Atlantic States Marine Fisheries Commission

Summer Flounder, Scup, and Black Sea Bass Management Board and Mid-Atlantic Fishery Management Council

April 30, 2018
10:00 a.m. – 3:00 p.m.
Arlington, Virginia

Draft Agenda

The times listed are approximate; the order in which these items will be taken is subject to change; other items may be added as necessary.

1. Welcome/Call to Order *(R. Ballou/M. Luisi)* — 10:00 a.m.

2. Board Consent — 10:00 a.m.
   - Approval of Agenda
   - Approval of Proceedings from February 2018

3. Public Comment — 10:05 a.m.

4. Consider Approval of Summer Flounder Draft Amendment and Public Hearing Document for Public Comment (*K. Dancy/K. Rootes-Murdy*) — 10:15 a.m.
   Action
   - Review Management Alternatives
   - Presentation of Management Documents

5. Lunch Break — 12:00 p.m.

6. Summer Flounder, Scup and Black Sea Bass Management (*J. Beaty/C. Starks*) — 1:00 p.m.
   Possible Action
   - Overview of Black Sea Bass Recreational Management Discussion Document
   - Review Draft Alternatives for Framework/Addendum on Recreational Issues
   - Review Preliminary February 2018 Black Sea Bass Recreational Harvest Estimates

7. Other Business/Recess — 3:00 p.m.

The meeting will be held at the Westin Crystal City, 1800 S. Eads Street, Arlington, Virginia; 703.486.1111

MEETING OVERVIEW

Summer Flounder, Scup, and Black Sea Bass Management Board and Mid-Atlantic Fishery Management Council Joint Meeting
April 30, 2018
10:00 a.m. - 12:00 p.m. and 1:00 - 3:00 p.m.
Arlington, Virginia

Board Chair: Bob Ballou (RI) Assumed Chairmanship: 10/17 Council Chair: Mike Luisi	Technical Committee Chair: Greg Wojcik (CT)	Law Enforcement Committee Representative: Snellbaker (NJ)
Board Vice Chair: Adam Nowalsky	Advisory Panel Chair: Vacant	Previous Board Meeting: February 8, 2018 and Conference Call on March 20, 2018
Voting Members: NH, MA, RI, CT, NY, NJ, DE, MD, PRFC, VA, NC, NMFS, USFWS (13 votes for Black Sea Bass; 12 votes for Summer Flounder and Scup)		

2. Board Consent

- Approval of Agenda
- Approval of Proceedings from February 2018

3. Public Comment – At the beginning of the meeting public comment will be taken on items not on the agenda. Individuals that wish to speak at this time must sign-in at the beginning of the meeting. For agenda items that have already gone out for public hearing and/or have had a public comment period that has closed, the Board Chair may determine that additional public comment will not provide additional information. In this circumstance the Chair will not allow additional public comment on an issue. For agenda items that the public has not had a chance to provide input, the Board Chair may allow limited opportunity for comment. The Board Chair has the discretion to limit the number of speakers and/or the length of each comment.

4. Consider Approval of Summer Flounder Draft Amendment for Public Comment (10:15-12:00 p.m.) Action

Background

- The Board and Council initiated a comprehensive amendment on summer flounder management in 2014. Since then the focus of the Draft Amendment has shifted to commercial management issues, specifically federal permit requalification, commercial allocation, and landings flexibility.
- In December 2017, the Board and Council were presented a range of alternatives on each of the commercial management issues and provided feedback on the development of the Draft Amendment. **(Supplemental Materials)**
- A Draft Public Hearing Document has been developed that summarizes the proposed alternatives and their expected impacts. **(Supplemental Materials)**

Presentations

- Review Management Alternatives and Management Documents by K. Dancy and K. Rootes-Murdy

Board actions for consideration at this meeting

- Review and approve Public Hearing Document for public comment

- Approve Summer Flounder Draft Amendment for public comment

5. Lunch Break

6. Summer Flounder, Scup and Black Sea Bass Management (1:00-3:00 p.m.) Possible Action

Background

- Some Commissioners have expressed interest in exploring ways to improve black sea bass management, and have prepared a discussion document to help the Board and Council strategize management in future years. **(Supplemental Materials)**
- In December 2017 the Board and Council initiated a joint Framework/Addendum to address several recreational issues for summer flounder, scup and black sea bass, including Conservation Equivalency for black sea bass, slot limits, and transit issues. The Council formed a Fishery Management Action Team (FMAT) to develop draft alternatives. **(Briefing Materials)**
- In March 2018, the Demersal Committee of the Council reviewed and provided feedback on the draft alternatives for the Framework/Addendum. **(Briefing Materials)**
- In October 2017, the Council and Board approved like motions to open a black sea bass recreational fishery in February 2018. 100,000 pounds of harvest were allocated to that fishery, with each state allocated a proportion of the total based on historical wave 1 harvest. Only the states of Virginia and North Carolina participated in the 2018 February fishery. **(Briefing Materials)**

Presentations

- Overview of Black Sea Bass Recreational Management Discussion Document by A. Nowalsky
- Review of Draft Alternatives for Framework/Addendum on Recreational Issues by J. Beaty and C. Starks
- Review of Preliminary February 2018 Black Sea Bass Recreational Harvest Estimates by C. Starks

Board discussion at this meeting

- Regarding the Black Sea Bass Recreational Management Discussion Document**,** is there support for moving forward, in short term, as proposed (i.e., next steps)?

Board actions for consideration at this meeting

- Provide guidance on Draft Alternatives for Framework/Addendum on Recreational Issues

7. Other Business/Recess

SUMMER FLOUNDER COMMERCIAL ISSUES AMENDMENT

DRAFT PUBLIC HEARING DOCUMENT FOR COUNCIL/BOARD REVIEW

APRIL 2018

Prepared by the
Mid-Atlantic Fishery Management Council (MAFMC or Council)
and the
Atlantic States Marine Fisheries Commission (ASMFC or Commission)

1.0 CONTENTS

2.0 INSTRUCTIONS FOR PROVIDING PUBLIC COMMENTS

The Mid-Atlantic Fishery Management Council (MAFMC or Council) and the Atlantic States Marine Fisheries Commission (ASMFC or Commission) will collect public comments on the Summer Flounder Commercial Issues Amendment during [*#*] public hearings to be held in [*July/August*] 2018, and during a 45-day written public comment period. Written comments may be sent by any of the following methods:

1. **Online** at www.mafmc.org/comments/summer-flounder-amendment
2. **Email** to the following address: **[TBD email address]**
3. **Mail or Fax** to either:

Chris Moore, Ph.D., Executive Director
Mid-Atlantic Fishery Management Council
North State Street, Suite 201
Dover, DE 19901
FAX: 302.674.5399

Bob Beal, Executive Director
Atlantic States Marine Fisheries Commission
1050 North Highland Street, Suite 200A-N
Arlington, VA 22201
FAX: 703.842.0741

If sending comments through the mail, please write "Summer Flounder Amendment Comments" on the outside of the envelope. If sending comments through email or fax, please write "Summer Flounder Amendment Comments" in the subject line.

All comments, regardless of submission method, will be compiled for review and consideration by both the Council and Commission. **Please do not send separate comments to the Council and Commission or submit the same comments through multiple channels.**

Interested members of the public are encouraged to attend any of the following [#] public hearings and to provide oral or written comments at these hearings:

Date and Time	Location
[TBD]	[TBD]
[TBD]	[TBD]
[TBD]	[TBD]
[TBD]	[TBD]
[TBD]	[TBD]
[TBD]	[TBD]
[TBD]	[TBD]
[TBD]	[TBD]
[TBD]	[TBD]
[TBD]	[TBD]
[TBD]	[TBD]
[TBD]	[TBD]

For additional information and updates, please visit: http://www.mafmc.org/actions/summer-flounder-amendment. If you have any questions, please contact either:

Kirby Rootes-Murdy, Senior FMP Coordinator
Atlantic States Marine Fisheries Commission
krootes-murdy@asmfc.org
(703) 842-0740

Kiley Dancy, Fishery Management Specialist
Mid-Atlantic Fishery Management Council
kdancy@mafmc.org
(302) 526-5257

3.0 INTRODUCTION AND AMENDMENT PURPOSE

3.1 Amendment Purpose

Summer flounder is managed along with scup and black sea bass under joint Fishery Management Plans (FMPs) developed by the Council and Commission. This public hearing document describes potential modifications to the FMP that would impact the **commercial summer flounder fishery as well as the existing FMP objectives for summer flounder**.

This public hearing document is a condensed summary of the proposed actions and their expected impacts. A full description of the actions under consideration, the current status of the resources and communities that may be impacted by this action, and the expected impacts of the proposed actions are described in a Draft Environmental Impact Statement (DEIS). The DEIS can be viewed at: http://mafmc.org/s/summer-flounder-commercial-DEIS.pdf. ***(Note for Council and Board: the DEIS will be completed prior to public hearings).***

The purposes of this amendment are:

1. **Consider implementing requalifying criteria for federal commercial moratorium permits:** Federal permit qualification criteria have not changed since establishment in 1993. Some stakeholders believe lenient original qualifications criteria resulted in more permits than the fishery could profitably support in the long term. There is concern that the current number of federal permits is too high relative to recent stock size estimates and resulting quotas. Given restrictions and stock trends in other fisheries, there is concern that inactive permits may re-enter the summer flounder fishery, putting further economic strain on participating vessels. The purpose of the options in section 5.0 is to consider whether a reduction in the number of commercial moratorium permits for summer flounder is appropriate to more closely reflect current stock and fishery conditions, and if so, how qualifying criteria should be revised.

2. **Consider modifications to commercial quota allocation:** The 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 the initial allocations may not have been equitable or were based on flawed data; therefore, stakeholders requested evaluation of alternative allocation systems. The purpose of the options in section 6.0 is to consider whether modifications to the commercial quota allocation are appropriate, and if so, how the quota should be re-allocated.

3. **Consider adding commercial landings flexibility as a framework issue in the Council's FMP:** 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 broader landings flexibility 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 allowing a future landings flexibility action to be completed through a framework action to the Council's FMP instead of a full amendment. The Board can likely already 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 the options in section 7.0 is to consider adding landings flexibility policies to the list of management measures in the Council's FMP that could be implemented via framework action.

4. **<u>Revise the FMP objectives for summer flounder</u>**: Many managers and stakeholders believe that the current objectives have become outdated and could provide more meaningful guidance if updated. Although the revisions to FMP objectives are not proposed as an explicit alternative set in this amendment, they are provided in this document for public comment. These proposed revisions are described in section 4.0, and **would not become final until approved by the Council and Board** following the public comment period.

<u>Please note</u>: the Council and Board have not yet identified preferred alternatives for any of the issues in this amendment.

3.2 What Happens Next?

This document supports a series of public hearings and a 45-day public comment period scheduled to take place during [*July/August 2018*]. Following public hearings, written and oral comments will be compiled and provided to the Council and Board for review. These comments will be considered prior to taking final action on the amendment, which is tentatively scheduled for December 2018. The Council's recommendations are not final until they are approved or partially approved by the Secretary of Commerce through the National Marine Fisheries Service, so the timing of full implementation of this action will depend on the federal rulemaking timeline. This rulemaking process is expected to occur in 2019, with revised measures possibly effective at the start of the 2020 fishing year.

4.0 PROPOSED REVISIONS TO FMP OBJECTIVES

4.1 Current FMP Objectives

The current FMP objectives for summer flounder, adopted via Amendment 2 (1993), 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 Proposed Revisions to FMP Objectives

The Council and Board are considering revisions to the existing FMP objectives for summer flounder through this amendment. These changes would **not** apply to the objectives for scup and black sea bass. 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, communicating high-level values and priorities for summer flounder management. *Objectives* are more specific and actionable, describing important steps toward accomplishing goals.

The proposed revisions are based on feedback from the Council and Board, as well as both bodies' Advisory Panels. Feedback on goals and objectives was also taken from the scoping process for this amendment and the Council's 2012 Visioning and Strategic Planning Project Stakeholder

Input Report. More information on how these revisions were developed can be found in section 4.2.2 of the DEIS.

Please note: While these revisions are not included as an explicit alternative within this amendment, the proposed revisions are not final until approved by the Council and Board. **The Council and Board are seeking feedback from the public on the proposed revisions during the public hearing process.**

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: 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.

5.0 FEDERAL MORATORIUM PERMIT REQUALIFICATION

5.1 Federal Moratorium Permit Requalification Alternatives

This action may revise 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*

Alternative 1A would make no changes to the current eligibility criteria for commercial moratorium permits for summer flounder. 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. To be eligible, 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. 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.[1]

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.

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 and has no impact on state level permits.

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 federal permits and was intended to help the Council and Board to identify latent effort in the fishery. All seven sub-alternatives below use requalifying time periods for summer flounder landings *prior to* August 1, 2014.

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-alternatives below in Table 1 would need to be selected**. These options are shown along with the number of MRIs that would eliminated and retained under each option. 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 consist of commercial summer flounder landings associated with each MRI as verified by NMFS through dealer records.

[1] 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: 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*	*941*	*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 Impacts of Federal Moratorium Permit Requalification Alternatives

This alternative set considers options to reduce the number of federal commercial permits available to be issued for summer flounder. Under all alternatives, overall annual 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. However, as described below, requalification of moratorium permits may result in a redistribution of effort among a different pool of vessels. However, it appears that most eliminated MRIs under each sub-alternative under 1B are associated with little to no activity for summer flounder in recent years; therefore, the near-term impacts of reducing permit capacity under alternative 1B may be minimal, as described below.

Because this alternative set 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. The sections below describe the general expected impacts of each proposed alternative for federal permit requalification. **Note that more in-depth analysis is provided in the DEIS in section 7.1. *(Note for Council and Board:*** *this analysis is not currently complete in the DEIS but will be available for public hearings).*

5.2.1 Impacts of Alternative 1A: No Action/*Status Quo*

The no action/*status quo* alternative 1A would have no near-term impacts in the sense that no changes would be made to the current pool of eligible vessels or permitting requirements. This alternative is associated with the highest number of summer flounder permits remaining eligible (941 MRIs currently exist for summer flounder, meaning 941 summer flounder moratorium permits are currently eligible to be issued). If conditions remain relatively similar to the past few years in terms of fishery participation and coastwide quota levels, the distribution of effort among vessels and along the coast is likely to remain similar to the current distribution.

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, associated employees, and fishing communities may experience negative socioeconomic impacts as the result of limited quotas being further spread among many participants. This is especially true under relatively low quotas, as have been implemented for summer flounder in the past few years due to declining stock biomass. Depending on the degree of re-entry to the fishery, more restrictive management measures may be necessary for all vessels to ensure that quotas are not exceeded.

The degree to which inactive or low activity vessels may increase landings of summer flounder in the future is difficult to predict. Thus, the impacts of this alternative are highly uncertain and depend on a variety of broader management and economic factors.

Quota reallocation, described in section 6.0 of this document, may influence the degree of re-entry to the fishery and associated distributional impacts. Under a revised state-by-state allocation system, whether latent permitholders 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 (see section 6.1.4), 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 coastwide winter period measures are appealing enough compared to their particular state measures in recent years.

Slight positive economic impacts are possible for low activity or latent permitholders under alternative 1A, as they would retain the flexibility to target summer flounder in the future. The magnitude of these positive impacts would depend on the degree to which this flexibility was used, as well as the overall degree of re-entry to the fishery, as some benefits may be offset by the need for more restrictive management measures.

Overall, the impacts of alternative 1A are highly uncertain and depend on the likelihood of latent effort re-entering the fishery. This alternative could result in no changes to current conditions, or could result in overall negative socioeconomic impacts due to effort being spread among more participants.

5.2.2 Impacts of Alternative 1B: Requalifying Criteria for 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 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 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 is not likely to impact overall effort each year but will impact the pool of vessels participating in the fishery, and may impact the distribution of effort depending on how active eliminated permits have been or would be in the future.

Because overall fishery effort is not expected to be influenced by these alternatives, each should have negligible to minor impacts on the summer flounder stock, non-target species, habitat, or protected resources compared to their current condition. 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. A slight increase in summer flounder discards from non-requalifying vessels is possible if they are no longer permitted to land this species. However, the total catch will still be accounted for and constrained by the annual catch limit. In addition, most eliminated vessels do not currently appear to be landing much summer flounder, so effects on summer flounder discards would likely be minimal.

Impacts of sub-alternatives under 1B will be primarily socioeconomic impacts to individual permit holders and fishing communities. Impacts could include direct near-term economic impacts through elimination of current effort and opportunity, as well as indirect 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 businesses 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 both positive and negative economic impacts 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.

Table 2 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.[2] According to this analysis, even though a substantial portion of summer flounder permits may be eliminated under some alternatives, all eliminated MRIs under these alternatives are associated with very little or no summer flounder landings in recent years. This indicates that the magnitude of near-term positive or negative economic impacts are likely to be very small or negligible. Vessels with eliminated permits would not see a substantial reduction in revenues given that they 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.

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, possibly leading to longer-term socioeconomic impacts. 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, at least to a degree. The reduced potential for latent effort would have positive economic impacts on remaining vessels and their communities, 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 permits could experience negative economic impacts due to having less flexibility 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 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.

Among the sub-alternatives considered, 1B-6 is likely to have the largest impacts due to having the highest associated landings and revenues for summer flounder. However, these impacts are still expected to be small given that these landings only accounted for 0.32% of the landings and 0.28% of the revenues from summer flounder from August 2009 through July 2014. Alternatives 1B-2 and 1B-4 eliminate permits that are associated with no summer flounder landings over this time period. Compared to the other alternatives, these alternatives are more likely to have negligible impacts on current fishery conditions (Table 2).

[2] 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 2: 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	August 1, 2009-July 31, 2014 (5 yrs)	≥1,000 pounds cumulative over this time period	516 (55%)	24,529	0.04%	$54,395	0.05%
1B-2	August 1, 2009-July 31, 2014 (5 yrs)	At least 1 pound in any year over this time period	448 (48%)	0	0.00%	$0	0.00%
1B-3	August 1, 2004-July 31, 2014 (10 yrs)	≥1,000 pounds cumulative over this time period	389 (41%)	5,713	0.01%	$10,980	0.01%
1B-4	August 1, 2004-July 31, 2014 (10 yrs)	At least 1 pound in any year over this time period	306 (33%)	0	0.00%	$0	0%
1B-5	August 1, 1999-July 31, 2014 (15 yrs)	≥1,000 pounds cumulative over this time period	295 (31%)	2,896	0.01%	$7,016	0.01%
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%)	181,302	0.32%	$326,034	0.28%
1B-7	August 1, 1994-July 31, 2014 (20 yrs)	≥1,000 pounds cumulative over this time period	233 (25%)	2,414	0.00%	$5,619	0.00%

6.0 COMMERCIAL QUOTA ALLOCATION

6.1 Commercial Quota Allocation Alternatives

This section describes options for modifying the current state-by-state allocation of the summer flounder commercial quota. 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.

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

Alternative 2A would make no changes to the current state allocation percentages, which are based on commercial landings by state from 1980-1989 (Table 3). Each state sets measures to achieve, but not exceed, their annual state-specific 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's waters. Any quota overages by a state during the year are subtracted (in pounds) from that state's quota the following year. Example quota distributions are described in section 6.2.1.

State-by-state allocations were first implemented via Amendment 2 (1993)[3], and slightly modified through Amendment 4 (1993).[4] Amendment 5 (1993) allowed two or more states, with the consent of NMFS, to transfer or combine their summer flounder commercial quota in a given year if desired.

Table 3: 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

[3] Estimated landings by state and year for 1980-1989 in Amendment 2 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.
[4] 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.

6.1.2 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, compared across the two ten-year time periods of **1980-1989 and 2007-2016**.[5] Similar to the approach taken in the black sea bass benchmark stock assessment, survey strata were grouped into two regions divided approximately at Hudson Canyon: a Northern region with waters approximately off the states of New York and north, and a Southern region with waters approximately off the states of New Jersey and south. Calculations were based on NEFSC spring and fall trawl survey catches; these surveys were used because they represent the only data sets with enough coverage in space and time to describe changes in geographic distribution of the stock over time. Survey catch for summer flounder below 14 inches was removed to derive an index of commercial exploitable biomass (i.e., to identify biomass retainable by the commercial fishery). A more detailed description of the analysis methods, including details of the survey strata divisions, can be found in the DEIS (section 5.2.2 and Appendix B).

Northern and Southern indices were weighted by the area surveyed to provide seasonal total indices to express the regional 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. 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 2007-2016 (Figure 1).**

[5] These time periods were chosen to reflect the period used as the basis for current allocations (1980-1989) and the most recent complete ten-year period at the time of the analysis.

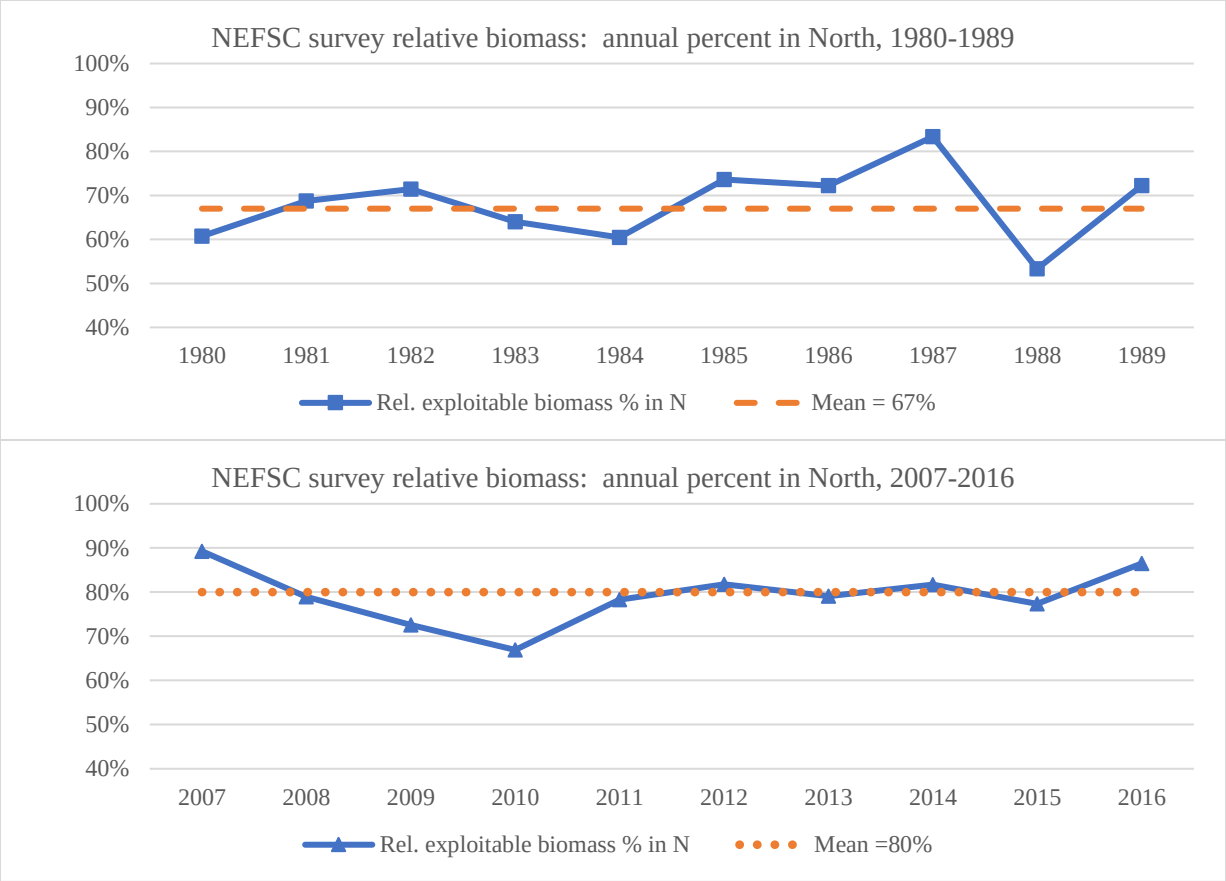


Figure 1: NEFSC survey relative exploitable biomass annual percent in Northern region, 1980-1989 and 2007-2016. The remaining relative biomass is attributable to the Southern region.

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**.[6] 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%.

6.1.2.1 Sub-Alternative 2B-1: Adjustment 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: (32.46%*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 Northern 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, shifting 6% of the coastwide allocation from the South to the North. This constitutes a 19% increase in the Northern region's allocation (relative to their starting allocation of ~32.46%), and a 9% decrease in the Southern region allocation (relative to their starting allocation of ~67.54%; 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 and the changes they represent are shown in Table 4. Revised allocations are taken to five decimal places to be consistent with the current state level allocations. Example allocations under hypothetical quota scenarios are described in section 6.2.2.

[6] 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 4: Alternative 2B-1: adjustment based on Northern region percent change in exploitable biomass. The shift in relative exploitable biomass in the North is expressed as a percent change (+19%) and applied as a percent change to the Northern allocation. Southern allocations are then calculated such that total allocations add to 100%.

State	A) Status quo state allocation (%)	B) Status quo % of regional alloc.	C) Status quo state % of regional total	D) Revised regional allocation based on 19% increase rel. to N region	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
ME	0.04756	32.46	0.14654	38.62	**0.05660**	+19.0%	+0.00904
NH	0.00046		0.00142		**0.00055**	+19.0%	+0.00009
MA	6.82046		21.01479		**8.11635**	+19.0%	+1.29589
RI	15.68298		48.32144		**18.66275**	+19.0%	+2.97977
CT	2.25708		6.95438		**2.68593**	+19.0%	+0.42885
NY	7.64699		23.56144		**9.09992**	+19.0%	+1.45293
NJ	16.72499	67.54	24.76145	61.38	**15.19806**	-9.1%	-1.52693
DE	0.01779		0.02634		**0.01617**	-9.1%	-0.00162
MD	2.0391		3.01890		**1.85294**	-9.1%	-0.18616
VA	21.31676		31.55959		**19.37062**	-9.1%	-1.94614
NC	27.44584		40.63373		**24.94014**	-9.1%	-2.50570
Total	100	100	--	100	**100**	--	0

[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).

6.1.2.2 Sub-Alternative 2B-2: Adjustment 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 45.45%).

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 than alternative 2B-1, shifting 13% of the coastwide allocation from the Southern region to the Northern region. 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 ~32.46%), and a 19% decrease in the Southern region allocation (relative to their starting allocation of ~67.54%; 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 and the changes they represent are shown in Table 5. Example allocations under hypothetical quota scenarios are described in section 6.2.2.

Table 5: Alternative 2B -2: adjustment based on absolute change in regional proportions. This option uses the 13% absolute shift in relative exploitable biomass and applies this change additively to the existing regional allocations.

State	A) Status quo state allocation (%)	B) Status quo % of regional alloc.	C) Status quo state % of regional total	D) Revised regional allocation based on 19% increase rel. 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
ME	0.04756	32.46	0.14654	45.46	**0.06661**	+40.1%	+0.01905
NH	0.00046		0.00142		**0.00064**	+40.1%	+0.00018
MA	6.82046		21.01479		**9.55238**	+40.1%	+2.73192
RI	15.68298		48.32144		**21.96477**	+40.1%	+6.28179
CT	2.25708		6.95438		**3.16115**	+40.1%	+0.90407
NY	7.64699		23.56144		**10.70998**	+40.1%	+3.06299
NJ	16.72499	67.54	24.76145	54.54	**13.50600**	-19.2%	-3.21899
DE	0.01779		0.02634		**0.01437**	-19.2%	-0.00342
MD	2.0391		3.01890		**1.64664**	-19.2%	-0.39246
VA	21.31676		31.55959		**17.21401**	-19.2%	-4.10275
NC	27.44584		40.63373		**22.16345**	-19.2%	-5.28239
Total	100	100	--	100	100	--	0

[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).

6.1.3 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. 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 substantially in most future years.

For both sub-alternatives, 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.

The "new" total allocation percentages by state under both sub-alternatives could not be calculated until the annual commercial quota is 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 is available to be distributed (see section 6.2.3).

6.1.3.1 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.[7]

Configuration of alternative 2C-1 is summarized in Table 6; example allocations under hypothetical quota scenarios are described in section 6.2.3.

Table 6: Alternative 2C-1: modified distribution of additional commercial quota beyond 8.40 million pounds (5-yr commercial quota trigger).

State	Allocation of baseline quota ≤ 8.40 mil lb	Allocation of <u>additional</u> quota beyond 8.40 mil lb	Revised state quota
ME	0.04756%	0.333%	Dependent on total annual coastwide quota; % share varies with amount of "additional" quota (see section 6.2.3)
NH	0.00046%	0.333%	
MA	6.82046%	12.375%	
RI	15.68298%	12.375%	
CT	2.25708%	12.375%	
NY	7.64699%	12.375%	
NJ	16.72499%	12.375%	
DE	0.01779%	0.333%	
MD	2.03910%	12.375%	
VA	21.31676%	12.375%	
NC	27.44584%	12.375%	
Total	100	100%	100%

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

6.1.3.2 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 pou**nds 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.[8]

Configuration of alternative 2C-2 is summarized in Table 7; example allocations under hypothetical quota scenarios are described in section 6.2.3.

Table 7: 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	Revised state quota
ME	0.04756%	0.333%	Dependent on total annual coastwide quota; % share varies with amount of "additional" quota (see section 6.2.3)
NH	0.00046%	0.333%	
MA	6.82046%	12.375%	
RI	15.68298%	12.375%	
CT	2.25708%	12.375%	
NY	7.64699%	12.375%	
NJ	16.72499%	12.375%	
DE	0.01779%	0.333%	
MD	2.03910%	12.375%	
VA	21.31676%	12.375%	
NC	27.44584%	12.375%	
Total	100	100%	100%

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

This alternative would allocate the annual summer flounder commercial quota into three unequal seasonal periods, similar to the way the commercial scup fishery is currently managed. The proposed quota periods include 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. 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. The Council and Board are seeking public feedback on the quota period dates in particular, in addition to general comments on this alternative, as described below.

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 would count toward the appropriate winter quota, and the fishery would be closed once this quota is exceeded. Winter period overages would be subtracted from the following year's quota for the same period.

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

In the Summer period, May-October, new state-by-state quota shares would be established and managed by individual states with state level possession limits and other measures. 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-alternatives are described in detail below.

6.1.4.1 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 8, and described below. Example allocations under hypothetical quota scenarios are described in section 6.2.4.

- **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) that moved October from Summer to Winter II for scup. For summer flounder, 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 the DEIS (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.[9] 55.26% of the annual quota would be allocated to Winter I, 27.65% to Summer, and 17.10% to Winter II (Table 8).
- **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.[10]
- **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 8).

Table 8: Alternative 2D-1: Scup model with Maryland exemption.

<table>
<tr><th>Quota Period</th><th>Allocation % (of remaining coastwide commercial quota after 2.03910% allocated to MD)</th><th>Measures</th></tr>
<tr><td>Winter I (Jan 1-Apr 30)</td><td>55.26%</td><td>Coastwide (except MD)</td></tr>
<tr><td>Summer (May 1- Oct 31)</td><td>27.65%</td><td rowspan="12">State-specific</td></tr>
<tr><td rowspan="11">State-specific summer allocations</td><td>ME 0.015%</td></tr>
<tr><td>NH 0.000%</td></tr>
<tr><td>MA 19.332%</td></tr>
<tr><td>RI 22.476%</td></tr>
<tr><td>CT 3.566%</td></tr>
<tr><td>NY 18.553%</td></tr>
<tr><td>NJ 29.667%</td></tr>
<tr><td>DE 0.045%</td></tr>
<tr><td>MD --[a]</td></tr>
<tr><td>VA 5.648%</td></tr>
<tr><td>NC 0.699%</td></tr>
<tr><td>Winter II (Nov 1 - Dec 31)</td><td>17.10%</td><td>Coastwide (except MD)</td></tr>
<tr><td>Total</td><td>100%</td><td>--</td></tr>
</table>

[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).

[9] Past state-level seasonal regulations (e.g., closures, possession limits) are not explicitly accounted for in this analysis.
[10] 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

6.1.4.2 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 9, and described below. Example allocations under hypothetical quota scenarios are described in section 6.2.4.

- **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 9).
- **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 9).

Table 9: Alternative 2D-2: scup model without Maryland exemption.

Quota Period	Allocation % (of annual coastwide commercial quota)		Measures
Winter I (Jan 1-Apr 30)	**54.68%**		Coastwide
Summer (May 1- Oct 31)	**28.28%**		State-specific
State-specific summer allocations	**ME**	**0.015%**	
	NH	0.000%	
	MA	18.525%	
	RI	21.538%	
	CT	3.417%	
	NY	17.779%	
	NJ	28.429%	
	DE	0.043%	
	MD	4.171%	
	VA	5.412%	
	NC	0.670%	
Winter II (Nov 1 - Dec 31)	**17.04%**		Coastwide
Total	**100%**		--

6.2 Impacts of Commercial Quota Allocation Alternatives

This alternative set considers options to modify the allocation of commercial quota for summer flounder. Under all alternatives, overall annual landings will still be constrained by the annual commercial quotas, meaning that catch and landings limits should remain the primary driving factor for overall fishery effort in a given year. However, as described below, reallocation would result in a redistribution of effort and revenues among states, and as a result, among fishery participants and shoreside businesses.

Because overall effort is still likely to be driven by annual catch limits and quotas (the impacts of which are analyzed during the specifications process), quota reallocation is unlikely to have substantial impacts on summer flounder or non-target species, habitat, or protected resources. Impacts to these resources may be possible if allocation changes cause substantial changes to the location or timing of fishing effort; however, in general these impacts are expected to be small.

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.

The sections below describe the general expected impacts of each proposed alternative for commercial allocation. **Note that more in-depth analysis is provided in the DEIS in section 7.2.** ***(Note for Council and Board:*** *this analysis is not currently complete in the DEIS but will be available for public hearings).*

6.2.1 Impacts of Alternative 2A: No Action/*Status Quo*

Under alternative 2A, no changes to the commercial allocation would be made, meaning this alternative would result in impacts to summer flounder, non-target species, habitat, protected resources, and human communities that are generally similar to conditions in recent years.

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 (Figure 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.

Table 10 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 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.

Commercial landings from Maine, New Hampshire, and Delaware are minimal if they occur at all, since directed fisheries for summer flounder do not exist in these states. 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 (Table 10).

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. Some states report negative economic impacts from current allocations due to a mismatch between their current allocation and their fishery capacity and/or summer flounder availability in their waters. Other states have experienced long-term positive socioeconomic impacts from the existing quota allocations. 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.

Table 11 gives examples of *status quo* allocations in pounds under hypothetical 8.12 million pound and 14.00 million pound coastwide quotas.

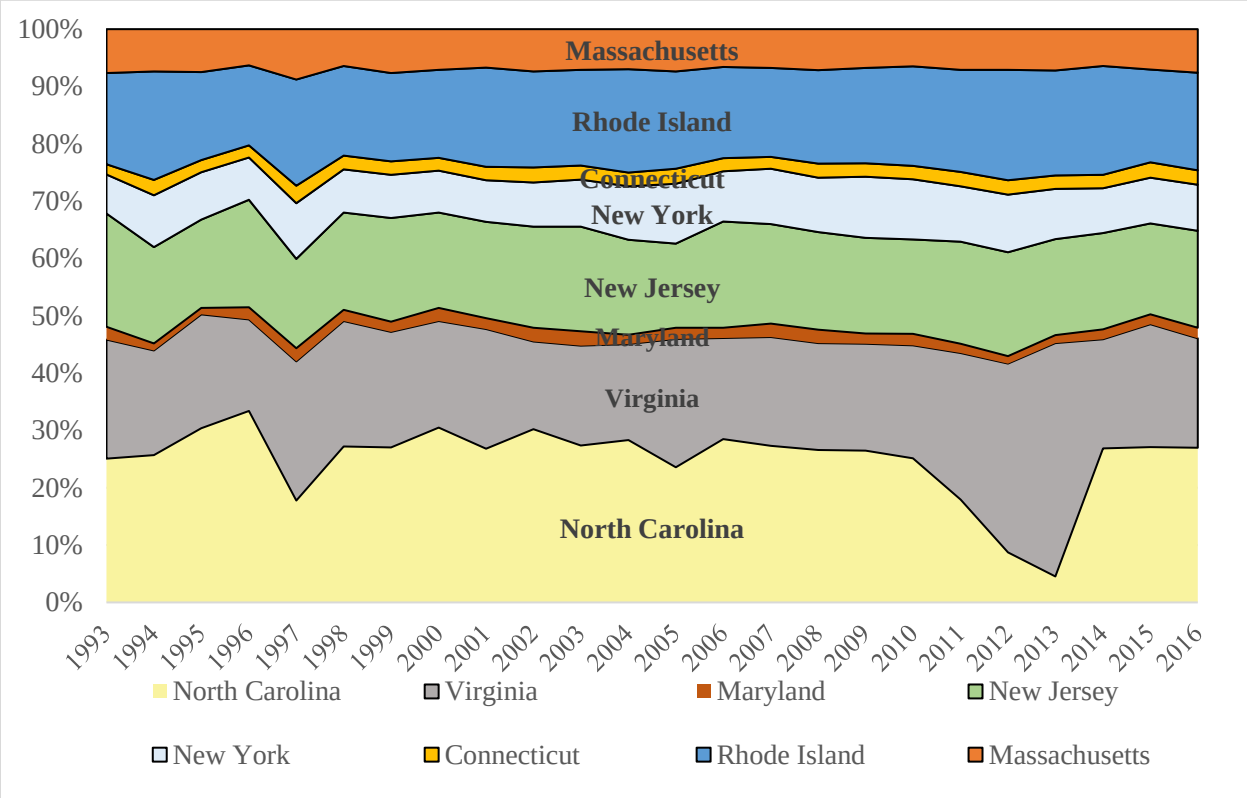


Figure 2: Percentage of coastwide landings by state 1993-2016, Massachusetts through North Carolina (excluding Delaware). Maine, New Hampshire, and Delaware each account for less than 0.1% of landings each year. Maryland and Virginia landings both include some Potomac River Fisheries Commission (PRFC) landings.

Table 10: 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.

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%**

Table 11: Alternative 2A: No Action/*Status Quo;* current allocations based on 1980-1989 landings. Example state quotas are provided under 8.12 million lb and 14.00 million lb coastwide quotas, prior to any transfers or deductions for overages.

State	Allocation (%)	Example allocation (lb) under 8.12 million lb quota	Example allocation (lb) under 14.00 million lb quota
ME	0.04756	3,862	6,658
NH	0.00046	37	64
MA	6.82046	553,821	954,864
RI	15.68298	1,273,458	2,195,617
CT	2.25708	183,275	315,991
NY	7.64699	620,936	1,070,579
NJ	16.72499	1,358,069	2,341,499
DE	0.01779	1,445	2,491
MD	2.03910	165,575	285,474
VA	21.31676	1,730,921	2,984,346
NC	27.44584	2,228,602	3,842,418
Total	100	8,120,001	14,000,001

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

Both sub-alternatives under alternative 2B would adjust state quotas to account for recent biomass distribution. Under both sub-alternatives 2B-1 and 2B-2, the states from New Jersey south would see reduced state allocations while the states from New York north would see increased allocation. This would change the distribution of landings by port and state, with increased landings expected in these northern states. By extension, these alternatives may modify the level of activity for individual fishery participants, if those in northern states are able to take more or longer trips, and if those in southern states have to reduce their effort.

The distribution of fishing effort and catch location is less likely to change substantially, but may experience some shifts, especially inshore. Fishing locations in offshore areas are generally expected to remain similar to current conditions, i.e., in the most productive locations, as the offshore fishery participants are generally highly mobile vessels that take longer trips and regularly travel long distances to fish in these areas. Nearshore commercial effort, which tends to be conducted more by smaller vessels with less ability to take longer trips, may shift toward the northern states with increased allocation.

Summer flounder populations should not experience significant impacts, since overall removals will still be constrained by catch and landings limits and other management measures. Changes in the timing or location of fishing effort could in theory impact localized effort and mortality for summer flounder, but it is uncertain to what extent this would occur, and as described above, would likely to be more pronounced in inshore areas. Given the changes considered here, any effects of this nature are likely be minor, as most fishing effort is likely to remain focused in the most traditionally productive locations.

The primary impacts of alternatives 2B-1 or 2B-2 are social and economic impacts to states and fishing communities. Under both sub-alternatives, landings in the northern states (New York north) would likely increase, resulting in positive economic impacts to fishing operations and shoreside businesses in those states. Landings in southern states would likely decrease, resulting in negative socioeconomic impacts to fishing operations and shoreside businesses in those states.

At the vessel and individual participant level, both sub-alternatives may result in increased participation in states New York and north and decreased participation in southern states. However, the distribution of positive or negative economic impacts among individual participants and businesses will be highly variable by state depending on restrictions on the overall number of participants and other measures used to manage the fishery. For example, a modest increase in quota to a state with many participants and restrictive management measures may result in less positive economic benefits at the level of individual businesses than a similar increase in quota to a state that has a more limited pool of participants under similar management measures. Distribution of economic benefits or costs is also likely to depend on price variations by state and port, given that ex-vessel price in a given port often varies in inverse relationship to the amount of landings of a given species. If increased landings in northern ports cause prices to decrease, this may offset some of the positive economic benefits in these areas.

The magnitude of these impacts is 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.

For **alternative 2B-1**, the states of New York through Maine would receive an increase in allocation of 19% relative to their current state allocations (with state share of coastwide quota allocation increased by between 0.00009% and 2.98% depending on the state). A corresponding increase in landings in these states is possible relative to average landings in recent years, however, total landings will depend on the annual coastwide commercial quota. States New Jersey through North Carolina would see a 9% decrease in their quota allocation relative to their current state allocations (with state share of coastwide quota allocation decreasing by between 0.0016% and 2.5%, depending on the state). While revenues generally correlate with landings, revenues are also influenced by price, vessel and shoreside costs, and other market factors and are difficult to predict.

Example quotas under alternative 2B-1 and hypothetical 8.12 million lb and 14.00 million lb coastwide quotas are shown in Table 12.

Alternative 2B-2 is a larger shift of allocation to the northern states and will result in more substantial socioeconomic impacts (positive or negative depending on the state as described above). New York through Maine would receive an increase in allocation of 40% relative to their current state allocations (with state share of coastwide quota allocation increased by between 0.00018% and 6.28% depending on the state). States New Jersey through North Carolina would see a 19% decrease in their quota allocation relative to their current state allocations (with state share of coastwide quota allocation decreasing by between 0.003% and 5.3%, depending on the state). Example quotas under alternative 2B-2 and hypothetical 8.12 million lb and 14.00 million lb coastwide quotas are shown in Table 13.

As described in section 6.1, the Council and Board intend to revisit any selected allocation within 10 years of implementation. It is important to note that when allocations are based in part on biomass distribution (as opposed to the distribution of landings) such as under alternative 2B-1 or 2B-2, it becomes more important to revisit these allocations regularly, because exploitable biomass can and will shift over time.

Table 12: Alternative 2B-1 resulting state allocations and relative changes. Example quota allocations based on hypothetical 8.12 million lb and 14.00 million lb coastwide quotas are also provided with comparison to status quo distribution.

State	Revised state allocation under Alt 2B-1 (%)[a]	Percent change relative to existing state allocation	Change in share of total coastwide quota	2B-1 example allocation (lbs) under 8.12 million lb quota	*Status Quo* allocation (lbs) under 8.12 million lb quota	2B-1 example allocation (lbs) under 14.00 million lb quota	*Status Quo* allocation (lbs) under 14.00 million lb quota
ME	**0.05660**	+19.0%	+0.00904	4,596	3,862	7,923	6,658
NH	**0.00055**	+19.0%	+0.00009	44	37	77	64
MA	**8.11635**	+19.0%	+1.29589	659,047	553,821	1,136,289	954,864
RI	**18.66275**	+19.0%	+2.97977	1,515,415	1,273,458	2,612,784	2,195,617
CT	**2.68593**	+19.0%	+0.42885	218,097	183,275	376,030	315,991
NY	**9.09992**	+19.0%	+1.45293	738,913	620,936	1,273,989	1,070,579
NJ	**15.19806**	-9.1%	-1.52693	1,234,083	1,358,069	2,127,728	2,341,499
DE	**0.01617**	-9.1%	-0.00162	1,313	1,445	2,263	2,491
MD	**1.85294**	-9.1%	-0.18616	150,459	165,575	259,411	285,474
VA	**19.37062**	-9.1%	-1.94614	1,572,894	1,730,921	2,711,887	2,984,346
NC	**24.94014**	-9.1%	-2.50570	2,025,139	2,228,602	3,491,619	3,842,418
Total	**100**	--	0	8,120,000	8,120,001	14,000,000	14,000,001

Table 13: Alternative 2B-2 resulting state allocations and relative changes. Example quota allocations based on hypothetical 8.12 million lb and 14.00 million lb coastwide quotas are also provided with comparison to status quo distribution.

State	Revised state allocation under Alt 2B-2 (%)[a]	Percent change relative to existing state allocation	Change in share of total coastwide quota	2B-2 example allocation (lbs) under 8.12 million lb quota	*Status Quo* allocation (lbs) under 8.12 million lb quota	2B-2 example allocation (lbs) under 14.00 million lb quota	*Status Quo* allocation (lbs) under 14.00 million lb quota
ME	**0.06661**	+40.1%	+0.01905	5,409	3,862	9,325	6,658
NH	**0.00064**	+40.1%	+0.00018	52	37	90	64
MA	**9.55238**	+40.1%	+2.73192	775,653	553,821	1,337,333	954,864
RI	**21.96477**	+40.1%	+6.28179	1,783,539	1,273,458	3,075,067	2,195,617
CT	**3.16115**	+40.1%	+0.90407	256,685	183,275	442,561	315,991
NY	**10.70998**	+40.1%	+3.06299	869,650	620,936	1,499,397	1,070,579
NJ	**13.50600**	-19.2%	-3.21899	1,096,687	1,358,069	1,890,840	2,341,499
DE	**0.01437**	-19.2%	-0.00342	1,167	1,445	2,011	2,491
MD	**1.64664**	-19.2%	-0.39246	133,707	165,575	230,530	285,474
VA	**17.21401**	-19.2%	-4.10275	1,397,778	1,730,921	2,409,961	2,984,346
NC	**22.16345**	-19.2%	-5.28239	1,799,672	2,228,602	3,102,883	3,842,418
Total	100	--	0	8,120,000	8,120,001	14,000,000	14,000,001

6.2.3 Impacts of Alternative 2C: Revise State Allocations Above a Commercial Quota Trigger

Alternative 2C maintains *status quo* quota allocations until the annual commercial quota exceeds a certain trigger point (8.40 million pounds for alternative 2C-1, and 10.71 million pounds for alternative 2C-2). This alternative is intended to spread the benefits of increased stock size more equally among states (with a smaller distribution to states without a directed fishery).

As with alternative 2B, this alternative is expected to have negligible to minor impacts on the summer flounder resource, non-target species, habitat, and protected resources. The impacts of allocation under alternative 2C will be primarily socioeconomic impacts to states and associated permit holders and fishing communities.

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. Figure 3 (alternative 2C-1) and Figure 4 (alternative 2C-2) show that 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. Additional breakdowns of how the revised quotas would be calculated are described in the DEIS in section 5.2.3.

Under both options, 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. However, the potential negative economic impacts associated with losing share of the overall quota would 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. States that currently have less than 12.375% of the coastwide quota will see their percent shares increase with growth of the annual quota beyond the trigger point.

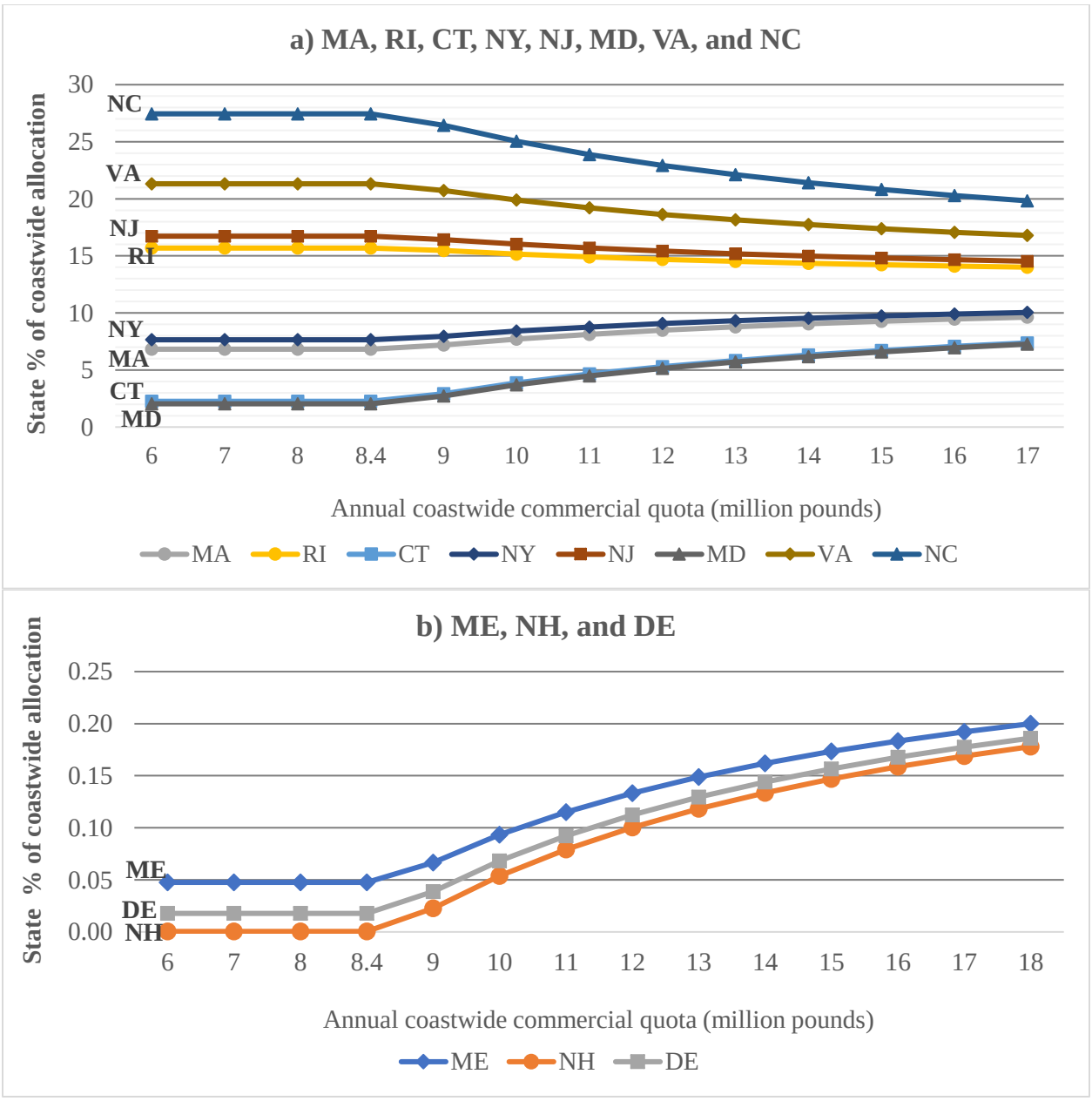


Figure 3: State quota allocation percentage with varying annual coastwide quotas under alternative 2C-1 (8.40 million pound trigger) for a) States with over 1% of the current allocation, and b) Maine, Delaware, and New Hampshire.

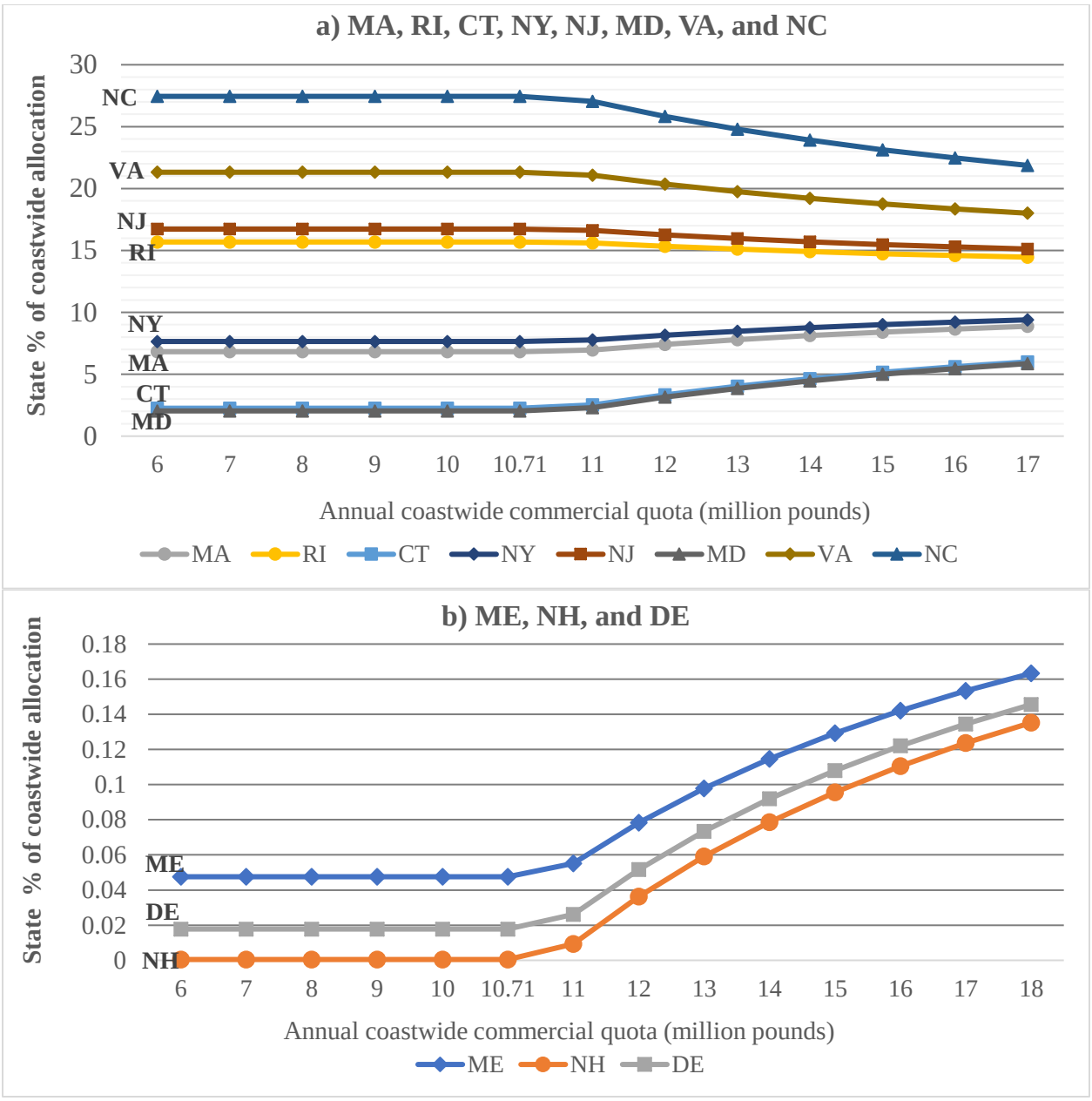


Figure 4: State quota allocation percentage with varying annual coastwide quotas under alternative 2C-2 (10.71 million pound trigger) for a) States with over 1% of the current allocation, and b) Maine, Delaware, and New Hampshire.

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).

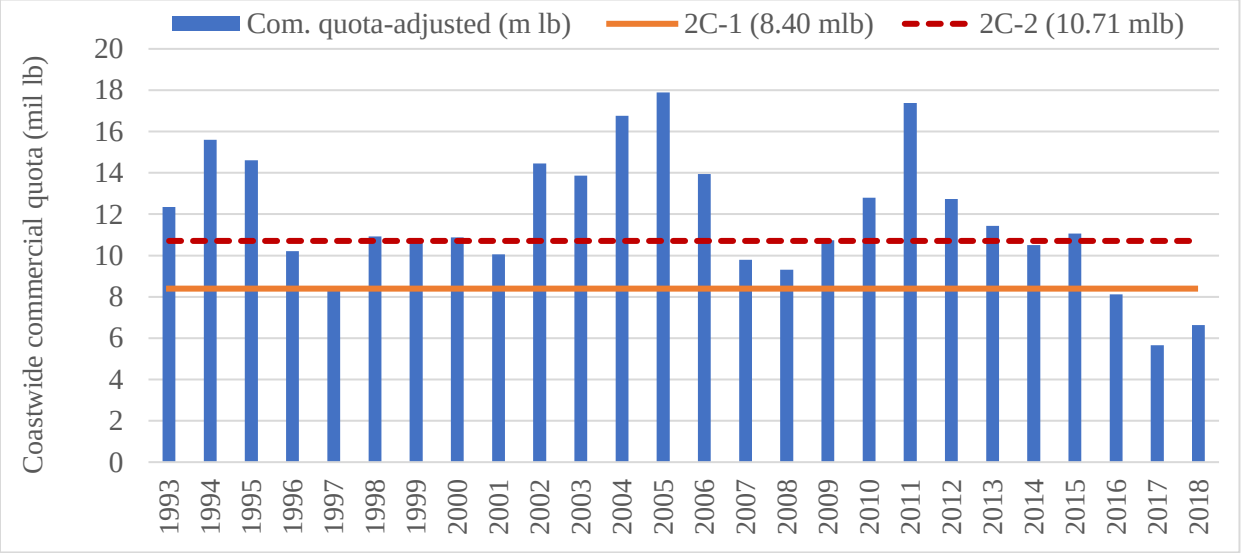


Figure 5: Time series of annual commercial quotas for summer flounder 1993-2018, and proposed commercial quota triggers under alternatives 2C-1 and 2C-2.

Table 14 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). This provides a range of reasonably expected allocation percentages for each state, assuming future quotas do not change substantially from what has been implemented in the past. 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 14).

The commercial fishery for summer flounder in the states of Maine, New Hampshire, and Delaware is considered largely incidental; there is little to no directed fishing effort. Given the current low landings and relatively small increase in quota under this alternative, it is not anticipated that this alternative would lead to meaningful amounts of directed fishing in these states, and thus the potential socioeconomic impacts to fishing communities in these states is expected to be minimal.

Table 14: 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

6.2.4 Impacts of Alternative 2D: "Scup Model" for Commercial Summer Flounder

The scup model quota system under alternative 2D, with two coastwide winter periods and a state-by-state summer period, is proposed in part as a way to distribute quota between smaller vessels, which tend to operate closer to shore in the summer months, and larger vessels, which typically operate offshore in the winter months.

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. The effects of moving toward seasonal coastwide management will depend on how many vessels are able to participate in this fishery and what the specific management measures would be under coastwide quota periods.

Coastwide winter periods would be open to any vessel permitted to land summer flounder (federal permits would still be required to fish in federal waters or to sell to a federal dealer, but otherwise state and federally permitted vessels could land summer flounder anywhere in the management unit provided they have the appropriate state permits). This will require the use of uniform management measures (possession limits, open and closed seasons within the quota period, etc.) to be applied in both state and federal waters throughout the management unit during the winter periods.

It would likely be difficult to develop coastwide possession limits that are acceptable to a wide variety of participants that still constrain landings to the period quota. The challenge inherent in this option is to develop a coastwide system that provides an equitable distribution of the quota to northern and southern participants as well as between smaller boats and larger offshore vessels. A system to revise possession limits mid-season will also need to consider the administrative costs of notifying permit holders, especially if limits change multiple times per season.

Council/Board members and other stakeholders have raised concerns about the potential for "derby fishing" during the coastwide winter periods under this option and are specifically seeking public comment on this issue. The concern is that coastwide quotas would create an incentive for high fishing effort toward the beginning of each winter quota period in order to participate while the quota period is still open. With any vessel being able to participate in the fishery during this time, the winter period quotas may be landed quickly. This could result in negative economic impacts to participating vessels as the result of increased competition during these time periods, with the potential for market flooding to occur. In addition, derby fishing could create incentives to fish in non-optimal conditions which could present a safety issue.

A scup model may work somewhat better during higher quota years where derby fishing may be less of a problem. Under lower quotas, there will be more pressure to land fish early in the quota period, especially if many vessels are participating in the winter fishery. However, summer flounder is a high demand species, and it is likely that there will be some difficulty controlling coastwide harvest in this scenario regardless of overall annual quota; thus, limits may need to be set at low levels to ensure reasonable access to the resource for all vessels, and so that landings can be spread throughout the quota period.

Shoreside businesses would also be impacted under this quota allocation configuration, potentially more so than under other allocation options since the location of landings during the winter season would be more difficult to predict. Socioeconomic impacts to these businesses would be driven by where vessels chose to land in the winter, and their state's allocation during the summer period. Ports that are relatively easier to access, closer to prime harvest locations, or with generally favorable market conditions are more likely to benefit. Businesses and communities in these ports could see increases in revenues and jobs. Likewise, ports and businesses that do not have these advantages may see a decrease in landings, revenues, and jobs.

Overall, social and economic impacts are expected to vary by state but are difficult to predict given the uncertainty in coastwide winter fishery participation. Each state's relative economic benefits or costs would depend on how many vessels they have that are able to participate in the winter fishery, how many trips could be taken by those vessels in a given year, market conditions in the areas where those vessels chose to land, among other factors.

The **differences between sub-alternatives 2D-1 and 2D-2** primarily impact the state of Maryland. Under alternative 2D-2, without an exemption for Maryland IFQ holders, these fishery participants and their communities are likely to experience negative socioeconomic impacts. An exemption for Maryland under alternative 2D-1 may cause enforcement and logistical concerns upon implementation, although NMFS has indicated that is likely to be possible for Maryland vessels to continue operating separately from an otherwise coastwide fishery. Increased administrative and enforcement effort may be needed under this exemption.

Table 15 provides an example of quota allocation breakdown under hypothetical quota scenarios under alternative 2D-1 (includes Maryland exemption), while Table 16 provides the same examples under alternative 2D-2 (no Maryland exemption). Table 17 compares the differences in allocations between alternatives 2D-1 and 2D-2.

Table 15: Alternative 2D-1: Scup model with Maryland exemption. Example allocations shown using hypothetical coastwide quotas at 8.12 million lb and 14.00 million lb.

Quota Period	Allocation % (of remaining coastwide commercial quota after 2.03910% allocated to MD)	Measures	Example allocation (lb) under 8.12 million lb quota	Example allocation (lb) under 14.00 million lb quota
Winter I (Jan 1-Apr 30)	**55.26%**	Coastwide (except MD)	4,486,850	7,735,948
Summer (May 1-Oct 31)	**27.65%**		2,244,955	3,870,612
State-specific summer allocations		State-specific		
	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** --[a]	**MD** --[a]
	VA 5.648%		**VA** 126,785	**VA** 218,594
	NC 0.699%		**NC** 15,702	**NC** 27,072
Winter II (November 1 - Dec 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).

Table 16: 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) under 8.12 million lb quota	Example allocation (lbs) under 14.00 million lb quota
Winter I (Jan 1-Apr 30)	**54.68%**	Coastwide	4,440,145	7,655,422
Summer (May 1-Oct 31)	**28.28%**	State-specific	2,296,255	3,959,060
State-specific summer allocations	**ME** 0.015% **NH** 0.000% **MA** 18.525% **RI** 21.538% **CT** 3.417% **NY** 17.779% **NJ** 28.429% **DE** 0.043% **MD** 4.171% **VA** 5.412% **NC** 0.670%		**ME** 340 **NH** 0 **MA** 425,389 **RI** 494,571 **CT** 78,466 **NY** 408,243 **NJ** 652,808 **DE** 993 **MD** 95,782 **VA** 124,272 **NC** 15,391	**ME** 586 **NH** 2 **MA** 733,429 **RI** 852,708 **CT** 135,287 **NY** 703,867 **NJ** 1,125,531 **DE** 1,711 **MD** 165,141 **VA** 214,263 **NC** 26,536
Winter II (Nov 1 - Dec 31)	**17.04%**	Coastwide	1,383,599	2,385,516
Total	**100%**	--	8,120,000	14,000,000

Table 17: 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 under 2D-1 (and thus no specific seasonal allocation for the summer period quota).

7.0 LANDINGS FLEXIBILITY FRAMEWORK PROVISIONS

7.1 Landings Flexibility Framework Provision Alternatives

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.**

7.3.1 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 inconsistent with 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.

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

Under alternative 3B, “landings flexibility” policies for the commercial summer flounder fishery would be added to the list of frameworkable items in the Council's FMP. 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.

"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.

Landings flexibility is typically proposed to work within a state-by-state quota system, and would not be necessary under the "scup model" configuration of alternative 2D. NMFS has indicated that quota transfers would likely be required for each "out of state" landing event to properly attribute landings to the permit state rather than the state of landing. It would not be possible to track landings at the individual permit/vessel level with timeliness and accuracy required of in-season commercial management. 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 and which state needs to participate in a quota transfer. Under the commonly discussed broad coastwide configuration of landings flexibility, each state would be required to accept any commercial vessels landing summer flounder and participate in the associated quota transfer.

Any future framework action would need 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.

7.3 Impacts of Landings Flexibility Framework Provision Alternatives

In general, the framework alternatives proposed in this action are primarily administrative and intended to simplify and improve the efficiency of future landings flexibility actions to the extent possible. 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). The impacts of alternatives 3A and 3B are briefly described below.

The sections below describe the general expected impacts of each proposed alternative for landings flexibility framework provisions.

7.3.1 Impacts of 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.

As stated above, 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.

7.3.2 Impacts of Alternative 3B: Add Landings Flexibility as a Frameworkable Issue in the FMP

Allowing landings flexibility policies to be implemented through a framework action would not have any direct impacts on the environment or human communities, as this alternative is primarily administrative. 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.

It is not possible to predict the magnitude and direction of impacts of any future landings flexibility framework actions; however, such actions would need to specify and analyze several aspects of how landings flexibility would work in practice. 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.**

Summer Flounder Amendment Commercial Issues Working Group Call Summary
February 21, 2018, 10-11:30AM

Alternative 2B for commercial reallocation uses Northeast Fisheries Science Center (NEFSC) survey data to calculate the change in relative exploitable biomass in the "Northern" region between 1980-1989 and 2007-2016. The commercial working group was tasked with providing guidance on how the estimated change in regional relative exploitable biomass between both time periods should be translated into a change in regional allocation. The working group also briefly discussed how revised regional allocations should be divided into state allocations, and the issue of precision and significant digits in the calculations leading to revised allocations. The working group's comments and recommendations are described below.

Configuration of Alternative 2B

- The working group was provided with a summary of the issue (**see Attachment**), which included four options for translating biomass shifts into allocation shifts for the group's consideration.
- The working group agreed that there is **more than one correct way** to approach the configuration for translating biomass shifts into allocation shifts for Alternative 2B. The working group believes that all four options are likely to be defensible, but the options vary somewhat in their underlying policy approach and outcome.
- The four options considered vary in how much they depart from the current allocation, and to what extent current biomass is incorporated. The group acknowledged varying opinions on these issues among working group members, Mid-Atlantic Council members, and ASMFC Board members, making it difficult to recommend one option at this stage since there is a policy angle to this decision.
- The group believes it's beneficial to seek public comment on two varying approaches in the form of **two sub-options** for public hearings: a more heavily "biomass-based" allocation (**Option 3**) and an option that is more of an adjustment to *status quo* allocations based on proportional shifts in biomass (one of **Options 1, 2, or 4**). The two choices would represent a range of different outcomes and have different underlying assumptions about to what degree the recent biomass should be incorporated into the allocations.
    - Allocation for fluke is currently not based on regional biomass, so **Option 3** is more of a departure from the *status quo,* because it creates a different basis for allocation that is more driven by the recent proportion of relative exploitable biomass in each region. **Options 1, 2, and 4** maintain more connection to the *status quo* allocation in that they are taking the *status quo* allocations and adjusting them based on regional shifts in biomass.
- **The working group recommends moving forward with Options 2 and 3 as sub-options for public hearings.** This approach offers two varying outcomes and two varying approaches, one with more of an emphasis on recent exploitable biomass (Option 3) and one with a more moderate adjustment to *status quo* based on a shift in exploitable biomass (Option 2).
- **Option 1** received mixed feedback. Some working group members expressed discomfort with mixing and matching the approaches of using "absolute shift" (in the biomass calculation) with

"percent change" (in the allocation calculation), and Option 1 was not recommended for that reason.

- **Option 2** while also having mixed feedback, emerged as potential sub-option. The consistency with the calculations was seen as an advantage in explaining the option to the public. One potential challenge is explaining why the change would vary depending on which region you use as the starting basis for the percent change calculations (i.e., why the percentage change relative to each region's starting quota is not the same magnitude in the North and South; see further explanation below).
- Some working group members did not fully support **Option 3**, while others supported it since the allocation change has its basis in math that is the same regardless of whether you start with the North or the Southern region (+/- 13% relative to the coast). For percent change based options (1 and 2), a choice must be made to start with the Northern or Southern region calculation first, and the results differ depending on this choice.
    - Note that regardless of the method, absolute shifts in allocation 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 allocation is always 100%. However, the percentage change (% increase or decrease) in state/regional quotas relative to the current state/regional quotas will never be equivalent in magnitude regardless of the method, because regional starting allocations are different. **Option 3** differs from the others in that it starts with the coastwide proportional shift and does not require starting with a regional percent change calculation.
- **Option 4** is a different approach that ultimately may be a different way to think about option 2. Working group members had varying opinions on whether option 4 was easier or harder to understand than other options. Option 4 was not recommended for public hearings since some believed it was a more complicated way to reach the same result as option 2. However, the group did suggest that the explanation for option 4 could be used to further support option 2, since it may be more intuitive to some.
- The working group agreed that **when allocations are based in part on biomass distribution, it becomes more important to revisit these allocations regularly**, because exploitable biomass can and will shift over time. Since all approaches under alternative 2B are proposed as a one-time change, the working group supports the Council and Board's intention to revisit any revised allocations within 10 years if not sooner.
    - Working group members noted it's important to understand that "revisiting" the allocation could mean very different things depending on whether a full allocation review is conducted (as with this amendment) or whether a simple recalculation could occur based on a more formulaic approach.
    - While the working group did not want to get too far into policy recommendations on the impacts of the reallocation options, several members raised potential consequences of either taking a more substantial shift based on biomass or keeping things closer to *status quo* that should be considered in this decision. Staff noted that the Draft Environmental Impact Statement (DEIS) and public hearing document should get into more detail on the consequences of these approaches.

Alternative Distribution of Northern Region Increase

- The working group discussed the possibility (raised at the December Council/Board meeting) of exploring different methods of distributing a regional increase to the Northern states under alternative 2B. Currently, all options for the math split the “revised regional” allocations into state allocations based on a given state's current share of the regional allocation. There has been some inquiry about splitting the Northern region’s "additional" allocation based on 50% existing quota and 50% equal shares (with some adjusting likely needed for ME and NH).
- The working group noted that while this seems like a reasonable approach, there isn't a clear underlying technical basis for the 50% current allocation/50% equal shares configuration. The working group overall believes this is likely more of a policy decision for the Council and Board.
- It is not clear whether the intent is to distribute the regional quota increase differently or distribute the entire revised regional quota differently. Depending on the approach, this could lead to complicated math that may be difficult for stakeholders to follow.
- This approach is also dependent on the outcome of the method of regional increase discussed above, and would make the document and analysis notably more complicated since under this alternative there would be at least 4 different combinations of choices.

Precision Discussion

- The working group discussed the level of precision/significant digits in the allocation analyses and resulting state allocations. Current state allocations are taken out to five decimal places. Without guidance to the contrary from the Council and Board, the default would likely be to continue this level of precision.
- Staff wanted to ensure the calculations for revised allocation under alternative 2B use the correct level of precision for various inputs and outputs. Jason McNamee will complete some work looking at significant digits for state by state allocations to inform how the analysis for percentage change/absolute change should be calculated.

Summer Flounder Amendment Commercial Working Group Issues for Discussion
February 2018

Amendment Status

The Council and Board have approved a range of alternatives for inclusion in a public hearing document and Draft Environmental Impact Statement (DEIS). Staff are currently developing these documents for potential approval in Spring 2018 (the next planned joint meeting will be April 30, 2018 at the Commission's meeting in Arlington). There are some remaining questions regarding exactly how to configure one of the commercial allocation alternatives, as described below. The Council and Board are seeking commercial working group input on the configuration of this alternative (Alt. 2B).

The recommended configuration (if applicable, depending on the working group's feedback) will be included in the public hearing document for approval, and a comparison to other approaches will be provided for context. The decision regarding the configuration is ultimately up to the Council and Board, but ideally one recommended approach can be included in the draft public hearing document. If additional guidance is needed or the working group cannot form a recommendation, a different approach may be needed, such as including multiple sub-options or holding a Demersal Committee webinar to identify the appropriate option for the public hearing document.

Primary Issue for Discussion: Math for Configuration of Alternative 2B: Revised state-by-state allocations based on current allocations adjusted for recent biomass distribution

Alternative 2B for commercial reallocation uses NEFSC survey data to calculate the change in relative exploitable biomass in the "Northern" region between 1980-1989 and 2007-2016, as described below. The Demersal Committee, the full Council, and the Board have struggled with how apply the change in relative exploitable biomass to the regional and state allocations. **The estimated change in regional relative exploitable biomass between two time periods needs to be translated into a change in regional allocation.** Both figures (regional exploitable biomass and the regional allocation) are expressed as percentages attributable to the Northern or Southern region.

The question remaining is whether to express the changes over the two time periods (change in relative biomass and the change in allocation) as an absolute change in percent relative to the coast, or as a percent change (percent increase/decrease) relative to the original value for that region).

The NEFSC analysis calculated an approximate shift in the percentage of exploitable biomass in a Northern vs. Southern region (divided approximately at Hudson Canyon), between the ten-year time periods of 1980-1989 and 2007-2016. 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 1 shows the results for trends in Northern and Southern region relative biomass for 1980-1989 and 2007-2016.[1]

[1] Additional details of this analysis can be found in: http://www.mafmc.org/s/Tab11_Summer-Flounder-Amendment-Dec2017.pdf

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, an absolute change of 13% relative to the coast** (+13% in the Northern region, -13% in the Southern region).

The change in relative exploitable biomass is intended to serve as the basis for a regionally-based adjustment to the current state-by-state allocation percentages. The current "regional" allocation is derived by combining the current state allocations. The current commercial landings allocation gives a total of **~32.46% to the 'Northern' states** (ME, NH, MA, RI, CT, NY), and a total of **~67.54% to the 'Southern' states** (NJ, DE, MD, VA, NC). This current regional allocation would then be adjusted based on the appropriate methodology option among the choices presented in this document.

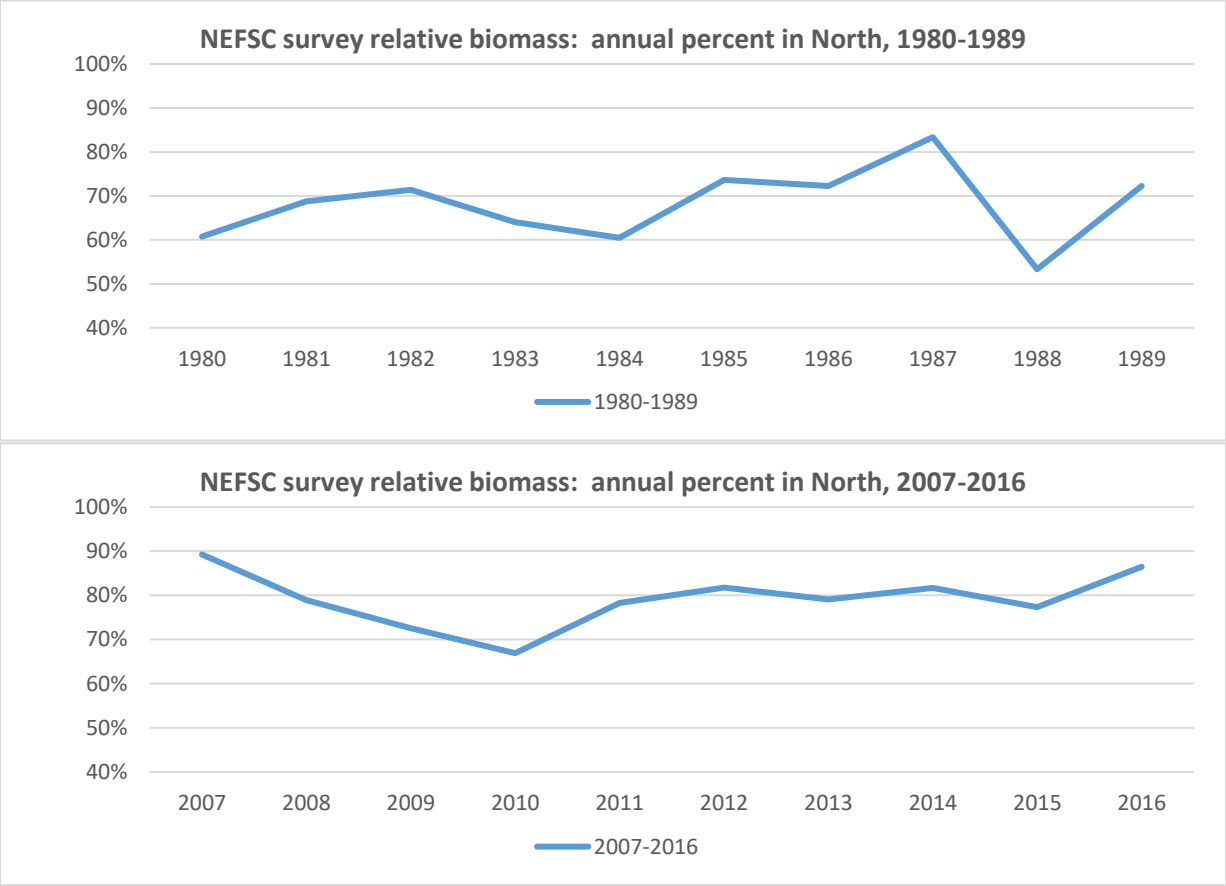


Figure 1: NEFSC survey relative biomass annual percent in Northern region, 1980-1989 and 2007-2016. The remaining relative biomass is attributable to the Southern region.

Options for Translating Regional Biomass Shift into Regional Allocation shift:

In the options below, **absolute change** 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 1980-1989→ 80% relative exploitable 2007-2016 = absolute increase in the North of **80-67=13%.** This describes how the proportions in the North and South change relative to the coastwide total,

Percent change expresses the change (increase or decrease) relative to the original regional value. 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." For the North, the percent change in the Northern region exploitable biomass between the two time periods would thus be: **((80-67)/67)*100=+19%.**

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 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%.

Three options, described below, were considered by the Committee, the Council and the Board. An additional idea was discussed in February 2018 by staff from the state of Connecticut and is described as option 4 for working group discussion.

1. **Option 1:** Apply the absolute change in relative exploitable biomass (+13% to the Northern region) as a percentage increase in the Northern regional allocation (original staff recommendation/NESFC analysis).
    - Absolute change in regional biomass: +13% to the North.
    - Apply this to current regional allocation as a percent increase to the Northern region starting allocation (32.46% *1.13 = 36.67% to the Northern region).
    - Adjust the Southern regional allocation accordingly to make the total coastwide allocation equal to 100%. Expressed as a percent change, this does not result in a 13% decrease in the Southern region, since this method looks as percent changes relative to each region's starting value, and the starting allocations are not 50/50.
    - New regional allocations (36.67% in the North and 63.33% in the South) divided into state shares based on each state's current proportion of their regional allocation.
    - This option produces the smallest shift in allocation, with a ±4% regional shift relative to the coast, and a 13% increase in the North relative to the existing Northern allocation, and a 6% decrease in the South relative to the existing Southern allocation.
    - **See Table 2.**
2. **Option 2:** Evaluate the change in relative exploitable biomass in the Northern region as a percent change, and apply this as a percent change to the Northern region allocation
    - Calculate the percent change in Northern regional biomass: ((80-67)/67)*100=19% increase in the North).
    - Apply to current regional allocation as a percent increase to the Northern region starting allocation (32.46% *1.19 = 38.62% to the Northern region).
    - Adjust the Southern regional allocation accordingly to make total coastwide allocation equal to 100%. Expressed as a percent change, this does not result in a 19% decrease in the Southern region, since this method calculates percent changes relative to each region's starting value, and the starting allocations are not 50/50.
    - New regional allocations (38.62% in the North and 61.38% in the South) are divided into state shares based on each state's current proportion of their regional allocation
    - This option produces a shift in allocation in between the other two options, with a ±6% regional shift relative to the coast, and a 19% increase in the North relative to the

existing Northern allocation, and a 9% decrease in the South relative to the existing Southern allocation.
    - **See Table 3.**

3. **Option 3:** Apply the absolute change in relative exploitable biomass as an absolute increase in percentage allocation relative to the coastwide total allocation.
    - Absolute change in regional biomass: +13% to the North
    - Apply this absolute change to the current regional allocation as an absolute change in the percentage allocated to the Northern region (i.e., add 13% to the Northern allocation relative to the coastwide total: 32.46% +13% = 45.46%).
    - Apply a 13% absolute decrease (relative to the coastwide total) to the Southern region allocation. The percent changes for each region are still shown in Table 3 for informational purposes, to demonstrate how each state's allocation changes relative to their existing allocation, but these are not the starting point for the modification and are not equivalent to the 13% absolute change in each region relative to the coast.
    - The new total regional allocations (45.46% in the North and 54.54% in the South) are then divided into state shares based on each state's current proportion of their regional allocation (e.g., Rhode Island receives 48.32% of the Northern region allocation).
    - This option produces the largest shift in allocation, with a ±13% regional shift relative to the coast, and a 40% increase in the North relative to the existing Northern allocation, and a 19% decrease in the South relative to the existing Southern allocation.
    - **See Table 4.**

4. **Option 4:** Use a "biomass sharing" approach, using the same proportion of Northern region relative exploitable biomass (1980-1989) that was historically allocated to the South, with an adjustment for the more recent relative exploitable biomass in the North.
    - During 1980-1989, the NEFSC analysis indicates that the Northern region relative exploitable biomass was 67%. Their quota allocation is 32.5%. Thus, roughly 51.5% of the "Northern " relative exploitable biomass was allocated to the southern region. (67-32.5)/67 = 51.5
    - This same split could be used to allocate based on the more recent relative exploitable biomass percentages (80% North/20% South from 2007-2016).
    - 80% of the relative exploitable biomass 2007-2016 was in the Northern region. Assuming the same "biomass sharing" approach, 51.5% of this would be allocated to the southern region.
        - North: 80 - (0.515*80) = **38.8%**
        - South: 20 + (0.515*80) = **61.2%**
    - This yields a very similar end result to option 2.
    - Feedback is requested on whether this approach makes sense, and whether or not this would be more intuitive for managers and stakeholders to understand.
    - **See Table 5.**

Table 1: Summary of math options for 2B allocation change. Status quo regional allocations are N. region = 32.46%; S. region = 67.54%.

Option	Math
1. Apply 13% absolute biomass shift as % change to Northern region	• N. region shift = (80%-67%)=13% • (N. region old allocation 32.46%)* (1.13) = (N. region new allocation 36.67%) • 100-36.67 = S. region new allocation = 63.33% • **N: 36.7%; S: 63.3%**
2. Calculate N. region shift as % change (19%) and apply as % change to N. region allocation	• N. region % change = ((80-67)/67)*100=+19% • (N. region old allocation 32.46%)* (1.19) = (N. region new allocation 38.62%) • 100-38.62 = S. region new allocation = 61.38% • **N: 38.6%; S: 61.4%**
3. Apply 13% absolute biomass shift as absolute 13% biomass shift in allocation relative to coast	• N. region shift = (80%-67%)=13% • (N. region old allocation 32.46%)+13% = N. region new allocation 45.46%) • 100-45.46 = S. region new allocation = 54.54% • **N: 45.5%; S: 54.5%**
4. Continue to apply same proportion of Northern region exploitable biomass historically allocated to southern region; adjust using new relative exploitable biomass	• During 1980-1989, ~51.5% of the relative exploitable biomass in the N. region was allocated to the southern region: (67-32.5)/67 = 51.5 • Apply this proportion to the 2007-2016 N. region relative exploitable biomass of 80% and add this amount to the S. region relative exploitable biomass: 20+(80*0.515) = 61.2% • N. region allocation = 80-(80*0.515) = 38.8% • **N: 38.8%; S: 61.2%**

Table 2: Allocation calculation under Alternative 2B - Option 1 configuration described above. This option uses a 13% absolute shift (67% to 80%) in relative exploitable biomass and applies this change in terms of % change relative 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.

	Status quo state alloc. (%)	Status quo regional alloc. (%)	State % of regional total	Revised regional alloc.	Revised state alloc. (%)	Absolute change in regional alloc. relative to coast	Absolute change in state alloc. relative to coast (%)	% Change relative to existing regional alloc.	% Change relative to existing state alloc.	Revised alloc. based on 8.12 mlb quota	*Status quo* alloc. based on 8.12 mlb quota	Revised vs. SQ quota diff. (8.12 mil lb)
ME	0.04756		0.15%		**0.05374**		0.00618		13.0%	4,364	3,862	502
NH	0.00046		0.00%		**0.00052**		0.00006		13.0%	42	37	5
MA	6.82046		21.01%		**7.70712**		0.88666		13.0%	625,818	553,821	71,997
RI	15.68298	**32.46**	48.32%	**36.67**	**17.72177**	4.22	2.03879	13.0%	13.0%	1,439,008	1,273,458	165,550
CT	2.25708		6.95%		**2.55050**		0.29342		13.0%	207,101	183,275	23,826
NY	7.64699		23.56%		**8.64110**		0.99411		13.0%	701,657	620,936	80,722
NJ	16.72499		24.76%		**15.68025**		-1.04474		-6.2%	1,273,236	1,358,069	-84,833
DE	0.01779		0.03%		**0.01668**		-0.00111		-6.2%	1,354	1,445	-90
MD	2.0391	**67.54**	3.02%	**63.33**	**1.91173**	-4.22	-0.12737	-6.2%	-6.2%	155,232	165,575	-10,343
VA	21.31676		31.56%		**19.98519**		-1.33157		-6.2%	1,622,797	1,730,921	-108,124
NC	27.44584		40.63%		**25.73141**		-1.71443		-6.2%	2,089,390	2,228,602	-139,212
Tot.	**100**	**100**	--	**100**	**100**	**0**	**0**	--	--	**8,120,000**	**8,120,000**	**0**

Table 3: Allocation calculation under Alternative 2B - Option 2 configuration described above. This option uses a 19% percentage change shift (the increase, as a percent change, between 67 and 80%) in relative exploitable biomass and applies this change in terms of % change 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.

	Status quo state alloc. (%)	Status quo regional alloc. (%)	State % of regional total	Revised regional alloc.	Revised state alloc. (%)	Absolute change in regional alloc. relative to coast	Absolute change in state alloc. relative to coast (%)	% Change relative to existing regional alloc.	% Change relative to existing state alloc.	Revised alloc. based on 8.12 mlb quota	*Status quo* alloc. based on 8.12 mlb quota	Revised vs. SQ quota diff. (8.12 mil lb)
ME	0.04756		0.15%		**0.05660**		0.00904		19.00%	4,596	3,862	734
NH	0.00046		0.00%		**0.00055**		0.00009		19.00%	44	37	7
MA	6.82046		21.01%		**8.11635**		1.29589		19.00%	659,047	553,821	105,226
RI	15.68298	**32.46**	48.32%	**38.62**	**18.66275**	6.17	2.97977	19.0%	19.00%	1,515,415	1,273,458	241,957
CT	2.25708		6.95%		**2.68593**		0.42885		19.00%	218,097	183,275	34,822
NY	7.64699		23.56%		**9.09992**		1.45293		19.00%	738,913	620,936	117,978
NJ	16.72499		24.76%		**15.19806**		-1.52693		-9.13%	1,234,083	1,358,069	-123,987
DE	0.01779		0.03%		**0.01617**		-0.00162		-9.13%	1,313	1,445	-132
MD	2.0391	**67.54**	3.02%	**61.38**	**1.85294**	-6.17	-0.18616	-9.1%	-9.13%	150,459	165,575	-15,116
VA	21.31676		31.56%		**19.37062**		-1.94614		-9.13%	1,572,894	1,730,921	-158,027
NC	27.44584		40.63%		**24.94014**		-2.50570		-9.13%	2,025,139	2,228,602	-203,463
Tot.	**100**	**100**	--	**100**	**100**	**0**	**0**	--	--	**8,120,000**	**8,120,000**	**0**

Table 4: Allocation calculation under Alternative 2B - Option 3 configuration described above. This option uses the 13% absolute shift (67% to 80%) in relative exploitable biomass and applies this change as an absolute shift in the regional allocations relative to the coast. Example state quotas are provided based on an 8.12 million lb coastwide quota with comparison to status quo distribution under the same quota.

	Status quo state alloc. (%)	Status quo regional alloc. (%)	State % of regional total	Revised regional alloc.	Revised state alloc. (%)	Absolute change in regional alloc. relative to coast	Absolute change in state alloc. relative to coast (%)	% Change relative to existing regional alloc.	% Change relative to existing state alloc.	Revised alloc. based on 8.12 mlb quota	*Status quo* alloc. based on 8.12 mlb quota	Revised vs. SQ quota diff. (8.12 mil lb)
ME	0.04756		0.15%		**0.06661**		0.01905		40.1%	5,409	3,862	1,547
NH	0.00046		0.00%		**0.00064**		0.00018		40.1%	52	37	15
MA	6.82046		21.01%		**9.55238**		2.73192		40.1%	775,653	553,821	221,832
RI	15.68298	**32.46**	48.32%	45.46	**21.96477**	13.00	6.28179	40.1%	40.1%	1,783,539	1,273,458	510,081
CT	2.25708		6.95%		**3.16115**		0.90407		40.1%	256,685	183,275	73,410
NY	7.64699		23.56%		**10.70998**		3.06299		40.1%	869,650	620,936	248,715
NJ	16.72499		24.76%		**13.50600**		-3.21899		-19.2%	1,096,687	1,358,069	-261,382
DE	0.01779		0.03%		**0.01437**		-0.00342		-19.2%	1,167	1,445	-278
MD	2.0391	**67.54**	3.02%	54.54	**1.64664**	-13.00	-0.39246	-19.2%	-19.2%	133,707	165,575	-31,868
VA	21.31676		31.56%		**17.21401**		-4.10275		-19.2%	1,397,778	1,730,921	-333,143
NC	27.44584		40.63%		**22.16345**		-5.28239		-19.2%	1,799,672	2,228,602	-428,930
Tot.	**100**	**100**	--	**100**	**100**	**0**	**0**	--	--	**8,120,000**	**8,120,000**	**0**

Table 5: Allocation calculation under Alternative 2B - Option 4 configuration described above. This option uses the same proportion of N. region relative exploitable biomass historically allocated to the South and applies this to the new N. region relative exploitable biomass. Example state quotas are provided based on an 8.12 million lb coastwide quota with comparison to status quo distribution under the same quota.

	Status quo state alloc. (%)	Status quo regional alloc. (%)	State % of regional total	Revised regional alloc.	Revised state alloc. (%)	Absolute change in regional alloc. relative to coast	Absolute change in state alloc. relative to coast (%)	% Change relative to existing regional alloc.	% Change relative to existing state alloc.	Revised alloc. based on 8.12 mlb quota	*Status quo* alloc. based on 8.12 mlb quota	Revised vs. SQ quota diff. (8.12 mil lb)
ME	0.04756		0.15%		**0.05686**		0.00930		19.5%	4,617	3,862	755
NH	0.00046		0.00%		**0.00055**		0.00009		19.5%	45	37	7
MA	6.82046		21.01%		**8.15374**		1.33328		19.5%	662,083	553,821	108,262
RI	15.68298	**32.46**	48.32%	38.80	**18.74872**	6.34	3.06574	19.5%	19.5%	1,522,396	1,273,458	248,938
CT	2.25708		6.95%		**2.69830**		0.44122		19.5%	219,102	183,275	35,827
NY	7.64699		23.56%		**9.14184**		1.49485		19.5%	742,317	620,936	121,382
NJ	16.72499		24.76%		**15.15401**		-1.57098		-9.4%	1,230,505	1,358,069	-127,564
DE	0.01779		0.03%		**0.01612**		-0.00167		-9.4%	1,309	1,445	-136
MD	2.0391	**67.54**	3.02%	61.20	**1.84757**	-6.34	-0.19153	-9.4%	-9.4%	150,022	165,575	-15,553
VA	21.31676		31.56%		**19.31447**		-2.00229		-9.4%	1,568,335	1,730,921	-162,586
NC	27.44584		40.63%		**24.86784**		-2.57800		-9.4%	2,019,269	2,228,602	-209,333
Tot.	**100**	**100**	--	**100**	**100**	**0**	**0**	--	--	**8,120,000**	**8,120,000**	**0**

Atlantic States Marine Fisheries Commission

Draft Amendment to the Interstate Fishery Management Plan for Summer Flounder, Scup, and Black Sea Bass for Public Comment

Summer Flounder Commercial Issues and Goals and Objectives

April 2018

Vision: Sustainably Managing Atlantic Coastal Fisheries

Draft Amendment to the Interstate Fishery Management Plan for

Summer Flounder, Scup, and Black Sea Bass

Prepared by

Atlantic States Marine Fisheries Commission and Mid-Atlantic Fishery Management Council's
Fishery Management Action Team

Fishery Management Action Team Members:
Mark Terceiro, Northeast Fisheries Science Center
Gregory Ardini, National Marine Fisheries Service
Emily Gilbert, National Marine Fisheries Service
Marianne Ferguson, National Marine Fisheries Service
Kiley Dancy, Mid-Atlantic Fishery Management Council
Kirby Rootes-Murdy, Atlantic States Marine Fisheries Commission

This is a report of the Atlantic States Marine Fisheries Commission pursuant to U.S. Department of Commerce, National Oceanic and Atmospheric Administration Award Nos. XXXXXXXXX.

The Atlantic States Marine Fisheries Commission (Commission) and Mid-Atlantic Fishery Management Council (Council) seek your input on Draft Amendment to the Summer Flounder Fishery Management Plan.

The public is encouraged to submit comments regarding this document during the public comment period. **The Commission and Council will determine the public comment period duration as well as public hearing dates and locations following the Commission's 2018 Spring Meeting.** The Commission and Council will consider public comment on this document before finalizing the Amendment.

You may submit public comment by attending a public hearing held in your state or jurisdiction or mailing, faxing, or emailing written comments to the address below. Comments can also be referred to your state's members on the Summer Flounder Management Board or Summer Flounder Advisory Panel; however, only comments received at a public hearing or written comments submitted to the Commission will become part of the public comment record.

Written comments may be sent by any of the following methods:

1. **Online** at www.mafmc.org/comments/summer-flounder-amendment
2. **Email** to the following addresses: comments@asmfc.org or nmfs.gar.FlukeAmendment@noaa.gov.
3. **Mail or Fax** to either:

Kirby Rootes-Murdy, Senior FMP Coordinator
Atlantic States Marine Fisheries Commission
1050 North Highland Street, Suite 200A-N
Arlington, VA 22201
FAX: 703.842.0741 302.674.5399

Kiley Dancy, Fishery Management Specialist
Mid-Atlantic Fishery Management Council
North State Street, Suite 201
Dover, DE 19901
FAX: 302.674.5399

If your organization is planning to release an action alert in response to this Draft Amendment , or if you have questions, please contact either Kirby Rootes-Murdy (email: krootes-murdy@asmfc.org; phone: (703)-842-0740) or Kiley Dancy (email: kdancy@mafmc.org ; phone at (302) 526-527)

Table of Contents

1.0 INTRODUCTION

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*) Fishery Management Plan (FMP) that was prepared cooperatively by the Mid-Atlantic Fishery Management Council (Council) and the Atlantic States Marine Fisheries Commission (Commission).

This amendment 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.

1.1 BACKGROUND INFORMATION

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.[1] 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. In addition, under the umbrella of those categories, the Council and Board indicated that they wished to explore summer flounder discards in the commercial and recreational fisheries; ecosystem, habitat, bycatch, and protected species issues, and data collection requirements and protocols.

However, later in the amendment process, the Council and Board began to consider splitting 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 May 2017, the Council and Board considered the full range of remaining issues (FMP goals and objectives and commercial issues) and identified the following priority issues for further development within this action. The commercial management listed below are outlined in section 4.2, while FMP objectives are addressed in section 2.5

2.5 Fishery Management Plan (FMP) goals and objectives for summer flounder

4.2 Commercial management measures and strategies, including:

1. Federal commercial moratorium permit requalification
2. Commercial allocation
3. Landings flexibility

In August 2017, landings flexibility was further identified as a framework provision item, not an immediate management option within this amendment. Draft options for the above issues were developed by staff and FMAT members following the May 2017 meeting, and refined by the Demersal Committee through their meetings in July 2017 and November 2017. The Council and

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

Board approved a range of alternatives for public hearings, based on the Demersal Committee recommendations, at the December 2017 meeting.

1.1.1 Statement of Problem

1.1.1.1 Federal Moratorium Permit Requalification (Issue 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 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 alternatives for Issue 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.

1.1.1.2 Commercial Quota Allocation (Issue 2)

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 alternatives for Issue 2 is to consider whether modifications to the commercial quota allocation are appropriate, and if so, how the quota should be re-allocated.

1.1.1.3 Landings Flexibility Framework Provisions (Issue 3)

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 alternatives for Issue 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 2.5

1.2 DESCRIPTION OF THE RESOURCE

1.2.1 Species Life History

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).

1.2.2 Stock Structure and Distribution

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).

1.2.3 Age and Growth

Ageing and Age Structure

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). A summer flounder aging workshop held in 1980 (Smith *et al.* 1981) noted that these early studies provided differing interpretations of the growth zones on summer flounder scales and otoliths. After comparative study by fisheries biologists from along the Atlantic coast, the workshop concluded that both structures followed the generalized temperate waters pattern of rapid growth during early summer through early winter. Scales were identified as the better structure for ageing, being preferred over otoliths due to the possibility of poor otolith calcification and/or resorption. Spawning was noted to occur to from early September in the north through the following March in the south. For uniformity, January 1 was considered the birthday, with fish not considered one year old until passing their first summer, to eliminate the possibility of fall spawn fish being classified as age 1 the following January. The 1980 workshop effectively set the first coast-wide conventions for ageing summer flounder, and importantly concluded that the minimum observed mean length of age 1 fish should be at about 17-18 cm and of age 2 fish at about 28-29 cm (Smith *et al*. 1981).

Growth

The length-weight relationship for summer flounder was described by Lux and Porter (1966), which used individual fish lengths and weights from 2,051 fish collected during 1956-1962 to

compute the parameters by calendar quarters. Wigley et al. (2003) updated the length-weight parameters used in audits of the NEFSC trawl survey data, using individual length and weight information from 9,373 fish for 1992-1999. For development of the 2018 benchmark stock assessment for summer flounder, individual length and weight information from 32,507 fish for 1992-2017 were used to estimate length-weight parameters for comparison with earlier studies. This comparison indicated very little difference in the estimated length-weight relationships between Lux and Porter (1966), Wigley *et al.* (2003), and the current examination for the NEFSC trawl survey data. The curves are virtually identical through a total length of 62 cm (the combined surveys mean length of age 7 fish; age 7 and older fish compose the assessment 'plus group'), a threshold below which over 95% of the fishery catch has occurred. 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).

Parameters of the von Bertalanffy growth equation were explored for summer flounder for the 2018 stock assessment using NEFSC trawl survey data for 1976-2016 for males, females, and sexes combined for the full time series and for seven multi-year bins. Female summer flounder attain a significantly larger asymptotic size than males. The von Bertalanffy asymptotic length parameter, L_{inf}, was estimated for males (n = 19,424) at 63.9 cm, with maximum length of 67 cm (age 6) and maximum age of 15 (length 56-57 cm). Parameters for females (n = 20,689) included L_{inf} = 80.6 cm, with maximum length of 82 cm (age 11) and age of 14 (length 76 cm). For sexes combined (n = 40,942, including small fish of undetermined sex) estimated parameters included L_{inf} = 83.6, with maximum age of 15 (Figure 1).

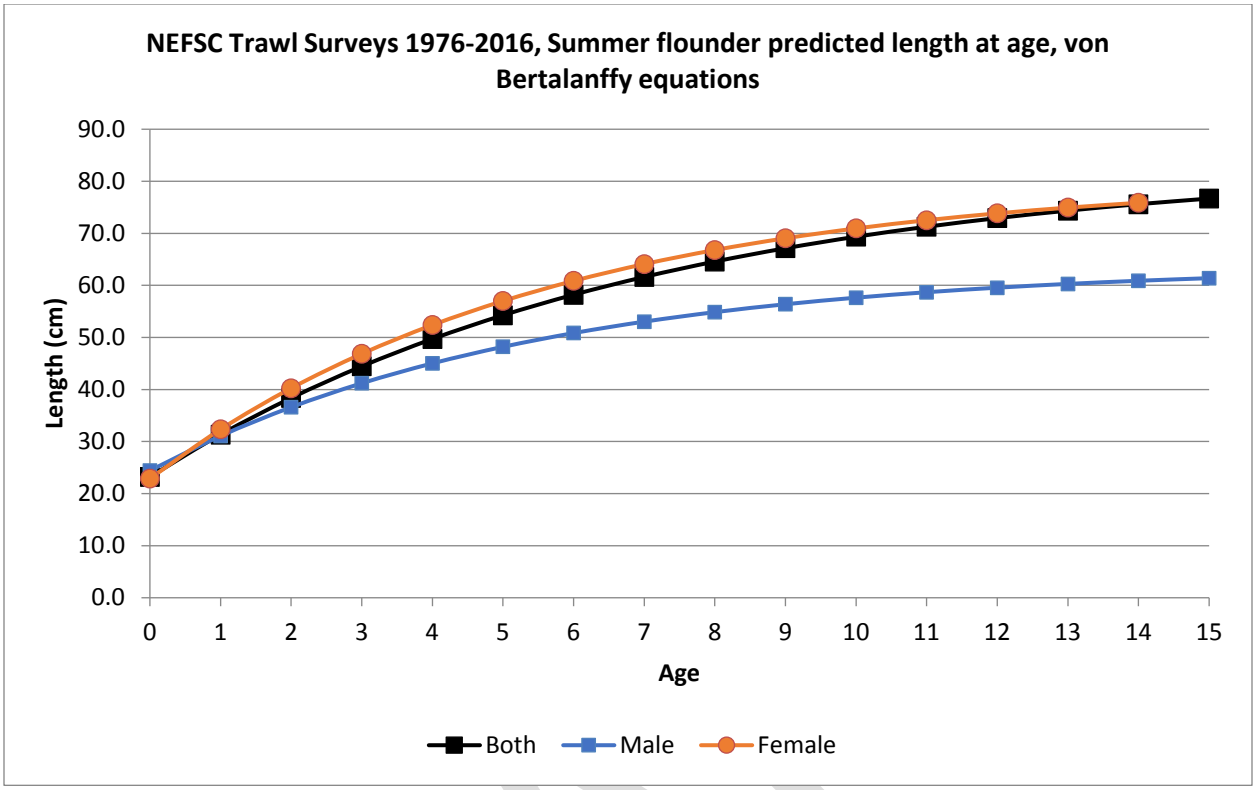


Figure 1: Predicted length at age from von Bertalanffy equations parameters estimated from NEFSC trawl survey data for 1976-2016. Maximum observed age for males is age 15; for females is age 14.

1.2.4 Spawning and Reproduction

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 calculated the percent of ovary weight to total fish weight as an index for maturity. The mean maturity index increased rapidly from August to September, peaked in October to 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. The length and peak spawning time as indicated by the maturity index agree with results determined by egg and larvae occurrence (Smith 1973; Herman 1963).

Fecundity of summer flounder is relatively high. Morse (1981) calculated fecundity estimates ranging from 463,000 to 4,188,000 eggs for fish between 14 inches and 27 inches. A high egg

production to body weight ratio is maintained by serial spawning, that is, batches of eggs are shed rather than all eggs shed at one time (Morse 1981).

Fertilized eggs are buoyant, floating at or near the surface, and are spherical with a transparent rigid shell of about 0.04 inch. 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 54o and 66o 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).

1.2.5 Mortality

The 2008 SAW 47 assessment assumed a natural mortality rate (M) of 0.20 for females and 0.30 for males, based mainly on recently observed maximum ages in the NEFSC survey data of 14 years (76 cm, in NEFSC Winter Survey 2005) for females and 12 years (63 cm, in NEFSC Spring Survey 2007) for males, and the expectation that larger and older fish are likely if fishing mortality rates were maintained at low rates in the future. 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 6). The 90% confidence interval for F in 2015 was 0.292 to 0.490 (Terceiro 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 2). The 90% confidence interval for F in 2015 was 0.292 to 0.490 (Terceiro 2016).

1.2.6 Distribution and Center of Biomass

As described in section 1.2.2, 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 2, section 1.26) 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 10 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/).

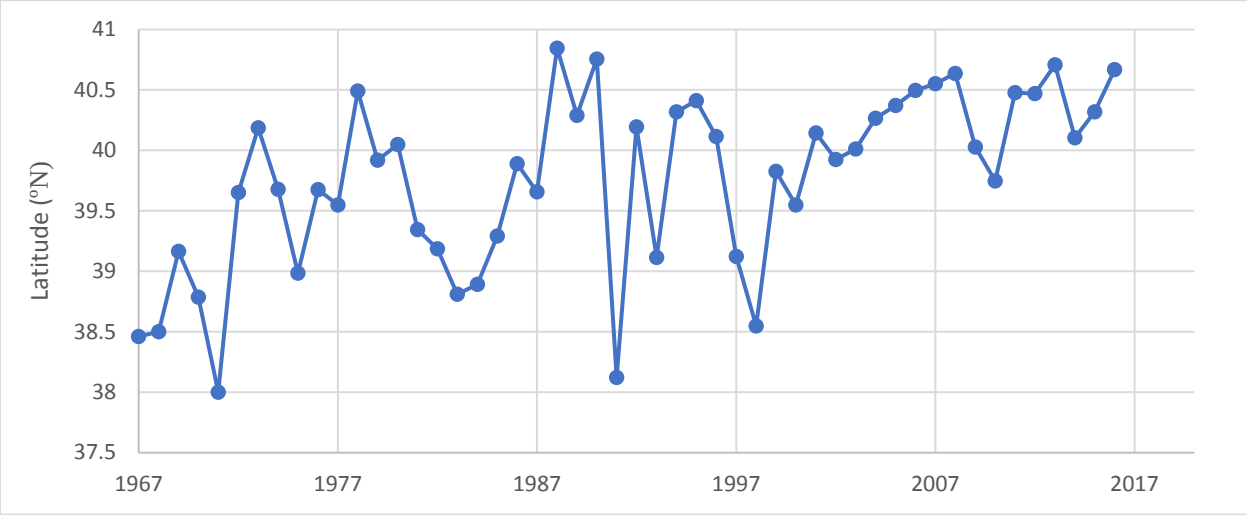


Figure 2. Mean biomass-weighted centroid latitude for summer flounder, 1967-2016, based on NEFSC trawl survey data. Data source: OceanAdapt portal, http://oceanadapt.rutgers.edu/.

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.

1.2.7 Stock Assessment Summary

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; NEFSC 2013), which identified revised biological reference points for the summer flounder stock. Overfishing for summer flounder is defined to occur when the fishing mortality rate (F) exceeds the threshold fishing mortality rate of F_{MSY}. Since F_{MSY} cannot be reliably estimated, F_{MAX} is used as a proxy for F_{MSY}. SARC 57 identified the maximum fishing mortality threshold (MFMT) as $F_{MSY\ PROXY} = F_{35\%} = 0.309$ (CV=15%) and associated estimates from long-term stochastic projections of MSY = 12,945 mt (28.539 million lbs; CV = 13%) and SSB_{MSY} = 62,394 mt (137.555 million lbs; CV = 13%). The biomass is specified to equal spawning stock biomass at maximum sustainable yield (SSB_{MSY}). Since SSB_{MSY} cannot be reliably estimated, the maximum biomass based on yield per recruit (YPR) analysis and average recruitment is used a proxy. 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).

1.2.8 Current Stock Status

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 3). 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 4).

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 detailed description of the history of past summer flounder stock assessments can be found in Terceiro (2001) and Terceiro (2011).

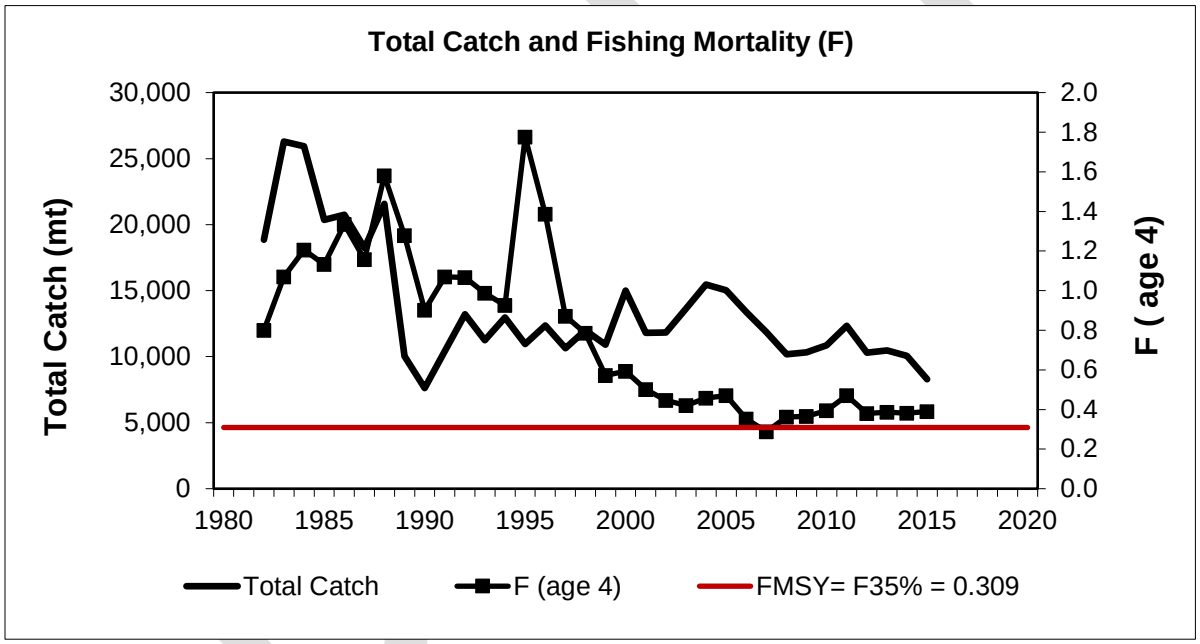


Figure 3: Total fishery catch and fully-recruited fishing mortality (F, peak at age 4) of summer flounder, 1982-2015. The horizontal dashed red line is the 2013 SAW 57 fishing mortality threshold reference point proxy.[4]

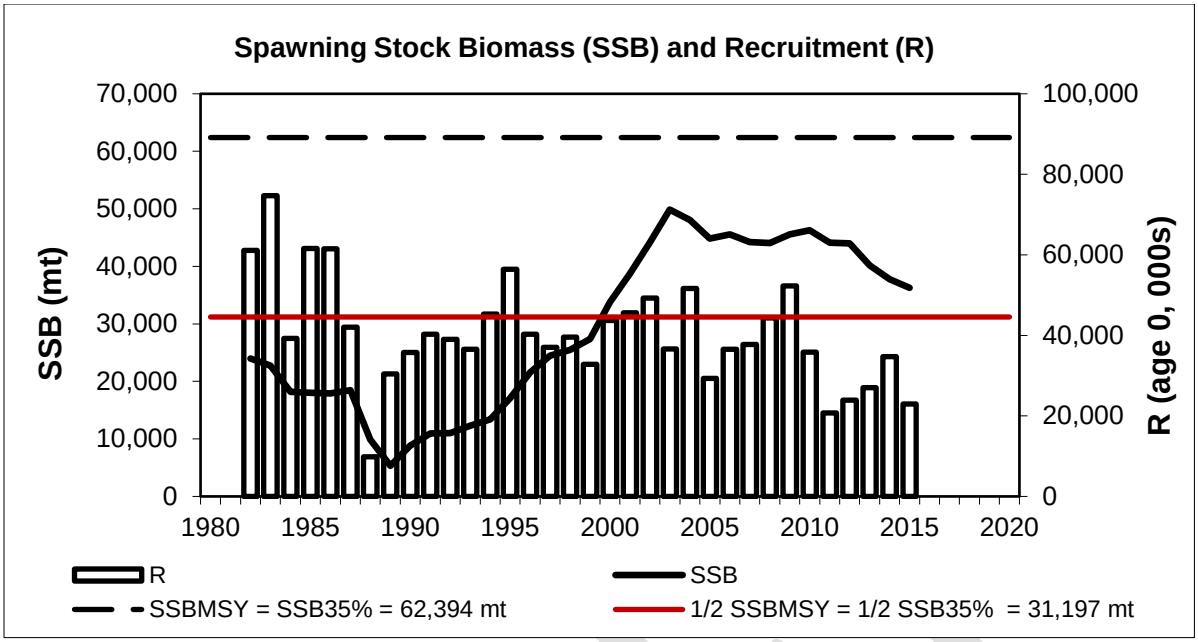


Figure 4: Summer flounder spawning stock biomass (SSB; solid line) and recruitment at age 0 (R; vertical bars) by calendar year, 1982-2015. The horizontal dashed line is the 2013 SAW 57 biomass target reference point proxy, the horizontal red line is the biomass threshold reference point proxy.[4]

1.3 DESCRIPTION OF THE FISHERY

1.3.1 Total Catch Composition

Commercial landings have accounted for 52% of the total catch since 1993, with recreational landings accounting for 36%, commercial dead discards about 10%, and recreational dead discards about 8%. 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 5).

Commercial discard losses in the fish trawl and scallop dredge fisheries have accounted for about 13% of the total *commercial* catch 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%.

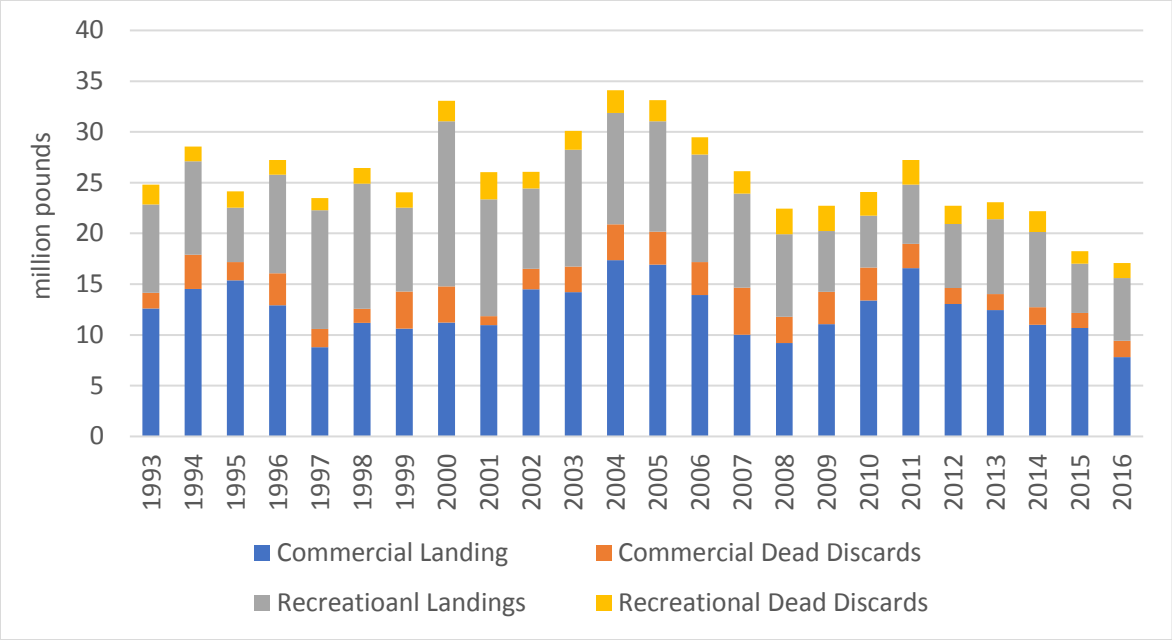


Figure 5: Components of the summer flounder fishery catch from 1993 (implementation of Amendment 2) through 2016. Source: M. Terceiro, pers. comm., July 2016, and Terceiro 2017a.

1.3.2 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, spatial characteristics of the fishery, seasonal characteristics of the fishery, and landings by state.

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 1970's 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 6).

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 1). A time series (1993-2015) of landings and dead discards is shown in Figure 23. 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 1: 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%

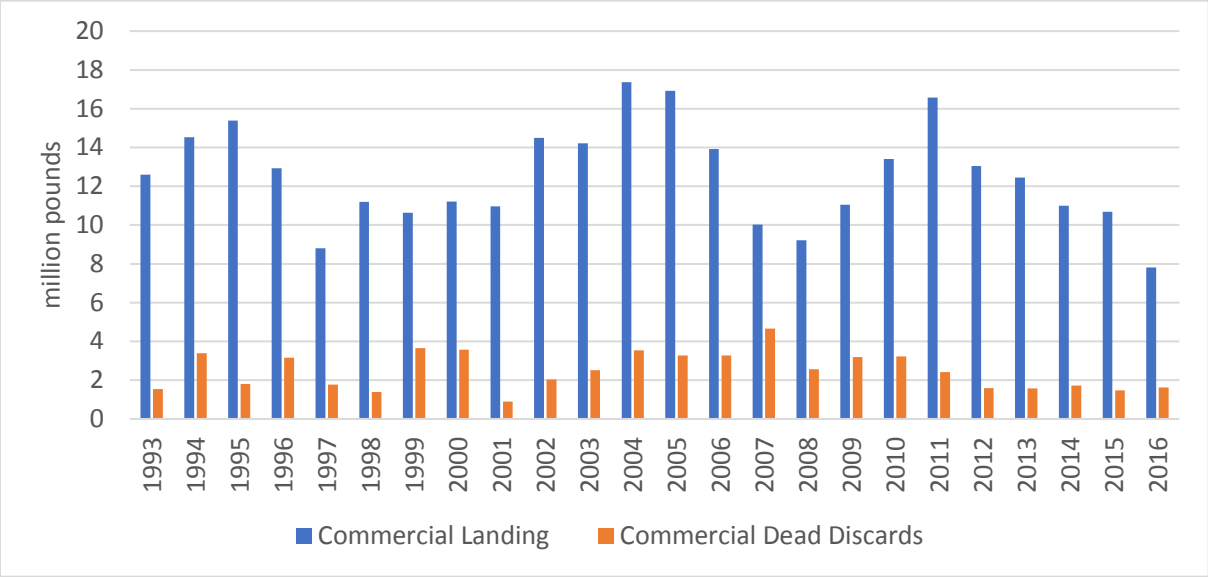


Figure 6: Summer flounder commercial discards and landings, 1993-2016. Source: M. Terceiro, personal communication, July 2016 and Terceiro 2017a.

According to the 2013 benchmark stock assessment, 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 2; 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 2: 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%

Spatial Characteristics of the Fishery

Figure 7 highlights the NMFS statistical areas accounting for more than 1 percent of the summer flounder commercial catch over 2015-2016, 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 5,861 trips by federally permitted vessels over these two years).

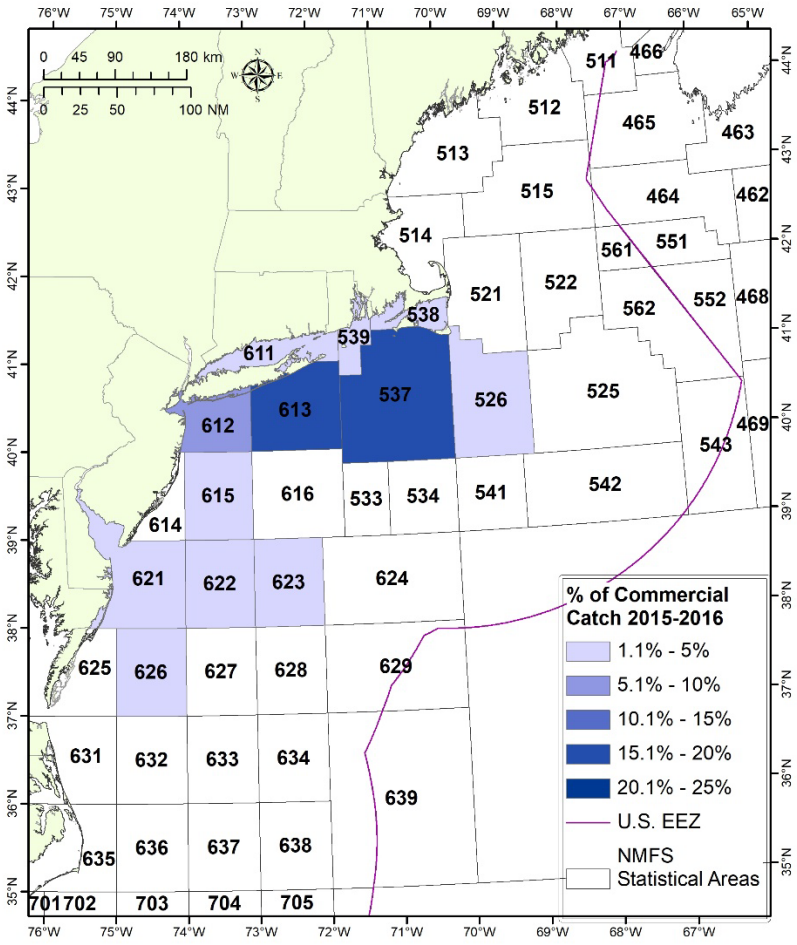


Figure 7: NMFS Statistical Areas, highlighting those that each accounted for more than 1% of VTR-reported commercial summer flounder catch, 2015-2016.

Reported fishing locations by statistical area can provide only a general location of catch. To look at landings and fishery 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, and a summary is provided 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 8 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; 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 9).

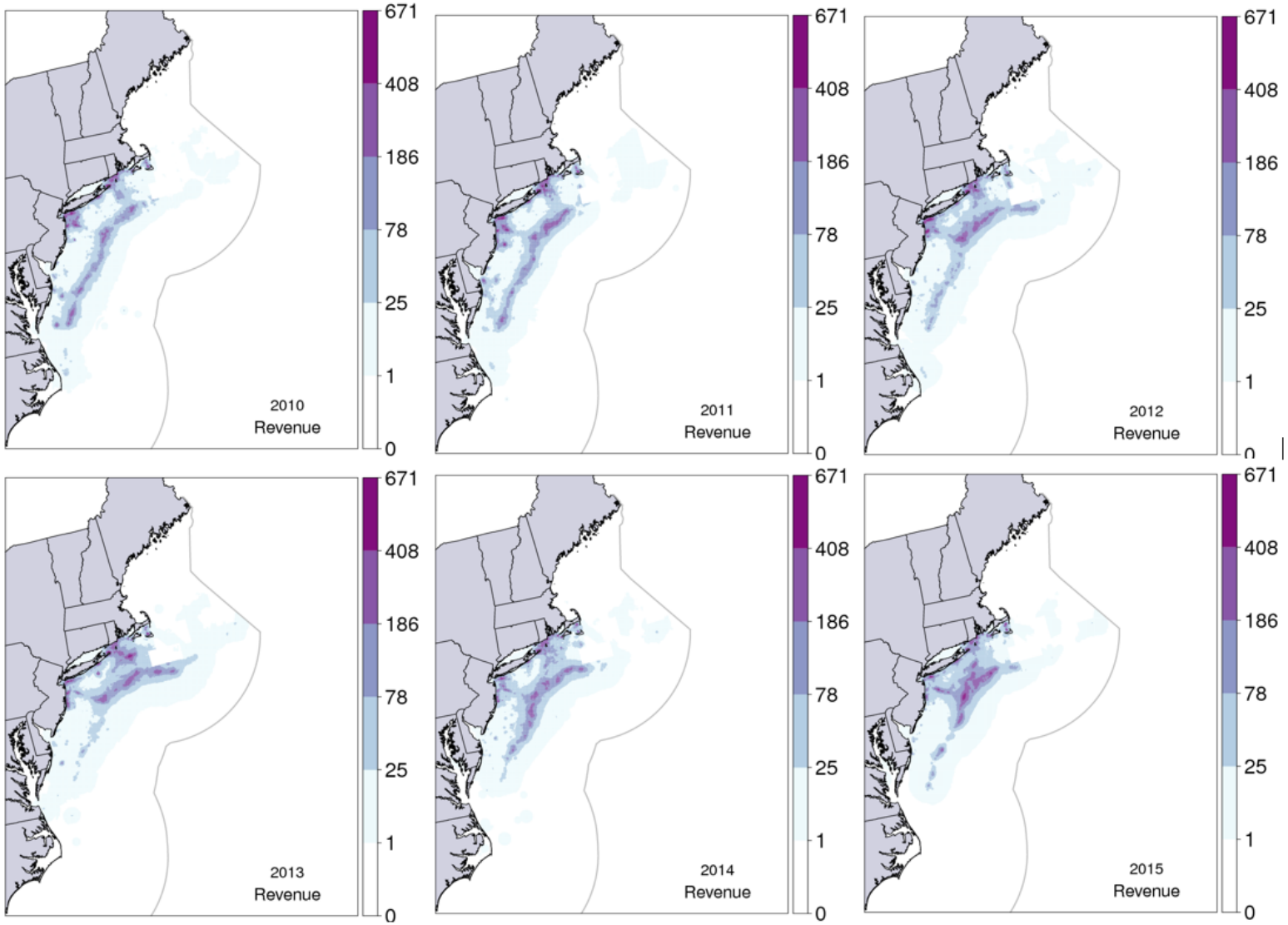


Figure 8: Commercial summer flounder revenue by catch location, 2010-2015, in 2014 real US dollars. Source: NEFSC Social Sciences Branch Fishing Footprints, based on DePiper (2014). Available at: https://www.nefsc.noaa.gov/read/socialsci/fishing-footprints.php.

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. Figures 9-12 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." As described in section 1.2.7, 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.

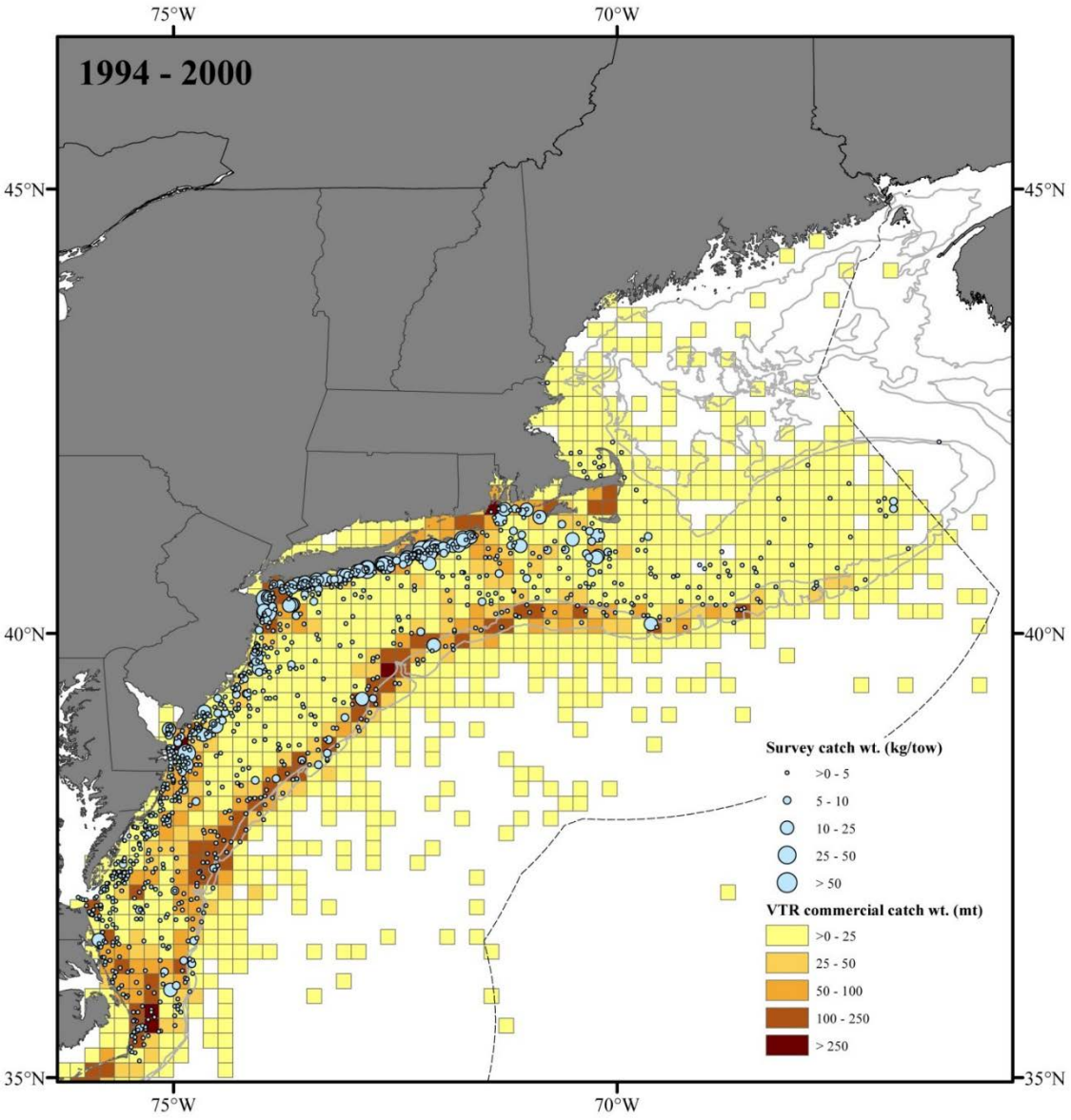


Figure 9: Spatial overlap of NEFSC trawl survey (spring and fall combined) catches (kg/tow) and commercial VTR-reported catch weight (landings and discards) binned to ten minute squares from, 1994-2000. Source: NEFSC 2013.

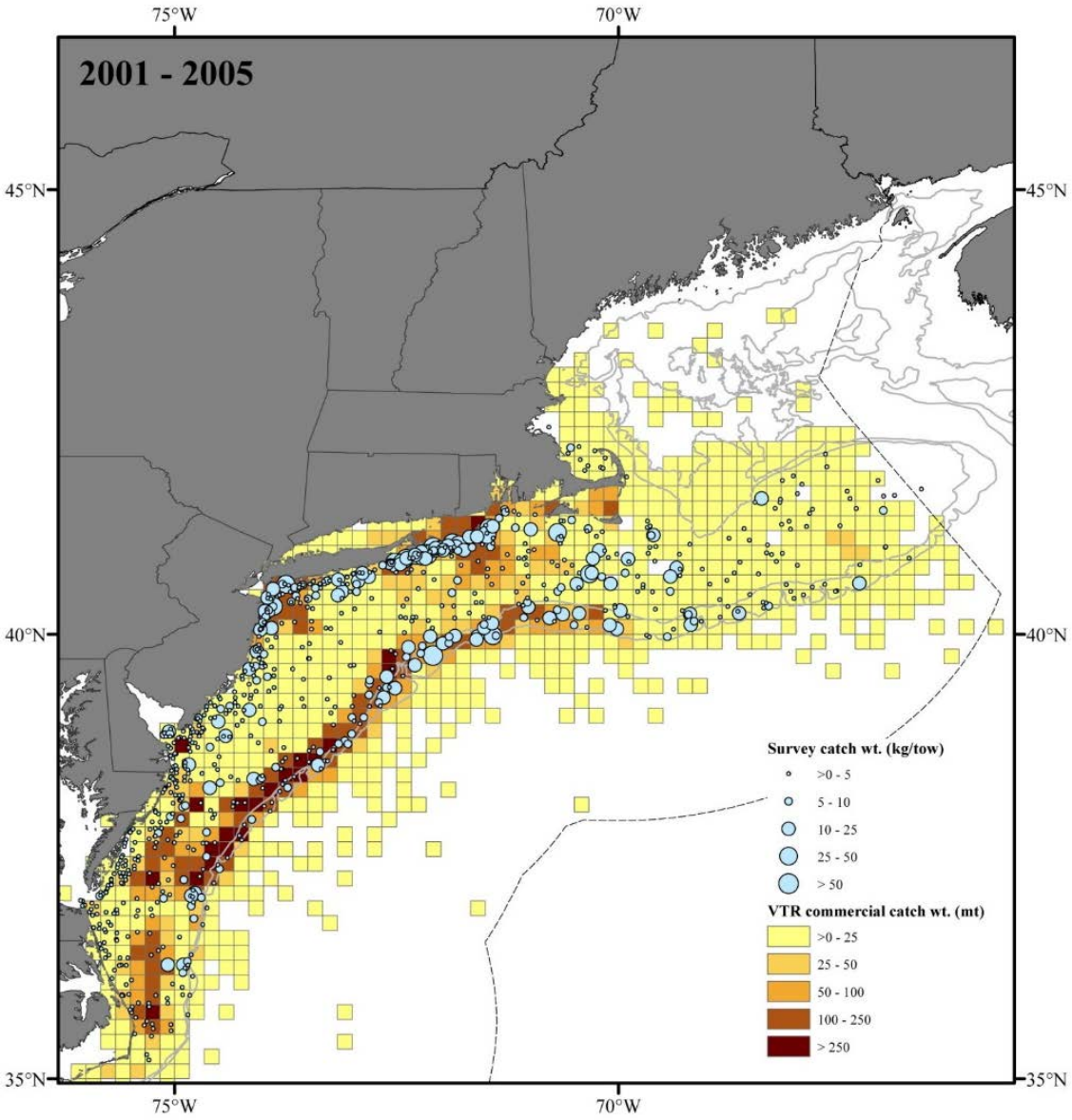


Figure 10: Spatial overlap of NEFSC trawl survey (spring and fall combined) catches (kg/tow) and commercial VTR-reported catch weight (landings and discards) binned to ten minute squares from, 2001-2005. Source: NEFSC 2013.

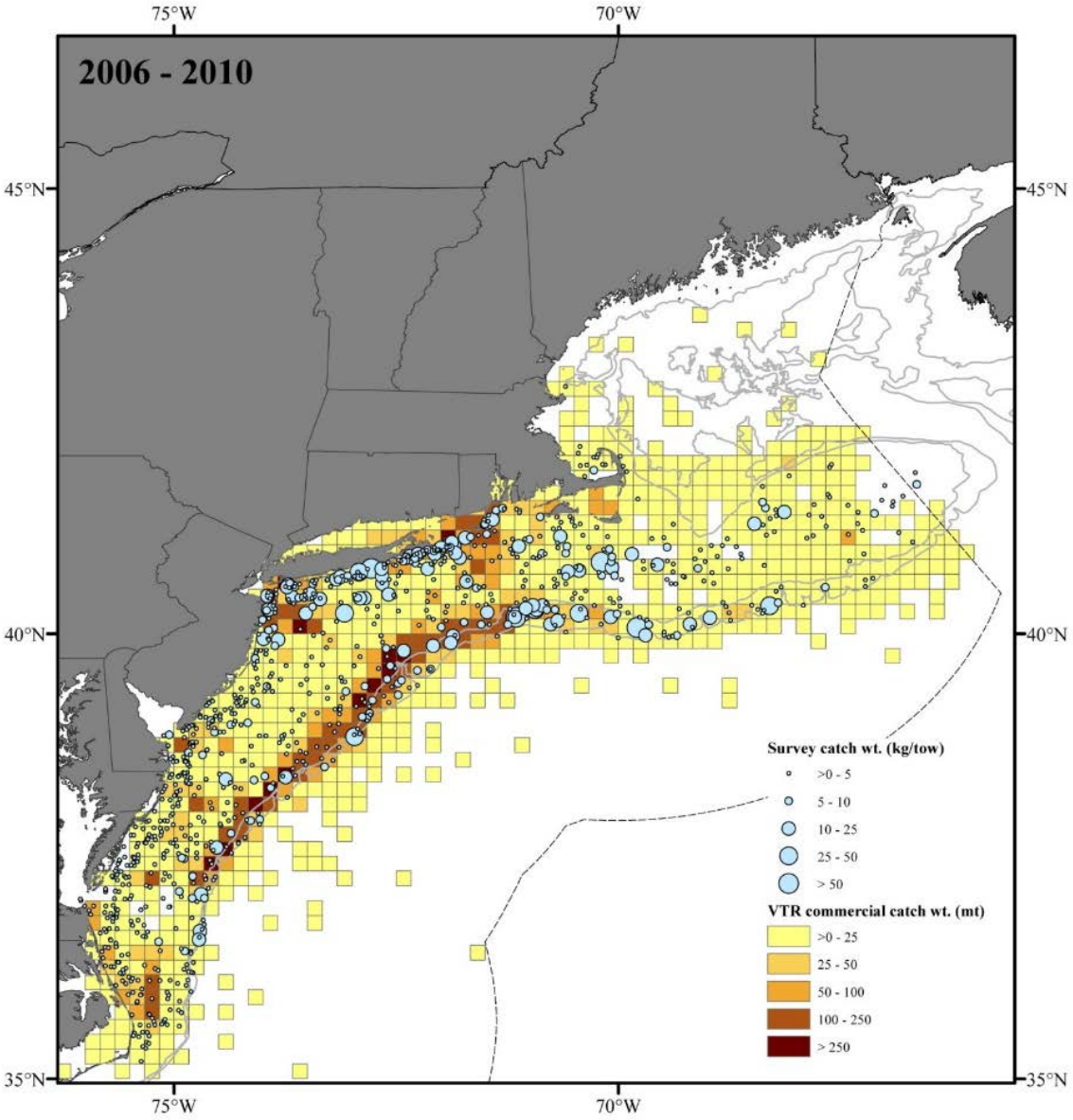


Figure 11: Spatial overlap of NEFSC trawl survey (spring and fall combined) catches (kg/tow) and commercial VTR-reported catch weight (landings and discards) binned to ten minute squares from, 2006-2010. Source: NEFSC 2013.

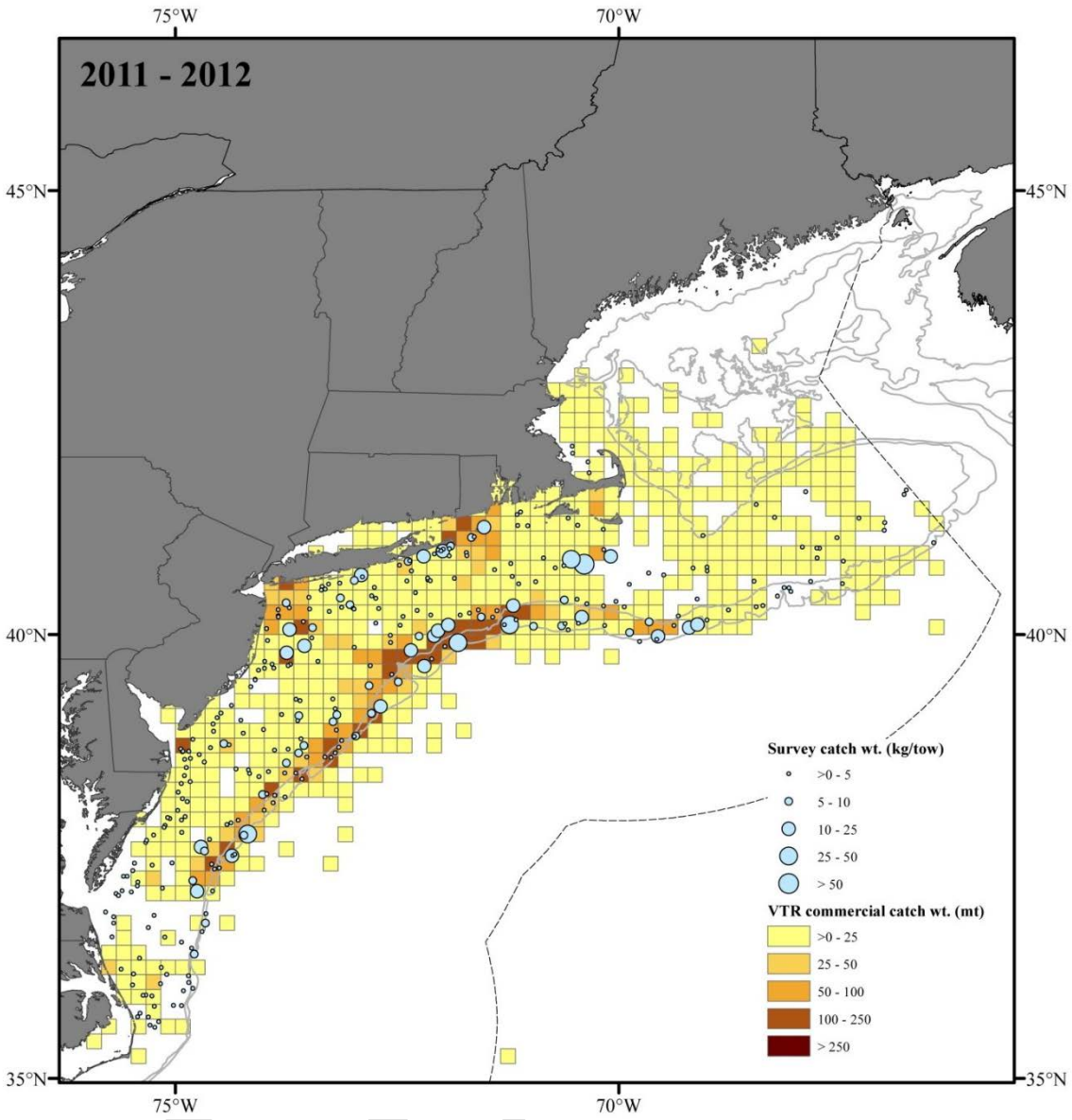


Figure 12: Spatial overlap of NEFSC trawl survey (spring and fall combined) catches (kg/tow) and commercial VTR-reported catch weight (landings and discards) binned to ten minute squares from, 2011-2012. Source: NEFSC 2013.

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 13). This corresponds with summer flounder being distributed offshore, where they are targeted by larger trawl vessels.

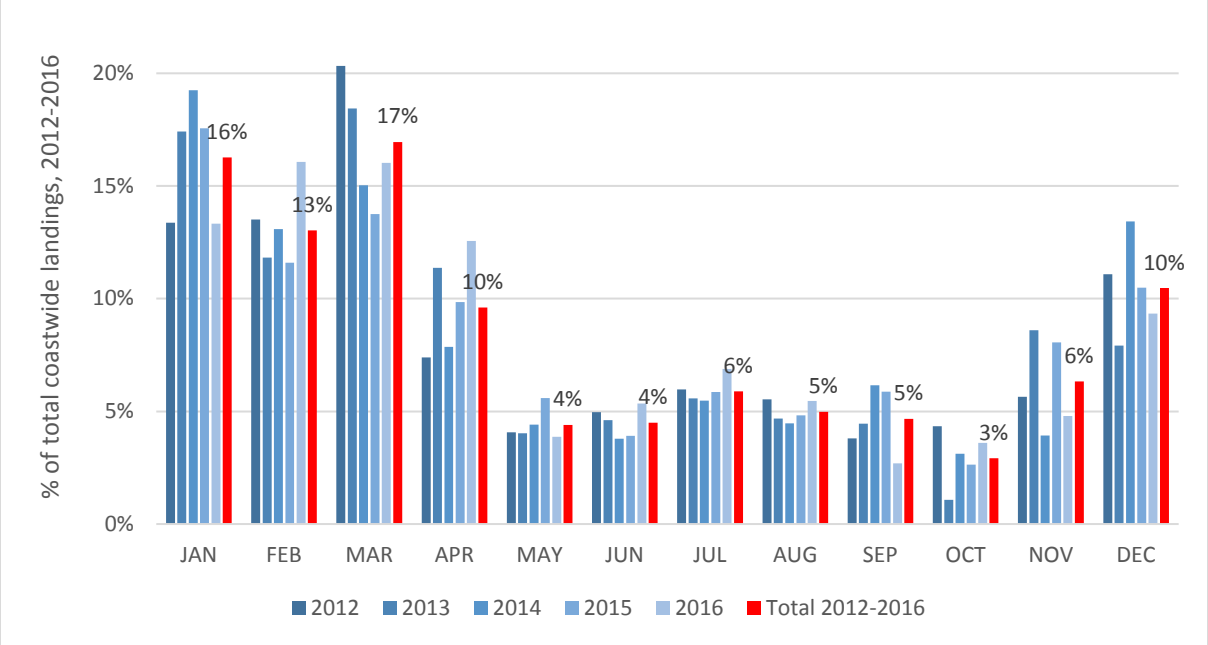


Figure13: Commercial summer flounder landings by month as a percentage of coastwide harvest, 2012-2016, MA-NC. Total percentages for 2012-2016 are labeled (red bars). Source: NMFS AA tables.

Figure 14 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 14). 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 15). 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 16).

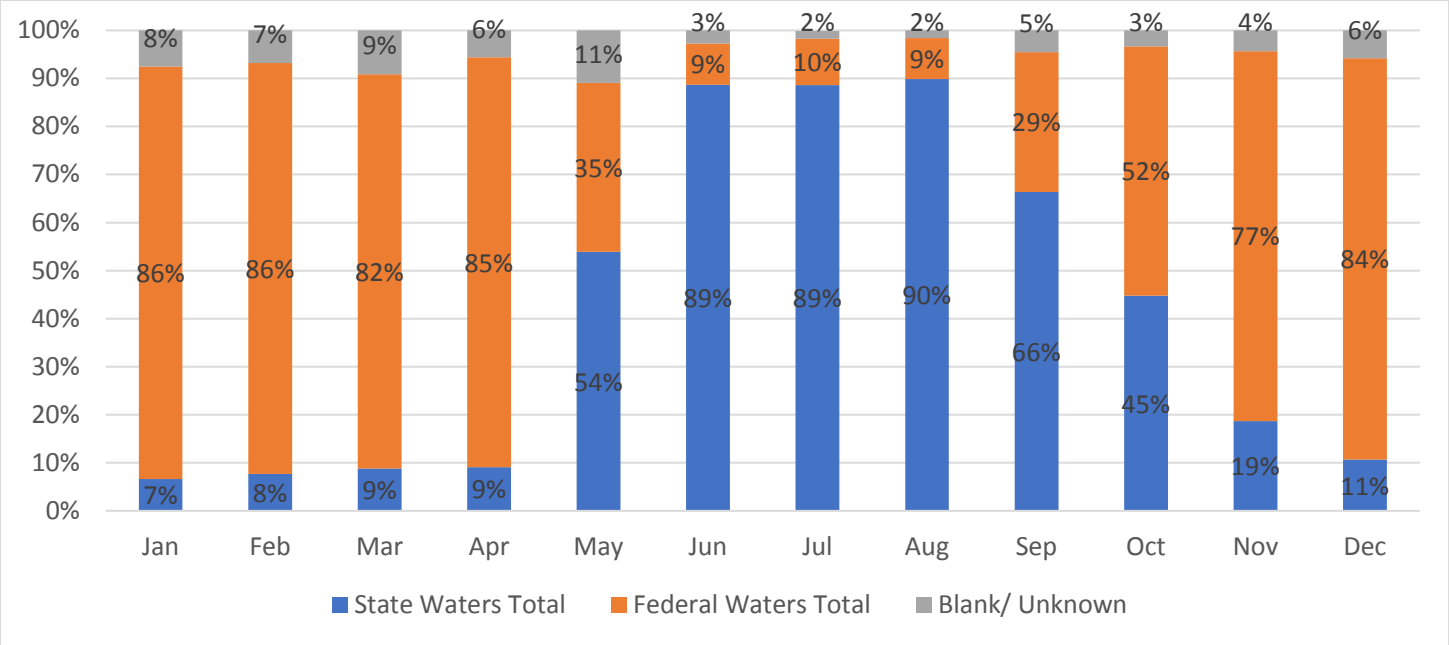
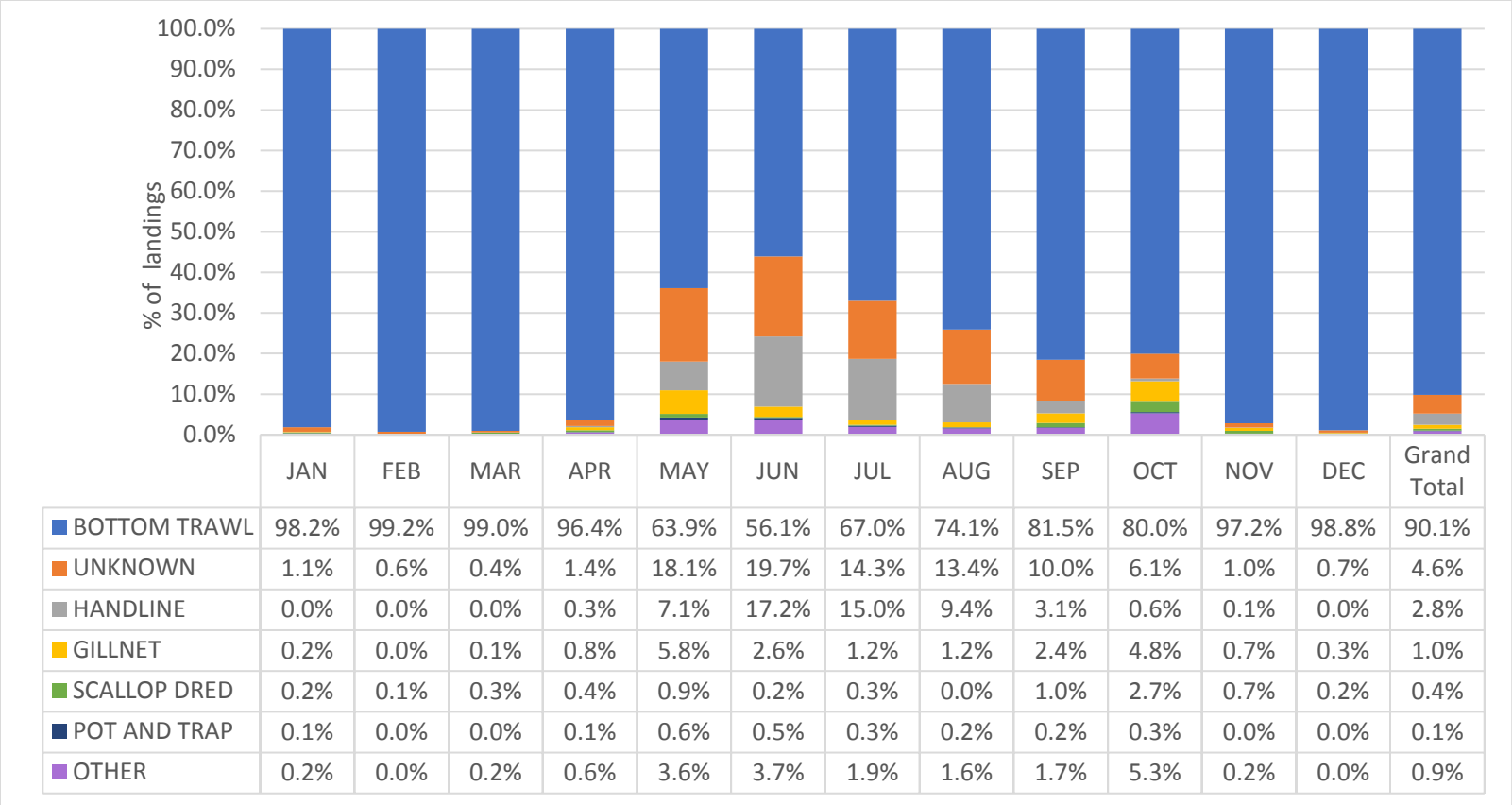
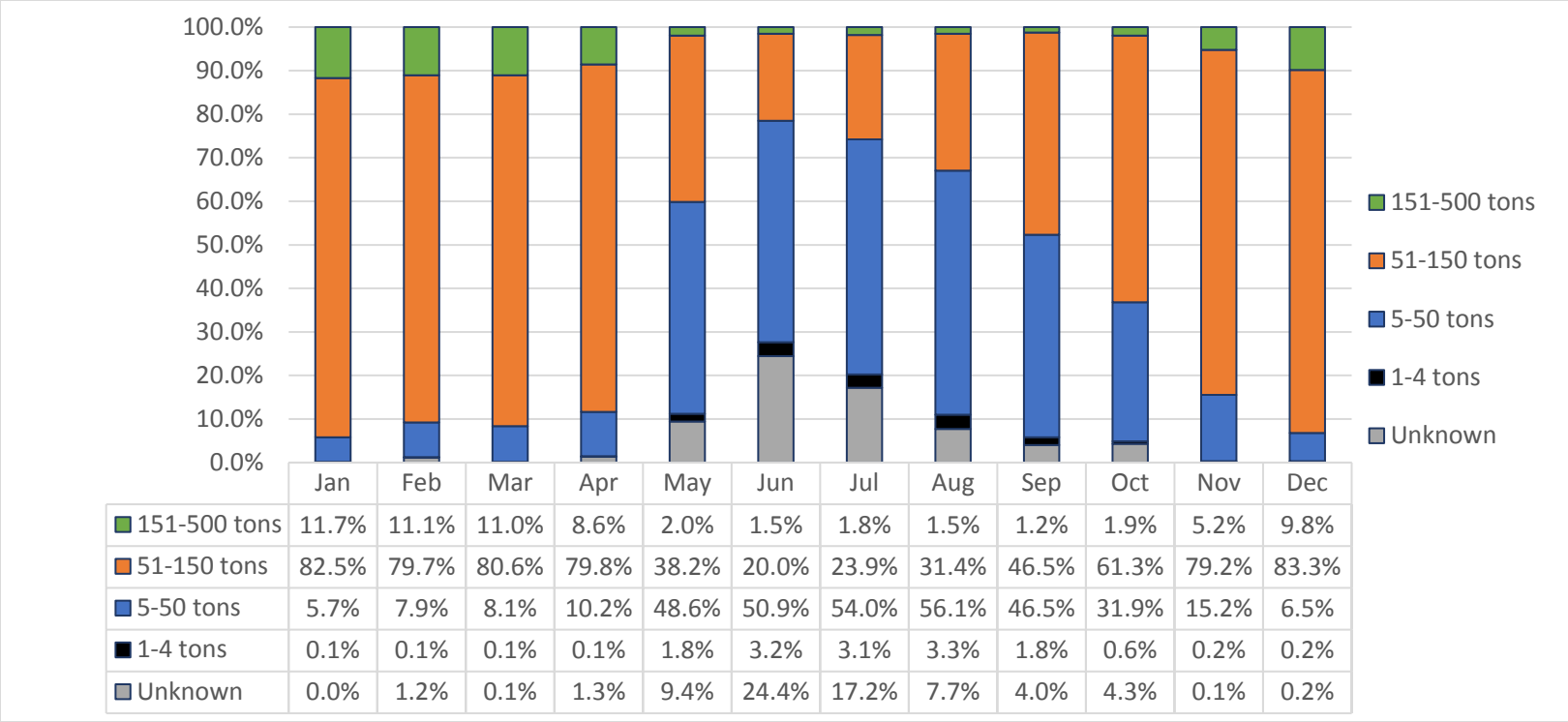


Figure 14: Commercial summer flounder landings by distance from shore by month, as reported on VTRs, 2015-2016, ME-NC. Source: NMFS VTR data as of May 2017.



	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 15: 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 16: Average percent of commercial summer flounder landings by vessel ton class in each month, 2011-2015. Source: NMFS dealer data.

Landings by State ***[Descriptive text and additional tables/figures to be completed]***

Table 3: 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 4: 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%

Table 5 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). Maine and New Hampshire have reported no landings of summer flounder in the past five years. 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 5: 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%**

Figure 17 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. The percentage of landings actually originating from state waters may be higher than portrayed here, as this dataset does not include state-only permitted vessels fishing only in state waters.

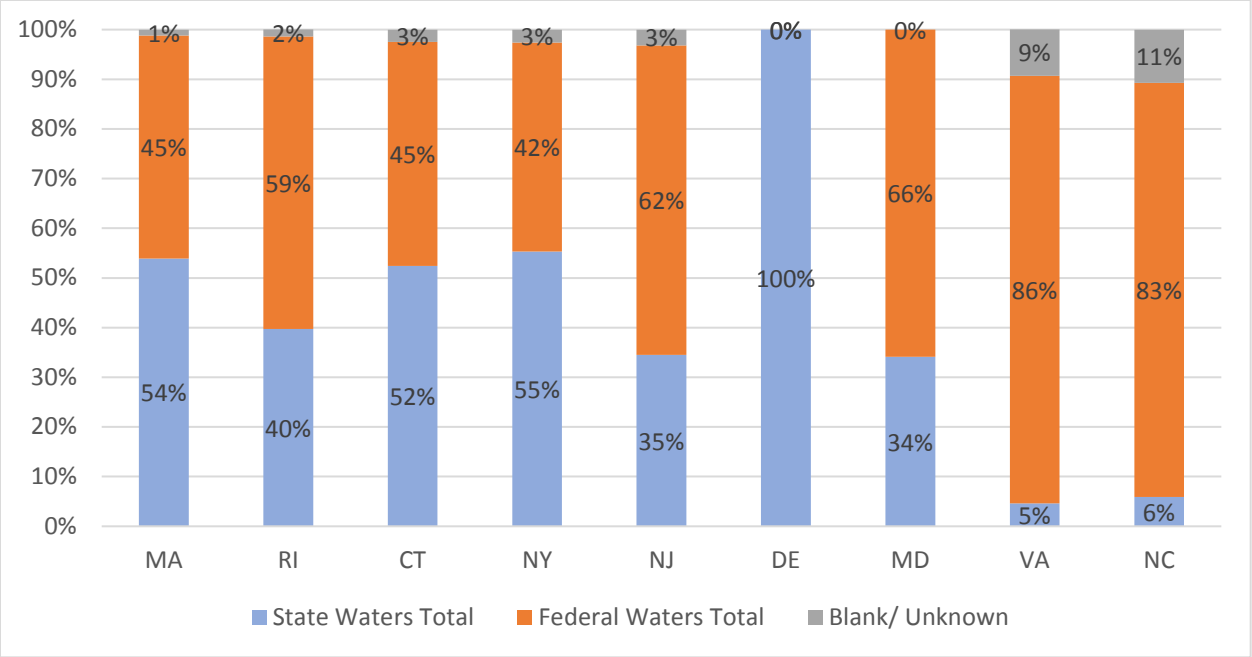
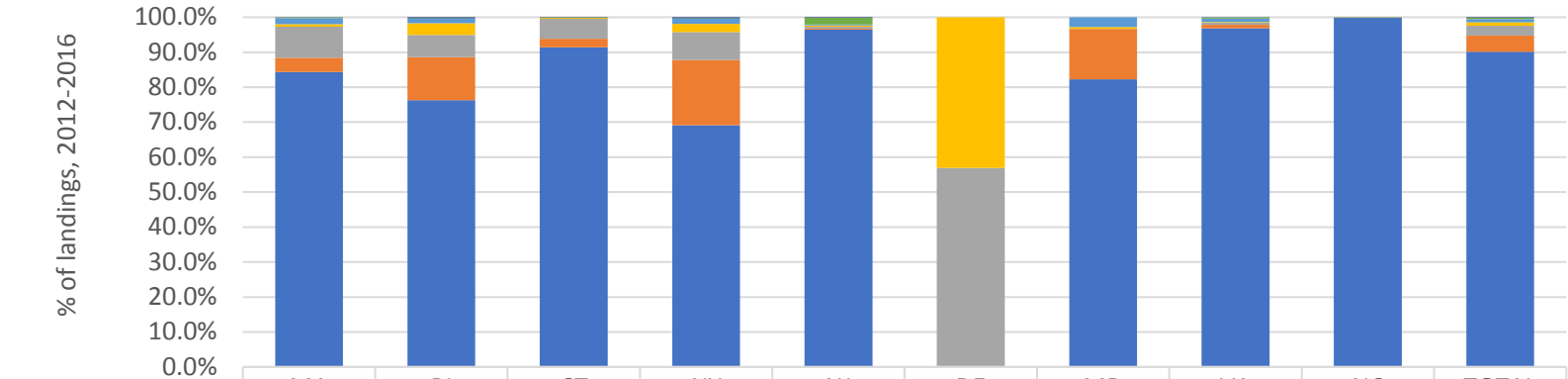


Figure 17: Commercial summer flounder landings by distance from shore by state, as reported on VTRs, 2015-2016. Source: NMFS VTR data as of May 2017. Note: does not include state-level-only VTR data.

Figure 18 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 18: 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.

[NOTE: all sub-sections below are in progress and will include additional information.]

1.3.2.1 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 19).

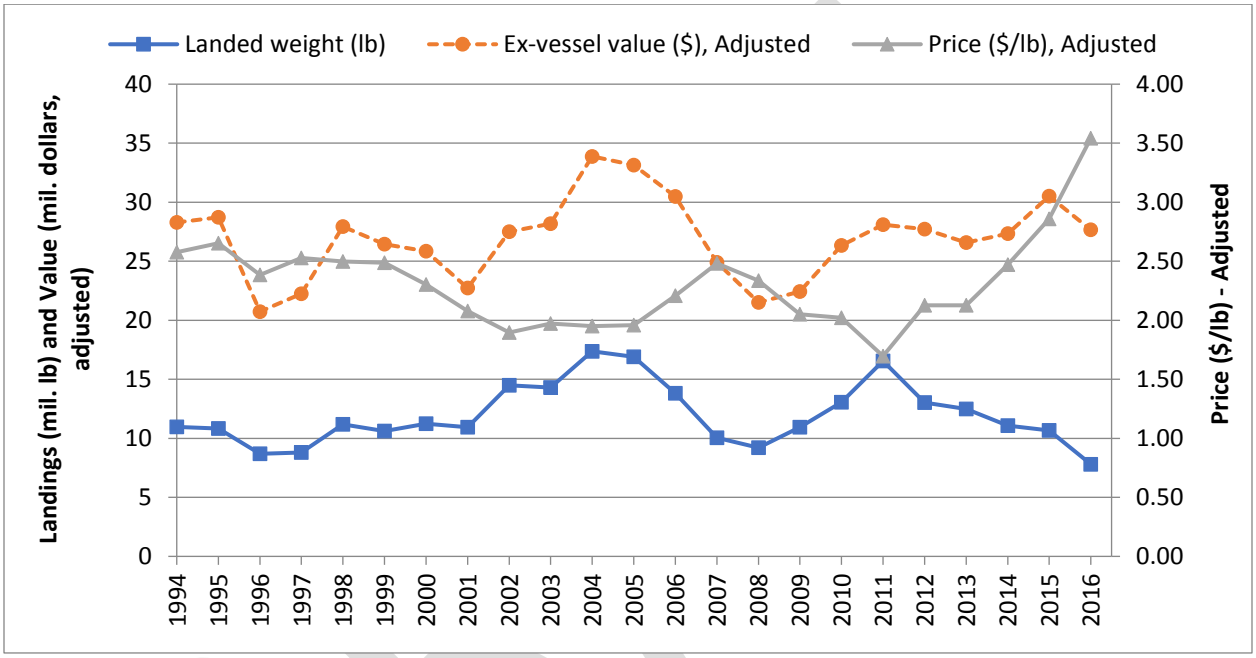


Figure 19: Landings, ex-vessel value, and price per pound for summer flounder, Maine through North Carolina, 1994-2016. Ex-vessel value and price are adjusted to real 2016 dollars.

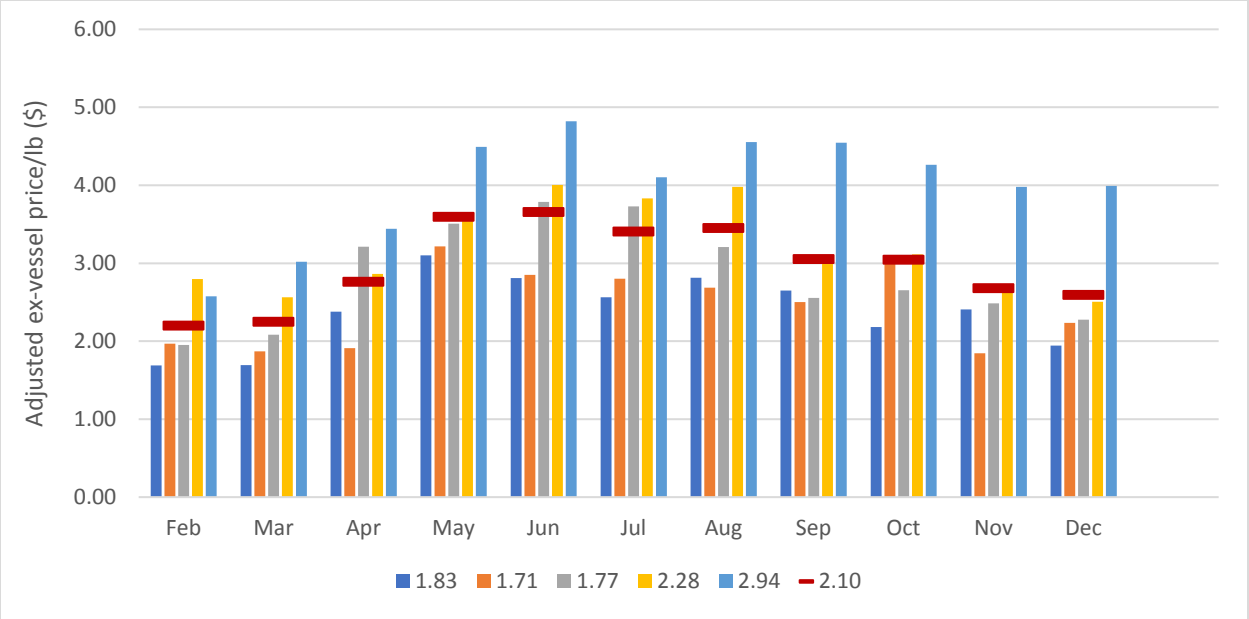


Figure 20: Average ex-vessel price per pounds ($; adjusted to 2016 US dollars) for summer flounder by month, with monthly average, 2012-2016.

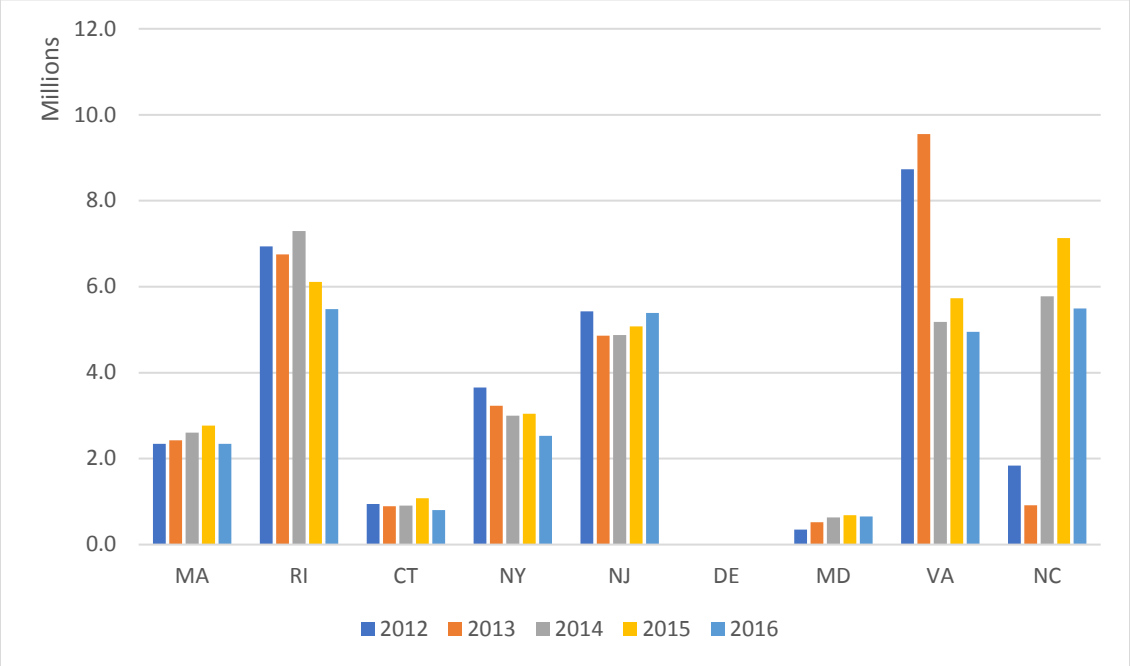


Figure 2: Total ex-vessel revenue (adjusted to 2016 US dollars) for summer flounder landings by state and year, 2012-2016. Source: NMFS dealer data as of May 2017.

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 6 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 6).

Table 6: 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**

1.3.2 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, with less emphasis given compared to the commercial fishery sections above given that the alternatives in this action do not directly impact the recreational fishery.

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). 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 2010 with 1.50 million fish landed (Table 7).

MRIP data indicate that on average, about 85% 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 11% from anglers aboard party or charter boats, and 4% from shore (Figure Figure 22). 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.

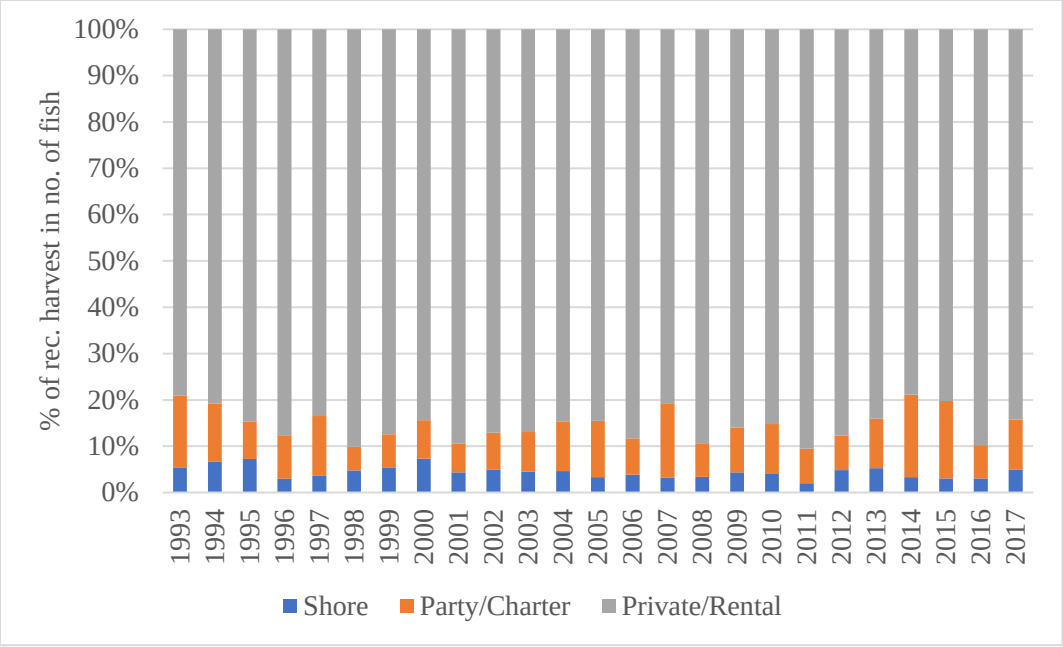


Figure 22: The percent of summer flounder harvested by recreational fishing mode, Maine through North Carolina, 1993-2017.

Table 7: 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[a]	8,225,802	993,540	3,100,440	3.12	88%

[a] Preliminary.

Recreational Landings by Area and State

On average, an estimated 86 percent of the landings (in numbers of fish) occurred in state waters over the past ten years (Figure 23). By state, the majority of summer flounder are typically landed in New York and New Jersey (Table 7).

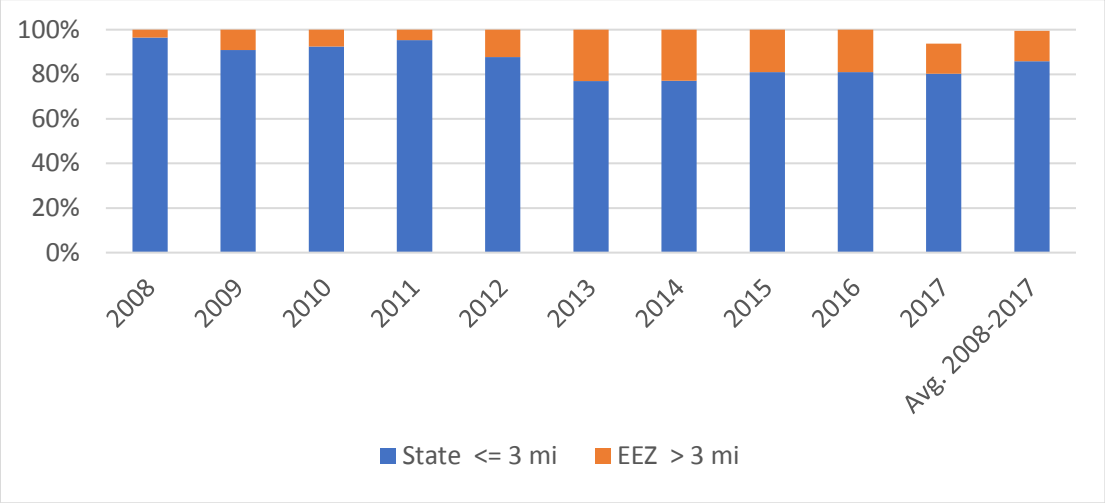


Figure 23: Estimated percentage of summer flounder recreational landings in state vs. federal waters, Maine through North Carolina, 2007-2016.

Table 8: 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%	5.9%	6.7%
Connecticut	5.7%	10.7%	8.8%	8.6%
New York	30.3%	35.1%	21.6%	30.5%
New Jersey	30.7%	37.2%	43.6%	36.3%
Delaware	3.2%	4.4%	3.3%	3.8%
Maryland	2.7%	1.1%	2.6%	2.0%
Virginia	9.8%	3.5%	9.0%	6.9%
North Carolina	2.5%	0.9%	2.6%	1.8%
Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**

1.3.3 Interactions with Other Fisheries

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.

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 24). 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.

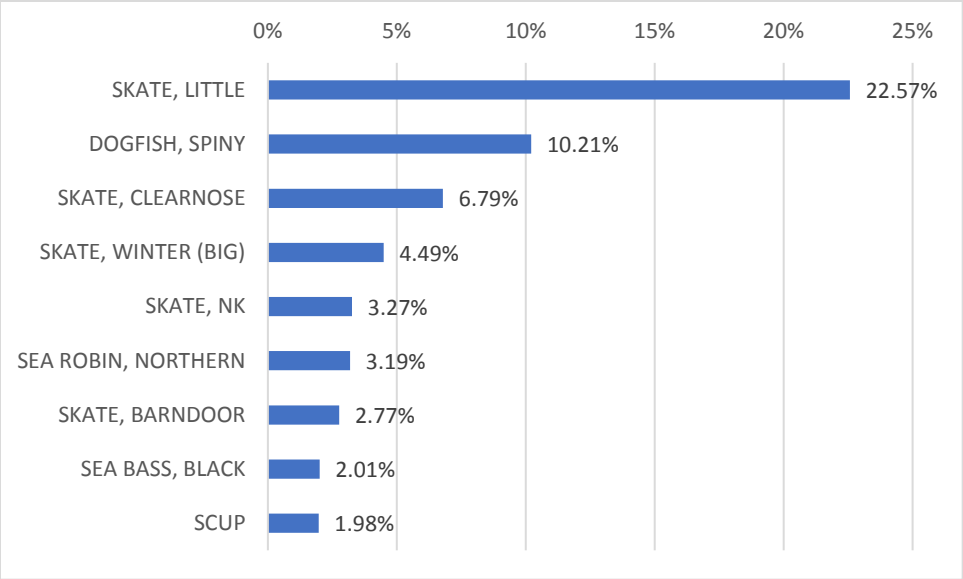


Figure 24: Most commonly caught fish species on observed hauls where summer flounder >50% of catch by weight, 2012-2016. Source: NEFOP data as of July 2016.

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. 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.

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.

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.

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).

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.

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. 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).

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).

1.4 Habitat Considerations

1.4.1 Description of Physical Habitat

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.

The Gulf of Maine is an enclosed coastal sea, characterized by relatively cold waters and deep basins, with a patchwork of various sediment types. Georges Bank is a relatively shallow coastal plateau that slopes gently from north to south and has steep submarine canyons on its eastern and southeastern edge. It is characterized by highly productive, well-mixed waters and strong currents. The Mid-Atlantic Bight is comprised of the sandy, relatively flat, gently sloping continental shelf from southern New England to Cape Hatteras, North Carolina.

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

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

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)[2], and benthic organisms.[3] 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 9).

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

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

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

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

Table 9: 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%

1.4.2 Environmental Requirements of Summer Flounder

Summer flounder habitat includes pelagic waters, demersal waters, saltmarsh creeks, seagrass beds, mudflats, and open bay areas from the Gulf of Maine through North Carolina. The center of its 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 (Packer et al. 1999).

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 (Packer et al. 1999).

1.4.3 Identification and Distribution of Essential Habitat

EFH for summer flounder was designated through 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 Error! Reference source not found..

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.

1.4.4 Anthropogenic Impacts on Summer Flounder and Their Habitat

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 10). 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 10 for years 2012-2016.

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 small percentage of non-trawl gear types used in the commercial scup 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.

Table 10: Gear type breakdown for summer flounder landings, 2012-2016 combined, from dealer data and VTR data. Source: NMFS dealer data (AA tables) as of February 2017 and NMFS federal VTR data as of January 2018. 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%

1.4.5 Description of Programs to Protect, Restore, & Preserve Summer Flounder

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 scup are rod and reel and handline. These gears have minimal adverse impacts on EFH in the region (Stevenson et al. 2004).

2.0 GOALS AND OBJECTIVES

2.1 History of Management

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.

Joint Management

The Council and Commission work cooperatively to develop fishery regulations for summer flounder off the east coast of the United States. The Council and Commission work in conjunction with 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 joint FMP for summer flounder became effective in 1988 and established the management unit for summer flounder as U.S. waters in the western Atlantic Ocean from the southern border of North Carolina northward to the U.S.-Canadian border. The FMP also established measures to ensure effective management of summer flounder fisheries, which currently 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.

There are large commercial and recreational fisheries for summer flounder. These fisheries 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. Summer flounder was under a stock rebuilding strategy beginning in 2000 until it was declared rebuilt in 2011, based on an assessment update with data through 2010. Although the most recent (2016) assessment update included a revised biomass time series indicating that estimated biomass never actually reached the target biomass, current biomass estimates are still above the minimum stock size threshold that would trigger a new rebuilding plan (section 6.1.1.2).

The ASMFC has primary authority for development of FMPs for state waters under the authority of the Atlantic Coastal Fisheries Cooperative Management Act (ACFCMA) of 1993. Recognizing the interjurisdictional nature of fishery resources and the necessity of the states and federal government coordination on regulations, under this act, 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 Commission and the Council 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 NOAA Fisheries issues rules to implemented approved FMPs prepared by the Councils.

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.

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) recommends annual Acceptable Biological Catch (ABC) levels for summer flounder, which are then approved by the Council and Commission and submitted to NMFS for final approval and implementation. The ABC is divided into commercial and recreational Annual Catch Limits (ACLs), based on the landings allocation prescribed in the FMP and the recent distribution of discards between the commercial and recreational fisheries. 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.

Each year during the specifications process, the SSC meets to review the latest scientific information, including any recent benchmark assessments, assessment updates, or data updates. The SSC either recommendations ABCs for the upcoming fishing year(s), or reviews previously implemented ABCs to ensure they are still appropriate. The Monitoring Committee then meets to recommend any changes to the ACLs, RHL, commercial quota, or commercial management measures (commercial minimum size, mesh size requirements, possession limits triggering the minimum mesh requirements, and exemption programs). The Council and Board typically meet jointly in August to review the SSC recommendations, Monitoring Committee recommendations, and Advisory Panel comments. The Council and Board recommend any necessary new specifications or changes to implemented specifications to NMFS (Table 11).

The recreational measures are considered later in the year (Table 11) 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.

Table 11: Typical specifications cycle for summer flounder, with major steps and products throughout the year. Details may change in a given year if necessary.

Group	*Timing*	*Action or Product*
Council staff	May/June	Council staff summarizes recent fishery performance data.
Council and Commission Advisory Panels	June/July	Council and Commission Advisory Panels meet to develop Fishery Performance Reports, summarizing recreational and commercial advisor observations on catch and landings trends, ecological trends, economic trends, and management issues.
NEFSC	June/July	NEFSC finalizes any assessment reports, possibly including: benchmark assessments (major changes and peer review), assessment updates (existing model updated with new data), or data updates (recent catch, landings, and fishery independent survey indices).
Council staff	June/July	Assessment information and the Council's risk policy is used to develop recommendations on catch limits and commercial management measures for the upcoming year(s) (up to 3 years at a time).
Council's SSC	July	SSC recommends or reviews the Annual Biological Catch (ABC) limits, or recommend new limits for the upcoming year(s), based on any assessment information and the Council's risk policy.
Council and Commission joint Monitoring Committee	July	Monitoring Committee reviews fishery performance and recommends sector-specific Annual Catch Limits (ACLs) and Annual Catch Targets (ACTs), as well as any changes to commercial management measures including minimum fish size, minimum mesh size, other gear requirements and restrictions, commercial possession limits, and exemption programs.
Council and Commission Advisory Panels	Late July/ early August	Advisory Panels review recent assessment information (if not available at previous meeting), and to comment on the recommendations of the SSC and Monitoring Committee.
Council and Board	August	Council and Board review information and recommendations from prior meetings and may recommend new specifications or changes to previously implemented specifications.
Council staff	Fall	Council staff develops supporting documents for submission to NMFS. NMFS goes through the rulemaking process to implement the catch limits, including a public comment process.
Council staff	November	Staff develops recreational information and recommendations for management strategies/specific measures (bag limit, size limit, and season) for upcoming fishing year.
Monitoring Committee	Mid-November	Monitoring Committee meets to recommend recreational management measures (bag limit, size limit, and season) and recreational management strategies for the upcoming fishing year.
Council and Commission Advisory Panels	November/ December	The Advisory Panels meet to discuss recreational fishery performance and make recommendations regarding recreational management measures.
Council and Commission's Summer Flounder Board	Mid-December	The Council and Board approve either conservation equivalency or specific coastwide measures for the upcoming year. The Board may also approve or discuss general management strategies affecting state waters measures.
Commission's Technical Committee and Board	January-April	If applicable, TC develops state-specific proposals for recreational measures that are considered and approved by the Board. Commission staff then submits letter to NMFS certifying that combination of state measures is conservationally equivalent to coastwide measures and will achieve the next year's RHL.
Council staff	Late winter/ early Spring	Council staff develops documents supporting the decisions on federal recreational measures, for submission to NMFS. NMFS rulemaking occurs.

Amendments and Other FMP Modifications

The following outlines Amendments and other modifications to the FMP to present specific to management of the commercial fishery.

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 was approved by NMFS on 6 August 1992. It 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 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.

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.

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). **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.

2.3 Management Unit

Summer flounder, scup, and black sea bass fisheries are managed cooperatively by the Commission in state waters (0-3 miles), and by the Council and NOAA Fisheries in Federal waters (3-200 miles). The management unit for summer flounder, scup, and black sea bass in US waters is the western Atlantic Ocean from the southern border of North Carolina northward to the US-Canadian border.

2.4 Purpose and Need for Action

Table 12 summarizes the needs for action and the corresponding purposes. The "Need for Action" describes "Why is the Board and Council taking a given action?" For each "Need for Action" there is a "Corresponding Purpose," which is how the Board and Council proposes 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 12: Summary of purposes and needs for this action.

Need for Action	Corresponding Purpose	Alternatives That Address This Purpose
Issue 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 permit capacity	• 1A (Status Quo) • 1B-1 • 1B-2 • 1B-3 • 1B-4 • 1B-5 • 1B-6 • 1B-7
Issue 2. Current commercial allocation was last modified in 1993. Summer flounder distribution, biomass, and fishing effort has 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 (Status Quo) • 2B-1 • 2B-2 • 2C-1 • 2C-2 • 2D-1 • 2D-2
Issue 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 landings flexibility as a frameworkable issue in the Council's FMP	• 3A(Status Quo) • 3B

Issue 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'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.

Issue 2: Consider Modifications to Current Commercial Quota Allocation

The current commercial allocation is perceived 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.

Issue 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.

2.5 Goals and Objectives

The original FMP objectives were adopted via Amendment 2 to the Summer Flounder FMP in 1993 and have remained unchanged since that time. This amendment proposes options to modify the current objectives of the FMP. 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.

2.5.1 Proposed Revisions to FMP Objectives

The Council and Board identified revising the current FMP objectives for summer as a priority for this amendment. The existing FMP objectives have remained unchanged since 1993 (Amendment 2). While the current FMP contains only management *objectives*, the proposed revisions contain both broader *goals* as well as objectives. During development, the Council and Board referenced the following general characterization of goals vs. objectives vs. strategies:

- 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)[4] 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 subsequent recommendations from the Summer Flounder Amendment Fishery Management Action Team (FMAT).[5]

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.

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

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

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.

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.**

3.0 MONITORING PROGRAM SPECIFICATION

3.1 Commercial Catch and Landings Program

The reporting requirements for the Summer flounder commercial fishery are specified by the two general permit types: 1) state issued commercial permits and 2) federal moratorium permit. State commercial permits are issued to individuals, with qualification and reporting requirements varying by state. Weekly landings information including species landed by gear and state are submitted by the Atlantic coastal states are submitted by through the Standard Atlantic Fisheries Information System (SAFIS). Landings information assembled in the SAFIS database include both state and federal landings data. **Please note that this Amendment does not propose options to change the current state issued commercial permit qualification or reporting requirements.** The following sub-section provides background the federal moratorium permit system. Options in section 4.2 Commercial Management propose modifications to the requirements to qualify for federal moratorium permits as well as total number of permits.

Federal Moratorium Permit System

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. In federal waters, a moratorium permit is required to fish commercially for summer flounder, meaning this permit is required 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.

3.2 Recreational Fishery Catch Reporting Process

The Marine Recreational Information Program (MRIP) contains estimated summer flounder

catches from 1981-2016. Recreational harvest of summer flounder was previously collected through the Marine Recreational Fisheries Statistics Survey (MRFSS), which was a recreational data collection program used from 1981-2003. The MRFSS program was replaced by MRIP in 2004 and was designed to provide more accurate and timely reporting as well as greater spatial coverage. The MRFSS and MRIP programs were simultaneously conducted in 2004-2006 and this information was used to calibrate past MRFSS recreational harvest estimates against MRIP recreational harvest estimates. Recreational catches of summer flounder were downloaded from http://www.st.nmfs.noaa.gov/st1/recreational/queries/index.html using the query option.

An online description of MRIP survey methods can be found here:
http://www.st.nmfs.noaa.gov/recreational-fisheries/index#meth

3.3 Social and Economic Collection Programs

Data on a number of variables relevant to social and economic dimensions of summer flounder fisheries are collected through existing ACCSP data collection programs and MRIP; however, no explicit mandates to collect socioeconomic data for summer flounder currently exist. In addition to landed quantities, commercial summer flounder harvesters and dealers may report ex-vessel prices or value, fishing and landing locations, landing disposition, and a variety of measures capturing fishing effort. MRIP regularly collects information on recreational fishing effort and landings, and occasionally gathers socioeconomic data on angler motivations and expenditures.

3.4 Biological Data Collection Programs

3.4.1 Fishery-Dependent Data Collection

Several states and NMFS collect information from commercial and recreational fisheries. The Commonwealth of Massachusetts monitors the commercial fishery through the observation of six directed trawl fishery trips, as well as through dealer Integrated Voice Response (IVR) systems and mandatory fishermen's logbook. Rhode Island monitors the commercial quota for summer flounder using an automated IVR system and dealers are required to provide weekly reports through the IVR of summer flounder landings. Connecticut commercial summer flounder landings are monitored through monthly commercial fishermen logbooks, and weekly and monthly dealer reports. These reports contain daily records of fishing and dealer purchase activity. New York conducts a survey of recreational anglers on open boats throughout the marine district to collect additional data on size composition of kept and discarded fish and also conducts a small mesh otter trawl survey in the Peconic Bays that samples summer flounder. New York requires trip level reporting from all of its commercial fishermen and monitors quota through a combination of trip reports and dealer reports. New Jersey collects data from the commercial trawl fishery and conducts an ocean trawl survey from which data on summer flounder are collected and catch-per-unit-of-effort and distribution information are generated for juveniles and adults. Delaware's commercial landings are monitored through a mandatory monthly harvest report from all state-licensed fishermen. Maryland constructs a juvenile index from trawl data collected in the ocean side bays and is also compiling data on population age, sex, and size from summer flounder taken in pound nets. A statewide voluntary angler survey is conducted that records location, time spent fishing, number of fish caught, number kept, and lengths of the first 20 fish caught. Virginia prepares a young-of-the-year index from data collected

from beach seine and trawl surveys. North Carolina conducts two otter trawl surveys for juvenile fluke and collects information on age and growth and catch-per-unit-of-effort for the winter trawl fishery, estuarine gill net fishery, pound net fishery, the ocean gill net fishery, commercial gig, and the long haul seine fishery.

3.4.1.1 Observer Program

As a condition of state and/or federal permitting, many vessels are required to carry at-sea observers when requested. A minimum set of standard data elements are to be collected through the ACCSP at-sea observer program (refer to the ACCSP Program Design document for details). Specific fisheries priorities will be determined by the Discard/Release Prioritization Committee of ACCSP.

3.4.2 Fishery-Independent Data Collection

Assessment of the summer flounder stock requires information from a variety of fishery-independent surveys along the coast. As a part of the 2013 Benchmark Stock Assessment and the 2015 and 2016 Stock Assessment Updates, thirteen fishery-independent surveys (many that include both seasonal fall and spring indices) were used to create both Juvenile or Young of Year (YOY) and adult indices of abundance. For many of the surveys used, the primary objective is to measure the abundance of multiple species including summer flounder. State and federal agencies and academic institutions conducting these surveys are encouraged to continue them into the future to allow for the best possible assessment of the Summer flounder population.

4.0 Management Program

4.1 Commercial 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.[6] 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 13 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.

[6] 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 13: 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%.[7]

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 14).

[7] 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 14: 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 200,00 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. To allow for these in-season adjustments, commercial state landings for summer flounder are monitored by the states and NOAA via the Dealer Electronic Reporting to the Standard Atlantic Fisheries Information System (SAFIS), as well as state agencies.

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 25).

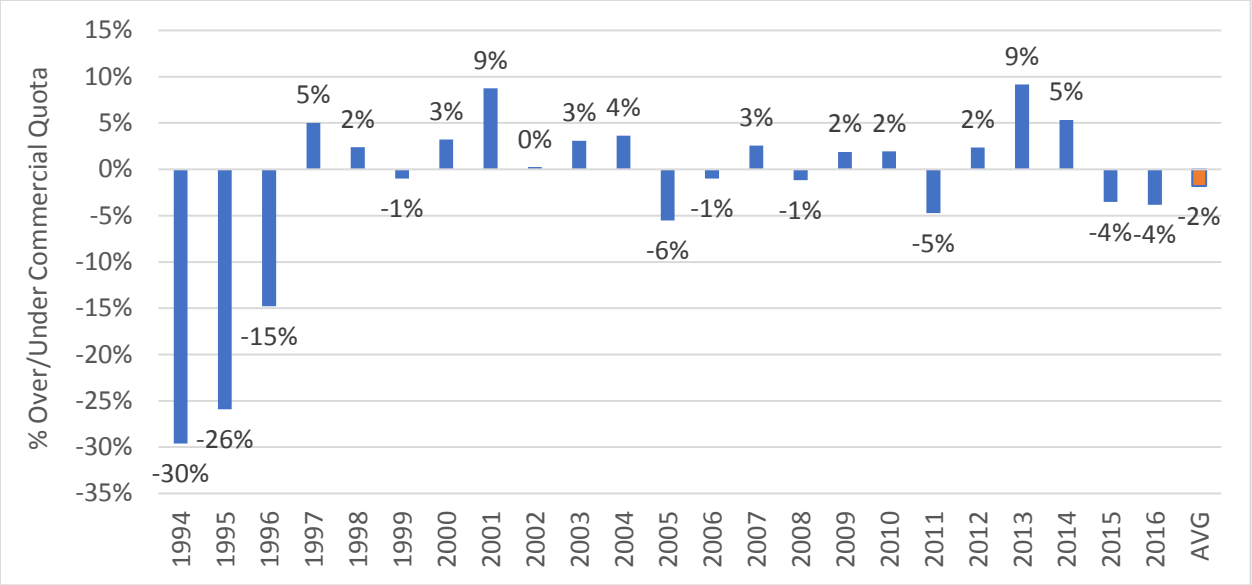


Figure 25: Percent overage/underage relative to summer flounder commercial quota since 1994. Data source: NMFS dealer data as of May 2017.

4.2 Proposed Commercial Management Program

4.2.1 Federal Moratorium Permit Requalification (Issue 1)

This alternative set contains options for requalification criteria for federal commercial moratorium permits for summer flounder, in the form of combinations of various landings thresholds and time periods over which those landings thresholds must have been achieved.

The permit requalification alternatives (sub-alternatives under alternative 1B) would evaluate requalification only from the existing pool of moratorium permit holders and would not allow new entrants to obtain a permit based on the qualifying criteria.

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

This alternative would maintain the current single-tier, commercial moratorium permit system for the summer flounder fishery, with no requalification. See section 3.1 for more details on current permit system)

4.2.1.2 Alternative 1B: Requalification of existing single-tier federal moratorium permits

This alternative would impose requalification criteria on current summer flounder moratorium permits under the existing single-tier federal permit system. Permits not meeting the requalification criteria would be permanently cancelled/relinquished. 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 and Board 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 15 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 15: 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*	*941*	*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%

4.2.2 Commercial Quota Allocation (Issue 2)

This issue item 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. NMFS 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.

4.2.2.1 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.

[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 4.1, Table 13).

Table 16: 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

4.2.2.2 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 Council's Demersal Committee in November 2017, the analysis was revised to include additional survey strata in the Gulf of Maine and Georges Bank.

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 26 shows the results for trends in spring relative biomass for 1980-1989 and 2007-2016 and Figure 27 shows the fall relative biomass over the same time periods.

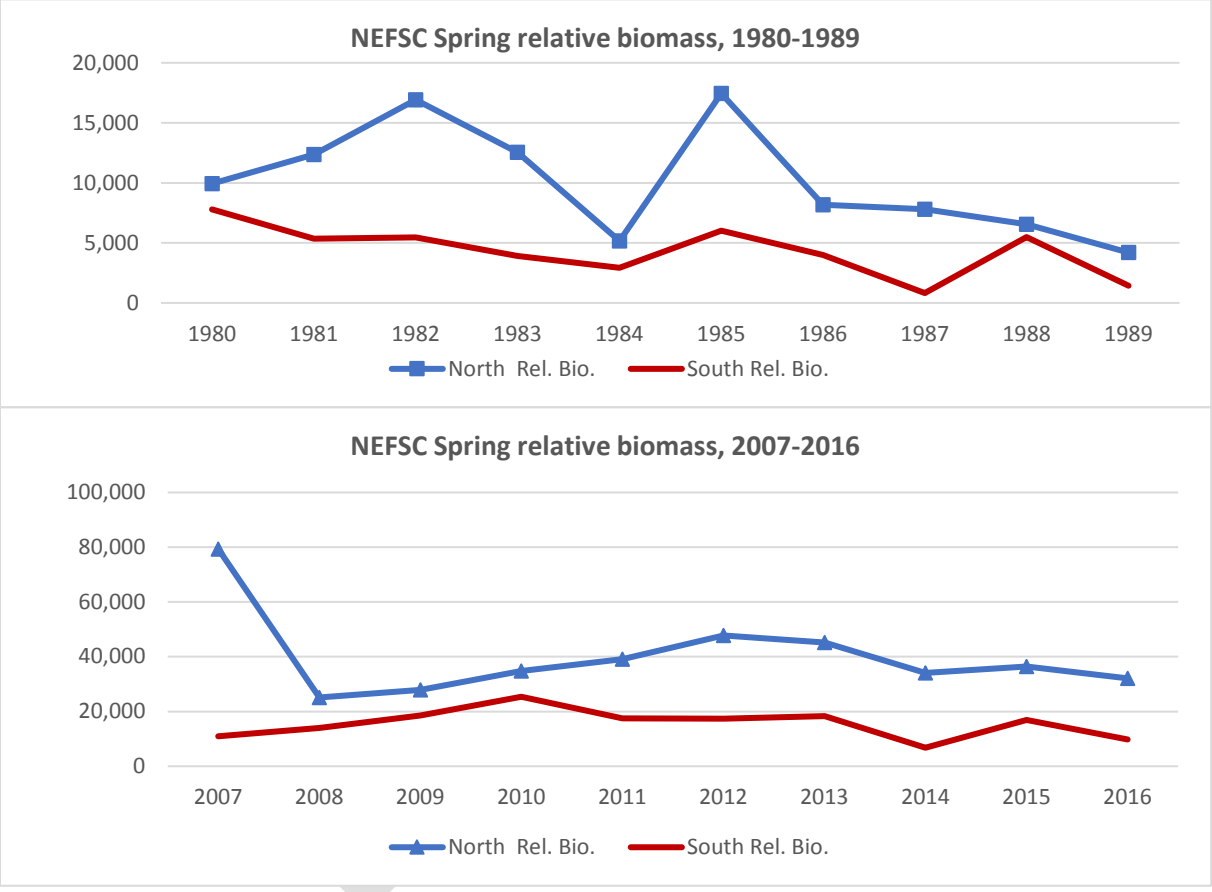


Figure 36: NEFSC spring survey relative biomass for 1980-1989 and 2007-2016; relative to area surveyed.

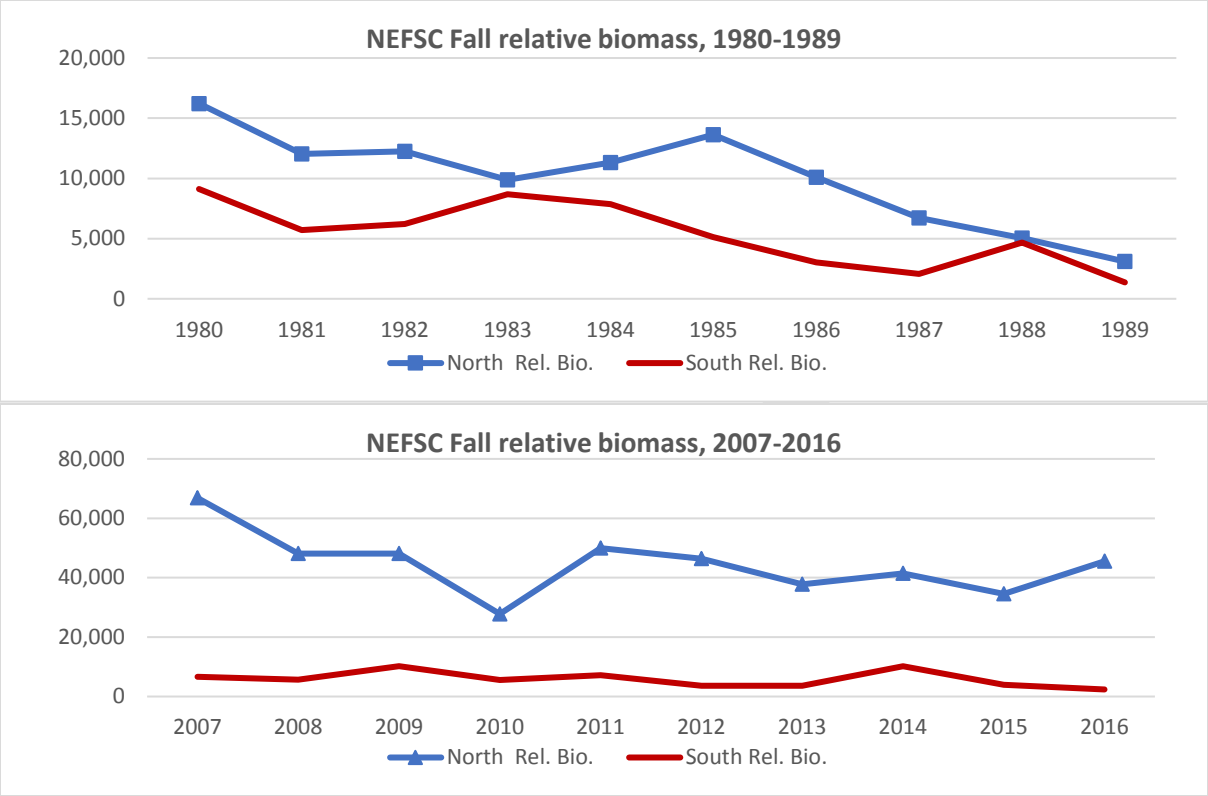


Figure 27: NEFSC fall survey relative biomass for 1980-1989 and 2007-2016; relative to area surveyed.

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 2007-2016 (Figure 28), an absolute increase of 13% relative to the coast (+13% in the Northern region, -13% in the Southern region).

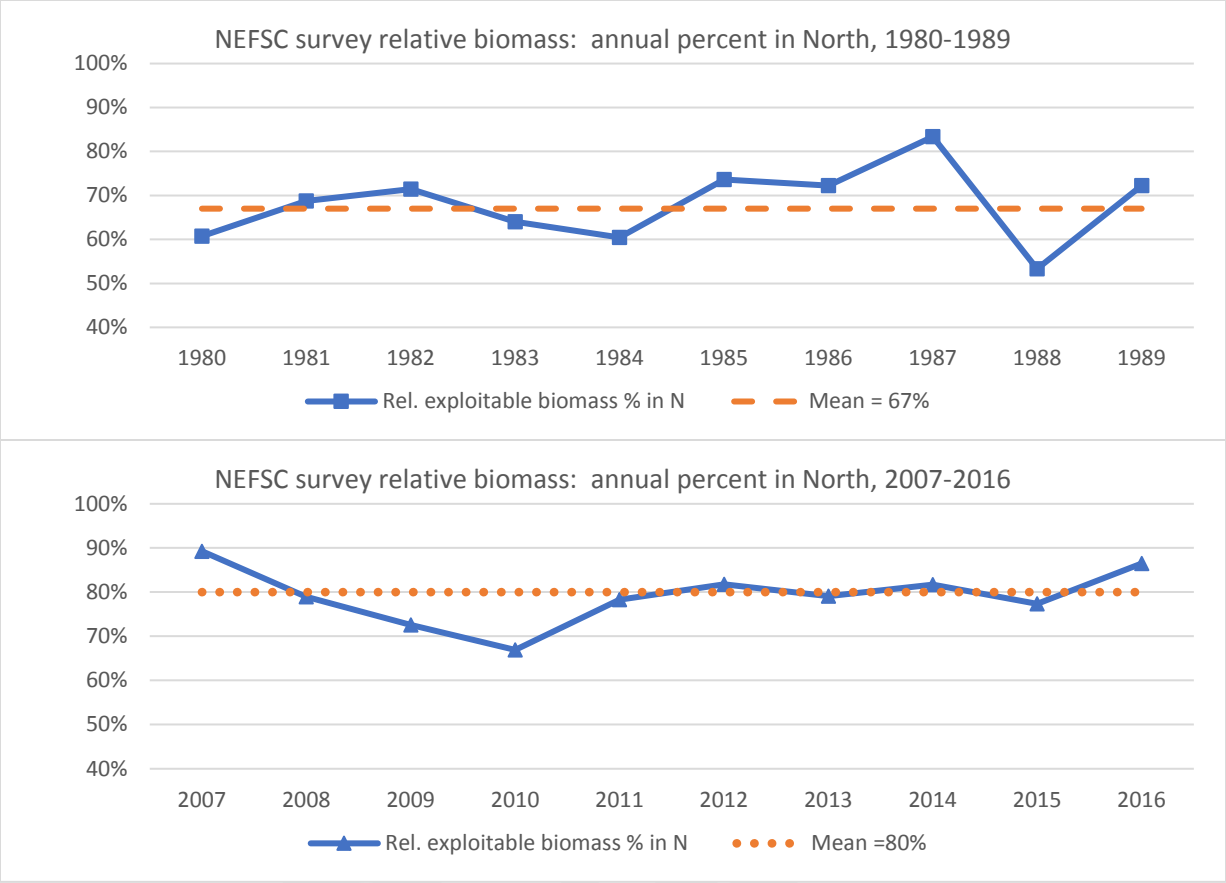


Figure 28: NEFSC survey relative biomass annual percent in Northern region, 1980-1989 and 2007-2016. The remaining relative biomass is attributable to the Southern region.

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%.

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

For this sub-alternative, the method of 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

[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.

relative to the coast and relative to the starting regional allocations, are shown in Table 17**.** Revised allocations are taken to five decimal places to be consistent with the current state level allocations.

Table 17: Allocation modification under Alternative 2B-1 described above. 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) % Change relative to existing state allocation	G) Absolute change in total coastwide allocation	H) Alt 2B-1 allocation based on 8.12 million pound Quota	I) *Status Quo* allocation based on 8.12 million pound 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).

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

For this sub-alternative, the following method 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 45.45%).

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 18**.**

Table 18: Allocation modification under Sub-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 in pounds based on an 8.12 million pound 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) % Change relative to existing state allocation	G) Absolute change in total coastwide allocation	H) Alt 2B-2 allocation based on 8.12 million pound Quota	I) *Status Quo* allocation based on 8.12 million pound 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).

4.2.2.3 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. 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 Council's SSC and Technical 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 6).

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

Under this sub-alternative, 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 9 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 19).

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

Table 19: Allocations under Alternative 2C-1, with modified distribution of additional coastwide commercial quota beyond 8.40 million pounds (5-year average quota; 2014-2018). Hypothetical quota examples represent initial quotas prior to any transfers or deductions for overages.

State	Allocation (%) of baseline Quota ≤ 8.40 mil pounds	Allocation (%) of additional quota beyond 8.40 mil pounds	Example allocation under 8.12 mil pound Quota[a] (same as *status quo*)	Example allocation based on 14.00 million pound Quota[b]				Comparison to *Status quo* under 14.00 million pound Quota	
				Status Quo distribution of 8.40 mil pound base Quota	New distribution of 5.60 mil pound additional quota	Alt 2C-1 allocation under 14.00 mil pound Quota	Alt 2C-1 allocation (%) under 14.00 mil pound Quota [c]	*Status quo* allocation in pounds	*Status quo* allocation (%)
ME	0.04756	0.3333	3,862	3,995	18,666	22,662	0.16187%	6,658	0.04756%
NH	0.00046	0.3333	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	0.3333	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] 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.

[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.

4.2.2.3.2 Sub-Option 2C-2: 10-year average commercial quota trigger (10.71 million pounds)

Under this sub-alternative, 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 20 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 20).

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

Table 20: 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 pound	Allocation (%) of <u>additional</u> quota beyond 10.71 mil pound	Example allocation under 8.12 mil pound Quota (same as *status quo*)[a]	Example allocation under 14.00 million pound Quota[b]				Comparison to *status quo* under 14.000 million pound Quota	
				Status quo distribution of 10.71 mil pound base Quota	New distribution of 3.29 mil pound additional quota	Alt 2C-2 allocation under 14.00 mil pound Quota	Alt 2C-2 allocation (%) under 14.00 mil pound Quota	*Status quo* allocation in pounds	*Status quo* allocation (%)
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.

4.2.2.4 Alternative 2D: "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.

4.2.2.4.1 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 22, and described below. Example allocations under hypothetical quota scenarios are described..

- **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 11). 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

[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

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 21).

Table 21: 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.

Year	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 22: 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%**		2,244,955	3,870,612
State-specific summer allocations	**ME** 0.015% **NH** 0.000% **MA** 19.332% **RI** 22.476% **CT** 3.566% **NY** 18.553% **NJ** 29.667% **DE** 0.045% **MD** --[a] **VA** 5.648% **NC** 0.699%	State-specific	**ME** 347 **NH** 0 **MA** 433,988 **RI** 504,568 **CT** 80,052 **NY** 416,495 **NJ** 666,004 **DE** 1,013 **MD** -- **VA** 126,785 **NC** 15,702	**ME** 598 **NH** 2 **MA** 748,255 **RI** 869,945 **CT** 138,021 **NY** 718,095 **NJ** 1,148,283 **DE** 1,746 **MD** -- **VA** 218,594 **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).

4.2.2.4.2 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 24, and described below. Example allocations under hypothetical quota scenarios are 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 13).
- **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 14).

Table 23: 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.

Year	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 24: 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% **NH** 0.000% **MA** 18.525% **RI** 21.538% **CT** 3.417% **NY** 17.779% **NJ** 28.429% **DE** 0.043% **MD** 4.171% **VA** 5.412% **NC** 0.670%		**ME** 340 **NH** 0 **MA** 425,389 **RI** 494,571 **CT** 78,466 **NY** 408,243 **NJ** 652,808 **DE** 993 **MD** 95,782 **VA** 124,272 **NC** 15,391	**ME** 586 **NH** 2 **MA** 733,429 **RI** 852,708 **CT** 135,287 **NY** 703,867 **NJ** 1,125,531 **DE** 1,711 **MD** 165,141 **VA** 214,263 **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 25 compares the differences in seasonal quota period and state summer period allocations under the two sub-options.

Table 25: 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).

4.2.3 Landings Flexibility Provisions (Issue 3)

This issue item 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.**

4.2.3.1 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 inconsistent with 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.

4.2.3.2 Alternative 3B: Add landings flexibility as a framework provision 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").

4.3 Recreational Management Measures

There is a significant recreational fishery for summer flounder, primarily in state waters when the fish migrate inshore during the warm summer months. For the recreational sector, Amendment 2 required each state to adopt the same minimum size and possession limit as established in Federal waters, allowing only for different open seasons. The consistent measures were intended to achieve conservation equivalency in all state and Federal waters throughout the range of the resource. However, states soon found that one set of measures applied coastwide did not achieve equivalent conservation due to the significant geographic differences in summer flounder abundance and size composition. To address this disparity, the FMP was amended via Addendum IV and Framework 2 (2001) and Addendum VIII (2003) to allow for the use of state conservation equivalency to manage recreational harvests.

The Council and Commission determine annually whether to manage the recreational fishery under coastwide measures or conservation equivalency. 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. From 2001 through 2013, measures were developed under state-by-state conservation equivalency. Since 2014, a regional approach has been used, under which the states within each region must have identical size limits, possession limits, and season length.

Until 2014, state-by-state harvest targets were developed based on the proportion of estimated state recreational landings in 1998 as reported in the Marine Recreational Fisheries Statistical Survey (MRFSS). Starting in 2014, the Commission has adopted regional conservation equivalency measures each year in an effort to address concerns over equitable access to the summer flounder fisheries. Factors contributing to the perceived inequity included: reliance upon recreational harvest estimates for a single year (1998) as the basis for individual state allocations; a change in the abundance and distribution of the resource; and changes in the socio-economic characteristics of the fishery. Under regional conservation equivalency each year from 2014-2017, the 1998 base-year targets are not used, and ad hoc adjustments to the state and regional measures are determined by the Board with a focus on constraining the overall coastwide harvest to the recreational harvest limit. Recreational measures for 2017 are shown in Table 26.

Table 6: 2017 regional measures for summer flounder and preliminary landings (in thousands of fish) by state and region, 2017.

Region	State	Min. Size (inches)	Poss. Limit	Open Season	Prelim. 2017 Landings ('000 fish)
1	**MA**	17	4 fish	May 22-Sept. 23	26
2	**RI**	19	4 fish	May 1-Dec. 31	59
3	**CT**	19	3 fish	May 17- Sept. 21	87
		17 (41 designated shore sites)			
	NY	19	3 fish	May 17- Sept. 21	214
	NJ	18	3 fish	May 25-Sept. 5	433
		16 (1 shore site)	2 fish		
		17 (NJ Delaware Bay)	3 fish		
4	**DE**	17	4 fish	Jan. 1- Dec. 31	33
	MD	16	4 fish	Jan. 1- Mar. 31	26
		17		April 1- Dec.31	
	PRFC	16	4 fish	Jan. 1- Dec.31	--
	VA	17	4 fish	Jan. 1- Dec. 31	90
5	**NC**	15	4 fish	Jan. 1- Dec. 31	26

4.4 IMPACTS OF THE FISHERY MANAGEMENT PROGRAM

This Amendment includes several options which could carry potential biological, social, and economic impacts. **Analysis on impacts for each of the management alternatives have not yet been completed but are anticipated to be completed by early summer 2018. Once the analysis on impacts is available, the Commission will release the information as an appendix to the current Amendment.**

4.5 Alternative State Management Regimes

4.5.1 General Procedures

A state may submit a proposal for a change to its regulatory program or any mandatory compliance measure under this amendment to the Commission. Such changes shall be submitted to the Chair of the Plan Review Team (PRT), who shall distribute the proposal to appropriate groups, including the Board, the PRT, the TC, and the AP.

The PRT is responsible for gathering the comments of the TC and the AP. The PRT is also responsible for presenting these comments to the Board for decision.

The Board will decide whether to approve the state proposal for an alternative management program if it determines that it is consistent with the target fishing mortality rate applicable as well as the goals and objectives of this amendment.

In order to maintain consistency within a fishing season, new rules should be implemented prior to the start of the fishing season. Given the time needed for the TC, AP, and Board to review the proposed regulations, as well as the time required by an individual state to promulgate new regulations, it may not be possible to implement new regulations for the on-going fishing season. In this case, new regulations should be effective at the start of the following season after a determination to do so has been made.

4.5.2 Management Program Equivalency

The TC, under the direction of the PRT, will review any alternative state proposals under this section and provide its evaluation of the adequacy of such proposals to the Board. The PRT can also ask for reviews by the Law Enforcement Committee (LEC) or the AP.

4.5.3 *De minimus* Fishery Guidelines

The Summer Flounder FMP is a joint plan prepared under both the Magnuson-Stevens Fishery Conservation and Management Act of 1976, as amended, and the Atlantic Coastal Fisheries Cooperative Management Act (ACFCMA). Under the ACFCMA, if a state does not implement measures required by an FMP, the Federal government may impose a moratorium on the landing of the species covered by the FMP in that state.

The Commission's Interstate Fisheries Management Program Charter defines *de minimus* as a situation in which, under existing conditions of the stock and scope of the fishery, conservation and enforcement actions taken by an individual state would be expected to contribute insignificantly to a coastwide conservation program required by an FMP or amendment. Commission FMP's commonly include *de minimus* provisions to relieve regulatory and monitoring burdens for states that meet predetermined conditions and follow a defined request process.

Any state in which commercial summer flounder landings during the last preceding calendar year for which data are available were less than 0.1 percent of the total coastwide quota for that year could be granted *de minimus* status for the summer flounder commercial fishery by NMFS and Commission upon the annual recommendation of the Council and Commission, by way of a formal written request from the state and subsequent review and recommendation of the Summer Flounder Monitoring Committee. The following conditions would apply:

(1) The *de minimus* status will be valid only for that year for which the specifications are in effect, and will be effective upon filing by the NMFS of the final specifications for the commercial summer flounder fishery with the Office of the Federal Register.

(2) The total quota allocated to each *de minimus* state will be set equal to 0.1 percent of the total yearly allocation, and will be subtracted from the coastwide quota before the remainder is allocated to the other states.

(3) In applying for *de minimus* status, a state must show that it has implemented reasonable steps to prevent landings from exceeding its *de minimus* allocation.

4.6 Adaptive Management

The Board may vary the requirements specified in this Amendment as a part of adaptive management in order to conserve the Summer flounder resource. The elements that can be modified by adaptive management are listed in *Section 4.6.2*. The process under which adaptive management can occur is provided below.

4.6.1 General Procedures

The PRT will monitor the status of the fishery and the resource and report on that status to the Board annually or when directed to do so by the Board. The PRT will consult with TC, the SASC, and the AP in making such review and report.

The Board will review the report of the PRT, and may consult further with the TC, or AP. The Board may, based on the PRT report or on its own discretion, direct the FMAT to prepare an addendum to make any changes it deems necessary. The addendum shall contain a schedule for the states to implement the new provisions.

The PDT will prepare a draft addendum as directed by the Board, and shall distribute it to all states for review and comment. A public hearing will be held in any state that requests one. The PDT will also request comment from federal agencies and the public at large. After a 30-day review period, staff, in consultation with the PDT, will summarize the comments received and prepare a final version of the addendum for the Board.

The Board shall review the final version of the addendum prepared by the PDT, and shall also consider the public comments received and the recommendations of the TC, LEC, and AP. The Board shall then decide whether to adopt, or revise and then adopt, the addendum.

Upon adoption of an addendum by the Board, states shall prepare plans to carry out the addendum, and submit them to the Board for approval according to the schedule contained in the addendum.

4.6.2 Measures Subject to Change

The following measures are subject to change under adaptive management upon approval by the Board:

(1.) Minimum fish size.
(2.) Maximum fish size.
(3.) Gear restrictions.
(4.) Gear requirements or prohibitions.
(5.) Permitting restrictions.
(6.) Recreational possession limit.
(7.) Recreational seasons.
(8.) Closed areas.
(9.) Commercial seasons.
(10.) Commercial trip limits.
(11.) Commercial quota system including commercial quota allocation procedure and possible quota set asides to mitigate bycatch.
(12.) Recreational harvest limit.
(13.) Annual specification quota setting process.
(14.) FMP Technical Monitoring Committee composition and process
(15.) Description and identification of essential fish habitat (EFH) and fishing gear management measures that impact EFH.
(16.) Description and identification of habitat areas of particular concern.
(17.) Overfishing definition and related thresholds and targets.
(18.) Regional gear restrictions.
(19.) Regional season restrictions (including option to split seasons).
(20.) Restrictions on vessel size (LOA and GRT) or shaft horsepower.
(21.)Operator permits4.5.4 Schedule for State Implementation

4.7 Emergency Procedures

Emergency procedures may be used by the Board to require any emergency action that is not covered by, is an exception to, or a change to any provision in this Amendment. Procedures for implementation are addressed in the ASMFC Interstate Fisheries Management Program Charter, Section Six (c)(10) (ASMFC 2016).

4.8 Management Institutions

4.8.1 Atlantic States Marine Fisheries Commission and ISFMP Policy Board

The Commission and the ISFMP Policy Board are generally responsible for the oversight and management of the Commission's fisheries management activities. The Commission must approve all fishery management plans and amendments, including this Amendment. The ISFMP Policy Board reviews any non-compliance recommendations of the various Boards and, if it concurs, forwards them to the Commission for action.

4.8.2 Summer Flounder, Scup, and Black Sea Bass Management Board

The Board was established under the provisions of the Commission's ISFMP Charter (Section Four; ASMFC 2016) and is generally responsible for carrying out all activities under this Amendment.

The Board establishes and oversees the activities of the PDT, PRT, TC, and the AP. In addition, the Board makes changes to the management program under adaptive management, reviews state programs implementing the amendment, and approves alternative state programs through conservation equivalency. The Board reviews the status of state compliance with the management program annually, and if it determines that a state is out of compliance, reports that determination to the ISFMP Policy Board under the terms of the ISFMP Charter.

4.8.3. Summer Flounder Fishery Management Action Team (?)

The Fishery Management Action Team (FMAT) is composed of personnel from state and federal agencies who have scientific knowledge of Summer Flounder and management abilities. The FMAT is responsible for preparing and developing management documents, including amendments, using the best scientific information available and the most current stock assessment information. The ASMFC FMP Coordinator is a member of the FMAT. The FMAT will either disband or assume inactive status upon completion of this Amendment.

4.8.4 Summer Flounder Plan Review Team

The Plan Review Team (PRT) is composed of personnel from state and federal agencies who have scientific and management ability and knowledge of Summer Flounder. The PRT is responsible for providing annual advice concerning the implementation, review, monitoring, and enforcement of this Amendment once it has been adopted by the Commission. After final action on the Amendment, the Board may elect to retain members of the PDT as members of the PRT, or appoint new members.

4.8.5 Summer Flounder, Scup, and Black Sea Bass Technical Committee (?)

The Summer Flounder, Scup, and Black Sea Bass Technical Committee (TC) consists of representatives from state or federal agencies, Regional Fishery Management Councils, the Commission, a university, or other specialized personnel with scientific and technical expertise, and knowledge of the summer flounder fishery. The Board appoints the members of the TC and

may authorize additional seats as it sees fit. The role of the TC is to assess the species' population, provide scientific advice concerning the implications of proposed or potential management alternatives, and respond to other scientific questions from the Board, PDT, or PRT. The SASC reports to the TC.

4.8.6 Summer Flounder, Scup, and Black Sea Bass Advisory Panel

The Summer Flounder, Scup, and Black Sea Bass Advisory Panel (AP) is established according to the Commission's Advisory Committee Charter. Members of the AP are citizens who represent a cross-section of commercial and recreational fishing interests and others who are concerned about Summer flounder conservation and management. The AP provides the Board with advice directly concerning the Commission's Summer flounder management program.

4.8.7 Federal Agencies

4.8.7.1 Management in the Exclusive Economic Zone

Management of summer flounder in the EEZ is within the jurisdiction of one Regional Fishery Management Council (the Mid-Atlantic Fishery Management Council) under the Magnuson-Stevens Act (16 U.S.C. 1801 et seq.). The Council annually makes recommendations on catch and landings limits as well as gear modifications to the NMFS through the specification process. More information can be found in section 4.1.

4.8.7.2 Federal Agency Participation in the Management Process

The Commission has accorded USFWS and NMFS voting status on the ISFMP Policy Board and the Summer Flounder, Scup, and Black Sea Bass Management Board in accordance with the Commission's ISFMP Charter. The NMFS can also participate on the Summer Flounder FMAT, PRT, and TC.

4.8.7.3 Consultation with Fishery Management Councils

At the time of adoption of this Amendment, the Mid-Atlantic Fishery Management Council is only Regional Fishery Management Council to have implemented a management plan for Summer flounder; no other Councils have indicated an intent to develop a plan.

4.9 Recommendations to the Secretaries for Complementary Actions in Federal Jurisdictions

The summer flounder, scup, and black sea bass fishery management plan is jointly managed between the Commission, Council, and NOAA Fisheries. The proposed alternatives in this Amendment will affect both state and federal permit holders operating in the commercial summer flounder fishery in both state and federal waters. The Atlantic States (through the Commission), the Council, and NOAA Fisheries through joint management coordinate to ensure consistency in management between state and federal waters. Therefore, a specific recommendation to the Secretary for complimentary action in federal jurisdictions is

unnecessary at this time. The Board may consider further recommendations to the Secretary if changes to this Amendment occur through the adaptive management process (*Section 4.6*).

4.10 Cooperation with Other Management Institutions

The Board will cooperate, when necessary, with other management institutions during the implementation of this amendment, including NMFS and the New England, Mid-Atlantic, and South Atlantic Fishery Management Council.

5.0 COMPLIANCE

The full implementation of the provisions included in this amendment is necessary for the management program to be equitable, efficient, and effective. States are expected to implement these measures faithfully under state laws. ASMFC will continually monitor the effectiveness of state implementation and determine whether states are in compliance with the provisions of this fishery management plan.

The Board sets forth specific elements that the Commission will consider in determining state compliance with this fishery management plan, and the procedures that will govern the evaluation of compliance. Additional details of the procedures are found in the ASMFC Interstate Fishery Management Program Charter (ASMFC 2016).

5.1 Mandatory Compliance Elements for States

A state will be determined to be out of compliance with the provision of this fishery management plan according to the terms of Section Seven of the ISFMP Charter if:

- Its regulatory and management programs to implement this Amendment have not been approved by the Board; or
- It fails to meet any schedule required by Section 5.2, or any addendum prepared under adaptive management (*Section 4.6*); or
- It has failed to implement a change to its program when determined necessary by the Board; or
- It makes a change to its regulations required under *Section 4* or any addendum prepared under adaptive management (*Section 4.6*), without prior approval of the Board.

5.1.1 Regulatory Requirements

To be considered in compliance with this fishery management plan, all state programs must include a regime of restrictions on summer flounder fisheries consistent with the requirements of *Section 3.1: Commercial Catch and Landings Programs; Section 3.4: Biological Data Collection Programs;* and *Section 4.1: Commercial Fishery Management Measures*. A state may propose an alternative management program under *Section 4.5: Alternative State Management Regimes*,

which, if approved by the Board, may be implemented as an alternative regulatory requirement for compliance.

States may begin to implement the Amendment after final approval by the Commission. Each state must submit its required summer flounder regulatory program to the Commission through ASMFC staff for approval by the Board. During the period between submission and Board approval of the state's program, a state may not adopt a less protective management program than contained in this Amendment or contained in current state law. The following lists the specific compliance criteria that a state/jurisdiction must implement in order to be in compliance with this Amendment:

- Commercial fishery management measures as specified in *Section 4.2* including the Federal Moratorium Requalification (*Section 4.2.1*), Commercial Quota Allocation (*Section 4.2.2*), and Landings Flexibility Provisions (*Section 4.2.3*).
- Monitoring requirements as specified in *Section 3.1*
- Fishery dependent data collection programs as specified in *Section 3.5.1*
- All state programs must include law enforcement capabilities adequate for successful implementation of the compliance measures contained in this Amendment.
- There are no mandatory research requirements at this time; however, research requirements may be added in the future under Adaptive Management, *Section 4.6*.
- There are no mandatory habitat requirements in this Amendment.

5.2 Compliance Schedule

States must implement this Amendment according to the following schedule:

Month Day, 201X: Submission of state programs to implement the Amendment for approval by the Board. Programs must be implemented upon approval by the Board.

Month Day, 201X: States with approved management programs must implement the Amendment. States may begin implementing management programs prior to this deadline if approved by the Board.

5.3 Compliance Report Content

Each state must submit to the Commission an annual report concerning its summer flounder fisheries and management program for the previous year, no later than June 1st. A standard compliance report format has been prepared and adopted by the ISFMP Policy Board. States should follow this format in completing the annual compliance report.

The report shall cover:

- The previous calendar year's fishery and management program including mandatory reporting programs (including frequency of reporting and data elements collected), fishery dependent data collection, fishery independent data collection, regulations in effect, total landings (including recreational catch and commercial landings by gear type), *de minimis* requests, and future regulatory changes.
- The planned management program for the current calendar year summarizing regulations that will be in effect and monitoring programs that will be performed, highlighting any changes from the previous year.

5.4 Procedures for Determining Compliance

Detailed procedures regarding compliance determinations are contained in the ISFMP Charter, Section Seven (ASMFC 2016). In brief, all states are responsible for the full and effective implementation and enforcement of fishery management plans in areas subject to their jurisdiction. Written compliance reports as specified in the Amendment must be submitted annually by each state with a declared interest. Compliance with this Amendment will be reviewed at least annually; however, the Board, ISFMP Policy Board, or the Commission may request the PRT to conduct a review of state's implementation and compliance with Amendment at any time.

The Board will review the written findings of the PRT within 60 days of receipt of a State's compliance report. Should the Board recommend to the Policy Board that a state be determined out of compliance, a rationale for the recommended noncompliance finding will be addressed in a report. The report will include the required measures of this Amendment that the state has not implemented or enforced, a statement of how failure to implement or enforce required measures jeopardizes summer flounder conservation, and the actions a state must take in order to comply with requirements of this Amendment.

The ISFMP Policy Board will review any recommendation of noncompliance from the Board within 30 days. If it concurs with the recommendation, it shall recommend to the Commission that a state be found out of compliance.

The Commission shall consider any noncompliance recommendation from the ISFMP Policy Board within 30 days. Any state that is the subject of a recommendation for a noncompliance finding is given an opportunity to present written and/or oral testimony concerning whether it should be found out of compliance. If the Commission agrees with the recommendation of the ISFMP Policy Board, it may determine that a state is not in compliance with this Amendment, and specify the actions the state must take to come into compliance.

Any state that has been determined to be out of compliance may request that the Commission rescind its noncompliance findings, provided the state has revised its summer flounder conservation measures.

5.5 Analysis of Enforceability of Proposed Measures

All state programs must include law enforcement capabilities adequate for successfully implementing that state's summer flounder regulations. The LEC will monitor the adequacy of a state's enforcement activity.

6.0 MANAGEMENT AND RESEARCH NEEDS

6.1 Stock Assessment and Population Dynamics

6.1.1 Biology/Community Ecology

6.2 Research and Data Needs

6.2.1 Biological

6.2.2 Social

6.2.3 Economic

6.2.4 Habitat

7.0 PROTECTED SPECIES

Numerous protected species inhabit the affected environment of the Summer Flounder, Scup, and Black Sea Bass FMP. 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.

7.1 Marine Mammal Protection Act (MMPA) Requirements

Since its passage in 1972, one of the underlying goals of the MMPA has been to reduce the incidental serious injury and mortality of marine mammals in the course of commercial fishing operations to insignificant levels approaching a zero mortality and zero serious injury rate. Under the 1994 Amendments, the Act requires NMFS to develop and implement a take reduction plan to assist in the recovery of, or prevent the depletion of, each strategic stock that interacts with a Category I or II fishery. A strategic stock is defined as a stock: (1) for which the level of direct human-caused mortality exceeds the potential biological removal (PBR)[15] level; (2) which is declining and is likely to be listed under the Endangered Species Act (ESA) in the foreseeable future; or (3) which is listed as a threatened or endangered species under the ESA or as a depleted species under the MMPA. Category I and II fisheries are those that have frequent or occasional incidental mortality and serious injury of marine mammals, whereas Category III fisheries are those which have a remote likelihood of incidental mortality and serious injury to marine mammals. Each year NMFS publishes a List of Fisheries (LOF), which classifies commercial fisheries into one of these three categories.

Under 1994 mandates, the MMPA also requires fishermen in Category I and II fisheries to register under the Marine Mammal Authorization Program (MMAP). The purpose of this is to provide an exception for commercial fishermen from the general taking prohibitions of the MMPA. All fishermen, regardless of the category of fishery in which they participate, must report all incidental injuries and mortalities caused by commercial fishing operations within 48 hours.

Section 101(a)(5)(E) of the MMPA allows for authorization of the incidental take of ESA-listed marine mammals in the course of commercial fishing operations if it is determined that: (1) incidental mortality and serious injury will have a negligible impact on the affected species or stock; (2) a recovery plan has been developed or is being developed for such species or stock under the ESA; and (3) where required under MMPA Section 118, a monitoring program has been established, vessels engaged in such fisheries are registered, and a take reduction plan has been developed or is being developed for such species or stock. MMPA Section 101(a)(5)(E) permits are not required for Category III fisheries, but any serious injury or mortality of a marine mammal must be reported.

7.2 Endangered Species Act (ESA) Requirements

The taking of endangered sea turtles and marine mammals is prohibited and considered unlawful under Section 9(a)(1) of the ESA. In addition, NMFS or the USFWS may determine Section 4(d) protective regulations to be necessary and advisable to provide for the conservation of threatened species. There are several mechanisms established in the ESA which allow for exceptions to the prohibited take of protected species listed under the ESA. Section 10(a)(1)(A) of the ESA authorizes NMFS to allow the taking of listed species through the

[15] PBR is the number of human-caused deaths per year each stock can withstand and still reach an optimum population level. This is calculated by multiplying the minimum population estimate by the stock's net productivity rate and a recovery factor ranging from 0.1 for endangered species to 1.0 for healthy stocks.

issuance of research permits, which allow ESA species to be taken for scientific purposes or to enhance the propagation and survival of the species. Section 10(a)(1)(B) authorizes NMFS to permit, under prescribed terms and conditions, any taking otherwise prohibited by Section 9(a)(1)(B) of the ESA if the taking is incidental to, and not the purpose of, carrying out an otherwise lawful activity. In recent years, some Atlantic state fisheries have obtained section 10(a)(1)(B) permits for state fisheries. Recent examples are at http://www.nmfs.noaa.gov/pr/permits/esa_review.htm#esa10a1b.

Section 7(a)(2) requires federal agencies to consult with NMFS to ensure that any action that is authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of critical habitat of such species. If, following completion of the consultation, an action is found to jeopardize the continued existence of any listed species or cause adverse modification to critical habitat of such species, reasonable and prudent alternatives need to be identified so that jeopardy or adverse modification to the species does not occur. Section (7)(o) provides the actual exemption from the take prohibitions established in Section 9(a)(1), which includes Incidental Take Statements that are provided at the end of consultation via the ESA Section 7 Biological Opinions.

7.3 Protected Species with Potential Fishery Interactions

Table 27 provides a list of protected species of seas turtle, marine mammal, and fish species present in the affected environment of the summer flounder fishery that may also be affected by the operation of this fishery. These species are described in the sections below, and the potential for these species to interact with summer flounder gear types is described in section 1.4

Table 27: 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***	***Yes***
Humpback whale, West Indies DPS (Megaptera novaeangliae)	Protected (MMPA)	Yes
Fin whale (Balaenoptera physalus)	***Endangered***	***Yes***
Sei whale (Balaenoptera borealis)	***Endangered***	***Yes***
Blue whale (Balaenoptera musculus)	***Endangered***	***No***
Sperm whale (Physeter macrocephalus	***Endangered***	***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.

7.3.1 Marine Mammals

Table 28 provides the species of large whales that occur in the area of operation for the summer flounder fishery. For additional information on the biology, status, and range wide distribution of each whale species please refer to: Waring *et al*. 2014a; Waring *et al*. 2015; Waring *et al*. 2016; NMFS 1991, 2005, 2010b, 2011a, 2012.

Table 28: Large whale species present in the area of operation for the summer flounder fishery.

Species	Listed Under the ESA	Protected Under the MMPA	MMPA Strategic Stock[1]
North Atlantic Right Whale	Yes-Endangered	Yes	Yes
Humpback Whale	No	Yes	Yes
Fin Whale	Yes-Endangered	Yes	Yes
Sei Whale	Yes-Endangered	Yes	Yes
Minke Whale	No	Yes	No

Notes:
[1]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.
Source: Waring *et al*. 2014a; Waring *et al*. 2015; Waring *et al*. 2016

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 35°N) wintering/calving grounds and high latitude spring/summer foraging grounds (primarily north of 41°N; Waring *et al*. 2014a; Waring *et al*. 2015; Waring *et al*. 2016; NMFS 1991, 2005, 2010b, 2011a, 2012). 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 (Waring *et al*. 2014a; Waring *et al*. 2015; Waring *et al*. 2016; 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 each whale species please refer to: Waring *et al*. 2014a; Waring *et al*. 2015; Waring *et al*. 2016; NMFS 1991, 2005, 2010b, 2011a, 2012.

To further assist in understanding how fisheries may overlaps in time and space with the occurrence of large whales, a general overview on species occurrence and distribution in the area of operation for the summer flounder fishery is provided in Table 29.

Table 29: Large whale occurrence in the area of operation for the summer flounder fishery.

Species	Prevalence and Approximate Months of Occurrence
North Atlantic Right Whale	• Distributed throughout all continental shelf waters from the Gulf of Maine to the South Atlantic Bight throughout the year. • New England waters (Gulf of Maine and Georges Bank regions) = **Foraging Grounds** (January through October). Seasonally important foraging grounds include: › Cape Cod Bay (January-April); › Great South Channel (April-June); › western Gulf of Maine (April-May, and July-October); › Jordan Basin (August-October); › Wilkinson Basin (April-July); › northern edge of Georges Bank (May-July); • Mid-Atlantic waters: Migratory pathway to/from northern (high latitude) foraging and southern calving grounds. • SAB (Coastal waters from Cape Fear, North Carolina, to 28°N (northeastern Florida) = **Calving and Nursing Grounds** (mid- November-early April). • Increasing evidence of wintering areas (approximately November – January) in: › Cape Cod Bay; › Jeffreys and Cashes Ledges; › Jordan Basin; and › Massachusetts Bay (e.g., Stellwagen Bank).
Humpback	• Distributed throughout all continental shelf waters of the Mid-Atlantic (Southern New England included), Gulf of Maine, and Georges Bank throughout the year. • New England waters (Gulf of Maine and Georges Bank regions) = **Foraging Grounds** (March-November). • Mid-Atlantic waters: Migratory pathway to/from northern (high latitude) foraging and southern (West Indies) calving grounds. • Increasing evidence of whales remaining in mid- and high- latitudes throughout the winter. Specifically, increasing evidence of wintering areas (for juveniles) in Mid-Atlantic (e.g., waters in the vicinity of Chesapeake and Delaware Bays; peak presence approximately January through March) and Southeastern coastal waters.
Fin	• Distributed throughout all continental shelf waters of the Mid-Atlantic (Southern New England included), Gulf of Maine, and Georges Bank throughout the year. • Mid-Atlantic waters: › Migratory pathway to/from northern (high latitude) foraging and southern (low latitude) calving grounds; and › Possible offshore calving area (October-January). • New England (Gulf of Maine and Georges Bank)/ Southern New England waters = **Foraging Grounds** (greatest densities March-August; lower densities September-November). Important foraging grounds include: › Massachusetts Bay (esp. Stellwagen Bank); › Great South Channel; › Waters off Cape Cod (~40-50 meter contour); › Gulf of Maine; › Perimeter (primarily eastern) of Georges Bank; and › Mid-shelf area off the east end of Long Island. • Evidence of wintering areas in mid-shelf areas east of New Jersey Stellwagen Bank; and eastern perimeter of Georges Bank.

Species	Prevalence and Approximate Months of Occurrence
Sei	• Uncommon in shallow, inshore waters of the Mid-Atlantic (SNE included), Georges Bank, and Gulf of Maine; however, occasional incursions during peak prey availability and abundance. • Primarily found in deep waters along the shelf edge, shelf break, and ocean basins between banks. • Spring through summer, found in greatest densities in offshore waters of the Gulf of Maine and Georges Bank; sightings concentrated along the northern, eastern (into Northeast Channel) and southwestern (in the area of Hydrographer Canyon) edge of Georges Bank.
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
Sources: NMFS 1991, 2005, 2010b, 2011a, 2012; Hain *et al.* 1992; Payne *et al*. 1984; Good 2008; Pace and Merrick 2008; McLellan *et al*. 2004; Hamilton and Mayo 1990; Schevill *et al*. 1986; Watkins and Schevill 1982; Payne *et al*.1990; Winn *et al.* 1986; Kenney et al. 1986, 1995; Khan *et al*. 2009, 2010, 2011, 2012; Brown *et al*. 2002; NOAA 2008; 50 CFR 224.105; CETAP 1982; Clapham *et al*. 1993; Swingle *et al*. 1993; Vu *et al*. 2012; Baumgartner *et al*. 2011; Cole *et al*. 2013; Risch *et al*. 2013; Waring *et al*. 2014a; Waring *et al*. 2015; Waring *et al*. 2016; 81 FR 4837(January 27, 2016); NMFS 2015b; Bort et al. 2015.	

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 gear types primarily used in the commercial summer flounder fishery (i.e., trawl (bottom or mid-water), gillnet, and hook and line (rod/reel)).

Bottom Trawl Gear

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 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.

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 discussed below (i.e., fixed gear), trawl gear represents a low source serious injury or mortality to any large whale.

Hook and Line Gear

Large whales have been reported or observed with hook and line or monofilament line wrapped around or trailing from appendages of the whale's body. In the most recent (2010-2014) mortality and serious injury determinations for baleen whales, the majority of cases identified with confirmed hook and line or monofilament entanglement did not result in the serious injury or mortality to the whale (89.5% observed/reported whales had a serious injury value of 0; 10.5% had a serious injury value of 0.75; none of the cases resulted in mortality; Henry *et al*. 2016).[16] In fact, 85.0% of the whales observed or reported with a hook/line or monofilament entanglement were resighted gear free and healthy; confirmation of the health of the other remaining whales remain unknown as no resightings had been made over the timeframe of the assessment (Henry *et al*. 2016). Based on this information, while large whale interactions with hook and line gear are possible, there is a low probability that an interaction will result in serious injury or mortality to any large whale species. Therefore, relative to other gear types discussed below (i.e., fixed gear), hook and line gear is expected to be low source serious injury or mortality to any large whale.

Gillnet Gear

The greatest entanglement risk to large whales is posed by fixed fishing gear that includes lines (vertical or ground) that rise into the water column. This includes both gillnet and pot/trap gear, although pot/trap gear is not described further in this document as it is rarely used to target summer flounder and does not account for a substantial portion of the summer flounder landings. Any line can become entangled in the mouth (baleen), flippers, and/or tail of the whale when the animal is transiting or foraging through the water column (Johnson *et al*. 2005; NMFS 2014a,c; Kenney and Hartley 2001; Hartley *et al*. 2003; Whittingham *et al*. 2005a,b; Waring *et al*. 2016). For instance, in a study of right and humpback whale entanglements, Johnson *et al*. (2005) attributed: (1) 89% of entanglement cases, where gear could be identified, to fixed gear consisting of pot and gillnets and (2) entanglement of one or more body parts of large whales (e.g., mouth and/or tail regions) to four different types of line associated with fixed gear (the buoy line, groundline, floatline, and surface system lines).[17] Although available data (e.g., Johnson *et al*. (2005), Waring *et al*. (2016); Henry *et al*. (2016)) provides insight into large whale entanglement risks with fixed fishing gear, determining which part of fixed gear creates the most entanglement risk for large whales is difficult (Johnson *et al.* 2005). The difficulties arise from uncertainties surrounding the nature of the entanglement event, as well as unknown biases associated with reporting effort and the lack of information about the types and amounts of gear being used. As a result, any type or part of fixed gear is considered to create an entanglement

[16] Any injury leading to a significant health decline (e.g., skin discoloration, lesions near the nares, fat loss, increased cyamid loads) is classified as a serious injury (SI) and will result in a SI value set at 1 (Henry *et al*. 2015, 2016).

[17] Buoy line connects the gear at the bottom to the surface system. Groundline in trap/pot gear connects traps/pots to each other to form trawls; in gillnet gear, groundline connects a gillnet, or gillnet bridle to an anchor or buoy line. Floatline is the portion of gillnet gear from which the mesh portion of the net is hung. The surface system includes buoys and high-flyers, as well as the lines that connect these components to the buoy line.

risk to large whales and should be considered potentially dangerous to large whale species (Johnson *et al.* 2005).

The effects of entanglement to large whales range from no injury to death (NMFS 2014a,c; Johnson *et al*. 2005; Angliss and Demaster 1998; Moore and Van der Hoop 2012). The risk of injury or death in the event of an entanglement may depend on the characteristics of the whale involved (species, size, age, health, etc.), the nature of the gear (e.g., whether the gear incorporates weak links designed to help a whale free itself), human intervention (e.g., the feasibility or success of disentanglement efforts), or other variables (NMFS 2014c). Although the interrelationships among these factors are not fully understood, and the data needed to provide a more complete characterization of risk are not available, available data indicates that entanglement in fishing gear is a significant source of serious injury or mortality for Atlantic large whales (Table 29; Henry *et al*. 2017; Waring *et al*. 2016).

Table 30 summarizes confirmed human-caused serious injury and mortality to humpback, fin, sei, minke, and North Atlantic right whales along the Gulf of Mexico Coast, U.S. East Coast, and Atlantic Canadian Provinces from 2011 to 2015 (Henry *et al.* 2017). The data provided in Table 29 is specific to confirmed serious injury or mortality to whales from entanglement in fishing gear. As many entanglement events go unobserved, and because the gear type, fishery, and/or country of origin for reported entanglements are often not traceable, the information presented in Table 29 likely underestimates the rate of large whale serious injury and mortality due to entanglement. Studies looking at scar rates for right whales and humpbacks suggest that entanglements may be occurring more frequently than the observed incidences indicate (NMFS 2014c; Robbins 2009; Knowlton *et al.* 2012).

Table 30: Summary of confirmed serious injury or mortality to fin, minke, humpback, sei, and North Atlantic right whales from 2011-2015 due to fisheries entanglements.[1]

Species	Total Confirmed Entanglement: Serious Injury[2]	Total Confirmed Entanglement: Non-Serious Injury	Total Confirmed Entanglement: Mortality	Entanglement Events: Total Average Annual Injury and Mortality Rate (US waters/Canadian waters/unassigned waters)
North Atlantic Right Whale	19	35	5	4.55 (0.4/0/4.15)
Humpback Whale	32	61	5	6.45 (1.5/0.3/4.65)
Fin Whale	6	2	4	1.85 (0.2/0.8/0.85)
Sei Whale	0	0	0	0
Minke Whale	20	12	22	7.75 (1.9/3.25/2.6)

Notes:
[1]Information presented in this table is based on confirmed human-caused injury and mortality events along the Gulf of Mexico Coast, US East Coast, and Atlantic Canadian Provinces; it is not specific to US waters only.
[2] NMFS defines a serious injury as an injury that is more likely than not to result in mortality (for additional details see: http://www.nmfs.noaa.gov/pr/pdfs/serious_injury_procedure.pdf)
Source: Henry *et al.* 2017

As noted in section 6.4.3.2, pursuant to the MMPA, NMFS publishes a List of Fisheries annually, classifying U.S. commercial fisheries into one of three categories based on the relative frequency of incidental serious injurious and mortalities of marine mammals in each fishery. Large whales, in particular, humpback, fin, minke, and North Atlantic right whales, are known to interact with Category I and II fisheries in the (Northwest) Atlantic Ocean. As fin and North Atlantic right whales are listed as endangered under the ESA, these species are considered strategic stocks under the MMPA (see section 6.4.2). Section 118(f)(1) of the MMPA requires the preparation and implementation of a Take Reduction Plan (TRP) for any strategic marine mammal stock that interacts with Category I or II fisheries. In response to its obligations under the MMPA, in 1996 NMFS established the Atlantic Large Whale Take Reduction Team (ALWTRT) to develop a plan (Atlantic Large Whale Take Reduction Plan (ALWTRP)) to reduce serious injury and mortality of large whales, specifically, humpback, fin, and North Atlantic right whales, due to incidental entanglement in U.S. commercial fishing gear.[18] The ALWTRP was implemented in 1997, and has been modified several times since as NMFS and the ALWTRT learn more about why whales become entangled and how fishing practices might be modified to reduce the risk of entanglement. Recent adjustments include the Sinking Groundline Rule and Vertical Line Rules (72 FR 57104, October 5, 2007;79 FR 36586, June 27, 2014; 79 FR 73848, December 12, 2014; 80 FR 14345, March 19, 2015; 80 FR 30367, May 28, 2015).[19]

The ALWTRP consists of regulatory (e.g., universal gear requirements, modifications, and requirements; area-and season- specific gear modification requirements and restrictions; time/area closures) and non-regulatory measures (e.g., gear research and development, disentanglement, education and outreach) that, in combination, seek to assist in the recovery of North Atlantic right, humpback, and fin whales by addressing and mitigating the risk of entanglement in gear employed by commercial fisheries, specifically trap/pot and gillnet fisheries (http://www.greateratlantic.fisheries.noaa.gov/Protected/whaletrp/; 73 FR 51228; 79 FR 36586; 79 FR 73848; 80 FR 14345; 80 FR 30367). The plan recognizes trap/pot and gillnet Management Areas in Northeast, Mid-Atlantic, and Southeast regions of the U.S, and identifies gear modification requirements and restrictions for Category I and II gillnet and trap/pot fisheries in these regions; these Category I and II fisheries must comply with all regulations of the Plan.[20]. For further details on the ALWTRP please see:
http://www.greateratlantic.fisheries.noaa.gov/Protected/whaletrp/

[18] The measures identified in the ALWTRP are also beneficial to the survival of the minke whale, which are also incidentally taken in commercial fishing gear.

[19] The most recent rule (Vertical Line Rule) focused on trap/pot vertical line reduction as the ALWTRT determined that gillnets represent less than 1% of the total vertical lines on the East Coast and that the impacts from this gear on large whales is minimal (see Appendix 3A, NMFS 2014c); however, even with the new rule, gear will still be subject to existing restrictions under the ALWTRP for gillnet gear.

[20] The fisheries currently regulated under the ALWTRP include: Northeast/Mid-Atlantic American lobster trap/pot; Atlantic blue crab trap/pot; Atlantic mixed species trap/pot; Northeast sink gillnet; Northeast anchored float gillnet; Northeast drift gillnet; Mid-Atlantic gillnet; Southeastern U.S. Atlantic shark gillnet; and Southeast Atlantic gillnet (NMFS 2014c).

Small Cetaceans

Table 31 provides the species of small cetaceans that occur in the area of operation for the summer flounder commercial fishery.

Table 31: 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	No
Long-Finned Pilot Whale	No	Yes	No
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*. 2014a; Waring *et al*. 2015; Waring *et al*. 2016.

Small cetaceans can be found throughout the year in waters of the Northwest Atlantic Ocean (Waring et al. 2014a; Waring et al. 2015; Waring et al. 2016). 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 32. For additional information on the biology, status, and range-wide distribution of each species please refer to Waring et al. (2014a), Waring et al. (2015), and Waring et al. (2016).

Table 32: 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 35°N), Southern New England, Georges Bank, and Gulf of Maine; however, most common in continental shelf waters from Hudson Canyon (~ 39°N) 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 (35° to 42°N). • **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 35°N), 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	**<u>Western North Atlantic Offshore Stock</u>** • Distributed primarily along the outer continental shelf and continental slope in the Northwest Atlantic from Georges Bank to FL. • Depths of occurrence: ≥40 meters **<u>Western North Atlantic Northern Migratory Coastal Stock</u>** • 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*. 1992, 2007, 2014a, 2015, 2016; Payne and Heinemann 1993; Payne *et al.* 1984; Jefferson *et al*. 2009.	

Pinnipeds

Table 33 provides the species of pinnipeds that occur in the area of operation for the summer flounder fishery.

Table 33: 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, Waring *et al*. 2015, Waring *et al*. 2016.			

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 (35°N) (Waring *et al*. 2007, 2014a, 2015, 2016). 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 34). 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), Waring *et al*. (2015), and Waring *et al*. (2016).

Table 34: 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 (35°N). • **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; Waring *et al*. 2015; Waring *et al*. 2016	

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 gear types primarily used in the commercial summer flounder fishery (i.e., trawl (bottom or mid-water), gillnet, and hook and line (rod/reel)).

Hook and Line

Over the past several years, observer coverage has been limited for fisheries prosecuted with hook and line gear. In the absence of extensive observer data for these fisheries, stranding data provides the next best source of information on species interactions with hook and line gear. It is important to note, however, stranding data underestimates the extent of human-related mortality and serious injury because not all of the marine mammals that die or are seriously injured in human interactions are discovered, reported, or show signs of entanglement. Additionally, if gear is present, it is often difficult to definitively attribute the animal's death to

the gear interaction, or if pieces of gear are absent, attribute the death or serious injury to a specific fishery or fishing gear type. As a result, the conclusions below should be taken with these considerations in mind, and with an understanding that interactions may occur more frequently than what we are able to detect at this time.

At the beginning of section 7.3, Table 27 provides the list of small cetacean and pinniped species that may be affected by the summer flounder fishery. Of these species, only several bottlenose dolphin stocks have been identified as species at risk of becoming seriously injured or killed by hook and line gear. For each dolphin stock identified in Table 27, stranding data provides the best source of information on species interaction history with hook and line gear types. Specifically, based on stranding data from 2007-2013, estimated mean annual mortality for each stock due to interactions with hook and line gear was approximately one annual mortality for each stock (Waring *et al*. 2014a; Waring *et al*. 2016).[21] Based on this and the best available information, hook and line gear is not expected to pose an interaction risk to pinniped species, and interaction risks to small cetaceans (specifically bottlenose dolphins) are expected to be low. Should an interaction with a small cetacean occur, serious injury or mortality to the animal is possible; however, relative to other gear types discussed below (i.e., trawl or gillnet gear), hook and line or trap/pot gear represents a low source serious injury or mortality to any small cetacean.

Gillnet and Bottom Trawl Gear

Small cetaceans and pinnipeds are vulnerable to interactions with gillnet and trawl gear. Species that have been observed (incidentally) seriously injured and/or killed by List of Fisheries Category I and II gillnet or trawl fisheries that operate in the affected environment of the summer flounder fishery are provided in Table 30 (Read *et al*. 2006; Waring *et al*. 2014a; Waring *et al*. 2015; Waring *et al*. 2016; 82 FR 3655 (January 12, 2017)). Based on the most recent (i.e., 2009 to 2013) information provided in Waring *et al*. (2016) and the January 12, 2017, MMPA List of Fisheries (82 FR 3655), of the gear types primarily used to prosecute the summer flounder fishery (i.e., bottom trawl; gillnets; and hook and line), Northeast and Mid-Atlantic gillnet fisheries, followed by the Northeast and Mid-Atlantic bottom trawl fisheries (Category I and II fisheries, respectively) pose the greatest risks of serious injury and mortality to small cetaceans and pinnipeds (i.e., approximately 80.6% of the estimated total mean annual mortality to marine mammals [small cetaceans + seals, large whales excluded] is attributed to gillnet fisheries, 18.9% attributed to bottom trawl, 0.14% attributed to mid-water trawl; 0.16% attributed to pot/trap (bottlenose

[21] Stranding data provided in Waring *et al*. 2015 was not considered in estimating mean annual mortality as not all bottlenose dolphin stocks are addressed in this stock assessment report. As all bottlenose dolphin stocks are considered in Waring *et al.* (2014a) and Waring *et al*. (2016), these stock assessment reports were used to estimate mean annual mortality. Estimates of mean annual mortality were calculated based on the total number of animals that stranded between 2007-2013, and that were determined to have incurred serious injuries or mortality as result of interacting with hook and line gear. Any animals released alive with no serious injuries were not included in the estimate. Also, if maximum or minimum number of animals stranded were provided, to be conservative, we considered the maximum estimated number in calculating our mean annual estimate of mortality.

dolphin stocks only); and 0.12% attributed to hook and line (bottlenose dolphin stocks only; Figure 29).[22]

Table 35: Small cetacean and pinniped species observed seriously injured and/or killed by Category I and II gillnet or trawl fisheries in the affected environment of the summer flounder fishery.

Fishery	Category	Species Observed or reported Injured/Killed
Northeast Sink Gillnet	I	Bottlenose dolphin (offshore)
		Harbor porpoise
		Atlantic white sided dolphin
		Short-beaked common dolphin
		Risso's dolphin
		Long-finned pilot whales
		Harbor seal
		Hooded seal
		Gray seal
		Harp seal
Mid-Atlantic Gillnet[1]	I	Bottlenose dolphin (Northern Migratory coastal)
		Bottlenose dolphin (Southern Migratory coastal)
		Bottlenose dolphin (offshore)
		White-sided dolphin
		Harbor porpoise
		Short-beaked common dolphin
		Risso's dolphin
		Harbor seal
		Harp seal
		Gray seal
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
		Pilot whales (spp)
		Short-beaked common dolphin
		Risso's dolphin

[22] Data used in the assessment was from 2009-2013 (Waring *et al*. 2016; MMPA LOF 82 FR 3655). Northeast anchored float gillnet, Southeast Atlantic gillnet, and Southeastern U.S. Atlantic shark gillnet fisheries were not included in the analysis as mean annual mortality estimates have not been provided for the species affected by these fisheries (Waring *et al*. 2016). In addition, for harp seals, the assessment used data from Waring *et al.* (2014a) as serious injury and mortality estimates for harp seals have not been updated since Waring *et al*. (2014a).

		Bottlenose dolphin (offshore)
		Gray seal
		Harbor seal

Notes:
[1,2] MMPA 2017 LOF (82 FR 3655, January 12, 2017) describes the gear used in the Mid-Atlantic Gillnet fishery (Category I) or Southeastern U.S. Atlantic Shark Gillnet fishery (Category II) as sink and drift gillnets.
Sources: Waring *et al*. 2016; MMPA LOF 82 FR 3655 (January 12, 2017).

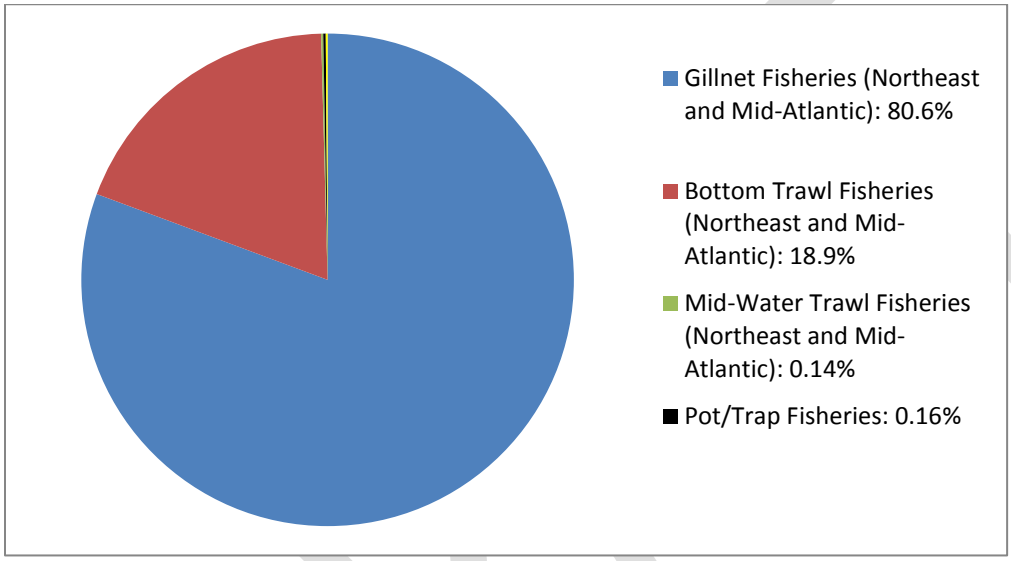


Figure 29: Estimated Total Mean Annual Mortality of Small Cetaceans and Pinnipeds by Greater Atlantic Region Fisheries from 2009-2013 (source Waring et al. 2016; MMPA LOF 82 FR 3655 (January 12, 2017).[23]

Although there are multiple Category I and II fisheries that have the potential to result in the serious injury and mortality of small cetaceans and pinnipeds in the Greater Atlantic Region, the risk of an interaction with a specific fishery is affected by multiple factors, including where and when fishing effort is focused, the type of gear being used, and how effort overlaps in time and space with specific species in the affected area. For instance Figure 30 and Figure 31 show observed marine mammal takes (large whales excluded) in gillnet and trawl gear in waters of the Gulf of Maine, Georges Bank, and Southern New England. As shown in these figures, over the last five years there appear to be particular areas in the Gulf of Maine, Georges Bank, and Southern New England where fishing effort is overlapping in time and space with small cetacean or pinniped occurrence. Although uncertainties remain, due to shifting fishing effort patterns and data on true density (or even presence/absence) for some species, the available observer data, as shown in Figure 30 and Figure 31, does provide some insight into areas in the ocean where the

[23] For harp seals, mean annual mortality estimates from 2007-2011 were considered as serious injury and mortality estimates have not been updated since Waring *et al.* (2014a).

likelihood of species interactions is high. These figures provide a baseline to consider potential impacts of future shifts or changes in fishing effort on small cetaceans and pinnipeds. For additional maps showing observed small cetacean and pinniped interactions with gear types used to prosecute fisheries in New England or the Mid-Atlantic see Appendix III in Waring *et al*. (2014a), Waring *et al*. (2015) or Waring *et al*. (2016).

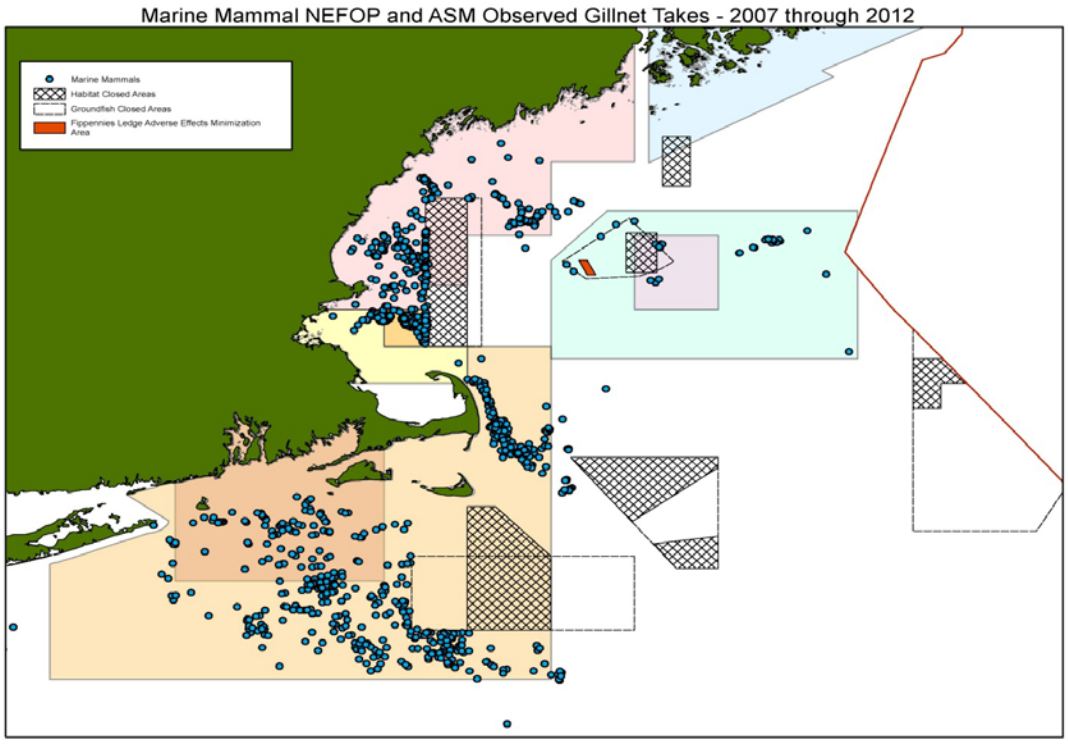


Figure 30: Map of Marine Mammal Bycatch in Gillnet Gear in the New England Region (Excluding Large Whales) Observed by Northeast Fisheries Observer Program (NEFOP) and At Sea Monitoring (ASM) Program Between 2007 and 2012.

Map legend: blue dot=observed marine mammal takes; cross hatched areas= Habitat Closure Areas; white box with hatched outline=Groundfish Closed Areas; orange box=Fippennies Ledge Area; pastel shaded boxes=harbor porpoise take reduction plan management areas. ***Notes***: Small cetacean and pinnipeds have been observed taken primarily in: (1) the waters west of the Gulf of Maine Habitat/Groundfish closed area: Harbor seals, harp seals, and harbor porpoise; (2) off of Cape Cod, MA: Gray seals, harbor seals, and harbor porpoise; (3) west of the Nantucket Lightship Closed Area: Harbor porpoise, short-beaked common dolphin, gray seals, harp seals, and harbor seals; and (4) waters off southern MA and RI: Gray seals and harbor seals, and some harbor porpoise and short-beaked common dolphin.

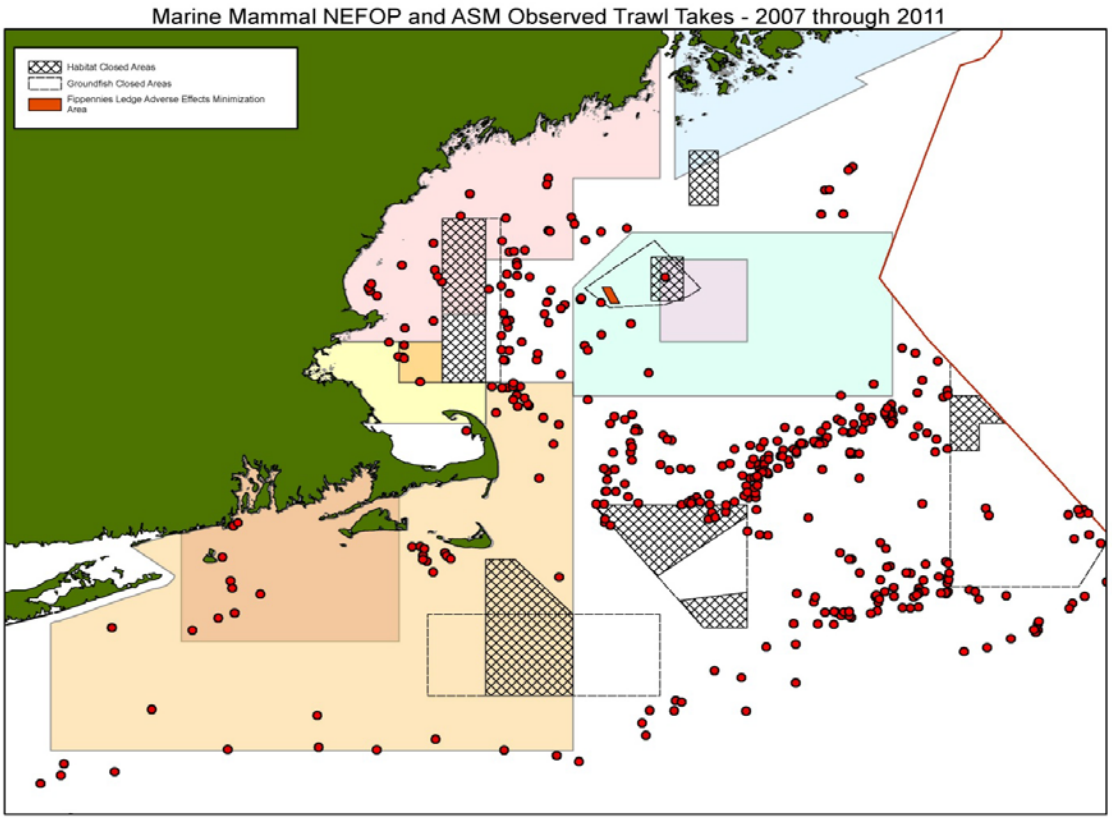


Figure 31: Map of Marine Mammal Bycatch in Trawl Gear in the New England Region (Excluding Large Whales) Observed by the Northeast Fisheries Observer Program (NEFOP) and At-Sea Monitoring (ASM) Program Between 2007 and 2011.

Map legend: red dot=observed marine mammal takes; cross hatched areas= Habitat Closure Areas; white box with hatched outline=Groundfish Closed Areas; orange box=Fippennies Ledge Area; pastel shaded boxes=Harbor Porpoise Take Reduction Plan Management Areas. ***Notes*:** Small cetacean and pinnipeds observed taken primarily in: (1) the waters between and around CA I and CA II (Groundfish closed areas): Short-beaked common dolphin, pilot whales, white-sided dolphins, gray seals, and some Risso's dolphins and harbor porpoise; and (2) eastern side of the Gulf of Maine Habitat/Groundfish closed area: White-sided dolphins, and some pilot whales and harbor seals.

7.3.2 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).

Sea turtle interactions with trawl and gillnet 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 2013; 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 and gillnet gear in these regions or produce a bycatch estimate for these regions. As a result, the bycatch estimates and discussion below are for trawl or gillnet gear in the Mid-Atlantic.

Bottom Trawl Gear

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[24] was 292 (CV=0.13, 95% CI=221-369), with an additional 61 loggerheads (CV=0.17, 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[25] 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 32). 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.

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

[25] 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)

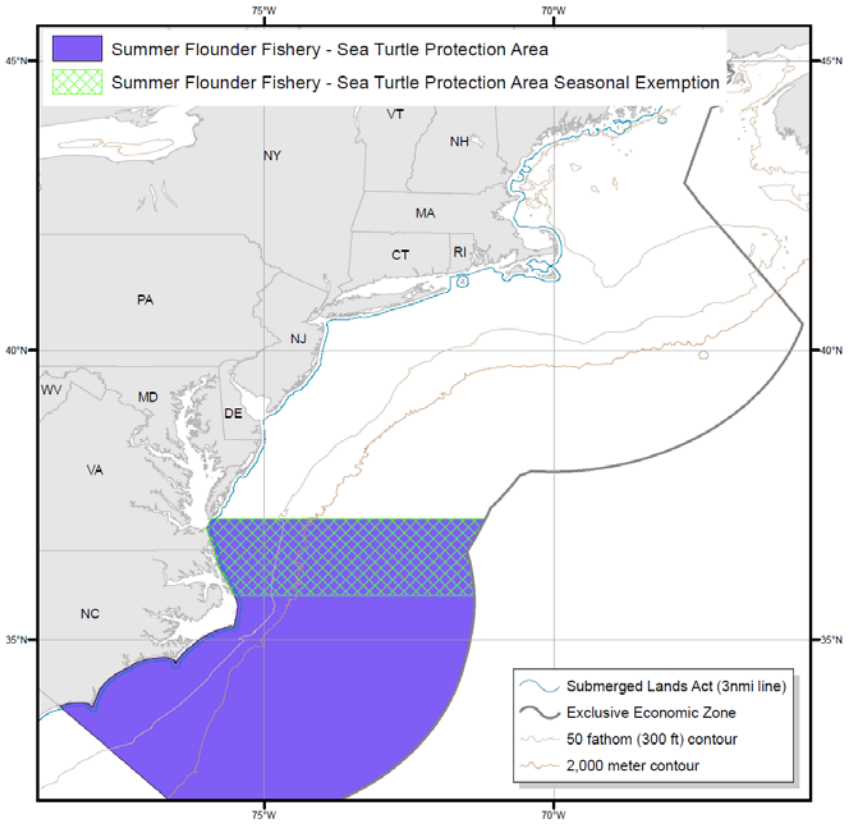


Figure 32: Summer Flounder Fishery Sea Turtle Protection Area.

Gillnet Gear

Gillnet gear of all types (drift sink, drift float, anchored sink, and drift large pelagic) pose an injury and mortality risk to all sea turtle species. Observers have documented green, Kemp's ridley, leatherback, loggerhead, and unidentified sea turtles in these gillnet gears. This section, however**,** focuses on sink gillnets where possible, and does not include drift pelagic gillnets as these type of gillnet does not catch summer flounder.

Murray (2013) conducted an assessment of loggerhead and unidentified hard-shell turtle interactions in Mid-Atlantic gillnet gear during 2007-2011.[26] Based on Northeast Fisheries Observer Program data from 2007-2011, interactions between loggerhead and hard-shelled sea turtles (loggerheads plus unidentified hard-shelled) and commercial gillnet gear in the Mid-Atlantic averaged 95 hard-shelled turtles and 89 loggerheads (equivalent to 9 adults) annually

[26] Based on NEFOP observed hauls in Mid-Atlantic gillnet fisheries, Murray (2013) classified the observed gillnet hauls as follows: anchored to the bottom (65% of hauls), unanchored but fishing on the ocean bottom (32% of hauls), or drift/floating (3% of hauls).

(Murray 2013).[27] However, average estimated interactions in large mesh gear in warm, southern Mid-Atlantic waters have declined relative to those from 1996-2006 (Murray 2009), as did the total commercial effort (Murray 2013).

Beginning in the spring of 1995, and continuing in subsequent years, large numbers of sea turtles stranded along the coastline of North Carolina. These stranding events coincided with the monkfish and dogfish large mesh gillnet fisheries operating offshore, and in fact, some of the stranded turtles coming ashore had large mesh gillnet gear wrapped around their bodies. Because of the documented strandings and subsequent investigation, NMFS enacted the Mid-Atlantic large mesh gillnet rule in waters of the EEZ on December 3, 2002 (67 FR 71895); this rule was subsequently revised on April 26, 2006 (71 FR 24776). The Mid-Atlantic large mesh gillnet rule establishes seasonally adjusted gear restrictions by closing portions of the Mid-Atlantic EEZ to fishing with gillnets with a mesh size ≥ 7–inch (17.8–cm) stretched mesh to protect migrating sea turtles (Figure 33).

[27] At Sea Monitoring (ASM) data was also considered in Murray (2013); however, as the ASM program began May 1, 2010, trips (1,085 hauls), trips observed by at-sea monitors from May 2010 – December 2011 were pooled with the NEFOP data. Further, as most of the ASM trips occur in the Gulf of Maine, only a small portion (9%) of ASM data was used in the Murray (2013) analysis.

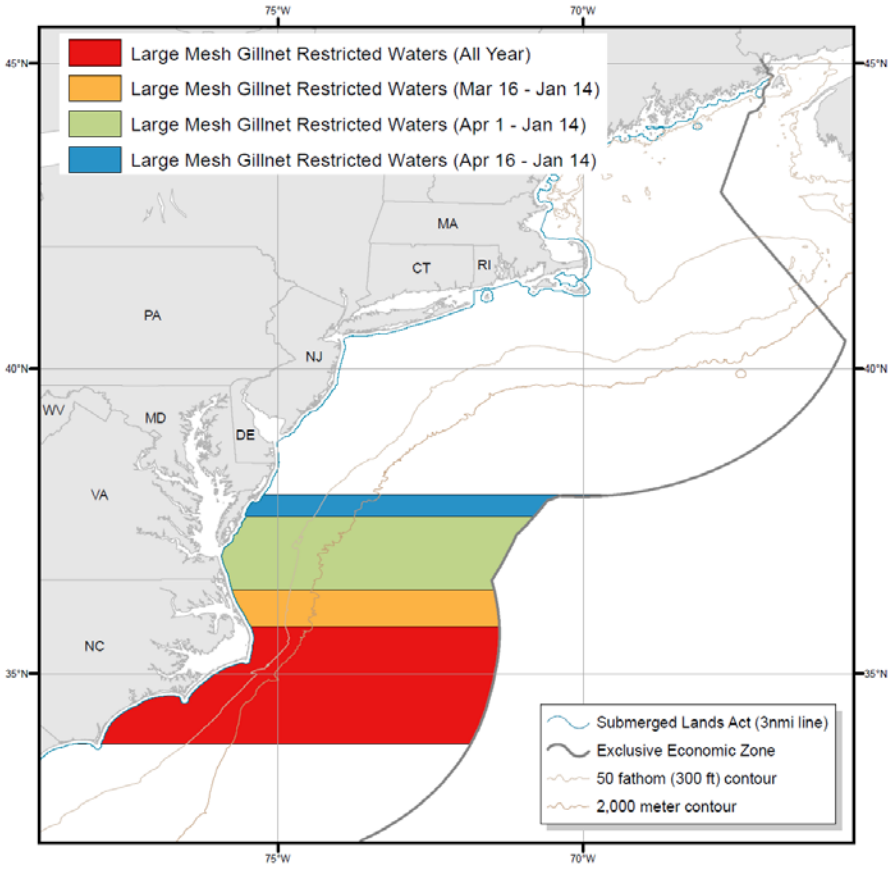


Figure 33: Mid-Atlantic Large Mesh Gillnet Restriction Area.

Summary of Observed Locations of Turtle Interactions with Bottom Trawl and Gillnet Gear

Figure 34 shows the observed locations of sea turtle interactions with gillnet and bottom trawl gear in the Greater Atlantic Region from 1989 to 2014 (all months included). This figure also includes scallop dredge gear, although this gear type is not described further in this document as it is not used to target summer flounder and does not account for a substantive portion of summer flounder landings.

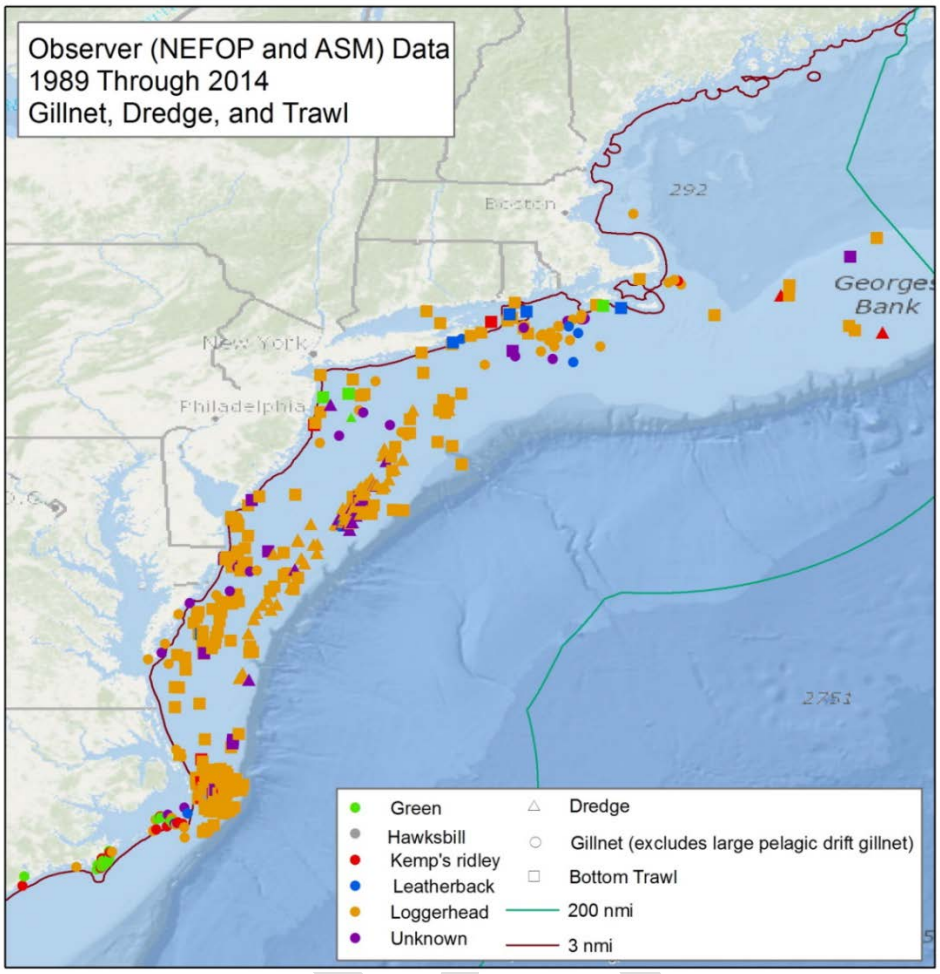


Figure 34: Observed Location of Turtle Interactions in Bottom Tending Gears in the Greater Atlantic Region 1989-2014.

Hook and Line

ESA-listed species of sea turtles are known to interact with hook and line gear and are more commonly reported in nearshore, southern waters (Sea Turtle Disentanglement Network; NMFS 2013). Hook and line gear can cause injury and mortality to sea turtles, and therefore, can pose a risk to these species. However, the extent to which these interactions impact sea turtle populations is still under investigation and, therefore, no conclusions can currently be made on the impact of hook and line gear on the continued survival of sea turtle populations.

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).

7.3.3 Atlantic Sturgeon

Table 36 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 36: 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 35; 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).

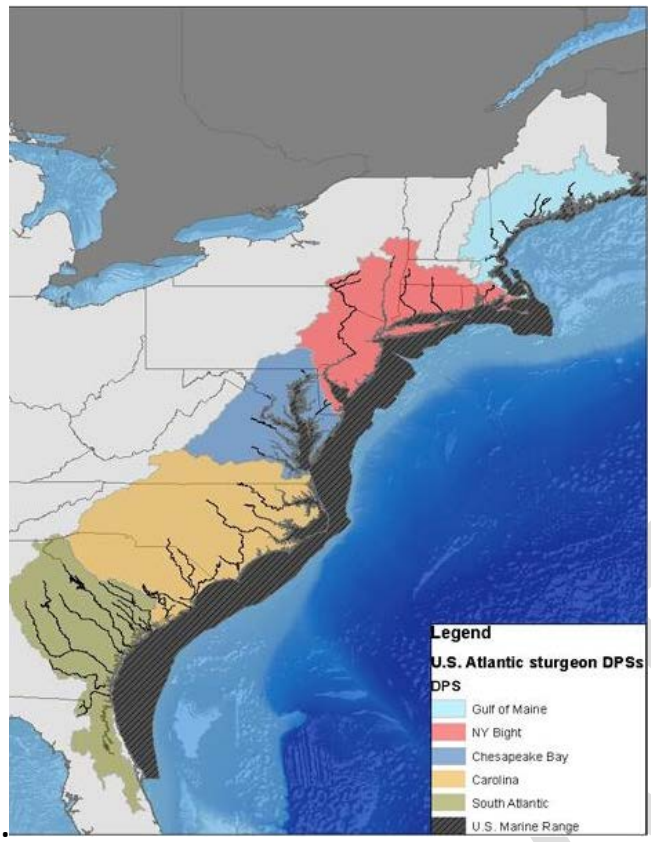


Figure 35: Geographic Locations for the Five ESA-listed DPSs of Atlantic Sturgeon (NMFS 2013).

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).[28] 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.

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 gear types primarily used in the summer flounder fishery (i.e., bottom trawls, gillnet, and hook/line).

Gillnets and Bottom Trawls

Atlantic sturgeon interactions (i.e., bycatch) with sink gillnet and bottom trawl gear have been observed since 1989; these interactions have the potential to result in the injury or mortality of

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

Atlantic sturgeon (NMFS NEFSC FSB 2015, 2016). Three documents, covering three time periods, that use data collected by the Northeast Fisheries Observer Program to describe bycatch of Atlantic sturgeon in gillnet and 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.[29] 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 gillnet and 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 gillnet and 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 gillnets to be 1,239 sturgeon and 1,342 sturgeon in bottom otter trawl gear. Miller and Shepard (2011) observed Atlantic sturgeon interactions in trawl gear with small (< 5.5 inches) and large (≥ 5.5 inches) mesh sizes, as well as gillnet gear with small (< 5.5 inches), large (5.5 to 8 inches), and extra-large mesh (>8 inches) sizes. Although Atlantic sturgeon were observed to interact with trawl and gillnet gear with various mesh sizes, Miller and Shepard (2011) concluded that, based on NEFOP observed sturgeon mortalities, gillnet gear, in general, posed a greater risk of mortality to Atlantic sturgeon than did trawl gear. Estimated mortality rates in gillnet gear were 20.0%, while those in otter trawl gear were 5.0% (Miller and Shepard 2011; NMFS 2013). Similar conclusions were reached in Stein *et al*. (2004b) and ASMFC (2007) reports; after review of observer data from 1989-2000 and 2001-2006, both studies concluded that observed mortality is much higher in gillnet gear than in trawl gear. 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 either gear type. To date, total Atlantic sturgeon mortality associated with gillnet or trawl gear remains uncertain.

Hook and Line Gear

ESA-listed species of Atlantic sturgeon are known to interact with hook and line gear, particularly in nearshore waters from the Gulf Maine to Southern New England (Network; NMFS 2013). Injury and mortality to Atlantic sturgeon can be incurred by hook and line gear interactions, and therefore, can pose a risk to these species. However, the extent to which these interactions are impacting Atlantic sturgeon DPSs is still under investigation and therefore, no conclusions can currently be made on the impact of hook and line gear on the continued survival of Atlantic sturgeon DPSs (NMFS 2013; NMFS 2011b).

[29] 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.

7.4 Proposed Federal Regulations/Actions Pertaining to Relevant Protected Species

In May 2016, NMFS proposed areas of Atlantic Sturgeon critical habitat along the Atlantic coast. The proposed critical habitat primarily consisted of rivers including the Penobscot River in Maine, the Hudson River in New York, the Potomac River in Maryland, and the Neuse River in North Carolina (81 FR 36077; 81 FR 35701). Comments on the proposal were accepted through the fall of 2016; however, a final rule has not yet been released.

7.5 Potential Impacts to Atlantic Coastal State and Interstate Fisheries

There are several take reduction teams, whose management actions have potential impacts to summer flounder fisheries. The Harbor Porpoise Take Reduction Plan (HPTRP) and the Bottlenose Dolphin Take Reduction Plan (BDTRP) were developed and implemented for these species.[30] The following provides a brief overview and summary for each Plan; however, additional information on each Plan can be found at: http://www.greateratlantic.fisheries.noaa.gov/protected/porptrp/ or http://www.nmfs.noaa.gov/pr/interactions/trt/bdtrp.htm

Harbor Porpoise Take Reduction Plan

To address the high levels of incidental take of harbor porpoise in the groundfish sink gillnet fishery, a Take Reduction Team was formed in 1996. A rule (63 FR 66464) to implement the Harbor Porpoise Take Reduction Plan to reduce harbor porpoise bycatch in U.S. Atlantic gillnets was published on December 2, 1998. The Plan became effective on January 1, 1999 and was amended on February 19, 2010 (75 FR 7383), and October 4, 2013 (78 FR 61821). Since gillnet operations differ between the New England and Mid-Atlantic regions, the following sets of measures were devised for each region:

- **New England Region**: The New England component of the Plan pertains to all fishing with sink gillnets and other gillnets capable of catching multispecies in New England waters from Maine through Rhode Island. This portion of the Plan includes time and area closures, as well as closures to multispecies gillnet fishing unless pingers are used in the manner prescribed in the Plan regulations. For additional details see 50 CFR 229.33 and the outreach guide at: http://www.greateratlantic.fisheries.noaa.gov/prot_res/porptrp/doc/HPTRPNewEnglandGuide.pdf).
- **Mid-Atlantic Region:** The Mid-Atlantic portion of the Plan pertains to the Mid-Atlantic shoreline from the southern shoreline of Long Island, New York to the North Carolina/South Carolina border. It includes four management areas (Waters off New Jersey, Mudhole North (located in Waters off New Jersey Management Area), Mudhole South (located in Waters off New Jersey Management Area), and Southern Mid-Atlantic), each with time and area closures to gillnet fishing unless the gear meets

[30] Although the most recent U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessment (Waring *et al.* 2016) no longer designates harbor porpoise as a strategic stock, HPTRP regulations are still in place per the mandates provided in Section 118(f)(1).

certain specifications. Additionally, during regulated periods, gillnet fishing in each management area of the Mid-Atlantic is regulated differently for small mesh (> 5 inches to < 7 inches) and large (7-18 inches) mesh gear. The Plan also includes some time and area closures in which gillnet fishing is prohibited regardless of the gear specifications. For additional details see 50 CFR 229.34 and the outreach guide at: http://www.greateratlantic.fisheries.noaa.gov/prot_res/porptrp/doc/HPTRPMidAtlanticGuide_Feb%202010.pdf

Bottlenose Take Reduction Plan

In April 2006, NMFS published a final rule to implement the BDTRP for the western North Atlantic coastal stock of bottlenose dolphin (April 26, 2006, 71 FR 24776) to reduce the incidental mortality and serious injury in the Mid-Atlantic gillnet fishery and eight other coastal fisheries operating within the dolphin's distributional range.[31] The measures contained in the Plan include gillnet effort reduction, gear proximity requirements, gear or gear deployment modifications, and outreach and educational measures to reduce dolphin bycatch below the marine mammals stock's PBR. On July 31, 2012 (77 FR 45268), the BDTRP was amended to permanently continue nighttime fishing restrictions of medium mesh gillnets operating in North Carolina coastal state waters. The Plan was most recently amended on February 9, 2015 (80 FR 6925) to reduce the incidental serious injury and mortality of strategic stocks of bottlenose dolphins in Virginia pound net fishing gear, and to provide consistent state and Federal regulations for Virginia pound net fishing gear. For additional details on the Plan please visit: http://www.nmfs.noaa.gov/pr/interactions/trt/bdtrp.htm

Atlantic Trawl Gear Take Reduction Strategy

In addition to the Harbor Porpoise and Bottlenose Dolphin take reduction plans, 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.[32]

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

[31] The final rule issued on April 26, 2006, for the BDTRP also revised the large mesh size restriction under the Mid-Atlantic large mesh gillnet rule for conservation of endangered and threatened sea turtles to provide consistency among Federal and state management measures.

[32] 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.

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/

8.0 REFERENCES

Adolf, J. E., C. L. Yeager, W. D. Miller, M. E. Mallonee, and L. W. Harding. 2006. Environmental forcing of phytoplankton floral composition, biomass, and primary productivity in Chesapeake Bay, USA. Estuarine, Coastal and Shelf Science 67(1-2):108- 122.

Ahrenholz, D.W. 1991. Population biology and life history of the North American menhadens, Brevoortia spp. Mar. Fish. Rev. 53: 3-19.

Ahrenholz, D.W., J.F. Guthrie, and R.M. Clayton. 1987. Observations of ulcerative mycosis infections on Atlantic menhaden (*Brevoortia tyrannus*). U.S. NMFS Tech. Mem. NMFS-SEFC 196. 28 p.

Ahrenholz, D.W., W.R. Nelson, and S.P. Epperly. 1987. Population and fishery characteristics of Atlantic menhaden, Brevoortia tyrannus. Fish. Bull. 85: 569-600.

AMAC. 2000. Atlantic Menhaden Management Review, 2000. Report to ASMFC Atlantic Menhaden Board. 18 p.

Anderson, J.D. 2007. Systematics of the North American menhadens: molecular evolutionary reconstructions in the genus Brevoortia (Clupeiformes: Clupeidae). Fishery Bulletin 205:368-378.

Annis, E. A., E. D. Houde, L. W. Harding, Jr., M.E. Mallonee, and M. J. Wilberg. 2011. Calibration of a bioenergetics model linking primary production to Atlantic Menhaden,Brevoortia tyrannus, growth in Chesapeake Bay. Mar. Ecol. Prog. Ser. Vol. 437: 253-267.

Anstead, K.A., J.J. Schaffler, and C.M. Jones. 2016. Coast-wide nursery contribution of new recruits to the population of Atlantic menhaden. Trans. Am. Fish. Soc. 145: 627-636.

Anstead, K.A., J.J. Schaffler, and C.M. Jones. 2017. Contribution of nursery areas to the adult population of Atlantic menhaden. Trans. Am. Fish. Soc. 146: 36-46.

Atlantic Large Whale Take Reduction Plan Regulations. 1999. 64 Fed. Reg. 7529 (February 16, 1999).

Atlantic Large Whale Take Reduction Plan Regulations. 2015. 80 Fed. Reg. 30367 (May 28, 2015).

Atlantic States Marine Fisheries Commission (ASMFC). 1992. Fishery Management Plan for Atlantic Menhaden: 1992 revision. FMR No. 22. ASMFC, Washington, D.C. 159 p.

Atlantic States Marine Fisheries Commission. 1981. Fishery Management Plan for Atlantic Menhaden. ASMFC, Washington, D.C. 146 p.

Atlantic States Marine Fisheries Commission. 1992. Fishery Management Plan for Atlantic Menhaden: 1992 revision. FMR No. 22. ASMFC, Washington, D.C. 159 p.

Atlantic States Marine Fisheries Commission. 1998. Amendment 1 to the Interstate Fishery Management Plan for Atlantic Sturgeon.

Atlantic States Marine Fisheries Commission. 2001. Amendment 1 to The Interstate Fishery Management Plan for Atlantic Menhaden. ASMFC, Washington, D.C. 146 p.

Atlantic States Marine Fisheries Commission. 2004. Addendum I to Amendment I to the Atlantic Menhaden Fishery Management Plan. ASMFC, Washington DC 52 p.

Atlantic States Marine Fisheries Commission. 2004. Atlantic Menhaden Stock Assessment Report for Peer Review. Atlantic States Marine Fisheries Commission, Stock Assessment Report No. 04-01 (supplement). ASMFC, Washington, D.C. 145 p. 2007.06.001 WOS:000250912300003.

Atlantic States Marine Fisheries Commission. 2005. Addendum II to Amendment 1 to the Atlantic Menhaden Fishery Management Plan. ASMFC, Washington, D.C. 30 p.

Atlantic States Marine Fisheries Commission. 2006. Addendum III to Amendment 1 to the Atlantic Menhaden Fishery Management Plan. ASMFC, Washington, D.C. 6 p.

Atlantic States Marine Fisheries Commission. 2009. Addendum IV to Amendment 1 to the Atlantic Menhaden Fishery Management Plan. ASMFC, Washington, D.C. 5 p.

Atlantic States Marine Fisheries Commission. 2011. Addendum V to Amendment 1 to the Atlantic Menhaden Fishery Management Plan. ASMFC, Arlington, VA 17 p.

Atlantic States Marine Fisheries Commission. 2012. Amendment 2 to The Interstate Fishery Management Plan for Atlantic Menhaden. ASMFC, Arlington, VA 114 p.

Atlantic States Marine Fisheries Commission. 2013. Technical Addendum I: Episodic Events Set Aside Program to Amendment 2 to the Atlantic Menhaden Fishery Management Plan. ASMFC, Arlington, VA 4 p.

Atlantic States Marine Fisheries Commission. 2015. Atlantic Menhaden Southeast Data, Assessment, and Review (SEDAR) 40 Stock Assessment Report. 146 p.

Atlantic States Marine Fisheries Commission. 2016. Addendum I to Amendment 2 to the Atlantic Menhaden Fishery Management Plan. ASMFC, Arlington, VA 12 p.

Atlantic States Marine Fisheries Commission. 2016. Interstate Fisheries Management Program Charter. ASMFC, Arlington VA. 29 p.

Atlantic States Marine Fisheries Commission. 2017. Atlantic Menhaden Stock Assessment Update. ASMFC, Arlington, VA. 182p.

Austin, H. 2002. Decadal oscillations and regime shifts, a characterization of the Chesapeake Bay Marine Climate. *In*: Fisheries in a Changing Climate. Amer. Fish. Soc. Symp. 32: 155-170.

Austin, H. M., J. Kirkley, and J. Jucy. 1994. By-catch and the fishery for Atlantic menhaden (Brevoortia tyrannus) in the mid-Atlantic bight: AN assessment of the nature and extent of by-catch. VIMS, Va. Mar. Resour. Advisory No. 53, Va. Sea Grant College Prog. Publ. No. VSG-94-06, 39 p.

Bellmund, S.A., J.A. Musick, R.C. Klinger, R.A. Byles, J.A. Keinath, and D.E. Barnard. 1987. Ecology of sea turtles in Virginia. Virginia Institute of Marine Science, College of William and Mary, Gloucester Point, Virginia.

Berrien, P., and J. Sibunka. 1999. Distribution patterns of fish eggs in the U.S. northeast continental shelf ecosystem, 1977–1987. U.S. Dep. Commer., NOAA Tech. Rep. NMFS 145, 310 p.

Best, P.B., A. Branadâo, and D.S. Butterworth. (2001). Demographic parameters of southern right whales off South Africa. J. Cetacean Res. Manage. (Special issue) 2: 161- 169.

Bjorndal KA. 1985. Nutritional ecology of sea turtles. Copeia 3:736– 751. doi:10.2307/1444767

Bjorndal, K. A. 1997. Foraging ecology and nutrition of sea turtles. Pages 199-231 in P. L. Lutz and J. A. Musick, editors. The biology of sea turtles. CRC Press, Boca Raton, Florida, USA.

Blazer, V. S., C. A. Ottinger and C. L. Densmore. 2007. Chapter 13. Factors affecting fish health. pp.54-59. In: Phillips, S. W. (ed.). Synthesis of U.S. Geological Survey science for the Chesapeake Bay ecosystem and implications for environmental management. U.S. Geological Survey Circular 1316.

Bottlenose Dolphin Take Reduction Plan Regulations. 2006. 71 Fed. Reg. 24776 (April 26, 2006).

Brandt, S. B., and D. M. Mason. 2003. Effect of nutrient loading on Atlantic menhaden (Brevoortia tyrannus) growth rate potential in the Patuxent River. Estuaries 26(2A):298- 309.

Brush, G. S. 1986. Geology and paleoecology of Chesapeake Bay: A long-term monitoring tool for management. J. Wash. Acad. Sciences 76: 146-160.

Brush, G.S. 2009. Historical land use, nitrogen, and coastal eutrophication: A paleoecological perspective. Estuar. Coast. 32: 18-28.

Buchheister, A., T.J. Miller, E.D. Houde, D.H. Secor, and R.J. Latour. 2016. Spatial and temporal dynamics of Atlantic menhaden (*Brevoortia tyrannus*) recruitment along the Northwest Atlantic Ocean. ICES J. Mar. Sci. 73: 1147-1159.

Burkholder, J. M., A. S. Gordon, P. D. Moeller, J. M. Law, K. J. Coyne, A. J. Lewitus, J. S. Ramsdell, H. G. Marshall, N. J. Deamer, S. C. Cary, J. W. Kempton, S. L. Morton, and P. A. Rublee. 2005. Demonstration of toxicity to fish and to mammalian cells by Pfiesteria species: Comparison of assay methods.

Burkholder, J. M., E. J. Noga, C. W. Hobbs, H. B. Glasgow, and S. A. Smith. 1992. New “phantom” dinoflagellate is the causative agent of major estuarine fish kills. Nature 358:407-410 (see correction in Nature 360:768).

Burnett, L. E. (1997). The challenge of living in hypoxic and hypercapnic aquatic environments. American Zoology 37: 633-640.

Burton, D. T., L. B. Richardson, and C. J. Moore. 1980. Effect of oxygen reduction rate and constant low dissolved oxygen concentration on two estuarine fish. Trans. Am. Fish. SOC. 109:552-557.

Burton, D. T., P. R. Abell, and T. P. Capizzi. 1979. Cold Shock effect of rate of thermal decrease on Atlantic menhaden, *Brevoortia tyrannus.* Mar. Pollut. Bull. 10:347-349.

Carr, A. 1963. Panspecific reproductive convergence in Lepidochelys kempii. Ergebnisse der Biologie 26:298-303.

Caswell, H., M. Fujiwara and S. Brault. (1999). Declining survival probability threatens the north Atlantic right whale. Proc. Nat. Acad. Sci. 96:3308-3313.

CETAP. 1982. A characterization of marine mammals and turtles in the mid- and north Atlantic areas of the U.S. outer continental shelf. Cetacean and Turtle Assessment Program, University of Rhode Island. Final Report #AA551- CT8-48 to the Bureau of Land Management, Washington, DC, 538 pp.

Checkley, D.M., Jr., S. Raman, G.L. Maillet and K.M. Mason. 1988. Winter storm effects on the spawning and larval drift of a pelagic fish. Nature 335(6188): 346-348.

Christmas, J.Y., G. Gunter, and E.C. Whatley. 1960. Fishes taken in the menhaden fishery of Alabama, Mississippi and eastern Louisiana. U.S. FWS, Spec. Sci. Rep. Fish. No. 339, 10 p.

Clagett, P.R. 2007. Human population growth and land-use change. *In*: Phillips, S.W. (ed). Synthesis of U.S. Geological Survey Science for the Chesapeake Bay Ecosystem and Implications for Environmental Management: U.S. Geological Survey Circular 1316. 63 p.

Clapham, P.J. & Mayo, C.A. 1987. Reproduction and recruitment of individually identified humpback whales, Megaptera novaeangliae, observed in Massachusetts Bay, 1979-1985. Can.. J. of Zool. 65: 2853-2863.

Clark, C. W. 1995. Application of US Navy underwater hydrophone arrays for scientific research on whales. *Reports of the International Whaling Commission* 45: 210-212.

Cooper, R. A. 1965. An unusually large menhaden, *Brevoortia tyrannus* (Latrobe), from Rhode Island. Transactions of the American Fisheries Society, 94:412.

Corkeron, P., E. Josephson, K. Maze-Foley, and P.E. Rosel, editors. 2016. Draft U.S. Atlantic and Gulf of Mexico Marine Mammal Stocks Assessments, 2016. NOAA Technical Memorandum NOAA-NE-xxx. 343 p.

Critical Habitat for the Endangered Carolina and South Atlantic Distinct Population Segments of Atlantic Sturgeon. 2016. 81 Fed. Reg. 36077 (June 3, 2016).

Cross, F.A., D.S. Peters, and W.E. Schaaf. 1985. Implications of waste disposal in coastal waters on fish populations, pp. 383-399 *In*: Cardwell, R.D., R. Purdy, and R.C. Bahner (eds). Aquatic Toxicology and Hazard Assessment: Seventh Symposium. ASTM STP854. Amer. Soc. for Testing and Materials, Philadelphia.

Designation of Critical Habitat for the Gulf of Maine, New York Bight, and Chesapeake Bay Distinct Population Segments of Atlantic Sturgeon. 2016. 81 Fed. Reg. 35701 (June 3, 2016).

Determination of Nine Distinct Population Segments of Loggerhead Sea Turtles as Endangered or Threatened; Final Rule. 76 Fed. Reg. 58868 (September 22, 2011).

Dryfoos, Robert L., Randall P. Cheek, and Richard L. Kroger. 1973. Preliminary analyses of Atlantic menhaden, Brevoortia tyrannus, migrations, population structure, survival and exploitation rates, and availability as indicated from tag returns. Fishery Bulletin 71(3):719-734.

Durbin, A.G. and E.G. Durbin. 1998. Effects of menhaden predation on plankton populations in Narragansett Bay, Rhode Island. Estuaries 21(3): 449-465.

Durbin, A.G., and E.G. Durbin. 1975. Grazing rates of the Atlantic menhaden, Brevoortia tyrannus, as a function of particle size and concentration. Mar. Biol. (Berl.) 33: 265-277.

Dykstra, M., and A. S. Kane. 2000. Pfiesteria piscicida and ulcerative mycosis of Atlantic Menhaden — Current status of understanding. J. of Aquatic Animal Health 12: 18-25.

Edward, J.L. 2009. An RNA:DNA-based index of growth in juvenile Atlantic menhaden (Brevoortia tyrannus): laboratory calibration and field assessment. University of Maryland, Marine-Estuarine Environmental Sciencies, Masters Sci. thesis.

Ehrhart, L.M., R.B. Sindler, and B.E. Witherington. 1986. Preliminary investigation of papillomatosis in green turtles: phase I--frequency and effects on turtles in the wild and in captivity. Final report to U.S. Department Commerce; NOAA, NMFS, Miami Laboratory. Contract No. 40-GENF-6-0060l.

Endangered Species Act of 1973, Pub L. No. 93-205, 16 U.S.C. § 1531, 87 Stat. 884 (1973).

Ferraro, S. P. 1980. Embryonic development of Atlantic menhaden, Brevoortia tyrannus, and a fish embryo age estimation method. U.S. Natl. Mar. Fish. Serv. Fish. Bull. 77:943-949.

Final Listing Determinations for Two Distinct Population Segments of Atlantic Sturgeon *(Acipenser oxyrinchus)* in the Southeast. 77 Fed. Reg. 5914 (February 6, 2012).

Final rule to List Eleven Distinct Population Segments of the Green Sea Turtle (Chelonia mydas) as Endangered or Threatened and Revision of Current Listings Under the Endangered Species Act; Final Rule. 81 Fed. Reg. 20057 (April 6, 2016).

Forward, Jr., R.B., M.C. De Vries, R.A. Tankersley, D. Rittschof, W.F. Hettler, J.S. Burke, J.M. Welch and D.E. Hoss. 1999. Behaviour and sensory physiology of Atlantic menhaden larvae, Brevoortia tyrannus, during horizontal transport. In: Crowder, L.B. and F.E. Werner (eds.) Fisheries Oceanography of the Estuarine-Dependent Fishes of the South Atlantic Bight. Fish. Oceanogr. 8(suppl. 2): 37-56.

Friedland KD, Hare JA. 2007. Long-term trends and regime shifts in sea surface temperature on the continental shelf of the northeast United States. Cont Shelf Res. 27(18):2313–28. doi: 10.1016/J.Csr.

Friedland, K. D., D. W. Ahrenholz, J. W. Smith, M. Manning, and J. Ryan. 2006. Sieving functional morphology of the gill raker feeding apparatus of Atlantic menhaden. J. Exp. Zool. 305A:974-985.

Friedland, K. D., Patrick D. Lynch, and Christopher J. Gobler. 2011. Time Series Mesoscale Response of Atlantic Menhaden Brevoortia tyrannus to Variation in Plankton Abundances. Journal of Coastal Research: Volume 27, Issue 6: pp. 1148 – 1158.

Friedland, K.D., D.W. Ahrenholz, and J.F. Guthrie. 1989. Influence of plankton on distribution patterns of the filter-feeder *Brevoortia tyrannus* (Pisces, Clupeidae). Mar. Ecol. Prog. Ser. 54: 1-11.

Friedland, K.D., D.W. Ahrenholz, and J.F. Guthrie. 1996. Formation and seasonal evolution of Atlantic menhaden juvenile nurseries in coastal estuaries. Estuaries 19(1): 105-114.

Friedland, K.D., L.W. Haas, and J.V. Merriner. 1984. Filtering rates of the juvenile Atlantic menhaden Brevoortia tyrannus (Pisces: Clupeidae), with consideration of the effects of detritus and swimming speed. Mar. Biol. (Berl.) 84: 109-117.

Geer, R.L. 2008. Shadow on the Chesapeake. Chesapeake Quarterly 7(3): 4-13.

Gilbert, R.J., and AR. Heidt. 1979. Movements of the short nose sturgeon, Acipenser brevirostrum, in the Altamaha River. Assoc. Southeastern Biol. Bull. 26:35.

Goetz, S. J., and P. Jantz. 2006. Sattelite maps show Chesapeake Bay urban development. EOS 87(15): 149, 152.

Goshorn, D., J. Deeds, P. Tango, C. Poukish, A. Place, M. McGinty, W. Butler, C. Luckett, and R. Magnien. 2004. Occurrence of Karlodinium micrum and its association with fish kills in Maryland Estuaries. In Proceedings of the Tenth International Conference on Harmful Algae, St. Petersburg, FL.

Gottlieb, S.J. 1998. Ecological role of Atlantic menhaden (Brevoortia tyrannus) in Chesapeake Bay and implications for management of the fishery. MS Thesis, U. of MD, MEES Program. 112 p.

Greer, R.L. 1915. The menhaden fishing industry of the Atlantic coast. Rep. U.S. Comm. Fish., 1914, Append. 3, 27 p.

Hain, J. H. W., M. J. Ratnaswamy, R. D. Kenney, and H. E. Winn. 1992. The fin whale, Balaenoptera physalus, in waters of the northeastern United States continental shelf. Rep. Int. Whal. Commn. 42: 653-669.

Hall Jr., L.W., S.A. Fisher, and J.A. Sullivan. 1991. A synthesis of water quality and contaminants data for the Atlantic menhaden, *Brevoortia tyrannus*: implications for Chesapeake Bay. J. Environ. Sci. Health Part A Environ. Sci. Eng. 26: 1513-1544.

Harbor Porpoise Take Reduction Plan Regulations. 1998. 63 Fed. Reg. 66464 (December 2, 1998).

Harbor Porpoise Take Reduction Plan Regulations. 2013. 78 Fed. Reg. 61821 (October 4, 2013).

Hare, J. A. and J. J. Govoni. 2005. Comparison of average larval fish vertical distributions among species exhibiting different transport pathways on the southeast United States continental shelf. Fish. Bull., U.S. 103:728-736.

Hare, J. A., S. Thorrold, H. Walsh, C. Reiss, A. Valle-Levinson and C. Jones. 2005. Biophysical mechanisms of larval fish ingress into Chesapeake Bay. Marine Ecology Progress Series 303:295-310.

Harrison, R.W. 1931. The menhaden industry. U.S. Bur. Fish., Invest. Rep. 1, 113 p.

Hettler Jr., W.F., and A.J. Chester. 1990. Temporal distribution of ichthyoplankton near Beaufort Inlet, North Carolina. Mar. Ecol. Prog. Ser. 68: 157-168.

Hettler, W. F., and D. R. Colby. 1979. A1 teration of heat resistance of Atlantic menhaden, Brevoortia tyrannus, by photoperiod. J. Comp. Biochem. Physiol. 63A: 141-143.

Hettler, W. F., Jr., D. S. Peters, D. R. Colby, and L. H. Laban. 1997. Daily variability in abundance of larval fishes inside Beaufort Inlet. Fish. Bull. 95:477–493.

Hettler, W.F. 1976. Influence of temperature and salinity on routine metabolic rate and growth of young Atlantic menhaden. J. Fish. Biol. 8: 55-65.

Hettler, W.F. 1981 Spawning and rearing Atlantic menhaden. Prog. Fish-Cult. 43:80-84.

Higham, J.R., and W.R. Nicholson. 1964. Sexual maturation and spawning of Atlantic menhaden. Fish. Bull. 63: 255-271.

Hilborn, R., Amoroso, R. O., Bogazzi, E., Jensen, O. P., Parma, A. M., Szuwalski, C., and C. J. Walters. 2017. When does fishing forage species affect their predators? Fisheries Research. 191:211-221.

Hilgartner, W. B. and G.S. Brush. 2006. Prehistoric habitat stability and post-settlement habitat change in a Chesapeake Bay freshwater tidal wetland, USA. Holocene 16:479-494.

Hirth, H.F. 1971. Synopsis of biological data on the green turtle Chelonia & (Linnaeus) 1758. FA0 Fish. Synop. 85:l-8, 19.

Houde unpublished. 2011. Unpublished data. Larval ingress research supported by NOAA Chesapeake Bay Office, Maryland DNR, and Atlantic States Marine Fisheries Commission. University of Maryland Center for Environmental Science, Chesapeake Biological Laboratory, Solomons, MD.

Houde, E. D. and L. W. Harding, Jr. 2009. Menhaden abundance and productivity in Chesapeake Bay: linking the environment and primary production to variability in fish recruitment. Final Report to NOAA Chesapeake Bay Office, Annapolis, MD. Grant No. NA04NMF4570359. Ref. No.

Houde, E. D., Annis, E. R., Harding, L. W., Mallonee, M. E., and M. J. Wilberg. 2016. Factors affecting the abundance of age-0 Atlantic menhaden (*Brevoortia tyrannus)* in Chesapeake Bay. ICES Journal of Marine Science, 73(9):2238-2251.

Hughes, A. R., S. L. Williams, C. M. Duarte, K. L. Heck, Jr., and M. Waycott. 2009. Associations of concern: declining seagrasses and threatened dependent species. Front. Ecol. Environ. 7(5): 242-246.

Humphrey, J., Wilberg, M.J., Houde E.D. & M. C. Fabrizio. 2014. Effects of Temperature on Age-0 Atlantic Menhaden Growth in Chesapeake Bay. Transactions of the American Fisheries Society. Vol. 143. Pages 1255-1265.

Identification of 14 Distinct Population Segments of the Humpback Whale *(Megaptera novaeangliea)* and Revision of Species-Wide Listing; Final Rule. 81 Fed. Reg. 62259 (September 8, 2016).

International Whaling Commission. 1992. Report of the comprehensive assessment special meeting on North Atlantic fin whales. Rep. int. Whal. Commn 42:595B644.

Judy, M.H., and R.M. Lewis. 1983. Distribution of eggs and larvae of Atlantic menhaden, Brevoortia tyrannus, along the Atlantic coast of the United States. U.S. NMFS. Spec. Sci. Rep. Fish. 774. 23 p.

June, F.C., and J.L. Chamberlin. 1959. The role of the estuary in the life history and biology of Atlantic menhaden. Proc. Gulf Carib. Fish. Inst. 11: 41-45.

Katona, S. K., and J. A. Beard. 1990. Population size, migrations, and feeding aggregations of the humpback whale (Megaptera novaeangliae) in the western North Atlantic Ocean. Rep. int. Whal. Commn. Special Issue 12: 295- 306.

Keinath, J.A., J.A. Musick, and R.A. Byles. 1987. Aspects of the biology of Virginia sea turtles: 1979-1986. Virginia Journal of Science 38(2):81.

Kendall, A.W. and J.W. Reintjes. 1975. Geographic and hydrographic distribution of Atlantic menhaden eggs and larvae along the middle Atlantic coast from R/V Dolphin cruises, 1965-1966. NMFS Fish. Bull. 73: 317-355.

Kenney, R. D. 2002. North Atlantic, North Pacific and southern right whales. Pages 806- 813 In W. F. Perrin, B. Wursig, J. G. M. Thewissen (eds.), Encyclopedia of marine mammals. Academic Press, San Diego, CA.

Kimmel, D. G., W. D. Miller, L. W. Harding Jr., E. D. Houde, and M. R. Roman. 2009. Estuarine ecosystem response captured using a synoptic climatology. Estuaries and Coasts. 32:3: 403-409.

Kiryu, Y., J. D. Shields, W. K. Vogelbein, D. E. Zwerner, and H. Kator. 2002. Induction of skin ulcers in Atlantic menhaden by injection and aqueous exposure to the zoospores of Aphanomyces invadans. J. of Aquatic Animal Health 14(1): 11-24.

Kleisner, K.M., M.J. Fogarty, S. McGee, A. Barnett, P. Fratantoni, J. Greene, J.A. Hare, S.M. Lucey, C. McGuire, J. Odell, and V.S. Saba. 2016. The effects of sub-regional climate velocity on the distribution and spatial extent of marine species assemblages. PLoS ONE 11(2): e0149220. doi:10.1371/journal.pone.0149220

Knowlton, A.R. and S.D. Kraus. 2001. Mortality and serious injury of North Atlantic right whales (Eubalaena glacialis) in the North Atlantic Ocean. J. Cetacean Res. Manage. (Special Issue) 2: 193-208.

Kraus, S. D., M. J., Crone and A. R. Knowlton. 1988. The North Atlantic right whale. Pages 684-698 *in* W. J. Chandler, ed. Audubon Wildlife Report, 1988/1989. Academic Press, New York, NY.

Kroger, R. L., J. F. Guthrie, and M. H. Judy. 1974. Growth and first annulus formation of tagged and untagged Atlantic menhaden. Trans. Am. Fish. SOC. 103:292-296.

Laist, D. W., Knowlton, A. R., Mead, J. G., Collet, A. S. and Podesta, M. 2001. Collisions between ships and whales. *Marine Mammal Science* 17(1): 35-75.

Laney, Wilson, Personal Communication. USFWS. March 2017.

Levine, J. F. 1990b. Species distribution of ulcerative lesions on finfish in the Tar-Pamlico River Estuary, North Carolina. Dis, of Aquatic Org. 8:1-5.

Levine, J. F., J. H. Hawkins, M. J. Dykstra, E. J. Noga, D. W. Moye, and R. S. Cone 1990a. Epidemiology of Ulcerative Mycosis in Atlantic Menhaden in the Tar-Palmico River Estuary, North Carolina. J. of Aquatic Animal Health 2:162-171.

Lewis R. M. and W. F. Hettler, Jr.1968. Effect of temperature and salinity on the survival of young Atlantic menhaden, Brevoortia tyrannus. Trans. Am. Fish. Soc. 97: 344-349.

Lewis, R. M. 1965. The effect of minimum temperature on the survival of larval Atlantic menhaden, Brevoortia tyrannus. Trans. Am. Fish. Soc. 94: 409-412.

Lewis, R.M. 1966. Effects of salinity and temperature on survival and development of larval Atlantic menhaden, *Brevoortia tyrannus*. Trans. Am. Fish. Soc. 95: 423-426.

Lewis, R.M., and W.C. Mann. 1971. Occurrence and abundance of larval Atlantic menhaden, *Brevoortia tyrannus*, at two North Carolina Inlets with notes on associated species. Trans. Am. Fish. Soc. 100: 296-301.

Lewis, R.M., D.W. Ahrenholz, and S.P. Epperly. 1987. Fecundity of Atlantic menhaden, Brevoortia tyrannus. Estuaries 10(4): 347-350.

Lewis, V.P., and D.S. Peters. 1984. Menhaden - a single step from vascular plant to fishery harvest. J. Exp. Mar. Biol. Ecol. 84: 95-100.

Light, P.R., and K.W. Able. 2003. Juvenile Atlantic menhaden (*Brevoortia tyrannus*) in Delaware Bay, USA are the result of local and long-distance recruitment. Estuar. Coast. Shelf. S. 57:1007-1014.

List of Fisheries for 2001. 66 Fed. Reg. 42780 (August 15, 2001).

List of Fisheries for 2003. 68 Fed. Reg. 41725 (July 15, 2003).

List of Fisheries for 2006. 71 Fed. Reg. 48802 (August 22, 2006).

List of Fisheries for 2007. 72 Fed. Reg. 14466 (March 28, 2007).

List of Fisheries for 2012. 76 Fed. Reg. 73911 (November 29, 2011).

List of Fisheries for 2017. 82 Fed. Reg. 3655 (January 12, 2017).

Lorenzen, K. 1996. The relationship between body weight and natural mortality in juvenile and adult fish: A comparison of natural ecosystems and aquaculture. Journal of Fish Biology 49:627-647.

Love, J. W., A. K. Johnson and E. B. May. 2006. Spatial and temporal differences of Atlantic menhaden (Brevoortia tyrannus) recruitment across major drainages (1966-2004) of the Chesapeake Bay watershed. Estuaries and Coasts 29:794-801.

Lozano, C. and E. D. Houde. 2013. Factors contributing to variability in larval ingress of Atlantic menhaden, *Brevoortia tyrannus.* Estuarine, Coastal and Shelf Science, 118:1-10.

Lozano, C., Houde, E. D., Wingate, R. L., and D. H. Sector. 2012. Age, growth and hatch dates of ingressing larvae and surviving juveniles of Atlantic menhaden *Brevoortia tyrannus.* Journal of Fish Biology, 81:1665-1685.

Luo, J., K. J. Hartman, S. B. Brandt, C. F. Cerco, and T. H. Rippetoe. 2001. A spatially-explicit approach for estimating carrying capacity: an application for the Atlantic menhaden (Brevoortia tyrannus) in Chesapeake Bay. Estuaries 24(4):545-556.

Lutcavage, M. and J.A. Musick. 1985. Aspects of sea turtle biology in Virginia. Copeia 2:449- 456.

Lynch, A. J., J. R. McDowell, J. E. Graves. 2010. A molecular genetic investigation of the population structure of Atlantic menhaden (Brevoortia tyrannus). Fishery Bulletin 108:87-97.

Lynch, P.D., M.J. Brush, E.D. Condon, and R.J. Latour. 2010. Net removal of nitrogen through ingestion of phytoplankton by Atlantic menhaden (Brevoortia tyrannus) in Chesapeake Bay. Marine Ecological Progress Series 401: 195-209.

Magnuson-Stevens Fishery Conservation and Management Act, Pub. L. No. 94-265, 16 U.S.C. § 1801 et seq., 90 Stat. 331 (1976).

Manderson, John, Personal Communication. NOAA Northeast Fishery Science Center. April 2017.

Marine Mammal Protection Act of 1972 As Amended, Pub. L. No. 92-522, 16 U.S.C. § 11361-1362, 1371-1389, 1401-1407, 1411-1418, 1421-1421h, 1423-1423h, 86 Stat. 1027 (1972).

MDSG, 2009. EBFM Menhaden Species Team. Ecosystem-Based Fisheries Management For Chesapeake Bay: Menhaden Background and Issue Briefs. Maryland Sea Grant, College Park, MD. UM-SG-TS-2009-08.

Miller, W. D., and L. W. Harding, Jr. 2007. Climate forcing of the spring bloom in Chesapeake Bay. Marine Ecology Progress Series 331:11-22.

Musick, J. A., and C. J. Limpus. 1997. Habitat utilization and migration in juvenile sea turtles. Pages 137-164 in P. L. Lutz and J. A. Musick, editors. The biology of sea turtles. CRC Press, Boca Raton, Florida, USA.

National Marine Fisheries Service. 1991. Proposed regime to govern the interactions between marine mammals and commercial fishing operations after October 1, 1993. Draft Environmental Impact Statement, June 1991.
National Marine Fisheries Service. 1993. Report on Implementation of the Marine Mammal Protection Act Interim Exemption Program, 1988-1993. Office of Protected Resources, NMFS, NOAA. 63 pp.
National Marine Fisheries Service. 1995. Status Reviews of Sea Turtles Listed Under the Endangered Species Act of 1973. Silver Spring, MD.
National Marine Fisheries Service. 1997. Fin Whale *(Balaenoptera physalus):* Western North Atlantic Stock.
National Marine Fisheries Service. 1999. Endangered Species Act Section 7 Consultation. Biological Opinion. Consultation Regarding the Federal Atlantic Herring Fishery.
National Marine Fisheries Service. 2002. U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments – 2002.
National Marine Fisheries Service. 2007. Hawksbill Sea Turtle *(Eretmochelys imbricata)* 5-Year Review: Summary and Evaluation. Office of Protected Resources. Silver Spring, MD.
National Marine Fisheries Service. 2008. Bottlenose Dolphin *(Tursiops truncates):* Western North Atlantic Coastal Morphotype Stocks.
National Marine Fisheries Service. 2011. Fin Whale *(Balaenoptera physalus)* 5-Year Review: Summary and Evaluation. Office of Protected Resources. Silver Spring, MD.
National Marine Fisheries Service. 2012. North Atlantic Right Whale 5 Year Review: Summary and Evaluation. Northeast Regional Office. Gloucester, MA.
National Marine Fisheries Service. 2013. Biological Report on the Designation of Marine Critical Habitat for the Loggerhead Sea Turtle, *Caretta caretta.*
National Marine Fisheries Service. 2013. Leatherback Sea Turtle *(Dermochelys coriacea)* 5-Year Review: Summary and Evaluation. Office of Protected Species, Silver Spring, MD.
National Marine Fisheries Service. 2015. Standardized Bycatch Reporting Methodology: An Omnibus Amendment to the Fishery Management Plans of the Mid-Atlantic and New England Regional Fishery Management Councils.
Nelson, W.R., M.C. Ingham, and W.E. Schaaf. 1977. Larval transport and year-class strength of Atlantic menhaden, Brevoortia tyrannus. Fish. Bull. 75: 23-41.
Nicholson, W.R. 1972. Population structure and movements of Atlantic menhaden, Brevoortia tyrannus, as inferred from back-calculated length frequencies. Ches. Sci. 13: 161-174.
Nicholson, W.R. 1978. Movements and population structure of Atlantic menhaden indicated by tag returns. Estuaries 1(3): 141-150.
Noga, E. J. and M. J. Dykstra. 1986. Oomycete fungi associated with Ulcerative Mycosis in Menhaden, Brevoortia-tyrannus (Latrobe). Journal of Fish Diseases 9(1):47-53.
Noga, E. J., J. F. Levine, M. J. Dykstra, and J. H. Hawkins. 1988. Pathology of ulcerative mycosis in Atlantic menhaden Brevoortia tyrannus. Dis. of Aquatic Org. 4: 189-197.
Nordlie, F. G. 1976. Influence of environmental temperature on plasma ionic and osmotic concentrations in *Mugil cephalus*. L. Comp. Biochem. Physiol. 55A:379-381.
Nordlie, F. G., W. A. Szelistowski, and W. C. Nordlie. 1982 Ontogenesis of osmostic regulation in the striped mullet, *Mugil cephalus*. L. J. Fish Biol. 20:79-86.
North Carolina Department of Environmental Quality. 2015. North Carolina Division of Water Resources Annual Report of Fish Kill Events 2015. North Carolina Department of Environmental Quality Division of Water Resources, Raleigh, NC.
Berkson, J., L. Barbieri, S. Cadrin, S. L. Cass-Calay, P. Crone, M. Dorn, C. Friess, D. Kobayashi, T. J. Miller, W. S. Patrick, S. Pautzke, S. Ralston, M. Trianni. 2011. Calculating Acceptable Biological Catch for

Stocks That Have Reliable Catch Data Only (Only Reliable Catch Stocks – ORCS). NOAA Technical Memorandum NMFS-SEFSC- 616, 56 P.

Orth, R, J., T. J. B. Carruthers, W. G. Dennison, C. M. Duarte, J. W. Fourqurean, K. L. Heck, Jr., A. R.Hughes, G. A. Kendrick, W. J. Kenworthy, S. Olyarnik, F. T. Short, M. Waycott, and S. L.Williams. 2006. A global crisis for seagrass ecosystems. BioScience 56(12): 987-996.

Oviatt, A. 1977. Menhaden, sport fish and fishermen, p. 53-66 In: Clepper, H. [Ed.] Marine recreational fisheries 2. Sport Fish. Inst., 220 p.

Oviatt, C.A., A.L. Gall, and S.W. Nixon. 1972. Environmental effects of Atlantic menhaden on surrounding waters. Chesapeake Sci. 13: 321-323.

Paerl, H. W., J. L. Pickney, J. M. Fear, and B. L. Peierls. 1998. Ecosystem responses to internal and watershed organic matter loading: consequences for hypoxia in the eutrophying Neuse River Estuary, North Carolina, USA. Marine Ecol. Progress Ser. 166: 17-25.

Perry S. L., DeMaster D. P. and Silber G. K. 1999. The fin whale. *Marine Fish Review* 61(1): 44-51.

Pershing, A. J., Alexander, M. A., Hernandez, C. M., Kerr, L. A., Bris, A. L. Mills, K. E., Nye, J. A., Record, N. R., Scannell, H. A., Scott, J. D., Sherwood, G. D., and A. C. Thomas. 2015. Slow adaptation in the face of rapid warming leads to collapse of the Gulf of Maine cod fishery. *Science,* Vol. 350, Issue 6262: 809-812.

Peters, D.S., and V.P. Lewis. 1984. Estuarine productivity: Relating trophic ecology to fisheries, p. 255-264 In: B.J. Copeland, K. Hart, N. Davis and S. Friday, (eds.) Research Managing the Nation's Estuaries. UNC Sea Grant College, Pub. UNC-SG-84-08, 420 p.

Peters, D.S., and W.E. Schaaf. 1981. Food requirements and sources for juvenile Atlantic menhaden. Trans. Am. Fish. Soc. 110: 317-324.

Poukish, Charles, Personal Communication. Environmental Assessment Division, Maryland Department of the Environment. March 2017.

Quinlan, J.A., B.O. Blanton, T.J. Miller, and F.E. Werner. 1999. From spawning grounds to the estuary: using linked individual-based and hydrodynamic models to interpret patterns and processes in the oceanic phase of Atlantic menhaden *Brevoortia tyrannus* life history. Fish. Ocean. 8 (Supplement 2): 224-246.

Reimschussel, R., C. M. Gieseker, C. Driscoll, A. Baya, A. S. Kane, V. S. Blazer, J. J. Evans, M. L. Kent, J. D. W. Moran and S. L. Poynton. 2003. Myxosporean plasmodial infection associated with ulcerative lesions in young-of-the-year Atlantic menhaden in a tributary of the Chesapeake Bay, and possible links to Kudoa clupeidae. Diseases Aquatic Organisms 53:143-166.

Reintjes, J.W., and A. Pacheco. 1966. The relation of menhaden to estuaries. Am. Fish. Soc. Spec. Publ. 3: 50-58.

Reish, R.L., R.B. Deriso, D. Ruppert, and R.J. Carroll. 1985. An investigation of the population dynamics of Atlantic menhaden (Brevoortia tyrannus). Can. J. Fish. Aquat. Sci. 42 (Suppl. 1): 147-157.

Rice, J.A., Quinlan, J.A., Nixon, S. W., Hettler, W. F., Warlen, S. M., and P. M. Steggmann. 1999. Spawning and transport dynamics of Atlantic menhaden: inferences from characteristics of immigrating larvae and predictions of a hydrodynamic model. Fisheries Oceanography 8:93-110.

Rogers, S. G., T. E. Targett, and S. B. VanSant. 1984. Fish-nursery use in Georgia salt-marsh estuaries: the influence of springtime freshwater conditions. Trans. AM. Fish. Soc. 113:595-606.

Rogers, S.G. and M.J. Van Den Avyle. 1989. Species Profiles: Life histories and environmental requirements of coastal fishes and invertebrates (Mid-Atlantic). Atlantic Menhaden. Biol. Rept. 82(11.108) TR EL-82-4. 23 p.

Schaaf, W. E. and G. R. Huntsman. 1972. Effects of fishing on the Atlantic menhaden stock: 1955-1969. Transactions of the American Fisheries Society, 101:290-297.

Schick, R. S., P. N. Halpin, A. J. Read, C. K. Slay, S. D. Kraus, B. R. Mate, M. F. Baumgartner, J. J. Roberts, B. D. Best, C. P. Good, S. R. Loarie, J.S. Clark. 2009. Striking the Right Balance in Right Whale Conservation. Canadian Journal of Fisheries and Aquatic Sciences 66(9):1399-1403.

Schueller, A.M., E.H. Williams, and R.T. Cheshire. 2014. A proposed, tested, and applied adjustment to account for bias in growth parameter estimates due to selectivity. Fisheries Research 158: 26-39.

Sherman, K., I. Belkin, K.D. Friedland, J. O'Reilly, and K. Hyde. 2009. Accelerated warming and emergent trends in fisheries biomass yields of the world's largest marine ecosystems. AMBIO: A Journal of the Human Environment 38(4): 215-224.

Smith, H.M. 1896. Notes on an investigation of the menhaden fishery in 1894 with special reference to the 93 food fishes taken. Bull. U.S. Fish Comm. 15: 285-302.

Smith, J. W. 1991. The Atlantic and gulf menhaden purse seine fisheries: origins, harvesting technologies, biostatistical monitoring, recent trends in fisheries statistics, and forecasting. Mar. Fish. Rev. 53(4):28–41.

Smith, J. W.1999. Distribution of Atlantic menhaden, Brevoortia tyrannus, purse-seine seta and catches from southern New England to North Carolina, 1985-1996, NOAA Tech. Rep. NMFS 144, 22p.

Smith, JW and WB O'Bier. 2011. The bait purse-seine fishery for Atlantic menhaden, Brevoortia tyrannus, in the Virginia portion of Chesapeake Bay. Mar Fish Rev 73(1): 1-12.

Smith, Kent, Personal Communication. Florida Fish Wildlife Conservation Commission. March 2017.

Stegmann, P.M., J.A. Quinlan, F.E. Werner, B.O. Blanton, and P. Berrien. 1999. Atlantic menhaden recruitment to a southern estuary: Defining potential spawning regions. Fish. Oceanogr. 8: 111-123.

Stephens, E. B., M. W. Newman, A. L. Zachary and F. M. Hetrick. (1980). A viral aetiology for the annual spring epizootics of Atlantic menhaden, Brevoortia tyrannus (Latrobe) in Chesapeake Bay. Journal of Fish Diseases 3:387-398.

Stine et al. 2005. Mycobacterial infection in laboratory-maintained Atlantic menhaden. J. Aquatic Animal Health 17:380-385.

Stout, V.F., C.R. Houle, and F.L. Beezhold. 1981. A survey of chlorinated hydrocarbon residues in menhaden fishery products. Mar. Fish. Rev. 43(3): 1-13.

Taking of Marine Mammals Incidental to Commercial Fishing Operations; Bottlenose Dolphin Take Reduction Plan Regulations; Sea Turtle Conservation; Restrictions to Fishing Activities; Final Rule. 71 Fed. Reg. 24776 (April 26, 2006).

Thompson, C. 2010. The Gulf of Maine in Context: State of the Gulf of Maine Report. Fisheries and Oceans Canada. Dartmouth, NS.

Threatened and Endangered Status for Distinct Population Segments of Atlantic Sturgeon in the Northeast Region. 77 Fed. Reg. 5880 (February 6, 2012).

U.S. Census Bureau. 2010. Coastline Population Trends in the United States: 1960 to 2008 Population Estimates and Projections. P25-1139. https://www.census.gov/prod/2010pubs/p25-1139.pdf

Vaughan, D.S., and J.W. Smith. 1988. A stock assessment of the Atlantic menhaden, Brevoortia tyrannus, fishery. NOAA Tech. Rep. NMFS 63, 18 p.

Viverette, C. B., Garman, G. ., McIninch, S. P., Markham, A. C., Watts, B. D., and S. A. Macko. 2007. Finfish-waterbird trophic interactions in tidal freshwater tributaries of the Chesapeake Bay. Waterbirds. 32:1: 50-62.

Walford, L.A., and R.I. Wicklund. 1968. Monthly sea temperature structure from the Florida Keys to Cape Cod. Serial Atlas of the Marine Environment. Folio 15. American Geographical Society, N .Y.

Walsh, H. J., Richardson, D. E., Marancik, K. E., and Hare, J. A. 2015. Long-term changes in the distributions of larval and adult fish the Northeast U.S. Shelf Ecosystem. PLoS ONE, 10: e0137382.

Waring GT, Josephson E, Fairfield-Walsh CP, Maze-Foley K, (eds.). 2009. U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments -- 2008. NOAA Tech Memo NMFS NE 210; 440 p.

Waring, G.T. J.M. Quintal and S.L. Swartz (eds.). 2000. U.S. Atlantic and GOM Marine Mammal Stock Assessments- 2000. NOAA Tech Memo. NMFS-NE-162, U.S. DOC. Washington, D.C. 303 p.

Waring, G.T., E. Josephson, K. Maze-Foley, and P.E. Rosel, editors. 2016. U.S. Atlantic and Gulf of Mexico Marine Mammal Stocks Assessments, 2015. NOAA Technical Memorandum NOAA-NE-238. 512 p.

Warlen, S. M. 1994. Spawning time and recruitment dynamic of larval Atlantic menhaden, *Brevoortia tyrannus,* in a North Carolina estuary. Fisheries Bulletin, 92:420-433.

Warlen, S.M., D.A. Wolfe, C.W. Lewis, and D.R. Colby. 1977. Accumulation and retention of dietary 14C-DDT by Atlantic menhaden. Trans. Am. Fish. Soc. 106: 95-104.

Warlen, S.M., K.W. Able, and E.H. Laban. 2002. Recruitment of larval Atlantic menhaden (*Brevoortia tyrannus*) to North Carolina and New Jersey estuaries: evidence for larval transport northward along the east coast of the United States. Fish. Bull. 100(3): 609-623.

Werner, F.E., B.O. Blanton, J.A. Quinlan and R.A. Luettich, Jr. 1999. Physical oceanography of the North Carolina continental shelf during the fall and winter seasons: implications for the transport of larval menhaden. In: Crowder, L.B. and F.E. Werner (eds.) Fisheries Oceanography of the Estuarine-dependent Fishes of the South Atlantic Bight. Fish. Oceanogr. 8(suppl. 2): 7-21.

Westman, J. R., and R. F. Nigrelli. 1955. Preliminary studies of menhaden and their mass mortalities in Long Island and New Jersey waters. N .Y. Fish Game J. 2: 142-153.

Whitehurst, J.W. 1973. The menhaden fishing industry in North Carolina. UNC-Sea Grant Publ. No. UNC-SG-72-12, 51 p.

Wiley, D. N., R. A. Asmutis, T. D. Pitchford, and D. P. Gannon. 1995. Stranding and mortality of humpback whales, Megaptera novaeangliae, in the mid-Atlantic and southeast United States, 1985-1992. Fish. Bull., U.S. 93: 196- 205.

Wilkens, E. P. H., and R. M. Lewos. 1971. Abundance and distribution of young Atlantic menhaden (*Brevoortia tyrannus)* in the White Oak River estuary, North Carolina. Fish. Bull., U.S. 69: 783-789.

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. Rep. Int. Whal. Comm. (Special issue) 10:129-138.

Wood, R. J., and H. M. Austin. 2009. Synchronous multidecadal fish recruitment patterns in Chesapeake Bay, USA. Can. J. Fish. Aquat. Sci.

Wood, R. J., E. D. Houde and S. Jung. 2004. Variability in the dynamics of forage fish abundances in Chesapeake Bay: retrospective analysis models and synthesis. Pages 97- 107. In; Orner, D. M. (ed). Chesapeake Bay Fisheries Research Program, Symposium Report- -2003. NOAA Chesapeake Bay Office, Annapolis, MD.

Wood, R.J. 2000. Synoptic scale climatic foraging of multispecies fish recruitment patterns in Chesapeake Bay. Coll. of William and Mary, Ph.D. Dissertation, 163 p.

Wynne, K. and M. Schwartz. 1999. Marine Mammals and Turtles of the U. S. Atlantic and Gulf of Mexico. Rhode Island Sea Grant. Narragansett, Rhode Island. 114 pp.

{This draft document is slated for presentation at the joint meeting of the ASMFC's Summer Flounder, Scup, and Black Sea Bass Board and the Mid-Atlantic Fishery Management Council on April 30, 2018, and is solely for the purpose of discussion.}

Strategic Plan

For Reforming Recreational Black Sea Bass Management

April 2018 – Discussion Draft

Goal: Improve the management program for recreational black sea bass by providing reasonable and equitable access to the resource, commensurate with stock status and distribution, and bolstering accountability.

General Strategy: Pursue a comprehensive, iterative approach -- developed and implemented via an interim program for 2018-2020, paving the way for fully amended program in 2021.

Timelines

A. 2018: Interim Program development and adoption
   2019-2020: Interim Program implementation

B. 2018-2020: Full Program development and adoption
   2021: Full Program implementation

Major Tracks

1. Stock Status
2. Catch & Effort Data
3. Management
4. Stakeholder Engagement

Key Related Consideration

- Addressing – and potentially integrating, as appropriate -- recreational summer flounder management

Initial Process for Board and Council Review & Feedback

- *At April 30th, 2018 joint Board/Council meeting, the Board and Council will not be called upon to engage in substantive discussion on the proposed strategy. Rather, after a brief presentation, the Board and Council will be asked if there is consensus support for the continued development of the strategy, per these next steps:*
  - *Following the meeting (through rest of May), Board and Council members are encouraged to provide feedback and guidance on the strategy: Does the strategy serve*

as a useful and appropriate platform for guiding reform of the management program? Does it capture the most important elements? Are there any key issues to be added/modified/removed?

- *June 2018: Leadership, staff, and GARFO identify/clarify tasks, actions, and timeframes needed to achieve key elements of strategy*
- *July 2018: Joint working group is convened to consider modifications to overall strategy, and develop initial set of options for 2019-2020 [interim] management program*
- *August 2018: Council and Board fully review overall strategy, and consider initial options for 2019-2020 management program*

Track 1: Stock Status

Assumptions/Findings/Factors:

- Managing for success; stock remains healthy and abundant; well above target status, with strong year class(es) continuing to support large amounts/levels of exploitable biomass.
- Stock status has remained strong notwithstanding yearly exceedances of ACLs, suggesting that ACLs may have been set too conservatively.
- The stock is differentiated into two distinct sub-areas separated by Hudson Canyon, and assessed and managed accordingly (via two or three regions).

Interim Program:

A. Summer 2018:
   - **Conduct data update, incorporating catch and survey data through 2017**
   - Present to SSC; use to recommend/establish interim, placeholder ABC & ACLs for 2019
     - Aim = begin process of ensuring that ABC/ACLs for 2019-2020 are commensurate with latest survey data pertaining to stock status and year-class strength.
     - Goal = no decrease if not warranted; status quo, or increase, as warranted
     - Consistent with MAFMC staff recommendations, offered in January 12, 2017 memo, suggesting that SSC and MC may want to revisit and evaluate specifications for 2019, due in part to potentially strong 2015 year class.
   - ACL used for initial development of 2019-2020 management program

   ❖ **ACTION ITEM:**
   Science Center confirms Data Update for summer 2018

B. Late 2018/Early 2019:
   - **Conduct Operational Update**
   - Complete early enough in 2019 to be applicable for 2019
   - Incorporate recalibrated MRIP data
   - Assess current F relative to F target, for southern and northern sub-units
   - Assess region-specific distribution, abundance, size structure, exploitable biomass
   - Use to establish ABC and ACLs for 2019-2020, including northern and southern sub-ACLs -- thereby updating interim, placeholder ABC/ACLs set in August 2018

   ❖ **ACTION ITEM:**
   NRCC prioritizes Operational Update for late 2018/early 2019

Full Program:

2020: New **Benchmark Stock Assessment**

- Use to set 3-year ACLs (2021-2024) in accordance with amended management program

❖ **ACTION ITEM:**
Schedule black sea bass benchmark assessment for 2020

[Post 2020: Operational Updates every 3 years; new Benchmark Assessments every 6 years]

Track 2: Catch & Effort Data

Assumptions/Findings/Factors:

- There is a continuing need for more accurate data on catch (harvest + discards) and effort to 1) improve the stock assessment; 2) better assess total mortality; 3) improve the basis for setting and evaluating management measures; and 4) establish exploitable biomass.
- Continued improvements to MRIP are necessary and important, but the program needs to be used in accordance with its design and purpose – to provide general status and trends on a broad, regional scale, over multiple years.
- MRIP should not be used for annual catch estimates and projections.
- There may be value in complementing MRIP with self-reported data provided directly by anglers.

Interim Program:

A. Late 2018/Early 2019: Recalibrated ***MRIP*** data is applied in Operational Update.

   2018-2020: MRIP continues to improve, with full transition to Fishing Estimate Survey, ongoing refinements to state-administered Access Point Angler Intercept Survey program, and lower refusal rates resulting from new Angler Stewardship and Reporting Initiative.

B. 2018: Data for federally permitted for-hire fleet is enhanced via new, mandatory ***eVTRs***.

   2018-2019: States consider complementing federal eVTR Program with similar requirements for state-permitted for-hire fleet.

   - How used by MRIP?
   - Need for dockside validation component?

C. 2018-2020: ***Data smoothing*** techniques are further refined and applied to MRIP-derived catch estimates, over multiple years.

   - Aim = mitigate variability (e.g., major outliers) that is unreflective of actual status/trends; [and address uncertainty in catch estimates via expanded use of confidence intervals/]
   - Stand-alone exercise, or integrated into MRIP?

   ❖ **ACTION ITEM:**
   Task TC with developing white paper on smoothing protocols and approved methodologies and applications.

D. 2018-2019: ***Angler Reporting*** component of Angler Stewardship and Reporting Initiative developed, in coordination with ACCSP, states, and community/industry advisors (see Track 4).

   2019-2020: Angler Reporting component implemented, as stand-alone initiative, or as complement to MRIP.

Full Program:

2020: New benchmark assessment and amended management program incorporate and advance improvements in catch & effort data

Track 3: Management

Assumptions/Findings/Factors:

- There is a need to transition the management program from one that involves chasing RHL-based hard targets on an annual basis to one that is focused on achieving ACL-based targets over multi-year periods (e.g., 3-5).
    - Affording more stability, more accurate evaluations of performance relative to targets, and more focus on total mortality (catch) versus fish retained (harvest).
- There is a need to apply an F-based approach, tied to update assessments, for setting measures and evaluating performance over multi-year periods (e.g., 3-5).
- There is a need to establish appropriately configured regional programs designed to achieve regional F targets that are aligned with regional stock status (exploitable biomass).
- There is a need to provide reasonable and equitable access to the resource, throughout its range, subject to regional differentiation (conservation equivalency); with equity based largely on the opportunity for similar yields (angling experience) for all anglers in all regions.

Interim Program

A. 2018: Develop new Framework/Addenda addressing conservation equivalency, slot limits and transiting (tools in the tool box)

   2018: Develop new/revised Addendum (replacing Addendum XXX), setting forth interim management program for 2018-2019, as placeholder, while fully amended program is being developed.

B. 2019-2020: Implement interim program, per Addendum

Full Program

A. 2018-2019: Develop
   2020: Adopt

B. 2021: Implement

Elements of Interim Program:

1. Addendum XXX sets forth a revised approach for management in 2018, and the Board may extend the Addendum through 2019. However, given concerns associated with the Addendum, the Board may prefer to revisit some, or all, of the provisions set forth in the Addendum, and potentially craft a significantly new (interim) approach for 2019-2020. Such an approach could involve, in essence, "hitting the reset button." In keeping with that perspective, the following option, involving interim ***baseline measures*** for three regions (as currently configured under Addendum XXX) is offered for potential consideration:

Region	**Min Size**	**Season & Bag**			
DE - NC	12"	May-June (15)	July-Aug (5)	Sept-Dec (15)	
NJ	12.5"	May – June (10)	July-Aug (5)	Sept-Oct (10)	Nov-Dec (12)
NY-MA	13"	May-Aug (5)		Sept-Oct (8)	Nov-Dec (10)

- Aim = Establish fair and level playing field, affording all anglers the same baseline angling experience (i.e., potential for similar yields); scaled, as appropriate, in accordance with resource distribution and abundance.
- Size, season, and bag to be scaled, as needed, to align projected catch (total mortality) with regional F targets.
- Fishery performance during Interim program will be assessed and used for the setting of specifications for Full program.
- As a matter of policy, all anglers will be called upon to report their catches and minimize discard mortality (see Angler Stewardship and Reporting Initiative under Track 4).

2. Address ***conservation equivalency***
   - Consider addressing some elements for 2019-2020, per Interim program; others for 2021, per Full program
   - Key elements:
     - Enabling NMFS to waive federal waters measures (i.e., non-preferred coastwide measures) in favor of regional CE measures
     - Enabling CE to rollover from year to year
     - Enabling CE measures to constrain catch to the ACL, rather than constraining harvest to the RHL
     - Integrating regional allocations as a component of CE
     - Further clarifying/codifying the "flexible consistency" nature of CE – i.e., enabling states to tailor regulations to address the needs and interests of their recreational fishing communities, provided the regulations remain bounded by/consistent with regional standards.

3. Address ***transiting*** in Block Island Sound.

4. Address ***slot limits.***

5. Address ***effective and uniform enforcement*** of regulatory program by all states.

❖ **ACTION ITEMS:**

1. **Continue with development and adoption of new Framework/Addendum addressing conservation equivalency, transiting, and slot limits.**
2. **Plan for development and adoption of additional, separate Addendum, to replace Addendum XXX for 2019-2010.**
1. **[Note: Recognize need for additional new Addendum for recreational summer flounder for 2019 and thereafter.]**

Elements of Full Program:

1. Establish new F-based management program, regionally applied (i.e., two areal sub-units), with regional programs designed to achieve regional F targets that are aligned with regional stock status.
    - Informed by contractual project, focused on summer flounder, being administered by the MAFMC
    - Tied to 2020 benchmark assessment, and northern and southern region biological reference points
    - Focused on managing for total mortality, i.e., ACL-based
    - Measures set and evaluated over 3-year periods

2. Address accountability measures – i.e., how to address exceedances of ACL, or F targets, at coastwide/regional levels.

3. Address standard(s) for achieving fair and equitable access to the resource throughout its range, subject to regional differentiation (conservation equivalency); with equity based largely on the opportunity for similar yields (angling experience) for all anglers in all regions.

4. Address conservation equivalency standard(s).
    - "Flexible consistency"
    - Regionally based
    - Enabling states within regions the opportunity to tailor their programs, to some extent, while maintaining fairness and equity and facilitating compliance and enforcement (e.g., via consistency within regions; and alignments with similar fisheries, such as summer flounder and scup)

5. Establish measures and programs aimed at minimizing discard mortality
    a. With fewer dead discards leading to more harvest opportunities.
    b. Support and enable low-discard fisheries, e.g., smaller minimum sizes, full retention programs, alignments of seasons for species guilds, etc.
    c. As a matter of policy, call upon angling community to employ best practices (see Angler Stewardship and Reporting Initiative under Track 4).
    d. Obtain better data on discard rates, and contributing factors; then use data to inform program development

6. Consider sector differentiation/separation
    - i.e., separate measures for shore-based, general category fishery, and for-hire fisheries

7. Consider establishing a Wave 1 fishery.

- **ACTION ITEMS:**
    1. **Establish process for determining most appropriate vehicles for addressing elements – e.g., changes to FMP, National Standard guidelines, Council/Commission risk policies – then chart course over 2018-2020 period to address the issues via the appropriate vehicles.**

Track 4: Stakeholder Engagement

Assumptions/Findings/Factors:

- The recreational angling community needs to serve as a full partner in all aspects of the reform initiative. That means full participation in the development of and implementation of the new program; and a willingness to advocate for and engage in the practices and activities that are critical to program success. As a matter of policy, all anglers should be fully accountable for their catches.
- Key areas of involvement include more comprehensive and accurate reporting on catches, reduced discard mortality, and enhanced regulatory compliance.
- Better reporting, less discards/discard mortality, and better compliance leads to better data, less waste and more harvest opportunities, a more level playing field, and, overall, an improved management program. The angling community has a vested interest in being part of the solution; no interest in being part of the problem. As such, they need to be afforded meaningful opportunities to contribute, and do so on their own terms. A new Initiative, as proposed, provides a platform for galvanizing such efforts along the coast.
- Recreational fishing groups and associations, with funding support from Sea Grant Programs, are ideally suited to spearhead this effort.
- The primary focus is on voluntary, industry-driven efforts; however, some elements could be considered for codification in management plans and/or regulation, if the industry supports moving in that direction.
- The role of voluntary angler reporting – e.g., as a source of useful information for management purposes, and/or as a complement to MRIP – needs to be further explored and clarified.

Interim/Final Program

Element 1: Public participation in reform process

2018-2020: Provide ample opportunities for public input and advice throughout the process

Element 2: Angler Stewardship and Reporting Initiative

2018-2019: Develop new Initiative

2019-2020: Implement new Initiative

Inherent in all aspects of reform plan is transparent decision-making process, with robust opportunities for public input.

Elements of Angler Stewardship and Reporting Initiative:

- Overall goal is to advance resource stewardship principles/angler ethics, such as:
  - ***Comprehensive and accurate catch reporting*** --
    - Via minimized refusal rates for MRIP interviews (APAIS), and maximized return rates for MRIP mail surveys (FES); recognizing that noncompliance with MRIP perpetuates recreational data problems, while compliance contributes to their resolution.
    - Via mandatory reporting for all state-permitted for-hire vessels (eVTRs)
      - Complementing mandatory program for federally permitted for-hire vessels.
    - Via new voluntary angler reporting program.
      - Coordinated through ACCSP as a citizen-science-based complement to MRIP.
      - Standardizing the various reporting apps and programs in place in various states (elogbooks → isnapper); enabling use of smart phones and tablets for real-time reporting on all trips (number and size caught, kept, discarded alive/dead/poor condition).
      - Enabling the recreational angling community to build their own database of information, which can be compared to that generated by MRIP.
      - Ultimately, program could be integrated with recreational saltwater licensing programs – i.e., as a matter of policy, all licensees would be called upon to report their catches as a license condition.
  - ***Reducing discards and discard mortality --***
    - Via advocacy for and adoption of practices and activities such as: use of larger hooks; never highlining; discontinuing fishing activities, or targeting other species, once limits have been caught; avoiding/limiting barotrauma.
      - Drawing upon NJ's campaign pertaining to summer flounder as a model.
      - Consider use of incentives (free hooks, hats) in return for those who commit to doing the right thing.
    - Via increased involvement in tagging programs.
    - Via pilot programs, tied to angler reporting component of program.