Henry *et al*. 2016, 2017; Hayes *et al*. 2017).

Based on above information, trawl gear is likely to pose a low interaction risk to any large whale species. Should an interaction occur, serious injury or mortality to any large whale is possible; however, relative to other gear types (i.e., fixed gear), trawl gear represents a low source of serious injury or mortality to any large whale (Henry *et al*. 2016, 2017; Hayes *et al*. 2017; Palmer 2017).

6.4.3.2.2 Small Cetaceans and Pinnipeds

Small cetaceans and pinnipeds are found throughout the waters of the Northwest Atlantic (see Section 6.4.2). As they feed, travel, and breed in many of the same ocean areas used for fishing, they are at risk of becoming entangled or caught in various types of fishing gear. Interactions can result in serious injury or mortality to the animal. Below we provide the best available information on small cetaceans and pinniped interaction risks with bottom trawl gear.

Small cetaceans and pinnipeds are vulnerable to interactions with bottom trawl gear. Species that have been observed incidentally injured and/or killed by MMPA LOF Category II (occasional interactions) bottom trawl fisheries that operate in the affected environment of summer flounder fishery are provided in Table 34 (Hayes et al. 2017; 83 FR 5349 (February 7, 2018)). Based on the most recent five years of observer data (2010-2014), Table 34 provides a list of species that have been observed (incidentally) seriously injured and/or killed by List of Fisheries Category II trawl fisheries that operate in the affected environment of the MSB fisheries (Hayes *et al*. 2017; 83 FR 5349 (February 7, 2018)).

Table 34: Small cetacean and pinniped species observed seriously injured and/or killed by Category II bottom trawl fisheries in the affected environment of the summer flounder fishery.

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
		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
***Sources*: Hayes *et al.* (2017); MMPA LOF 83 FR 5349 (February 7, 2018).		

In 2006, the Atlantic Trawl Gear Take Reduction Team was convened to address the incidental mortality and serious injury of long-finned pilot whales (*Globicephala melas*), short-finned pilot whales (*Globicephala macrorhynchus*), common dolphins (*Delphinus delphis*), and white-sided dolphins (*Lagenorhynchus acutus*) 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.[24]

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/

[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.

6.4.3.3 Atlantic Sturgeon

Atlantic sturgeon feed, migrate, and rest in many of the same ocean areas used for fishing, and therefore may interact with fishing gear (see section 6.4.2.5). Below we provide the best available information on Atlantic sturgeon interaction risks with bottom trawl gear.

Atlantic sturgeon interactions (i.e., bycatch) with bottom trawl gear have been observed since 1989; these interactions have the potential to result in the injury or mortality of Atlantic sturgeon (NMFS NEFSC FSB 2015, 2016, 2017). Three documents, covering three time periods, that use data collected by the Northeast Fisheries Observer Program to describe bycatch of Atlantic sturgeon in bottom trawl gear: Stein et al. (2004b) for 1989-2000; ASMFC (2007) for 2001-2006; and Miller and Shepard (2011) for 2006-2010; none of these documents provide estimates of Atlantic sturgeon bycatch by Distinct Population Segment.[25] Miller and Shepard (2011), the most of the three documents, analyzed fishery observer data and VTR data in order to estimate the average annual number of Atlantic sturgeon interactions in otter trawl in the Northeast Atlantic that occurred from 2006 to 2010. This timeframe included the most recent, complete data and as a result, Miller and Shepard (2011) is considered to represent the most accurate predictor of annual Atlantic sturgeon interactions in the Northeast bottom trawl fisheries (NMFS 2013).

Based on the findings of Miller and Shepard (2011), NMFS (2013) estimated that the annual bycatch of Atlantic sturgeon in bottom trawl gear to be 1,342 sturgeon. Miller and Shepard (2011) observed Atlantic sturgeon interactions in trawl gear with small (< 5.5 inches) and large (≥ 5.5 inches) mesh sizes. Regardless of mesh size, Miller and Shepard (2011), estimated Atlantic sturgeon mortality rates in bottom trawl gear to be 5.0% ;similar conclusions were reached in Stein *et al*. (2004b) and ASMFC (2007) reports. However, an important consideration to these findings is that observed mortality is considered a minimum of what actually occurs and therefore, the conclusions reached by Stein *et al*. (2004b), ASMFC (2007), and Miller and Shepard (2011) are not reflective of the total mortality associated with bottom trawl gear . To date, total Atlantic sturgeon mortality associated with trawl gear remains uncertain.

6.4.3.4 Atlantic Salmon

As described in Section 6.4.2.6, the marine range of the Gulf of Maine Distinct Population Segment extends from the Gulf of Maine (primarily northern portion) to the coast of Greenland (NMFS and USFWS 2005, 2016; Fay *et al*. 2006). Although the distribution of Atlantic salmon in the marine environment likely overlaps with commercial fisheries, there have been a low number of observed interactions with fisheries and various gear types. Below we provide the best available information on Atlantic salmon interaction risks with bottom trawl gear.

Atlantic salmon interactions (i.e., bycatch) with bottom trawl have been observed since 1989; in many instances, these interactions have resulted in the injury and mortality of Atlantic salmon (NMFS NEFSC FSB 2015, 2016, 2017). NMFS Northeast Fisheries Science Center's (NEFSC) Northeast Fisheries Observer and At-Sea Monitoring Programs documented a total of 15 individual salmon incidentally caught on more than 60,000 observed commercial fishing trips from 1989 through August 2013 (NMFS 2013; Kocik *et al*. 2014)); of those 15 salmon, four were observed caught in bottom trawl gear (Kocik (NEFSC), pers. comm (February 11, 2013) in NMFS 2013). Since 2013, no additional Atlantic salmon have been observed bottom trawl gear (NMFS NEFSC FSB

[25] Atlantic sturgeon bycatch analysis conducted by Stein et al. (2004b) was limited to otter trawl, sink gillnet, and drift gillnet gear. ASMFC (2007) and Miller and Shepard (2011) estimates of Atlantic sturgeon bycatch are based on NEFOP observed sink gillnet and otter trawl trips.

2015, 2016, 2017). Based on the above information, interactions with Atlantic salmon are likely rare (Kocik *et al*. 2014).

6.5 HUMAN ENVIRONMENT

Summer flounder supports the most important commercial and recreational flatfish fisheries of the U.S. Atlantic coast. The directed fishery ranges from Massachusetts to North Carolina. The sections below describe the commercial and recreational summer flounder fisheries and their management, with an emphasis on the commercial fishery as commercial management is the subject of the proposed actions in this amendment.

Commercial gear types used in the summer flounder fishery were previously described in section 6.3.3. Section 6.5.1 characterizes each fishery in terms of catch and landings patterns and trends over time. Section 6.5.2 describes the economic characteristics of the summer flounder fishery that are relevant to this action, including ex-vessel values, participation and use of commercial moratorium permits, and the major communities and ports impacted by the commercial summer flounder fishery.

6.5.1 Description of the Fisheries

6.5.1.1 Total Catch Composition

Commercial landings have accounted for 49% of the total catch since 1993, with recreational landings accounting for 34%, commercial dead discards about 10%, and recreational dead discards about 7%. Over the more recent time period of 2012-2016, the comparable percentages are 53% commercial landings, 31% recreational landings, 8% commercial dead discards, and 8% recreational dead discards (Figure 24).

Commercial discard losses in the fish trawl and scallop dredge fisheries accounted for about 13% of the total *commercial* catch during 2012-2016, assuming a discard mortality rate of 80%. Recreational discard losses have accounted for 20% of the total *recreational* catch over 2012-2016, assuming a discard mortality rate of 10%.

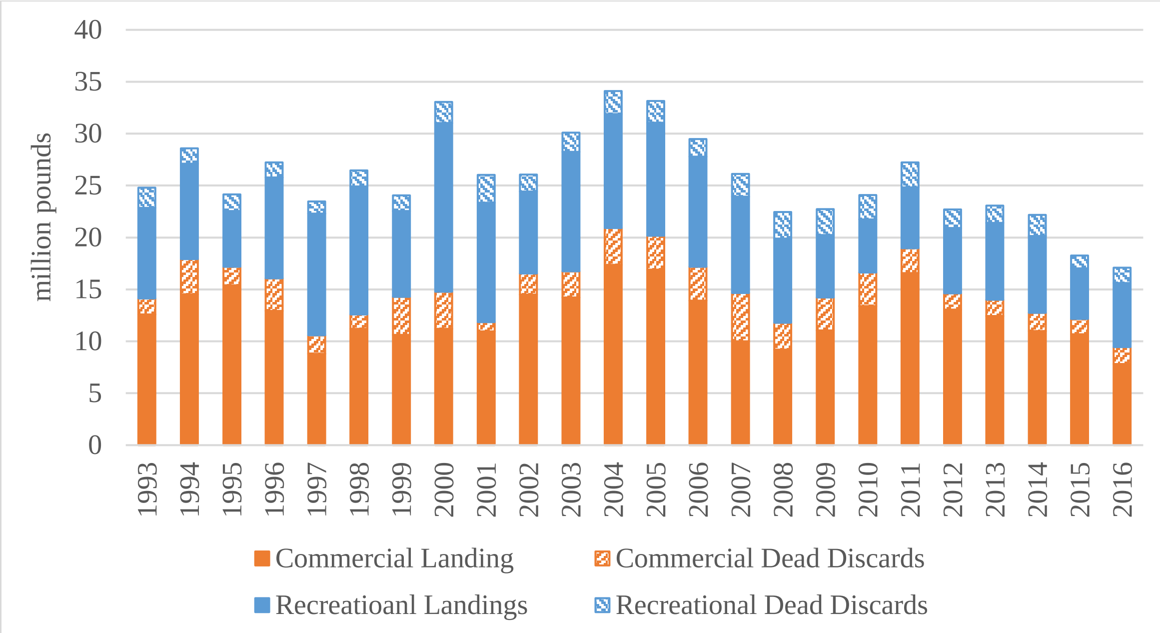


Figure 24: Components of the summer flounder fishery catch from 1993 (implementation of Amendment 2) through 2016. Source: M. Terceiro, pers. comm., July 2016, and Terceiro 2017a.

6.5.1.2 Commercial Fishery

Summer flounder support an extensive commercial fishery along the Atlantic Coast, principally from Massachusetts through North Carolina.

The following sections describe the commercial fishery for summer flounder in terms of trends in landings and discards (section 6.5.1.2.1), spatial characteristics of the fishery (6.5.1.2.2), seasonal characteristics of the fishery (6.5.1.2.3), and landings by state (6.5.1.2.4). Major commercial gear types for summer flounder were previously described in section 6.3.3.1 in the context of fishing gear impacts on habitat. Typically between 90% and 98% of the summer flounder landings are taken by bottom otter trawl gear, depending on the dataset evaluated (section 6.3.3.1).

6.5.1.2.1 Trends in Commercial Landings and Discards

Dealer reporting for commercial summer flounder landings has been mandatory only since 1994, thus, landings for years prior have greater uncertainty and may be underestimated.

Large scale, offshore commercial exploitation of summer flounder began around 1920. The fishery expanded during the 1920s and 1930s, and by 1940, commercial landings of summer flounder were estimated to have reached about 4,900 mt (10.8 million lb). Annual harvests averaged around 20 million pounds during the 1950s and early 1960s, then steadily declined during the 1960s, falling to 3,000 mt (6.6 million lb) in 1969 (MAFMC 2002; Terceiro 2001). Commercial landings increased in the mid-1970s until 1989, due to increased levels of effort in the southern winter trawl fishery (MAFMC 1993). Since 1993, the first year that a coastwide quota was implemented, commercial landings have fluctuated between a high of about 17.37 million pounds in 2004, to a low of 7.81 million pounds in 2016 (Figure 25).

Commercial summer flounder dead discards over the period 1993-2016 averaged approximately 2.49 million pounds, or about 18% of total commercial catch. Over the same time period, commercial discards also accounted for about 10% of the total catch (recreational + commercial) in weight. In recent years, commercial discards have been below this average (Table 35). A time series (1993-2015) of commercial landings and dead discards is shown in Figure 25. The current stock assessment for summer flounder assumes a commercial discard mortality of 80%. This discard mortality rate is applied to the live discard estimate regardless of the discard estimation method used.

Table 35: Summer flounder estimated commercial discards and % of total summer flounder catch in weight, 2012-2016. Source: M. Terceiro, pers. comm., and Terceiro 2017a.

	Commercial dead discards, mil lb (mt)	% of total summer flounder catch in weight
2012	1.58 (718)	7%
2013	1.57 (712)	7%
2014	1.73 (785)	8%
2015	1.48 (670)	8%
2016	1.63 (738)	10%

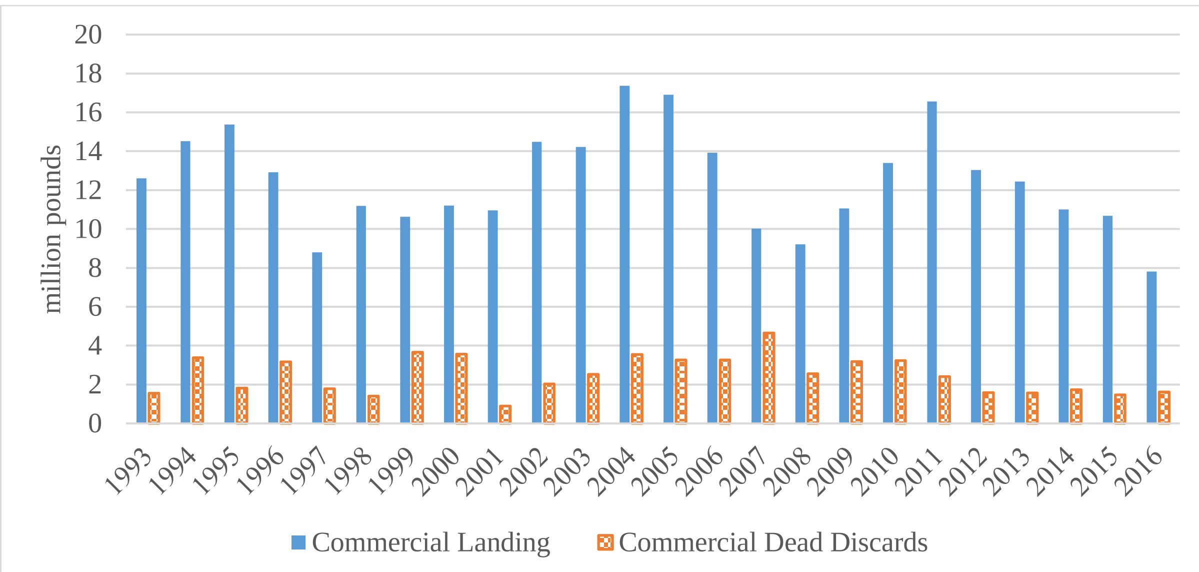


Figure 25: Summer flounder commercial discards and landings, 1993-2016. Source: M. Terceiro, personal communication, July 2016 and Terceiro 2017a.

The reasons for discarding summer flounder in the fish trawl and scallop dredge fisheries have been changing over time. For example, during 1989 to 1995, the minimum size regulation was recorded as the reason for discarding summer flounder in over 90% of the observed trawl and scallop dredge tows (NEFSC 2013). During 2012-2016, minimum size regulations were identified as the discard reason in 51% of the observed trawl tows on average, quota or trip limits in 36% of the tows, high grading in 5%, and other reasons 8% (Table 36; M. Terceiro, pers. comm.). The assessment also indicates that as a result of the increasing impact of trip limits, fishery closures, and high grading as reasons for discarding, the age structure of the summer flounder discards has also changed, with a higher proportion of older fish being discarded (NEFSC 2013).

Table 36: Percentage of observed summer flounder discards by recorded discard reason, trawl and scallop gear, 2012-2016.

	% of trawl discards	% of scallop dredge discards
Unknown	0.0%	0.1%
No market	1.6%	66.0%
Market, too small	1.8%	1.6%
Market, too large	0.1%	0.0%
Market, will spoil	1.9%	0.5%
Special sample	0.1%	0.0%
Regs., unknown	1.1%	0.4%
Regs., too small	50.6%	5.5%
Quota filled	36.1%	25.6%
Poor quality	1.6%	0.3%
High Graded	5.3%	0.2%

6.5.1.2.2 Spatial Characteristics of the Commercial Fishery

Figure 26 highlights the NMFS statistical areas accounting for more than 1 percent of the summer flounder commercial catch over 2015-2017, based on federal VTR data. Statistical area 616 is typically responsible for the highest percentage of the catch and landings. Statistical area 539 accounted for the highest number of trips that caught summer flounder (at least 7,736 trips by federally permitted vessels over these three years).

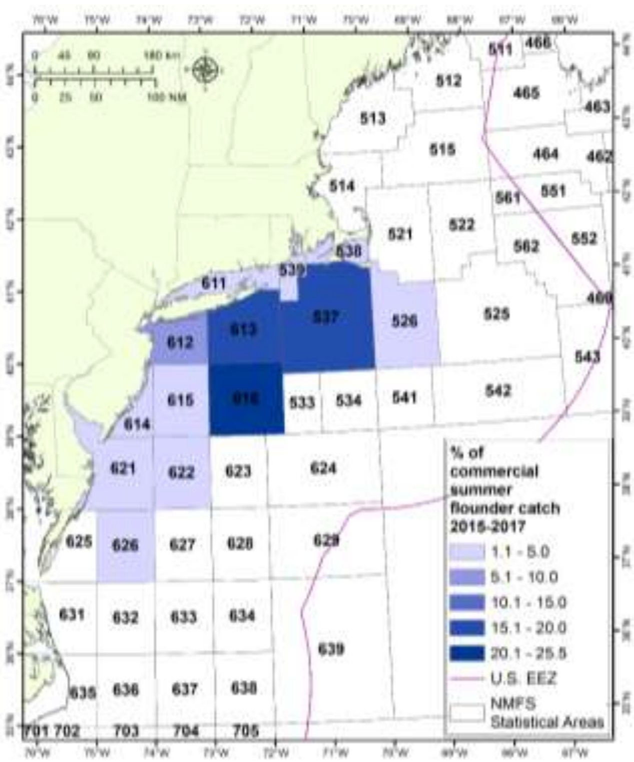


Figure 26: NMFS Statistical Areas, highlighting those that each accounted for more than 1% of VTR-reported commercial summer flounder catch, 2015-2017.

Reported fishing locations by statistical area can provide only a general location of catch. To look at landings and revenues at a finer spatial scale, the NEFSC Social Sciences Branch developed a VTR-based revenue mapping model that incorporates NEFOP observer data with known fishing locations. DePiper (2014) describes this model and its application, summarized below.

Federally-permitted vessels are required to submit a VTR for each trip, the requirements of which include indicating a general fishing location as a set of geographic coordinates. These self-reported coordinates do not precisely indicate the location of fishing effort, given that only one point is provided regardless of trip length or distance covered during the trip. In the absence of spatially explicit fishery effort data for many fisheries, the VTR mapping model allows for more robust analysis using VTR data by taking into account some of the uncertainties around each reported point. Using observer data, for which precise locations are available, the model was developed to derive probability distributions for actual fishing locations, around a provided VTR point. Other variables likely to impact the precision of a given VTR point, such as trip length, vessel size, and fishery, were also incorporated into the model. This model allows for generation of maps that predict the spatial footprint of fishing. Price information from dealer reports was used to transform VTR catches into revenues. Trip information was used to incorporate information about revenue generated from each trip, resulting in a model that can produce maps of revenue generated for a given set of specified parameters such as gear type, species, or port of landing. The revenue-mapping model can be used to identify areas important to specific fishing communities, species, gears, and seasons to establish a baseline of commercial fishing effort. The probability distributions generated from each reported VTR point create a likelihood of actual fishing locations in all directions from a given point, and do not take into account any specific directionality that may be associated with specific fishing methods or specific locations. For example, the model does not take into account fishing behavior along depth contours or other specific habitat features.

Figure 27 shows these revenue maps for commercial summer flounder landings from 2010-2015 (in 2014 dollars). Revenues are closely correlated with the total amount of landings (similar maps for summer flounder landings show a distribution very close to the revenue maps and thus are not provided here; see: https://www.nefsc.noaa.gov/read/socialsci/fishing-footprints.php). In general, the bulk of commercial landings and revenue for summer flounder are taken either from nearshore areas off of Rhode Island/Connecticut/eastern Long Island and New Jersey/southern Long Island, or from offshore on the continental shelf between the Delmarva Peninsula and offshore areas south of Cape Cod (Figure 27).

Maps using the same revenue mapping model are also provided for commercial summer flounder revenue by region for 2012-2016, according to state of landing (Figure 28 A-C). The Northern region includes the states of Maine through New York (primarily Massachusetts through New York), while the Southern region includes New Jersey through North Carolina. These regional maps indicate that catch landed in the Northern region is typically caught in waters directly off of these Northern states (i.e., north of Hudson Canyon). For the Northern region, the highest concentration of revenues tends to originate from the Block Island Sound/Eastern Long Island region. Catch landed in the Southern region, on the other hand, originates from a broader geographic range along the coast. For the Southern region, high revenue concentrations tend to come from offshore locations along the outer continental shelf, as well as some inshore areas concentrated near Northern New Jersey/South of Long Island. This indicates that there are clear regional differences in the highest concentrations of fishing effort between the northern and southern states.

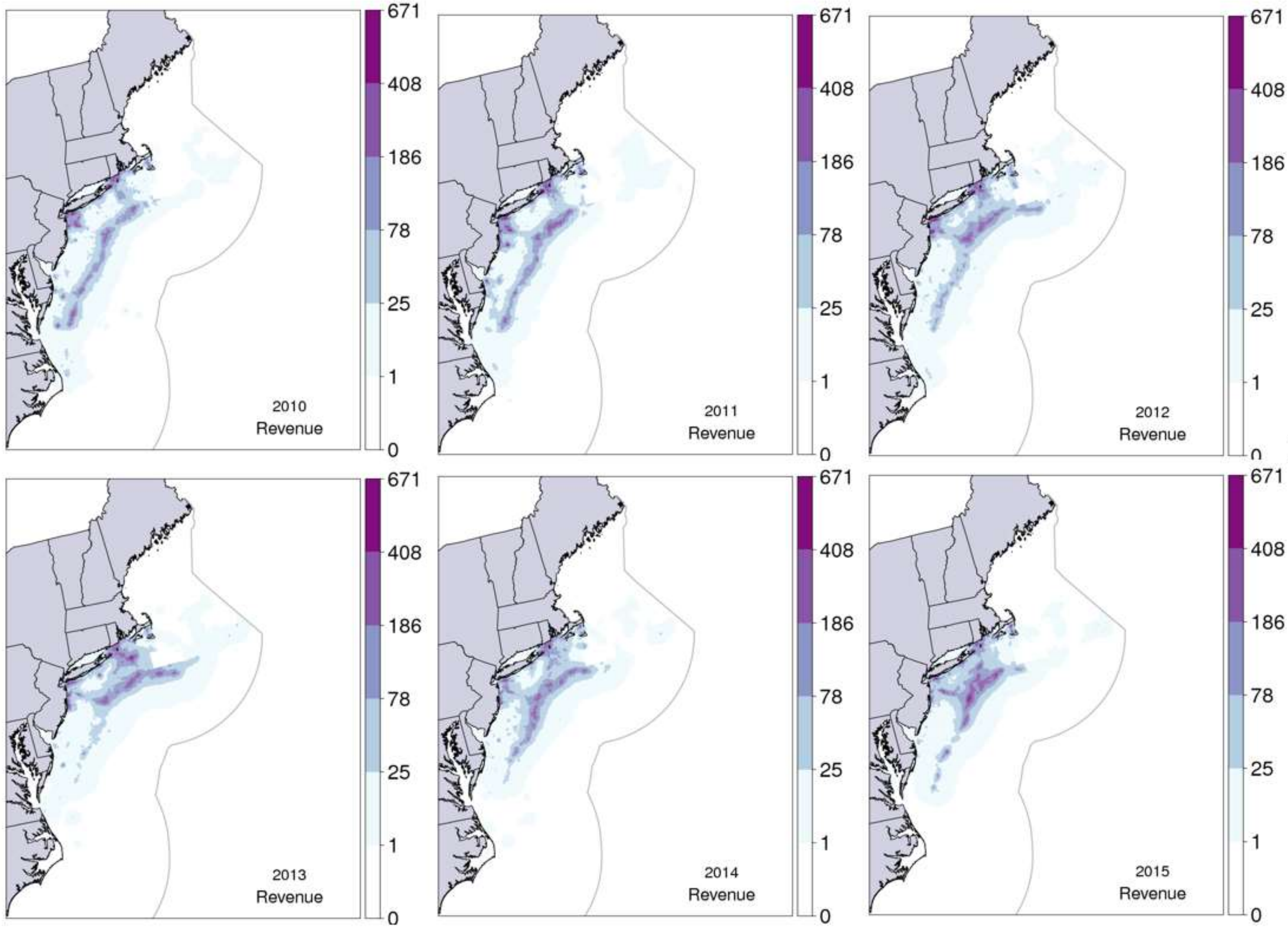


Figure 27: Commercial summer flounder revenue by catch location, 2010-2015, in 2014 real US dollars. Source: NEFSC Social Sciences Branch Fishing Footprints, based on DePiper (2014). Available at: https://www.nefsc.noaa.gov/read/socialsci/fishing-footprints.php.

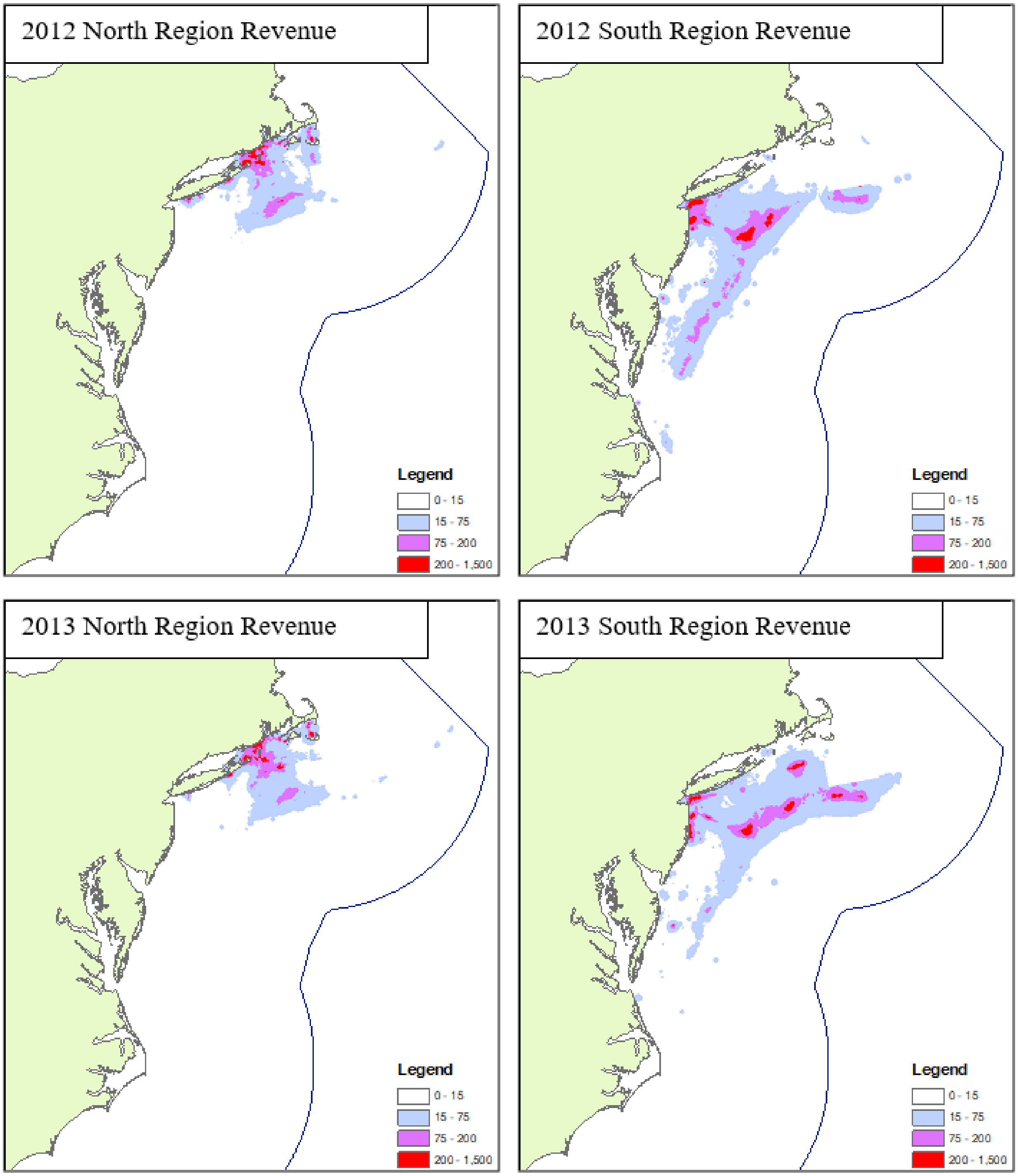


Figure 28 (A): Commercial summer flounder revenue by region as indicated by state of landing, 2012-2013, in 2014 dollars. North region includes revenue from Maine through New York; South region includes revenue from states New Jersey through North Carolina. Source: pers. comm., NEFSC Social Sciences Branch.

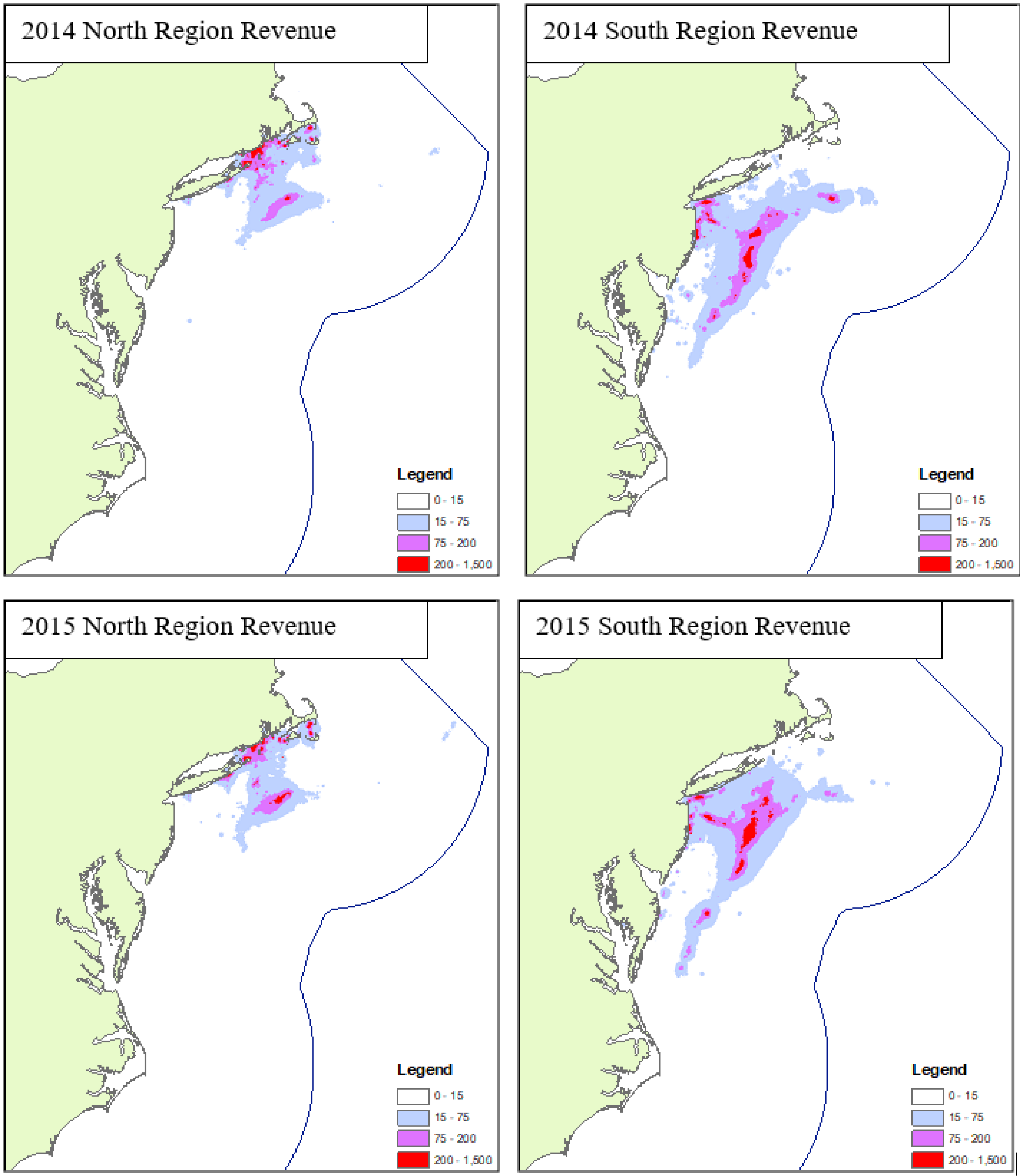


Figure 29 (B): Commercial summer flounder revenue by region as indicated by state of landing, 2014-2015, in 2014 dollars. North region includes revenue from Maine through New York; South region includes revenue from states New Jersey through North Carolina. Source: pers. comm., NEFSC Social Sciences Branch.

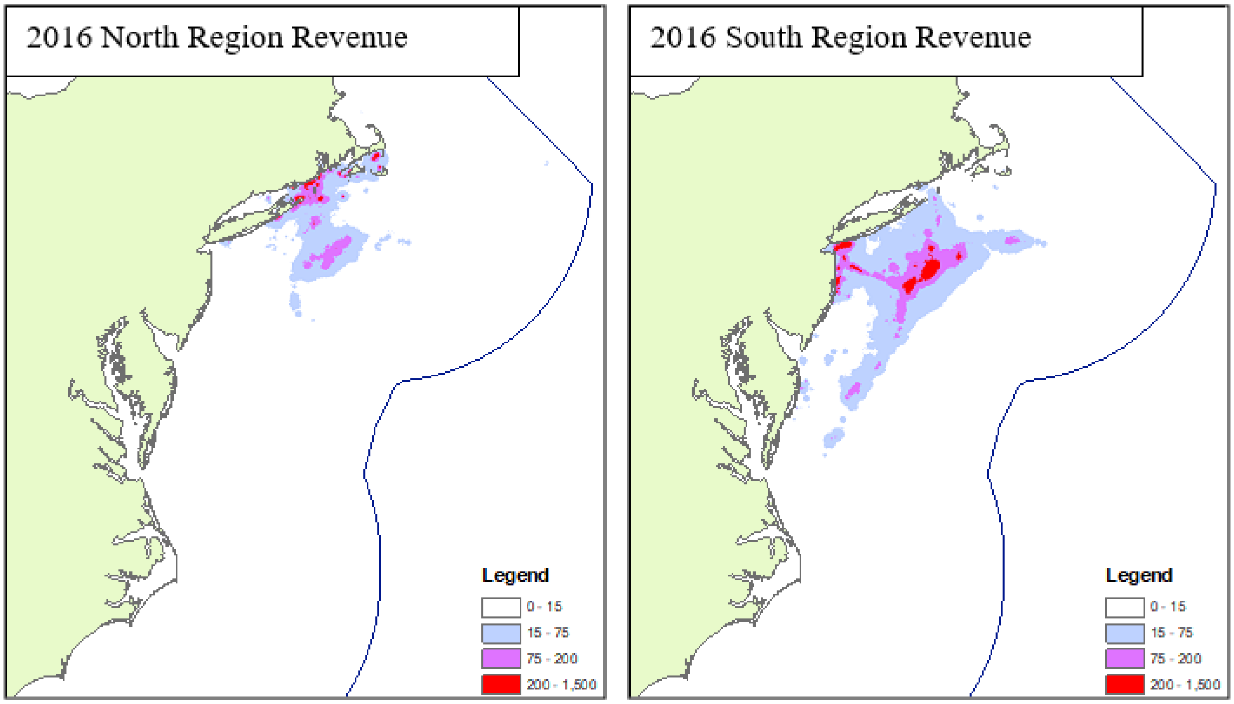


Figure 30 (C): Commercial summer flounder revenue by region as indicated by state of landing, 2016, in 2014 dollars. North region includes revenue from Maine through New York; South region includes revenue from states New Jersey through North Carolina. Source: pers. comm., NEFSC Social Sciences Branch.

The 2013 stock assessment examined spatial trends in commercial catch over time, with comparisons to the survey distribution over the same time frames, beginning in 1994 to coincide with the first year of mandatory vessel trip reporting. Figure 31 through Figure 34 show the results of this exercise from the assessment, with data through 2012.

The 2013 assessment report notes that "the heaviest commercial fishery catches (and by inference, effort) in the 1990s were reported just off of Cape Hatteras, concentrated around the entrances to Hudson Canyon and Narragansett Bay, and offshore along the shelf edge from the Chesapeake Bay entrance through SNE. Large catches of summer flounder continued along the shelf during the early 2000s with concentrations slightly farther north off the Delaware-Maryland-Virginia coast. This northerly trend of offshore commercial catches continued through the present decade with the largest catches now south of Rhode Island. Commercial catches of summer flounder at its southern extent are reduced after 2005. Fishery observer data show a much larger presence of large summer flounder catches on Georges Bank after 2005. The earliest years (1968-1990) of NEFSC fish trawl surveys showed the largest catches of summer flounder in inshore waters from Long Island to Cape Hatteras, with intermittent catches of summer flounder in the Georges Bank-Great South Channel strata or in the Gulf of Maine. The lowest catches occurred during the early 1990s, before increasing slowly in the late 1990s. During the rebuilding period of the 2000s, larger catches of summer flounder began appearing in northern areas, particularly south of Rhode Island and Massachusetts" (NEFSC 2013). As described in section 6.1.4, a general pattern increasing latitude in the summer flounder center of biomass from the trawl surveys can be observed since 1994 in the figures below.

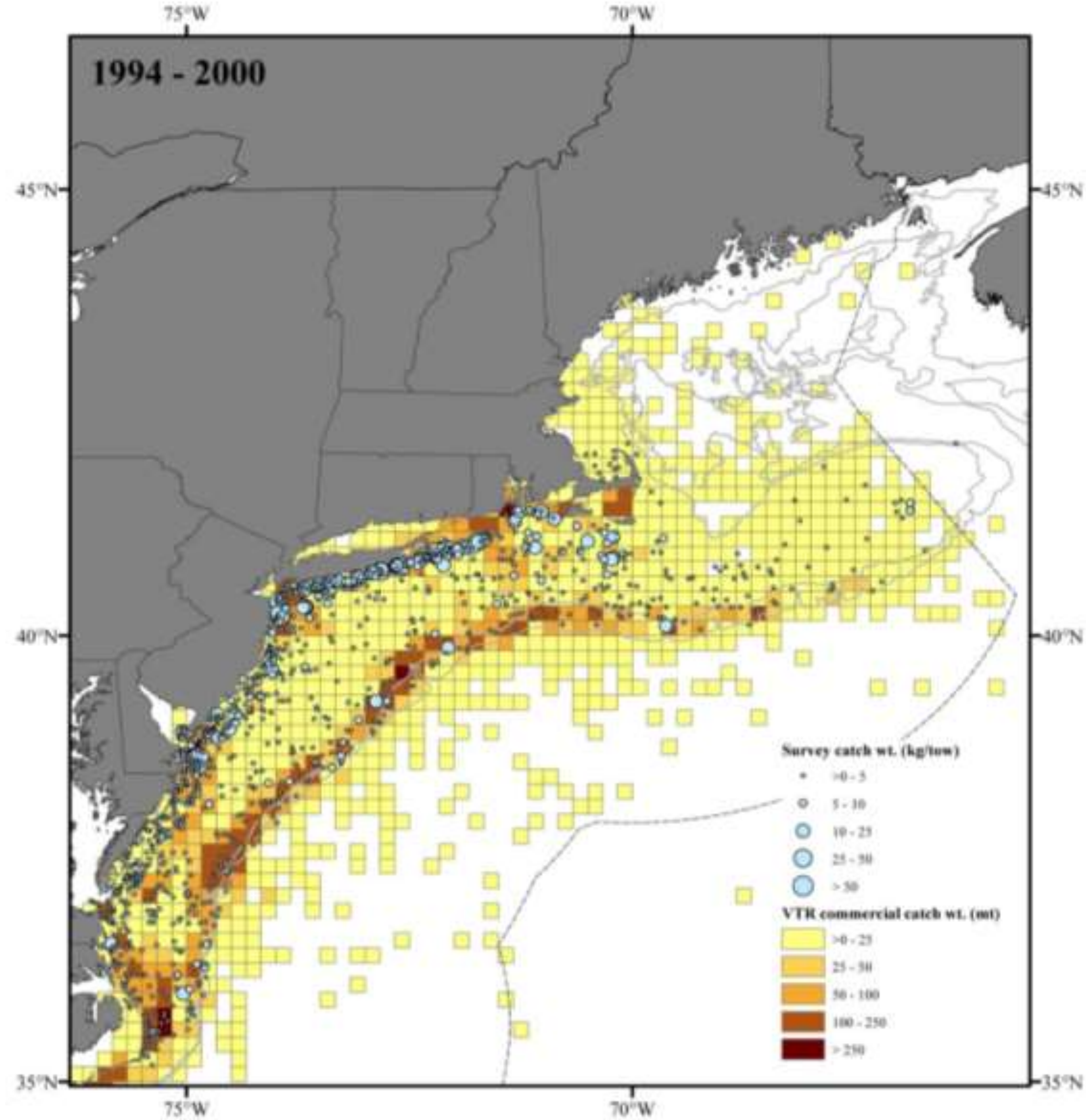


Figure 31: Spatial overlap of NEFSC trawl survey (spring and fall combined) catches (kg/tow) and commercial VTR-reported catch weight (landings and discards) binned to ten minute squares from, 1994-2000. Source: NEFSC 2013.

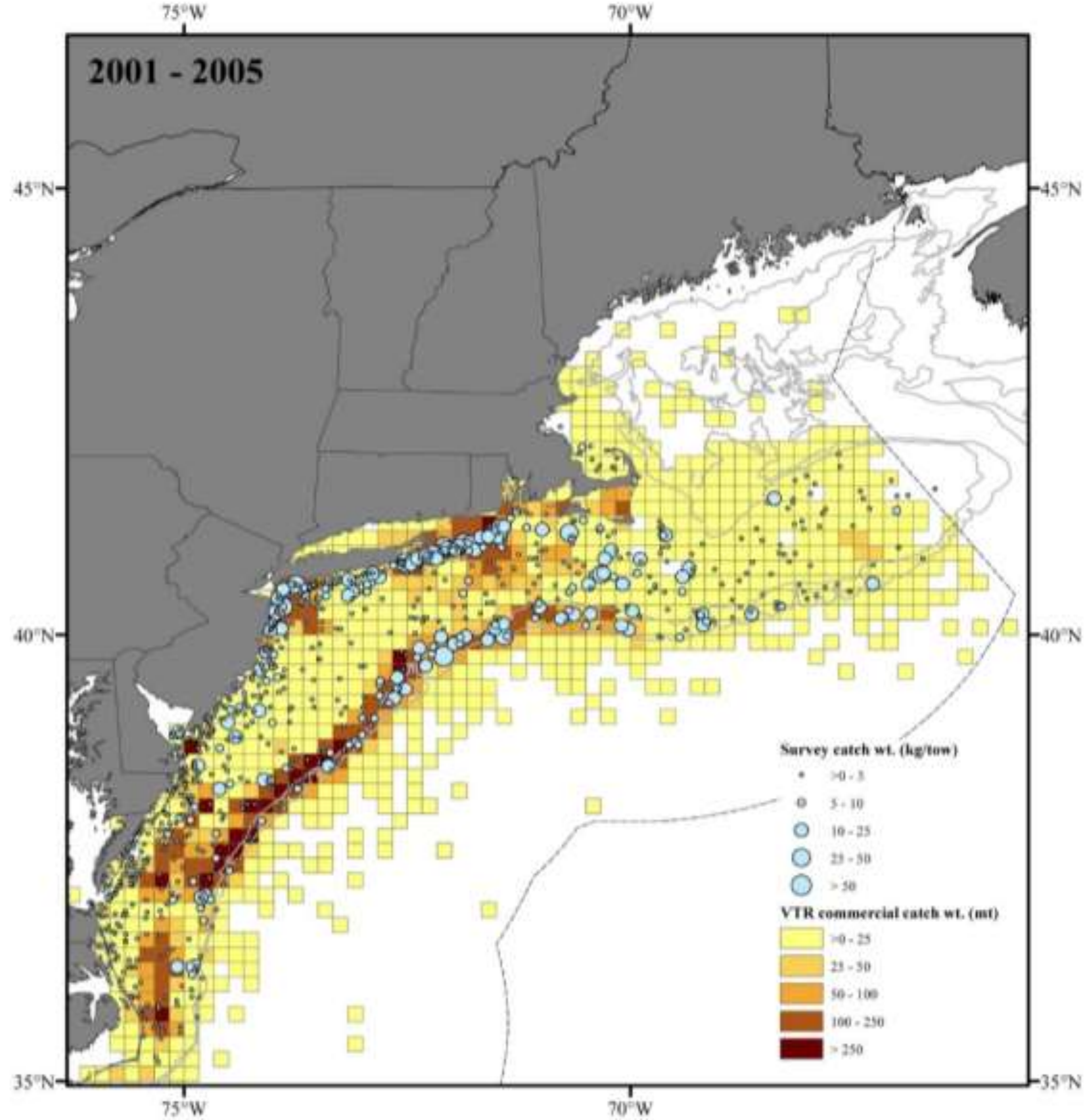


Figure 32: Spatial overlap of NEFSC trawl survey (spring and fall combined) catches (kg/tow) and commercial VTR-reported catch weight (landings and discards) binned to ten minute squares from, 2001-2005. Source: NEFSC 2013.

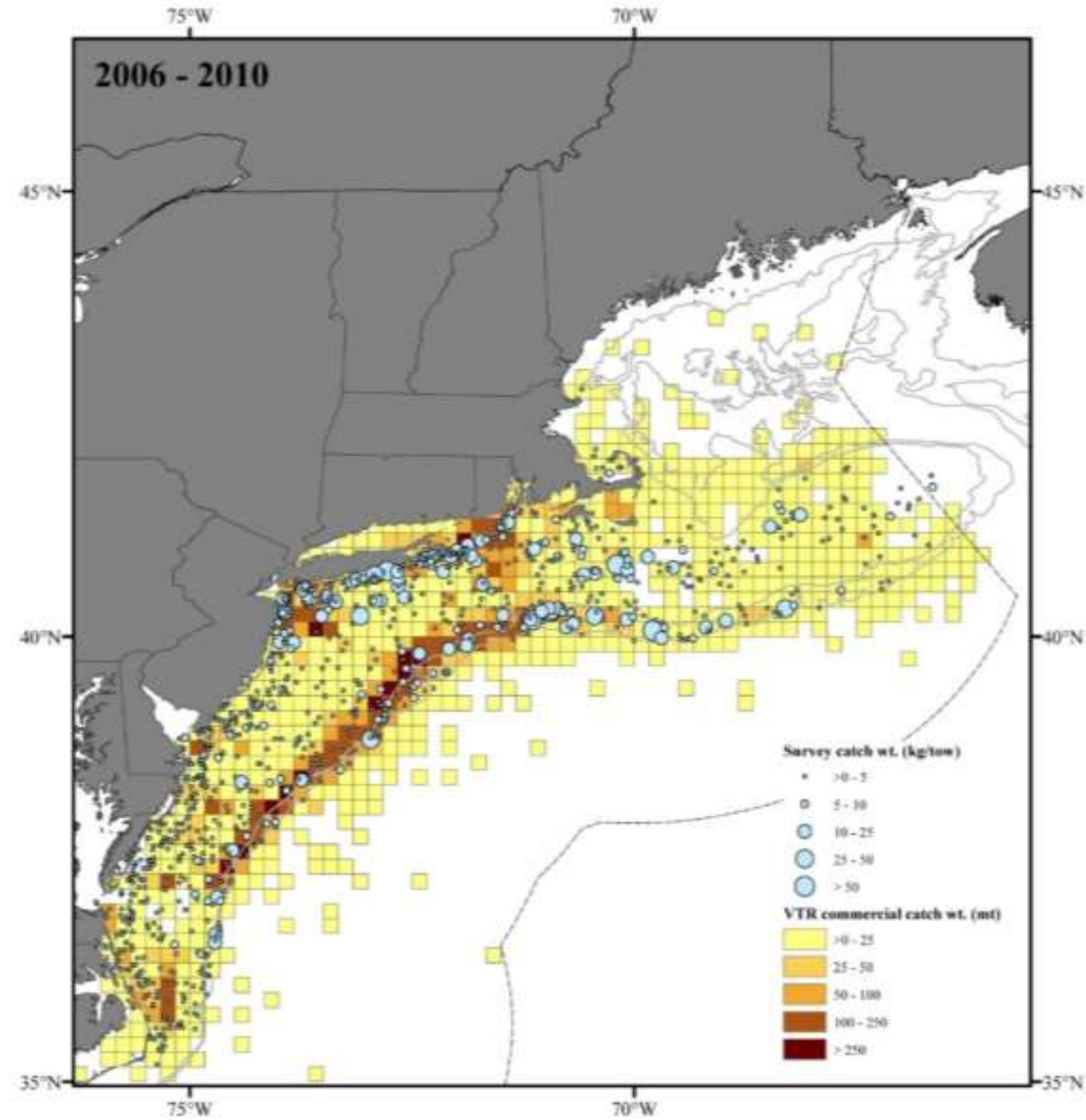


Figure 33: Spatial overlap of NEFSC trawl survey (spring and fall combined) catches (kg/tow) and commercial VTR-reported catch weight (landings and discards) binned to ten minute squares from, 2006-2010. Source: NEFSC 2013.

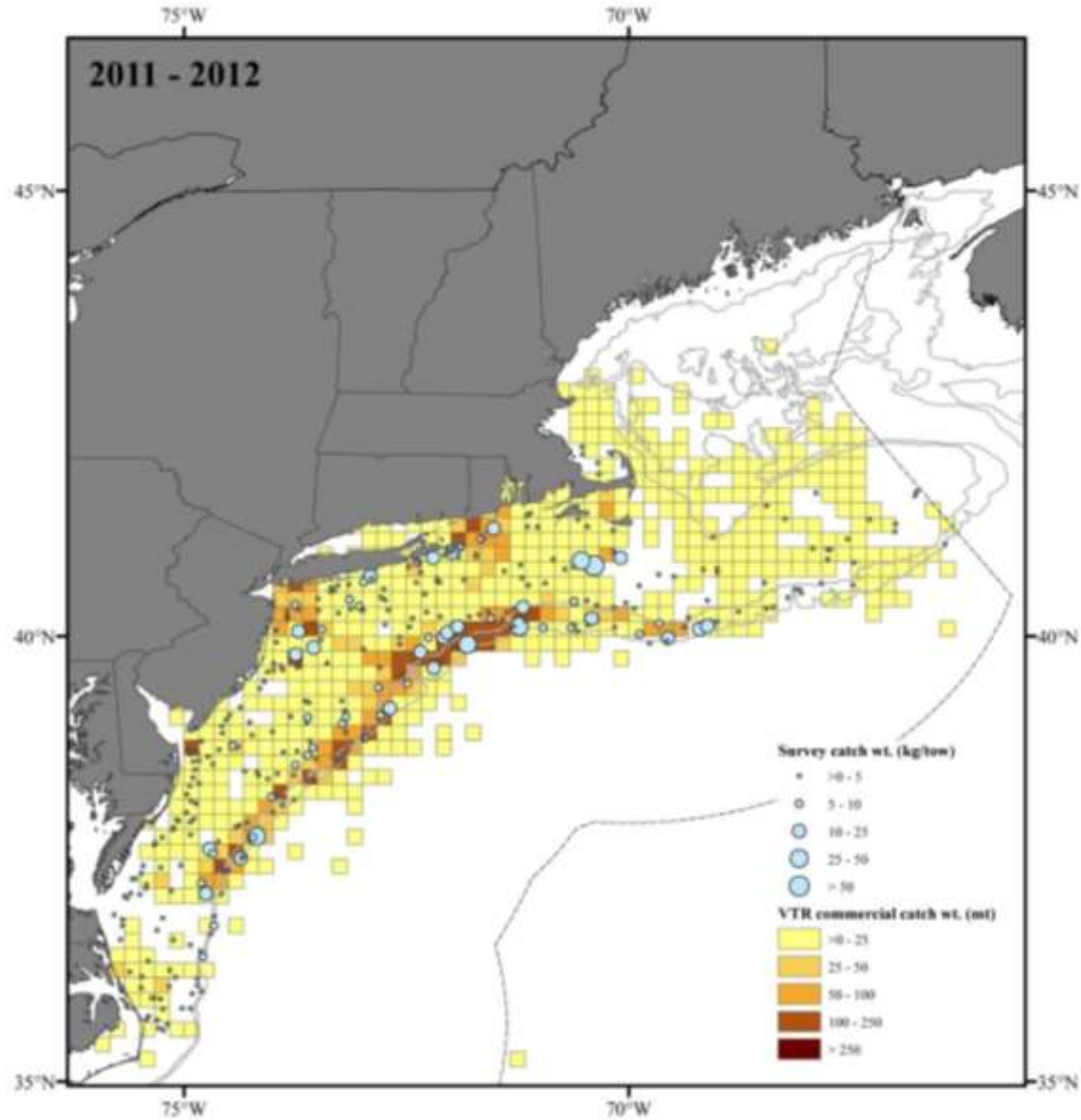


Figure 34: Spatial overlap of NEFSC trawl survey (spring and fall combined) catches (kg/tow) and commercial VTR-reported catch weight (landings and discards) binned to ten minute squares from, 2011-2012. Source: NEFSC 2013.

6.5.1.2.3 Seasonal Characteristics of the Commercial Fishery

As a percentage of coastwide harvest, more summer flounder is landed commercially in the winter months, particularly January through March (Figure 35). This corresponds with summer flounder being distributed offshore, where they are targeted by larger trawl vessels.

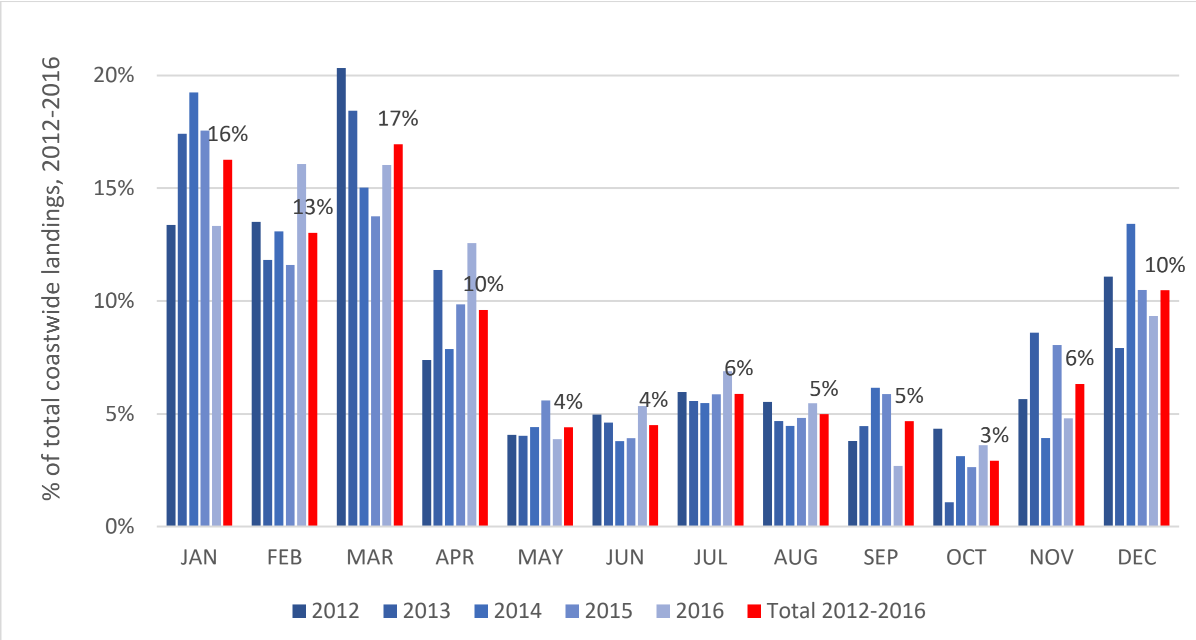


Figure 35: Commercial summer flounder landings by month as a percentage of coastwide harvest, 2012-2016, MA-NC. Total percentages for 2012-2016 are labeled (red bars). Source: NMFS AA tables.

Figure 36 shows that the months of November-April, over 75% of the landings originate from federal waters, as reported on federal VTRs. May, September, and October see a more balanced mix of federal and state waters harvest, while June-August harvest occurs mostly in state waters (Figure 36). There is some seasonal variation in landings by gear type. In the summer, more of the fishery is prosecuted in state waters with smaller vessels using a wider variety of gear types. While bottom trawls are still the dominant gear type in the summer, other gear types, such as hand lines, gill nets, and other gear types are more commonly used compared to the winter fishery (Figure 37). Larger vessels (classified as vessels 51 tons or larger) are dominant in the winter, offshore fishery, while during the spring and early fall, more of a mix of small and larger vessels participate (Figure 38).

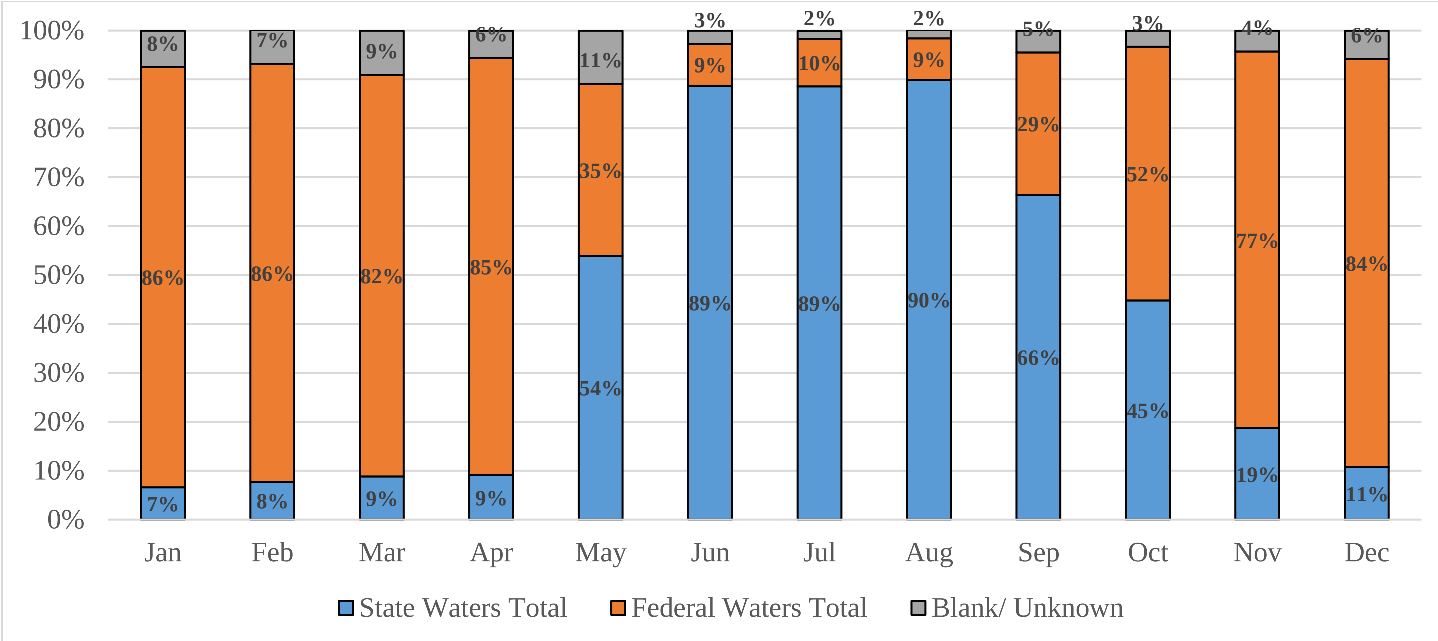
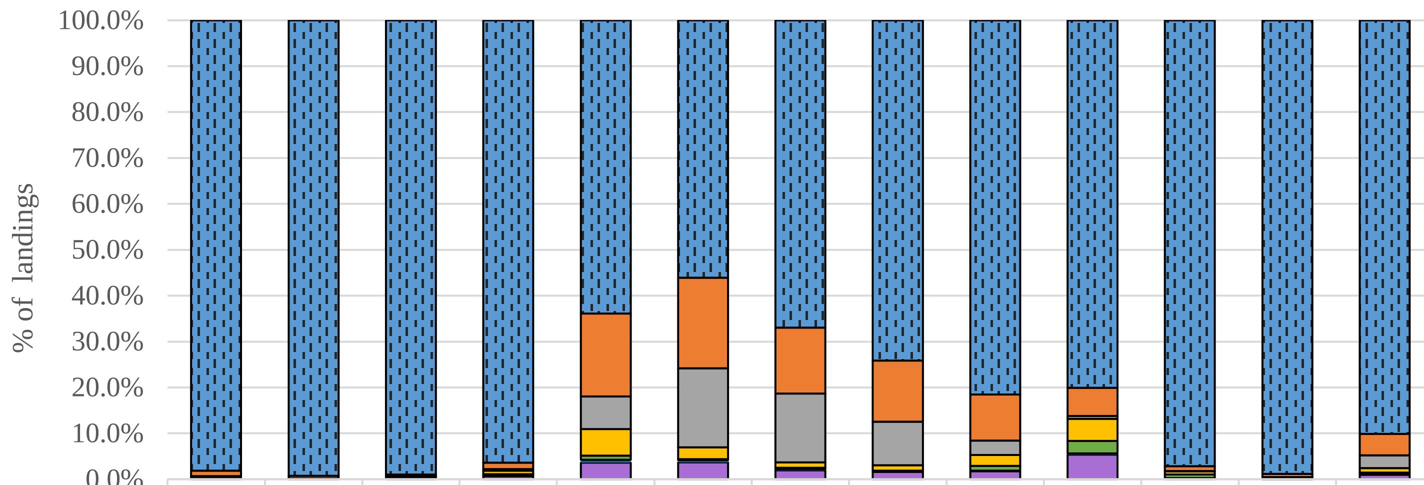
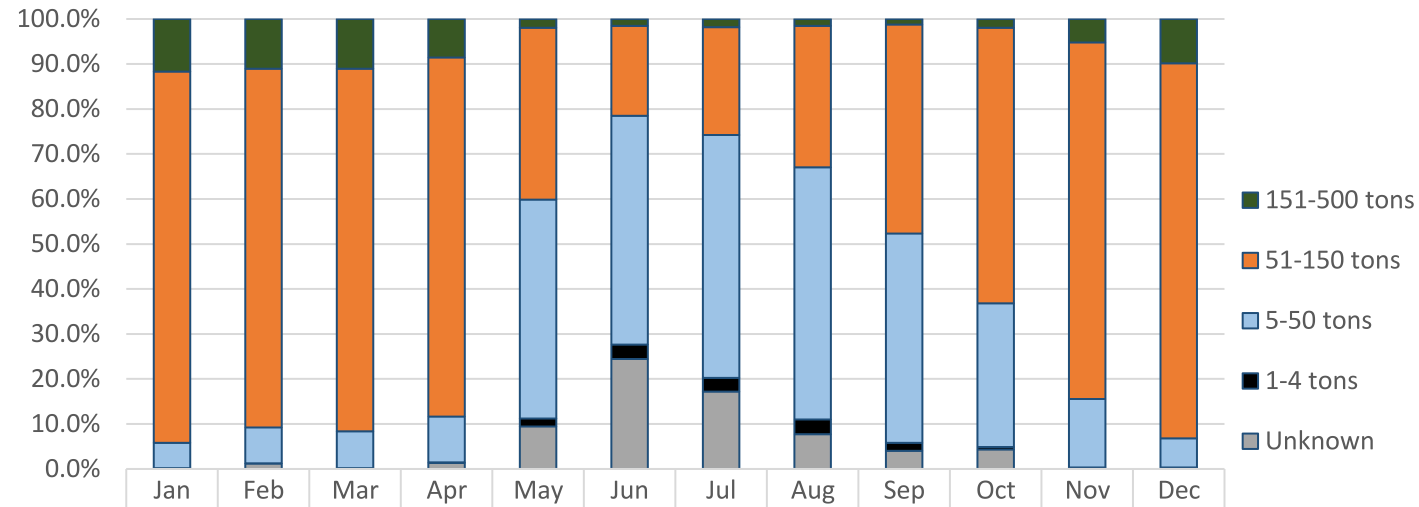


Figure 36: Commercial summer flounder landings by distance from shore by month, as reported on VTRs, 2015-2016, ME-NC. Source: NMFS VTR data as of May 2017.



	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Grand Total
BOTTOM TRAWL	98.2%	99.2%	99.0%	96.4%	63.9%	56.1%	67.0%	74.1%	81.5%	80.0%	97.2%	98.8%	90.1%
UNKNOWN	1.1%	0.6%	0.4%	1.4%	18.1%	19.7%	14.3%	13.4%	10.0%	6.1%	1.0%	0.7%	4.6%
HANDLINE	0.0%	0.0%	0.0%	0.3%	7.1%	17.2%	15.0%	9.4%	3.1%	0.6%	0.1%	0.0%	2.8%
GILLNET	0.2%	0.0%	0.1%	0.8%	5.8%	2.6%	1.2%	1.2%	2.4%	4.8%	0.7%	0.3%	1.0%
SCALLOP DRED	0.2%	0.1%	0.3%	0.4%	0.9%	0.2%	0.3%	0.0%	1.0%	2.7%	0.7%	0.2%	0.4%
POT AND TRAP	0.1%	0.0%	0.0%	0.1%	0.6%	0.5%	0.3%	0.2%	0.2%	0.3%	0.0%	0.0%	0.1%
OTHER	0.2%	0.0%	0.2%	0.6%	3.6%	3.7%	1.9%	1.6%	1.7%	5.3%	0.2%	0.0%	0.9%

Figure 37: Percentage of commercial summer flounder landings in each month by gear type, Massachusetts through North Carolina, 2012-2016. Source: NMFS dealer data (AA tables) as of February 2018.



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
151-500 tons	11.7%	11.1%	11.0%	8.6%	2.0%	1.5%	1.8%	1.5%	1.2%	1.9%	5.2%	9.8%
51-150 tons	82.5%	79.7%	80.6%	79.8%	38.2%	20.0%	23.9%	31.4%	46.5%	61.3%	79.2%	83.3%
5-50 tons	5.7%	7.9%	8.1%	10.2%	48.6%	50.9%	54.0%	56.1%	46.5%	31.9%	15.2%	6.5%
1-4 tons	0.1%	0.1%	0.1%	0.1%	1.8%	3.2%	3.1%	3.3%	1.8%	0.6%	0.2%	0.2%
Unknown	0.0%	1.2%	0.1%	1.3%	9.4%	24.4%	17.2%	7.7%	4.0%	4.3%	0.1%	0.2%

Figure 38: Average percent of commercial summer flounder landings by vessel ton class in each month, 2011-2015. Source: NMFS dealer data.

6.5.1.2.4 Landings by State

Recent Landings by State

Table 37 shows commercial landings of summer flounder by state (in millions of pounds) since the implementation of state-specific quotas in 1993.

As a percentage of coastwide landings, landings by state have generally been stable since allocations were implemented in 1993 (Figure 39). Exceptions can occur under special circumstances, such as 2012-2013 when a high amount of North Carolina landings were landed in Virginia by mutual agreement due to shoaling at Oregon Inlet, NC. Since 1993, state-level allocations have remained constant, and utilization rates have generally been high among all states involved in the summer flounder fishery.

Commercial summer flounder landings from Maine, New Hampshire, and Delaware are not shown in Figure 2 since landings are minimal, if they occur at all. No commercial summer flounder landings have been reported in Maine since 2010. New Hampshire has indicated that they do not allow commercial harvest of summer flounder and that their reported landings (less than 100 pounds in total) were probably misidentified. Delaware landings have consistently been 0.1% or less of coastwide landings each year since 1993 and have averaged less than 0.01% in recent years.

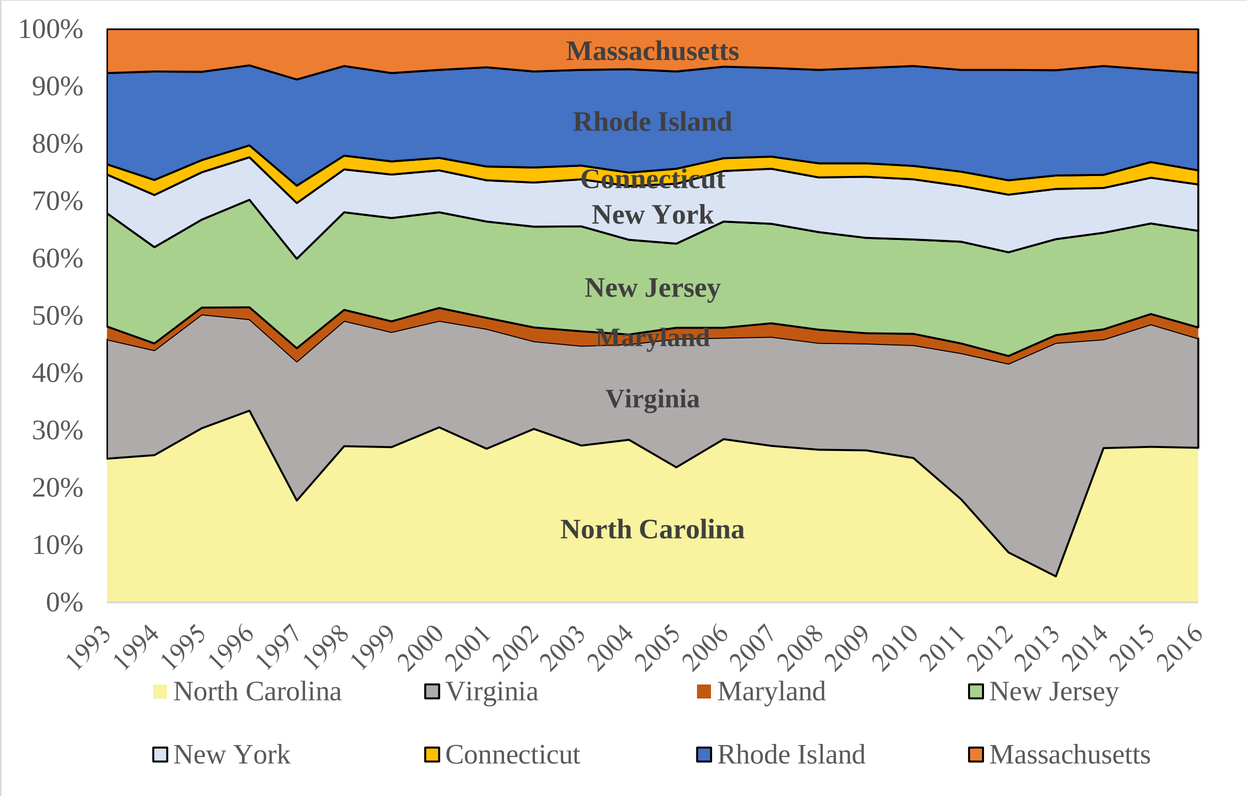


Figure 39: Percentage of coastwide landings by state 1993-2016, Massachusetts through North Carolina (excluding Delaware). Maine, New Hampshire, and Delaware each account for less than 0.1% of landings each year. Maryland and Virginia.

Table 37: Commercial summer flounder landings by state in millions of pounds, 1993-2016. C= confidential. New Hampshire's landings were not provided but are negligible (less than 100 pounds total). The confidentiality status of Delaware's data have not been confirmed. Data source: ACCSP

	ME	MA	RI	CT	NY	NJ	DE	MD	VA	NC	Coast
1993	C	0.954	1.982	0.222	0.844	2.463	C	0.278	2.591	3.121	12.469
1994	C	1.031	2.648	0.371	1.269	2.354	C	0.165	2.559	3.593	13.997
1995	C	1.127	2.320	0.319	1.245	2.319	C	0.175	2.995	4.582	15.092
1996	C	0.800	1.763	0.266	0.936	2.369	C	0.266	2.019	4.227	12.662
1997	C	0.744	1.565	0.257	0.822	1.320	C	0.192	2.055	1.501	8.465
1998	C	0.707	1.712	0.263	0.822	1.863	C	0.211	2.397	2.983	10.973
1999	C	0.812	1.635	0.245	0.801	1.917	C	0.191	2.134	2.869	10.618
2000	C	0.789	1.704	0.245	0.812	1.848	C	0.252	2.063	3.387	11.118
2001	C	0.694	1.799	0.247	0.752	1.745	C	0.197	2.173	2.785	10.422
2002	C	1.009	2.286	0.357	1.053	2.407	C	0.327	2.090	4.129	13.662
2003	-	0.926	2.178	0.317	1.073	2.385	C	0.329	2.269	3.572	13.056
2004	C	1.193	3.085	0.406	1.594	2.831	C	0.284	2.853	4.844	17.098
2005	C	1.274	2.926	0.449	1.804	2.529	C	0.333	3.862	4.064	17.251
2006	C	0.921	2.227	0.317	1.227	2.591	C	0.248	2.469	3.981	13.991
2007	C	0.661	1.516	0.205	0.942	1.698	C	0.229	1.858	2.670	9.787
2008	C	0.646	1.474	0.221	0.860	1.541	C	0.209	1.685	2.407	9.045
2009	C	0.732	1.794	0.251	1.152	1.799	C	0.191	2.012	2.859	10.793
2010	-	0.852	2.289	0.308	1.380	2.166	C	0.261	2.594	3.311	13.163
2011	-	1.132	2.824	0.401	1.537	2.831	C	0.259	4.065	2.854	15.905
2012	-	0.891	2.409	0.315	1.255	2.269	C	0.165	4.123	1.090	12.519
2013	-	0.859	2.193	0.281	1.046	2.004	C	0.164	4.869	0.542	11.959
2014	-	0.696	2.056	0.253	0.846	1.826	C	0.187	2.058	2.912	10.835
2015	-	0.748	1.716	0.287	0.847	1.682	C	0.187	2.275	2.879	10.622
2016	-	0.585	1.306	0.190	0.619	1.297	C	0.144	1.465	2.071	7.680

Table 38 shows the percentages of summer flounder landings by state over a 5-year time period (2012-2016) and a 10-year time period (2007-2016). Note that the percentages for recent years are of the total harvest, not the total quota, so a percentage that is over or under a state's current allocation does not necessarily mean that state was over or under their allocation on average.

Table 38: Percentage of landings within the management unit from each state Maine-North Carolina, 2012-2016 and 2007-2016, and current state-by-state allocations. Source: ACCSP database. Specific poundage amounts not shown due to confidentiality issues with some states.

State	% of landings by state, 5-YR (2012-2016)	% of landings by state, 10-YR (2007-2016)	Current Allocation (1980-1989)
ME	0.00000%	0.00405%	0.04756%
NH	0.00000%	0.00001%	0.00046%
MA	7.05052%	6.95463%	6.82046%
RI	18.04914%	17.44612%	15.68298%
CT	2.48158%	2.42149%	2.25708%
NY	8.45865%	9.23102%	7.64699%
NJ	16.90554%	17.02198%	16.72499%
DE	0.01332%	0.01765%	0.01779%
MD	1.75850%	1.88532%	2.0391%
VA	27.59778%	24.01402%	21.31676%
NC	17.68497%	21.00370%	27.44584%
Total	**100.00%**	**100.00%**	**100.00%**

By Month by State

Table 39 shows commercial summer flounder landings by state and month as a percentage of overall coastwide landings, combined over 2012-2016. Table 40 shows commercial summer flounder landings by month as a percentage of each state's annual landings. Combined, these two tables provide insights into the seasonality of summer flounder commercial harvest by state.

Overall, more summer flounder are landed in the winter compared to the summer fishery; about two thirds of annual commercial summer flounder landings typically occur during the months of December through April (Table 39). Virginia and North Carolina vessels, which currently receive nearly 50% of the coastwide allocation, are much more active in the winter months and have low activity in the months of May-September (Table 40). It follows that as a percentage of coastwide annual landings, the largest percentages come from Virginia and North Carolina during the winter months (Table 39). Rhode Island and New Jersey, which have the next highest allocations, tend to spread their fishing effort more evenly throughout the year. Rhode Island is somewhat more active February-April and New Jersey has higher activity in September-November and January. The northern states of New York through Massachusetts are generally more active in the summer months compared to the southern states of New Jersey and south (Table 39; Table 40).

Table 39: Commercial summer flounder landings by state and month as the percentage of the total coastwide landings, 2012-2016. Note: based on state of landing, not accounting for any quota transfers. Color coding indicates highest percentage (dark green) to lowest percentage (dark red). Source: NMFS dealer data.

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
MA	0.45%	0.44%	0.29%	0.40%	0.12%	1.27%	1.87%	1.48%	0.37%	0.01%	0.08%	0.00%	6.78%
RI	0.37%	2.71%	3.31%	2.23%	1.42%	1.44%	1.43%	1.25%	0.91%	0.65%	1.03%	0.98%	17.73%
CT	0.28%	0.22%	0.29%	0.29%	0.16%	0.26%	0.25%	0.18%	0.09%	0.05%	0.07%	0.25%	2.40%
NY	0.53%	0.88%	0.53%	0.33%	1.11%	0.76%	0.87%	0.96%	0.76%	0.26%	0.14%	0.27%	7.40%
NJ	4.02%	0.95%	1.19%	0.30%	0.78%	0.65%	1.28%	0.79%	2.39%	1.57%	2.16%	0.68%	16.77%
DE	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%
MD	0.04%	0.04%	0.19%	0.24%	0.10%	0.04%	0.05%	0.23%	0.07%	0.14%	0.08%	0.29%	1.49%
VA	4.63%	2.70%	9.32%	4.96%	0.21%	0.05%	0.13%	0.03%	0.03%	0.17%	2.57%	4.90%	29.69%
NC	5.96%	5.10%	1.84%	0.85%	0.49%	0.02%	0.01%	0.04%	0.05%	0.07%	0.21%	3.09%	17.73%
Total	**16.27%**	**13.03%**	**16.95%**	**9.60%**	**4.40%**	**4.50%**	**5.89%**	**4.98%**	**4.66%**	**2.92%**	**6.32%**	**10.47%**	**100%**

Table 40: Commercial summer flounder landings by state and month as the percentage of each state's total landings, 2012-2016. Note: based on state of landing, not accounting for any quota transfers. Color coding indicates highest percentage (dark green) to lowest percentage (dark red). Source: NMFS dealer data.

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
MA	6.59%	6.43%	4.30%	5.94%	1.71%	18.80%	27.60%	21.84%	5.49%	0.11%	1.13%	0.06%	100%
RI	2.06%	15.30%	18.67%	12.59%	8.02%	8.14%	8.07%	7.07%	5.11%	3.65%	5.78%	5.53%	100%
CT	11.69%	9.36%	11.90%	12.05%	6.86%	10.69%	10.52%	7.58%	3.74%	2.08%	3.08%	10.45%	100%
NY	7.15%	11.87%	7.13%	4.46%	15.03%	10.22%	11.71%	13.04%	10.28%	3.57%	1.83%	3.71%	100%
NJ	23.97%	5.65%	7.10%	1.77%	4.66%	3.90%	7.63%	4.71%	14.28%	9.36%	12.90%	4.07%	100%
DE	0.00%	0.00%	2.16%	15.27%	24.51%	7.13%	14.26%	27.88%	8.21%	0.27%	0.14%	0.18%	100%
MD	2.70%	2.40%	12.79%	15.93%	6.60%	2.50%	3.05%	15.60%	4.43%	9.30%	5.16%	19.54%	100%
VA	15.59%	9.10%	31.38%	16.70%	0.71%	0.17%	0.44%	0.11%	0.09%	0.59%	8.64%	16.49%	100%
NC	33.61%	28.76%	10.37%	4.81%	2.79%	0.13%	0.08%	0.24%	0.26%	0.37%	1.17%	17.41%	100%
Coast	**16.27%**	**13.03%**	**16.95%**	**9.60%**	**4.40%**	**4.50%**	**5.89%**	**4.98%**	**4.66%**	**2.92%**	**6.32%**	**10.47%**	100%

By Area by State

Figure 40 shows summer flounder commercial landings by distance from shore by state (i.e., state vs. federal waters) for 2015-2016, as reported on federal VTRs. This data indicate that some states prosecute their fishery primarily in federal waters/offshore (i.e., Virginia and North Carolina), while other states have substantial landings originating from both state and federal waters. Note that Delaware landings are incidental; Delaware does not have a directed fishery for summer flounder (meaning their vessels are not targeting summer flounder and all landings are incidental). The percentage of landings originating from state waters may in reality be higher than portrayed here, as this dataset does not include state-only permitted vessels fishing only in state waters.

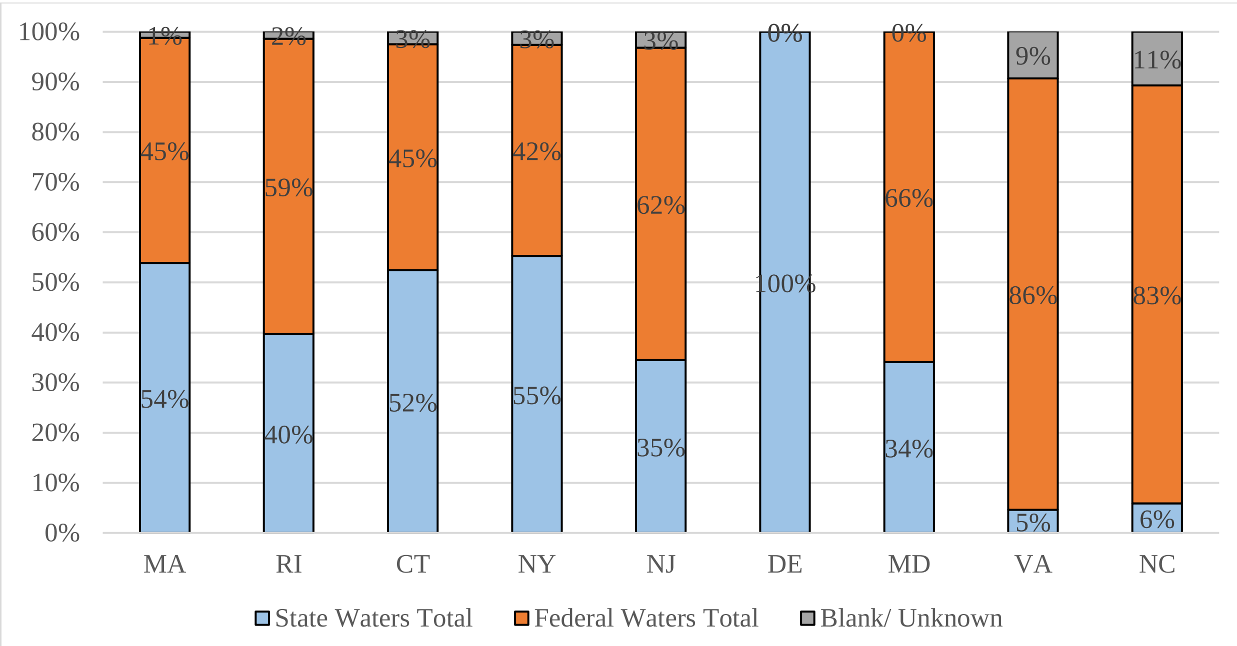
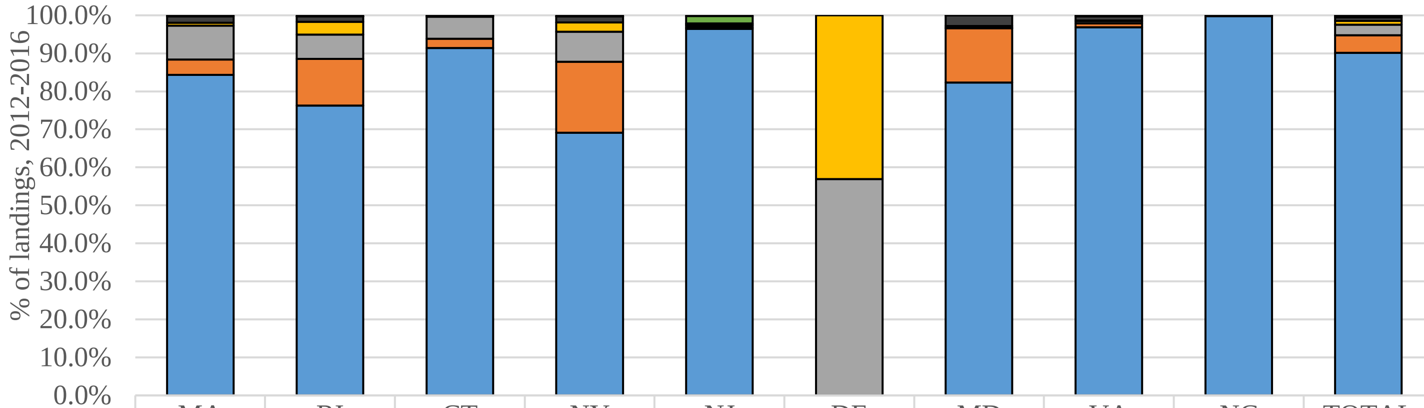


Figure 40: Commercial summer flounder landings by distance from shore by state, as reported on VTRs, 2015-2016. Source: NMFS VTR data as of May 2017. Note: does not include state-level-only VTR data.

By Gear Type by State

Figure 41 shows recent percentages of landings by gear type in each state according to dealer data merged with VTR information (AA tables), illustrating that landings in most states originate overwhelmingly from bottom trawl gear, especially the states of New Jersey, Virginia, and North Carolina, which are all over 95% trawl gear. Several states have a substantial amount of "unknown" gear type landings in the dealer data, indicating that data quality of the gear type variable in dealer data varies by state and may not be reliable in each state within the management unit. However, completing this analysis with VTR data would not include state-only permitted vessel landings.



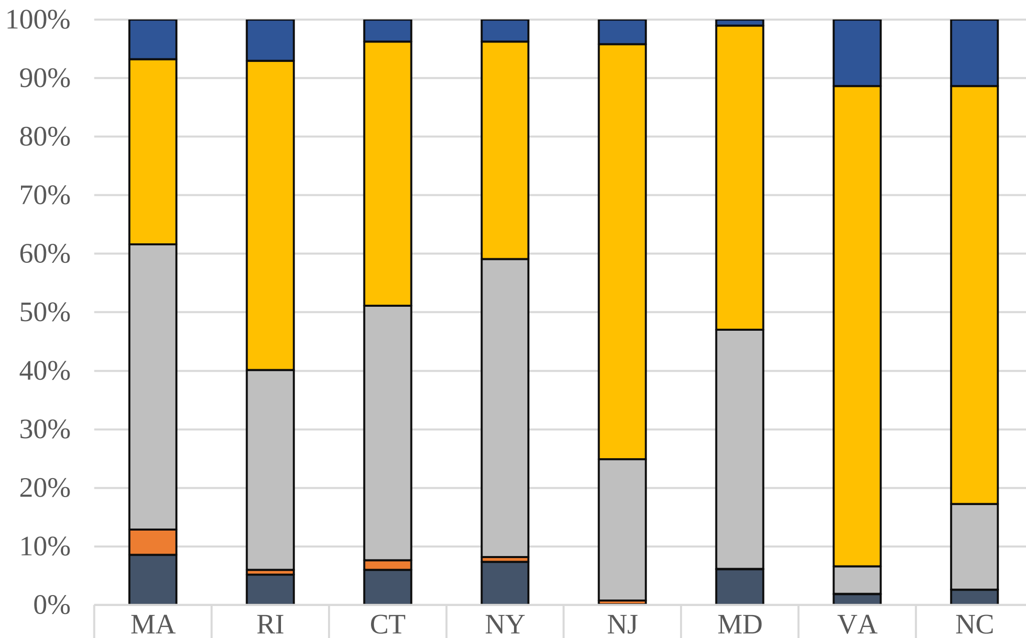
	MA	RI	CT	NY	NJ	DE	MD	VA	NC	TOTAL
POT AND TRAP	0.1%	0.3%	0.0%	0.2%	0.2%	0.0%	0.0%	0.1%	0.0%	0.1%
SCALLOP DREDGE	0.2%	0.0%	0.1%	0.0%	1.9%	0.0%	0.0%	0.2%	0.1%	0.4%
OTHER	1.7%	1.4%	0.1%	1.7%	0.3%	0.0%	2.8%	1.1%	0.1%	0.9%
GILLNET	0.7%	3.4%	0.2%	2.4%	0.3%	43.1%	0.6%	0.2%	0.0%	1.0%
HANDLINE	8.9%	6.3%	5.8%	7.9%	0.5%	56.9%	0.0%	0.6%	0.0%	2.8%
UNKNOWN	4.1%	12.3%	2.4%	18.7%	0.3%	0.0%	14.3%	1.0%	0.0%	4.6%
BOTTOM TRAWL	84.3%	76.3%	91.4%	69.1%	96.5%	0.0%	82.3%	96.8%	99.8%	90.1%

Figure 41: Percentage of commercial summer flounder landings in each state by gear type, Massachusetts through North Carolina, 2012-2016. Source: NMFS dealer data (AA tables) as of February 2018.

By Vessel Size by State

By Vessel Size by State

Figure 42 shows recent percentages of landings by vessel tonnage class in each state. The predominant size tonnage class for vessels landing in North Carolina and Virginia, the states with the highest quota allocations, is 51-150 tons. Relative to other states, Virginia and North Carolina also have a higher percentage of vessels in the largest tonnage class for summer flounder, 151-500 tons, making up about 11% of each of their fleets. The 51-150 ton class is the most common vessel size class for vessels landing in Rhode Island, Connecticut, New Jersey, and Maryland. The most common vessel size class for vessels landing in Massachusetts and New York is 5-50 tons. Vessels >150 tons and <5 tons represent a relatively small component of landings in all states active in the summer flounder fishery (Figure 42).



	MA	RI	CT	NY	NJ	MD	VA	NC
151-500 tons	6.7%	7.1%	3.8%	3.8%	4.2%	1.0%	11.3%	11.3%
51-150 tons	31.6%	52.8%	45.1%	37.1%	70.9%	51.9%	82.1%	71.4%
5-50 tons	48.7%	34.1%	43.5%	50.9%	24.1%	40.9%	4.7%	14.7%
1-4 tons	4.3%	0.8%	1.7%	0.8%	0.7%	0.0%	0.1%	0.0%
Unknown	8.6%	5.2%	6.0%	7.3%	0.1%	6.1%	1.8%	2.6%

Figure 42: Percent of summer flounder landings by state by vessel tonnage class, 2007-2016.

6.5.1.3 Recreational Fishery

There is a significant recreational fishery for summer flounder, primarily in state waters when the fish migrate inshore during the warm summer months. Summer flounder have historically been highly sought by sport fishermen, especially in New York and New Jersey waters. Characteristics of the recreational fishery are summarized in the sections below. Because this action does not directly impact the recreational fishery for summer flounder, only a brief summary is provided here.

NMFS has conducted recreational fishing surveys since 1979 to obtain estimates of participation, effort, and catch by recreational anglers in marine waters. Recreational data for years 2004 and later are available from the Marine Recreational Information Program (MRIP). For years prior to 2004, recreational data were generated by the Marine Recreational Fishery Statistics Survey (MRFSS). Note that the MRIP program has recently undergone major changes in its collection of effort data,[26] as well as changes to its angler intercept methods for private boat and shore anglers.[27] As such, major changes to the time series of recreational catch and landings were released in July 2018. These changes have not yet been incorporated into the stock assessment or otherwise used for management; therefore, pre-revision data is used in the summary of the recreational fishery below.

Recreational catch and landings for summer flounder peaked in 1983 with 32.11 million fish caught and 21.00 million fish landed. Catch reached a low in 1989 with 2.69 million fish caught, while landings reached a low in 2017 with 1.03 million fish landed (Table 41).

MRIP data indicate that on average, about 82% of recreational summer flounder landings (in number of fish) in the past ten years (2008-2017) were caught by anglers fishing on private or rental boats, about 13% from anglers aboard party or charter boats, and 5% from shore (Figure 43). For-hire vessels carrying passengers in federal waters must obtain a federal party/charter permit. In 2016, there were 763 party and charter vessels that held summer flounder federal for-hire permits. Many of these vessels also hold recreational permits for scup and black sea bass.

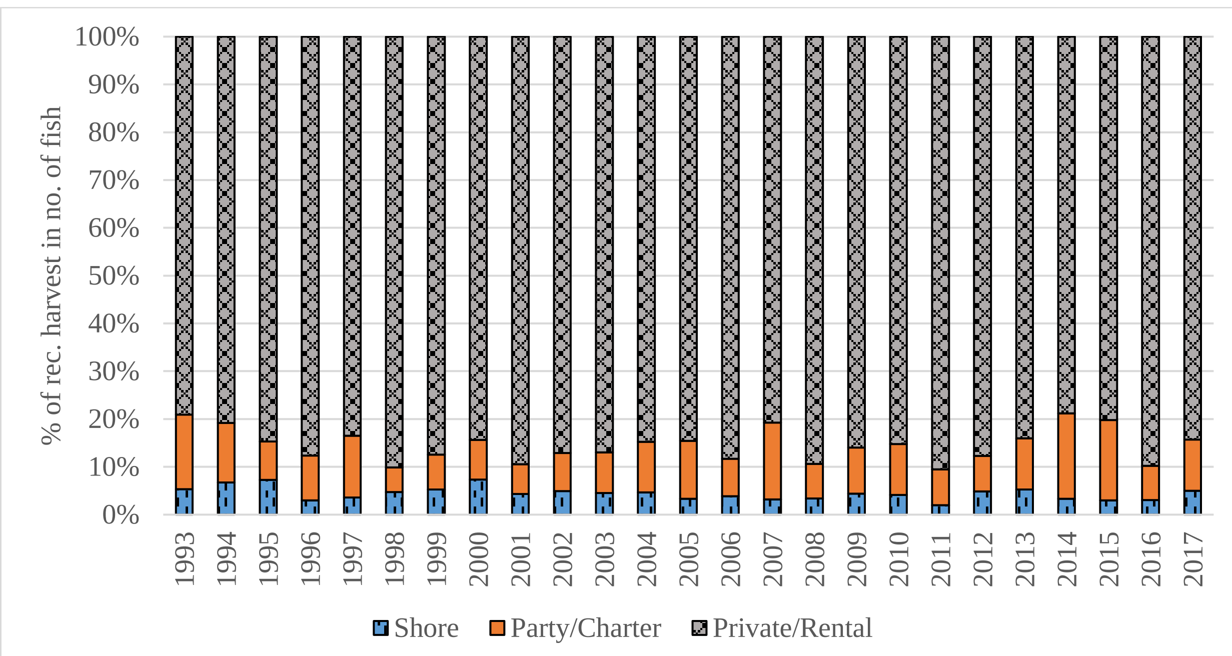


Figure 43: The percent of summer flounder harvested by recreational fishing mode, Maine through North Carolina, 1993-2017.

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[26] See https://www.fisheries.noaa.gov/recreational-fishing-data/effort-survey-improvements

[27] See https://www.fisheries.noaa.gov/event/access-point-angler-intercept-survey-calibration-workshop

Table 41: Recreational summer flounder landings, catch, mean weight of landed fish, and percent discarded, from the NMFS recreational statistics databases, Maine through North Carolina, 1981-2017.

Year	Catch (number of fish)	Landings (number of fish)	Landings (pounds)	Mean weight of landed fish (lb)	% Discarded
1981	13,578,784	9,566,574	10,081,009	1.05	30%
1982	23,562,020	15,472,700	18,233,138	1.18	34%
1983	32,062,267	20,996,307	27,969,296	1.33	35%
1984	29,784,927	17,475,171	18,764,678	1.07	41%
1985	13,525,921	11,066,191	12,489,684	1.13	18%
1986	25,292,462	11,620,861	17,861,284	1.54	54%
1987	21,023,452	7,864,762	12,167,243	1.55	63%
1988	17,170,738	9,959,659	14,624,189	1.47	42%
1989	2,676,591	1,716,765	3,158,026	1.84	36%
1990	9,100,825	3,793,585	5,134,330	1.35	58%
1991	16,074,809	6,067,651	7,959,828	1.31	62%
1992	11,909,554	5,002,106	7,147,691	1.43	58%
1993	22,904,142	6,494,041	8,830,916	1.36	72%
1994	17,725,048	6,702,691	9,327,506	1.39	62%
1995	16,307,629	3,325,714	5,421,094	1.63	80%
1996	18,994,405	6,996,985	9,820,336	1.40	63%
1997	20,027,081	7,166,820	11,865,867	1.66	64%
1998	22,085,841	6,979,095	12,476,561	1.79	68%
1999	21,377,718	4,106,995	8,366,202	2.04	81%
2000	25,384,426	7,801,074	16,467,529	2.11	69%
2001	28,187,215	5,293,611	11,636,796	2.20	81%
2002	16,674,286	3,262,159	8,008,107	2.45	80%
2003	20,531,904	4,558,670	11,638,493	2.55	78%
2004	20,336,209	4,316,498	11,021,884	2.55	79%
2005	25,805,581	4,027,466	10,915,335	2.71	84%
2006	21,400,010	3,950,283	10,504,639	2.66	82%
2007	20,731,500	3,107,578	9,336,713	3.00	85%
2008	22,896,846	2,349,873	8,150,661	3.47	90%
2009	24,085,181	1,806,178	6,030,381	3.34	93%
2010	23,721,585	1,501,467	5,108,358	3.40	94%
2011	21,558,699	1,839,876	5,955,714	3.24	91%
2012	16,528,455	2,272,221	6,489,806	2.86	86%
2013	16,105,140	2,521,366	7,355,057	2.92	84%
2014	18,969,451	2,458,003	7,389,014	3.01	87%
2015	12,152,658	1,621,480	4,721,147	2.91	87%
2016	14,170,750	2,027,770	6,182,405	3.05	86%
2017	8,441,805	1,028,483	3,188,669	3.10	88%

On average, an estimated 86 percent of the landings (in numbers of fish) occurred in state waters over the past ten years (Figure 44). By state, the majority of summer flounder are typically landed in New York and New Jersey (Table 42).

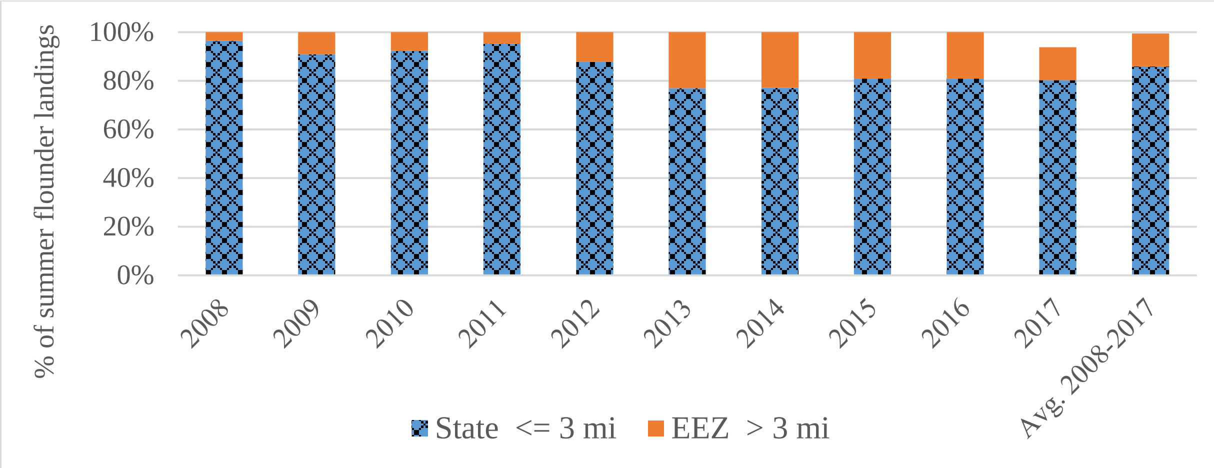

Figure 44: Estimated percentage of summer flounder recreational landings in state vs. federal waters, Maine through North Carolina, 2008-2017.

Table 42: State contribution (as a percentage) to total recreational landings of summer flounder (in numbers of fish), from Maine through North Carolina, 2015-2017.[6]

State	2015	2016	2017	Avg 2015-2017
Maine	0.0%	0.0%	0.0%	0.0%
New Hampshire	0.0%	0.0%	0.0%	0.0%
Massachusetts	4.9%	2.7%	2.6%	3.4%
Rhode Island	10.1%	4.3%	6.1%	6.8%
Connecticut	5.7%	10.7%	8.5%	8.3%
New York	30.3%	35.1%	21.5%	29.0%
New Jersey	30.7%	37.2%	43.9%	37.3%
Delaware	3.2%	4.4%	3.3%	3.6%
Maryland	2.7%	1.1%	2.5%	2.1%
Virginia	9.8%	3.5%	9.0%	7.4%
North Carolina	2.5%	0.9%	2.5%	2.1%
Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**

6.5.2 Socioeconomic Characteristics and Participation in the Commercial Fishery

Additional information is provided in this section on the socioeconomic characteristics of the fishery, given the focus of this proposed action on management changes that would impact these characteristics.

6.5.2.1 Value and Revenue

For the years 1994 through 2016, NMFS dealer data indicate that summer flounder total ex-vessel revenue (adjusted to 2016 dollars to account for inflation) from Maine to North Carolina ranged from a low of $21.30 million in 1996 to a high of $34.80 million in 2004. The adjusted mean price per pound for summer flounder ranged from a low of $1.74 in 2011 ($1.84 in 2011 dollars) to a high of $3.64 in 2016. In 2016, 7.71 million pounds of summer flounder were landed generating $27.35 million in total ex-vessel revenue (an average of $3.64 per pound; Figure 45). Figure 46 shows average ex-vessel price per pound by month for 2012-2016, and Figure 47 shows ex-vessel revenue by state over the same time period.

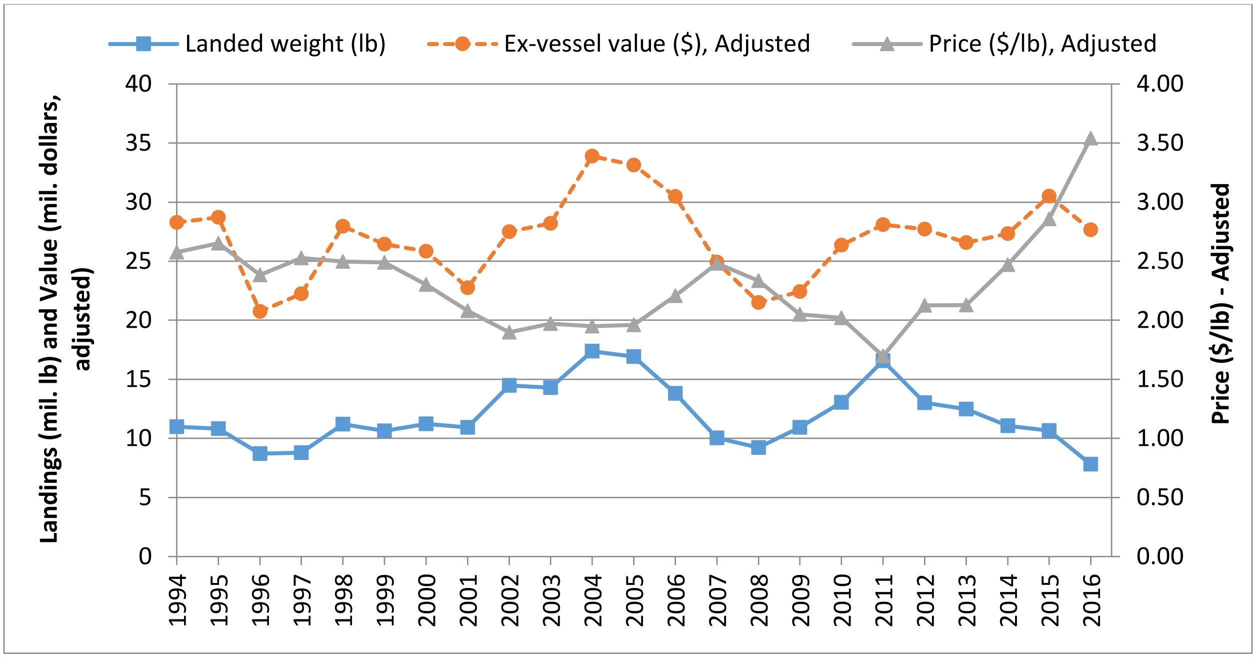

Figure 45: Landings, ex-vessel value, and price per pound for summer flounder, Maine through North Carolina, 1994-2016. Ex-vessel value and price are adjusted to real 2016 dollars.

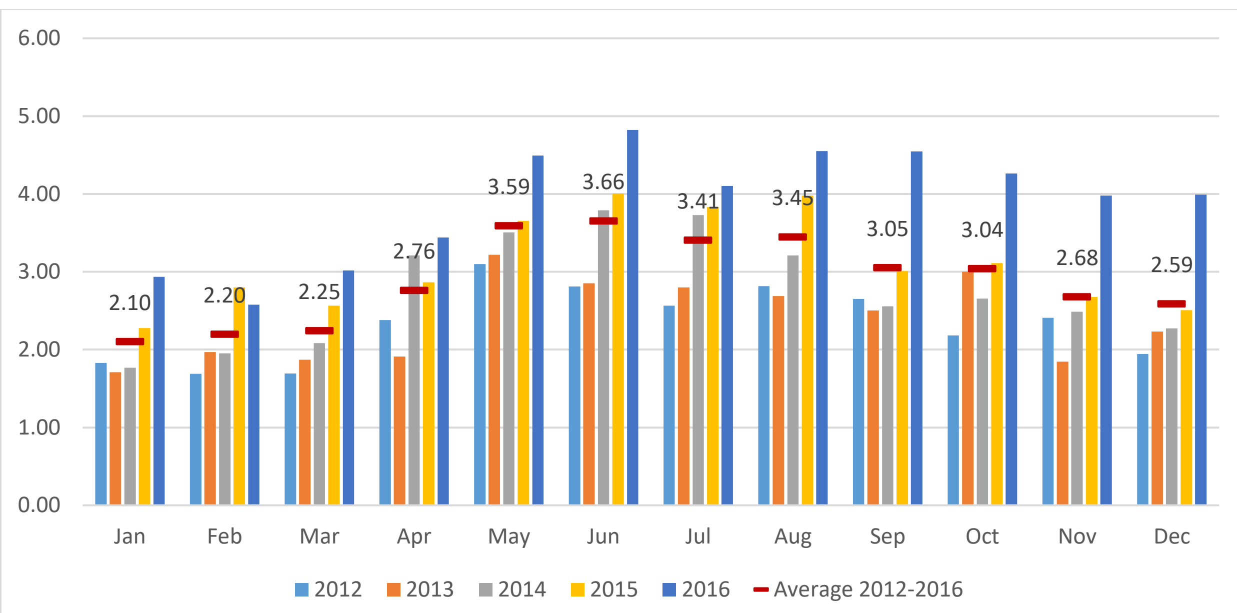

Figure 46: Average ex-vessel price per pounds ($; adjusted to 2016 US dollars) for summer flounder by month, with monthly average (red line) labeled, 2012-2016.

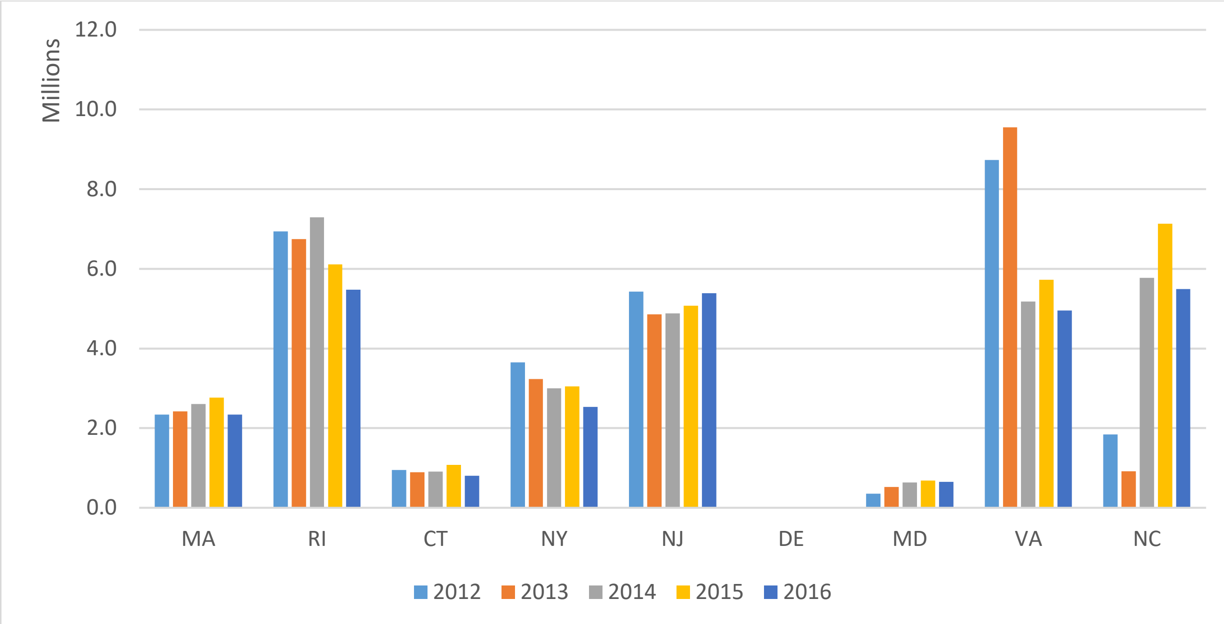

Figure 47: Total ex-vessel revenue (adjusted to 2016 US dollars) for summer flounder landings by state and year, 2012-2016. Source: NMFS dealer data as of May 2017.

6.5.2.2 Ports and Communities

This amendment will impact communities and ports throughout the coastal northeast and mid-Atlantic. A "fishing community" is defined in the MSA as "a community which is substantially dependent on or substantially engaged in the harvesting or processing of fishery resources to meet social and economic needs, and includes fishing vessel owners, operators, and crew and United States fish processors that are based in such community (16 U.S.C. § 1802(17)).

Table 43 describes the top commercial ports for summer flounder landings from 2007-2016, including all ports accounting for at least 1% of the total ex-vessel revenue for summer flounder reported by commercial dealers over this ten-year time period. Together, these 17 ports accounted for over 80% of the summer flounder ex-vessel value during this time period. The top five ports for summer flounder include Point Judith, RI; Hampton, VA; Newport News, VA; Pt. Pleasant, NJ; and Montauk, NY (Table 43).

A characterization of the major commercial ports for summer flounder is provided in **APPENDIX C.**

Table 43: Top ports for commercial summer flounder landings 2007-2016; showing ports landing >1% of total summer flounder ex-vessel revenue 2007-2016. Source: NMFS dealer data as of May 2017.

PORT	Landings (lb), 2007-2016	% of total landings, 2007-2016	Avg. lb per year (2007-2016)	Value ($; unadjusted), 2007-2016	% of total value ($; unadjusted), 2007-2016	Avg. $ per year (2007-2016)
POINT JUDITH, RI	16,542,993	14.40%	1,654,299	48,815,097	17.96%	4,881,510
HAMPTON, VA	11,361,504	9.89%	1,136,150	21,625,623	7.96%	2,162,562
NEWPORT NEWS, VA	11,399,574	9.92%	1,139,957	20,753,942	7.64%	2,075,394
PT. PLEASANT, NJ	8,075,938	7.03%	807,594	19,853,161	7.31%	1,985,316
MONTAUK, NY	4,897,173	4.26%	489,717	16,457,629	6.06%	1,645,763
BEAUFORT, NC	6,476,496	5.64%	647,650	13,858,843	5.10%	1,385,884
WANCHESE, NC	6,954,845	6.05%	695,485	12,387,082	4.56%	1,238,708
BELFORD, NJ	4,119,069	3.59%	411,907	11,773,253	4.33%	1,177,325
CHINCOTEAGUE, VA	5,511,316	4.80%	551,132	9,866,785	3.63%	986,679
CAPE MAY, NJ	4,976,111	4.33%	497,611	9,673,034	3.56%	967,303
NEW BEDFORD, MA	3,644,411	3.17%	364,441	9,624,704	3.54%	962,470
ENGELHARD, NC	3,873,479	3.37%	387,348	7,252,482	2.67%	725,248
STONINGTON, CT	2,029,304	1.77%	202,930	6,251,765	2.30%	625,177
ORIENTAL, NC	3,369,336	2.93%	336,934	6,038,194	2.22%	603,819
HAMPTON BAYS, NY	1,973,522	1.72%	197,352	5,571,142	2.05%	557,114
OCEAN CITY, MD	1,678,651	1.46%	167,865	4,268,405	1.57%	426,841
LONGBEACH/ BARNEGAT LIGHT, NJ	1,415,733	1.23%	141,573	3,825,376	1.41%	382,538
TOP PORTS SUM	**98,299,455**	**85.58%**	**9,829,946**	**227,896,517**	**83.86%**	**22,789,652**

6.5.2.3 Commercial Dealers

Over 200 federally permitted dealers from Maine through North Carolina bought summer flounder in 2016. More dealers bought summer flounder in New York than in any other state (Table 44). All dealers combined bought approximately $27.65 million worth of summer flounder in 2016. Figure 48 shows trends in the number of unique federally permitted dealers buying summer flounder from vessels in each state between 2012-2016.

Table 44: Dealers reporting buying summer flounder, by state in 2016. C=Confidential.

State	ME	NH	MA	RI	CT	NY	NJ	DE	MD	VA	NC
Number Of Dealers	0	0	32	33	13	48	30	C	7	16	29

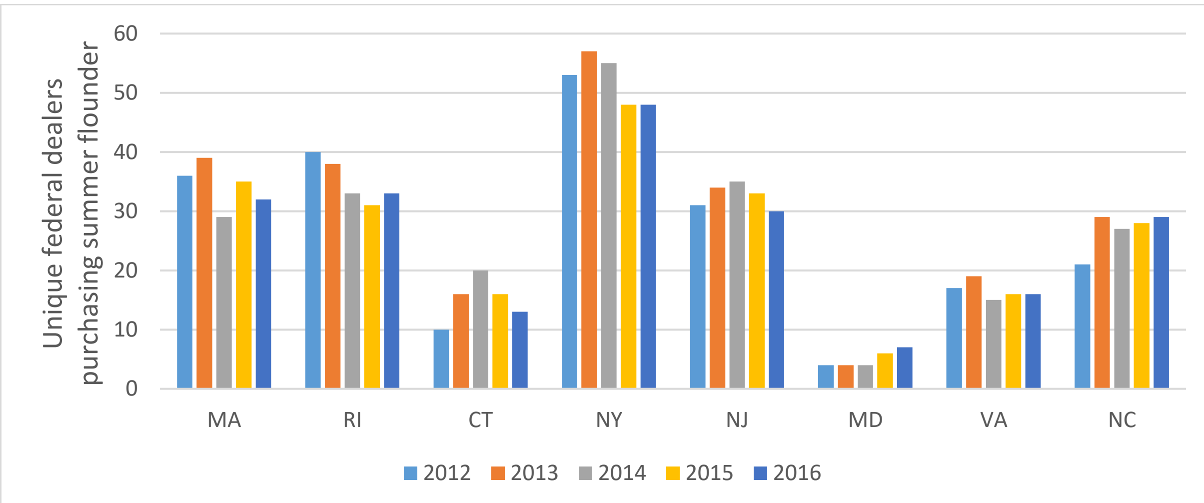

Figure 48: Number of unique federal dealers purchasing summer flounder from commercial vessels, by state and year, 2011-2015. Maine, New Hampshire, and Delaware data are confidential and cannot be displayed. Source: NMFS dealer data as of February 2017.

6.5.2.4 Federal Commercial Moratorium Permits

This section describes the current requirements and status of federal commercial moratorium permits for summer flounder. State level permits are not addressed in this action, however, state permit requirements are provided in **APPENDIX A**.

There is a single limited access federal permit category for the summer flounder commercial fishery: summer flounder moratorium permits. There are no commercial open access permits or incidental catch permits for summer flounder. The original qualification criteria and continued eligibility conditions are described in section 5.1.1.

Permit data indicate that 766 federal commercial permits for summer flounder were issued in 2017.[28] In total, there are 940 Moratorium Rights IDs for summer flounder, meaning that 940 is the total number of federal summer flounder moratorium permits that could ever be held from this point forward, based on the qualifying criteria in the FMP. Of those, 208 permits are in CPH as of

[28] Source: Dealer data pulled on January 31, 2017.

May 2018. Additional federal permit information was provided by GARFO in May 2018 (Table 45).

Table 45: Federal summer flounder moratorium permit characterization as of May 2018. Data sources: Commercial Fisheries Dealer Reports, GARFO permit database, and the GARFO Moratorium Rights Qualification System (MQRS) database accessed on 05/29/2018.

Summer Flounder Moratorium Rights as of May 2018	Permits	Comments/Explanation
Inactive status (Confirmation of permit history or history retention)	208	These permits have been removed from a vessel.
Active status	732	These permits are eligible to be issued.
Total moratorium rights IDs	940	The current number of federal summer flounder moratorium permits that could be held at a given time, based on the qualifying criteria in the FMP[a]
Summer Flounder Federal Permits (Permit Database)- Permit year 2017 (May 1, 2017 to April 30, 2018)		
Summer Flounder Commercial Moratorium Permits **Issued** in 2017	766	This is the number of commercial permits that were **issued** in permit year 2017. Some of these would have been duplicates (i.e., a replacement vessel) or some would have been taken out of History Retention and put on a vessel. Not all of these permits had associated landings in 2017.
Commercial Fisheries Dealer Database Permit/Hull number Counts - Calendar year 2017 (Permit years 2016 and/or 2017)		
Federal summer flounder limited access commercial permitted vessels **with dealer-reported summer flounder landings in calendar year 2017**	332	These vessels reported commercial summer flounder landings in calendar year 2017.
Number of federal summer flounder charter/party (open access) permitted vessels with dealer-reported commercial summer flounder landings in calendar year 2017	45	These are vessels that have a Federal charter/party permit AND a state commercial license, selling to a federally permitted commercial dealer.
Number of **distinct vessels** (as identified by dealer-reported hull number) with dealer-reported summer flounder landings in calendar year 2017	1,124	Includes both federally-permitted and state-only permitted vessels.

[a] This number has decreased over time due to some vessels not renewing their permits and not being in CPH.

6.5.2.5 *State Permit Activity*

While this action does not impact state level permits, state permits are required in the state of landing for any federally permitted vessels, so a general characterization of the number of active state permits can help provide a sense of the level of participation in the fishery in each state. The precise number of active vessels and/or fishermen in any given state can be difficult to determine.

State permit information for the past five years was compiled by Commission staff and the Atlantic Coastal Cooperative Statistics Program (ACCSP) and is shown in Table 46. States were asked to provide the number of "active" permits over the past five years, meaning there were summer flounder landings associated with that permit over the last five years. The exact method of pulling "active" permits was not necessarily consistent among states. Note that some states permit a vessel, while some states permit an individual. State permit data was provided by state marine fisheries agencies to Commission staff, and is provided along with ACCSP database information for known fishermen with summer flounder landings in each year 2012-2016.

Table 46: ACCSP summer flounder state commercial permit summary; 2012-2016. Delaware and Maine not provided for confidentiality reasons.

	State Provided Permits[a]		Number of Known Fishermen in ACCSP Summer Flounder Landings[e]				
State	**Total Count**	**Active Count[b]**	**2016**	**2015**	**2014**	**2013**	**2012**
MA	699	274	210	226	203	230	265
RI	1192	546	522	482	486	538	540
CT	N/A	N/A	67	70	68	64	62
NY[c]	491	416	191	199	222	225	234
NJ	177	89	68	61	68	60	51
MD	N/A	N/A	26	27	45	43	47
VA	175	175	114	117	160	47	58
NC[d]	166	138	251	201	222	191	186

[a] "State-provided permits" indicates counts of total and active state commercial summer flounder permits that were provided to Commission staff by individual states. Maryland and Connecticut data had not been provided at time of this report. [b] Provided by individual states; methods may not be consistent. Some states permit a vessel; some states permit individuals. [c] "Active count" in the table above indicates active during the period of 2012-2016, but not necessarily active in each of those years. New York provided an additional breakdown of active permits over each individual year for 2012-2016:

Year	NY Active Count
2012	255
2013	242
2014	251
2015	234
2016	203

[d] Some North Carolina landings by year would have been from non-North Carolina permit holders, leading to the "known fishermen" counts by year being higher than the number of "active" NC permits. [e] "Known fishermen" counts are derived from ACCSP database fisherman ID. "Unknown" fishermen not included. Among identified fishermen (people) in ACCSP Summer Flounder Landings for the period of 2012-2016, approximately 93% had a single fishermen state permit, 6% had two fishermen state permits, and less than 0.5% had three or more fishermen state permits. This includes state permits only, as Federal permits are issued to vessels. Approximately 95% landed in a single state and the remaining 5% landed in two to four states. These percentages are similar in each year throughout the 5-year period.

7.0 ENVIRONMENTAL IMPACTS OF THE ALTERNATIVES

This section analyzes the impacts to the affected environment of the alternatives described in section 5.0. These alternatives contain options that could 1) implement requalifying criteria for federal commercial moratorium permits, 2) modify the allocation of commercial summer flounder quota, and 3) add framework provisions to the FMP that would allow for commercial landings flexibility policies for summer flounder to be developed through later framework actions.

Environmental impacts are analyzed with respect to five valued ecosystem components (VECs):

1. The **managed resources,** i.e., summer flounder, the managed species potentially affected by the measures under consideration (sections 7.1.1 and 7.2.1);
2. **Non-target species**, including the primary species or species groups that interact with summer flounder, summer flounder habitat, and/or commercial summer flounder fishing gear (sections 7.1.2 and 7.2.2);
3. The **physical environment and habitat**, including Essential Fish Habitat (EFH; sections 7.1.3 and 7.2.3);
4. **Protected resources**, including ESA-listed and MMPA-protected large and small cetaceans, pinnipeds, sea turtles, fish, and critical habitat occurring in the affected area (sections 7.1.4 and 7.2.4);
5. The **human environment**, including socioeconomic aspects of the fisheries (especially commercial fisheries) targeting summer flounder and the communities associated with those fisheries, as well as other human communities with an interest in summer flounder conservation and management (sections 7.1.5 and 7.2.5).

In sections 7.1 and 7.2, the impacts are described both in terms of their direction (negative, positive, or no impact) and their magnitude (slight, moderate, or high). Table 47 summarizes the main guidelines used for each VEC to determine the magnitude and direction of the impacts described in this section. As described in section 7.3., the framework provision alternatives for landing flexibility are primarily administrative and are not expected to have direct impacts on any of the VECs.

When considering impacts on each VEC, the impact of each alternative on the current, or baseline, condition of the VEC is described. The impacts of each alternative on each VEC are also compared to each other. The no action alternative describes what would happen if no action were taken. For all options considered in this document, the "no action" alternative would have the same outcome as *status quo* management, therefore, these alternatives are at times described as "no action/*status quo*." Where an alternative is said to "maintain the current condition of a VEC," this means that while the alternative may have some effect on the VEC, overall it is not likely to change the VEC's current baseline condition.

The recent conditions of the VECs include the biological conditions of the target stock, non-target stocks, and protected species over the most recent five years (sections 6.1, 6.2, and 6.4). They also include the fishing practices and levels of effort and landings in the commercial summer flounder fishery over the most recent five years, as well as the economic characteristics of the fisheries over the most recent three to five years (depending on the dataset; section 6.5). The recent conditions of the VECs also include recent levels of habitat availability and quality (section 6.3). The current condition of each VEC is described in Table 48.

The alternatives are not compared to a theoretical condition where the fisheries are not operating. These fisheries have occurred for many decades and are expected to continue into the foreseeable future. The nature and extent of the management programs for these fisheries have been examined in detail in past EAs and EISs prepared for previously implemented management actions under the Summer Flounder, Scup, and Black Sea Bass FMP, and are further described in this document.

When considering overall impacts on each VEC, impacts resulting from management changes in the commercial sector of the summer flounder fishery are the focus of the discussion, given that no recreational management modifications are proposed in this action. There may be indirect impacts to recreational communities within the human environment that could occur from changes in commercial management, and those are also described where relevant.

In general, alternatives which may result in overfishing or an overfished status for target and non-target species may have negative biological impacts for those species. Conversely, alternatives which may result in a decrease in fishing effort, resulting in ending overfishing or rebuilding to the biomass target, may result in positive impacts for those species by resulting in a decrease in fishing mortality (Table 47).

For the physical environment and habitat, alternatives that improve the quality or quantity of habitat or allow for recovery are expected to have positive impacts. Alternatives that degrade the quality or quantity, or increase disturbance of habitat are expected to have negative impacts (Table 47). The proposed actions in this document only impact the commercial summer flounder fishery; thus, the evaluation of habitat impacts is focused on how the interaction of commercial gear types and vessels may change with each alternative. Bottom trawls are the predominant commercial gear type used to harvest summer flounder and typically account for 90-97% of all landings (see section 6.3.3). Alternatives that may result in a reduction in fishing effort or fleet capacity may decrease the time that fishing gear is in the water, thus reducing the potential for interactions between fishing gear and habitat; however, most habitat areas where summer flounder are fished have been heavily fished by multiple fishing fleets over many decades and may not see a measurable improvement in their condition in response to shifts in effort in a single fishery (Table 47).

For protected species, consideration is given to both ESA-listed species and MMPA-protected species. ESA-listed species include populations of fish, marine mammals, or turtles at risk of extinction (endangered) or endangerment (threatened). For endangered or threatened species, any action that results in interactions with or take of ESA-listed resources 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 with protected species (i.e., no take). By definition, all species listed under the ESA are in poor condition and any take has the potential to negatively impact that species' recovery. Under the MMPA, the stock condition of each protected species varies, but all are in need of protection.

For marine mammal stocks/species that have their potential biological removal (PBR) level reached or exceeded, negative impacts would be expected from any alternative that has the potential to interact with these species or stocks. For species that are at more sustainable levels (i.e., PBR levels have not been exceeded), actions not expected to change fishing behavior or effort such that interaction risks increase relative to what has been in the fishery previously, may have positive impacts by maintaining takes below the PBR level and approaching the Zero Mortality Rate Goal (Table 47). Thus, the overall impacts on the protected resources VEC for each alternative 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 exceeded or are in danger of exceeding their PBR level (Table 47).

Socioeconomic impacts are considered primarily in relation to potential changes in landings and prices, and by extension, revenues, compared to the current fishery conditions. Alternatives which could lead to increased availability of target species and/or an increase in catch per unit effort (CPUE) could lead to increased landings for particular communities or for the fishery as a whole. Alternatives which could result in an increase in landings are generally considered to have positive socioeconomic impacts because they could result in increased revenues (for fishing businesses as well as shoreside businesses); however, if an increase in landings leads to a decrease in price or a decrease in SSB for any of the landed species, then negative socioeconomic impacts could occur (Table 47). In addition, socioeconomic impacts can be considered in terms of other economic metrics and effects on the social wellbeing of fishery participants and communities, including factors like effect on community resilience, jobs, and employee income.

The expected impacts to each VEC are derived from both consideration of the current condition of the VEC and the expected changes in the characteristics and prosecution of the fishery (including but not limited to changes in overall effort, the spatial and seasonal distribution of effort, and fishing techniques) under each of the alternatives. It is not possible to quantify with confidence how these factors will change under each alternative; therefore, expected changes are estimated and/or described qualitatively.

Table 47 also describes the qualifiers that are used to describe the magnitude and direction of impacts throughout this section. Impacts may range from negligible or no impact to significant impacts, and expected impacts may be positive, negative, or mixed. Impacts that are associated with a higher degree of uncertainty are qualified as "likely" or "uncertain."

Table 47: General definitions for impacts and qualifiers relative to resource condition (i.e., baselines) summarized in Table 48 below.

General Definitions				
VEC	Resource Condition	Impact of Action		
		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 / populations
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)	Stock health may vary 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 MMPA protected species
Physical environment / habitat / EFH	Many habitats degraded from historical effort and slow recovery time (see condition of the resources table for details)	Alternatives that improve the quality or quantity of habitat or allow for recovery	Alternatives that degrade the quality/quantity or increase disturbance of habitat	Alternatives that do not impact habitat quality
Human communities (socioeconomic)	Highly variable but generally stable in recent years (see condition of the resources table for details)	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
	Impact Qualifiers			
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 (sl), as in slight positive or slight negative	To a lesser degree / minor		
	Moderate (M) positive or negative	To an average degree (i.e., more than "slight", but not "high")		
	High (H), as in high positive or high negative	To a substantial degree (not significant unless stated)		
	Significant (in the case of an EIS)	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 resource attribute aside from the MSA status, but this must be justified within the impact analysis.				

Table 48: Baseline conditions of VECs considered in this action, as summarized in Section 6.

VEC		Baseline Condition	
		Status/Trends, Overfishing?	Status/Trends, Overfished?
Target stock (section 6.1)	**Summer flounder**	Yes	No
Non-target species (principal species listed in section 6.2)	**Black Sea Bass**	No	No
	Scup	No	No
	Northeast skate complex	No	No, except thorny skate
	Spiny dogfish	No	No
	Northern sea robin	Unknown	Unknown
Habitat (section 6.3)		Commercial fishing impacts are complex and variable and typically adverse; Non-fishing activities had historically negative but site-specific effects on habitat quality.	
Protected resources (section 6.4)	**Sea turtles**	Leatherback and Kemp's ridley sea turtles are classified as endangered under the ESA; loggerhead (NW Atlantic DPS) and green (North Atlantic DPS) sea turtles are classified as threatened.	
	Fish	Atlantic salmon (Gulf of Maine DPS), shortnose sturgeon, and the New York Bight, Chesapeake, Carolina, and South Atlantic DPSs of Atlantic sturgeon are classified as endangered under the ESA; the Atlantic sturgeon Gulf of Maine DPS is listed as 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. Pursuant to section 118 of the MMPA, the 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 all protected under the MMPA. Pursuant to section 118 of the MMPA, the HPTRP and BDTRP were implemented to reduce bycatch of harbor porpoise and bottlenose dolphin stocks, respectively, in gillnet gear.	
	Pinnipeds	Gray, harbor, hooded, and harp seals are protected under the MMPA.	
Human communities (section 6.5)		Summer flounder supports large commercial and recreational fisheries; human communities impacted by the commercial fishery are relevant in this action. Over the past five years (2012-2016), the commercial fishery has averaged $28 million ex-vessel value per year (in 2016 dollars). Approximately 789 commercial moratorium permits for summer flounder were issued in 2016, with 344 reporting summer flounder landings. 19 ports from MA through NC have averaged over 100,000 lb of summer flounder landings annually from 2012-2016. Over 200 federally-permitted dealers from Maine through North Carolina purchased summer flounder in 2016.	

7.1 IMPACTS OF ALTERNATIVE SET 1: FEDERAL MORATORIUM PERMIT REQUALIFICATION

This alternative set contains options for requalification criteria for federal commercial moratorium permits for summer flounder, in the form of various combinations of landings thresholds and time periods over which those landings thresholds must have been achieved. The permit requalification alternatives are fully described in section 5.1 and briefly summarized here.

Alternative 1A (no action/*status quo*) would make no changes to the current commercial moratorium permit eligibility requirements established in 1993. To be eligible for a moratorium permit, a vessel must have been issued a moratorium permit in the previous year, or be replacing a vessel that was issued a moratorium permit after the owner retires the vessel from the fishery. All moratorium permits must be reissued on an annual basis by the last day of the fishing year for which the permit is required, unless the permit is in CPH.

Alternative 1B and sub-options (requalification of existing federal moratorium permits) presents various options for revising the qualifying criteria for summer flounder moratorium permits. All sub-options under this alternative, as described below, would evaluate requalification only from the existing pool of summer flounder moratorium permit holders and would not allow new entrants to obtain a permit based on the qualifying criteria. The qualifying criteria are associated with the summer flounder moratorium right ID (MRI) number maintained by GARFO.

Under all alternatives and sub-alternatives, overall annual summer flounder landings will still be constrained by the annual commercial quotas, which should remain the primary driving factor for overall fishery effort in a given year. As described below, requalification of moratorium permits theoretically could result in a redistribution of effort among a different pool of vessels. However, it appears that most MRIs that would be eliminated under each sub-alternative of 1B are associated with little to no activity for summer flounder in recent years; therefore, the impacts of reducing permit capacity under alternative 1B may be minimal, as described below.

Because this alternative set would not substantially modify overall effort, but considers how fishery effort will be distributed among participants, the impacts of this alternative set are primarily socioeconomic, both on individual permit holders and more broadly on fishing communities, as described below in section 7.1.5.

7.1.1 Impacts to the Target Stock (Summer Flounder)

7.1.1.1 Alternative 1A: No Action/Status Quo

This alternative would take no action to revise federal permit qualifications and would result in moderate positive impacts to the summer flounder stock, since the fishery would continue to be managed to prevent overfishing and to prevent the stock from becoming overfished. The summer flounder stock will continue to be managed under ACLs and AMs as required by the MSA, with the commercial fishery managed under an annual commercial quota derived from the commercial ACL and based on the best scientific information available.

When compared to alternative 1B and its sub-alternatives, alternative 1A is expected to have a similar magnitude of positive impacts. Neither of these alternatives are expected to change the overall level of effort in the fishery, which will continue to be constrained by ACLs and the annual commercial quota. The slight changes in vessel permit access under any 1B sub-alternative is expected to result in very minor practical impacts to the fishery, as described below. Therefore, the positive impacts to summer flounder from both alternatives are not expected to meaningfully differ in their magnitude.

7.1.1.2 Alternative 1B: Requalification of Existing Federal Moratorium Permits

Similar to alternative 1A, all-sub-alternatives under alternative 1B would not be expected to result in overall changes in fishing effort for summer flounder. The fishery will still be constrained by annual catch and landings limits, therefore, overall fishery effort in a given year will remain driven by these limits. Summer flounder is a high demand species and it is likely that utilization rates will remain high and annual quotas will continue to be reached every year. Therefore, a reduction in permit capacity under alternative 1B is not likely to impact overall effort each year but will impact the pool of vessels participating in the fishery.

Summer flounder removals will continue to be limited by annual catch limits, which will have positive impacts on the stock as the annual catch limits are based on the best available science and are intended to prevent overfishing.

Changes in the distribution of effort by vessel are not expected to have a meaningful impact on the summer flounder stock, especially given that most eliminated permits under all sub-alternatives are associated with little to no summer flounder landings in recent years. Between August 2009 and July 2014, summer flounder commercial landings associated with each group of eliminated MRIs were minimal for most sub-alternatives and non-existent for alternatives 1B-2 and 1B-4. These landings represented between 0% and 0.32% of coastwide summer flounder landings over the same time period (Table 49). Given this information, it is likely that most eliminated permits under each sub-alternative are not actively participating in the summer flounder fishery. Thus, changes in distribution of effort amongst participants under any of the sub-alternatives is likely to have minimal or no impacts on summer flounder landings, and would not be expected to influence stock status.

Overall incidental catch levels of summer flounder catch for vessels targeting other species are likely to be unaffected. While in theory, a slight increase in summer flounder discards from non-requalifying vessels is possible if they are no longer permitted to land summer flounder, it does not appear that most of the eliminated vessels under various sub-alternatives are landing much, if any, summer flounder in recent years. Thus, there should not be a substantial conversion from landings into discards, since landings among these vessels are currently very low to non-existent. In addition, the total dead catch (i.e., total removals from the fishery) will still be accounted for and constrained by the annual catch limit.

In theory, a reduction in the number of moratorium permits for summer flounder could result in a reduction in management uncertainty (in the near-term or long-term) based on a reduction in the potential for an influx of latent effort into the fishery. Such an influx is difficult to predict, but if it occurred could cause managers difficulty in constraining catch to the ACL. By reducing the total permit capacity in the summer flounder fishery, some of this management uncertainty is reduced, resulting in possible indirect slight positive impacts to the resource due to a better ability to control catch and landings.

Table 49: Recent landings for eliminated MRIs associated with sub-alternatives under Alternative 1B, between August 1, 2009 and July 31, 2014. Landings thresholds under each sub-alternative refer to commercial landings of summer flounder associated with each MRI.

Sub-alternative under 1B	Time Period	Landings Threshold	# MRIs Eliminated (%)	Combined landings (lb) from eliminated MRIs, 8/1/09-7/31/14	% of coastwide summer flounder landings, 8/1/09-7/31/14
1B-1	8/1/09-7/31/14 (5 yrs)	≥1,000 pounds cumulative	516 (55%)	24,529	0.04%
1B-2	8/1/09-7/31/14 (5 yrs)	At least 1 pound in any year	448 (48%)	0	0.00%
1B-3	8/1/04-7/31/14 (10 yrs)	≥1,000 pounds cumulative	389 (41%)	5,713	0.01%
1B-4	8/1/04-7/31/14 (10 yrs)	At least 1 pound in any year	306 (33%)	0	0.00%
1B-5	8/1/99-7/31/14 (15 yrs)	≥1,000 pounds cumulative	295 (31%)	2,896	0.01%
1B-6	8/1/94-7/31/14 (20 yrs)	At least 1 pound in 20% of years (i.e., in at least 4 years over this 20-year period)	271 (29%)	181,302	0.32%
1B-7	8/1/94-7/31/14 (20 yrs)	≥1,000 pounds cumulative	233 (25%)	2,414	0.00%

Compared to alternative 1A, all of the sub-alternatives under 1B are likely to have a similar magnitude of moderate positive impacts to the summer flounder stock. All alternatives maintain the current management to the annual catch and landings limits, which is designed to prevent overfishing and prevent the stock from becoming overfished. Maintaining the current pool of participants (alternative 1A) and reducing the number of current permits to eliminate those that are inactive or very low activity will not meaningfully change the status of the summer flounder resource. Similarly, differences among sub-alternatives for alternative 1B are unlikely to vary in their magnitude of positive impacts to the summer flounder resource. While the number of MRIs eliminated under these sub-options varies (ranging from 25% to 55% of existing MRIs), landings from these MRIs in recent years consist of less than a third of one percent of coastwide landings at most.

7.1.2 Impacts to Non-Target Species

Primary non-target species identified for the commercial summer flounder trawl fishery, as described in section 6.2, are several species of skate, spiny dogfish, Northern sea robin, black sea bass, and scup. Non-target species could be affected by the alternatives for moratorium permit requalification if these alternatives were expected to change the level of effort or the prosecution of the fishery in a manner that would impact the interaction rates with non-target species. However, this is unlikely to be the case for alternatives 1A and 1B in this document. As described above in section 7.1.1, the permit requalification alternatives are not expected to change the overall level of effort for summer flounder. In addition, the alternatives in this document are not expected to change how the fishery is currently prosecuted, including the timing, areas fished, or gear types used. Impacts to non-target species from all federal permit alternatives are thus expected to be minimal and will contribute to maintaining the current stock status of non-target species, as described below.

7.1.2.1 Alternative 1A: No Action/Status Quo

As described in section 7.1.1, alternative 1A would make no changes to the current pool of commercial moratorium rights for summer flounder. As with impacts to summer flounder, this alternative would result in moderate positive impacts to non-target species that currently have a positive stock condition, since this alternative would contribute to maintaining that positive stock status.

The stock conditions of non-target species relevant to this action are described in Table 48. With the exception of thorny skate (overfished status) and Northern sea robin (status unknown), none of the non-target species are experiencing overfishing or are currently overfished. Most of these fisheries (with the exception of sea robin) are currently managed by the MAFMC or NEFMC. These fisheries would continue to be managed to prevent overfishing and to prevent the stock from becoming overfished under the requirements of the MSA, based on the best scientific information available. Incidental dead catch of MSA managed species is accounted for through the setting and monitoring of ACLs and AMs.

Alternative 1A would result in no changes in effort, and no changes in the prosecution of the fishery. Thus, impacts to non-target species from this alternative are expected to be overall moderate positive as they would maintain the positive stock status of most relevant non-target species. For species with unknown or overfished (thorny skate) stock status, alternative 1A would be expected to slight negative to no impacts, as it would be expected to maintain the current overfished or unknown stock status for these species. Given the condition of most non-target species, overall, alternative 1A would result in moderate positive impacts for non-target species.

Compared to alternative 1B and sub-alternatives, alternative 1A is likely to have very similar magnitude of moderate positive impacts, because the overall fishing effort and the prosecution of the fishery are not expected to vary in a meaningful way between these alternatives.

7.1.2.2 Alternative 1B: Requalification of Existing Federal Moratorium Permits

As described in section 7.1 for impacts to summer flounder, alternative 1B and its sub-alternatives would not be expected to affect the overall amount of effort for summer flounder since catch and landings will still be constrained by annual catch and landings limits. In addition, most of the eliminated MRIs under all 1B sub-alternatives are landing little or no summer flounder in recent years (Table 49), meaning that actual changes in the distribution of effort as the result of alternative 1B are expected to be negligible.

Thus, the impacts of all sub-alternatives under alternative 1B are expected to be similar to each other and to impacts of alternative 1A. Moderate positive impacts are expected overall, since alternative 1B and sub-options would maintain the positive stock status of most non-target species relevant to this action. For overfished or unknown status species (thorny skate and Northern sea robin, respectively), this action is not expected to meaningfully contribute to a change in stock status.

7.1.3 Impacts to Physical Habitat and EFH

7.1.3.1 Alternative 1A: No Action/Status Quo

Alternative 1A is not expected to alter the prosecution of the fishery in any way that would directly either improve or degrade the quality of habitat. The summer flounder fisheries operate in areas that have been fished for many years, not only for summer flounder but for a variety of species, with a variety of gear types, and this is not expected to change under this alternative, which simply maintains the number of eligible moratorium permits at their current level and is not expected to alter overall effort levels, times and areas fished, or gear types used in the fishery. However, this alternative does allow continued permitting of summer flounder trawl vessels which are known to interact with habitat through their operation. As described in Table 47, alternatives that allow for recovery of habitat quality would result in positive impacts to the physical environment and habitat, meaning that actions that prevent recovery may result in indirect negative impacts to habitat.

As such, while alternative 1A is not expected to directly alter the level of habitat quality either positively or negatively, this alternative may have slight negative indirect impacts to habitat and EFH by continuing to prevent degraded habitats from recovering (i.e., this alternative will continue the current operating conditions which do not allow for recovery of degraded habitats due to continued fishing in those areas).

Alternative 1A is expected to have the same impacts (indirect slight negative impacts) as alternative 1B, as described below.

7.1.3.2 Alternative 1B: Requalification of Existing Federal Moratorium Permits

As described in the sections above, as with alternative 1A, none of the sub-alternatives under 1B are expected to result in changes in overall effort in the fishery. In addition, these sub-alternatives are not expected to have meaningful impacts on the distribution of effort in time and space due to the very low summer flounder effort observed in recent years for eliminated MRIs under each sub-alternative (Table 49). The current footprint of the fishery will continue to be fished by remaining summer flounder vessels and other fishing vessels. Like alternative 1A, sub-alternatives under 1B would result in indirect slight negative impacts to habitat, as they contribute to maintaining fishery impacts that prevent the recovery of degraded habitats.

Alternative 1B is expected to result in the same magnitude of indirect slight negative impacts to habitat as alternative 1A, as none of the alternatives for federal permit requalification are expected to change the overall degree of effort or the prosecution of the fishery in terms of areas fished or gear types used. Both alternatives 1A and 1B will result in a similar or identical footprint of fishing, and overall effort will remain tied to annual catch and landings limits.

7.1.4 Impacts to Protected Resources

As described above in the introduction to section 7, the impacts on protected resources may vary between ESA-listed and MMPA-protected species. For ESA-listed species, any action that could result in take of ESA-listed species is expected to have negative impacts, including actions that reduce interactions. Under the MMPA, the impacts of the proposed alternatives would vary based on the stock condition of each protected species and the potential for each alternative to impact fishing effort. For marine mammal stocks/species that have their PBR level reached or exceeded, negative impacts would be expected from any alternative that has the potential to interact with these species or stocks. For 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 47). Taking the latter into consideration, the overall impacts on the protected resources VEC for each alternative 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.

Overall, the federal permit requalification alternatives could have potential impacts on protected resources ranging from slight positive to slight negative, with slight positive to slight negative impacts likely on non-ESA listed marine mammals, and slight negative impacts likely for ESA-listed species. Because overall effort and the timing and location of fishery operation is not expected to vary between any of these alternatives, alternative 1A and all sub-alternatives under alternative 1B would have similar magnitudes of slight positive to slight negative impacts on protected resources.

7.1.4.1 Alternative 1A: No Action/Status Quo

MMPA (Non-ESA Listed) Species Impacts

The summer flounder fishery overlaps with the distribution of non-ESA listed species of marine mammals (cetaceans and pinnipeds). As a result, marine mammal interactions with fishing gear used to prosecute the commercial fishery are possible (i.e., otter trawls, see section 6.4). Ascertaining the risk of an interaction and the resultant potential impacts on marine mammals is uncertain because quantitative analyses have not been performed and data are limited (section 6.4). However, we have considered, the most recent (2010-2014) information on marine mammal interactions with commercial fisheries (Hayes *et al*. 2017; https://www.nefsc.noaa.gov/fsb/take_reports/nefop.html).

Aside from pilot whales and several stocks of bottlenose dolphin, there has been no indication that takes of non-ESA listed species of marine mammals in commercial fisheries have gone beyond levels which would result in the inability of each species population to sustain itself. Specifically, aside from pilot whales and several stocks of bottlenose dolphin, the PBR level has not been exceeded for any of the non-ESA listed marine mammal species identified in section 6.4 (Hayes *et al*. 2017). Although pilot whales and several stocks of bottlenose dolphin have experienced levels of take that resulted in the exceedance of each species PBR level, take reduction strategies and/or plans have been implemented to reduce bycatch in the fisheries affecting these species (Atlantic Trawl Gear Take Reduction Strategy, Pelagic Longline Take Reduction Plan effective May 19, 2009 (74 FR 23349); Bottlenose Dolphin Take Reduction Plan, effective April 26, 2006 (71 FR 24776)). These efforts are still in place and are continuing to assist in decreasing bycatch levels for these species. Although NEFOP observer reports[29] and the most recent five years of information presented in Hayes et al. (2017) are a collective representation of commercial fisheries interactions with non-ESA listed species of marine mammals, and do not address the effects of the summer flounder fishery specifically, the information does demonstrate that thus far, operation of any fishery has not resulted in a collective level of take that threatens the continued existence of non-ESA listed marine mammal populations, aside from those species (pilot whales and bottlenose dolphin stocks) noted above.

[29] https://www.nefsc.noaa.gov/fsb/take_reports/nefop.html.

Taking into consideration the above information, and the fact that there are non-listed marine mammal stocks/species whose populations may or may not be at optimum sustainable levels, impacts of alternative 1A on non-ESA listed marine mammal species are likely to range from slight negative to slight positive. As noted above, there are some marine mammal stocks/species that 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 interactions with non-ESA listed marine mammals are possible under alternative 1A, for these species/stocks with a current sub-optimal stock condition, alternative 1A is likely to result in slight negative impacts to these species.

Alternatively, there are also many non-ESA listed marine mammals that, even with continued fishery interactions, are maintaining an optimum sustainable level (i.e., PBR levels have not been exceeded) over the last several years. 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 equate to 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 condition as they have over the past several years, it is expected that these slight positive impacts would remain. Thus, given that alternative 1A is not expected to change fishing effort relative to the *status quo*, the impacts of alternative 1A on these non-ESA listed species of marine mammals with positive stock conditions are expected to be slight positive (i.e., continuation of current operating conditions is not expected to result in exceedance of any of these stocks/species PBR level).

Based on this information, overall alternative 1A is expected to have slight negative to slight positive impacts on non-ESA listed species of marine mammals.

ESA Listed Species Impacts

The summer flounder commercial fishery is prosecuted primarily with bottom trawl gear. As provided in section 6.4, ESA listed species of sea turtles, Atlantic sturgeon, large whales, and Atlantic salmon are vulnerable to interactions with bottom trawl, sink gillnet, and/or hook and line gear , with interactions often resulting in the serious injury or mortality to the species. Based on this, the summer flounder fishery has the potential to interact with these species and therefore, result in some level of negative impacts to ESA listed species. Interaction risks with protected species 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 a protected species (with risk of an interaction increasing with increases in of any or all of these factors). Because alternative 1A simply maintains the current total number of possible moratorium permits in the fishery and will not impact overall effort in a given year, this alternative is not expected to increase or decrease interaction rates with ESA listed species. However, because alternative 1A would maintain access to the fishery and maintain the possibility of interactions with ESA listed species, slight negative impacts are expected to result from this alternative.

Overall Impacts

Overall, alternative 1A is expected to have slight negative to slight positive impacts on protected resources, with slight negative to slight positive impacts likely on non-ESA listed marine mammals and slight negative impacts likely for ESA-listed species.

Compared to alternative 1B, alternative 1A is likely to have similar magnitude and direction of impacts, assuming that other conditions impacting participation in the fishery remain similar to current conditions. Because all sub-alternatives under 1B would eliminate mostly vessels with low or no activity for summer flounder, the near-term differences between alternatives in terms of the prosecution of the summer flounder fishery are expected to be negligible. However, sub-alternatives under 1B, as described below, do have the possibility of preventing future latent effort from re-entering the fishery. Relative to alternative 1A, this could result in slightly more positive impacts to protected resources, as this could reduce the possibility of increased interactions with marine mammals and ESA listed species resulting from a re-entry of latent effort to the fishery.

7.1.4.2 Alternative 1B: Requalification of Existing Federal Moratorium Permits

Impacts of alternative 1B, and all of its sub-alternatives, are expected to be similar in direction and magnitude to the impacts of alternative 1A, given that overall effort and the manner in which the fishery is prosecuted are not expected to change under any of these alternatives. As described above, the MRIs that would be eliminated under each sub-alternative under 1B are associated with little to no landings of summer flounder in recent years, meaning that any of the sub-alternatives under 1B would have little or no practical impact as far as modifying the distribution of participation and effort in the fishery. As with alternative 1A, slight negative to slight positive impacts are possible for non-ESA listed species of marine mammals. Slight positive impacts are expected for those species where takes have not exceeded that stock's PBR, and slight negative impacts are expected for those species with less positive stock conditions. For ESA listed species, any action resulting in takes is likely to have negative impacts; however, given that this action is not expected to substantially change the prosecution of the fishery, these negative impacts are expected to be minor relative to the current conditions.

As mentioned above, it's possible that alternative 1B and its sub-alternatives would result in a reduced risk of latent effort re-entering the fishery in future years, which could possibly increase the rates of interactions with protected species. However, the re-entry of latent effort is difficult to predict, and the sub-alternatives under 1B may result in different combinations of vessels being eliminated. Because all 1B sub-alternatives eliminate vessels with little or no recent summer flounder activity, and because conditions that would theoretically cause latent permits to re-enter the fishery are highly uncertain and are likely to vary based on individual businesses considerations, it is difficult to draw meaningful conclusions about the differences in the magnitude of impacts of each sub-alternative on protected resources. For example, it is impossible to demonstrate that alternative 1B-1 (eliminating 516 MRIs) will have meaningfully different impacts from alternative 1B-3 (eliminating 389 MRIs; Table 49). However, in general, sub-alternatives eliminating more MRIs will theoretically have a greater impact on reductions in permit capacity, meaning a greater reduction in the potential for future re-entry of latent effort. In that sense, relative to alternative 1A, the sub-alternatives under alternative 1B may afford vary levels of positive impacts to protected species, with the level of positive impacts be greatest for alternative 1B-1 (eliminates the most permits), followed by alternative 1B-2, and so on in numerical order through alternative 1B-7 (which eliminates the least amount of permits). Based on this and the information provided above, relative Alternative 1A, the impacts of Alternative 1B and its sub-alternative on protected species are likely to range from neutral to moderately positive.

7.1.5 Impacts to Human Communities

Alternatives for federal moratorium permit qualifications may have an impact on human communities by impacting permit holders (both those who requalify and those who do not under various alternatives), as well as their fishing communities and ports, including associated fishing businesses.

As described above, overall summer flounder landings will still be constrained by the annual commercial quotas, which should remain the primary driving factor for overall fishery effort in a given year. Requalification of moratorium permits under alternative 1B would result in a smaller pool of vessels eligible to participate in the fishery. However, most eliminated MRIs under each sub-alternative under 1B are associated with little (or no) activity for summer flounder in recent years; therefore, the overall near-term impacts of reducing permit capacity under alternative 1B are likely to be small, as described below.

7.1.5.1 Alternative 1A: No Action/Status Quo

The no action/*status quo* alternative 1A would make no changes to the current pool of eligible vessels or permitting requirements. This alternative is associated with the highest number of summer flounder permits remaining eligible (940 MRIs currently exist for summer flounder, meaning 940 summer flounder moratorium permits are currently eligible to be issued). The magnitude and direction of impacts of alternative 1A to individual vessels depends on the potential for latent effort to re-enter the fishery, which is difficult to predict; thus, the impacts are presented as a range of possible outcomes.

If conditions remain similar to the past few years in terms of fishery participation (which can be influenced by factors such as overall quota levels, market factors, restrictions in other fisheries, or broader economic factors, among other things) then the distribution of effort among vessels will remain similar to the current distribution. In this case, alternative 1A would have minimal impacts (positive or negative) to human communities, as this alternative would not change revenues or other socioeconomic metrics for fishery participants and their communities.

If conditions change and inactive or low activity permits increase their landings of summer flounder (as the result of constraints in other fisheries, quota reallocation through this action, market factors, etc.), some permit holders that are currently active in the fishery may experience negative socioeconomic impacts as the result of limited quotas being further spread among participants. The fishing communities associated with these permit holders also could experience negative impacts. The magnitude of these effects would depend on the degree of re-entry to the fishery and how active the formerly latent vessels become, which is difficult to predict.

If many latent vessels re-enter the fishery and/or these vessels begin landing substantial amounts of summer flounder, more restrictive management measures would likely be necessary for all summer flounder vessels to ensure that quotas are not exceeded. Because there are several hundred inactive or mostly inactive federal permits (Table 50; Table 51), the capacity for summer flounder landings from these vessels is theoretically large, however, the likelihood of a large proportion of these vessels becoming active in the fishery is uncertain and probably low.

Slight positive socioeconomic impacts are possible under alternative 1A for those current permit holders with low or no activity, as these vessels would retain the flexibility to target summer flounder in the future and may increase their revenues from summer flounder if that flexibility was utilized. Some of these benefits may be limited if an influx of effort results in tighter management measures. Under a scenario where latent effort does re-enter the fishery, socioeconomic impacts at the vessel level would likely range from slight positive (for inactive/low activity permit holders who choose to re-enter the fishery) to slight negative (to all currently active summer flounder permit holders and communities if there is a notable influx of latent effort).

Quota reallocation options under alternative set 2 may influence the degree of re-entry to the fishery and associated distributional impacts. Under a revised state-by-state allocation system, whether latent permit holders re-enter the fishery may be driven by how their state allocation and resulting measures change. Participants in some states that have been inactive in recent years may be incentivized to target summer flounder if their state's quota is increased. Under a scup model system (alternative 2D-1 or 2D-2), the winter quota periods would have no state-level measures or quotas. Under this scenario, latent permits (especially those associated with vessels capable of fishing offshore in the winter) may re-enter the fishery if coast-wide winter period measures are appealing enough compared to their particular state measures in recent years.

Overall, the impacts of alternative 1A to the fishery as a whole are likely to be negligible, but for individual participants and communities could range from slight negative to slight positive. An influx of effort is theoretically possible under alternative 1A, resulting in an increase in revenue for some vessels and a decrease in revenue for others. The efficiency of the vessels entering the fishery would have to be compared against those already active in the fishery to quantify the precise economic impacts. Under alternative 1A there may be no changes to current conditions (and therefore no impacts to human communities). Alternatively, there could be slight positive impacts (for permit holders exercising flexibility to fish for summer flounder) and slight negative socioeconomic impacts (due to effort being spread among more participants).

Compared to alternative 1B, alternative 1A is expected to have slightly less negative socioeconomic impacts on low/no activity permit holders and their associated fishing businesses (although the impacts of all alternatives are expected to be small). Similarly, alternative 1A would have less positive impacts to active participants in the fishery compared to 1B, since alternative 1A would not prevent federal latent effort from re-entering the fishery.

7.1.5.2 Alternative 1B: Requalification of Existing Federal Moratorium Permits

Alternative 1B would reduce the number of eligible federal summer flounder moratorium permits, to varying degrees depending on the sub-alternative selected. Under each sub-alternative for permit requalification, impacts to human communities will depend primarily on how many permits are eliminated and how active these permits have been in recent years.

The fishery will still be constrained by annual catch and landings limits, therefore, overall fishery effort in a given year would not be expected to be heavily impacted by any of the 1B sub-alternatives. Summer flounder is a high demand species and it is likely that utilization rates will remain high. Therefore, a reduction in permit capacity is not likely to drive landings each year but will impact the pool of vessels that are eligible to participate in the fishery. Alternative 1B may impact the distribution of effort depending on how active eliminated permits have been or would be in the future.

Impacts to human communities from alternative 1B could include near-term economic impacts through elimination of current effort and opportunity, as well as longer-term economic impacts resulting from reduced potential for latent effort to re-enter the fishery.

Direct near-term, and possibly long-term, negative economic impacts may occur to non-requalifying permit holders that have landed some summer flounder in recent years, and their associated communities. Near-term negative economic impacts would not be expected for permits that are completely inactive, as these vessels are not currently generating any revenue from summer flounder. For permit holders that requalify, near-term and long-term positive economic impacts are possible since overall effort may be spread among a smaller pool of vessels, possibly leading to higher revenues for some vessels.

The magnitude of economic impacts to vessels that requalify and those that do not would depend on a) how many permits are eliminated and b) how active those eliminated permits have been in recent years (i.e., how much landings and revenue they have generated). The more summer flounder landings and revenues that are associated with each group of eliminated permits under each sub-alternative, the larger the distributional impacts will be. Impacts will also depend on what other species eliminated vessels are able to fish for and how dependent are they on summer flounder, with vessels that are more dependent on summer flounder experiencing more negative impacts. Due to the low landings evident in recent years across many eliminated MRIs, it is likely that most eliminated vessels are not heavily dependent on summer flounder.

Table 50 describes the number of eliminated MRIs under each sub-alternative along with their associated landings and revenues over the 5-year time period of August 1, 2009 through July 31, 2014.[30] Over this time period, all eliminated MRIs under these alternatives are associated with very little or no summer flounder landings in recent years (ranging from 0 to 131,302 total pounds for all eliminated permitholders over this time period, or 0% to 0.32% of coastwide landings).

Table 51 shows the same analysis over the fishing years 2013-2017. Over these years, eliminated MRIs under these alternatives are associated with slightly higher summer flounder landings and revenues, though they are still a relatively small portion of coastwide landings and revenues (ranging from 0.14% to 3.04% of landings and from 0.18% to 3.19% of revenues). This appears to indicate that there was a small influx of effort for summer flounder after the publication of the control date on August 1, 2014.

According to this analysis, even though a substantial portion of summer flounder permits may be eliminated under some alternatives (ranging from 25% to 55% of current MRIs), the overall portion of summer flounder landings and revenues that would be eliminated under any 1B sub-alternative is relatively low and is spread among a few hundred vessels. This indicates that the magnitude of overall impacts is likely to be low, although impacts may vary at the vessel level based on each vessel's recent activity. Near-term positive (for remaining permit holders) or negative economic impacts (for eliminated permit holders) are in general likely to be small or negligible, though some vessels eliminated from the fishery may experience moderate negative impacts if they have recently invested in this fishery or increased effort for summer flounder. Most vessels with eliminated permits would not see a substantial reduction in revenues given that most vessels are landing very small amounts of summer flounder on average and are very unlikely to be highly dependent on the summer flounder fishery. Remaining vessels are unlikely to see a substantial near-term economic benefit from reduced permit capacity in the fishery.

[30] Although this period is the requalification time frame for only alternatives 1B-1 and 1B-2, it was used in evaluating all sub-alternatives in order to allow comparison between each option.

Table 50: Comparison of impacts of sub-alternatives under Alternative 1B, in terms of associated number of moratorium rights eliminated, with associated landings and revenues between August 1, 2009 and July 31, 2014. Landings thresholds under each sub-alternative refer to commercial landings of summer flounder associated with each MRI.

Sub-alternative under 1B	Time Period	Landings Threshold	# MRIs Eliminated (%)	Combined landings (lb) from eliminated MRIs, 8/1/09-7/31/14	% of coastwide summer flounder landings, 8/1/09-7/31/14	Combined ex-vessel revenue 8/1/09-7/31/14	% of coastwide summer flounder revenue, 8/1/09-7/31/14
1B-1	8/1/09-7/31/14 (5 yrs)	≥1,000 pounds cumulative	516 (55%)	24,529	0.04%	$54,395	0.05%
1B-2	8/1/09-7/31/14 (5 yrs)	At least 1 pound in any year	448 (48%)	0	0.00%	$0	0.00%
1B-3	8/1/04-7/31/14 (10 yrs)	≥1,000 pounds cumulative	389 (41%)	5,713	0.01%	$10,980	0.01%
1B-4	8/1/04-7/31/14 (10 yrs)	At least 1 pound in any year	306 (33%)	0	0.00%	$0	0%
1B-5	8/1/99-7/31/14 (15 yrs)	≥1,000 pounds cumulative	295 (31%)	2,896	0.01%	$7,016	0.01%
1B-6	8/1/94-7/31/14 (20 yrs)	At least 1 pound in 20% of years (i.e., in at least 4 years over this 20-year period)	271 (29%)	181,302	0.32%	$326,034	0.28%
1B-7	8/1/94-7/31/14 (20 yrs)	≥1,000 pounds cumulative	233 (25%)	2,414	0.00%	$5,619	0.00%

Table 51: Comparison of impacts of sub-alternatives under Alternative 1B, in terms of associated number of moratorium rights eliminated, with associated landings and revenues between January 1, 2013 through December 31, 2017. Landings thresholds under each sub-alternative refer to commercial landings of summer flounder associated with each MRI.

Sub-alternative under 1B	Time Period	Landings Threshold	# MRIs Eliminated (%)	Combined landings (lb) from eliminated MRIs, 1/1/13-12/31/17	% of coastwide summer flounder landings, 1/1/13-12/31/17	Combined ex-vessel revenue 1/1/13-12/31/17	% of coastwide summer flounder revenue, 1/1/13-12/31/17
1B-1	8/1/09-7/31/14 (5 yrs)	≥1,000 pounds cumulative	516 (55%)	1,083,694	3.04%	$3,540,052	3.19%
1B-2	8/1/09-7/31/14 (5 yrs)	At least 1 pound in any year	448 (48%)	663,985	1.86%	$2,326,859	2.1%
1B-3	8/1/04-7/31/14 (10 yrs)	≥1,000 pounds cumulative	389 (41%)	503,356	1.41%	$1,613,440	1.46%
1B-4	8/1/04-7/31/14 (10 yrs)	At least 1 pound in any year	306 (33%)	334,151	0.94%	$1,117,053	1.01%
1B-5	8/1/99-7/31/14 (15 yrs)	≥1,000 pounds cumulative	295 (31%)	109,573	0.31%	$393,944	0.36%
1B-6	8/1/94-7/31/14 (20 yrs)	At least 1 pound in 20% of years (i.e., in at least 4 years over this 20-year period)	271 (29%)	290,894	0.81%	$946,917	0.85%
1B-7	8/1/94-7/31/14 (20 yrs)	≥1,000 pounds cumulative	233 (25%)	48,464	0.14%	$204,436	0.18%

In addition to the near-term impacts of a reduced pool of participants, sub-alternatives under alternative 1B would also lead to reduced potential for future expansion of latent effort. As described above under alternative 1A, broader management or economic conditions could drive latent permit holders to re-enter the fishery for summer flounder (e.g., restrictions in other fisheries, quota reallocation, market conditions, etc.) if they are still permitted. The sub-alternatives under alternative 1B would prevent re-entry to a degree, and/or would reverse some of the re-entry that appears to have occurred since publication of the control date. The reduced potential for latent effort would have positive economic impacts on remaining vessels, and possibly on their communities depending on the community's characteristics, by reducing the likelihood of needing to spread quota between a larger number of vessels, and reducing uncertainty about whether measures would need to be restricted due to an influx of latent effort. Permit holders with eliminated summer flounder permits could experience negative economic impacts due to not having the opportunity to target summer flounder in the future. Some fishing communities may experience mixed impacts from these alternatives, depending on their associated permit holders and how many requalify.

It is worth noting that this alternative has no impact on state level permits. Re-entry of latent effort would still be possible in state waters under this alternative (in some states, depending on current and future state-level restrictions), confounding the impacts of reductions in federal permit capacity.

Analysis of the number of MRIs eliminated (including permits in CPH) by state was also conducted for each sub-alternative (Table 52). The "home port" of a vessel as indicated by the owner on the official U.S. Coast Guard documentation was used to associate an approximate number of MRIs with each state, to describe general possible impacts by state. However, home port does not necessarily reveal where these vessels typically land, as some vessels are permitted to land in multiple states. A small number of permits that would be eliminated under alternative 1B identify their home port in states that are outside the management unit (i.e., Texas and Florida).

Among the states with affected permits, some states have more eliminated permits than others. In terms of home port states that stand to lose the most summer flounder MRIs under Alternative 1B, Massachusetts ranks highest for all sub-alternatives. For Massachusetts, the percentage of their MRIs eliminated under each sub-alternative ranges from 38% to 77%, indicating that there are many inactive federal permits associated with a Massachusetts home port. New Jersey ranks second highest in terms of eliminated MRIs under most sub-alternatives. All states stand to lose significantly more MRIs with a shorter qualification period (sub-alternatives 1B-1 and 1B-2), and when looking at a longer qualification period (sub-alternatives 1B-6 and 1B-7), the clear majority of MRIs not requalifying are in the northern region of the fishery (Table 52). Although some states would have a high proportion of permits eliminated under some sub-alternatives, it is important to remember that the previously described analysis of recent effort indicates that individual eliminated permits are mostly associated with little or no summer flounder landings in recent years, with cumulative landings over several hundred vessels under all options making up a small percentage of coastwide landings. Thus, despite having a high number or proportion of eliminated permits on paper for some states, the actual socioeconomic impact on those states is expected to be fairly small.

Table 52: Number of MRIs requalifying (REQ.) and eliminated (ELIM.) under each 1B sub-alternative by state of home port. C= Confidential.

	1B-1		1B-2		1B-3		1B-4		1B-5		1B-6		1B-7	
Home port state	REQ.	ELIM.	REQ.	ELIM.	REQ.	ELIM.	REQ.	ELIM.	REQ.	ELIM.	REQ.	ELIM.	REQ.	ELIM.
ME	3	39	3	39	9	33	14	28	19	23	22	20	23	19
NH	C	14	C	13	C	13	6	C	4	11	6	C	5	10
MA	83	276	106	253	142	217	180	179	187	172	203	156	223	136
RI	76	12	76	12	81	C	83	5	83	C	81	7	83	C
CT	15	C	17	7	16	8	18	6	17	C	14	10	19	C
NY	55	35	62	28	62	28	66	24	67	23	69	21	68	22
NJ	94	74	117	51	122	46	142	26	139	29	141	27	146	22
PA	C	C	3	C	C	C	C	C	C	C	C	C	C	C
DE	0	C	0	C	0	C	0	C	0	C	0	C	0	C
MD	C	C	C	C	4	C	5	0	4	C	4	C	4	C
VA	23	32	30	25	33	22	38	C	41	14	45	10	48	C
NC	69	17	72	14	78	8	79	7	81	5	80	6	84	C
FL	0	C	0	C	0	C	0	C	0	C	C	C	C	C
TX	C	0	C	0	C	0	C	0	C	0	C	0	C	0

Overall, impacts from the sub-alternatives under 1B are expected to vary by individual permit holder and by fishing community, depending on the degree of activity of eliminated vessels and the extent to which each sub-alternative prevents re-entry of latent effort into the fishery. The socioeconomic impacts of each sub-alternative under 1B at the vessel level is likely to range from slight positive (for remaining permit holders and their communities due to the reduced potential for re-entry of latent effort) to moderate negative (for eliminated permit holders, due to likely small to moderate losses in revenues as well as lost flexibility to fish for summer flounder in the future).

Among the sub-alternatives considered, the magnitude of expected impacts at the vessel level is likely to vary slightly between each sub-alternative in the short-term based on the analysis of 2013-2017 landings and revenues shown in Table 51. As a percentage of overall coastwide landings and revenues, the highest magnitude of negative impacts (to eliminated permit holders) and positive impacts (to remaining permit holders) are likely to occur from alternative 1B-1 due to having the highest associated landings and revenues for summer flounder, followed in order by alternative 1B-2, 1B-3, 1B-4, 1B-6, 1B-5, and 1B-7 (Table 51). Again, these impacts are likely to be overall small, but would be expected to vary more at the individual vessel level.

Compared to alternative 1A, alternative 1B and its sub-alternatives are expected to have moderately more adverse socioeconomic impacts on eliminated individual permit holders and their associated fishing businesses (although the impacts of all alternatives are expected to be small). Similarly, alternative 1A would have fewer positive impacts to active participants in the fishery compared to 1B, since alternative 1A would not prevent federal latent effort from re-entering the fishery.

7.1.6 Summary of Impacts of Alternative Set 1

Because overall fishery effort is not expected to be heavily influenced by these alternatives, and catch and landings will remain driven by annual limits, each alternative should have no impacts to minor impacts on the summer flounder stock, non-target species, habitat, or protected resources compared to their current condition as described in the sections above. This results in moderate positive impacts to the summer flounder stock and non-target species, indirect slight negative impacts to habitat, and slight negative to slight positive impacts to protected resources under all alternatives. Impacts of sub-alternatives under 1B will be primarily socioeconomic impacts to individual permit holders and fishing communities. However, given the small magnitude of recent summer flounder landings and revenues from eliminated permits under requalification alternatives, the short-term impacts of these alternatives are likely to be small overall. There is some uncertainty associated with the long-term socioeconomic impacts depending on the realistic potential for latent effort to re-enter the fishery, as described above. A summary of impacts to each VEC is provided in Table 53.

Table 53: Summary of impacts of Alternative Set 1: requalification of existing commercial moratorium permits.

Alt.	Description	Expected Impacts				
		Summer flounder	***Non-target species***	***Habitat***	***Protected Resources***	***Human communities***[a]
1A	No action/*status quo*	Moderate +	Moderate +	Indirect slight negative	Slight - to slight +	No impact if conditions remain similar; slight - if incentives to re-enter fishery change; slight + to latent permit holders due to flexibility
1B-1	Requalify at ≥1,000 pounds cumulatively over 8/1/09-7/31/14 (5 yrs)	Moderate +	Moderate +	Indirect slight negative	Slight - to slight +	No impact to moderate - (for eliminated permit holders), no impact to slight + (for remaining permit holders)
1B-2	Requalify at ≥1 pound in any year from 8/1/09-7/31/14 (5 yrs)	Moderate +	Moderate +	Indirect slight negative	Slight - to slight +	No impact to moderate - (for eliminated permit holders), no impact to slight + (for remaining permit holders)
1B-3	Requalify at ≥1,000 pounds cumulatively over 8/1/04-7/31/14 (10 yrs)	Moderate +	Moderate +	Indirect slight negative	Slight - to slight +	No impact to moderate - (for eliminated permit holders), no impact to slight + (for remaining permit holders)
1B-4	Requalify at ≥1 pound of summer flounder in any one year from 8/1/04-7/31/14 (10 yrs).	Moderate +	Moderate +	Indirect slight negative	Slight - to slight +	No impact to moderate - (for eliminated permit holders), no impact to slight + (for remaining permit holders)
1B-5	Requalify at ≥1,000 pounds cumulatively over 8/1/99-7/31/14 (15 yrs)	Moderate +	Moderate +	Indirect slight negative	Slight - to slight +	No impact to moderate - (for eliminated permit holders), no impact to slight + (for remaining permit holders)
1B-6	Requalify at ≥1 lb in 20% of years 8/1/94-7/31/14 (20 yrs; i.e., at least 1 lb of landings is required in any 4 years over this time period).	Moderate +	Moderate +	Indirect slight negative	Slight - to slight +	No impact to moderate - (for eliminated permit holders), no impact to slight + (for remaining permit holders)
1B-7	Requalify at ≥1,000 pounds cumulatively over 8/1/94-7/31/14 (20 yrs).	Moderate +	Moderate +	Indirect slight negative	Slight - to slight +	No impact to moderate - (for eliminated permit holders), no impact to slight + (for remaining permit holders)

[a] All impacts to human communities are uncertain and likely mixed depending on the stakeholder/community affected, as described above.

7.2 IMPACTS OF ALTERNATIVE SET 2: COMMERCIAL QUOTA ALLOCATION

This alternative set contains options for reallocation of the annual commercial quota for summer flounder. The allocation alternatives are fully described in section 5.2 and briefly recapped here.

Alternative 2A (no action/*status quo*) would make no changes to the current commercial allocations established on the basis of 1980-1989 landings history (section 5.2.1).

Alternative 2B (Adjust State Quotas Based on Recent Biomass Distribution) would modify state-by-state allocations by accounting for a shift in relative exploitable biomass by region between 1980-1989 and 2007-2016. There are two sub-options for calculating the change in relative exploitable biomass and applying this change to revised allocations. Both options would shift allocation from the Southern region (states of New Jersey through North Carolina) to the Northern region (states of New York through Maine).

Alternative 2C (Revise State Allocations Above a Commercial Quota Trigger Point) would create state allocations that vary with overall stock abundance and resulting commercial quotas. For all years when the annual commercial quota is at or below a specified annual commercial quota trigger level, the state allocations would remain *status quo*. In years when the annual coastwide quota exceeded the specified trigger, the trigger amount would be distributed according to *status quo* allocations, and the additional quota beyond that trigger would be distributed by equal shares (with the exception of Maine, New Hampshire, and Delaware, which would split 1% of the additional quota). Alternative 2C has two sub-alternatives for different annual coastwide quota triggers.

Alternative 2D ("Scup Model" Quota System for Summer Flounder) would allocate quota into three unequal seasonal periods, as is done for scup. During the two winter periods, January-April ("Winter I") and November-December ("Winter II"), a coastwide quota system would be implemented in conjunction with a system of coastwide possession limits and other measures. In a "Summer" period, May-October, a state-by-state quota system would be implemented by the Commission, and state-specific measures would be set to constrain landings to the summer period state quotas. Alternative 2D has two sub-alternatives for exempting or not exempting the state of Maryland from this allocation system.

The quota reallocation alternatives under alternative set 2 are not expected to impact overall fishing effort in terms of annual catch and landings (i.e., total removals of summer flounder from the commercial fishery), which will remain driven by annual catch and landings limits. The allocation alternatives will primarily affect access to the resource at the state/and or individual fishing vessel level within the management unit, depending on the allocation option selected. This could result in a somewhat modified distribution of fishing effort in space and time, as described below, and is expected to modify the distribution of landings (and thus revenues) by state and port. Changes in access to summer flounder quota could also impact effort in terms of the total number and duration of trips and hauls for summer flounder if modified allocations result in a change in participation in the fishery terms of vessel sizes or gear types; however, in general the fishery is expected to remain dominated by trawl gear.

Changes in the distribution of effort as the result of reallocation are generally difficult to predict, as effort is influenced by many factors. Characteristics of the commercial fishery, including seasonal effort, spatial effort, gear types used, and landings by state are described in section 6.5 of the Affected Environment in this document. From these descriptions, some general patterns of fishing effort can be described to provide a basis for predicting the general range of impacts of each reallocation alternative. In general, the commercial fishery for summer flounder varies seasonally and by region, with larger trawl vessels generally fishing offshore on the continental shelf in the winter months (approximately late October through April) and with summer effort (approximately May through early October) taking place primarily in state waters (0-3 miles from shore), corresponding with the seasonal inshore-offshore migrations of summer flounder (see section 6.1.3.1.) As described in section 6.5.1.2.3., during November-April, over 75% of the landings are estimated to originate from federal waters. May, September, and October see a more balanced mix of federal and state waters harvest, while June-August harvest occurs mostly in state waters. In the summer, more of the fishery is prosecuted in state waters with smaller vessels using a wider variety of gear types. While bottom trawls are still the dominant gear type in the summer, other gear types, such as hand lines, gill nets, and other gear types are more commonly used compared to the winter fishery. Larger vessels (classified as vessels 51 tons or larger) are dominant in the winter offshore fishery, while during the spring and early fall, more of a mix of small and larger vessels participate.

By state, the commercial fisheries in Virginia and North Carolina are clearly dominated by large trawl vessels fishing offshore in the winter. These states heavily influence the regional (states New York and north vs. states New Jersey and South) patterns of fishing effort described in section 6.5.1.2, which show that southern region revenues tend to originate from offshore on the outer continental shelf. In contrast, Northern region revenues are more concentrated inshore off of Block Island Sound/Eastern Long Island, although the Northern states derive revenue from offshore fishing as well. States other than Virginia and North Carolina tend to have more of a mix of gear types, vessel sizes, and dominant months of commercial summer flounder effort (see section 6.5.1.2).

As the result of reallocation alternatives in this document, some location and/or timing of commercial summer flounder effort could change, which could affect each VEC, although the magnitude and direction of impacts are difficult to predict. Offshore winter fishing effort locations are not expected to change substantially, as the larger vessels that typically participate in this season have historically been more mobile vessels that target prime summer flounder fishing locations offshore even when long steam times are required to do so. For this fleet, footprints of fishing effort do not necessarily closely correlate with distance from state of landing.

However, it is possible that there could be a shift in the balance of offshore vs. inshore effort under some reallocation alternatives, due to changes in the allocation for states that are dominant in the winter fishery. In addition, nearshore effort observed mainly in the summer months (prosecuted by a variety of vessel types with more representation from smaller day boats) may see a small to moderate shift in location under some reallocation alternatives, as discussed below; however, the extent to which this may occur is difficult to predict and would depend on other factors such as management response to increased or decreased quotas. These possibilities are explored further below.

Because the overall catch will remain driven by annual catch limits, reallocation alternatives in general are not expected to affect the stock status of summer flounder, leading to positive overall impacts on the target resource. For non-target species and protected resources, the possible changes in distribution of fishing effort could lead to changes in interaction rates that may influence stock status, although these effects are highly uncertain, as discussed below. For habitat, any effort shifts resulting from reallocation are not expected to change the overall footprint of fishing effort for summer flounder, over which fishing effort for many species has taken place for many years. However, continued fishing effort within this footprint will prevent recovery of any degraded habitats within this area. For human communities, this action is expected to have socioeconomic impacts that would vary by state and by individual participants and their communities, based on changes in the distribution of access and revenues from the resource.

7.2.1 Impacts to the Target Stock

7.2.1.1 Alternative 2A: No Action/Status Quo

Alternative 2A would maintain current quota allocations described in Table 10 (section 5.2.1). This is expected to result in moderate positive impacts to the summer flounder stock, since the fishery would continue to be managed to prevent overfishing and to prevent the stock from becoming overfished. The summer flounder stock will continue to be managed under ACLs and AMs as required by the MSA, with the commercial fishery managed under an annual commercial quota derived from the commercial ACL and based on the best scientific information available. Alternative 2A does not modify the current allocation and thus would not be expected to cause changes in the distribution of effort or participation in the fishery.

When compared to alternatives 2B-2C and its sub-alternatives, alternative 2A is expected to result in a similar magnitude of moderate positive impacts. None of these alternatives are expected to change the overall level of effort in the fishery, which will continue to be constrained by ACLs and the annual commercial quota. The changes in commercial allocation under alternatives 2B, 2C, and 2D are expected to result in changes in the distribution of effort and participation by state and individual fishing vessels, however, these changes are not expected to result in biological effects on the summer flounder stock that would modify stock status, as described below. Therefore, the positive impacts to summer flounder from both alternatives are not expected to meaningfully differ in their magnitude.

7.2.1.2 Alternative 2B: Adjust State Quotas Based on Recent Biomass Distribution

Alternative 2B, under either of its sub-alternatives 2B-1 and 2B-2, would shift quota allocation from the Southern region of the management unit (North Carolina through New Jersey) to the Northern region (New York through Maine). Under alternative 2B-1, the total amount of allocation shifted from the South to the North would be 6% (with Northern states increasing their relative allocations by 19% and southern states decreasing their relative allocations by 9%), while under 2B-2, allocation shifted to the North from the South would 13% of the coastwide allocation (with the Northern states increasing their allocations by 40% and the Southern states decreasing theirs by 19%). This alternative would thus increase access to the fishery for vessels in Northern states, possibly leading to changes in effort distribution. Any changes in fishery effort would depend on the characteristics of each state's fishery and how management responded to increased or decreased quotas, as well as additional external factors that may drive regional effort fluctuations, like local market conditions.

Although changes in the distribution of fishing effort by state and by fishing vessel may occur under alternatives 2B-1 and 2B-2, this is not expected to affect the biological characteristics of the summer flounder stock in a way that would impact overall stock status. Summer flounder is managed and assessed as a single unit stock, and there is currently no evidence to suggest that relatively small to moderate scale changes in the location of fishing effort would impact stock status, if overall effort in the fishery remains constrained. As described above, it is possible that under both alternatives 2B-1 and 2B-2 that effort may shift toward Northern states, especially nearshore effort. It is likely that the location of offshore effort will remain similar to current condition, for reasons described in the beginning of section 7.2. It is possible that a slight shift in the balance between winter offshore fishing and summer inshore fishing may occur, with slightly more effort possibly shifting to nearshore areas, although this is difficult to predict and depends on each state's future management measures. Any such shift is likely to be small to moderate in magnitude. Virginia and North Carolina (which mostly participate in the winter fishery) are expected to remain dominant players during the winter months under alternatives 2B-1 and 2B-2, although perhaps to a slightly lesser extent than under the *status quo*. Increased allocation in the North may result in larger Northern vessels increasing their offshore fishery participation, offsetting any decreases in North Carolina and Virginia offshore effort. Any shifts in fishing effort as the result of reallocation are unlikely to have a meaningful biological impact on the stock.

Shifts in timing of fishing effort are also difficult to predict. Most states spread their fishing effort throughout the year using open and closed seasons along with other management measures. Shifts in timing of fishing effort under alternatives 2B-1 and 2B-2 could occur, but would depend on management responses to modified allocations and would vary by state. The timing of fishing effort can also vary based on market factors such as price, and may vary from year to year, so the effect of these alternatives on timing is highly uncertain.

Overall, alternatives 2B-1 and 2B-2 are expected to have moderate positive impacts on the summer flounder resource, as they will work within the existing management framework that aims to prevent negative biological impacts to the stock. All states, regardless of an allocation increase or decrease, will still be required to set management measures to control effort and landings within their revised allocation. Accountability measures will still be in place, including a landings-based accountability system at the state level, and overall catch-based accountability evaluated annually.

Compared to other alternatives in alternative set 2, alternatives 2B-1 and 2B-2 are likely to have a similar magnitude of moderate positive impacts to the summer flounder stock. All alternatives maintain the current management to the annual catch and landings limits, which is designed to prevent overfishing and prevent the stock from becoming overfished. There is not expected to be a notable difference in the biological outcomes between alternative 2B-1 and 2B-2.

7.2.1.3 Alternative 2C: Revise State Allocations Above a Commercial Quota Trigger Point

Similar to alternatives 2A and 2B, alternative 2C is not expected to impact the overall removals of summer flounder from the commercial fishery, but would impact the distribution of effort among states in years when the annual commercial quota is above a certain trigger. The effects of this redistribution would differ from those of alternative 2B, in that there is not a broader North/South pattern of increased/decreased allocation. Instead, some states receive increased allocations under increasing quotas, and some states lose a portion of their allocation under increasing quotas.

As summarized in section 5.2.3, the state allocations would vary as the annual commercial quota grows beyond the specified trigger. For quotas up to the trigger point, allocations remain *status quo*. As the annual commercial quota level grows beyond the quota trigger, the state quota allocation percentages get closer together, i.e., with increasing quotas above the trigger, quota is distributed more evenly among the states (see Figure 6 and Figure 7; section 5.2.3).

The only difference between alternative 2C-1 and 2C-2 is that alternative 2C-1 specifies an 8.40 million pound trigger, while 2C-2 specifies a 10.71 million pound trigger, which impacts how often future quotas would exceed the trigger. Table 13 and Figure 5 in section 5.2.3 indicate that for alternative 2C-1, historically between 1993-2018, the 8.40 million trigger has been exceeded in 22 of 26 of these years, while for alternative 2C-2, the trigger has been exceeded in 17 of 26 of these years. It would thus be expected that in at least some future years, the quota would be redistributed slightly compared to *status quo* allocations.

In years where the quota was at or below the trigger amount, there would be no allocation changes and impacts would be identical to those described under alternative 2A (no action/*status* quo). As annual quotas grow beyond the quota trigger, the allocation for the states of Rhode Island, New Jersey, Virginia, and North Carolina (states that currently have less than 12.375% of the coastwide allocation) decreases, and the allocation for all other states increases.

As with alternative 2B, the small to moderate shifts in allocation under annual quotas exceeding the trigger are not expected to affect the biological characteristics of the summer flounder stock in a way that would impact overall stock status, since summer flounder is managed and assessed as a single unit stock and overall catch in the fishery will remain constrained by the ACL. Any shifts in allocation away from the states of Rhode Island, New Jersey, Virginia and North Carolina are small to moderate and would likely not occur every year, and would not have a substantial impact on the health of the overall summer flounder population.

Overall, as with alternative 2B, alternatives 2C-1 and 2C-2 are expected to have moderate positive impacts on the summer flounder resource, as they will work within the existing management framework that aims to prevent negative biological impacts to the stock. All states will still be required to control effort and landings within their revised allocation. Accountability measures will still be in place, including a landings-based accountability system at the state level, and overall catch-based accountability evaluated annually.

Compared to other alternatives in alternative set 2, alternatives 2C-1 and 2C-2 are likely to have a similar magnitude of moderate positive impacts to the summer flounder stock. All alternatives maintain the current management to the annual catch and landings limits, which is designed to prevent overfishing and prevent the stock from becoming overfished. Although alternative 2C-1 would result in modified allocations more often than alternative 2C-2, there is not expected to be a notable difference in the biological outcomes between these sub-alternatives.

7.2.1.4 Alternative 2D: Implement "Scup Model" Quota System for Summer Flounder

Under alternative 2D, the same annual catch and landings limits and accountability measures as discussed above would remain in place to constrain summer flounder removals. This is expected to result in the same impacts as described for alternatives 2A-2C; moderate positive impacts on the stock, for similar reasons as described above. Alternatives 2D-1 and 2D-2 are not expected to result in the summer flounder stock becoming overfished.

The difference between alternatives 2D-1 and 2D-2 is that 2D-1 exempts the state of Maryland, while 2D-2 does not. This very slightly modifies the seasonal quota period allocations and the state summer quota periods as described in section 5.2.4. Because Maryland has a relatively small fishery (about seven vessels directing on summer flounder) and a relatively small percent of the current quota allocation (about 2%), the practical differences between these alternatives with regard to their impact on the summer flounder resource is expected to be negligible. In either case, the state of Maryland, like other states, will still be required to implement measures that constrain effort and harvest to the appropriate levels. Thus, alternatives 2D-1 and 2D-2 are expected to have the same magnitude of moderate positive impacts on the summer flounder resource.

While overall catch and landings will still be driven by annual catch and landings limits and associated measures, among all commercial allocation alternatives, the effects of alternative 2D on effort and participation are the most difficult to predict. Alternatives 2D-1 and 2D-2 would open the winter months (January-April and November-December) to any properly permitted summer flounder vessel, under consistent coastwide management measures. While possession limits, fishery closures triggers, and other mechanisms would be put in place to control harvest throughout the winter periods and constrain landings to the period quotas, there is some management uncertainty associated with the expected level of participation in these seasonal fisheries and with what specific management restrictions would be necessary to effectively manage commercial harvest during these periods.

It is difficult to predict whether and how latent effort may re-enter the fishery if there were fewer constraints on participation in the winter. Depending on current state level restrictions that may be preventing some vessels from targeting summer flounder, the scup model allocation system may result in increased participation. In addition, under current state management, not every vessel is able to fish at the same times of the year due to state level seasonal restrictions, but under alternative 2D, there is more likely to be many vessels participating at once. Depending on the coastwide management measures selected (possession limits, closure triggers, etc.), managers may experience some difficulty in constraining effort and landings, especially in the first few years of implementation. It is uncertain how this alternative would impact summer flounder discards, but if winter open seasons for summer flounder close quickly due to a high volume of activity, it is possible that this alternative could lead to increased discarding relative to the other allocation alternatives. Thus, while overall, alternatives 2D-1 and 2D-2 are expected to have moderate positive impacts on summer flounder, these alternatives are likely to have slightly less positive impacts compared to alternatives 2A, 2B-1, 2B-2, 2C-1, and 2C-2 due to the introduction of additional management uncertainty and the possible increased difficulty in controlling catch and landings under this alternative.

7.2.2 Impacts to Non-Target Species

Primary non-target species identified for the commercial summer flounder trawl fishery, as described in section 6.2, are several species of skate, spiny dogfish, Northern sea robin, black sea bass, and scup. Non-target species could be affected by the alternatives for reallocation if these alternatives were expected to change rates of interaction with the summer flounder fishery in a manner that would influence the stock status or the biological sustainability of non-target species, although the likelihood of this occurring is highly uncertain.

Commercial allocation alternatives, as described above, are not expected to influence overall coastwide effort, however, there is the possibility that alternatives 2B, 2C, and 2D could affect spatial and temporal effort trends within this overall effort. Changes in participation resulting from reallocation could also influence the number of total annual trips and hauls for summer flounder, if the composition of gear types and/or vessel sizes changed substantially, although it is highly uncertain to what extent this would occur, if at all. Overall, the fishery is highly likely to remain dominated by trawl vessels, with mesh size restrictions that are unlikely to change substantially. The potential impacts of each alternative depend on each non-target species' existing stock status and how likely reallocation alternatives are to change that status. Impacts to non-target species from commercial allocation alternatives are expected to range from slight negative to moderate positive, depending on the alternative and the non-target species, as described below.

7.2.2.1 Alternative 2A: No Action/Status Quo

As described in section 7.2.1, alternative 2A would make no changes to the current allocations. As with impacts to summer flounder, this alternative would result in moderate positive impacts to non-target species that currently have a positive stock condition, since this alternative would contribute to maintaining that positive stock status.

The stock conditions of non-target species relevant to this action are described in Table 48. With the exception of thorny skate (overfished status) and Northern sea robin (status unknown), none of the non-target species are experiencing overfishing or are currently overfished. Most of these fisheries (with the exception of sea robin) are currently managed by the MAFMC or NEFMC. These fisheries would continue to be managed to prevent overfishing and to prevent the stock from becoming overfished under the requirements of the MSA, based on the best scientific information available. Incidental dead catch of MSA managed species is accounted for through the setting and monitoring of ACLs and AMs.

Alternative 2A would result in no reallocation and therefore no resulting changes in effort or changes in the prosecution of the fishery. Thus, impacts to non-target species from this alternative are expected to be overall moderate positive as they would maintain the positive stock status of most relevant non-target species. For species with unknown or overfished (thorny skate) stock status, alternative 2A would be expected to slight negative to no impacts, as it would be expected to maintain the current overfished or unknown stock status for these species. Given the condition of most non-target species, overall, alternative 1A would result in moderate positive impacts for non-target species.

As described below, the impacts of alternatives 2B-1, 2B-2, 2C-1, 2C-2, 2D-1, and 2D-2, are more uncertain relative to non-target species. As such, there is some uncertainty when comparing alternative 2A to other allocation alternatives. If the other allocation alternatives did not shift effort or change the prosecution of the fishery, alternative 2A would have the same magnitude of moderate positive impacts on non-target species. If the other allocation alternatives modified effort in a manner that negatively impacted non-target species, as discussed below, then alternative 2A would have more positive impacts on non-target species compared to other alternatives.

7.2.2.2 Alternative 2B: Adjust State Quotas Based on Recent Biomass Distribution

As described in section 7.2.1.2, alternative 2B, under either of its sub-alternatives 2B-1 and 2B-2, would shift quota allocation from the Southern region of the management unit (North Carolina through New Jersey) to the Northern region (New York through Maine). Under alternative 2B-1, the total amount of allocation shifted from the South to the North would be 6% (with Northern states increasing their relative allocations by 19% and southern states decreasing their relative allocations by 9%), while under 2B-2, allocation shifted to the North from the South would 13% of the coastwide allocation (with the Northern states increasing their allocations by 40% and the Southern states decreasing theirs by 19%).

It is possible that alternatives 2B-1 and 2B-2 could lead to regional effort changes or other changes in the prosecution of the fishery (e.g., changes in gear type composition or number of total hauls) that could affect interaction rates with non-target species. It is unclear to what extent this may occur, and if interaction rates did change, if it would have a meaningful impact on the stock status of non-target species. Small to moderate scale changes in the locations of fishing effort could increase or decrease localized interaction rates with non-target species. Depending on the distribution of non-target species, the effects of effort redistribution on non-target species are likely to range from slight negative to slight positive. Most non-target species relevant to this action are distributed throughout the range of summer flounder, however, any non-target species that may have higher densities in more northerly areas may experience increased interactions under alternative 2B. Likewise, non-target species that have lower densities toward the southern end of the management unit may see decreased interactions that could have slight positive impacts on the stock. These effects are highly uncertain, especially given that the overlap in habitat preferences for summer flounder and non-target species may vary by region. Interaction rates with non-target species are also influenced by factors like seasonality of effort, which as previously mentioned, is difficult to predict under various reallocation alternatives.

Because overall current conditions for non-target species are positive (with the exception of thorny skate, which is overfished, and Northern sea robin, which is unknown), if no changes or relatively minor changes in the distribution of effort occurred, the result would likely be moderate positive impacts on non-target species due to the maintenance of current stock conditions (the same impacts as alternative 2A). As described above, if effort or other fishery patterns change, slight negative to slight positive impacts are possible.

Thus, the overall impacts of alternatives 2B-1 and 2B-2 could range from slight negative (if interaction rates changed enough to negatively impact the biological characteristics of non-target stocks) to moderate positive (if little change in interaction rates occurred, or if reallocation reduced interaction rates enough to positively impact stock condition).

As described above, alternatives 2B-1 and 2B-2 would both likely result in some effort shift toward Northern states, especially nearshore effort. Alternative 2B-2 results in a more substantial shift compared to 2B-1, and thus between the two alternatives, alternative 2B-2 has a higher potential for slight negative impacts (if effort distribution changes negatively influence non-target interactions).

As described under alternative 2A, there is some uncertainty when comparing alternative 2B-1 and 2B-2 to other allocation alternatives. Alternatives 2B-1 and 2B-2 could have the same magnitude of moderate positive impacts on non-target species as alternative 2A, if non-target species interactions did not notably change under these alternatives. If fishing effort distribution did change in a manner influencing non-target species interactions, it is possible that alternatives 2B-1 and 2B-2 could have either slightly more negative impacts or slightly more positive impacts compared to alternative 2A, due to the possibility of increased or decreased interactions with non-target species as the result of shifts in fishing effort. Because alternatives 2C and 2D have similar uncertainties regarding the range of impacts as alternative 2B, these three alternatives are likely to have a similar range of the magnitude of impacts.

7.2.2.3 Alternative 2C: Revise State Allocations Above a Commercial Quota Trigger Point

Similar to alternative 2B, the impacts of alternative 2C are uncertain, and specifically for alternative 2C, would vary by year depending on the annual quota and how it influenced the final state allocations.

In years where the quota was at or below the trigger amount, there would be no allocation changes and non-target species impacts would be identical to those described under alternative 2A (no action/*status* quo).

Alternative 2C in some years would result in higher allocations to most states except for Rhode Island, New Jersey, Virginia, and North Carolina, which would see decreased allocations. Thus, there is not as clear of a north/south shift in allocation, although there may be some northerly shift in effort since Virginia and North Carolina currently have the highest percentages of the allocation. Overall changes in effort or fishery prosecution under this alternative are difficult to predict, and thus a range of possible impacts are possible in years when the quota exceeds the reallocation trigger.

As with alternative 2B, because overall current conditions for non-target species are positive (with the exception of thorny skate, which is overfished, and Northern sea robin, which is unknown), if no changes or relatively minor changes in the distribution of effort occurred, the result would likely be moderate positive impacts on non-target species due to the maintenance of current stock conditions (the same impacts as alternative 2A). As described above, if effort or other fishery patterns change, slight negative to slight positive impacts are possible.

Thus, the overall impacts of alternatives 2C-1 and 2C-2 could range from slight negative (if interaction rates changed enough to negatively impact the biological characteristics of non-target stocks) to moderate positive (if little change in interaction rates occurred, or if reallocation reduced interaction rates enough to positively impact stock condition). The difference between alternative 2C-1 and 2C-2 is the annual quota trigger, which would impact in how many future years the allocation is modified. Alternative 2C-1 is likely to have a higher magnitude of impacts (positive or negative depending on the state) in the long-term compared to alternative 2C-2 given that the trigger is lower and thus allocations would be modified more frequently under this alternative compared to 2C-2.

As described under alternative 2A, there is some uncertainty when comparing alternative 2C-1 and 2C-2 to other allocation alternatives. Alternatives 2C-1 and 2C-2 could have the same magnitude of moderate positive impacts on non-target species as alternative 2A, if non-target species interactions did not notably change under these alternatives. If fishing effort distribution did change in a manner influencing non-target species interactions, it is possible that alternatives 2C-1 and 2C-2 could have either slightly more negative impacts or slightly more positive impacts compared to alternative 2A, due to the possibility of increased or decreased interactions with non-target species as the result of shifts in fishing effort. Because alternatives 2B and 2D have similar uncertainties regarding the range of impacts as alternative 2C, these three alternatives are likely to have a similar range of the magnitude of impacts. However, alternative 2C is also variable by year and in some years would have impacts that are identical to or close to *status quo* (alternative 2A).

7.2.2.4 Alternative 2D: Implement "Scup Model" Quota System for Summer Flounder

The impacts to non-target species from alternative 2D are highly uncertain given that effort changes, and general changes in the prosecution of the fishery under this alternative, are very difficult to predict. Overall catch and landings of summer flounder will still remain driven by annual catch and landings limits and associated measures, however there may be regional shifts or inshore/offshore shifts in effort that occur, but it is not possible to predict to what extent this would occur without knowing which vessels would likely participate and what management measures may be put in place to constrain harvest during the coastwide winter quota periods.

Alternative 2D-1 (Maryland exemption) and alternative 2D-2 (no Maryland exemption) are very unlikely to have meaningful differences in terms of impacts to non-target species. Maryland has a small summer flounder fishery (about seven vessels directing on summer flounder) and a relatively small percent of the current quota allocation (about 2%). The Maryland fishery is thus unlikely to have substantially different non-target species or interaction rates compared to comparable vessels in other states. Thus, alternatives 2D-1 and 2D-2 are expected to have the same magnitude of impacts ranging from slight negative to moderate positive on non-target species.

Compared to alternative 2A, if major changes in the distribution of effort and prosecution of the fishery do not occur, then alternative 2D would have similar moderate positive impacts as alternative 2A. If fishing effort distribution did change in a manner influencing non-target species interactions, it is possible that alternatives 2D-1 and 2D-2 could have either slightly more negative impacts or slightly more positive impacts compared to alternative 2A, due to the possibility of increased or decreased interactions with non-target species as the result of shifts in fishing effort. Because alternatives 2B and 2C have similar uncertainties regarding the range of impacts as alternative 2D, these three alternatives are likely to have a similar range of the magnitude of impacts.

7.2.3 Impacts to Physical Habitat and EFH

7.2.3.1 Alternative 2A: No Action/Status Quo

Alternative 2A is not expected to alter the prosecution of the fishery in any way that would directly either improve or degrade the quality of habitat. The summer flounder fisheries operate in areas that have been fished for many years, not only for summer flounder but for a variety of species, with a variety of gear types, and this is not expected to change under this alternative, which simply maintains the current allocations and is not expected to alter overall effort levels, times and areas fished, or gear types used in the fishery. However, this alternative does allow continued access to the fishery for summer flounder vessels which are known to interact with habitat through their operation, especially trawl vessels that account for most landings. As described in Table 47, alternatives that allow for recovery of habitat quality would result in positive impacts to the physical environment and habitat, meaning that actions that prevent recovery may result in indirect negative impacts to habitat.

As such, while alternative 2A is not expected to directly alter the level of habitat quality either positively or negatively, this alternative may have slight negative indirect impacts to habitat and EFH by continuing to prevent degraded habitats from recovering (i.e., this alternative will continue the current operating conditions which do not allow for recovery of degraded habitats due to continued fishing in those areas).

Alternative 2A is expected to have the same impacts (indirect slight negative impacts) as all sub-alternatives under alternatives 2B, 2C, and 2D, as described below.

7.2.3.2 Alternative 2B: Adjust State Quotas Based on Recent Biomass Distribution

As described in the sections above, as with alternative 2A, the two sub-alternatives under 2B are not expected to result in changes in overall catch and landings in the fishery. While these alternatives may alter the distribution of effort by region, as described above, these changes are not expected to negatively impact habitat beyond its current condition. The summer flounder fishery has been prosecuted for many years, and the overall footprint of the fishery is unlikely to change. Alternatives 2B-1 and 2B-2 are unlikely to drive effort into places that are not currently impacted by the summer flounder fishery or by trawl effort for the many other species targeted in the Greater Atlantic region.

Like alternative 2A, sub-alternatives under 2B would result in indirect slight negative impacts to habitat, as they contribute to maintaining fishery impacts that prevent the recovery of degraded habitats. Compared to other allocation alternatives, alternative 2B is likely to result in the same magnitude of indirect slight negative impacts.

7.2.3.3 Alternative 2C: Revise State Allocations Above a Commercial Quota Trigger Point

Like alternatives 2A and 2B, alternative 2C is not expected to result in a modified overall footprint of fishing effort for summer flounder and it not expected to increase the level of habitat impacts in any areas within that footprint. The areas fished have been fished for many years by a variety of gear types and fisheries. Alternatives 2C-1 and 2C-2 would result in the same magnitude of slight negative indirect impacts on habitat, resulting from continued fishing preventing recovery of any degraded habitats. Compared to other allocation alternatives, alternative 2C is likely to result in the same magnitude of indirect slight negative impacts.

7.2.3.4 Alternative 2D: Implement "Scup Model" Quota System for Summer Flounder

Like other allocation alternatives, alternative 2D is not expected to result in a modified overall footprint of fishing effort for summer flounder and it not expected to increase the level of habitat impacts in any areas within that footprint. The areas fished have been fished for many years by a variety of gear types and fisheries. Alternatives 2D-1 and 2D-2 would result in the same magnitude of slight negative indirect impacts on habitat, resulting from continued fishing preventing recovery of any degraded habitats. Compared to other allocation alternatives, alternative 2D is likely to result in the same magnitude of indirect slight negative impacts.

7.2.4 Impacts to Protected Resources

As described above in the introduction to section 7, the impacts on protected resources may vary between ESA-listed and MMPA-protected species. For ESA-listed species, any action that could result in take of ESA-listed species is expected to have negative impacts, including actions that reduce interactions. Under the MMPA, the impacts of the proposed alternatives would vary based on the stock condition of each protected species and the potential for each alternative to impact fishing effort. For marine mammal stocks/species that have their PBR level reached or exceeded, negative impacts would be expected from any alternative that has the potential to interact with these species or stocks. For 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 47). Taking the latter into consideration, the overall impacts on the protected resources VEC for each alternative 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.

The quota reallocation alternatives are not expected to heavily influence overall effort for summer flounder, which will remain driven by annual catch and landings limits. The primarily effect of the allocation alternatives under alternative set 2 will be on fishery access and effort among states in the management unit, which may or may not have notable effects on where the bulk of fishing effort occurs. As described above, offshore fishing effort (which mostly occurs in the winter by larger trawl vessels) may not change substantially, as more mobile vessels will continue to fish in prime summer flounder fishing locations offshore. Inshore effort (prosecuted by a mix of vessels with more small day boats participating) may see a small to moderate shift under reallocation alternatives, as discussed below; however, the extent to which this may occur is difficult to predict and would depend on other factors such as management response to increased or decreased quotas. It is possible that under some options there could be a shift in the proportion of offshore vs. inshore effort.

Interactions with protected resources (ESA listed and MMPA protected species) are difficult to predict as they depend on many factors, including local environmental factors. Combined with the uncertainty of exactly how effort or the prosecution of the fishery may change under reallocation options, any resulting changes in interaction rates with ESA-listed or MMPA-protected species is highly uncertain; therefore, a range of possible impacts is provided.

Overall, the commercial quota reallocation alternatives could have potential impacts on protected resources ranging from moderate positive to moderate negative, with moderate positive to moderate negative impacts likely on non-ESA listed marine mammals, and slight to moderate negative impacts likely for ESA-listed species.

7.2.4.1 Alternative 2A: No Action/Status Quo

MMPA (Non-ESA Listed) Species Impacts

As described in section 7.1.4, the summer flounder fishery overlaps with the distribution of non-ESA listed species of marine mammals (cetaceans and pinnipeds). As a result, marine mammal interactions with fishing gear used to prosecute the commercial fishery are possible (i.e., otter trawls, see section 6.4). Ascertaining the risk of an interaction and the resultant potential impacts on marine mammals is uncertain because quantitative analyses have not been performed and data are limited (section 6.4). However, we have considered, the most recent (2010-2014) information on marine mammal interactions with commercial fisheries (Hayes *et al*. 2017; https://www.nefsc.noaa.gov/fsb/take_reports/nefop.html).

Aside from pilot whales and several stocks of bottlenose dolphin, there has been no indication that takes of non-ESA listed species of marine mammals in commercial fisheries have gone beyond levels which would result in the inability of each species population to sustain itself. Specifically, aside from pilot whales and several stocks of bottlenose dolphin, the PBR level has not been exceeded for any of the non-ESA listed marine mammal species identified in section 6.4 (Hayes *et al*. 2017). Although pilot whales and several stocks of bottlenose dolphin have experienced levels of take that resulted in the exceedance of each species PBR level, take reduction strategies and/or plans have been implemented to reduce bycatch in the fisheries affecting these species (Atlantic Trawl Gear Take Reduction Strategy, Pelagic Longline Take Reduction Plan effective May 19, 2009 (74 FR 23349); Bottlenose Dolphin Take Reduction Plan, effective April 26, 2006 (71 FR 24776)). These efforts are still in place and are continuing to assist in decreasing bycatch levels for these species. Although NEFOP observer reports[31] and the most recent five years of information presented in Hayes et al. (2017) are a collective representation of commercial fisheries interactions with non-ESA listed species of marine mammals, and do not address the effects of the summer flounder fishery specifically, the information does demonstrate that thus far, operation of any fishery has not resulted in a collective level of take that threatens the continued existence of

[31] https://www.nefsc.noaa.gov/fsb/take_reports/nefop.html.

non-ESA listed marine mammal populations, aside from those species (pilot whales and bottlenose dolphin stocks) noted above.

Taking into consideration the above information, and the fact that there are non-listed marine mammal stocks/species whose populations may or may not be at optimum sustainable levels, impacts of alternative 2A on non-ESA listed marine mammal species are likely to range from slight negative to slight positive. As noted above, there are some marine mammal stocks/species that 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 interactions with non-ESA listed marine mammals are possible under alternative 2A, for these species/stocks with a current sub-optimal stock condition, alternative 2A is likely to result in negative impacts to these species; however, given that effort and interaction rates are not expected to change under alternative 2A, the magnitude of negative impacts is expected to be small.

Alternatively, there are also many non-ESA listed marine mammals that, even with continued fishery interactions, are maintaining an optimum sustainable level (i.e., PBR levels have not been exceeded) over the last several years. 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 equate to 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 condition as they have over the past several years, it is expected that these slight positive impacts would remain. Thus, given that alternative 2A is not expected to change fishing effort relative to the *status quo*, the impacts of alternative 2A on these non-ESA listed species of marine mammals with positive stock conditions are expected to be slight positive (i.e., continuation of current operating conditions is not expected to result in exceedance of any of these stocks/species PBR level).

Based on this information, overall alternative 2A is expected to have slight negative to slight positive impacts on non-ESA listed species of marine mammals.

ESA Listed Species Impacts

The summer flounder commercial fishery is prosecuted primarily with bottom trawl gear. As provided in section 6.4, ESA listed species of sea turtles, Atlantic sturgeon, large whales, and Atlantic salmon are vulnerable to interactions with bottom trawls, with interactions often resulting in the serious injury or mortality to the species. Based on this, the summer flounder fishery has the potential to interact with these species and therefore, result in some level of negative impacts to ESA listed species. Interaction risks with protected species 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 a protected species (with risk of an interaction increasing with increases in of any or all of these factors). Because alternative 2A simply maintains the current commercial allocation and will not impact overall effort in a given year, this alternative is not expected to increase or decrease interaction rates with ESA listed species. However, because alternative 2A would maintain current state-level access to the fishery and maintain the possibility of interactions with ESA listed species, slight negative impacts are expected to result from this alternative.

Overall Impacts

Overall, alternative 2A is expected to have slight negative to slight positive impacts on protected resources, with slight negative to slight positive impacts likely on non-ESA listed marine mammals and slight negative impacts likely for ESA-listed species.

Compared to alternatives 2B-2D, alternative 2A is likely to have a slightly narrow range of possible negative or positive impacts, given that under this alternative, interactions with protected resources are slightly more predictable and should remain at close to *status quo* levels. The other commercial allocation alternatives introduce additional uncertainties regarding how fishery effort may change that could theoretically result in higher negative or higher positive impacts to protected resources.

7.2.4.2 Alternative 2B: Adjust State Quotas Based on Recent Biomass Distribution

As described above, alternative 2B, under either of its sub-alternatives, would shift quota allocation from the Southern region of the management unit (North Carolina through New Jersey) to the Northern region (New York through Maine). Under alternative 2B-1, the total amount of allocation shifted from the South to the North would be 6%, while under 2B-2, allocation shifted to the North from the South would be 13% of the coastwide allocation. This increased quota for vessels in Northern states may result in small to moderate changes in the spatial or temporal patterns of fishery effort that may impact protected resources. However, the extent to which this may occur is uncertain, and interaction rates between this fishery and specific protected resources as the result of small to moderate effort shifts are difficult to predict.

MMPA (Non-ESA Listed) Species Impacts

As described above, alternatives 2B-1 and 2B-2 could lead to regional effort changes or other changes in the prosecution of the fishery (e.g., changes in gear type composition or number of total hauls) that could affect interaction rates with protected resources. It is unclear to what extent this may occur, and if interaction rates did change, if it would have a meaningful impact on the stock status of protected resources. Small to moderate scale changes in the locations of fishing effort could increase or decrease localized interaction rates. Depending on the redistribution of effort, and how that redistribution changes the area of overlap, either in space or time, between the gear and marine mammal species, impacts to non-ESA listed marine mammals may be similar to or greater than those under current operating conditions.

Specifically, should the allocation to the northern region result in the redistribution of effort to an area with high overlap with non-ESA listed species of marine mammals, the potential for interactions may increase. Under this scenario, impacts to non-ESA listed species of marine mammals are likely to range from slight negative (i.e., for non-ESA listed species of marine mammals with positive stock condition) to moderate negative (i.e., for non-ESA listed species of marine mammals with sub-optimal stock condition). Alternatively, should the redistribution of effort result in the movement of vessels from an area of high, to an area of low overlap with non-ESA listed marine mammal species, then interactions with non-ESA listed species of marine mammals have the potential to decrease. Under this scenario, impacts to non-ESA listed species of marine mammals are likely to range from moderately positive (i.e., for non-ESA listed species of marine mammals with positive stock condition) to slight negative (i.e., for non-ESA listed species of marine mammals with sub-optimal stock condition). These effects are highly uncertain, especially given that the overlap in habitat preferences for summer flounder and non-ESA listed species of marine mammals may vary by region. Interaction rates are also influenced by factors like seasonality of effort, which as previously mentioned, is difficult to predict under various reallocation alternatives.

Thus, the overall impacts of alternatives 2B-1 and 2B-2 on MMPA-protected species could have a broad range from slight to moderate negative (if redistribution of effort results in high overlap with non-ESA listed marine mammal species) or from moderate positive to slight negative (if redistribution of effort results in a reduced overlap with non-ESA listed marine mammal species).

ESA Listed Species Impacts

The summer flounder commercial fishery is primarily prosecuted with bottom trawl gear. As provided in section 6.4, ESA listed species of sea turtles, minke whales, Atlantic sturgeon, and Atlantic salmon are vulnerable to interactions with bottom trawls, with interactions often resulting in the serious injury or mortality to the species. Based on this, the summer flounder fishery has the potential to interact with these species and therefore, result in some level of negative impacts to ESA listed species. Interaction risks with protected species 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 a protected species (with risk of an interaction increasing with increases in of any or all of these factors).

Because alternative 2B may shift effort and could possibly impact the composition of gear types used and/or the number of hauls/trips taken (for example, if the balance of large vs. small vessels or inshore vs. offshore effort changed), the allocation under alternative 2B could lead to increased or decreased interactions with ESA listed species. As described above, any action that results in continued takes of ESA-listed species is expected to have negative impacts on those species. Therefore, alternatives 2B-1 and 2B-2 are expected to result in slight to moderate negative impacts on ESA-listed species.

Overall Impacts

Overall, the impacts to protected species from alternatives 2B-1 and 2B-2 are highly uncertain and depend on exactly how effort and the prosecution of the fishery may change as the result of allocation. Impacts also vary with the stock status of impacted species. Overall, the impacts of alternatives 2B-1 and 2B-2 range from moderate negative to moderate positive.

As described above, alternatives 2B-1 and 2B-2 would both likely result in some effort shift toward Northern states, especially nearshore effort. Alternative 2B-2 results in a more substantial shift compared to 2B-1, and thus between the two alternatives, alternative 2B-2 has a higher potential for impacts of higher magnitude (positive or negative) within the previously described range.

As described under alternative 2A, there is some uncertainty when comparing alternative 2B-1 and 2B-2 to other allocation alternatives. Alternatives 2B-1 and 2B-2 could have the same magnitude of impacts on protected species as alternative 2A, if protected species interactions did not notably change under these alternatives. If interaction rates did change, it is possible that alternatives 2B-1 and 2B-2 would have slightly more negative impacts, or slightly more positive impacts, compared to alternative 2A, depending on how exactly changes in the fishery influenced interaction rates with protected species. As Alternative 2B is likely to have the same magnitude of possible impacts to protected species compared to alternatives 2C and 2D, relative to Alternatives 2C and 2D, Alternative 2B is expected to have neutral impacts to protected species (see below for rationale to support this determination).

7.2.4.3 Alternative 2C: Revise State Allocations Above a Commercial Quota Trigger Point

As described above, alternative 2C, under either of its sub-alternatives, would distribute additional quota above a certain trigger point differently than *status quo* allocations. In years where the quota was at or below this trigger point, allocations would remain *status quo*. In years where the quota trigger is exceeded, the states of Rhode Island, New Jersey, Virginia, and North Carolina would see a reduction in allocation while other states would have their allocations increased. The scale of these changes would be small to moderate for annual quotas near the trigger and would grow larger as the quotas approached the time series high (17.9 million pounds). A moderate to large redistribution of quota could result in small to moderate changes in the spatial or temporal patterns of fishery effort that may impact protected resources. However, the extent to which this may occur is uncertain, and interaction rates between this fishery and specific protected resources as the result of small to moderate effort shifts are difficult to predict.

The range of possible impacts to protected resources from alternative 2C are very similar to that of alternative 2B, given that both alternatives are associated with high uncertainty regarding characteristics of possible effort changes and changes in the prosecution of the fishery. Overall catch and landings of summer flounder will remain driven by annual catch and landings limits and associated measures.

For alternative 2C, in years when the quota is at or below the reallocation trigger, impacts to protected resources would be expected to be identical to those described for alternative 2A, as the allocations would not change. In this case, impacts on protected resources are expected to range from slight negative to slight positive impacts on protected resources, with slight negative to slight positive impacts likely on non-ESA listed marine mammals and slight negative impacts likely for ESA-listed species.

In years where the quota is above the reallocation trigger, there may be regional shifts or inshore/offshore shifts in effort that occur due to some states receiving increased allocation and other states decreased allocation, but it is not possible to predict to what extent this would occur. In addition, if shifts did occur, it is not clear to what extent this would affect non-ESA listed marine mammals and ESA-listed species given that interactions can be highly variable and dependent on a number of factors (e.g., amount of gear in the water, gear soak or tow time, area of overlap of the gear and a protected species).

Overall, as with alternatives 2B and 2D, it is unclear how alternatives 2C-1 and 2C-2 may or may not change interaction risks to protected species relative to status quo conditions. Taking the latter into consideration, depending on the actual changes in the fishery, either sub-alternative could lead to impacts to protected species that range from slight negative to slight positive (similar to Alternative 2A), to impacts that range from moderate negative to moderate positive (similar to Alternatives 2B and 2D). These effects are highly uncertain, especially given that the overlap in habitat preferences for summer flounder and protected species may vary by region. Interaction are also influenced by factors like seasonality of effort, which as previously mentioned, is difficult to predict under various reallocation alternatives.

As described under alternative 2A (No Action/Status Quo), there is some uncertainty when comparing alternative 2C-1 and 2C-2 to other allocation alternatives. In years where the quota was at or below the trigger point set under 2C-1 or 2C-2, allocations would remain *status quo* and therefore, fishing effort would be expected to remain similar to status quo operations. Under this scenario, Alternatives 2C-1 and 2C-2 could have the same magnitude of impacts to protected species as alternative 2A, and therefore, under either of 2C's sub-alternatives, relative to Alternative 2A, impacts to protected species would be neutral. However, if the trigger point set under Alternative 2C-1 or 2C-2 is met, interaction rates may change due to changes in fishing effort. Under this scenario, it is possible that alternatives 2C-1 and 2C-2 would have slightly more negative impacts, or slightly more positive impacts, compared to alternative 2A, depending on how exactly changes in the fishery influenced interaction rates with protected species. As Alternative 2C is likely to have the same magnitude of possible impacts to protected species compared to alternatives 2B and 2D, relative to Alternatives 2B and 2D, Alternative 2C is expected to have neutral impacts to protected species (see below for rationale to support this determination).

7.2.4.4 Alternative 2D: Implement "Scup Model" Quota System for Summer Flounder

The impacts to protected resources from alternative 2D are highly uncertain given that effort changes, and general changes in the prosecution of the fishery under this alternative, are very difficult to predict. Overall catch and landings of summer flounder will still remain driven by annual catch and landings limits and associated measures, however there may be regional shifts or inshore/offshore shifts in effort that occur, but it is not possible to predict to what extent this would occur without knowing which vessels would likely participate and what management measures may be put in place to constrain harvest during the coastwide winter quota periods. In addition, if shifts did occur, it is not clear to what extent this would affect non-ESA listed marine mammals and ESA-listed species given that interactions can be highly variable and dependent on a number of factors (e.g., amount of gear in the water, gear soak or tow time, area of overlap of the gear and a protected species).

Based on the above, alternatives 2D-1 and 2D-2 could lead to modifications in the prosecution of the fishery, such as regional inshore effort shifts, a shift between inshore/offshore effort, changes in gear use, changes in total number of hauls, etc. However, it is unclear how the fishery will respond to either alternative and therefore, to what extent these potential changes in the fishery, relative to status quo, may occur and change effort. As a result, it is unclear how alternatives 2D-1 and 2D-2 may or may not change interaction risks to protected species relative to status quo conditions. Taking the latter into consideration, depending on the actual changes in the fishery, either sub-alternative could lead to impacts to protected species that range from slight negative to slight positive (similar to Alternative 2A), to impacts that range from moderate negative to moderate positive (similar to Alternatives 2B and 2C). These effects are highly uncertain, especially given that the overlap in habitat preferences for summer flounder and protected species may vary by region. Interaction are also influenced by factors like seasonality of effort, which as previously mentioned, is difficult to predict under various reallocation alternatives.

Alternatives 2D-1 and 2D-2 only differ in their exemption of Maryland, which will continue to fish regardless of which allocation scheme is selected. Because of the small size of Maryland's fleet, whether or not this fishery is exempt is likely to have negligible impacts on protected resources.

As described under alternative 2A, there is some uncertainty when comparing alternative 2D-1 and 2D-2 to other allocation alternatives. Alternatives 2D-1 and 2D-2 could have the same magnitude of impacts on protected species as alternative 2A; under this scenario, impacts to protected species from either of 2D's sub-alternatives, relative to Alternative 2A, would be neutral. However, if fishing effort, relative to status quo conditions, does change in response to either sub-alternative 2D-1 or 2D-2, it is possible that alternatives 2D-1 or 2D-2 could have slightly more negative impacts, or slightly more positive impacts, compared to alternative 2A, depending on how exactly changes in the fishery influenced interaction rates with protected species. Under this scenario, relative to Alternatives 2B and 2C, Alternative 2D is likely to have the same magnitude of possible impacts to protected species and therefore, relative to Alternatives 2B and 2C, Alternative 2D would be expected to have neutral impacts to protected species .

7.2.5 Impacts to Human Communities

The impacts of this alternative set are primarily socioeconomic impacts on states and their fishing communities, including revenues and jobs for vessel owners and crew, shoreside operations, and other associated businesses. Alternatives 2A, 2B, and 2C can be generally described in terms of impacts to states, since they either maintain the *status quo* (2A) or propose modified state-by-state quotas (2B and 2C). Alternative 2D (the "scup model" allocation) is the most extreme departure from current management given that it opens the winter fishery to any permitted vessel and allows those vessels to land in any port provided they are licensed to land in that state. The impacts of this alternative are the most uncertain, as described below.

7.2.5.1 Alternative 2A: No Action/Status Quo

Under alternative 2A, no changes to the commercial allocation would be made. Summer flounder catch and effort would continue to be constrained by annual catch limits and associated management measures. States would continue to be constrained to their existing state allocation, and the distribution of landings by state would remain similar to the generally stable levels observed since allocations were implemented in 1993 (see Figure 39 and Table 38 in section 6.5.1.2). Typically, landings by state as a percentage of the coastwide landings do not fluctuate much from year to year, since allocations are constant and most states land or come close to landing their quota. Exceptions can occur under special circumstances, such as 2012-2013 when a high amount of North Carolina landings were landed in Virginia by mutual agreement due to shoaling at Oregon Inlet, NC.

The socioeconomic impacts of the existing allocations have varied depending on the state, although as the allocations have been in place for 25 years, conditions in each state resulting from state allocations have been relatively stable in recent years. Generally, states with more allocation currently experience more positive socioeconomic benefits; however, socioeconomic benefits also vary depending on the management approaches used to achieve each allocation, and with external economic and community factors. Each state manages their fishery differently in terms of total number of participants, possession limits, seasons, and other measures; these measures are a large driver of the social and economic impacts of the current quotas. Socioeconomic consequences of the current state allocations are also dependent on factors such as local or regional market conditions, dependence of the state's fishing industry on summer flounder, and community resilience characteristics of ports and communities in each state. Overall, the *status quo* socioeconomic condition relative to commercial allocations is mixed.

Throughout the development of this amendment, states have reported varied socioeconomic impacts resulting from their current allocation share. Some Northern states have reported negative socioeconomic impacts due to a perceived mismatch between their current allocation and summer flounder availability in their waters, especially in recent years as the stock distribution and center of biomass have appeared to shift northward. New York in particular has reported negative socioeconomic impacts of their current allocation as the result of a) perceived problems with the original 1980-1989 landings data used to set current allocations, b) relatively higher availability in waters off of New York relative to their current allocation shares, and c) a disparity in their allocation compared to two nearby states, Rhode Island and New Jersey. Other states have experienced long-term positive socioeconomic impacts from the existing quota allocations, in particular Rhode Island, New Jersey, Virginia, and North Carolina, which have the highest allocation shares and the highest resulting revenues.

Recent socioeconomic information for the commercial summer flounder fishery is provided in section 6.5. Overall, alternative 2A is expected to maintain the current socioeconomic conditions by state, resulting in mixed and variable impacts by state ranging from moderate negative to moderate positive.

7.2.5.2 Alternative 2B: Adjust State Quotas Based on Recent Biomass Distribution

As described above, alternative 2B, under either of its sub-alternatives 2B-1 and 2B-2, would shift quota allocation from the Southern region of the management unit (North Carolina through New Jersey) to the Northern region (New York through Maine). Both sub-alternatives are expected to result in a range of socioeconomic impacts that vary by state, with increased revenues in states New York and north and decreased revenues in states New Jersey and south.

Under alternative 2B-1, the total amount of allocation shifted from the South to the North would be 6% (with Northern states increasing their relative allocations by 19% and southern states decreasing their relative allocations by 9%), while under 2B-2, allocation shifted to the North from the South would be 13% of the coastwide allocation (with the Northern states increasing their allocations by 40% and the Southern states decreasing theirs by 19%). Each state's change in revenues is expected to be heavily influenced by the percentage change in that state's allocation, relative to their existing allocation. It is impossible to precisely predict the impacts to revenue and employment from changes in allocation, since the distribution of socioeconomic benefits will vary based on a number of factors. Among these factors are: state/port level interest in and dependence on the summer flounder fishery, current or future state level restrictions on the number of participants, other state management measures to constrain harvest to the allocation, and broader economic resilience of each state and port. The distribution of economic benefits will depend on operation costs, price and other market conditions that vary by location and over time.

Alternative 2B-2 would be expected to have greater positive socioeconomic benefits to the Northern states compared to alternative 2B-1, as this sub-alternative presents a more substantial shift in allocation from the southern states to the northern states. Likewise, alternative 2B-2 would have more negative socioeconomic impacts on southern states. Under alternative 2B-1, the total amount of allocation shifted from the South to the North would be 6% (with Northern states increasing their relative allocations by 19% and southern states decreasing their relative allocations by 9%), while under alternative 2B-2, allocation shifted to the North from the South would 13% of the coastwide allocation (with the Northern states increasing their allocations by 40% and the Southern states decreasing theirs by 19%). In both cases, allocation shifts of this magnitude could have substantial impacts on some states.

Specifically, alternatives 2B-1 and 2B-2 are likely to have high positive impacts for the states of New York through Massachusetts, all of which have important directed fisheries for summer flounder. Slight positive impacts are possible for Maine and New Hampshire given that these northern states do not currently have a directed fishery for summer flounder and currently have a very small portion of the coastwide allocation. The increase in allocation under alternatives 2B-1 and 2B-2 would result in Maine and New Hampshire maintaining a very low percentage of the coastwide quota (less than 0.07%) and is unlikely to encourage these states to develop directed fisheries for summer flounder. However, increased allocation could result in increased flexibility for fishermen in these states to land and sell a slightly higher total amount of any incidentally caught summer flounder if desired. These states could also transfer their small poundage amounts of allocation to other states.

Alternatives 2B-1 and 2B-2 are expected to have a range of impacts on southern states ranging from slight negative to high negative. For most states New Jersey through North Carolina, summer flounder is an important target species, and a loss of 9% or 19% of their current allocation (under alternatives 2B-1 and 2B-2, respectively) is likely to result in moderate to high negative impacts in states with directed fisheries. The state of Delaware does not have a directed fishery for summer flounder, but could experience slight negative socioeconomic impacts due to a reduced allocation for summer flounder bycatch. Delaware typically is allocated zero quota at the beginning of each fishing year due to a substantial overage many years ago. A reduced allocation for Delaware would likely ensure that this pattern continues and that summer flounder incidental landings would continue to be restricted in that state.

The general expected impacts of alternatives 2B-1 and 2B-2 is summarized in Table 54. Overall, alternative 2B is likely to result in a range of impacts from high negative to high positive depending on the state, with alternative 2B-2 having distributional impacts of higher magnitude.

Compared to the other allocation alternatives, the impacts of alternative 2B are difficult to determine due to the uncertainty in how vessels will respond and how fishing patterns may change under each alternative. However, alternative 2B is expected to have impacts of higher magnitude than alternative 2A, as revised allocations will permanently increase or decrease the quota in each state, likely resulting in more severe positive or negative consequences depending on the state. Compared to alternative 2C, alternative 2B is also more likely to have a higher magnitude of positive or negative impacts (depending on the state), as allocation changes would be permanently revised from *status quo,* while under 2C there is the potential for *status quo* allocation and in addition has a higher likelihood that costs/benefits will be shared more equally over time as the quota fluctuates above and below the trigger points. Compared to alternative 2D, the impacts of alternative 2B are uncertain due to the high uncertainty in how alternative 2D will modify the fishery. However, alternative 2D is likely to have more severe positive or negative impacts to states and individual businesses as this alternative is more of a departure from the current management system.

Table 54: Expected impacts by state of alternatives 2B-1 and 2B-2.

State	2B-1 % increase/decrease relative to current allocation	2B-1 likely impacts	2B-2 % increase/decrease relative to current allocation	2B-2 likely impacts
ME	+19%	No impact to slight positive	+40%	No impact to slight positive
NH	+19%	No impact to slight positive	+40%	No impact to slight positive
MA	+19%	Moderate to high positive	+40%	High positive
RI	+19%	Moderate to high positive	+40%	High positive
CT	+19%	Moderate to high positive	+40%	High positive
NY	+19%	Moderate to high positive	+40%	High positive
NJ	-9%	Moderate to high negative	-19%	High negative
DE	-9%	No impact to slight negative	-19%	No impact to slight negative
MD	-9%	Moderate to high negative	-19%	High negative
VA	-9%	Moderate to high negative	-19%	High negative
NC	-9%	Moderate to high negative	-19%	High negative

7.2.5.3 Alternative 2C: Revise State Allocations Above a Commercial Quota Trigger Point

Under alternative 2C, final state percentage allocations would vary in each year depending on the overall coastwide quota, because the overall allocation percentages vary depending on how much additional quota there is to be distributed. For quotas up to the trigger point, allocations remain *status quo*. In years when the allocation is below the trigger, allocations would be *status quo* and would result in the same socioeconomic impacts as described under alternative 2A (variable by state ranging from moderate negative to moderate positive).

As the annual commercial quota level grows beyond the quota trigger, the state quota allocation percentages get closer together, i.e., with increasing quotas above the trigger, quota is distributed more evenly among the states. Under both sub-alternatives, states with current allocations above 12.375% of the coastwide quota (NC, VA, RI, and NJ) will lose allocation percentage as the quota grows beyond the trigger point, likely leading to negative economic impacts for these states relative to the *status quo*. In years when the annual quota was above the trigger, the impacts to each state would vary depending on the final quota and thus the final allocation, with more extreme changes to allocation occurring in years where the quota is well above average. Under annual quotas that are marginally higher than the trigger amount, slight negative impacts (to NC, VA, RI, and NJ) and slight positive impacts (to all other states) are possible; in years where the annual quota is well above the trigger, the impacts have the potential to be high in magnitude due to substantial modifications to the coastwide allocation.

As described in section 7.2.1.3, the fact that the state allocations vary with the annual coastwide quota makes the impacts of alternatives 2C-1 and 2C-2 somewhat difficult to predict; however, general conclusions can be reached by evaluating what is reasonably expected in terms of commercial quotas in future years. During the period of 1993-2018, annual commercial quotas have ranged from a low of 5.66 million pounds (2017) to a high of 17.9 million pounds (2005). If quotas were to shift out of this range substantially based on new stock information, it is likely that the quota trigger would need to be re-evaluated.

As described in section 5.2.3, the triggers under both sub-alternatives would have been exceeded in the majority of years from 1993-2018. Under 2C-1, historical quotas would have been exceeded in 22 out of 26 years, and under 2C-2, the trigger would have been exceeded in 19 out of 26 years. In the past few years (particularly since 2016), quotas have been below the time series average, meaning that from 2016-2018, the quota trigger would not have been exceeded under either option. However, in most years, if annual quotas remain generally within their historical range, allocations would be modified in most years, to varying degrees (see section 5.2.3, Figure 5 and Table 13).

States that currently have allocations between 2% and 12.5% (MD, CT, NY, and MA) are likely to strongly benefit from these alternatives in years where the annual quota is moderately to substantially above the trigger, whereas the states of North Carolina and Virginia may lose a substantial portion of their quota in years where the annual quota is relatively high. The potential negative economic impacts associated with states that lose share of the overall quota could be somewhat mitigated by the fact that this loss would only happen in relatively higher quota years, meaning revenues for these states may be more stable than what would be expected under a permanent reallocation. For all states, the annual variability in allocation under this alternative may lead to reduced predictability in revenues and a reduced ability to plan for business and infrastructure needs.

The impacts to the states of Maine, New Hampshire, and Delaware are likely to be minimal given that these states currently have only incidental fisheries; there is little to no directed fishing effort. In addition, the alternatives as proposed, while increasing these states allocations by a large percentage relative to their current allocation, still result in very small allocations (less than 0.2%) given that their starting allocations are very small. Thus, both alternatives are likely to have small magnitudes of positive impacts on these states.

The difference between alternative 2C-1 and 2C-2 is the annual quota trigger, which would impact in how many future years the allocation is modified. Alternative 2C-1 is likely to have a higher magnitude of impacts (positive or negative depending on the state) in the long-term compared to alternative 2C-2 given that the trigger is lower and thus allocations would be modified more frequently under this alternative compared to 2C-2.

The general expected impacts of alternatives 2C-1 and 2C-2 is summarized in Table 55. Because the percentage change for each state would vary by year, a range is shown based on historic quotas from 1993-2018. It is important to note that in recent years the annual quotas have been relatively lower and therefore the percentage change for each state would be on the lower end of this range if quotas remained similar to the last few years.

Overall, alternatives 2C-1 and 2C-2 are expected to result in a range of socioeconomic impacts from high negative to high positive, depending on the state and the annual quota in each year.

Again, see section 5.2.3 for a range of annual quotas relative to the proposed triggers and the range of state allocations that result.

Table 55: Expected impacts by state of alternatives 2C-1 and 2C-2, under historic range of commercial quotas.

State	2C-1 % increase/decrease relative to current allocation[a,b]	2C-1 likely impacts	2C-2 % increase/decrease relative to current allocation[a,c]	2C-2 likely impacts
ME	0 % to +319%	No impact to slight positive	0 % to +241%	No impact to slight positive
NH	0 % to +38,404%	No impact to slight positive	0 % to +29,067%	No impact to slight positive
MA	0 % to +43%	No impact to high positive	0 % to +33%	No impact to high positive
RI	0 % to -11%	No impact to high negative	0 % to -8%	No impact to high negative
CT	0 % to +238%	No impact to high positive	0 % to +180%	No impact to high positive
NY	0 % to +33%	No impact to high positive	0 % to +25%	No impact to high negative
NJ	0 % to -14%	No impact to high negative	0 % to -10%	No impact to high negative
DE	0 % to +941%	No impact to slight positive	0 % to +712%	No impact to slight positive
MD	0 % to +269%	No impact to high positive	0 % to +204%	No impact to high positive
VA	0 % to -22%	No impact to high negative	0 % to -17%	No impact to high negative
NC	0 % to -29%	No impact to high negative	0 % to -22%	No impact to high negative

[a] Variable annually as allocation varies with annual quota; range provided covers historic commercial quotas, 1993-2018. Percent increases/decreases may vary from this range if future coastwide quotas exceed historic high quota of 17.9 million lb. Annual quotas below the historic low would result in *status quo* allocations.
[b] Annual quotas would have exceeded the 2C-1 trigger in 22 out of 26 years from 1993-2018; see section 5.2.3.
[c] Annual quotas would have exceeded the 2C-2 trigger in 17 out of 26 years from 1993-2018; see section 5.2.3.

Compared to the other allocation alternatives, the impacts of alternative 2C are difficult to determine due to the uncertainty in how vessels will respond and how fishing patterns may change under each alternative. However, alternative 2C is expected to have impacts of higher magnitude than alternative 2A, as revised allocations will increase or decrease the quota in each state annually, likely resulting in more fluctuations in revenues and fishing effort in each state. Compared to alternative 2B, alternative 2C is likely to have a lower magnitude of positive or negative impacts (depending on the state), as allocation changes would not be permanent. In addition, alternative 2C could result in costs/benefits to each state that would be shared more equally over time as the quota fluctuates above and below the trigger points. Compared to alternative 2D, the impacts of alternative 2C are uncertain due to the high uncertainty in how alternative 2D will modify the fishery. However, alternative 2D is likely to have more severe positive or negative impacts to states and individual businesses as this alternative is more of a departure from the current management system.

7.2.5.4 Alternative 2D: Implement "Scup Model" Quota System for Summer Flounder

Alternative 2D (the "scup model" allocation) is the most extreme departure from current management given that it opens the winter fishery to any permitted vessel. Because this quota system eliminates the historical year-round state-by-state quota system, the expected impacts of this alternative are highly uncertain, more so than the impacts of the other allocation options.

It is very difficult to predict the socioeconomic impacts of this alternative on any given state due to uncertainty regarding how many vessels would participate in the winter fishery, and what specific management measures would be implemented under each quota period. In addition, this alternative could have a relatively higher impact on market conditions for summer flounder, which would influence the distribution of socioeconomic benefits. Alternative 2D could lead to high fishing effort toward the beginning of each winter period, which could lead to increased competition for fishing grounds and market share. One possible scenario is that an influx of effort at the start of the winter coastwide periods may result in an increase in overall landings during those time periods, resulting in possible price declines. As discussed in section 7.1, there are currently a large number of latent federal permits for summer flounder, although most of the permits discussed for elimination from the fishery under alternative set 1 have not been active or have been minimally active in recent years.

The overall impacts of alternative 2D are highly uncertain, but are likely to be more variable at the vessel and shoreside business level compared to the other allocation alternatives, as different businesses would be expected to have varying levels of success under coastwide quota periods implemented for half the year. Some vessels would likely be unsuccessful in maintaining stable revenues under this management system, if they are unable to remain competitive during coastwide fishing periods, particularly if an influx of effort under coastwide management increased competition. However, some vessels are highly likely to benefit from a scup model management system. Larger vessels that are capable of remaining competitive in the offshore winter fishery, as well as smaller vessels that participate primarily in the summer fishery in states with moderate to high summer allocations are likely to benefit.

Shoreside communities would also be impacted by alternative 2D. Many states have invested heavily in shoreside infrastructure to support their state's fleet. Under alternative 2D, the distribution of landings in the winter would be driven more by vessel preference and market factors, which would positively impact some shoreside businesses and negatively impact others. It is difficult to predict how the distribution of landings by state and port would change, and therefore difficult to reach conclusions regarding distributional impacts. Stakeholders and managers have asserted that under alternative 2D, southern shoreside businesses in Virginia and North Carolina would be negatively impacted. Under coastwide measures and allocation, vessels are more likely to opt to land in states that are closer to the center of distribution of the resource and/or in ports where market conditions may be more favorable at the time of landing. Some ports will likely see increased landings during coastwide management periods. Thus, the impacts on shoreside infrastructure and associated jobs are likely to range from high negative to high positive, however these impacts are uncertain and depend on market factors and fishermen behavior.

Similar to alternatives 2B and 2C, the states of Maine, New Hampshire, and Delaware will have smaller expected impacts compared to other states given that these states do not currently participate in a directed fishery for summer flounder. Under alternative 2D, it is possible that some directed effort from vessels in these states would enter the fishery, although the extent to which this would occur is unknown.

The difference between alternative 2D-1 and 2D-2 is whether or not the state of Maryland is exempt from the three-period quota system. Under alternative 2D-1, Maryland will maintain their existing state allocation and continue managing under their IFQ system. In this case, for Maryland, the socioeconomic impacts are likely to be moderate to high positive. Maryland has reported relative success in managing their fishery under this IFQ system for many years, due to relatively high stability and predictability for IFQ vessels. Under alternative 2D-2, the state of Maryland has indicated that high negative socioeconomic impacts are possible given that the "scup model" system is incompatible with their IFQ management. IFQ holders would be unable to maintain their individual quotas, except for possibly in the summer months. For all other states, there would likely be a negligible difference between these two sub-alternatives.

The general expected impacts of alternatives 2D-1 and 2D-2 is summarized in Table 56. Overall, alternative 2D is likely to have impacts to human communities ranging from high negative to high positive, and would vary by individual vessel and shoreside community.

As described above, compared to the other allocation alternatives, the impacts of alternative 2D are the most difficult to determine, as this alternative is associated with the highest uncertainty regarding impacts on vessel participation, fishing effort, landings patterns, and market responses. Relative to alternative 2A, alternative 2D is expected to have a higher magnitude of positive or negative impacts to states and businesses, due to the substantial change in the management system that will benefit some and negatively impact others. Compared to alternative 2C, alternative 2D is also more likely to have a higher magnitude of positive or negative impacts (depending on the state), as allocation under 2C has the potential to be *status quo* in some years and in general is less of a departure from the *status quo* allocation in any year. Thus, alternative 2D is likely to have the largest range of positive and negative impacts on states and businesses due to the large range of possible responses from affected entities, and the likelihood that this system would have larger distributional impacts among vessels.

Table 56: Expected impacts by state of alternatives 2D-1 and 2D-2.

State	2D-1 % increase/ decrease relative to current allocation	2D-1 likely impacts	2D-2 % increase/ decrease relative to current allocation	2D-2 likely impacts
ME	Unknown/ variable	No impact to slight positive	Unknown/ variable	No impact to slight positive
NH		No impact to slight positive		No impact to slight positive
MA		Uncertain/variable, high negative to high positive, depending on vessel and port level outcomes		Uncertain/variable, high negative to high positive, depending on vessel and port level outcomes
RI				
CT				
NY				
NJ				
DE		No impact to slight positive		No impact to slight positive
MD		Moderate to high positive given exemption and maintenance of current allocation		Moderate to high negative given resulting incompatibility with current IFQ system
VA		Variable, high negative to high positive, depending on vessel and port level outcomes; more likely to result in negative impacts due to loss of higher allocation and impacts to shoreside infrastructure		Variable, high negative to high positive, depending on vessel and port level outcomes; more likely to result in negative impacts due to loss of higher allocation and impacts to shoreside infrastructure
NC		Variable, high negative to high positive, depending on vessel and port level outcomes; more likely to result in negative impacts due to loss of higher allocation and impacts to shoreside infrastructure		Variable, high negative to high positive, depending on vessel and port level outcomes; more likely to result in negative impacts due to loss of higher allocation and impacts to shoreside infrastructure

7.2.6 Summary of Impacts of Alternative Set 2

The quota reallocation alternatives under alternative set 2 are not expected to impact overall fishing effort in terms of annual catch and landings (i.e., total removals of summer flounder from the commercial fishery), which will remain driven by annual catch and landings limits. The allocation alternatives will primarily affect access to the resource at the state/and or individual fishing vessel level within the management unit, depending on the allocation option selected. This could result in a somewhat modified distribution of fishing effort in space and time, although the extent to which this would occur is difficult to predict. In general, the commercial fishery for summer flounder is typically prosecuted by larger trawl vessels fishing offshore in federal waters in the winter months (approximately late October through April), while summer effort (approximately May through early October) takes place primarily in state waters from a mix of gear types and vessels sizes. These patterns correspond with the seasonal inshore-offshore migrations of summer flounder (see section 6.1.3.1.)

Under reallocation alternatives, offshore winter fishing effort is not expected to change substantially in terms of location, as the larger vessels that typically participate in this season have historically been more mobile vessels that target prime summer flounder fishing locations offshore even when long travel distances are required to do so. For this fleet, footprints of fishing effort do not necessarily closely correlate with distance from state of landing. However, it is also possible that there could be a shift in the balance of offshore winter vs. inshore summer effort under some reallocation alternatives, due to changes in the allocation for states that are dominant in the winter fishery.

Nearshore effort observed mainly in the summer months (prosecuted by a variety of vessel types with more representation from smaller day boats) may see a small to moderate shift in location under some reallocation alternatives, as discussed below; however, the extent to which this may occur is difficult to predict and would depend on other factors such as management response to increased or decreased quotas.

It is difficult to determine how these possible changes in fishing location will affect fleet-wide costs. Inshore fishing requires less fuel consumption than offshore, but there may be more vessels active in the inshore fishery than offshore. It is possible that a reallocation that will result in more inshore fishing effort will result in lower costs per vessel, but fleet-wide summer flounder fishing related costs could conceivably increase.

The reallocation alternatives are expected to modify the distribution of landings (and thus revenues) by state and port, resulting in impacts to vessels, shoreside businesses, and communities/states. Changes in access to quota could also impact effort changes related to the total number and duration of trips and hauls for summer flounder, if modified allocations resulted in modified participation in terms of vessel types, vessel sizes, or gear types; however, in general these changes are not expected to be substantial.

Table 57: Summary of impacts of Alternative Set 2: commercial quota allocation.

Alternative	Description	Expected Impacts				
		Summer flounder	***Non-target species***	***Habitat***	***Protected Resources***	***Human communities***
2A	No action/*status quo*	Moderate +	Moderate +	Indirect slight negative	Slight - to Slight +	Mixed; Moderate + to Moderate - depending on state
2B-1	Adjust state quotas based on northern region percent change in exploitable biomass	Moderate +	Uncertain; Slight - to Moderate +	Indirect slight negative	Uncertain; Moderate - to Moderate +	Mixed; High - to High+ depending on state
2B-2	Adjust state quotas based on absolute change in regional proportion of exploitable biomass	Moderate +	Uncertain; Slight - to Moderate +	Indirect slight negative	Uncertain; Moderate - to Moderate +	Mixed; High - to High+ depending on state
2C-1	Revise state allocations above 8.40 million lb commercial quota trigger point	Moderate +	Uncertain; Slight - to Moderate +	Indirect slight negative	Uncertain; Moderate - to Moderate +	High - to High + depending on state, variable with annual quota
2C-2	Revise state allocations above 10.71 million lb commercial quota trigger point	Moderate +	Uncertain; Slight - to Moderate +	Indirect slight negative	Uncertain; Moderate - to Moderate +	High - to High + depending on state, variable with annual quota
2D-1	Scup model with exemption for Maryland	Moderate +	Uncertain; Slight - to Moderate +	Indirect slight negative	Uncertain; Moderate - to Moderate +	Uncertain; High - to High +; variable by state and vessel
2D-2	Scup model with no exemption for Maryland	Moderate +	Uncertain; Slight - to Moderate +	Indirect slight negative	Uncertain; Moderate - to Moderate +	Uncertain; High - to High+; variable by state and vessel

7.3 IMPACTS OF ALTERNATIVE SET 3: LANDINGS FLEXIBILITY FRAMEWORK PROVISIONS

The framework provision alternatives proposed in this action are administrative and intended to simplify and improve the efficiency of future landings flexibility actions to the extent possible. Under this alternative set, the Council and Board would either take no action, or modify the list of framework provisions in the FMP, which would have no effect on summer flounder management until a future framework action was developed and implemented through a separate process. The purpose of modifying the list of "frameworkable items" in the FMP is to demonstrate that the concepts included on the list have previously been considered in an amendment (i.e., they are not novel).

Because these alternatives are administrative, they are expected to have no impacts on any of the VECs. The impacts of any future framework action relevant to landings flexibility would be analyzed through a separate process, including additional opportunities for public comment.

It is not possible to predict the magnitude and direction of impacts of any future landings flexibility framework actions, because impacts will depend on the configuration of landings flexibility. Future actions would need to define how landings flexibility would work, including resolving questions related to who would be allowed to or required to participate in landings flexibility programs, how such policies should be enforced, and how quota would need to be transferred to maintain the underlying state-by-state quota system (if quota remains allocated by state). As previously mentioned, alternatives 3A and 3B themselves will not have direct impacts on any of the VECs, however, some general considerations for future framework actions are briefly described below to provide additional context for decision making on these alternatives.

Alternative 3A: No Action/Status Quo

Alternative 3A would make no changes to the current list of framework provisions in the Council's FMP. Any future proposed landings flexibility policy that required coastwide participation or modification to the federal measures would likely require a full FMP amendment. The timeline and complexity of such an amendment would heavily depend on the nature of options considered and to what extent landings flexibility could work within the existing management program.

States would remain free to develop landings flexibility agreements by state-level agreements, provided that such agreements are consistent with other Council and Commission FMP requirements and would not require modification to the federal management measures.

Alternative 3B: Add Landings Flexibility as a Frameworkable Issue in the FMP

Under this alternative, any future landings flexibility framework action (likely developed in conjunction with a Commission addendum) would be analyzed through a separate process with associated public comment opportunities and a full description of expected impacts.

Landings flexibility policies have been suggested as a means of addressing rising fishing costs, fuel use, increasing adaptability to market conditions, addressing safety concerns, adapting to a changing distribution of fish, and improving efficiency. However, landings flexibility also raises questions and concerns relative to enforcement (e.g., which state's measures are enforced), administrative burdens associated with associated quota transfers and monitoring, and possibly substantial impacts to shoreside operations. Additional concerns have been raised about the potential for flooding markets and rapid swings in market prices if many vessels ultimately chased ports with higher prices at a given time.

Given these issues, depending on how landings flexibility is configured, the social and economic impacts associated with a future framework action may be significant and require substantial analysis. Although the timeline for Magnuson Stevens Act requirements could be shortened by completing a framework instead of an amendment, **an EIS may still be required** for NEPA analysis depending on the expected impacts of future management options, **extending the timeline of a typical framework and possibly eliminating time savings entirely.**

7.4 CUMULATIVE EFFECTS ASSESSMENT

A cumulative effects assessment (CEA) is a required part of an EIS or EA according to the Council on Environmental Quality (CEQ) (40 CFR part 1508.7) and NOAA's agency policy and procedures for NEPA, found in NOAA Administrative Order 216-6. The purpose of the CEA is to integrate into the impact analyses the combined effects of many actions over time that would be missed if each action were evaluated separately. CEQ guidelines recognize that it is not practical to analyze the cumulative effects of an action from every conceivable perspective but, rather, the intent is to focus on those effects that are truly meaningful. This section serves to examine the potential direct and indirect effects of the alternatives in the Summer Flounder Commercial Issues Amendment together with past, present, and reasonably foreseeable future actions that affect the summer flounder environment. It should also be noted that the predictions of potential synergistic effects from multiple actions, past, present and/or future will generally be qualitative in nature.

7.4.1 Valued Ecosystem Components

Consistent with the guidelines for CEA, cumulative effects can be more easily identified by analyzing the impacts of the proposed action on valued ecosystem components (VECs). The affected environment is described in this document based on VECs that were identified for consideration relative to the proposed actions. The VECs described in this document and considered in this CEA are listed below.

VECs represent the resources, areas, and human communities that may be affected by a proposed action or alternatives and by other actions that have occurred or will occur outside the proposed action. VECs are generally the "place" where the impacts of management actions are exhibited. An analysis of impacts is performed on each VEC to assess whether the direct/indirect effects of an alternative adds to or subtracts from the effects that are already affecting the VEC from past, present and future actions outside of the proposed action (i.e., cumulative effects).

The Affected Environment is described in this document based on VECs that were identified specifically for this action, including:

1. The **managed resources,** i.e., summer flounder, the managed species potentially affected by the measures under consideration (impacts described in sections 7.1.1 and 7.2.1);
2. **Non-target species**, including the primary species or species groups that interact with summer flounder, summer flounder habitat, and/or commercial summer flounder fishing gear (impacts described in sections 7.1.2 and 7.2.2);
3. The **physical environment and habitat**, including Essential Fish Habitat (EFH; impacts described in sections 7.1.3 and 7.2.3);

4. **Protected resources**, including ESA-listed and MMPA-protected large and small cetaceans, pinnipeds, sea turtles, fish, and critical habitat occurring in the affected area (impacts described in sections 7.1.4 and 7.2.4);
5. The **human environment**, including socioeconomic aspects of the fisheries (especially commercial fisheries) targeting summer flounder and the communities associated with those fisheries, as well as other human communities with an interest in summer flounder conservation and management (impacts described in sections 7.1.5and 7.2.5).

7.4.2 Spatial and Temporal Boundaries

The geographic area that encompasses the physical, biological and human communities impacts to be considered in the cumulative effects analysis are described in detail in the Affected Environment (Section 6.0) of this amendment document. The geographic range for impacts to the target species (summer flounder), non-target species, and protected resources is the total range of each species. The geographic range for impacts to habitat and EFH is the range of the core operation of the summer flounder fishery, which generally corresponds to the management unit, i.e., the U.S. waters in the western Atlantic Ocean from the southern border of North Carolina northward to the U.S.-Canadian border with a core area of operation from Massachusetts through North Carolina. For human communities, the core geographic boundaries are defined as those U.S. fishing communities directly involved in the harvest of summer flounder and associated shore-side operations. These communities were found to occur in coastal states from Maine through North Carolina, with a core range from Massachusetts through North Carolina.

The temporal scope of the past and present actions for the target species, non-target species, habitat, and human communities is primarily focused on actions that have occurred after implementation of the main components of the FMP (Amendment 2; 1993). These actions reflect changes to the resource as a result of Council management. For endangered and other protected species, the scope of the past and present actions is on a species-by-species basis (section 6.4.2) and is largely focused on the 1980s and 1990s through the present, when NMFS began generating stock assessments and protections for marine mammals and turtles that inhabit the waters of the U.S. EEZ.

The temporal scope of future actions for all five VECs, which includes the measures proposed by this amendment, extends five years into the future following the expected effective date of these measures in 2020 (i.e., ~2020-2024). This period was chosen because the dynamic nature of resource management and lack of information on projects that may occur in the future make it difficult to predict impacts beyond this timeframe with any certainty.

7.4.3 Actions Other Than Those Proposed in This Document

The impacts of each of the alternatives considered in this amendment document are given in Sections 7.1 through 7.3. The text below describes the meaningful past (P), present (Pr), or reasonably foreseeable future (RFF) actions to be considered other than those actions being considered in this amendment document. Table 58 summarizes the possible impacts of these actions on each VEC. These impacts are described in chronological order and qualitatively, as the actual impacts of these actions are too complex to be quantified in a meaningful way. When any of these abbreviations occur together (i.e., P, Pr, RFF), it indicates that some past actions are still relevant to the present and/or future actions. A brief explanation of the rationale for concluding what effect each action has (or will have) had on each VECs is provided in the table and is not repeated here.

Note that most of these *other* actions come from *fishery-related activities* (e.g., Federal fishery management actions). Numerous actions have been taken to manage these fisheries through the establishment of the original FMPs and subsequent amendments and framework adjustment actions. The specifications process for annual catch limits to constrain catch and harvest, as required by the MSA, provides the opportunity for the Councils and NOAA Fisheries to regularly assess the status of the fisheries and to make necessary adjustments to ensure that there is a reasonable expectation of meeting the objectives of the FMPs. The statutory basis for federal fisheries management is the MSA. To the degree that this regulatory regime and National Standards are complied with, the cumulative impacts of past, present, and reasonably foreseeable future federal fishery management actions on the target and non-target species VECs should generally be associated with positive long-term outcomes, which should bring about long-term sustainability of human communities, especially those that are economically dependent upon the managed stocks.

Other FMP Actions

As with the summer flounder actions described in Table 58, there are many other FMPs and associated fishery management actions for other species that have impacted these VECs over the temporal scale described in section 7.4.2. These include FMPs managed by the Mid-Atlantic Fishery Management Council, New England Fishery Management Council, Atlantic States Marine Fisheries Commission, and to a lesser extent the South Atlantic Fishery Management Council and are developed in compliance with the MSA. They have had positive long-term cumulative impacts on managed and non-target species, habitat, and protected resources because they constrain fishing effort and manage stocks at sustainable levels. However, constraining fishing effort through regulatory actions can have negative short-term economic impacts. These impacts are sometimes necessary to bring about long-term sustainability of a resource, and should, in the long-term, promote positive effects on human communities.

In some cases, fishery management plan actions are developed in an omnibus fashion to update many plans at once. Actions associated with other FMPs and omnibus amendments have included measures to regulate fishing effort for other species, measures to protect habitat and forage species, and fishery monitoring and reporting requirements. One special case set of omnibus actions are the Standardized Bycatch Reporting Methodology (SBRM) amendments, which cover Federal waters fisheries managed by the New England and/or Mid-Atlantic Councils. The first SBRM amendment 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 FR 37182). The updated regulations modify the following elements of the monitoring program: new prioritization process for allocation of observers if agency funding is insufficient to achieved target observer coverage level; bycatch reporting and monitoring mechanisms; analytical techniques and allocation of at sea fisheries observers; a precision-based performance standard for discard estimates; a review and reporting process; framework adjustment and annual specifications provisions; and provisions for industry-funded observers and observer set-aside programs. Separate from the SBRM amendment, NMFS, in collaboration with the MAFMC and NEFMC, is currently developing an industry funded monitoring amendment. The Omnibus Observer Coverage Amendment will not necessarily result in immediately increased observer coverage because sufficient funds (from both industry for at-sea coasts and NOAA for shore side costs) may not be available. Rather, this amendment will set a mechanism for increasing observer coverage should sufficient funding become available. The MAFMC also recently developed an Omnibus Unmanaged Forage Amendment (82 FR 40721), to prohibit the development of new, or expansion of existing, directed fisheries on unmanaged forage species until adequate scientific information is available to promote ecosystem sustainability. This action could affect the summer flounder resource, non-target species, and protected resources as it provides some protections for forage species that may prey on or be preyed on by these species at various life stages.

Regarding protected resources, an Atlantic Trawl Gear take reduction strategy for long-finned pilot whales (*Globicephala melas*), short-finned pilot whales (*Globicephala macrorhynchus*), white-sided dolphins (*Lagenorhynchus acutus*), and common dolphins (*Delphinus delphis*) has been developed and is described in Section 6.

Summary of Non-Fishing Effects

In addition to the direct effects on the environment from fishing, the cumulative effects (from past, present, and reasonably foreseeable future actions) to the physical and biological dimensions of the environment may also come from non-fishing activities. Non-fishing activities that have meaningful effects on the VECs include the introduction of chemical pollutants, sewage, changes in water temperature, salinity, dissolved oxygen, and suspended sediment into the marine environment. Human-induced non-fishing activities that affect the VECs under consideration in this document are those that tend to be concentrated in nearshore areas. Examples of these activities include, but are not limited to agriculture, port maintenance, beach nourishment, coastal development, marine transportation, marine mining, dredging, and the disposal of dredged material. These activities pose a risk to all of the identified VECs in the long term. Wherever these activities co-occur, they are likely to work additively or synergistically to decrease habitat quality and, as such, may indirectly lower the maximum sustainable yield of the managed resources, and negatively affect non-target species (including deep sea corals) and protected resources.

The overall impact to the affected species and their habitats on a population level is no impact to slight negative, since a large portion of these species have a limited or minor exposure to these local non-fishing perturbations. Decreased habitat suitability would tend to reduce the tolerance of those VECs to the impacts of fishing effort. Impacts from non-fishing activities generally relate to habitat loss from human interaction and alteration or natural disturbances. Mitigation of this outcome through regulations that would reduce fishing effort could then negatively impact human communities.

Non-fishing activities permitted under other federal agencies (e.g. beach nourishment, offshore wind facilities, etc.) 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). 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 and by commenting on federal actions likely to substantially affect habitat.

In addition to the activities above, in recent years, offshore wind energy and oil and gas exploration have become more relevant activities in the Greater Atlantic region that are expected to impact all VECs, as described below. For potential biological impacts of wind, the turbines and cables may influence water currents and electromagnetic fields, respectively, which can affect patterns of movement for various species (target, non-target, protected). Habitats directly at the turbine and cable sites would be affected and there could be scouring concerns around turbines. Impacts on human communities in the general sense will be mixed – there will be economic benefits in the form of jobs associated with construction and maintenance, and replacement of some electricity generating fossil fuels with renewable resources. But there may be negative effects on fishing activities in terms of effort displacement, or making fishing more difficult or expensive near the turbines or cables.

For oil and gas, this timeframe would include leasing and possible surveys. Seismic surveys impact the acoustic environment within which marine species live, and have uncertain effects on fish behaviors that could cumulatively lead to negative population level impacts. The science on this is fairly uncertain. If marine resources were affected by seismic, then so in turn the fisherman targeting the resources would be affected. However, there would be an economic component in the form of increased jobs where there may be some positive effects on human communities.

While there are currently no operational wind farms in Mid-Atlantic waters, potential offshore wind energy sites have been identified off Virginia, Maryland, New Jersey, Delaware, and New York, and there are several proposals to develop wind farms in both nearshore and offshore waters. In New England, offshore wind project construction south of Massachusetts/Rhode Island may begin as early as 2019 (three projects including Vineyard Wind, Bay State Wind, and South Fork Wind Farm). Additional areas have been leased and will have site assessment activities in the next few years. These projects could have slight negative impacts on EFH, as well as summer flounder, non-target, and fishing communities if there are any negative impacts on those resources. Furthermore, there could be negative impacts on protected species of birds and marine mammals if they interact with the wind farms.

The overall impact of offshore wind energy and oil and gas exploration on the affected species and their habitats on a population level is unknown, but likely to range from no impacts to moderate negative, depending on the number and locations of projects that occur, as well as the effects of mitigation efforts.

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. 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). Climate change will potentially exacerbate the stresses imposed by fishing and other non-fishing human activities and stressors (described in this section).

Regarding climate change, all of the species considered in this document are potentially vulnerable to changing climate conditions. NOAA scientists have recently developed an assessment of the climate vulnerability of 82 fish and invertebrate species in the Northeast region, including exploited, forage, and protected species. The results of the assessment were published in Hare et al. (2016). Results from this "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 these species to the changing environment (Hare et al. 2016).

Based on this assessment, summer flounder was determined to have a moderate vulnerability to climate change. The exposure of summer flounder 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 occur during all life stages. Summer flounder is an obligate estuarine-dependent species that spawns on the shelf and juveniles develop in estuaries. Adults make seasonal north-south migrations exposing them to changing condition inshore and offshore. The distributional vulnerability of summer flounder was ranked as "high," given that summer flounder spawn in shelf waters and eggs and larvae are broadly dispersed. Adults make regional-scale north-south migrations seasonally. Adults use a range of habitats including estuarine, coastal, and shelf. The life history of the species has a strong potential to enable shifts in distribution. Summer flounder were determined to have low biological sensitivity to climate change (Hare et al. 2016).[32]

Overall climate vulnerability results for additional Greater Atlantic species, including most of the non-target species identified in this action, are shown in Figure 49 from Hare et al. 2016. Overall, 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 on stakeholders will depend on stakeholder and community dependence on the fisheries, and their capacity to adapt to change. Commercial and recreational fisheries may adapt to change 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 (MAFMC 2014).

[32] The climate vulnerability profile for Summer Flounder is available at: https://www.st.nmfs.noaa.gov/ecosystems/climate/northeast-fish-and-shellfish-climate-vulnerability/index

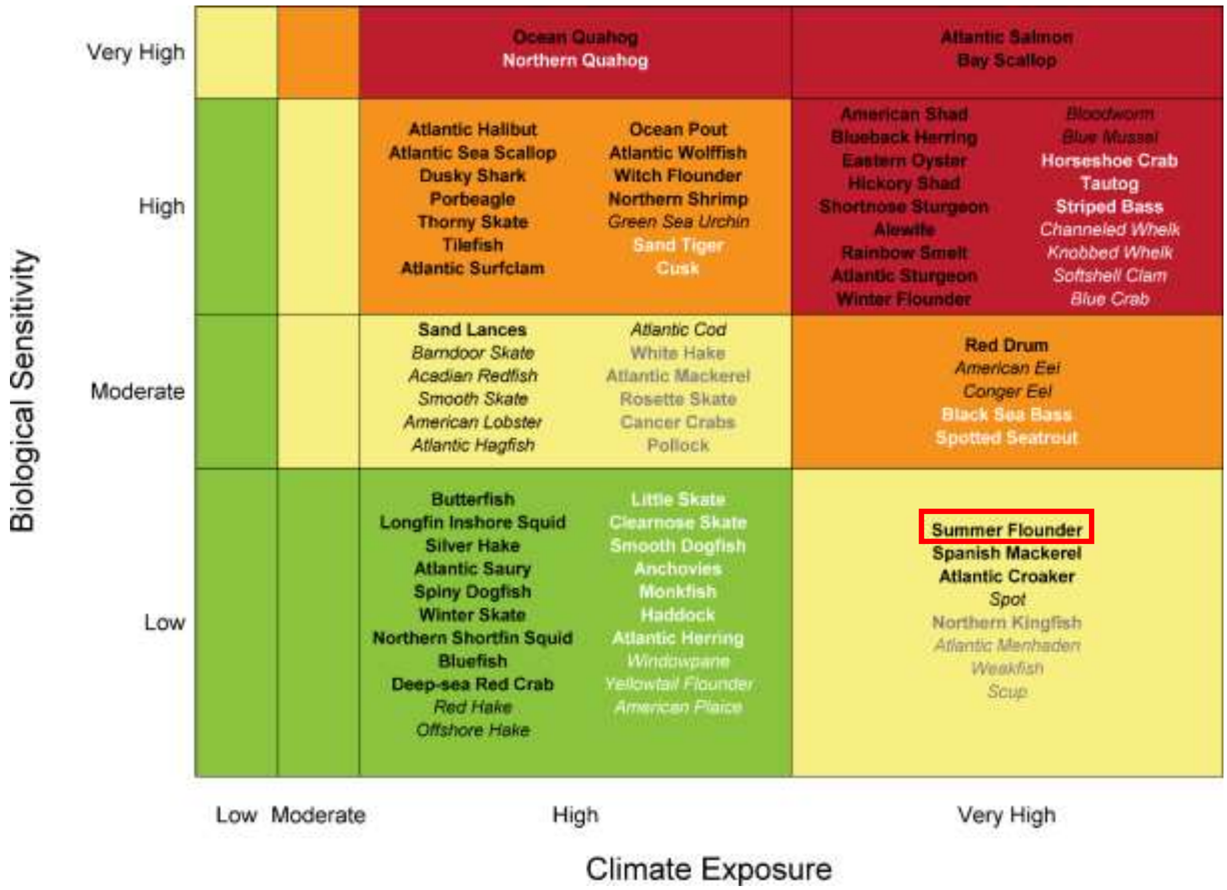

Figure 49: Overall climate vulnerability score for Greater Atlantic species analyzed in Hare et al. 2016, with summer flounder highlighted in red box. Overall climate vulnerability is denoted by color: low (green), moderate (yellow), high (orange), and very high (red). Certainty in score is denoted by 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.

The overall impacts of these *other* (past, present, and reasonably foreseeable) actions are summarized in Table 58 and discussed below. These impacts, in addition to the impacts of the management actions being developed in this document (Section 7), comprise the total cumulative effects that will contribute to the significance determination for each of the VECs exhibited later in Table 61.

Table 58: Summary of Past (P), Present (Pr), and Reasonably Foreseeable Future (RFF) actions other than those proposed in this document, and their associated impacts. "The FMP" refers to the Summer Flounder, Scup, and Black Sea Bass FMP except where otherwise specified.

FISHERY RELATED ACTIONS						
Action	**Description**	**Impacts on Managed Resources**	**Impacts on Non-target Species**	**Impacts on Habitat and EFH**	**Impacts on Protected Species**	**Impacts on Human Communities**
[P] Original FMP	Established management plan for summer flounder.	**Direct Positive** Regulatory tool available to rebuild and manage stocks and to regulate fishing effort	**Indirect Positive** Regulated fishing effort and gear use	**Indirect Positive** Reduced fishing effort; gear requirements	**Indirect Positive** Regulated fishing effort; gear requirements	**Indirect Positive** Benefited domestic businesses
[P, Pr, RFF] Annual specifications for the FMP species [P, Pr, RFF]	Establish quotas, recreational harvest limits, and other fishery regulations (commercial and recreational)	**Indirect Positive** Regulatory tool to specify catch limits, and other regulations; allows response to annual stock updates	**Indirect positive** Regulates fishing effort and can include measures to respond to bycatch	**Indirect Slight Negative** Allows continuation of fishing effort that prevents recovery of degraded habitats	**Indirect Positive** Regulated fishing effort; gear requirements	**Indirect Positive** Benefited domestic businesses
[P] Amendment 2 to the FMP	Established rebuilding schedule, commercial quotas, recreational harvest limits, size limits, gear restrictions, permits, and reporting requirements for summer flounder; Created the Summer Flounder Monitoring Committee.	**Direct Positive** Regulatory tool available to rebuild and manage stocks and to regulate fishing effort	**Indirect Positive** Regulated fishing effort and gear use	**Indirect Positive** Reduced fishing effort; gear requirements	**Indirect Positive** Regulated fishing effort; gear requirements	**Indirect Positive** Benefited domestic businesses

FISHERY RELATED ACTIONS						
Action	**Description**	**Impacts on Managed Resources**	**Impacts on Non-target Species**	**Impacts on Habitat and EFH**	**Impacts on Protected Species**	**Impacts on Human Communities**
P Frameworks 2 and 6 to the FMP P	Established state-specific and region-specific recreational conservation equivalency measures.	**Indirect Positive** Regulatory tool available to constrain recreational harvest	**Indirect Positive** Regulatory tool to constrain recreational harvest and effort impacting non-target species	**Indirect Slight Negative** Allows continuation of fishing effort that prevents recovery of degraded habitats	**Likely Indirect Negative to Indirect Positive** Maintains fishing effort; negatively impacting species with poor stock status and positively impacting stocks with positive stock status	**Indirect Positive** Allowed state/regional level flexibility in tailoring recreational measures
P Amendment 10 to the FMP P	Modified commercial minimum mesh requirements; continued commercial vessel moratorium; prohibited transfer of summer flounder at sea; established party/charter permits for summer flounder.	**Direct Positive** Regulatory tool available to rebuild and manage stocks and to regulate fishing effort	**Indirect Positive** Regulated fishing effort and gear use	**Indirect Slight Negative** Allows continuation of fishing effort that prevents recovery of degraded habitats	**Likely Indirect Negative to Indirect Positive** Maintains fishing effort; negatively impacting species with poor stock status and positively impacting stocks with positive stock status	**Direct slight negative to Indirect slight positive** Imposed some costs and restrictions on fishing industry, but contributed to management of sustainable stock and benefitted some businesses

FISHERY RELATED ACTIONS						
Action	**Description**	**Impacts on Managed Resources**	**Impacts on Non-target Species**	**Impacts on Habitat and EFH**	**Impacts on Protected Species**	**Impacts on Human Communities**
P, Pr, RFF Omnibus ACL/AMs amendment (Amendment 15)	Established Annual Catch Limits (ACLs) and Accountability Measures (AMs)	**Direct Positive** Regulatory tool available to rebuild and manage stocks and to regulate fishing effort	**Direct Positive** Regulatory tool available to rebuild and manage stocks and to regulate fishing effort	**Indirect Slight Negative** Allows continuation of fishing effort that prevents recovery of degraded habitats	**Likely Indirect Negative to Indirect Positive** Maintains fishing effort; negatively impacting species with poor stock status and positively impacting stocks with positive stock status	**Indirect Negative to Indirect Positive** Decreased fishing effort in some cases, but required sustainable management for long-term sustainable yield
P, Pr, RFF Omnibus Recreational AMs amendment	Modified the accountability measures for the Council's recreational fisheries	**Indirect Slight Positive** Added flexibility in managing stocks and to regulate fishing effort	**Indirect Slight Positive** Added flexibility in managing stocks and to regulate fishing effort	**Indirect Slight Negative** Allows continuation of fishing effort that prevents recovery of degraded habitats	**Likely Indirect Negative to Indirect Positive** Maintains fishing effort; negatively impacting species with poor stock status and positively impacting stocks with positive stock status	**Indirect Slight Positive** Allowed additional flexibility in responding to recreational overages, lessening required management restrictions
P, Pr, RFF Vessel baseline amendment (Amendment 18)	Removed some of the restrictions for upgrading vessels listed on Federal fishing permits	**Indirect Slight Positive** Allows management of fleet to regulate fishing effort	**Indirect Slight Positive** Allows management of fleet to regulate fishing effort	**Indirect Slight Negative** Allows continuation of fishing effort that prevents recovery of degraded habitats	**Likely Indirect Negative to Indirect Positive** Maintains fishing effort; negatively impacting species with poor stock status and positively impacting stocks with positive stock status	**Indirect Slight Positive** Allowed increased flexibility in vessel modifications

FISHERY RELATED ACTIONS						
Action	**Description**	**Impacts on Managed Resources**	**Impacts on Non-target Species**	**Impacts on Habitat and EFH**	**Impacts on Protected Species**	**Impacts on Human Communities**
P, Pr, RFF Standardized Bycatch Reporting Methodology	Established acceptable level of precision and accuracy for monitoring of bycatch in fisheries	**Indirect Slight Positive** May improve data quality for monitoring total removals	**Indirect Slight Positive** May improve data quality for monitoring total removals	**No impact** Impacts monitoring of fishery but does not influence effort or level of participation	**Indirect Slight Positive** May increase observer coverage and will not affect distribution of effort	**Uncertain – Likely Indirect Negative** May impose an inconvenience on vessel operations
P, Pr, RFF Unmanaged Forage Omnibus Amendment	Prohibits development of new and expansion of existing directed commercial fisheries on unmanaged forage species in MAFMC waters until the Council can consider available scientific information and potential impacts	**Indirect Positive** Is intended to protect the food source for a variety of species in the Mid-Atlantic	**Indirect Positive** Is intended to protect the food source for a variety of species in the Mid-Atlantic	**Indirect Slight Negative** Allows continuation of fishing effort that prevents recovery of degraded habitats	**Indirect Positive** Intended to protect the food source for a variety of species in the Mid-Atlantic including protected resources	**Mixed** Could have positive impacts by maintaining a food source for several fish stocks. Could have negative impacts for fishermen who already harvest unmanaged forage species.
RFF Recreational Issues Framework and Addendum	Will consider adding slot limits, transit provisions for Block Island, and conservation equivalency for black sea bass	**Likely Indirect Positive** Will introduce new tools to manage stock to sustainable harvest levels	**Likely Indirect Positive** Will maintain non-target species at sustainable harvest levels	**Indirect Slight Negative** Allows continuation of fishing effort that prevents recovery of degraded habitats	**Likely Indirect Negative to Indirect Positive** Maintains effort at current levels; negatively impacting species with poor stock status and positively impacting stocks with positive stock status	**Likely Indirect Slight Positive** Will introduce management tools that may improve access to the resource and angler satisfactions

FISHERY RELATED ACTIONS						
Action	**Description**	**Impacts on Managed Resources**	**Impacts on Non-target Species**	**Impacts on Habitat and EFH**	**Impacts on Protected Species**	**Impacts on Human Communities**
[RFF] Omnibus Observer Coverage Amendment	Measures to implement industry-funded monitoring coverage in some FMPs above levels required by SBRM	**Likely Indirect Positive** May improve monitoring and reporting for managed resources	**Likely Indirect Positive** May improve monitoring and reporting for non-target resources	**Uncertain – Likely No Impact** Depending on actions implemented, will not likely result in significant changes to fishing access or effort	**Likely Indirect Positive** May improve monitoring and reporting for protected resources interactions	**Likely Direct Negative** Likely to impose additional costs on fishing operations
[P, Pr, RFF] Convening of Take Reduction Teams (periodically)	Recommend measures to reduce mortality and injury to marine mammals and sea turtles	**Indirect Positive** Will improve data quality for monitoring total removals; Gear requirements could reduce bycatch	**Indirect Positive** Will improve data quality for monitoring total removals; Gear requirements could reduce bycatch	**Indirect Positive** Gear requirements could reduce gear impacts	**Direct Positive** Reducing amount of gear in water could reduce encounters	**Indirect Negative** Gear requirements could reduce revenues
[RFF] Summer flounder recreational issues and sector allocation amendment	Will consider recreational/commercial sector allocation and consider revisions to recreational management strategies	**Likely Indirect Positive** Will allow for continued management to sustainable harvest levels and modernize some management strategies	**Likely Indirect Positive** Likely to maintain or possibly reduce non-target species interactions	**Indirect Slight Negative** Allows continuation of fishing effort that prevents recovery of degraded habitats	**Likely Indirect Negative to Indirect Positive** Maintains effort at current levels; negatively impacting species with poor stock status and positively impacting stocks with positive stock status	**Mixed** Will positively impact some human communities and negatively impact others by modifying access to the resource

FISHERY RELATED ACTIONS						
Action	**Description**	**Impacts on Managed Resources**	**Impacts on Non-target Species**	**Impacts on Habitat and EFH**	**Impacts on Protected Species**	**Impacts on Human Communities**
[Pr, RFF] Revisions to commercial AMs	Adds additional flexibility in commercial AMs based on stock status	**Indirect Slight Positive** Adds flexibility in managing stocks and to regulate fishing effort	**Indirect Slight Positive** Adds flexibility in managing stocks and to regulate fishing effort	**Indirect Slight Negative** Allows continuation of fishing effort that prevents recovery of degraded habitats	**Likely Indirect Negative to Indirect Positive** Maintains fishing effort; negatively impacting species with poor stock status and positively impacting stocks with positive stock status	**Indirect Positive** Will increase flexibility in response to ACL overages, making responses less burdensome to fishing industry

NON-FISHERY RELATED ACTIONS						
Action	**Description**	**Impacts on Managed Resources**	**Impacts on Non-target Species**	**Impacts on Habitat and EFH**	**Impacts on Protected Species**	**Impacts on Human Communities**
[P, Pr, RFF] Agriculture runoff	Nutrients applied to agriculture land are introduced into aquatic systems	**Indirect Negative** Reduced habitat quality in the immediate project area	**Indirect Negative** Reduced habitat quality in the immediate project area	**Direct Negative** Reduced habitat quality in the immediate project area	**Indirect Negative** Reduced habitat quality in the immediate project area	**Indirect Negative** Reduced habitat quality negatively affects resource viability in the immediate project area
[P, Pr, RFF] Port maintenance	Dredging of wetlands, coastal, port and harbor areas for port maintenance	**Indirect Negative** Localized decreases in habitat quality	**Indirect Negative** Localized decreases in habitat quality	**Direct Negative** Reduced habitat quality in the immediate project area	**Direct and Indirect Negative** Potential dredge interactions with protected species ;Localized decreases in habitat quality in the immediate project area	**Indirect Negative** Reduced habitat quality negatively affects resource viability in the immediate project area

NON-FISHERY RELATED ACTIONS						
Action	**Description**	**Impacts on Managed Resources**	**Impacts on Non-target Species**	**Impacts on Habitat and EFH**	**Impacts on Protected Species**	**Impacts on Human Communities**
P, Pr, RFF Offshore disposal of dredged materials	Disposal of dredged materials	**Indirect Negative** Localized decreases in habitat quality in the immediate project area	**Indirect Negative** Localized decreases in habitat quality in the immediate project area	**Direct Negative** Reduced habitat quality in the immediate project area	**Indirect Negative** Localized decreases in habitat quality in the immediate project area	**Indirect Negative** Reduced habitat quality negatively affects resource viability in the immediate project area
P, Pr, RFF Beach nourishment	Offshore mining of sand for beaches	**Indirect Negative** Localized decreases in habitat quality in the immediate project area	**Indirect Negative** Localized decreases in habitat quality in the immediate project area	**Direct Negative** Reduced habitat quality in the immediate project area	**Direct and Indirect Negative** Potential dredge interactions with protected species; Localized decreases in habitat quality in the immediate project area	**Mixed** Positive for mining companies, possibly negative for fisheries
	Placement of sand to nourish beach shorelines	**Indirect Negative** Localized decreases in habitat quality in the immediate project area	**Indirect Negative** Localized decreases in habitat quality in the immediate project area	**Direct Negative** Reduced habitat quality in the immediate project area	**Indirect Negative** Localized decreases in habitat quality in the immediate project area	**Positive** Beachgoers generally like sand

NON-FISHERY RELATED ACTIONS						
Action	**Description**	**Impacts on Managed Resources**	**Impacts on Non-target Species**	**Impacts on Habitat and EFH**	**Impacts on Protected Species**	**Impacts on Human Communities**
P, Pr, RFF Marine transportation	Expansion of port facilities, vessel operations and recreational marinas	**Indirect Negative** Localized decreases in habitat quality in the immediate project area	**Indirect Negative** Localized decreases in habitat quality in the immediate project area	**Direct Negative** Reduced habitat quality in the immediate project area	**Direct and Indirect Negative** potential for interactions (ship strikes) with protected species; Localized decreases in habitat quality in the immediate project area	**Mixed** Positive for some interests, potential displacement for others
P, Pr, RFF Installation of pipelines, utility lines and cables	Transportation of oil, gas and energy through pipelines, utility lines and cables	**Unknown** Dependent on mitigation effects	**Unknown** Dependent on mitigation effects	**Potentially Direct Negative** Reduced habitat quality in the immediate project area	**Direct and Indirect Negative** Reduced habitat quality; Sound Exposure (physical injury or behavioral harassment); Potential interactions with vessels;Dependent on mitigation effects	**Unknown** Dependent on mitigation effects

NON-FISHERY RELATED ACTIONS						
Action	**Description**	**Impacts on Managed Resources**	**Impacts on Non-target Species**	**Impacts on Habitat and EFH**	**Impacts on Protected Species**	**Impacts on Human Communities**
RFF Liquefied Natural Gas (LNG) terminals (w/in 5 years)	Transportation of natural gas via tanker to terminals located offshore and onshore (Several LNG terminals are proposed, including MA, RI, NY, NJ and DE)	**Unknown** Dependent on mitigation effects	**Unknown** Dependent on mitigation effects	**Potentially Direct Negative** Localized decreases in habitat quality possible in the immediate project area	**Direct and Indirect Negative** Reduced habitat quality; Sound Exposure (physical injury or behavioral harassment); Potential interactions with vessels**;**Dependent on mitigation effects	**Unknown** Dependent on mitigation effects
RFF Offshore Wind Energy Facilities (medium probability w/in 5 years)	Construction of wind turbines to harness electrical power (Several facilities proposed from ME through NC, including off the coast of MA, NY/NJ and VA)	**Unknown** Dependent on mitigation effects	**Unknown** Dependent on mitigation effects	**Potentially Direct Negative** Localized decreases in habitat quality possible in the immediate project area	**Direct and Indirect Negative** Reduced habitat quality; Sound Exposure (physical injury or behavioral harassment); Potential interactions with vessels**;** Dependent on mitigation effects	**Unknown** Dependent on mitigation effects

Summary Effects of Past and Present Actions

The present conditions of the VECs are empirical indicators of the summary effects of past actions since, independent of natural processes, and these present conditions are largely the product of these past actions. The combined effects of these actions are described in the VEC-by VEC discussion below and are summarized in Table 59.

Managed Species

The cumulative impacts of past and present management actions have resulted in overall positive impacts to the managed resource. Summer flounder stock biomass has trended up over the long term, recovering from population lows in the late 1980s/early 1990s. Although biomass has decreased slightly in recent years, management measures have maintained the population above an overfished condition. The age structure of the population has expanded as the result of minimum size and minimum mesh size requirements and other management measures, contributing to a more sustainable population. Foreseeable future management measures are expected to prevent overfishing and prevent the stock from becoming overfished, and allow for continued stock recovery.

While the negative effects of past and present actions associated with non-fishing activities (Table 58) may have increased negative effects, it is likely that those actions were minor due to the limited scale of the habitat impact compared with the populations at large.

Therefore, the cumulative impacts of past and present actions should yield positive impacts for managed species in the long term.

Non-target Species

Actions taken by the Council in the Summer Flounder, Scup, and Black Sea Bass FMP in the past and present are mostly positive 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, most of the major relevant non-target species in the commercial summer flounder fishery have a positive stock condition, with the exceptions of thorny skate (overfished) and Northern sea robin (unknown). While there are no sub-ACLs for other species in the commercial summer flounder fishery, most of the non-target species are managed by the MAFMC and/or the NEFMC and are managed under their own ACLs and AMs, which will continue to promote the health of each stock. Future actions are anticipated to continue rebuilding and maintaining sustainable stocks. Therefore, the cumulative impacts of the past and present actions should yield positive impacts for non-target species in the long-term.

The summary effects of past and present actions are less certain than for the managed resources. This is because the information needed to quantitatively measure the impacts on these species resulting from summer flounder fishery activities and non-fishing activities is generally lacking. The continued implementation of the Omnibus SBRM Amendment is expected to provide more data to allow management to better manage bycatch. The summary effects of past and present actions on non-target species are considered to be a mixed set of partially offsetting positive effects through fishery effort reduction or gear modifications will, in effect, reduce the magnitude of the negative impacts of fishing in general. This would likely improve with future actions to reduce bycatch. Again, although the negative effects of past and present actions associated with non-fishing activities (Table 58) may have increased negative effects, it is likely that the impacts of those actions have been minor due to the limited scale of the habitat impact compared with the populations at large.

Therefore, the cumulative impacts of past and present actions should yield positive impacts for non-target species in the long term.

Habitat

The summer flounder fishery is dominated by otter trawls, accounting for over 90% of commercial landings. Other minor gear types include gill nets, traps, hook and line, and dredge gear (with dredge gear accounting for mostly incidental landings of summer flounder). Due to the very small percentage of non-trawl gear types used in the commercial summer flounder fishery, and the minimal impacts of hook and line gear on habitat (see section 6.3), the impacts of past, present, and future FMP actions are primarily focused on the bottom trawl fishery rather than on other gear types.

Trawl gear can have negative impacts on habitat by creating furrows in sediments, re-suspending and dispersing sediments, reducing the abundance of benthic prey species. The summer flounder fishery takes place predominantly in dynamic environments with less structured bottom composition, where habitat impacts are more likely to be shorter in duration.

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. The principal gears used in the recreational fisheries for summer flounder are rod and reel and handline. These gears have minimal adverse impacts on EFH in the region (Stevenson et al. 2004).

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. However, despite these mitigation measures, it is likely that fishing and non-fishing activities will continue to degrade habitat quality and prevent recovery of degraded habitats.

Therefore, the cumulative impacts of past and present actions should yield mixed impacts for habitat in the long term.

Protected Species

Those past, present, and reasonably foreseeable future actions which may impact protected species, and the direction of those impacts, are summarized in Table 58. The primary protected species impacted by the fishery include whales (North Atlantic right whale, humpback whale, fin whale, sei whale, minke whale, pilot whale), small cetaceans (Risso's dolphin, Atlantic white-sided dolphin, short beaked common dolphin, bottlenose dolphin, harbor porpoise), sea turtles (leatherback, Kemp's ridley, green, loggerhead), pinnipeds (harbor seal, gray seal, harp seal, hooded seal) and fish (Atlantic salmon, Atlantic sturgeon).

NMFS has several means under which it can review non-fishing actions of other Federal or state agencies that may impact protected species prior to permitting or implementation of those projects. This serves to minimize the extent and magnitude of indirect negative impacts those actions could have on protected species under NMFS' jurisdiction.

Past fishery management actions taken through the respective FMPs and annual specifications process have 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. It is anticipated that future management actions, described in Table 58, will result in additional indirect positive effects on protected species. These impacts could be broad in scope. In addition, Take Reduction Teams have been convened to develop measures for certain marine mammal species that have generally reduced interactions over time.

Since modifications to MAFMC management actions will occur through framework adjustments and plan amendments, they will undergo additional review to assess protected species.

Overall, the cumulative impacts of the past and present actions are positive for protected resources, due to reduced gear action with species of concern.

Human Communities

All actions taken under the Summer Flounder, Scup, and Black Sea Bass FMP have had effects on human communities. None have specifically been developed to primarily address elements of fishing related businesses and communities, but many actions have included specific 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.

In particular, the development of ACLs and AMs and associated annual specifications have resulted in constraints on effort and revenues in the fishery, but annual catch limits and other measures have resulted in positive impacts on the stock that will positively impact human communities in the future. Amendments 2 and 10 had major implications for human communities, by limiting participation and allocating the resource by state, and imposing other gear and permitting requirements. These major actions resulted in mixed impacts to human communities, by imposing costs and eliminating some participants, but improving management's ability to control harvest and maintain positive biological conditions for the stock. Frameworks 2 and 6 for the recreational fishery provided overall positive benefits to human communities by allowing for increased management flexibility within the constraints of annual catch limits.

While short-term negative impacts may follow an action that reduces effort, past and present actions had positive cumulative impacts on vessel owners, crew, and their families in the summer flounder fishery by increasing their fishing revenues, incomes, and standards of living. The impacts of these past and present actions were also positive for the related sectors including dealers, processors, primary suppliers, to the vessels that sell them gear, engines, boats, etc. The increase in gross profits for summer flounder vessels and in crew incomes have had positive economic benefits on these sectors indirectly through the multiplier impacts. In general, revenues and price have increased over time. Future actions are expected to continue this trend. Therefore, the cumulative impacts of past and present actions are positive for human communities.

The summary effect of past and present actions is complex since the effects have varied among fishery participants, consumers, and communities. Nevertheless, the net effect is considered to be positive in that the fisheries managed under the Summer Flounder, Scup, and Black Sea Bass FMP currently support viable domestic and international market demand. While some short-term economic costs have been associated with effort reductions and gear modifications (Table 58), economic returns have generally been positive and as such, have tended to make a positive contribution to the communities associated with the harvest of these species.

Summary Effects of Future Actions

As with past and present actions, the list of reasonably foreseeable future actions is provided in Table 58. Additionally, the same general trends will be noted with regard to the expected outcomes of fishery related actions and non-fishing actions, the summary effects of fishery related actions tend to be positive with respect to natural resources though short-term negative or mixed effects are expected for human communities. Conversely, for the non-fishing actions listed in Table 58, the general outcome remains negative in the immediate project area, but minor for all VECs again due to the difference in scale of exposure of the habitat perturbation and the population. The directionality of impacts of future actions on the VECs will necessarily be a function of the offsetting negative vs. positive impacts of each of the actions. Since the magnitude and significance of the impacts of these future actions, especially non-fishing impacts, is poorly understood, conclusions as to the summary effects will essentially consist of an educated guess.

Recall that the future temporal boundary for this CEA is five years after full implementation of the amendment (~2024, section 7.4.2). Within that timeframe, the summary effects of future actions on managed resources, non-target species, habitat, and protected resources are all expected to be positive, notwithstanding the localized nearshore negative effects of non-fishing actions. The optimization of the conditions of the resources is the primary objective of the management of these natural resources. Additionally, it is unknown, but expected that technology to allow for mitigation of the negative impacts of non-fishing activities will improve.

For human communities, short-term (i.e., within the temporal scope of this CEA) costs may occur. This negative impact is expected to be the byproduct of an adjustment to the improved management of natural resources. In the longer term, positive impacts on human communities should come about as sustainability of natural resources is attained.

In terms of FMP-specific actions expected to be implemented before 2020, other than the continuation of specifications, the only known FMP modification for summer flounder, scup, and black sea bass expected is a framework action to increase flexibility in recreational fisheries management for summer flounder, scup, and black sea bass. This action is expected to have positive impacts on target and non-target species, would maintain the current conditions of habitat and protected resources, and would have mostly positive impacts on human communities.

For longer-term actions under the FMP for summer flounder, scup, and black sea bass, the MAFMC will begin development of a summer flounder amendment to re-evaluate the commercial/recreational allocation, as well as to consider modifications to recreational management strategies. This action will be initiated following implementation of this Commercial Issues Amendment, and is expected to result in positive impacts on non-target species. Similar to this action, this future amendment is expected to maintain the current condition of habitat, and will have uncertain impacts on protected resources and likely mixed impacts on human communities. It is possible that the MAFMC will develop a black sea bass amendment addressing similar issues, which would have similar impacts on each VEC as those described for the future summer flounder amendment.

A summary of the cumulative impacts of past, present, and reasonably foreseeable future actions on each VEC is provided in Table 59.

Table 59: Summary of expected impacts of combined past, present, and reasonably foreseeable future actions on each VEC.

VEC	Past Actions (P)	Present Actions (Pr)	Reasonably Foreseeable Future Actions (RFFA)	Combined Effects of Past, Present, Future Actions
Managed Resources	**Positive** Combined effects of past actions have decreased effort, improved habitat protection	**Positive** Current regulations continue to manage for a sustainable stock	**Positive** Future actions are anticipated to strive to maintain a sustainable stock	**Positive** Stocks are being managed sustainably
Non-Target Species	**Positive** Combined effects of past actions have decreased effort and reduced bycatch	**Positive** Current regulations continue to decrease effort/increase efficiency and reduce bycatch	**Positive** Future regulations are being developed to improve monitoring and address bycatch issues	**Low positive** Decreased effort/increased efficiency and reduced bycatch continue; most non-target stocks continue to be sustainably managed under ACLs/AMs
Habitat	**Mixed** Combined effects of effort reductions and better control of non-fishing activities have been positive, but fishing activities and non-fishing activities have reduced habitat quality	**Mixed** Effort reductions and better control of non-fishing activities have been positive but fishing activities continue to reduce habitat quality	**Mixed** Future regulations will likely control effort and habitat impacts but as stocks improve, effort may increase along with additional non-fishing activities	**Mixed** Continued fisheries management will likely control effort and thus fishery related habitat impacts but fishery and non-fishery related activities will continue to reduce habitat quality
Protected Resources	**Positive** Combined effects of past fishery actions have reduced effort and thus interactions with protected resources	**Positive** Current regulations continue to control effort, thus reducing opportunities for interactions	**Mixed** Future regulations will likely control effort and thus protected species interactions, but as stocks improve effort will likely increase, possibly increasing interactions	**Positive** Continued effort controls along with past regulations will likely help stabilize protected species interactions
Human Communities	**Mixed** Management actions have imposed requirements that reduced short-term revenues and increased costs, however, stock improvements have led to community benefits and in the long term	**Mixed** Management actions continue to constrain effort, at times reducing short-term revenues, however, stock improvements continue to benefit human communities in the long term; price and revenues are generally increasing	**Mixed** Future regulations will likely control effort and thus reduce revenues at times, but long-term maintenance of sustainable stock will lead to long-term benefits to human communities	**Mixed** Continued fisheries management will impose requirements that may reduce short-term revenues or increase costs; sustainable management should improve community benefits in long-term

7.4.4 Baseline Condition for the Resources, Ecosystems, and Human Communities

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

Table 60 summarizes the added effects of the condition of the VECs (i.e., status/trends/stresses from Section 6 and Table 58) and the sum effect of the past, present, and reasonably foreseeable future actions (from Table 59). The resulting CEA baseline for each VEC is exhibited in the last column of Table 60 (shaded). In general, only qualitative metrics are available for the VECs. For managed species, the baseline condition is likely positive given the continued fisheries that target and catch the managed species. For non-target species, none of the relevant species identified in section 6.2 are experiencing overfishing (although the Northern sea robin stock is unassessed, and the status is unknown). Black sea bass, scup, spiny dogfish, and species within the Northeast skate complex are not overfished with the exception of thorny skate; the status of sea robins is unknown. The conditions of the habitat and human communities VECs are complex and varied. As such, the reader should refer to the characterizations given in Sections 6.3 and 6.5, respectively. For protected resources the baseline is negative in the short run given continued interaction but should be positive in the long run as additional mitigations are implemented. As mentioned above, the CEA Baseline is then used to assess cumulative effects of the proposed management actions.

Table 60: Summary of the current status, combined effects of P,PR,RFF actions, and the combined baseline condition of each VEC.

VEC	Status and Trends	Combined Effects of Past, Present, and Reasonably Foreseeable Future Actions (Table 59)	Combined CEA Baseline Conditions
Managed Resource	Not overfished, overfishing occurring as of 2015 fishing year. Biomass trending down since 2011.	**Positive** Stocks are being managed sustainably	**Positive** Stocks are being managed sustainably
Non-target Species	Black sea bass, scup, spiny dogfish are not overfished/overfishing is not occurring. No stocks in Northeast skate complex are experiencing overfishing and none are overfished except thorny skate. Status of Northern sea robin is unknown.	**Low positive** Decreased effort and reduced bycatch continue; most non-target stocks continue to be sustainably managed under ACLs/AMs	**Low positive** Decreased effort and reduced bycatch continue; most non-target stocks are not overfished/not overfishing
Habitat	Fishing impacts are complex and variable and typically adverse (see section 6.3); Non-fishing activities have had historically negative but site-specific effects on habitat	**Mixed** Continued fisheries management will likely control effort and thus fishery related habitat impacts but fishery and non-fishery related activities will continue to reduce habitat quality and/or prevent recovery	**Low positive** Continued fisheries management will likely control effort and thus fishery related habitat impacts; recovery will be limited, but overall knowledge of and protection of key habitats continues to improve

VEC	Status and Trends	Combined Effects of Past, Present, and Reasonably Foreseeable Future Actions (Table 59)	Combined CEA Baseline Conditions
Protected Resources	Sea Turtles: Endangered or threatened under ESA Large whales: Some endangered under ESA, all protected under MMPA Small cetaceans and pinnipeds: protected under MMPA Atlantic salmon (Gulf of Maine DPS): threatened under ESA Atlantic sturgeon: New York Bight, Chesapeake, Carolina, and South Atlantic DPSs are endangered under ESA	**Positive** Continued effort controls along with past regulations will likely help stabilize protected species interactions	**Positive** Stocks are being managed for sustainability, but some in poor status. Reduced gear encounters through effort reductions and additional management actions taken under ESA/MMPA have resulted in generally positive baseline conditions with the exception of some species, e.g., northern right whales.
Human Communities	Complex and variable. Landings have since 2011 due to declining stock biomass and catch limits. From 2012-2016, commercial ex-vessel value averaged $28 million per year. 766 commercial moratorium permits were issued in 2017, with 332 reporting summer flounder landings. 19 ports from MA through NC have averaged over 100,000 lb of summer flounder landings annually from 2012-2016. Over 200 federally-permitted dealers from Maine through North Carolina purchased summer flounder in 2016.	**Mixed** Continued fisheries management will likely control effort and thus fishery related habitat impacts but fishery and non-fishery related activities will continue to reduce habitat quality	**Positive** Short term negative impacts occur from effort limitations, but long-term positive conditions result from higher prices and continued management under ACLs and AMs. Resource supports viable communities and economies.

Managed Resource Impacts CEA Baseline

The summer flounder stock is currently not overfished but is experiencing overfishing as of 2015 (the most recent year of data available for overfishing status). Biomass has generally been declining since 2011, although the stock has not reached the overfished threshold. Despite this trend, generally catch has not been exceeding the implemented ACLs, and overfishing has been largely resulting from several years of below average recruitment and a retrospective pattern in the stock assessment. Managers continue to adapt to changing scientific information to set catch limits to prevent overfishing and overfished status. In general, the stock is being managed for continued sustainability and the **baseline condition of the managed resource is positive**.

Non-target Species Impacts CEA Baseline

In general, interactions with non-target species in the commercial summer flounder fishery do not presently have a major impact on non-target stock status. Removals of these species as the result of the summer flounder fishery are generally low relative to their total removals. Most non-target species caught in this fishery have a positive stock status (with the exception of thorny skate, which is overfished, and Northern sea robin, which is unknown) and most are managed under ACLs and AMs to control and account for their total removals.

Incidental catch in the fishery is regularly monitored, and measures may be put in place to address any problematic increases in non-target bycatch that may occur. As mentioned above, non-fishing effects, although potentially negative to all fish species, are likely not exerting much negative effects on non-target species, due to the small scale of the habitat perturbation relative to the populations at large.

Overall, the baseline condition of the non-target species is positive as most non-target species have a positive stock condition and are managed for sustainability. Incidental catch is monitored and bycatch in the summer flounder fishery does not appear to be heavily influencing stock status at present.

Habitat Impacts CEA Baseline

For habitat, the summary effects of past and present actions assessed above in section 7.4.3 were considered to be low positive. Effort reduction or gear modifications will, in effect, reduce the magnitude of the direct negative impact on this VEC that results from fishing activities. Again, although the negative effects of past and present actions associated with non-fishing activities (Table 58) may have increased negative effects, it is likely that those actions were minor due to the limited scale of the habitat impact compared with the populations at large. Considering fishing effort over the next 5 years will likely remain similar to current levels, a resultant low positive impact on the habitat of "other" actions is anticipated. **Overall, the baseline condition of habitat is low positive**, due the combination of overall effort reductions reducing the extent of negative interactions with habitat, and continued advancement of the knowledge of and protection of important habitats.

Protected Resource Impacts CEA Baseline

For the protected species affected by this Amendment (listed in Section 6.4), the summary effects of the "other" past and present actions assessed above were considered to be negative in the short term but positive in the long term due to future effort reduction or gear modifications (gear modifications lessen the negative impact of a given level of effort). There are no currently planned actions that would directly reduce the mortality of protected resources from encounters with the summer flounder fishery.

Current and future actions and the current protection under MMPA and ESA are expected to result in positive cumulative impacts for these protected resources. Overall, while negative impacts occur in the short term due to fishery interactions, **the baseline condition of protected resources is generally positive over the long term** due to effort reduction and other efforts to reduce gear interactions, with the exception of species with particularly poor stock status, i.e., northern right whales.

Human Communities Impacts CEA Baseline

The net effect of past and present "other" actions is considered to be positive in that the fisheries managed under the FSB FMP currently support viable domestic and international market demand. While some short-term economic costs have been associated with effort reductions and gear modifications (See Table 58), economic returns have generally been positive and as such, have tended to make a positive contribution to the communities associated with harvest of these species. In the short-term future (i.e., within the temporal scope of this CEA), costs may occur. The negative impact is expected to the byproduct of an adjustment to the improved management of natural resources. In the longer term, positive impacts on human communities should come about as sustainability of natural resources is attained. **Overall, the baseline condition of human communities is uncertain but generally positive in the long term.**

7.4.5 Magnitude and Significance of Cumulative Effects

Determining the magnitude of the cumulative effects consists of determining the separate effects of the past actions, present actions, the proposed action (and reasonable alternatives), and other future actions. Once that is done, cumulative effects can be described. The significance of the effects is related to the magnitude, but also takes into account context distribution. Table 58 in section 7.4.3 lists the effects of individual past, present, and future actions to assist the reader in understanding the conclusions presented below regarding the summary effects of these separate actions. Note that fishery-related activities consist almost entirely of positive effects (with the exception of some short term negative effects on human communities) while non-fishing activities are generally associated with negative effects. This is not to say that some aspects of various VECs are not experiencing negative impacts, but rather that when taken as a whole and compared to the level of unsustainable effort that existed prior to and just after the fishery came under management control, the overall long-term trend is positive. The basis for this general outcome is explained in the text provided in section 7.4.3. Table 59 and associated text describes the summary effects of the past, present, and future actions on the VECs.

Summary Incremental Impacts of the Proposed Actions

The impacts of the proposed actions are described in Section 7 and summarized in the executive summary. Since the impact of every alternative on every VEC is described in those sections, they are not repeated here. For the Final EIS the incremental impacts of the preferred alternatives will be repeated here but there are no preferred alternatives yet.

Summary Cumulative Effects of the Proposed Actions

The cumulative effects of the proposed actions are strongly dependent on which combinations of actions are ultimately implemented. Once preferred alternatives have been selected a summary effects comparison will be made. However, regardless of which actions are ultimately implemented through this amendment, it is expected that the overall long-term cumulative effects should be positive for all VECs. This is because, barring some unexpected natural or human induced catastrophe, the regulatory atmosphere within which Federal fishery management operates requires that management actions be taken in a manner that will optimize the conditions of resources, 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. The document functions to identify the likely outcomes of various management alternatives. Identification of alternatives that would compromise resource sustainability should make implementation of those alternatives unlikely. With this in mind, the expected likely cumulative impacts for the VECs are described below. While again, the final selection of alternatives are not known, all of the alternatives in this document are geared toward goals of improved management of summer flounder. Assuming that some alternatives are ultimately selected, and the ones that are selected are those predicted to have positive impacts as described above in section 7, there should be positive impacts related to the above goals.

To determine the magnitude and extent of cumulative impacts of the 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 effects identified and discussed relative to the past, present, and reasonably foreseeable future actions of both fishing and non-fishing actions).

Table 61 provides a summary of likely cumulative effects found in the various groups of management alternatives contained in this Amendment. The CEA baseline that, as described above in Table 60, represents the sum of past, present, and reasonably foreseeable future (identified hereafter as "other") actions and conditions of each VEC. When an alternative has a positive impact on the VEC, for example, reduced fishing mortality on a managed species, it has a positive cumulative effect on the stock size of the species when combined with "other" actions that were also designed to increase stock size. In contrast, when an alternative has negative effects on a VEC, such as increased mortality, the cumulative effect on the VEC would be negative and tend to reduce the positive effects of the other actions. The resultant positive and negative cumulative effects are described below for each VEC.

Table 61: Summary of cumulative impacts expected on the VECs.

Management measures	Target species (summer flounder)	Non-target species	Habitat/EFH	Protected Resources	Human communities
Federal permit requalification	**Slight positive:** Contributes to managing for a sustainable stock	**Slight positive:** Contributes to maintaining positive stock status for non-target species	**No impact:** Measures are not expected to create additional impacts on habitat	**Slight positive:** Measures will contribute to overall trend of reduced takes	**Mixed:** Cumulative effects will vary by community
Commercial allocation	**Slight positive:** Contributes to managing for a sustainable stock	**Slight positive:** Contributes to maintaining positive stock status for non-target species	**No impact:** Measures are not expected to create additional impacts on habitat	**Slight positive:** Measures will contribute to overall trend of reduced takes	**Mixed:** Cumulative effects will vary by community
Landings flexibility framework provisions	**Slight positive:** Contributes to managing for a sustainable stock	**Slight positive:** Contributes to maintaining positive stock status for non-target species	**No impact:** Measures are not expected to create additional impacts on habitat	**Slight positive:** Measures will contribute to overall trend of reduced takes	**Mixed:** Cumulative effects will vary by community

Cumulative Managed Resources Impacts

As noted in Table 58, the combined impacts of past federal fishery management actions have increased summer flounder biomass and increased the resilience of the stock, for example, by allowing the age structure of the stock to expand relative to its truncated status in earlier years. For the most part, the actions proposed by this amendment are expected to have slight positive impacts and continue the sustainability of the summer flounder resource.

Past fishery management actions taken through FMP and the annual specifications process have had a positive cumulative effect on managed resources. It is anticipated that the future management actions described in Table 58 will have additional indirect positive effects on the managed resources through actions which reduce and monitor bycatch, protect habitat, and protect the ecosystem services on the productivity of managed species depends. Overall, the past, present, and reasonably foreseeable future actions that are truly meaningful to the managed resources have had positive cumulative effects.

Catch limits, commercial quotas, and recreational harvest limits for summer flounder have been specified to ensure that the rebuilt stocks are managed sustainably and that measures are consistent with the objectives of the FMP under the guidance of the MSA. The impacts of annual specification of management measures are largely dependent on how effective those measures are in meeting the objectives of preventing overfishing and achieving optimum yield, and on the extent to which mitigating measures are effective. The proposed actions described in this document would positively reinforce the past and anticipated positive cumulative effects on the managed resources individually or in conjunction with other anthropogenic activities (Table 58). The impacts of this action (all permit requalification and reallocation alternatives) are expected to result in moderate positive impacts to summer flounder by maintaining the current positive stock status (sections 7.1.1 and 7.2.1).

The CEA baseline for managed resources is likely positive (Table 60). While the stock biomass has decreased somewhat in recent years, the stock remains above an overfished status, and catch limits are continually implemented based on the best available scientific information in order to prevent overfishing.

The past and present impacts, combined with any alternatives from the proposed alternatives and future actions which are expected to build stock biomass to target levels and strive to maintain sustainable stocks, should continue to yield non-significant positive impacts to the managed resources in the long term.

Cumulative Non-target Species Impacts

As noted in Table 58, the combined impacts of past federal fishery management actions have decreased effort and improved habitat protection, which benefits non-target species. In addition, current regulations continue to manage for sustainable stocks, thus control effort on direct and discard/bycatch species. The actions proposed by this amendment are expected to continue this trend. Finally, future actions are anticipated to continue rebuilding and thus limit the take of discards/bycatch in the summer flounder fishery, particularly through ACL management with AMs. Continued management of directed stocks will also control catch of non-target species. In addition, the effects of non-fishing activities on bycatch are potentially negative.

The CEA baseline for non-target resources is low positive (see Table 60). The provisions considered in this amendment are expected to have no impact to small impacts on non-target species, resulting in overall slight negative to moderate positive impacts to non-target species depending on possible effort shifts. In general, the alternatives in this amendment are expected to maintain the current positive stock status for non-target species.

The past and present impacts, combined with any alternatives selected from the proposed alternatives and future actions which are expected to continue to minimize impacts to non-target species, should continue to reduce negative impacts to non-target species and produce no impact to slight positive cumulative impacts in the future.

Cumulative Habitat Impacts

As noted in Table 58, the combined impacts of past federal fishery management actions have had positive impacts on EFH. In addition, better control of non-fishing activities has also been positive for habitat protection. However, both fishing and non-fishing activities continue to decrease habitat quality. None of the measures in this amendment are expected to have substantial impacts on habitat or EFH.

Past fishery management actions taken through the FMP and annual specifications process have had positive cumulative effects on habitat. The actions have constrained fishing effort both at a large scale and locally and have implemented gear requirements, which may reduce impacts on habitat. As required under these FMP actions, EFH and Habitat Areas of Particular Concern were designated for the managed resources. It is anticipated that the future management actions described in Table 58 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. These impacts could be broad in scope. All the VECS are interrelated; therefore, the linkages among habitat quality, managed resources, and non-target species productivity, and associated fishery yields should be considered. For habitat, there are direct and indirect negative effects from actions which may be localized or broad in scope; however, positive actions that have broad implications have been, and will likely continue to be, taken to improve the condition of the habitat. 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. Overall, the past, present, and reasonably foreseeable future actions that are truly meaningful to habitat have had no impact to positive cumulative effects.

The proposed actions described in this document would not significantly change the past and anticipated cumulative effects on habitat and thus would not have any significant effect on habitat individually or in conjunction with other anthropogenic activities (Table 58). The impacts of this action (all permit requalification and reallocation alternatives) are expected to be indirect slight negative due to a continuation of current levels of fishing effort and as a result, prevention of habitat recovery in fished areas.

Overall, the combination of past, present, and future actions is expected to reduce fishing effort and hence reduce damage to habitat; however, it is likely that fishing and non-fishing activities will continue to degrade habitat quality and/or prevent habitat recovery. Thus, when the direct and indirect effects of the alternatives are considered in combination with all other actions (i.e., past, present, and reasonably foreseeable future actions), the cumulative effects should yield non-significant no impacts on habitat and EFH.

Cumulative Protected Resources Impacts

As noted in Table 58, the combined impacts of past federal fishery management actions have had positive effects on protected resources. Given their life history dynamics, large changes in protected species abundance over long time periods, and the multiple and wide-ranging fisheries management actions that have occurred, the cumulative impacts on protected species were evaluated over a long-time frame (i.e., from the 1980's through the present). While some protected species are doing better than others, overall the trend of stock condition for protected resources has improved over the long-term due to reductions in the number of interactions. Past fishery management actions taken through the respective FMPs and annual specifications process have contributed to this long-term trend toward positive cumulative effect on protected species through the reduction of fishing effort (and thus reduction in potential interactions) and implementation of gear requirements. It is anticipated that future management actions, described in Table 58 will result in additional indirect positive effects on protected species. These impacts could be broad in scope. Overall, the past, present, and reasonably foreseeable future actions that are truly meaningful to protected species have had a positive cumulative effect.

The proposed actions described in this document would not change the past and anticipated cumulative effects on protected species and thus would not have any significant effect on protected species individually or in conjunction with other anthropogenic activities (Table 58).

Continued fishing activity will continue to result in interactions with protected resources, potentially resulting in short-term negative impacts on these species, depending on their stock status. However, these fishing activities will continue to be regulated through FMPs and various federal agency actions to ensure that species of concern are protected.

Take reduction teams for marine mammals will continue to be convened and will continue to develop strategies and gear modifications for reducing interactions with protected marine mammals. Foreseeable future summer flounder FMP actions may have positive impacts on protected resources by reducing interaction rates with protected species.

Thus, when the direct and indirect effects of the alternatives are considered in combination with other actions (i.e. past, present, and reasonably foreseeable future actions), the cumulative effects should yield generally non-significant positive impacts on protected resources, with some exceptions for species with a mixed or negative baseline condition (e.g., northern right whales; note that this proposed action does not directly impact right whales).

Cumulative Human Communities Impacts

As noted in Table 58 the past federal fishery management actions have had mixed but generally positive impacts on human communities over the long-term.

Past major fishery actions such as Amendment 2, Amendment 10, and Amendment 15 have had impacts that have varied by community and in some cases have had negative short-term impacts by reducing access to the fishery (through permitting, allocations, and other measures). However, in the long-term, these measures generally contribute to a management system designed to maintain a sustainable stock for the long-term benefits of human communities. Implementing a system of limited access, allocated quotas, and overall annual catch and landings limits has had overall positive long-term benefits to human communities by maintaining a positive stock condition and generally improving prices and stability of the resource over time. In general, revenues have tended to increase over time.

Past fishery management actions taken through the FMP and annual specifications process have had both positive and negative cumulative effects by benefiting domestic fisheries through sustainable fishery management practices while also sometimes reducing the availability of the resources to fishery participants. Sustainable management practices are, however, expected to yield broad positive impacts to fishermen, their communities, businesses, and the nation as a whole. It is anticipated that the future management actions described in Table 58 will result in positive effects for human communities due to sustainable management practices, although negative effects on the human communities could occur if management actions result in reduced revenues. Overall, the past, present, and reasonably foreseeable future actions that are truly meaningful to human communities have had overall positive cumulative effects.

Catch limits, commercial quotas, and recreational harvest limits for summer flounder have been specified to ensure that these rebuilt stocks are managed in a sustainable manner and that management measures are consistent with the objectives of the FMPs under the guidance of the MSA. The impacts from annual specification of management measures on the managed species are largely dependent on how effective those measures are in meeting their intended objectives and the extent to which mitigating those measures are effective.

Overages may alter the timing of commercial fishery revenues such that revenues can be realized a year earlier. Impacts to some fishermen may be caused by unexpected reductions in their opportunities to earn revenues from commercial fisheries in the year during which the overages are deducted. For the commercial fishery, landings trends have generally been within 5% of the annual landings limits for the past 15 or more years, so generally any overage deductions for landings limits have been minor. While there have also been commercial ACL overages resulting in paybacks, these have been relatively small for summer flounder. The recreational fishery in some years has exceeded their harvest limit and/or their recreational ACL, resulting in short-term negative impacts resulting from necessary restrictions on recreational measures.

Despite the potential for negative short-term effects on human communities, positive long-term effects are expected due to the long-term sustainability of the managed stocks. Overall, the proposed actions described in this document would not change the past and anticipated cumulative effects on human communities and thus, would not have any significant effects on human communities individually or in conjunction with other anthropogenic activities (Table 58).

The direct and indirect effects of the measures under consideration in this amendment are expected to be mixed in the short term and low positive in the long-term compared to the No Action because while a redistribution of fishery access may impact some communities negatively and some communities positively, over the long-term the measures in this action are expected to contribute to a management program that balances the needs of many stakeholder groups with the health of the resource, and results in long-term stock benefits that will provide long-term social and economic benefits to human communities.

Therefore, net cumulative impacts of the proposed measures and past actions on revenues and economic benefits from the summer flounder fishery would be low positive compared to the No Action.

Thus, the overall effects of reasonably foreseeable future actions on the fishery-related businesses and communities are low positive. In addition, the effects of non-fishing activities on fishing-related businesses and communities are mostly potentially negative (Table 58).

In this proposed action, the impacts of federal permit requalification alternatives are expected to have impacts on human communities ranging from moderate negative to slight positive, due to restricted access for some participants and a limitation of competition for others. For allocation alternatives, the impacts will vary by state and community, but could range from high negative to high positive.

The CEA baseline for human communities is positive. In summary, when the direct and indirect effects of the alternatives are considered in combination with other actions (i.e., past, present, and reasonably foreseeable future actions), these actions yield potentially low positive impacts on the fishery-related businesses and communities.

8.0 CONSISTENCY WITH MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

This section will be completed prior to finalization of this action to document compliance with the Magnuson Stevens Act, including the Magnuson National Standards, EFH provisions, and other provisions of the MSA.

9.0 OTHER APPLICABLE LAWS

This section will be completed prior to finalization of this action to document compliance with other applicable federal laws, including a summary of NEPA and ESA/MMPA compliance, as well as compliance with Coastal Zone Management Act, Administrative Procedures Act, Data Quality Act, Paperwork Reduction Act, Executive Order (E.O.)13132, E.O. 12866, and the Regulatory Flexibility Act.

10.0 LIST OF AGENCIES AND PERSONS CONSULTED

In preparing this document the Council consulted with NMFS, the Atlantic States Marine Fisheries Commission, the New England and South Atlantic Fishery Management Councils, the U.S. Fish and Wildlife Service, Department of State, and the states of Maine through North Carolina through their membership on the Mid-Atlantic and New England Fishery Management Councils and the Atlantic States Marine Fisheries Commission. To ensure compliance with NOAA Fisheries formatting requirements, the advice of NOAA Fisheries GARFO personnel was sought.

11.0 LIST OF PREPARERS AND POINT OF CONTACT

This Environmental Impact Statement was prepared by Council staff, in consultation with the National Marine Fisheries Service, the Atlantic States Marine Fisheries Commission, and the New England Fishery Management Council. Members of the Summer Flounder Amendment Fishery Management Action Team (FMAT) prepared and reviewed portions of analyses and provided technical advice during the development of the EIS. Current and former members of the FMAT members include:

Agency	Fishery Management Action Team (FMAT) Role	Past and Current FMP Representative(s)
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NMFS GARFO	Sustainable Fisheries (Plan Coordinator)	Moira Kelly/Emily Gilbert
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NMFS GARFO	Habitat	David Stevenson
NMFS NEFSC	Stock Assessment/Technical	Mark Terceiro
NMFS NEFSC	Socioeconomics	Scott Steinback
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NMFS GARFO	General Counsel (consulted as needed)	Kevin Collins/John Almeida

Questions about this environmental assessment or additional copies may be obtained by contacting. Christopher Moore, PhD, Executive Director, Mid-Atlantic Fishery Management Council, 800 N. State Street, Dover, DE 19901 (302-674-2331). This Environmental Impact Statement may also be accessed by visiting the NMFS Greater Atlantic Region website at http://www.greateratlantic.fisheries.noaa.gov/.

12.0 DEIS DISTRIBUTION LIST

This document is available on the Council's web page, www.mafmc.org and has been provided to all Council members. Announcements of document availability will be made in the *Federal Register* and to interested parties' mailing lists. Copies were distributed to:

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13.0 REFERENCES

Able, K.W., R.E. Matheson, W.W. Morse, M.P. Fahay, and G. Shepherd. 1990. Patterns of summer flounder *Paralichthys dentatus* early life history in the Mid-Atlantic Bight and New Jersey estuaries. Fish. Bull. (U.S.) 88: 1-12.

Amos, A.F. 1989. The occurrence of hawksbills (Eretmochelys imbricate) along the Texas coast. Pages 9-11 in S.A. Eckert, K.L. Eckert, and T.H. Richardson, compilers. Proceedings of the ninth annual workshop on sea turtle conservation and biology. NOAA technical memorandum NMFS/SEFC-232.

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.

Atlantic States Marine Fisheries Commission (ASMFC). 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. 95 pp.

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

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

Bain, M. B., N. Haley, D. Peterson, J. R. Waldman, and K. Arend. 2000. Harvest and habitats of Atlantic sturgeon *Acipenser oxyrinchus* Mitchill, 1815, in the Hudson River Estuary: Lessons for Sturgeon Conservation. Instituto Espanol de Oceanografia. Boletin 16: 43-53.

Blaylock, J. and G.R. Shepherd. 2016. Evaluating the vulnerability of an atypical protogynous hermaphrodite to fishery exploitation: results from a population model for black sea bass (*Centropristis striata*). Fishery Bulletin 114(4): 476-489.

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. Mar. Ecol. Prog. Ser. 264: 155–166.

Baumgartner, M.F. and B.R. Mate. 2003. Summertime foraging ecology of North Atlantic right whales. Mar. Ecol. Prog. Ser. 264: 123–135.

Baumgartner, M.F., N.S.J. Lysiak, C. Schuman, J. Urban-Rich, and F.W. Wenzel. 2011. Diel vertical migration behavior of *Calanus finmarchicus* and its influence on right and sei whale occurrence. Marine Ecology Progress Series 423:167-184.

Bell R.J., Richardson D.E., Hare J.A., Lynch P., 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 U.S. Shelf. ICES Journal of Marine Science. https://doi.org/10.1093/icesjms/fsu217

Bort, J., S. Van Parijs, P. Stevick, E. Summers and S. Todd. 2015. North Atlantic right whale *Eubalaena glacialis* vocalization patterns in the central Gulf of Maine from October 2009 through October 2010. Endang. Species Res. 26(3):271–280.

Blumenthal, J.M., J.L. Solomon, C.D. Bell, T.J. Austin, G. Ebanks-Petrie, M.S. Coyne, A.C. Broderick, and B.J. Godley. 2006. Satellite tracking highlights the need for international cooperation in marine turtle management. Endangered Species Research 2:51-61.

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: Vol. 5: 257–266, 2008.

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 pp.

Cetacean and Turtle Assessment Program (CeTAP). 1982. Final report or the cetacean and turtle assessment program, University of Rhode Island, to Bureau of Land Management, U.S. Department of the Interior. Ref. No. AA551-CT8-48. 568 pp.

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. Can. J. Zool. 71: 440-443.

Colburn, L., Clay, P. M., Olson, J. & Pinto da Silva, P., Smith, S., Westwood, A., and J. Ekstrom. (2010). Community Profiles for Northeast U.S. Marine Fisheries. Available at: https://www.nefsc.noaa.gov/read/socialsci/pdf/community-profiles/introduction.pdf.

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. Endang Species Res 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 pp.

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.

Damon-Randall, K., M. Colligan, and J. Crocker. 2013. Composition of Atlantic Sturgeon in Rivers, Estuaries, and Marine Waters. National Marine Fisheries Service, NERO, Unpublished Report. February 2013. 33 pp.

DePiper GS. 2014. Statistically assessing the precision of self-reported VTR fishing locations. NOAA Tech Memo NMFS NE 229; 16 p. doi: 10.7289/V53F4MJN

Dery LM. 1988. Summer flounder, *Paralichthys dentatus.* Chapter 15 *in* Pentilla J, Dery LM, eds. Age determination methods for Northwest Atlantic species. NOAA Technical Memorandum NMFS 72:97-102.

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.

DPSWG (Northeast Data Poor Stocks Working Group). 2009. The Northeast Data Poor Stocks Working Group report, December 8-12, 2008 meeting. Part A. Skate species complex, deep sea red crab, Atlantic wolffish, scup, and black sea bass. Northeast Fisheries Science Center Reference Document 09-02; 496 p.

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., D. Chapman, A. Jordaan, K. Feldheim, S. J. O'Leary, K. A. McKown, and M. G. Frisk. 2012. Brief Communications: Genetic mixed-stock analysis of Atlantic sturgeon *Acipenser oxyrinchus oxyrinchus* in a heavily exploited marine habitat indicates the need for routine genetic monitoring. Journal of Fish Biology 80: 207–217.

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.

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. Chel. Cons. Biol. 5(2): 239-248.

Eldridge, PJ. 1962. Observations on the winter trawl fishery for summer flounder, Paralichthys dentatus.MS thesis, College of William and Mary, Virginia Institute of Marine Science, Gloucester Point, VA.

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.

Epperly, S.P., J. Braun, and A. Veishlow. 1995c. Sea turtles in North Carolina waters. Conservation Biology 9(2):384-394.

Epperly, S., L. Avens, L. Garrison, T. Henwood, W. Hoggard, J. Mitchell, J. Nance, J. Poffenberger, C. Sasso, E. Scott-Denton, and C. Yeung. 2002. Analysis of sea turtle bycatch in the commercial shrimp fisheries of southeast U.S. waters and the Gulf of Mexico. NOAA Technical Memorandum NMFS-SEFSC-490:1-88.

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. J. Appl. Ichthyol. 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.

Fisheries Leadership and Sustainability Forum (Fisheries Forum). 2016. Regional Use of the Habitat Area of Particular Concern (HAPC) Designation. 52 p. Available at: http://www.mafmc.org/s/Regional-HAPC-Report_WEB.pdf.

Gaichas, S., J. Hare, M. Pinksy, 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/

Gilbert, CR and JD Williams. 2002. National Audubon Society Field Guide to Fishes: North America. Alfred A. Knopf, New York, NY.

Good, C. 2008. Spatial Ecology of the North Atlantic Right Whale (*Eubalaena glacialis*). Doctoral Dissertation, Duke University. Available at: http://dukespace.lib.duke.edu/dspace/handle/10161/588

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 used by a recovering subpopulation of adult female loggerhead sea turtles: implications for conservation. Mar. Biol. 160: 3071–3086.

Groombridge, B., and R. Luxmoore. 1989. The green turtle and hawksbill (Reptilia: Cheloniidae): world status, exploitation and trade. CITES Secretariat; Lausanne, Switzerland.

Hamazaki, T. 2002. Spatiotemporal prediction models of cetacean habitats in the mid-western North Atlantic Ocean (from Cape Hatteras, No. Carolina, USA to Nova Scotia, Canada). Mar. Mamm. Sci. 18(4): 920-939.

Hamilton, P.K., and C.A. Mayo. 1990. Population characteristics of right whales (*Eubalaena glacialis*) observed in Cape Cod and Massachusetts Bays, 1978-1986. Reports of the International Whaling Commission, Special Issue No. 12: 203-208.

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.

Henderson EM. 1979. Summer flounder (*Paralichthys dentatus*) in the Northwest Atlantic. Northeast Fisheries Center Laboratory Reference Document No. 79-31. 27 p.

Henry AG, Cole TVN, Hall L, Ledwell W, Morin D, Reid A. 2015. Mortality and serious injury determinations for baleen whale stocks along the Gulf of Mexico, United States east coast and Atlantic Canadian provinces, 2009-2013. U.S. Dept Commer, Northeast Fish Sci Cent Ref Doc. 15-10; 45 p. doi: 10.7289/V5C53HTB

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.

Herman, S.S. 1963. Planktonic fish eggs and larvae of Narragansett Bay. Limnol. Oceanogr. 8: 103-109.

Hirth, H.F. 1997. Synopsis of the biological data of the green turtle, Chelonia mydas (Linnaeus 1758). USFWS Biological Report 97(1):1-120.

Hyvarinen, P., P. Suuronen and T. Laaksonen. 2006. Short-term movement of wild and reared Atlantic salmon smolts in brackish water estuary – preliminary study. Fish. Mgmt. Eco. 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. Proc. R. Soc. 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.

Jefferson, T.A., D. Fertl, J. Bolanos-Jimenez and A.N. Zerbini. 2009. Distribution of common dolphins (*Delphinus spp.*) in the western North Atlantic: a critical re-examination. Mar. Biol. 156:1109-1124.

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.

Jones WJ, Quattro JM. 1999. Genetic structure of summer flounder (*Paralichthys dentatus*) populations north and south of Cape Hatteras. Mar Bio 133: 129-135.

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. Mar. Mamm. Sci. 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*). Cont. Shelf Res. 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 pp.

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 pp.

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 ResultsSummary. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 11-05. 6 pp.

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. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 12-09; 6 p. Available from: National Marine Fisheries Service, 166 Water Street, Woods Hole, MA 02543-1026, or online at http://nefsc.noaa.gov/publications/

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 pp.(cited with permission of authors).

Kraus RT, Musick JA. 2003. A brief interpretation of summer flounder, (*Paralichthys dentatus*), movements and stock structure with new tagging data on juveniles. Mar Fish Rev. 63(3):1-6.

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 McCurdy, P. 1996. Migratory behavior of post-smolt Atlantic salmon during initial stages of seaward migration. J. Fish Biol. 49, 1086-1101.

Lacroix, G. L, McCurdy, P., Knox, D. 2004. Migration of Atlantic salmon post smolts in relation to habitat use in a coastal system. Trans. Am. Fish. Soc. 133(6): pp. 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. Can. J. Fish. Aquat. Sci. 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. Am. Fish. Soc. Symp. 56, Bethesda, MD.

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.

Lund, P. F. 1985. Hawksbill turtle Eretmochelys imbricata nesting on the east coast of Florida. Journal of Herpetology 19:164-166.

Lux, F.E. and Nichy, F.E. (1980) Movements of tagged summer flounder, *Paralichthys dentatus*, off southern New England. Northeast Fisheries Center Laboratory Reference Document No. 80-34, 20 pp.

Lux FE, Porter LR. 1966. Length-weight relation of the summer flounder (Paralichthys dentatus (Linneaus). US Bur Comm Fish. Spec Sci Rep Fish. No 531. 5 p.

Lyssikatos MC. 2015. Estimates of cetacean and pinniped bycatch in Northeast and mid-Atlantic bottom trawl fisheries, 2008-2013. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 15-19.

MAFMC (Mid-Atlantic Fishery Management Council). 1993. Amendment 2 to the Fishery Management Plan for the Summer Flounder Fishery. Dover, DE. Available at: http://www.mafmc.org/s/SFSCBSB_Amend_2.pdf

MAFMC (Mid-Atlantic Fishery Management Council). 1998. Amendment 12 to the Summer Flounder, Scup, and Black Sea Bass Fishery Management Plan. Dover, DE. 398 p. + appendices. Available at: http://www.mafmc.org/s/SFSCBSB_Amend_12.pdf.

MAFMC (Mid-Atlantic Fishery Management Council). 2002. Amendment 13 to the Summer Flounder, Scup, and Black Sea Bass Fishery Management Plan. Dover, DE. Available at: https://mafmc.squarespace.com/s/SFSCBSB_Amend_13_Vol_1compressed.pdf

MAFMC (Mid-Atlantic Fishery Management Council). 2014. Workshop Report: East Coast Climate Change and Fisheries Governance Workshop. March 19-21, 2014, Washington, DC.

MAFMC (Mid-Atlantic Fishery Management Council). 2016. Specifications and Management Measures for Spiny Dogfish, 2016-2018, Environmental Assessment and Initial Regulatory Flexibility Analysis. Dover, DE. 91 p.

Mansfield, K.L., V.S. Saba, J. Keinath, and J.A. Musick. 2009. Satellite telemetry reveals a dichotomy 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. Can. J. Zool. 68: 2214–2220.

Meylan, A.B. and M. Donnelly. 1999. Status justification for listing the hawksbill turtle (*Eretmochelys imbricata*) as critically endangered on the 1996 IUCN Red List of Threatened Animals. Chelonian Conservation and Biology 3(2):200-224.

McClellan, C.M., and A.J. Read. 2007. Complexity and variation in loggerhead sea turtle life history. Biology Letters 3:592-594

McLellan, W.A., E. Meagher, L. Torres, G. Lovewell, C. Harper, K. Irish, B. Pike and A.D. Pabst 2004. Winter right whale sightings from aerial surveys of the coastal waters of the U.S. mid-Atlantic. 15th Biennial Conference on the Biology of Marine Mammals.

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. March 2003. 113 pp.

Monaghan, J.P., Jr. (1992) Migration and population dynamics of summer flounder (*Paralichthys dentatus*) in North Carolina, Study 3A. Transactions of the North Carolina Division of Marine Fisheries. In Marine Fisheries Research, Completion Report for Project F-29, 36 pp.

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

Morgan, L.E., and R. Chuenpagdee. 2003. Shifting gears: addressing the collateral impacts of fishing methods in U.S. waters. Pew science series on conservation and the environment.

Morreale, S.J. and E.A. Standora. 2005. Western North Atlantic waters: Crucial developmental habitat for Kemp's ridley and loggerhead sea turtles. Chel. Conserv. Biol. 4(4):872-882.

Morse, W.W. 1981. Reproduction of the summer flounder, *Paralichthys dentatus* (L.). J. Fish Biol. 19: 189-203.

Mullin, K.D. and G.L. Fulling. 2003. Abundance and distribution of cetaceans in the southern U.S. North Atlantic Ocean during summer 1998. Fish. Bull., U.S. 101:603-613.

Murawski, W.S. (1970) Results of tagging experiments of summer flounder, (*Paralichthys dentatus*), conducted in New Jersey waters from 1960–1967. New Jersey Division of Fish, Game, and Shellfisheries, Nacote Research Station. Miscellaneous Report No. 5M, 72 pp.

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. Chel. Cons. Biol. 5(2): 216-224.

Murray, K.T. 2009. Characteristics and magnitude of sea turtle bycatch in U.S. mid-Atlantic gillnet gear. Endang Species Res 8:211-224.

Murray, K.T. 2011. Interactions between sea turtles and dredge gear in the U.S. sea scallop (*Placopecten magellanicus*) fishery, 2001-2008. Fisheries Research 107:137-146.

Murray, K.T. 2013. Estimated loggerhead and unidentified hard-shelled turtle interactions in mid-Atlantic gillnet gear, 2007-2011. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-NM-225. 20 pp. Available at http://www.nefsc.noaa.gov/publications/tm/.

Murray, K.T. 2015a. Estimated loggerhead (*Caretta caretta*) interactions in the Mid-Atlantic scallop dredge fishery, 2009-2014. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 15-20; 15 p. doi: 10.7289/V5GT5K5W.

Murray, K.T. 2015b. 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.

Murray, K.T. and C.D. Orphanides. 2013. Estimating the risk of loggerhead turtle *Caretta caretta* bycatch in the U.S. mid-Atlantic using fishery-independent and –dependent data. Marine Ecology Progress Series. 477:259-270.

NEFMC (New England Fishery Management Council). 2018. Framework Adjustment 5 to the Northeast Skate Complex FMP. Newburyport, MA.

NEFSC (Northeast Fisheries Science Center). 1996a. Report of the 20th Northeast Regional Stock Assessment Workshop (20th SAW). Northeast Fisheries Science Center Ref Doc. 95-19. 52 p.

NEFSC (Northeast Fisheries Science Center). 1996b. Report of the 22nd Northeast Regional Stock Assessment Workshop (22nd SAW): Stock Assessment Review Committee (SARC) Consensus Summary of Assessments. Northeast Fisheries Science Center Ref Doc. 96-13. 242 p.

NEFSC (Northeast Fisheries Science Center). 2007. 44th Northeast Regional Stock Assessment Workshop (44th SAW) assessment summary report. US Dep Commer, Northeast Fish Sci Cent Ref Doc. 07-03; 58 p.

NEFSC (Northeast Fisheries Science Center). 2008. 47th Northeast Regional Stock Assessment Workshop (47th SAW) Assessment Report. US Dept Commerce, Northeast Fish Sci Cent Ref Doc. 08-12a, 335 p.

NEFSC (Northeast Fisheries Science Center). 2013. 57th Northeast Regional Stock Assessment Workshop (57th SAW) Assessment Report. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 13-16; 967 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). 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/.

NMFS NEFSC FSB (National Marine Fisheries Service (NMFS) Northeast Fisheries Science Center Fisheries Statistics Branch (NEFSC FSB)). 2015. Northeast Fisheries Observer Program: Incidental Take Reports. Omnibus data request + supplemental data for 2014 from http://www.nefsc.noaa.gov/fsb/take_reports/nefop.html.

NMFS NEFSC FSB (National Marine Fisheries Service (NMFS) Northeast Fisheries Science Center Fisheries Statistics Branch (NEFSC FSB)). 2016. Northeast Fisheries Observer Program: Incidental Take Reports. Omnibus data request + supplemental data for 2015 from http://www.nefsc.noaa.gov/fsb/take_reports/nefop.html.

NMFS NEFSC FSB (Northeast Fisheries Science Center, Fisheries Sampling Branch). 2017. Northeast Fisheries Observer Program (NEFOP) and At-Sea Monitoring (ASM) Program: Incidental Take Reports for Sea Turtles, Sturgeon, and Salmon. Omnibus data request + supplemental data from 1989-2016. Data compiled on May 10 and 15, 2017.

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 pp.

NMFS (National Marine Fisheries Service). 2001. Endangered Species Act Section 7 consultation on the golden tilefish fishery management plan. Gloucester, MA. 78pp.

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 pp.

NMFS (National Marine Fisheries Service). 2010a. Biological Assessment of Shortnose Sturgeon (*Acipenser brevirostrum*). Prepared by the Shortnose Sturgeon Status Review Team for the National Marine Fisheries Service, Gloucester MA. 417pp.

NMFS (National Marine Fisheries Service). 2010b. Final recovery plan for the fin whale (*Balaenoptera physalus*). Prepared by the Office of Protected Resources National Marine Fisheries Service, Silver Spring, MD. 121 pp.

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 pp.

NMFS (National Marine Fisheries Service). 2011b. Bycatch Working Group Discussion Notes.NMFS Sturgeon Workshop, Alexandria, VA. February 11, 2011.

NMFS (National Marine Fisheries Service). 2012. North Atlantic Right Whale (*Eubalaena glacialis*) five year review: summary and evaluation. NOAA Fisheries Service, Northeast Regional Office, Gloucester, MA. 36pp.

NMFS (National Marine Fisheries Service). 2013. NMFS-Greater Atlantic Region 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.

NMFS (National Marine Fisheries Service). 2014a. NMFS-Greater Atlantic Region Endangered Species Act Section 7 Consultation on the Continued Implementation of Management Measures for the American Lobster Fishery.

NMFS (National Marine Fisheries Service). 2014b. 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). 2014c. 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 and USFWS (National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS)). 1991. Recovery plan for U.S. population of Atlantic green turtle (*Chelonia mydas*). National Marine Fisheries Service, Washington, D.C. 58 pp.

NMFS and USFWS (National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS)). 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 pp.

NMFS and USFWS (National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS)). 1995. Status reviews for sea turtles listed under the Endangered Species Act of 1973. Silver Spring, Maryland: National Marine Fisheries Service. 139 pp.

NMFS and USFWS (National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS)). 1998a. Recovery Plan for U.S. Pacific Populations of the Leatherback Turtle (*Dermochelys coriacea*). Silver Spring, Maryland: National Marine Fisheries Service. 65 pp.

NMFS and USFWS (National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS)). 1998b. Recovery Plan for U.S. Pacific Populations of the Green Turtle (*Chelonia mydas*). Silver Spring, Maryland: National Marine Fisheries Service. 84 pp.

NMFS and USFWS (National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS)). 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 (NMFS) and U.S. Fish and Wildlife Service (USFWS)). 2007a. Kemp's ridley sea turtle *(Lepidochelys kempii*) 5 year review: summary and evaluation. Silver Spring, Maryland: National Marine Fisheries Service. 50 pp.

NMFS and USFWS (National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS)). 2007b. Green sea turtle (*Chelonia mydas*) 5 year review: summary and evaluation. Silver Spring, Maryland: National Marine Fisheries Service. 102 pp.

NMFS and USFWS (National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS)). 2008. Recovery plan for the Northwest Atlantic population of the loggerhead turtle (*Caretta caretta*), Second revision. Washington, D.C.: National Marine Fisheries Service. 325 pp.

NMFS and USFWS (National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS)). 2013a. Hawksbill sea turtle (*Eretmochelys imbricata*)5 year review: summary and evaluation. Silver Spring, Maryland: National Marine Fisheries Service. 89 pp.

NMFS (National Marine Fisheries Service) and USFWS (U.S. Fish and Wildlife Service). 2013b. Leatherback sea turtle (*Dermochelys coriacea*) 5 year review: summary and evaluation. Silver Spring, Maryland: National Marine Fisheries Service. 91 pp.

NMFS and USFWS (National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS)). 2015. Kemp's ridley sea turtle (*Lepidochelys kempii*) 5 year review: summary and evaluation. Silver Spring, Maryland: National Marine Fisheries Service. 62 pp.

NMFS and USFWS (National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS)). 2016. Draft Recovery Plan for the Gulf of Maine Distinct Population Segment of Atlantic Salmon (*Salmo salar*). http://www.fisheries.noaa.gov/pr/pdfs/20160329_atlantic_salmon_draft_recovery_plan.pdf

NMFS (National Marine Fisheries Service), U.S. Fish and Wildlife Service, 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 pp. + appendices.

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.

Northeast Region Essential Fish Habitat Steering Committee (NREFHSC). 2002. Workshop on the effects of fishing gear on marine habitat off the northeastern United States. October 23-25, Boston, Massachusetts. NEFSC Ref. Doc. 02-01, 86 pp.

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.

Olla, B.L., C.E. Samet, and A.L. Studholme. 1972. Activity and feeding behavior of the summer flounder (*Paralichthys dentatus*) under controlled laboratory conditions. Fish. Bull. (U.S.) 70: 1127-1136.

Oliver, M.J., M. W. Breece, D. A. Fox, D. E. Haulsee, J. T. Kohut, J. Manderson, and T. Savoy. 2013. Shrinking the Haystack: Using an AUV in an Integrated Ocean Observatory to Map Atlantic Sturgeon in the Coastal Ocean. Fisheries 38(5): 210-216.

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. Conserv Genet: DOI 10.1007/s10592-014-0609-9; ISSN 1566-0621.

Pace, R.M. III and R. Merrick. 2008. Northwest Atlantic Ocean Habitats Important to the Conservation of North Atlantic Right Whales (*Eubalaena glacialis*). NEFSC Ref. Doc. 08-07.

Packer, David; Griesbach, Sara; Berrien, Peter; Zetlin, Christine; Johnson, Donna; Morse, Wallace. 1999. "Essential Fish Habitat Source Document: Summer Flounder, *Paralichthys dentatus*, Life History and Habitat Characteristics." Highlands, NJ. Available at: http://www.nefsc.noaa.gov/nefsc/publications/tm/tm151/tm151.pdf.

Palka, D. L. 2006. Summer abundance estimates of cetaceans in US North Atlantic Navy Operating Areas. Northeast Fish. Sci. Cent. Ref. Doc. 06-03. 41 pp. http://www.nefsc.noaa.gov/nefsc/publications/crd/crd0603/crd0603.pdf

Payne, P.M. and D.W. Heinemann. 1993. The distribution of pilot whales (*Globicephala sp*.) in shelf/shelf edge and slope waters of the northeastern United States, 1978-1988. Rep. Int. Whal. Comm. (Special Issue) 14: 51- 68.

Payne, P.M., L. A**.** Selzer, and A. R. Knowlton. 1984. Distribution and density of cetaceans, marine turtles, and seabirds in the shelf waters of the northeastern United States, June 1980 - December 1983, based on shipboard observations. National Marine Fisheries Service-NEFSC, Woods Hole, MA. 294pp.

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*. Fish. Bull. 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. Fish. Bull. 88: 687-696.

Peters, D.S. and J.W. Angelovic. 1971. Effect of temperature, salinity, and food availability on growth and energy utilization of juvenile summer flounder, *Paralichthys dentatus*. *In* D.J. Nelson ed. Proc. 3rd Natl. Symp. Radioecology USAEC Conf.,-710501-PI. p. 545-554. National Technical Information Service, Springfield, VA.

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.

Plotkin, P. and A.F. Amos. 1988. Entanglement in and ingestion of marine turtles stranded along the south Texas coast. Pages 79-82. In: B.A. Schroeder, compiler. Proceedings of the eighth annual workshop on sea turtle conservation and biology. NOAA Technical Memorandum NMFS/SEFC-214. On file at U.S. Fish and Wildlife Service, South Florida Ecosystem Office; Vero Beach, FL.

Plotkin, P. and A.F. Amos. 1990. Effects of anthropogenic debris on sea turtles in the northwestern Gulf of Mexico. In: R.S. Shomura and M.L. Godfrey (eds.), Proceedings of the Second International Conference on Marine Debris, 2-7 April 1989, Honolulu, HI, p. 736-747, NOAA Tech. Mem. NMFS-SWFSC-154. 1274 pp.

Poole, J.C. 1961. Age and growth of the fluke in Great South Bay and their significance to the sport fishery. N.Y. Fish Game J. 8: 1-18.

Powell AB. 1974. Biology of the summer flounder, *Paralichthys dentatus*, in Pamlico Sound and adjacent waters, with comments on *P. lethostigma* and *P. albigutta*. M.S. Thesis. University of North Carolina, Chapel Hill, NC. 145 p.

Read, A.J., P. Drinker, and S. Northridge. 2006. Bycatch of Marine Mammals in the U.S. and Global Fisheries. Conservation Biology 20(1): 163-169.

Reddin, D.G. 1985. Atlantic salmon (*Salmo salar*) on and east of the Grand Bank. J. Northwest Atl. Fish. Soc. 6(2):157-164.

Reddin, D.G and P.B. Short. 1991. Postsmolt Atlantic salmon (*Salmo salar*) in the Labrador Sea. Can. J. Fish Aquat. Sci. 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.

Risch, D., C. W. Clark, P. J. Dugan, M. Popescu, U. Siebert, and S. M. Van Parijs. 2013. Minke whale acoustic behavior and multi-year seasonal and diel vocalization patterns in Massachusetts Bay, USA. Mar Ecol Prog Ser 489: 279–295.

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.

Rudnicky, B.M., and J.A. Sulikowski. 2016. First Observation of YOY *Paralichthys dentatus* (summer flounder) in a Southern Maine estuary. Northeastern Naturalist 23(1):N1-N3.

Sasso, C.R., and S.P. Epperly. 2006. Seasonal sea turtle mortality risk from forced submergence in bottom trawls. Fisheries Research 81:86-88.

Savoy, T., and D. Pacileo. 2003. Movements and important habitats of subadult Atlantic sturgeon in Connecticut waters. Transactions of the American Fisheries Society. 132: 1-8.

Schevill, W.E., W.A. Watkins, and K.E. Moore. 1986. Status of *Eubalaena glacialis* off Cape Cod. Report of the International Whaling Commission, Special Issue 10: 79-82.

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.

Sears, R. 2002. Blue whale, *Balaenoptera musculus*. Pages 112-116. In: W.F. Perrin, B. Würsig, and J.G.M. Thewissen, eds. Encyclopedia of Marine Mammals. San Diego: Academic Press.

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: A pelagic ecosystem survey targeting Atlantic salmon in the Northwest Atlantic. ICES Journal of Marine Science, doi:10.1093/icesjms/fss052.

Shepherd G. 1980. A comparative study of aging methods for summer flounder (*Paralichthys dentatus*). Northeast Fisheries Center Lab Ref Doc. 80-13. 26 p.

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.

Smith, W.G. 1973. The distribution of summer flounder, *Paralichthys dentatus*, eggs and larvae on the continental shelf between Cape Cod and Cape Lookout, 1965-66. Fish. Bull. (U.S.) 71: 527-548.

Smith, R.W. and F.C. Daiber. 1977. Biology of the summer flounder, *Paralichthys dentatus*, in Delaware Bay. Fish. Bull. (U.S.) 75: 823-830.

STDN (Sea Turtle Disentanglement Network. 2016. Northeast Region Sea Turtle Disentanglement Network Summary of Entanglement/Disentanglement Data from 2002-2016. Unpublished report compiled by NMFS NERO.

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.

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.

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.

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. Mar. Mamm. Sci. 9: 309-315.

Terceiro, M. 2001. “The summer flounder chronicles: Science, politics, and litigation, 1975–2000.” Reviews in Fish Biology and Fisheries,11: p. 125-168. Available at: https://www.nefsc.noaa.gov/saw/2006FlukeReview/chronicles.pdf.

Terceiro, M. 2011. “The summer flounder chronicles II: new science, new controversy, 2001-2010.” Reviews in Fish Biology and Fisheries, 21: p. 681-712. Available at: https://www.researchgate.net/publication/251269270_The_summer_flounder_chronicles_II_New_science_new_controversy_2001-2010.

Terceiro M. 2012. Stock assessment of summer flounder for 2012. Northeast Fisheries Science Center Ref Doc. 12-21. 148 p.

Terceiro M. 2015. Stock assessment update of summer flounder for 2015. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 15-13; 18 p. doi: 10.7289/V57D2S4G

Terceiro M. 2016. Stock Assessment of Summer Flounder for 2016. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 16-15; 117 p. Available from: National Marine Fisheries Service, 166 Water Street, Woods Hole, MA 02543-1026, or online at http://www.nefsc.noaa.gov/publications/.

Terceiro, M. 2017a. Summer Flounder Data Update for 2017. US Dept Commer, Northeast Fish Sci Cent. Available at: http://www.mafmc.org/s/5-Summer_flounder_2017_Data_Update-t9ap.pdf

Terceiro, M. 2017b. Stock Assessment of Scup for 2017. US Dept Commer, Northeast Fish Sci Cent. Available at: http://www.mafmc.org/s/5Scup_2017_Assesssment_Update.pdf.

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.

Timmons, M. 1995. Relationships between macroalgae and juvenile fishes in the inland bays of Delaware. Ph.D. dissertation, Univ. Delaware, Newark, DE. 155 p.

Timoshkin, V. P. 1968. Atlantic sturgeon (*Acipenser sturio* L.) caught at sea. Prob. Ichthyol. 8(4):598.

U.S. Atlantic Salmon Assessment Committee (USASAC). 2004.Annual Report of the U.S. Atlantic Salmon Assessment Committee.

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. Aq. Biol.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 pp. http://www.nefsc.noaa.gov/publications/crd/.

Waring G.T., E. Josephson, C.P. Fairfield-Walsh , K. Maze-Foley K, editors. 2007. U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments -- 2007. NOAA Tech Memo NMFS-NE- 205. 415 pp.

Waring, G.T., E. Josephson, K. Maze-Foley, and P.E. Rosel, editors. 2010. U.S. Atlantic and Gulf of Mexico marine mammal stock assessments—2010. NOAA Tech Memo NMFS-NE-219. 606 pp.

Waring, G.T., E. Josephson, K. Maze-Foley, and P.E. Rosel, editors. 2014a. U.S. Atlantic and Gulf of Mexico marine mammal stock assessments—2013. NOAA Tech Memo NMFS- NE-228. 475 pp.

Waring, G.T, F. Wenzel, E. Josephson, M.C. Lyssikatos. 2014b. Serious Injury Determinations for Small Cetaceans and Pinnipeds Caught in Commercial Fisheries off the Northeast U.S. Coast, 2007-2011. U.S. Dept Commer, Northeast Fish Sci Cent Ref Doc. 14-13; 26 p. doi: 10.7289/V5QN64QH

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. 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

Watkins, W.A., and W.E. Schevill. 1982. Observations of right whales (*Eubalaena glacialis*) in Cape Cod waters. Fish. Bull. 80(4):875-880.

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.

Whitehead, H. 2002. Estimates of the Current Global Population Size and Historical Trajectory for Sperm Whales. Mar. Ecol. Prog. Ser. 242: 295-304.

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.

Wigley SE, McBride HM, McHugh NJ. 2003. Length-weight relationships for 74 fish species collected during NEFSC research vessel bottom trawl surveys, 1992-99. NOAA Technical Memorandum NMFS-NE-171.

Winn, H.E., C.A. Price, and P.W. Sorensen. 1986. The distributional biology of the right whale (*Eubalaena glacialis*) in the western North Atlantic. Reports of the International Whaling Commission (Special issue). 10: 129-138.

Wilk SJ, Smith WG, Ralph DE, Sibunka J. 1980. The population structure of summer flounder between New York and Florida based on linear discriminant analysis. Trans Am Fish Soc. 109: 65-271.

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.

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.

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