

Atlantic Salmon Fishery Management Plan

Framework Adjustment 1

Including an Environmental Assessment and
Regulatory Flexibility Analysis



FINAL

January 25, 2024

Prepared by the
New England Fishery Management Council
In consultation with the
National Marine Fisheries Service



Document history

Initial Framework Meeting:	September 28, 2022
Final Framework Meeting:	April 18, 2023
Preliminary Submission:	May 3, 2023
Final Submission:	January 25, 2024

Cover image

NOAA Fisheries

FRAMEWORK ADJUSTMENT 1 TO THE ATLANTIC SALMON FISHERY MANAGEMENT PLAN

Proposed Action:	Possessing Atlantic salmon in the U.S. Exclusive Economic Zone (EEZ) is prohibited under the Fishery Management Plan. Framework 1 would authorize conditions for possession of farmed Atlantic salmon consistent with the conservation objectives of the Atlantic Salmon FMP and establish the requirements of an Atlantic salmon aquaculture Letter of Authorization program to be administered by NOAA Fisheries. Compliance with this program would facilitate the legal possession of farmed Atlantic salmon in a manner that promotes efficient operations and supports continued enforcement of the prohibition against possessing wild Atlantic salmon.
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Abstract:	<p>The New England Fishery Management Council, in consultation with NOAA’s National Marine Fisheries Service, has prepared Framework Adjustment 1 to the Atlantic Salmon Fishery Management Plan, which includes an environmental assessment that presents the range of alternatives to achieve the goals and objectives of the action. The purpose of the action is to consider authorizing conditions for the possession of farm-raised Atlantic salmon within the EEZ. This document describes the affected environment and valued ecosystem components and analyzes the impacts of the alternatives on both. It addresses the requirements of the Magnuson Stevens Fishery Conservation and Management Act, the National Environmental Policy Act, the Regulatory Flexibility Act, and other applicable laws.</p>

1.0 EXECUTIVE SUMMARY

The New England Fishery Management Council (NEFMC) manages the Atlantic salmon fishery under the Atlantic Salmon Fishery Management Plan (FMP). The FMP has been updated through a series of amendments.

This action, Framework 1 (FW1), includes alternatives that would authorize conditions for possession of farmed Atlantic salmon consistent with the conservation objectives of the Atlantic Salmon FMP (Table 1). The need for this action is to develop conservation and management measures that facilitate legal possession of aquaculture-raised Atlantic salmon within NEFMC jurisdiction under conditions that are consistent with the FMP's goals and objectives (i.e., to facilitate the legal possession of farmed Atlantic salmon in a manner that promotes efficient operations and supports continued enforcement of the prohibition against possessing wild Atlantic salmon).

Proposed Action

The Council is recommending Alternative 3, authorization of conditions for possession of farmed Atlantic Salmon in the Exclusive Economic Zone (EEZ) via a Letter of Authorization (LOA). Under Alternative 3, possession of farmed Atlantic salmon would be explicitly authorized under conditions that are consistent with the conservation objectives of the Atlantic Salmon FMP. This alternative would allow each aquaculture operation to be issued and maintain a single Letters of Authorization that would list all vessels authorized to possess and transport Atlantic salmon within the EEZ. Measures are the same as for Alternative 2, described below, except that vessel and dealer permitting production reporting requirements are not included.

Impacts of the Proposed Action

No direct impacts of the proposed action on wild Atlantic salmon, other managed and ecosystem component species, the physical environment and essential fish habitat, and protected species are expected. Direct effects on human communities are expected to be negligible to slight negative, due to the need to comply with administrative requirements of the LOA. See section 6.0 for impacts of all alternatives.

Alternatives to the Proposed Action

Under Alternative 1 (No Action), possession of wild Atlantic salmon would remain prohibited in federal waters of the EEZ off the Northeastern U.S. The Council would not establish a specific authorization program for aquaculture operators to help ensure operational consistency with the Atlantic salmon FMP and would not establish any reporting or monitoring requirements. Aquaculture operators and related parties such as dealers may be required to individually ensure that they can provide evidence sufficient to demonstrate such fish were harvested or transferred from aquaculture enterprises.

Under Alternative 2, possession of farmed Atlantic salmon would be explicitly authorized under conditions that are consistent with the conservation objectives of the Atlantic Salmon FMP, requiring adherence to certain reporting and enforcement provisions outlined below. These provisions include the issuance of LOAs which list vessels that would be used to transport farmed Atlantic salmon within the EEZ, as well as vessel and dealer permitting and reporting requirements.

Table 1. Summary of potential impacts of the alternatives under consideration in Framework 1 across the valued ecosystem components. Direct impacts of this action vs. potential future effects of aquaculture development are denoted separately. The preferred alternative is shaded.

Alternatives	Direct and Indirect Impacts				
	Atlantic Salmon	Other Managed and Ecosystem Component Species	Physical Env. and Essential Fish Habitat	Protected Species	Human Communities
Alt. 1: No Action	Direct effects: None Potential future effects: Highly uncertain, potentially negative	Direct effects: None Potential future effects: Highly uncertain, potentially negative	Direct effects: None Potential future effects: Highly uncertain, potentially negative	Direct effects: None Potential future effects: Highly uncertain, potentially negative	Direct effects: Negligible to slight negative, more negative than Alternatives 2 and 3 Potential future effects: Highly uncertain
Alt. 2: Authorization via LOA, Vessel and Dealer Reporting	Direct effects: None Potential future effects: Highly uncertain, potentially negative	Direct effects: None Potential future effects: Highly uncertain, potentially negative	Direct effects: None Potential future effects: Highly uncertain, potentially negative	Direct effects: None Potential future effects: Highly uncertain, potentially negative	Direct effects: Negligible to slight negative Potential future effects: Highly uncertain
Alt. 3: Authorization via LOA (Preferred Alternative)	Direct effects: None Potential future effects: Highly uncertain, potentially negative	Direct effects: None Potential future effects: Highly uncertain, potentially negative	Direct effects: None Potential future effects: Highly uncertain, potentially negative	Direct effects: None Potential future effects: Highly uncertain, potentially negative	Direct effects: Negligible to slight negative Potential future effects: Highly uncertain

2.0 TABLE OF CONTENTS

1.0	EXECUTIVE SUMMARY.....	4
2.0	TABLE OF CONTENTS.....	6
2.1	Tables.....	8
2.2	Figures.....	9
2.3	Maps.....	9
2.4	Acronyms.....	9
3.0	BACKGROUND AND PURPOSE	12
3.1	Background.....	12
3.2	Purpose and Need	12
3.3	Goals and Objectives	13
4.0	ALTERNATIVES UNDER CONSIDERATION.....	14
4.1	Alternative 1 - No Action.....	14
4.2	Alternative 2 – Explicitly Authorize Conditions for Possession of Farmed Atlantic Salmon in the EEZ via Letter of Authorization, Vessel, and Dealer Reporting.....	14
4.3	Alternative 3 – Explicitly Authorize Conditions for Possession of Farmed Atlantic Salmon in the EEZ via Letter of Authorization (Preferred Alternative)	17
4.4	Alternatives Considered but Rejected.....	19
5.0	AFFECTED ENVIRONMENT	20
5.1	Introduction.....	20
5.2	Atlantic Salmon	23
5.2.1	Stock Status.....	23
5.2.2	Federal Management.....	23
5.2.3	Elements of a Typical Net Pen Atlantic Salmon Aquaculture Operation	24
5.2.4	Potential impacts of aquaculture activities on Atlantic salmon.....	25
5.3	Physical Environment and Essential Fish Habitat	25
5.3.1	Oceanography	25
5.3.2	Sediments	26
5.3.3	Benthic Invertebrates	27
5.3.4	Essential Fish Habitat.....	28
5.3.5	Potential Impacts of Aquaculture Activities	36
5.4	NEFMC-Managed Fishery and Ecosystem Component Species.....	37
5.4.1	Species occurring within the affected environment for this action	37
5.4.2	Potential impacts of aquaculture activities on fishery and ecosystem component species ...	38
5.5	Other Protected Species	39
5.5.1	Species present in the area	39

5.5.2	Potential impacts of aquaculture activities on protected species.....	41
5.6	Human Communities	42
5.6.1	Commercial and Recreational Fisheries and Fishing Communities.....	42
5.6.2	Fishery Reporting Mechanisms.....	44
5.6.3	Aquaculture Businesses and Broader Community Impacts	45
6.0	ENVIRONMENTAL IMPACTS OF ALTERNATIVES.....	46
6.1	Introduction.....	46
6.2	Impacts on Atlantic Salmon.....	48
6.3	Impacts on Other Managed and Ecosystem Component Species	49
6.4	Impacts on the Physical Environment and Essential Fish Habitat.....	49
6.5	Impacts on Protected Species.....	50
6.6	Impacts on Human Communities.....	51
6.6.1	Alternative 1 – No Action	51
6.6.2	Alternative 2 – Explicitly Authorize Conditions for Possession of Farmed Salmon via LOA, Vessel, and Dealer Reporting.....	53
6.6.3	Alternative 3 – Explicitly Authorize Conditions for Possession of Farmed Salmon via LOA (Preferred Alternative).....	54
6.7	Cumulative Effects Analysis.....	55
6.7.1	Introduction.....	55
6.7.2	Relevant Actions Other Than Those Proposed in this Document.....	56
6.7.3	Magnitude and Significance of Cumulative Effects.....	64
6.7.4	Proposed Action on all the VECs.....	67
7.0	APPLICABLE LAWS/EXECUTIVE ORDERS.....	70
7.1	Magnuson-Stevens Fishery Conservation and Management Act	70
7.1.1	National Standards	70
7.1.2	Other MSA Requirements.....	71
7.2	National Environmental Policy Act.....	73
7.2.1	Environmental Assessment	73
7.2.2	Point of Contact.....	74
7.2.3	Agencies Consulted.....	74
7.2.4	List of Preparers	74
7.2.5	Opportunity for Public Comment.....	75
7.3	Marine Mammal Protection Act (MMPA).....	75
7.4	Endangered Species Act (ESA)	76
7.5	Administrative Procedures Act (APA)	76
7.6	Paperwork Reduction Act.....	76

7.7	Coastal Zone Management Act (CZMA).....	76
7.8	Information Quality Act (IQA).....	77
7.9	Executive Order 13158 (Marine Protected Areas).....	79
7.10	Executive Order 13132 (Federalism).....	79
7.11	Executive Order 12898 (Environmental Justice).....	80
7.12	Regulatory Flexibility Act (RFAS).....	80
7.12.1	Description and estimate of the number of small entities to which the rule applies.....	81
7.12.2	Summary of the Proposed Action and significant alternatives	82
7.12.3	Description and estimate of economic impacts on small entities, by entity size and industry	84
7.12.4	Summary and Conclusions	88
7.13	Executive Order 12866 (Regulatory Planning and Review).....	89
7.13.1	Determination of significance under E.O. 12866	89
7.13.2	Goals and Objectives	89
7.13.3	Description of the Proposed Management Action	90
7.13.4	Background, Purpose and Need.....	90
7.13.5	Analysis of Alternatives.....	91
7.13.6	Determination of Significance	95
8.0	GLOSSARY	96
9.0	REFERENCES	100
10.0	APPENDIX A: ATLANTIC SALMON MANAGEMENT	105
10.1	State Management.....	105
10.2	International Management	106
10.3	Cooperative Agreements.....	107
11.0	APPENDIX B: PERMITTING PROCESS FOR FINFISH AQUACULTURE	108

2.1 TABLES

Table 1. Summary of potential impacts of the alternatives under consideration in Framework 1 across the valued ecosystem components. Direct impacts of this action vs. potential future effects of aquaculture development are denoted separately. The preferred alternative is shaded.	5
Table 2. Purpose and need for Framework 1.	13
Table 3. Summary of Geographic distributions and habitat characteristics of Essential Fish Habitat designations for benthic fish and shellfish species managed by the New England and Mid-Atlantic fishery management councils in the Greater Atlantic region, as of October 2019.....	28
Table 6. Stock status of the top species (by landings) managed by NEFMC in the Gulf of Maine.	37

Table 4. Species protected under the ESA and/or MMPA that may occur in the area of the EEZ within which Atlantic salmon aquaculture operations may occur. Marine mammal species italicized and in bold are considered MMPA strategic stocks. ¹	39
Table 5. General definitions for impacts and qualifiers relative to resource condition (i.e., baseline).....	47
Table 7. Summary of Cumulative Effects of the Preferred Alternatives.	69
Table 8. Public meetings related to Framework 1.....	75
Table 9. Permitting considerations for aquaculture projects addressed through this framework action that are not directly addressed in other federal agency permitting processes.....	112
Table 10. Considerations for aquaculture projects addressed through other federal agency permitting and therefore not included in framework alternatives. These are common requirements typically required through consultations with other federal agencies, but others can be added because of agency consultations and public input. Note: USACE only permits aquaculture structures. Other conditions are typically added based on consultations with NMFS.....	113

2.2 FIGURES

Figure 1. Overall climate vulnerability score for Greater Atlantic species. Atlantic salmon is very highly sensitive and very highly exposed to climate change.....	64
Figure 2. Draft Environmental review and permitting process for federal waters finfish aquaculture projects in the Greater Atlantic Region.	114

2.3 MAPS

Map 1. Spatial footprint of the affected environment where Atlantic salmon aquaculture is likely to occur, overlaid on bathymetry. Areas shallower than 100 ft were excluded from the footprint. Depths below 1,200 ft are shaded a uniform dark blue to better show shallow and deep areas in the Gulf of Maine.	21
Map 2. Spatial footprint of the affected environment where Atlantic salmon aquaculture is likely to occur, overlaid on average annual surface temperature. Areas within the analysis footprint do not exceed the thermal maxima for salmon growth, which is approximately 25° C.....	22
Map 3. Gulf of Maine call area.	61
Map 4. Active renewable energy leases in Southern New England.....	62

2.4 ACRONYMS

ALWTRP	Atlantic Large Whale Take Reduction Plan
AP	Advisory Panel
APA	Administrative Procedures Act
APHIS VS	Animal and Plant Health Inspection Service Veterinary Service
ASMFC	Atlantic States Marine Fisheries Commission

BDTRP	Bottlenose Dolphin Take Reduction Plan
BiOp, BO	Biological Opinion, a result of a review of potential effects of a fishery on Protected Resource species
BOEM	Bureau of Ocean Energy Management
CAAP	Concentrated Aquatic Animal Production
CC	Cape Cod
CEA	Cumulative Effects Analysis
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CMS	Containment Management System
CRMC	Coastal Resources Management Council (Rhode Island)
CVA	Climate Vulnerability Assessment
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
DMF	Division of Marine Fisheries (Massachusetts)
DMR	Department of Marine Resources (Maine)
DOF	Declare out of Fishery
DPS	Distinct Population Segment
EA	Environmental Assessment
EEZ	Exclusive economic zone
EFH	Essential fish habitat
EFP	Exempted Fishing Permit
EIS	Environmental Impact Statement
EO	Executive Order
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FDA	U.S. Food and Drug Administration
FEIS	Final Environmental Impact Statement
FMP	Fishery management plan
FW	Framework
FWCA	Fish and Wildlife Coordination Act
GARFO	Greater Atlantic Regional Fisheries Office
GB	Georges Bank
GIS	Geographic Information System
GOM	Gulf of Maine
HAPC	Habitat area of particular concern
HPTRP	Harbor Porpoise Take Reduction Plan
IQA	Information Quality Act
LOA	Letter of Authorization

LOF	List of Fisheries
MAB	Mid-Atlantic Bight
MAFMC	Mid-Atlantic Fishery Management Council
MMPA	Marine Mammal Protection Act
MMAP	Marine Mammal Authorization Program
MPA	Marine Protected Area
MSA	Magnuson-Stevens Fishery Conservation and Management Act
NASCO	North Atlantic Salmon Conservation Organization
NEFMC	New England Fishery Management Council
NEFSC	Northeast Fisheries Science Center
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NMSA	National Marine Sanctuaries Act
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollution Discharge Elimination System
OLE	Office for Law Enforcement (NMFS)
OMB	Office of Management and Budget
PBR	Potential Biological Removals
PDT	Plan Development Team
PRA	Paperwork Reduction Act
RFA	Regulatory Flexibility Act
RHA	Rivers and Harbors Act
SAFIS	Standard Atlantic Fisheries Information System
SBNMS	Stellwagen Bank National Marine Sanctuary
SBRM	Standardized Bycatch Reporting Methodology
SFA	Sustainable Fisheries Act
SSC	Scientific and Statistical Committee
TRP	Take Reduction Plans
USCG	United States Coast Guard
USFWS	United States Fish and Wildlife Service
USACE	United States Army Corps of Engineers
VMS	Vessel Monitoring System
VEC	Valued Ecosystem Component
VTR	Vessel Trip Report (eVTR, electronic VTR)
WGOM	Western Gulf of Maine

3.0 BACKGROUND AND PURPOSE

3.1 BACKGROUND

The need for Atlantic salmon (*Salmo salar*) conservation and management is a long-recognized issue. The New England coastal states manage salmon in their waters under various commissions, agreements, and programs established as early as the 1940s. The North Atlantic Salmon Conservation Organization (NASCO) is an international organization established by the [Convention for the Conservation of Salmon in the North Atlantic Ocean](#), in 1984. The Convention created protected areas free from targeted salmon fishing beyond 12 miles from the coast. NASCO standards, especially the Williamsburg Resolution, are designed to minimize the impacts of Atlantic salmon aquaculture, introductions, transfers, and transgenics on wild stocks (see <https://nasco.int/conservation/aquaculture-and-related-activities/>).

Despite state management and international cooperation under the 1984 Convention, a gap remained in terms of conservation and management measures between 3-12 miles from shore. Thus, the [1987 Council Fishery Management Plan \(FMP\)](#) for Atlantic Salmon was developed to address this gap and support restoration of the U.S. Atlantic salmon resource. The FMP prohibits a directed or incidental fishery in federal waters (3-200 miles), and the primary measure in the FMP is a prohibition on possession of Atlantic salmon in federal waters. The FMP complements Atlantic salmon conservation measures enacted by the states. Amendment 1 (1999) included a framework process to develop conservation and management measures that facilitate Atlantic salmon aquaculture if “it is consistent with the goals and objectives of the Atlantic Salmon FMP” ([final rule](#)).

The possible need for Council action related to Atlantic salmon aquaculture arose because of the proposed Blue Water Fisheries Project. Blue Water Fisheries is proposing a commercial-scale marine finfish aquaculture facility within federal waters; the specific site location remains to be determined but is generally planned to be ENE of Newburyport Harbor. The facility would be used to raise steelhead trout (*Oncorhynchus mykiss*) and Atlantic salmon. Lumpfish (*Cyclopterus lumpus*) culture is planned to be used to manage external parasites. The permitting process for this project is underway and an environmental impact statement (EIS) will be prepared, coordinated by NOAA Fisheries. A notice of intent has not yet been published for the EIS, so there is no specific timeline for this development.

Authorizing conditions for possession of farmed Atlantic salmon within the U.S. EEZ through this framework would facilitate operation of Atlantic salmon aquaculture projects, including the Blue Water Fisheries project, and ensure continued enforcement of the prohibition on possession of wild Atlantic salmon in the EEZ, but providing a means to differentiate authorized possession of farmed Atlantic salmon from unauthorized possession of wild Atlantic salmon in the EEZ. This Council action is intended to align with the timing of the Blue Water Fisheries permitting process including EIS development.

3.2 PURPOSE AND NEED

The purpose for this action is to authorize conditions for possession of farmed Atlantic salmon consistent with the conservation objectives of the Atlantic Salmon Fishery Management Plan. The need for this action is to develop conservation and management measures that facilitate legal possession of farmed Atlantic salmon within NEFMC jurisdiction under conditions that are consistent with and support the FMP’s goals and objectives (i.e., to facilitate possession of farmed Atlantic salmon from the prohibition against harvesting and possessing wild Atlantic salmon in a manner that promotes efficient operations and supports continued enforcement of the prohibition against possessing wild Atlantic salmon) (Table 2).

Table 2. Purpose and need for Framework 1.

Purpose	Need
To authorize conditions for possession of farmed Atlantic salmon within the EEZ consistent with conservation objectives of the Atlantic Salmon FMP.	To develop conservation and management measures that facilitate legal possession of farmed Atlantic salmon for aquaculture operations within NEFMC jurisdiction.
	To help differentiate the legal possession of farmed Atlantic salmon from the possession of wild Atlantic salmon, which is prohibited per 50 CFR 648.40 and 50 CFR 648.41 regulations.

3.3 GOALS AND OBJECTIVES

The Council identified the following goals and objectives for this action.

Goals: Facilitate the implementation of Atlantic salmon aquaculture projects through the adjustment of the management measures prohibiting the possession and harvest of wild Atlantic salmon in the EEZ. If necessary, add or adjust management measures to ensure aquaculture projects in the EEZ are conducted in a manner consistent with the goals and objectives of the Atlantic Salmon Fishery Management Plan.

Objectives:

1. Clarify, add, or adjust management measures that differentiate authorized possession of farmed Atlantic salmon from unauthorized possession of wild Atlantic salmon in the EEZ. This will allow for the continued enforcement of the prohibition on the harvest and possession of wild Atlantic Salmon within the EEZ. It also may provide aquaculture operations with measures designed to help ensure consistency with the Atlantic salmon FMP while in possession of farmed Atlantic salmon in the EEZ. Examples of possible adjustments or new management measure include:
 - a. Amending the FMP with additional language clarifying the terms of authorized possession,
 - b. Requiring aquaculture operators to obtain aquaculture operation and/or vessel specific authorizations from NMFS prior to possessing farmed Atlantic salmon within the EEZ,
 - c. Requiring aquaculture operators to employ techniques that would allow farmed and wild Atlantic salmon to be differentiated (e.g., reporting, container tagging, notching, etc.) to aid in enforcement during vessel inspections, and/or
 - d. Developing protocols to ensure any farmed Atlantic salmon are not landed by unauthorized entities.
2. Clarify, add, or adjust management measures to ensure that federal dealers are not restricted from purchasing, possessing, and/or selling farmed Atlantic salmon harvested from authorized EEZ aquaculture operations. This section would include any dealer permitting requirements.
3. Identify specific concerns related to Atlantic salmon aquaculture in the EEZ that may require monitoring and develop management measures to address enforcement or management concerns.
4. Identify any specific concerns related to Atlantic salmon aquaculture in the EEZ that may require reporting to NMFS and develop measures, including reporting methods and frequency, to address enforcement or management concerns.
5. Avoid duplication of existing state and federal enforcement, monitoring, and reporting requirements and mechanisms, while meeting the Council's conservation and management objectives for Atlantic salmon.

6. Ensure adjustments to the FMP are done in a manner that applies generally to Atlantic salmon aquaculture operations and allows for flexibility associated with future changes in enforcement, monitoring, or reporting technologies and methods.

4.0 ALTERNATIVES UNDER CONSIDERATION

The Council considered the alternatives described below. It did not consider any others because these provide a reasonable range of alternatives to address the purpose and need for action described in Section 3.2.

The action alternatives below focus on identifying entities and associated vessels authorized to possess farmed Atlantic salmon in the EEZ by issuing a Letter of Authorization (LOA). Alternative 2 also includes production reporting via Vessel Trip Reports (VTR) and Federal Dealer Reports. Compared to No Action, Alternatives 2 and 3 are expected to provide greater clarity for aquaculture operators and potentially to related parties, by developing an efficient method for them to demonstrate farmed Atlantic salmon in their possession were harvested or transferred from aquaculture enterprises, as well as providing more information for the Council, so that the Council can be sure that the conservation objectives of the FMP are being considered relative to aquaculture project authorization and operations.

4.1 ALTERNATIVE 1 - NO ACTION

Under Alternative 1 (No Action), harvest and possession of Atlantic salmon (wild and farmed) would remain prohibited in federal waters of the EEZ off the Northeastern U.S. The regulation creates a presumption that vessels possessing Atlantic salmon in the EEZ have done so in violation of regulatory prohibitions. Federal regulations associated with the Atlantic salmon FMP at 50 CFR §648.40 related to the prohibition on possession of Atlantic salmon state that ‘evidence that such fish were harvested...from aquaculture enterprises will be sufficient to rebut this presumption’, i.e., rebut that salmon were taken in violation of the regulations.

Under No Action, the Council would not establish a specific authorization program for aquaculture operators to help ensure operational consistency with the Atlantic salmon FMP and would not establish any reporting or monitoring requirements. Aquaculture operators and related parties such as dealers may be required to individually ensure that they can provide evidence sufficient to demonstrate such fish were harvested or transferred from aquaculture enterprises.

Rationale: Given the possession prohibition and rebuttable presumption regulations, selecting Alternative 1 and taking no action could be sufficient for the operation of Atlantic salmon aquaculture facilities in the EEZ.

4.2 ALTERNATIVE 2 – EXPLICITLY AUTHORIZE CONDITIONS FOR POSSESSION OF FARMED ATLANTIC SALMON IN THE EEZ VIA LETTER OF AUTHORIZATION, VESSEL, AND DEALER REPORTING

Under Alternative 2, possession of farmed Atlantic salmon by aquaculture operators at, or enroute to or from, permitted offshore aquaculture facilities would be explicitly authorized consistent with the conservation objectives of the Atlantic Salmon FMP, requiring adherence to certain reporting and enforcement provisions outlined below. These provisions include authorization for vessels that would be used to transport farmed Atlantic salmon within the EEZ and vessel and dealer reporting requirements. The reporting requirements would enable NOAA Fisheries and the Council to track harvest and landings of farmed Atlantic salmon such that there is accounting of farmed salmon. As outlined below, this would

include a requirement that operators of each permitted vessel submit an electronic Vessel Trip Report in accordance with regulations at 50 CFR §648.7(b)(1) when farmed Atlantic salmon are transferred from the permitted EEZ facilities to shore, i.e., per trip, including landings disposition. Regarding dealer reporting, federally permitted dealers purchasing Atlantic salmon would be required to submit reports in accordance with regulations at 50 CFR §648.7(a)(1), i.e., twice weekly. Because this alternative requires a federal Atlantic salmon permit, vessels would be required to sell to a dealer with a federal Atlantic salmon permit to be consistent with other Council-managed species.

Application of measures

These measures would apply to any federally permitted Atlantic salmon aquaculture operation with facilities located within the EEZ. Vessels associated with the operation that would be used to transport farmed Atlantic salmon would be required to carry a copy of the LOA when in possession of farmed Atlantic salmon within the EEZ.

Letter of Authorization

- All federally permitted aquaculture companies that intend to possess farmed Atlantic salmon in the EEZ as a component of their operation will be required to obtain a Letter of Authorization (LOA) from NOAA Fisheries on an annual basis. Vessel owners or operators with Atlantic salmon on board must provide enforcement agencies with a valid LOA to confirm authorized possession of farmed Atlantic salmon. The LOA should include the following information at a minimum:
 - o Name of the aquaculture company,
 - o Names, State Boat Registration or USCG Official Number, and federal permit numbers (if available) of all vessels associated with the operation that may be used to transport farmed Atlantic salmon,
 - o Location of the aquaculture operation (offshore facilities),
 - o Permit numbers for the aquaculture operation,
 - o Source of the farmed Atlantic salmon,
 - o Other farmed species that might also be onboard the vessel(s), and
 - o Point of contact for the project.
- The LOA could also include any other information as required by Greater Atlantic Regional Fisheries Office (GARFO) Regional Administrator.

LOA requirements may include measures relating to species identification, gear stowage, species separation or storage, offloading procedures, or other measures related to transporting, unloading, and selling farmed Atlantic salmon. When operating under an LOA, vessels must comply with the following measures, or modified or additional measures as specified:

- Vessel operators would be required to transfer fish in a manner consistent with this authorization and separated from other species. This does not necessarily require individually tagged containers.
- Vessel operators shall maintain a logbook that estimates the volume of farmed Atlantic salmon transferred, date of the trip, fish disposition (e.g., fish intended for sale, mortalities), and provides dealer transaction records.
- A vessel may not fish for or possess any other managed species, other than those identified on the LOA.
- All fishing gear must be properly stowed in accordance with the definition of not available for immediate use (50 CFR § 648.2). This refers to gears used for commercial and recreational wild capture fishing. Gears used to remove farmed Atlantic salmon from offshore facilities at sea would not need to be stowed.

- No discarding of farmed Atlantic salmon would be allowed at sea, including at the project site or during transit to shore. This provision is consistent with the authority of the MSA to establish requirements for fishing operations in the EEZ and does not establish any permitting requirements inconsistent with 40 CFR 220.1 (c)(1).

Fishing vessels not associated with an aquaculture operation should return any Atlantic salmon incidentally caught in their gear to the water. This includes any farmed Atlantic salmon that may have escaped from an authorized aquaculture operation, or any wild Atlantic salmon.

Production Reporting

The following measures are proposed to help NOAA Fisheries and the Council track harvest and landings of farmed Atlantic salmon.

- Vessel operators transferring farmed Atlantic salmon to their final disposition from offshore facilities to shore for harvest will be required to have an Atlantic Salmon vessel permit (i.e., smolt and harvestable-sized salmon and any mortalities).
- Federally permitted vessel operators must submit an electronic VTR in accordance with regulations at 50 CFR §648.7(b)(1) when farmed Atlantic salmon are transferred from the offshore facilities to shore, i.e., per trip.
- Dealers purchasing farmed Atlantic salmon from these vessels, including dealers that are directly affiliated with the vessels/aquaculture facility operators, must obtain an Atlantic salmon federal dealer permit.
- Federally permitted dealers purchasing farmed Atlantic salmon must submit reports in accordance with regulations at 50 CFR §648.7(a)(1), i.e., twice weekly.

Exemptions from vessel monitoring for authorized vessels

- Vessels operating under the LOA are exempt from SBRM requirements.
- If a vessel operating under the LOA uses VMS to comply with other federal regulations, the operator should declare out of fishery (DOF) when servicing the aquaculture facility, using an appropriate DOF code.

Under current rules for Endangered Species Act (ESA)-listed species and under the Magnuson Stevens Act, fishing vessels not associated with an aquaculture operation should return any incidentally caught Atlantic salmon to the water. This includes any farmed Atlantic salmon that may have escaped from an authorized aquaculture operation, or any wild Atlantic salmon (aquaculture origin fish cannot always be easily distinguished from a wild or hatchery origin endangered salmon). This would not change under this alternative.

Rationale:

Documenting a vessel's authority to possess farmed Atlantic salmon in the EEZ, and outlining the conditions for such possession will facilitate operation of Atlantic salmon aquaculture projects. Aquaculture operators will know what the administrative requirements associated with possession of farmed Atlantic salmon would be and will not need to seek individual authorizations to ensure compliance with the information requirements related to Atlantic salmon possession at 50 CFR §648.40. In addition, because federal dealers cannot buy products prohibited under the [Magnuson Stevens Act \(MSA\)](#), allowing possession at sea via this framework will allow dealers to buy farmed salmon.

While no effects to Atlantic salmon are anticipated to occur as a result of the framework, effects are likely to occur later in time as projects are permitted. As a party to NASCO, the U.S. Government has obligations to adhere to the NASCO standards, including NASCO's Williamsburg Resolution. We anticipate that actions taken to adhere to these standards as aquaculture projects are proposed and permitted in federal waters will help ensure that Atlantic salmon harvest from future projects will not compromise restoration of wild stocks.

The Letter of Authorization is proposed to help ensure that NOAA Office of Law Enforcement and partner agencies have the information they need to evaluate whether harvested Atlantic salmon are from a federally permitted aquaculture operation and are not wild capture. The VTR and dealer reporting requirements would ensure that data on harvest of farmed Atlantic salmon are fully integrated with existing federal databases.

Vessels that have other federal fishing permits requiring VMS units would be required to declare out of fishery (DOF). Gear stowage requirements versus gear prohibition would be consistent with vessels that DOF for other reasons.

The Council is seeking, to the extent possible, to minimize discards of live or dead Atlantic salmon at sea. This can potentially be accomplished during project permitting. Specifically, the EPA National Pollutant Discharge Elimination System (NPDES) permit for an aquaculture site could potentially prohibit discharge and disposal of farmed Atlantic salmon mortalities; however, the EPA does not regulate discharges that occur during transit to and from the site. The EPA's and U.S. Coast Guard's [Vessel General Permit](#)¹ regulates incidental discharges and also authorizes solid fish waste disposal at sea as long as harbors and protected and enclosed coastal waters are avoided.

The measures included under Alternative 2 are not intended to duplicate the reporting requirements and permit conditions that will be required from federal agencies for individually permitted aquaculture projects (see Section 11.0 for information about federal permitting requirements). More specifically, the concerns and considerations not addressed through this framework action will be addressed via project pre-application phase, essential fish habitat, and other consultations addressed through other federal agency permit requirements.

4.3 ALTERNATIVE 3 – EXPLICITLY AUTHORIZE CONDITIONS FOR POSSESSION OF FARMED ATLANTIC SALMON IN THE EEZ VIA LETTER OF AUTHORIZATION (PREFERRED ALTERNATIVE)

Under Alternative 3, possession of farmed Atlantic salmon at, or enroute to or from, permitted offshore aquaculture facilities would be explicitly authorized consistent with the conservation objectives of the Atlantic Salmon FMP. Measures are the same as for Alternative 2, except that production reporting requirements are not included. Because this alternative does not require a federal salmon permit, vessels would not necessarily be required to sell to a dealer with a federal salmon permit (like what is required under Alternative 2). Dealer requirements depend on the state of landing which could require a state permitted vessel or state permitted dealer to sell farmed salmon, a requirement to obtain a state or federal dealer permit to sell the salmon to retail, or a requirement that the dealer would need to be a state dealer to process salmon and sell to wholesale for additional processing.

Application of measures

These measures would apply to any federally permitted Atlantic salmon aquaculture company with facilities located within the EEZ. Vessels associated with the operation that would be used to transport farmed Atlantic salmon would be required to carry a copy of the LOA when in possession of farmed Atlantic salmon.

¹ From the Fish Hold Effluent section of the Vessel General Permit document: "Solid fish waste must be disposed of shoreside on land or at sea (but outside of harbors or other protected and enclosed coastal waters, and other areas where EPA has found that such deposits could endanger health, the environment, or ecological systems in a specific location under the Marine Protection, Research and Sanctuaries Act, 33 U.S.C 1412(d))."

Letter of Authorization

- All federally permitted aquaculture companies that intend to possess farmed Atlantic salmon in the EEZ as a component of their operation will be required to obtain a Letter of Authorization (LOA) from NOAA Fisheries on an annual basis. Vessel owners or operators with Atlantic salmon on board must provide enforcement agencies with a valid LOA to confirm authorized possession of farmed Atlantic salmon. The LOA should include the following information at a minimum:
 - o Name of the aquaculture company,
 - o Names, State Boat Registration or USCG Official Number, and federal permit numbers (if available) of all vessels associated with the operation that may be used to transport farmed Atlantic salmon,
 - o Location of the aquaculture operation (offshore facilities),
 - o Permit numbers for the aquaculture operation,
 - o Source of the farmed Atlantic salmon,
 - o Other farmed species that might also be onboard the vessel(s), and
 - o Point of contact for the project.
- The LOA could also include any other information as required by Greater Atlantic Regional Fisheries Office (GARFO) Regional Administrator.

LOA requirements may include measures relating to species identification, gear stowage, species separation or storage, offloading procedures, or other measures related to transporting, unloading, and selling farmed Atlantic salmon. When operating under an LOA, vessels must comply with the following measures, or modified or additional measures as specified:

- Vessel operators would be required to transfer fish in a manner consistent with this authorization and separated from other species. This does not necessarily require individually tagged containers.
- Vessel operators shall maintain a logbook that estimates the volume of farmed Atlantic salmon transferred, date of the trip, fish disposition (e.g., fish intended for sale, mortalities), and provides dealer transaction records.
- A vessel may not fish for or possess any other managed species, other than those identified on the LOA.
- All fishing gear must be properly stowed in accordance with the definition of not available for immediate use (50 CFR § 648.2). This refers to gears used for commercial and recreational wild capture fishing. Gears used to remove farmed Atlantic salmon from offshore facilities at sea would not need to be stowed.
- No discarding of farmed Atlantic salmon would be allowed at sea, including at the project site or during transit to shore. This provision is consistent with the authority of the MSA to establish requirements for fishing operations in the EEZ and does not establish any permitting requirements inconsistent with 40 CFR 220.1 (c)(1).

Fishing vessels not associated with an aquaculture operation should return any Atlantic salmon incidentally caught in their gear to the water. This includes any farmed Atlantic salmon that may have escaped from an authorized aquaculture operation, or any wild Atlantic salmon.

LOAs would not be issued to federal dealers because the bill of sale or landing would likely show the dealer purchased the salmon from an entity operating under the LOA (if there is an enforcement issue). The purpose of the LOA for vessels is to rebut the presumption that any salmon you possess in the EEZ is an illegal wild salmon (e.g., provide evidence that the farmed salmon is legal to possess). Such a presumption does not exist for dealers.

Exemptions from vessel monitoring for authorized vessels

- Vessels operating under the LOA are exempt from Standardized Bycatch Reporting Monitoring (SBRM) requirements.
- If a vessel operating under the LOA uses VMS to comply with other federal regulations, the operator should declare out of fishery when servicing the aquaculture facility, using an appropriate DOF code.
- If a vessel operating under the LOA is normally required to submit eVTRs, they are exempt from such requirements.
- For example, work vessels used for daily operations such as personnel transport to the site, service vessels used to place nets and moorings, well boats and barges used for smolt transport and adult harvesting, in addition, any specialized vessels used for sea lice treatments or other operational needs in association with the owner/operators of the site.

Rationale: As for Alternative 2, except that vessel and dealer permits, and associated VTRs and dealer reports, are not required. Alternative 3 presumes that an LOA is sufficient for identifying authorized vessels, and that farmed Atlantic salmon production data, although less detailed than what would be provided via VTRs and federal dealer reports, would be available via other sources. These include state dealer data and through reporting requirements that would be part of the EPA NPDES permit.

4.4 ALTERNATIVES CONSIDERED BUT REJECTED

In order to address Objective 3, monitoring measures were initially considered but deemed not necessary for inclusion as part of this framework's authorization of Atlantic salmon aquaculture. In terms of Standardized Bycatch Reporting Methodology (SBRM) requirements, finfish bycatch is not anticipated to result from these operations, and protected species monitoring is part of permit requirements of other federal agencies. Thus, it seems unnecessary for vessels operating under the Atlantic salmon aquaculture authorization to carry at-sea observers or monitors. Exemption from Vessel Monitoring System (VMS) requirements is also appropriate.

Annual reporting requirements were also considered (Objective 4), however reporting criteria/requirements are included within other federal agencies permit conditions, and thus not further considered here. This includes reporting any fish escapement events (near time or close, as required by EPA), any water quality events in exceedance of National Pollution Discharge Elimination System (NPDES) thresholds (as required by EPA), information about the source of Atlantic salmon to be cultured, methods used by the operator to allow the salmon reared at the facility to be distinguished from wild Atlantic salmon, any enforcement violations, etc.

5.0 AFFECTED ENVIRONMENT

5.1 INTRODUCTION

The Affected Environment is described in this action based on valued ecosystem components (VECs), including Atlantic salmon, the focus of this FMP, other managed and ecosystem component species, protected species, physical environment and essential fish habitat (EFH), and human communities, including commercial and recreational fisheries. VECs represent the resources, areas and human communities that may be affected by the alternatives under consideration in this amendment. VECs are the focus since they are the “place” where the impacts of management actions occur.

A spatial footprint² of the affected environment for this action was created to bound the definition of the VECs and the impacts analysis. This footprint is based on a minimum operational depth of 100 ft (30.5 m) (Map 1). A maximum depth of 1,000 ft (304.8 m) was used as the outer bound for the footprint. The 3 arc second resolution digital elevation model used to identify locations with depths between 100 and 1,000 m was developed by USGS in 2013. In general, federal waters of the Gulf of Maine and Georges Bank are deeper than 100 ft, except for the top of Stellwagen Bank, the top of Cashes Ledge, sand ridges atop Georges Bank, and Nantucket Shoals. These sites are excluded from the footprint based on depth. A small section of Georges Basin along the EEZ boundary was included in the footprint although it is slightly deeper than the 1,000 ft outer bound.

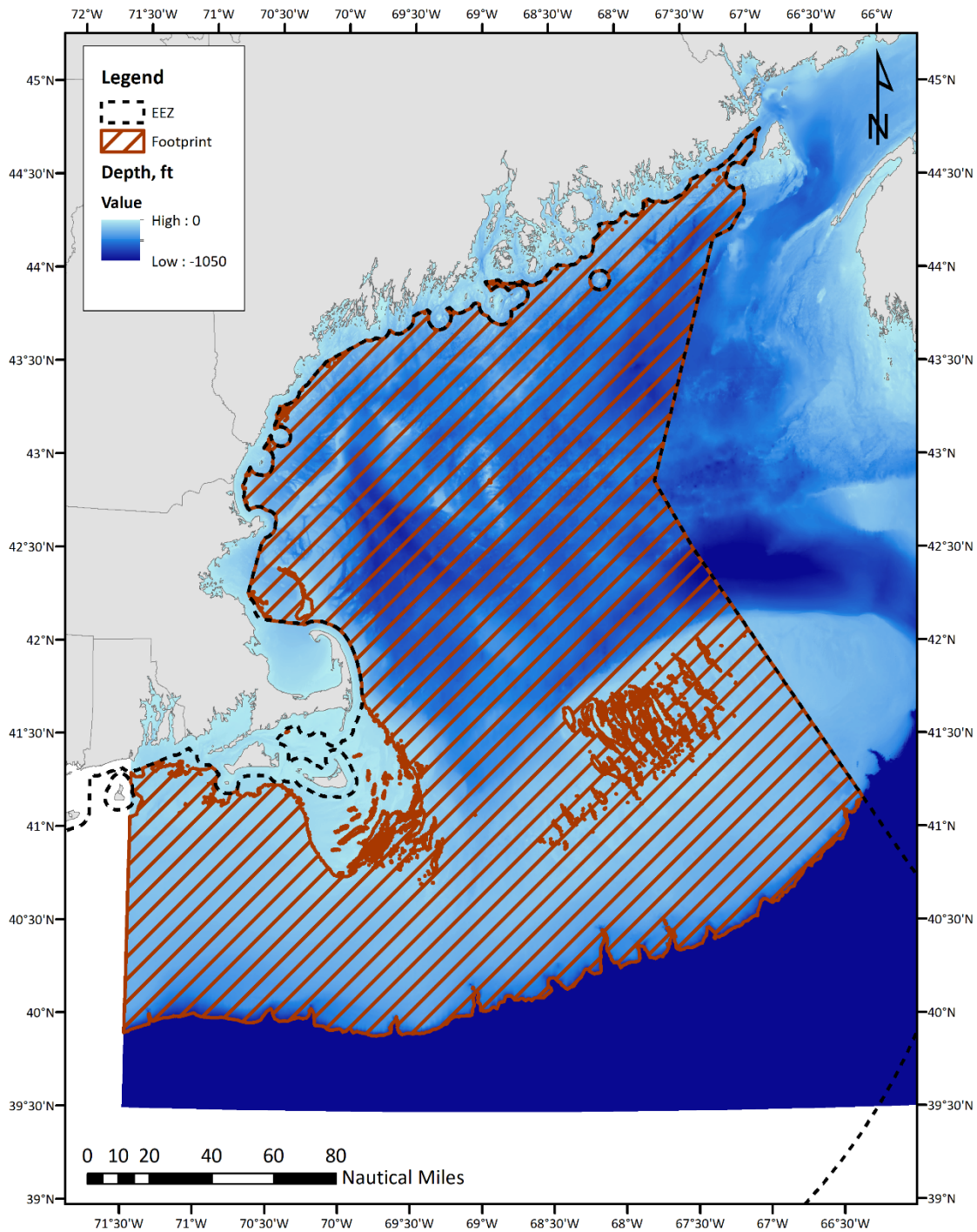
The spatial footprint also considers biological constraints for Atlantic salmon, specifically temperature (Map 2). A liberal sea surface temperature range of 6° C to 25° C was used given this represents the range in which growth can occur, accounting for some variance in the sea surface temperature (6° C is the thermal minimum and 22.5° C is the thermal maximum of growth). It is worth noting that the thermal minimum and maximum values are not exact and can vary by 2-3 degrees depending on fish biology, rate of decline, etc. The larger temperature range also helps account for potential changes in temperature from warming sea surface temperatures, thus, does not exclude any areas that might possibly work in the future. The entire depth-based footprint meets these temperature criteria (6-25° C) on average, as shown on Map 2. An examination of seasonal temperature data confirmed that while portions of the footprint are cooler than 6° C in the winter months, no areas exceed 25° C at any time during the year.

This footprint is deliberately broad so that all elements of VECs that might potentially overlap future Atlantic salmon aquaculture projects are considered in this analysis. Individual project siting would be based on a variety of decision parameters and data local to the site, including, but not limited to, water temperature range, water depth, water quality, substrate, current, distance to port, and other existing uses.

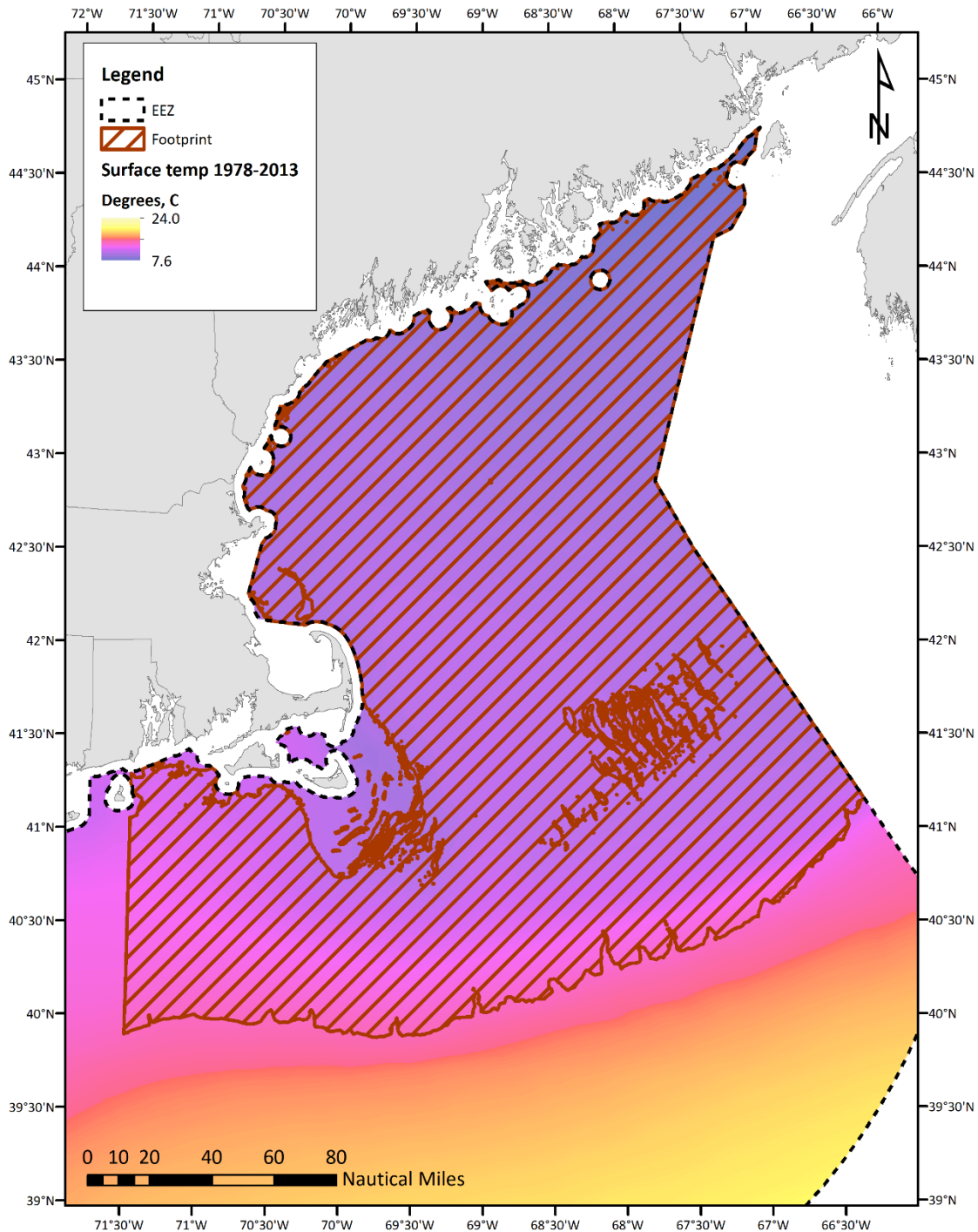
The analysis for this action considers the direct effects of these administrative measures, as well as the potential effects of future aquaculture projects that are enabled via this authorization granted under this framework. For this reason, the potential impacts of finfish aquaculture on each of the VECs are outlined in the sections below.

² Staff at NOAA’s National Centers for Coastal Ocean Science (NCCOS) created the footprint in March 2023.

Map 1. Spatial footprint of the affected environment where Atlantic salmon aquaculture is likely to occur, overlaid on bathymetry. Areas shallower than 100 ft were excluded from the footprint. Depths below 1,200 ft are shaded a uniform dark blue to better show shallow and deep areas in the Gulf of Maine.



Map 2. Spatial footprint of the affected environment where Atlantic salmon aquaculture is likely to occur, overlaid on average annual surface temperature. Areas within the analysis footprint do not exceed the thermal maxima for salmon growth, which is approximately 25° C.



5.2 ATLANTIC SALMON

5.2.1 Stock Status

Atlantic salmon is listed as endangered under the Endangered Species Act (ESA). NOAA Fisheries and the U.S. Fish and Wildlife Service listed the Gulf of Maine distinct population segment (DPS) of Atlantic Salmon as endangered in 2000, with a recovery plan subsequently finalized in 2005. Additional fish in the Penobscot, Kennebec, and Androscoggin rivers and tributaries were added to the DPS in 2009. In 2015, NOAA Fisheries created the Species in the Spotlight program designed to enhance rebuilding efforts for several species including Atlantic salmon. The 2020 stock assessment determined that Atlantic salmon remains overfished and at historically low levels.

The U.S. Atlantic Salmon Assessment Committee, comprised of state and federal biologists, monitors the population status of Atlantic salmon and reports their findings on number of adult returns annually. This is done by counting the number of adults that return to spawn directly at the traps and weirs or using nest surveys and modeling. In 2020, the assessment found that there were 1,715 documented and estimated returns to US rivers, most of which were to rivers and tributaries that are part of the Gulf of Maine DPS.

According to the [Annual Report of the U.S. Atlantic Salmon Assessment Committee](#), the U.S. returns are well below conservation spawner requirements, which are particularly relevant during periods when the salmon stock size is low. This is important because the released smolt to adult return ratios are also very low (less than 3%) due to high mortality from downstream passage barriers and overall low survival in the ocean ([NOAA 2022a](#)). Based on a [Trout Unlimited report](#) for steelhead on the West Coast, a 2% adult to smolt ratio is required to maintain existing population levels. Two U.S. Fish and Wildlife Service hatcheries support salmon recovery efforts. Over 4 million juveniles and around 2,000 adult salmon were released into rivers in 2020; 71,000 fish were tagged. Smolt emigration to the sea is tracked, however, 2020 data are missing due to the pandemic. From April to November every year, adult returns are monitored via trapping. Sorting facilities are in place on the Androscoggin, Kennebec, Penobscot, Union and Narraguagus Rivers that allow for monitoring of adult returns and capture of escapes in some locations. However, there are no sorting facilities in the Dennys, Machias and East Machias rivers, which are most proximate to existing aquaculture development. In addition, there are no externally applied marks or tags to aquaculture fish which means that on site detection of aquaculture fish may not always be possible at existing facilities. At the existing facilities, the numbers of aquaculture origin captures are generally small, with zero Maine aquaculture origin fish recaptured between 2017 and 2020, and four documented in 2021 (Union River). Based on the Northeast Fisheries Observer Program, bycatch events are also very rare with only seven individuals documented in trawl or sink gillnet gear between 1993 and 2022. Additional information can be found within the report document.

5.2.2 Federal Management

The Atlantic Salmon FMP prohibits a directed or incidental fishery in federal waters (3-200 miles), and the primary measure in the FMP is a prohibition on possession of salmon in federal waters. The FMP complements Atlantic salmon conservation measures enacted by the states.

- Management objective: Complement restoration and management programs of the states and the North Atlantic Salmon Conservation Organization (NASCO), an international organization which created protected areas free from targeted salmon fishing beyond 12 miles from the coast.
- Management unit: All anadromous salmonids of US origin in the N. Atlantic throughout their migratory range, except when in the waters of another nation.

Amendments 1 (1999) and 3 (2018) designated and subsequently updated essential fish habitat and habitat area of particular concern. Amendment 1 also allows the Council to take action authorizing Atlantic salmon aquaculture projects if “such an action is consistent with the goals and objectives of the Atlantic Salmon FMP” ([final rule](#)). The language in the original regulations has two separate provisions that are meant to be interpreted together and as required measures: 1) prohibition on possession of salmon and 2) framework specifications, which in part permits the Council to initiate an action to allow salmon aquaculture projects in the EEZ (further described below). These sections of the regulations are complementary, not conflicting, and do not negate the need for this framework action. The intent of the regulations is that a framework is needed to exempt possession of farmed Atlantic salmon from the prohibition.

Regulations based on the Council’s FMP are available [here](#). Note §648.40 prohibiting possession, as well as the §648.41(b) listing the types of aquaculture measures that can be considered in a framework action.

State and international management, as well as the cooperative agreement between NOAA Fisheries and USFWS for the conservation of Atlantic salmon, are summarized in Appendix A (Section 10.0).

5.2.3 Elements of a Typical Net Pen Atlantic Salmon Aquaculture Operation

Elements of a typical salmon net pen aquaculture operation include the construction and operation of the facility. Once all applicable permits are obtained, construction of the aquaculture facility can take a year or longer. Often components of the mooring system and pens are assembled on land and transported to the farm site on, or towed by, transport vessels. Construction is often conducted in phases.

In salmon operations, fish generally spend the first 18 months of their life cycle in a freshwater hatchery growing from egg to smolt. During their time at the hatchery, their health and growth is continually assessed and monitored and smolts are graded and vaccinated against certain pathogens. Salmon smolts are roughly five inches long when they are transported from their freshwater environment and transferred directly to saltwater into floating or submersible net pens.

During their ocean grow-out phase, fish are fed specially formulized pellets made of fish meal, fish oil, plant proteins and vitamins, and minerals. After roughly 18 months in the ocean pens, fish grow from smolts weighing 3-5 oz. (80-120 grams) to fish with a market weight of 6-12 pounds. The fish are monitored regularly for signs of disease, stress, and other issues. In order to control outbreaks of external parasites, fish are removed from individual net pens into a well boat specially designed to treat fish with a hot water spray bath to remove any sea lice. After exposure to hot water sprays, fish are placed back into the net pen to continue grow-out to harvest.

When the salmon have reached the desired size and weight, they are harvested using a variety of methods, including seine netting, pumping, and hand-netting. The harvested fish are then bled on board and placed on ice in totes or transported whole to processing facilities on land for cleaning, processing, and packaging.

Generally, dedicated vessels support feeding, personnel transport, and harvest activities. Harvest vessels visit the aquaculture facility site at least three times per week at full production to harvest fish from the net pens. Actual frequency can depend on time of year and harvesting schedule as determined by fish growth and aquaculture facility needs. Feeding occurs daily in warm months and less frequently during winter months. Feeding is often automated to reduce vessel trips.

Cages must be regularly inspected, maintained, and cleaned to ensure the health and well-being of the fish and to minimize the risk of escapement. This involves tasks such as repairing holes in nets, replacing equipment, and cleaning the cages to remove accumulated biofouling and marine debris.

5.2.4 Potential impacts of aquaculture activities on Atlantic salmon

The types of reasonably foreseeable impacts to the ESA listed GOM DPS of Atlantic salmon that could be anticipated to result from Atlantic salmon aquaculture projects are generally associated with concerns over genetic introgression (e.g., transfer of genetic information from one species to another) and pathogen transfers to wild stocks. Additional concerns are potential disturbance during spawning, and competition for resources, resulting in a decrease in spawning success and overall fitness of the population.

Commercial aquaculture gear used for farming Atlantic salmon consists of large net pens anchored to the sea floor with a complex mooring array. The structures can be floating on the surface or suspended in the water column, depending on the design and configuration of the various components deployed (see Section 5.3 for more detail). Siting and gear configuration should be considered when identifying and quantifying the impacts of specific aquaculture projects on VECs and other resources. In general, the impacts to Atlantic salmon of placing offshore net pen aquaculture gear in the water could be negligible to highly negative. Highly negative impacts would be, for example, a large-scale escapement event or disease outbreak. Special conditions placed on the permit could significantly reduce the risk but would not eliminate the potential for these events to occur.

5.3 PHYSICAL ENVIRONMENT AND ESSENTIAL FISH HABITAT

The Gulf of Maine and Georges Bank are part of the affected environment for this action. The Gulf of Maine is an enclosed coastal sea, bounded on the east by Browns Bank, on the north by the Nova Scotian Shelf, on the west by the New England states, and on the south by Cape Cod and Georges Bank. The Gulf of Maine is glacially derived, and is characterized by a system of deep basins, moraines and rocky protrusions with limited access to the open ocean. This geomorphology influences complex oceanographic processes that in turn produce a rich biological community. Georges Bank is a shallow, elongated extension of the continental shelf that was formed during the Wisconsinian glacial episode. It is characterized by a steep slope on its northern edge and a broad, flat, gently sloping southern flank. The Great South Channel lies to the west. Bottom topography on eastern Georges Bank is characterized by linear ridges in the western shoal areas; a relatively smooth, gently dipping sea floor on the deeper, easternmost part; a highly energetic peak in the north with sand ridges up to 30 m high; and steeper and smoother topography incised by submarine canyons on the southeastern margin.

5.3.1 Oceanography

An intense seasonal cycle of winter cooling and turnover, springtime freshwater runoff, and summer warming influences oceanographic processes in the Gulf of Maine. The Gulf has a general counterclockwise non-tidal surface current that flows around its coastal margin. It is primarily driven by fresh, cold Scotian Shelf water that enters over the Scotian Shelf and through the Northeast Channel, and freshwater river runoff, which is particularly important in the spring. Dense, relatively warm, and saline slope water entering through the bottom of the Northeast Channel from the continental slope also influences gyre formation. Counterclockwise gyres generally form in Jordan, Wilkinson, and Georges Basins and the Northeast Channel as well. These surface gyres are more pronounced in spring and summer; in winter, they weaken and become more influenced by the wind.

Stratification of surface waters during spring and summer seals off a mid-depth layer of water that preserves winter salinity and temperatures. This cold layer of water is called Maine Intermediate Water and is located between more saline Maine Bottom Water and the warmer, stratified Maine Surface Water. The stratified surface layer is most pronounced in the deep portions of the western Gulf of Maine. Tidal mixing of shallow areas prevents thermal stratification and results in thermal fronts between the stratified

areas and cooler mixed areas. Mixed areas include Georges Bank, the southwest Scotian Shelf, eastern Maine coastal waters, and the narrow coastal band surrounding the remainder of the Gulf.

The Northeast Channel provides an exit for cold Maine Intermediate Water and outgoing surface water while it allows warmer, more saline slope water to move in along the bottom and spill into the deeper basins. The influx of water occurs in pulses, and appears to be seasonal, with lower flow in late winter and a maximum flow in early summer.

Gulf of Maine circulation and water properties can vary significantly from year to year. Notable episodic events include shelf-slope interactions such as the entrainment of shelf water by Gulf Stream rings, and strong winds that can create currents as high as 1.1 m/s over Georges Bank. Warm core Gulf Stream rings can influence upwelling and nutrient exchange on the Scotian shelf and affect the water masses entering the Gulf of Maine. Annual and seasonal inflow variations also affect water circulation.

Internal waves are episodic and can greatly affect the biological properties of certain habitats. Internal waves can shift water layers vertically, so that habitats normally surrounded by cold Maine Intermediate Water are temporarily bathed in warm, organic-rich, surface water. On Cashes Ledge, it is thought that deeper nutrient rich water is driven into the photic zone, providing for increased productivity. Localized areas of upwelling interaction occur in numerous places throughout the Gulf of Maine.

Oceanographic frontal systems separate water masses of the Gulf of Maine and Georges Bank from oceanic waters south of the bank. These water masses differ in temperature, salinity, nutrient concentration, and planktonic communities, which influence productivity and may influence fish abundance and distribution. Currents on Georges Bank include a weak, persistent clockwise gyre around the Bank, a strong semidiurnal tidal flow predominantly northwest and southeast, and very strong, intermittent storm induced currents, which all can occur simultaneously. Tidal currents over the shallow top of Georges Bank can be very strong and keep the waters over the Bank well mixed vertically. This results in a tidal front that separates the cool waters of the well mixed shallows of the central Bank from the warmer, seasonally stratified shelf waters on the seaward and shoreward sides of the Bank. The clockwise gyre is instrumental in distribution of plankton, including fish eggs and larvae, and the strong, erosive currents affect the character of the biological community.

5.3.2 Sediments

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

Coastal sediments exhibit a high degree of small-scale variability. Bedrock is the predominant substrate along the western edge of the Gulf of Maine north of Cape Cod in a narrow band out to a depth of about 60 m. Rocky areas become less common with increasing depth, but some rock outcrops poke through the mud covering the deeper sea floor. On the inner continental shelf, mud is the second most common substrate, and it predominates in coastal valleys and basins that often abruptly border rocky substrates. Many of these basins extend without interruption into deeper water. Gravel, often mixed with shell, is

common adjacent to bedrock outcrops and in fractures in the rock. Large expanses of gravel are not common but do occur near reworked glacial moraines and in areas where the seabed has been scoured by bottom currents. Gravel and bedrock are most abundant at depths of 20-40 m, except in eastern Maine where a gravel-covered plain exists to depths of at least 100 m. Bottom currents are stronger in eastern Maine where the mean tidal range exceeds 5 m. Sandy areas are relatively rare along the inner shelf of the western Gulf of Maine, but are more common south of Casco Bay, especially offshore of sandy beaches.

Northeastern Georges Bank is composed of a series of parallel northwest-southeast trending sand waves with intervening troughs of coarser gravel (granule-pebble and cobble) substrate. There are also some areas dominated by boulders (diameter >10 inches). Strong tidal currents constantly move the sand back and forth and the shallower portions of the bank are also periodically affected by wave action, particularly during winter storms. The coarser gravel substrate is much more stable and provides a more suitable substrate for attached epifaunal organisms (e.g., sponges, bryozoans).

On the flanks of the bank between 60 and 100 m, where the tidal currents are weaker, sediment movement is less frequent, and transport is primarily associated with strong winter storms. The sediment here is somewhat finer than on the crest of the bank and the seafloor is largely featureless. In these areas, sediments are generally stable due to lower flows.

The central region of the Bank is shallow, and the bottom is characterized by shoals and troughs, with sand dunes superimposed upon them. The two most prominent elevations on the ridge and trough area are Cultivator and Georges Shoals. This shoal and trough area is a region of strong currents, with average flood and ebb tidal currents greater than 4 km/h, and as high as 7 km/h. The dunes migrate at variable rates, and the ridges may also move. In an area that lies between the central part and Northeast Peak, Twichell et al. (1987) identified high-energy areas as between 35 - 65 m deep, where sand is transported on a daily basis by tidal currents, and a low-energy area at depths > 65 m that is affected only by storm currents.

The Great South Channel separates the main part of Georges Bank from Nantucket Shoals. Just east of the Great South Channel, the depth is approximately 50-70 m with dominant sand, granule-pebble, cobble, and boulder substrates, transitioning to deeper water and mud substrates in the Channel. Strong southward-flowing tidal and residual currents on the western side of this area have produced 5-15 m high sand waves that run east and west with steeper slopes on their southern sides. Bottom disturbance can be significant during episodic storms.

Further to the west, Nantucket Shoals is similar in nature to the central region of the Bank. Currents in these areas are strongest where water depth is shallower than 50 m. Sediments in this region include gravel pavement and mounds, some scattered boulders, sand with storm generated ripples, and scattered shell and mussel beds. Tidal and storm currents range from moderate to strong, depending upon location and storm activity. Sediment mobility thresholds on Nantucket Shoals are exceeded over 50% of the time (annually) due to the combined effects of currents and wave action (Dalyander et al. 2013).

5.3.3 Benthic Invertebrates

Theroux and Wigley (1998) analyzed benthic samples from the Gulf of Maine and Georges Bank. Common groups of benthic invertebrates in the Gulf of Maine included annelid worms, bivalve mollusks, and amphipod crustaceans. Biomass in the Gulf of Maine was dominated by bivalves, sea cucumbers, sand dollars, annelids, and sea anemones. Amphipod crustaceans and annelid worms numerically dominated the contents of benthic samples. Biomass on Georges Bank was dominated by sand dollars and bivalves.

One group of organisms of interest because of the additional structure they can provide for habitat and their potential long lifespan are the deep-sea corals. Although the soft corals (Order Alcyonacea) were

historically considered common components of hard bottom communities in the deep waters of the Gulf of Maine region, they are now spatially rare and have been difficult to detect using standard towed-gear surveys. They can be bush or treelike in shape and attach to hard substrates such as rock outcrops or gravel and can grow quite large in some areas. Exploratory ROV and towed camera surveys in 2002-03 and 2013-15 documented a limited number of locations with often dense coral communities at around 200 m in western Jordan Basin, central Jordan Basin, near Mount Desert Rock, on Outer Schoodic Ridge, and on Lindenkohl Knoll (Auster 2005; Watling and Auster 2005; Auster et al. 2013; Auster et al. 2014, Packer et al., unpublished data).

5.3.4 Essential Fish Habitat

The Sustainable Fisheries Act defines EFH as “[t]hose waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.” This action could potentially affect EFH species that are managed under the Northeast Multispecies; Atlantic Sea Scallop; Monkfish; Northeast Skate Complex; Atlantic Herring; Summer Flounder, Scup, and Black Sea Bass; Golden Tilefish; Atlantic Mackerel, Squid, and Butterfish; and Atlantic Surfclam and Ocean Quahog FMPs (Table 3).

Table 3. Summary of Geographic distributions and habitat characteristics of Essential Fish Habitat designations for benthic fish and shellfish species managed by the New England and Mid-Atlantic fishery management councils in the Greater Atlantic region, as of October 2019.

Species	Life Stage	Geographic Area	Depth (meters)	Habitat Type and Description
Acadian redfish	Larvae	GOM and the southern portion of GB, and on the continental slope north of 37°38'N	NA	Pelagic
	Juveniles	Gulf of Maine and the continental slope north of 37°38'N	50-200 in Gulf of Maine, to 600 on slope	Sub-tidal coastal and offshore rocky reef substrates with associated structure-forming epifauna (e.g., sponges, corals), and soft sediments with cerianthid anemones
	Adults	Gulf of Maine and the continental slope north of 37°38'N	140-300 in Gulf of Maine, to 600 on slope	Offshore benthic habitats on finer grained sediments and on variable deposits of gravel, silt, clay, and boulders
American plaice	Eggs	GOM, GB and estuaries from Pass Bay to Saco Bay, ME and from Mass Bay to CC Bay, MA	NA	Pelagic
	Larvae	GOM, GB, Southern NE and bays and estuaries from Pass Bay to Saco Bay, ME and from Mass Bay to CC Bay, MA		
	Juveniles	Gulf of Maine and bays and estuaries from Passamaquoddy Bay to Saco Bay, Maine and from Massachusetts Bay to Cape Cod Bay, Massachusetts Bay	40-180	Sub-tidal benthic habitats on mud and sand, also found on gravel and sandy substrates bordering bedrock
	Adults	Gulf of Maine, Georges Bank and bays and estuaries from Passamaquoddy Bay to Saco Bay, Maine and from Massachusetts Bay to Cape Cod Bay, Massachusetts Bay	40-300	Sub-tidal benthic habitats on mud and sand, also gravel and sandy substrates bordering bedrock
Atlantic cod	Eggs	GOM, GB, and the MAB, in selected bays and estuaries in the	NA	Pelagic
	Larvae			

Atlantic Salmon Framework 1

Species	Life Stage	Geographic Area	Depth (meters)	Habitat Type and Description
		GOM, and in Buzzards Bay GOM, GB, and the MAB, in selected bays and estuaries in the GOM, and in Buzzards Bay		
	Juveniles	Gulf of Maine, Georges Bank, and Southern New England, including nearshore waters from eastern Maine to Rhode Island and the following estuaries: Passamaquoddy Bay to Saco Bay; Massachusetts Bay, Boston Harbor, Cape Cod Bay, and Buzzards Bay	Mean high water-120	Structurally-complex intertidal and sub-tidal habitats, including eelgrass, mixed sand and gravel, and rocky habitats (gravel pavements, cobble, and boulder) with and without attached macroalgae and emergent epifauna
	Adults	Gulf of Maine, Georges Bank, Southern New England, and the Mid-Atlantic to Delaware Bay, including the following estuaries: Passamaquoddy Bay to Saco Bay; Massachusetts Bay, Boston Harbor, Cape Cod Bay, and Buzzards Bay	30-160	Structurally complex sub-tidal hard bottom habitats with gravel, cobble, and boulder substrates with and without emergent epifauna and macroalgae, also sandy substrates and along deeper slopes of ledges
Atlantic halibut	Eggs & Larvae	GOM, GB, and continental slope south of GB	NA	Pelagic
	Juveniles & Adults	Gulf of Maine, Georges Bank, and continental slope south of Georges Bank	60-140 and 400-700 on slope	Benthic habitats on sand, gravel, or clay substrates
Atlantic herring	Eggs	Coastal GOM, GB, and SNE	5-90	Sub-tidal benthic habitats on coarse sand, pebbles, cobbles, and boulders and/or macroalgae
	Larvae	GOM, GB, and the upper MAB, including selected bays and estuaries from Pass Bay to CC Bay, Narragansett Bay, Raritan Bay, and the Hudson River	NA	Inshore and offshore pelagic habitats
	Juveniles	Entire NE region, including selected bays and estuaries from Pass Bay to CC Bay, Buzzards Bay to LIS, and Gardiners Bay to Delaware Bay	To 300	Intertidal and sub-tidal pelagic habitats
	Adults	Entire Northeast region, including selected bays and estuaries from Pass Bay to CC Bay, Buzzards Bay to LIS, and Gardiners Bay to Chesapeake Bay		Sub-tidal pelagic habitats
Atlantic salmon	Eggs, larvae, and fry	Designated streams and rivers in New England	<1	Riffle and run habitats in shallow, well-oxygenated, fresh water streams with gravel/rocky substrates,
	Parr	Designated streams and rivers in New England		Variety of riverine habitats
	Smolts	Designated streams and rivers in New England, including coastal	NA	Variety of riverine, lacustrine, estuarine, and coastal marine

Atlantic Salmon Framework 1

Species	Life Stage	Geographic Area	Depth (meters)	Habitat Type and Description
		areas adjacent to river mouths out to three miles		habitats used during downstream migration
	Adults	Designated streams and rivers in New England, including coastal areas adjacent to river mouths out to three miles	NA	Variety of riverine, lacustrine, estuarine, and coastal marine habitats used during upstream spawning migration and by spent adults following spawning, as they return to the ocean
Atlantic wolffish	Eggs	U.S. waters north of 41°N latitude and east of 71°W longitude	<100	Sub-tidal benthic habitats under rocks and boulders in nests
	Juveniles	U.S. waters north of 41°N latitude and east of 71°W longitude	70-184	Sub-tidal benthic habitats
	Adults	U.S. waters north of 41°N latitude and east of 71°W longitude	<173	A wide variety of sub-tidal sand and gravel substrates once they leave rocky spawning habitats, but not on muddy bottom
Haddock	Eggs	Coastal and offshore waters in the GOM, SNE, and on GB, including certain bays and estuaries in the SW GOM and Buzzards Bay, MA	NA	Pelagic habitats
	Larvae	Same as eggs with addition off Narragansett Bay		
	Juveniles	Inshore and offshore waters in the Gulf of Maine, on Georges Bank, and on the continental shelf in the Mid-Atlantic region	40-140 and as shallow as 20 in coastal Gulf of Maine	Sub-tidal benthic habitats on hard sand (particularly smooth patches between rocks), mixed sand and shell, gravelly sand, and gravel
	Adults	Offshore waters in the Gulf of Maine, on Georges Bank, and on the continental shelf in Southern New England	50-160	Sub-tidal benthic habitats on hard sand (particularly smooth patches between rocks), mixed sand and shell, gravelly sand, and gravel and adjacent to boulders and cobbles along the margins of rocky reefs
Ocean pout	Eggs	Georges Bank, Gulf of Maine, and the Mid-Atlantic, including certain bays and estuaries in the Gulf of Maine	<100	Sub-tidal hard bottom habitats in sheltered nests, holes, or rocky crevices
	Juveniles	Gulf of Maine, on the continental shelf north of Cape May, New Jersey, on the southern portion of Georges Bank, and including certain bays and estuaries in the Gulf of Maine	Mean high water-120	Intertidal and sub-tidal benthic habitats on a wide variety of substrates, including shells, rocks, algae, soft sediments, sand, and gravel
	Adults	Gulf of Maine, Georges Bank, on the continental shelf north of Cape May, New Jersey, and including certain bays and estuaries in the Gulf of Maine	20-140	Sub-tidal benthic habitats on mud and sand, particularly in association with structure forming habitat types; i.e. shells, gravel, or boulders
Pollock	Eggs	Inshore and offshore waters in the GOM, including certain bays and estuaries in the SW GOM, on GB, and in SNE	NA	Pelagic habitats
	Larvae	Inshore and offshore waters in the GOM, including certain bays and		

Atlantic Salmon Framework 1

Species	Life Stage	Geographic Area	Depth (meters)	Habitat Type and Description
		estuaries in the GOM, on GB, and in the MAB		
	Juveniles	Inshore and offshore waters in the Gulf of Maine (including bays and estuaries in the Gulf of Maine), the Great South Channel, Long Island Sound, and Narragansett Bay, Rhode Island	Mean high water-180 in Gulf of Maine, Long Island Sound, and Narragansett Bay; 40-180 on Georges Bank	Intertidal and sub-tidal pelagic and benthic rocky bottom habitats with attached macroalgae, small juveniles in eelgrass beds, older juveniles move into deeper water habitats also occupied by adults
	Adults	Offshore Gulf of Maine waters, Massachusetts Bay and Cape Cod Bay, on the southern edge of Georges Bank, and in Long Island Sound	80-300 in Gulf of Maine and on Georges Bank; <80 in Long Island Sound, Cape Cod Bay, and Narragansett Bay	Pelagic and benthic habitats on the tops and edges of offshore banks and shoals with mixed rocky substrates, often with attached macro algae
White hake	Eggs	GOM, including bays and estuaries in NH and MA, and the outer continental shelf and slope	NA	Pelagic habitats
	Larvae	GOM, including Mass Bay and CC Bay, SNE, and GB		
	Juveniles	Gulf of Maine, Georges Bank, and Southern New England, including bays and estuaries in the Gulf of Maine	Mean high water - 300	Intertidal and sub-tidal estuarine and marine habitats on fine-grained, sandy substrates in eelgrass, macroalgae, and un-vegetated habitats
	Adults	Gulf of Maine, including coastal bays and estuaries, and the outer continental shelf and slope	100-400 offshore Gulf of Maine, >25 inshore Gulf of Maine, to 900 on slope	Sub-tidal benthic habitats on fine-grained, muddy substrates and in mixed soft and rocky habitats
Windowpane flounder	Eggs & Larvae	Continental shelf and certain bays and estuaries from GB to Cape Hatteras, NC	NA	Pelagic habitats
	Juveniles	Estuarine, coastal, and continental shelf waters from the Gulf of Maine to northern Florida, including bays and estuaries from Maine to Maryland	Mean high water - 60	Intertidal and sub-tidal benthic habitats on mud and sand substrates
	Adults	Estuarine, coastal, and continental shelf waters from the Gulf of Maine to Cape Hatteras, North Carolina, including bays and estuaries from Maine to Maryland	Mean high water - 70	Intertidal and sub-tidal benthic habitats on mud and sand substrates
Winter flounder	Eggs	Eastern Maine to Absecon Inlet, New Jersey (39° 22'N) and Georges Bank	0-5 south of Cape Cod, 0-70 Gulf of Maine and Georges Bank	Sub-tidal estuarine and coastal benthic habitats on mud, muddy sand, sand, gravel, submerged aquatic vegetation, and macroalgae
	Larvae	Coastal Gulf of Maine, Georges Bank, and continental shelf in Southern New	0-70	Pelagic, but near bottom as they age

Atlantic Salmon Framework 1

Species	Life Stage	Geographic Area	Depth (meters)	Habitat Type and Description
	Juveniles	England and Mid-Atlantic to Absecon Inlet, New Jersey, including bays and estuaries from eastern Maine to northern New Jersey	Mean high water - 60	Intertidal and sub-tidal benthic habitats on a variety of bottom types, such as mud, sand, rocky substrates with attached macro algae, tidal wetlands, and eelgrass; young-of-the-year juveniles on muddy and sandy sediments in and adjacent to eelgrass and macroalgae, in bottom debris, and in marsh creeks
	Adults	Coastal Gulf of Maine, Georges Bank, and continental shelf in Southern New England and Mid-Atlantic to Absecon Inlet, New Jersey, including bays and estuaries from eastern Maine to northern New Jersey	Mean high water - 70	Intertidal and sub-tidal benthic habitats on muddy and sandy substrates, and on hard bottom on offshore banks; for spawning adults, also see eggs
Witch flounder	Eggs	Continental shelf throughout the region	NA	Pelagic habitats
	Larvae			
	Juveniles	Gulf of Maine and outer continental shelf and slope	50-400 and to 1500 on slope	Sub-tidal benthic habitats with mud and muddy sand substrates
	Adults	Gulf of Maine and outer continental shelf and slope	35-400 and to 1500 on slope	Sub-tidal benthic habitats with mud and muddy sand substrates
Yellowtail flounder	Eggs	Coastal and continental shelf waters in the GOM, on GB, and in the MAB as far south as the upper Delmarva peninsula, including certain bays and estuaries in the GOM	NA	Pelagic habitats
	Larvae	Coastal and continental shelf waters in the GOM, on GB, and in the MAB as far south as Cape Hatteras, NC, including certain bays and estuaries in the GOM		
	Juveniles	Gulf of Maine, Georges Bank, and the Mid-Atlantic, including certain bays and estuaries in the Gulf of Maine	20-80	Sub-tidal benthic habitats on sand and muddy sand
	Adults	Gulf of Maine, Georges Bank, and the Mid-Atlantic, including certain bays and estuaries in the Gulf of Maine	25-90	Sub-tidal benthic habitats on sand and sand with mud, shell hash, gravel, and rocks
Silver hake	Eggs and larvae	GOM to Cape May, NJ, including CC Bay and Mass Bay	NA	Pelagic habitats
	Juveniles	Gulf of Maine, including certain bays and estuaries, and on the continental shelf as far south as Cape May, New Jersey	40-400 in Gulf of Maine, >10 in Mid-Atlantic	Pelagic and sandy sub-tidal benthic habitats in association with sand-waves, flat sand with amphipod tubes, shells, and in biogenic depressions
	Adults	Gulf of Maine, including certain bays and estuaries, the southern portion of Georges Bank, and the outer continental shelf and some shallower coastal locations in the Mid-Atlantic	>35 in Gulf of Maine, 70-400 on Georges Bank and in the Mid-Atlantic	Pelagic and sandy sub-tidal benthic habitats, often in bottom depressions or in association with sand waves and shell fragments, also in mud habitats bordering deep boulder reefs, on over deep boulder reefs in the southwest Gulf of Maine

Atlantic Salmon Framework 1

Species	Life Stage	Geographic Area	Depth (meters)	Habitat Type and Description
Offshore hake	Eggs	Outer continental shelf and slope from GB to 37°N	100-1500	Pelagic habitats
	Larvae		60-1500	
	Juveniles	Outer continental shelf and slope from Georges Bank to 34° 40'N	160-750	Pelagic and benthic habitats
	Adults	Outer continental shelf and slope from Georges Bank to 34° 40'N	200-750	Pelagic and benthic habitats
Red hake	Eggs	GOM, GB, and the MAB, including Buzzards Bay, MA and Narragansett Bay, RI	NA	Pelagic habitats
	Larvae	GOM, GB, and the MAB, including certain bays and estuaries in the SW GOM, Buzzards Bay and Narragansett Bay, Raritan Bay, and the Hudson River		
	Juveniles	Gulf of Maine, Georges Bank, and the Mid-Atlantic, including Passamaquoddy Bay to Cape Cod Bay in the Gulf of Maine, Buzzards Bay and Narragansett Bay, Long Island Sound, Raritan Bay and the Hudson River, and lower Chesapeake Bay	Mean high water-80	Intertidal and sub-tidal soft bottom habitats, especially those that provide shelter, such as depressions in muddy substrates, eelgrass, macroalgae, shells, anemone and polychaete tubes, on artificial reefs, and in live bivalves (e.g., scallops)
	Adults	In the Gulf of Maine, the Great South Channel, and on the outer continental shelf and slope from Georges Bank to North Carolina, including inshore bays and estuaries as far south as Chesapeake Bay	50-750 on shelf and slope, as shallow as 20 inshore	Sub-tidal benthic habitats in shell beds, on soft sediments (usually in depressions), also found on gravel and hard bottom and artificial reefs
Monkfish	Eggs	Continental shelf and slope throughout the region	NA	Pelagic habitats
	Larvae			
	Juveniles	Gulf of Maine, outer continental shelf in the Mid-Atlantic, and the continental slope	50-400 in the Mid-Atlantic, 20-400 in the Gulf of Maine, and to 1000 on the slope	Sub-tidal benthic habitats on a variety of habitats, including hard sand, pebbles, gravel, broken shells, and soft mud, also seek shelter among rocks with attached algae
	Adults	Gulf of Maine, outer continental shelf in the Mid-Atlantic, and the continental slope	50-400 in the Mid-Atlantic, 20-400 in the Gulf of Maine, and to 1000 on the slope	Sub-tidal benthic habitats on hard sand, pebbles, gravel, broken shells, and soft mud, but seem to prefer soft sediments, and, like juveniles, utilize the edges of rocky areas for feeding
Smooth skate	Juveniles	Offshore Gulf of Maine, some coastal bays in Maine and New Hampshire, and on the continental slope from Georges Bank to North Carolina	100-400 offshore Gulf of Maine, <100 inshore Gulf of Maine, to 900 on slope	Benthic habitats, mostly on soft mud in deeper areas, but also on sand, broken shells, gravel, and pebbles on offshore banks in the Gulf of Maine
	Adults	Offshore Gulf of Maine and the continental slope from Georges Bank to North Carolina	100-400 offshore Gulf of Maine, to 900 on slope	Benthic habitats, mostly on soft mud in deeper areas, but also on sand, broken shells, gravel, and pebbles on offshore banks in the Gulf of Maine
Thorny skate	Juveniles	Offshore Gulf of Maine, some coastal bays in the Gulf of Maine, and on the	35-400 offshore Gulf of Maine,	Benthic habitats on a wide variety of bottom types,

Atlantic Salmon Framework 1

Species	Life Stage	Geographic Area	Depth (meters)	Habitat Type and Description
		continental slope from Georges Bank to North Carolina	<35 inshore Gulf of Maine, to 900 on the slope	including sand, gravel, broken shells, pebbles, and soft mud
	Adults	Offshore Gulf of Maine and on the continental slope from Georges Bank to North Carolina	35-400 offshore Gulf of Maine, <35 inshore Gulf of Maine, to 900 on the slope	Benthic habitats on a wide variety of bottom types, including sand, gravel, broken shells, pebbles, and soft mud
Little skate	Juveniles	Coastal waters in the Gulf of Maine, Georges Bank, and the continental shelf in the Mid-Atlantic region as far south as Delaware Bay, including certain bays and estuaries in the Gulf of Maine	Mean high water-80	Intertidal and sub-tidal benthic habitats on sand and gravel, also found on mud
	Adults	Coastal waters in the Gulf of Maine, Georges Bank, and the continental shelf in the Mid-Atlantic region as far south as Delaware Bay, including certain bays and estuaries in the Gulf of Maine	Mean high water-100	Intertidal and sub-tidal benthic habitats on sand and gravel, also found on mud
Winter skate	Juveniles	Coastal waters from eastern Maine to Delaware Bay, including certain bays and estuaries from eastern Maine to Chincoteague Bay, Virginia, and on Georges Bank and the continental shelf in Southern New England and the Mid-Atlantic	0-90	Sub-tidal benthic habitats on sand and gravel substrates, are also found on mud
	Adults	Coastal waters from eastern Maine to Delaware Bay, including certain bays and estuaries in Maine and New Hampshire, and on Georges Bank and the continental shelf in Southern New England and the Mid-Atlantic	0-80	Sub-tidal benthic habitats on sand and gravel substrates, are also found on mud
Barndoor skate	Juveniles and adults	Primarily on Georges Bank and in Southern New England and on the continental slope	40-400 on shelf and to 750 on slope	Sub-tidal benthic habitats on mud, sand, and gravel substrates
Clearrnose skate	Juveniles	Inner continental shelf from New Jersey to the St. Johns River in Florida and certain bays and certain estuaries including Raritan Bay, inland New Jersey bays, Chesapeake Bay, and Delaware Bays	0-30	Sub-tidal benthic habitats on mud and sand, but also on gravelly and rocky bottom
	Adults	Inner continental shelf from New Jersey to the St. Johns River in Florida and certain bays and certain estuaries including Raritan Bay, inland New Jersey bays, Chesapeake Bay, and Delaware Bays	0-40	Sub-tidal benthic habitats on mud and sand, but also on gravelly and rocky bottom
Rosette skate	Juveniles and adults	Outer continental shelf from approximately 40°N to Cape Hatteras, North Carolina	80-400	Benthic habitats with mud and sand substrates
Atlantic sea scallop	Eggs	Gulf of Maine coastal waters and offshore banks, Georges Bank, and the Mid-Atlantic, including the following estuaries: Passamaquoddy Bay to	18-110	Inshore and offshore benthic habitats (see adults)

Atlantic Salmon Framework 1

Species	Life Stage	Geographic Area	Depth (meters)	Habitat Type and Description
		Sheepscot River; Casco Bay, Massachusetts Bay, and Cape Cod Bay		
	Larvae	Gulf of Maine coastal waters and offshore banks, Georges Bank, and the Mid-Atlantic, including the following estuaries: Passamaquoddy Bay to Sheepscot River; Casco Bay, Massachusetts Bay, and Cape Cod Bay	No information	Inshore and offshore pelagic and benthic habitats: pelagic larvae ("spat"), settle on variety of hard surfaces, including shells, pebbles, and gravel and to macroalgae and other benthic organisms such as hydroids
	Juveniles	Gulf of Maine coastal waters and offshore banks, Georges Bank, and the Mid-Atlantic, including the following estuaries: Passamaquoddy Bay to Sheepscot River; Casco Bay, Great Bay, Massachusetts Bay, and Cape Cod Bay	18-110	Benthic habitats initially attached to shells, gravel, and small rocks (pebble, cobble), later free-swimming juveniles found in same habitats as adults
	Adults	Gulf of Maine coastal waters and offshore banks, Georges Bank, and the Mid-Atlantic, including the following estuaries: Passamaquoddy Bay to Sheepscot River; Casco Bay, Great Bay, Massachusetts Bay, and Cape Cod Bay	18-110	Benthic habitats with sand and gravel substrates
Summer flounder	Juveniles	Continental shelf and estuaries from Cape Cod, Massachusetts, to Cape Canaveral, Florida	To maximum 152	Benthic habitats, including inshore estuaries, salt marsh creeks, seagrass beds, mudflats, and open bay areas
	Adults	Continental shelf from Cape Cod, Massachusetts, to Cape Canaveral, Florida, including shallow coastal and estuarine waters during warmer months	To maximum 152 in colder months	Benthic habitats
Scup	Juveniles	Continental shelf between southwestern Gulf of Maine and Cape Hatteras, North Carolina and in nearshore and estuarine waters between Massachusetts and Virginia	No information	Benthic habitats, in association with inshore sand and mud substrates, mussel and eelgrass beds
	Adults	Continental shelf and nearshore and estuarine waters between southwestern Gulf of Maine and Cape Hatteras, North Carolina	No information, generally overwinter offshore	Benthic habitats
Black sea bass	Juveniles and adults	Continental shelf and estuarine waters from the southwestern Gulf of Maine and Cape Hatteras, North Carolina	Inshore in summer and spring	Benthic habitats with rough bottom, shellfish and eelgrass beds, man-made structures in sandy-shelly areas, also offshore clam beds and shell patches in winter
Longfin inshore squid	Eggs	Inshore and offshore waters from Georges Bank southward to Cape Hatteras	Generally <50	Bottom habitats attached to variety of hard bottom types, macroalgae, sand, and mud
Spiny dogfish	Juveniles	Primarily the outer continental shelf and slope between Cape Hatteras and Georges Bank and in the Gulf of Maine	Deep water	Pelagic and epibenthic habitats
	Female sub-adults	Throughout the region	Wide depth range	Pelagic and epibenthic habitats

Species	Life Stage	Geographic Area	Depth (meters)	Habitat Type and Description
	Male sub-adults	Primarily in the Gulf of Maine and on the outer continental shelf from Georges Bank to Cape Hatteras	Wide depth range	Pelagic and epibenthic habitats
	Female adults	Throughout the region	Wide depth range	Pelagic and epibenthic habitats
	Male adults	Throughout the region	Wide depth range	Pelagic and epibenthic habitats
Atlantic surfclam	Juveniles and adults	Continental shelf from southwestern Gulf of Maine to Cape Hatteras, North Carolina	Surf zone to about 61, abundance low >38	In substrate to depth of 3 ft
Ocean quahog	Juveniles and adults	Continental shelf from southern New England and Georges Bank to Virginia	9-244	In substrate to depth of 3 ft

5.3.5 Potential Impacts of Aquaculture Activities

The impacts of aquaculture activities on the physical environment and EFH can be positive, neutral, or negative, primarily depending on the system used, the species being farmed, the ecological setting, and the experience level of the operators. For example, excess nutrients, organic matter, and suspended solids from finfish aquaculture effluents can exacerbate eutrophication in nearshore receiving water bodies when nutrient inputs exceed the capacity of natural dispersal and assimilative processes. On the other end of the spectrum, some forms of aquaculture have been used to mitigate eutrophication by sequestering nutrients in nearshore waters (e.g., shellfish and algae culture). In some cases, evaluating whether the impacts from aquaculture activities on EFH will be positive or negative is more complicated.

Positive impacts of aquaculture operations include carbon and nutrient sequestration, acidification regulation, improved water clarity, coastal protection, and habitat provisioning (Gentry 2019). The majority of these are associated with shellfish and algae aquaculture, however habitat provisioning associated with equipment used for marine fish culture is widely documented (Gentry 2019). Aquaculture gear has been documented to attract structure-oriented species and increase biomass and biodiversity on an otherwise minimally structured bottom. This “reef effect” may result in a localized increase in biomass and local biodiversity at varying trophic levels.

In some cases, the effects from aquaculture activities on EFH can be viewed as both positive and negative. For example, cages or cultch associated with aquaculture operations placed on soft sediments may be viewed as habitat conversion, however, conversion may have positive impacts if increased structural complexity is desired at the proposed site due to historic loss of structure from other anthropogenic activities. This issue would have to be considered on a project-specific basis.

Marine fish culture can cause a range of adverse effects, which is defined by the MSA as any impact that reduces quality and/or quantity of EFH. These may include direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality and/or quantity of EFH. More specifically:

- degradation of water quality resulting from the discharge of effluents containing uneaten feed and waste products (including drugs, chemicals, and other inputs);
- habitat degradation (including alteration of sediment composition and chemistry from settling wastes; alteration to benthic habitats, and changes to infaunal species composition);

- introduction of invasive species; impacts from the escape of farmed organisms (i.e., trophic and gene pool alterations); and
- the spread of pathogens and parasites from farmed to wild marine organisms.

A significant consideration associated with finfish aquaculture is the potential for impacts on water quality and the seafloor environment adjacent to culture facilities from the discharge of effluents containing unused feed, metabolic fish wastes, and other inputs.

Adverse effects to EFH may result from actions occurring within EFH or outside of EFH and may include site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810(a)). The individual and cumulative risk of these specific adverse effects occurring as a result of aquaculture activities, and the magnitude of the impacts when they do occur, will vary by location (i.e., onshore, near-shore, and offshore) and by production format and species (i.e., fish, shellfish, algae). In some cases, the likely impacts from aquaculture activities are well understood and proper siting protocols, standardized operating procedures, and best management practices can be put in place to reduce or eliminate risk. In other cases, the impacts are not well understood, and managers are required to err on the side of caution and use their best professional judgment when considering how activities may impact the environment and the most appropriate means to avoid or minimize those impacts.

Additional information can be found within the Council's [Aquaculture Background Document](#), updated on March 1, 2020, and [Appendix G](#) of the Omnibus Essential Fish Habitat Amendment 2 FEIS, starting on page 133.

5.4 NEFMC-MANAGED FISHERY AND ECOSYSTEM COMPONENT SPECIES

5.4.1 Species occurring within the affected environment for this action

Species of concern within the affected environment for this action include the following:

- Top species managed by NEFMC by landings in GOM: Atlantic herring, sea scallop, haddock, pollock, cod, monkfish, and winter flounder.
- Top species managed by NEFMC by revenue in GOM: Sea scallop, Atlantic herring, cod, pollock, haddock, monkfish, white hake, redfish, American plaice, and witch flounder.
- Note there was a recent drop off in herring landings and revenue and gears used, but prior to 2019, herring was very important.

Status of these resources is summarized in Table 6.

Table 4. Stock status of the top species (by landings) managed by NEFMC in the Gulf of Maine.

Species and stock	Stock status
Atlantic herring	Overfished, not subject to overfishing
Atlantic sea scallop	Not overfished, not subject to overfishing
Haddock (Gulf of Maine stock)	Not overfished, subject to overfishing
Atlantic pollock	Not overfished, not subject to overfishing
Atlantic cod (Gulf of Maine stock)	Overfished, subject to overfishing

Monkfish (Gulf of Maine / Northern Georges Bank stock)	Unknown
Winter flounder (Gulf of Maine stock)	Unknown overfished status, not subject to overfishing

5.4.2 Potential impacts of aquaculture activities on fishery and ecosystem component species

Some marine aquaculture activities have the potential to result in direct adverse effects to species managed by the NEFMC, beyond the indirect effects associated with habitat impacts. Some of these adverse effects may be minimized or mitigated if the aquaculture operations are properly managed. Adverse effects include impacts associated with the escape of farmed organisms, the introduction of invasive or non-native species; and the spread of pathogens and parasites from farmed to wild marine organisms (Naylor et al. 2005).

The escape of farmed fish from aquaculture facilities, especially non-native species, is a significant concern related to aquaculture. The likelihood of escapes from aquaculture operations, and the severity of the impacts associated with escapement, will vary depending on the species being farmed, siting guidelines, structural engineering and operational design, management practices (including probability for human error), adequacy of biosecurity and contingency plans, frequency of extreme weather events, and direct interactions with predators such as sharks and marine mammals that may compromise the integrity of fish enclosures.

Another concern to NEFMC-managed species is impacts from the spread of endemic and introduced pathogens and parasites from farmed populations to wild populations. Risks posed by pathogens and parasites are harder to quantify than those posed by competition or predation, as a single individual transferred to a recipient population can have dramatic consequences. Further, these agents can be spread by water, independent of any escape of farmed individuals. The risk and prevalence of disease in aquaculture operations is influenced by many factors, including immune status, stress level, pathogen load, environmental conditions, water quality, nutritional health, life history stage, and feeding management. The type and level of husbandry practices and disease surveillance will also influence the potential spread of pathogens to wild stocks.

There is also the potential for fish distribution to change due to the presence of aquaculture farms. If commercially and recreationally important fish species are attracted to or avoid areas where fish farms are present, then that could indirectly affect where fishermen harvest the fish and their overall fishing behavior.

Sections 6.3 and 6.6 include additional detail on how these adverse impacts could affect fisheries and other managed and ecosystem component species and is not repeated here. This information includes stock status and potential impacts to stock status for top species by landings in the Gulf of Maine region.

Additional information can be found within the Council's [Aquaculture Background Document](#), updated on March 1, 2020, and [Appendix G](#) of the Omnibus Essential Fish Habitat Amendment 2 FEIS, starting on page 133.

5.5 OTHER PROTECTED SPECIES

5.5.1 Species present in the area

The term protected species encompasses all marine mammals as well as ESA-listed marine mammals, sea turtles and fishes. Numerous protected species occur within the affected environment of for this action (Table 4). 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. Atlantic salmon is considered a protected species but is discussed above in a separate section because it is the focus of this FMP.

Because this framework focuses solely on authorizing the possession of commercially reared farmed Atlantic salmon in the EEZ, the measures proposed are unlikely to cause any direct effects to these resources. A brief summary of the status of these resources is provided below to support cumulative effects determinations.

Table 5. Species protected under the ESA and/or MMPA that may occur in the area of the EEZ within which Atlantic salmon aquaculture operations may occur. Marine mammal species italicized and in bold are considered MMPA strategic stocks.¹

Species	Status
Cetaceans	
<i>North Atlantic right whale (Eubalaena glacialis)</i>	<i>Endangered</i>
Humpback whale, West Indies DPS (<i>Megaptera novaeangliae</i>)	Protected (MMPA)
<i>Fin whale (Balaenoptera physalus)</i>	<i>Endangered</i>
<i>Sei whale (Balaenoptera borealis)</i>	<i>Endangered</i>
<i>Blue whale (Balaenoptera musculus)</i>	<i>Endangered</i>
<i>Sperm whale (Physeter macrocephalus)</i>	<i>Endangered</i>
Minke whale (<i>Balaenoptera acutorostrata</i>)	Protected (MMPA)
Pilot whale (<i>Globicephala</i> spp.) ²	Protected (MMPA)
Pygmy sperm whale (<i>Kogia breviceps</i>)	Protected (MMPA)
Dwarf sperm whale (<i>Kogia sima</i>)	Protected (MMPA)
Risso's dolphin (<i>Grampus griseus</i>)	Protected (MMPA)
Atlantic white-sided dolphin (<i>Lagenorhynchus acutus</i>)	Protected (MMPA)
Short Beaked Common dolphin (<i>Delphinus delphis</i>)	Protected (MMPA)
Atlantic Spotted dolphin (<i>Stenella frontalis</i>)	Protected (MMPA)
Striped dolphin (<i>Stenella coeruleoalba</i>)	Protected (MMPA)
<i>Bottlenose dolphin (Tursiops truncatus)</i> ³	<i>Protected (MMPA)</i>
Harbor porpoise (<i>Phocoena phocoena</i>)	Protected (MMPA)
Sea Turtles	
Leatherback sea turtle (<i>Dermochelys coriacea</i>)	Endangered
Kemp's ridley sea turtle (<i>Lepidochelys kempi</i>)	Endangered
Green sea turtle, North Atlantic DPS (<i>Chelonia mydas</i>)	Threatened
Loggerhead sea turtle (<i>Caretta caretta</i>), Northwest Atlantic Ocean DPS	Threatened
Hawksbill sea turtle (<i>Eretmochelys imbricate</i>)	Endangered
Fish	
Shortnose sturgeon (<i>Acipenser brevirostrum</i>)	Endangered
Giant manta ray (<i>Manta birostris</i>)	Threatened
Oceanic whitetip shark (<i>Carcharhinus longimanus</i>)	Threatened
Atlantic salmon (<i>Salmo salar</i>)	Endangered
Atlantic sturgeon (<i>Acipenser oxyrinchus</i>)	
<i>Gulf of Maine DPS</i>	Threatened
<i>NY Bight DPS, Chesapeake Bay DPS, Carolina DPS, S. Atlantic DPS</i>	Endangered

Species	Status
Cusk (<i>Brosme brosme</i>)	Candidate
Pinnipeds	
Harbor seal (<i>Phoca vitulina</i>)	Protected (MMPA)
Gray seal (<i>Halichoerus grypus</i>)	Protected (MMPA)
Harp seal (<i>Phoca groenlandicus</i>)	Protected (MMPA)
Hooded seal (<i>Cystophora cristata</i>)	Protected (MMPA)
Critical Habitat	
North Atlantic Right Whale	ESA Designated
Northwest Atlantic DPS of Loggerhead Sea Turtle	ESA Designated

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 NMFS [Marine Mammal Stock Assessment Reports \(SARs\) for the Atlantic Region](#) for further details

The population status and trends for these protected resources are variable, and as follows:

Sea turtles

Although stock assessments and similar reviews have been completed for sea turtles none have been able to develop a reliable estimate of absolute population size. As a result, nest counts are used to inform population trends for sea turtle species. For the Northwest Atlantic Ocean DPS of loggerhead sea turtles, there are five unique recovery units that comprise the DPS. Nesting trends for each of these recovery units are variable; however, Florida index nesting beaches comprise most of the nesting in the DPS (<https://myfwc.com/research/wildlife/sea-turtles/nesting/beach-survey-totals/>). Overall, short-term trends for loggerhead sea turtles (Northwest Atlantic Ocean DPS) have shown increases; however, over the long-term the DPS is considered stable (NMFS 2021).

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

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

Leatherback turtle nesting in the Northwest Atlantic is showing an overall negative trend, with the most notable decrease occurring during the most recent time frame of 2008 to 2017 (NW Atlantic Leatherback Working Group 2018). The leatherback status review in 2020 concluded that leatherbacks are exhibiting an overall decreasing trend in annual nesting activity (NMFS and USFWS, 2020). Given continued

anthropogenic threats to the species, according to NMFS (2021), the species' resilience to additional perturbation both within the Northwest Atlantic and worldwide is low.

Large whales

Review of large whale stock assessment reports covering the period of 2010 through 2019, indicate a decreasing trend for the North Atlantic right whale population; however, for fin, humpback, minke, sperm, and sei whales, it is unknown what the population trajectory is as a trend analysis has not been conducted. For additional information on the status of humpback, North Atlantic right, fin, sei, sperm, and minke whales, refer to the [NMFS Marine Mammal SARs for the Atlantic Region](#).

Small cetaceans

Review of the most recent stock assessment (Hayes et al. 2021) indicates that as a trend analysis has not been conducted for Risso's, white-sided, short-beaked common dolphins; long-finned pilot whales; or harbor porpoise, the population trajectory for these species is unknown. For short-finned pilot whales a generalized linear model indicated no significant trend in the abundance estimates (Hayes et al 2022). For the Western North Atlantic Offshore stock, review of the most recent information on the stock shows no statistically significant trend in population size for this species; however, the high level of uncertainty in the estimates limits the ability to detect a statistically significant trend (Hayes et al. 2021). In regards to the Northern and Southern Migratory Coastal stocks (both considered a strategic stock under the MMPA), the most recent analysis of trends in abundance suggests a probable decline in stock size between 2010–2011 and 2016, concurrent with a large UME in the area; however, there is limited power to evaluate trends given uncertainty in stock distribution, lack of precision in abundance estimates, and a limited number of surveys (Hayes et al. 2021).

Pinnipeds

Based on Hayes et al. (2019) and Hayes et al. (2022), the status of pinniped populations is as follows: (1) the Western North Atlantic harbor seal and hooded seal, relative to Optimum Sustainable Population (OSP), in the U.S. Atlantic EEZ is unknown; (2) gray seal population relative to OSP in U.S. Atlantic EEZ waters is unknown, but the stock's abundance appears to be increasing in Canadian and U.S. waters; and, (3) harp seal stock, relative to OSP, in the U.S. Atlantic EEZ is unknown, but the stock's abundance appears to have stabilized.

5.5.2 Potential impacts of aquaculture activities on protected species

All species of marine mammals are protected under the MMPA (16 U.S.C. §§ 1371 et seq.). The MMPA prohibits the "taking" of any marine mammal species in U.S. waters where "take" means to hunt, harass, capture, or kill any marine mammal or attempting to do so (NOAA 2022b). Under the MMPA Section 118 and the List of Fisheries, most aquaculture operations are considered commercial fisheries (NOAA 2022b). Under Section 118, fisheries can be authorized to incidentally "take" marine mammals while commercial fishing or operating an aquaculture facility as long as certain requirements (e.g., reporting) are met.

Commercial aquaculture gear used for farming Atlantic salmon consists of large net pens or cages anchored to the sea floor with a complex mooring array (Section 5.3). The structures can be floating on the surface or suspended in the water column, depending on the design and configuration of the various components deployed.

Potential effects from commercial aquaculture operations on protected species include encountering the underwater gear and risk of entanglement, entrapment, and harm caused by cuts and abrasion with moorings, nets, and buoy lines that could result in serious injury and mortality. For example, marine

mammals could be attracted to the fish being reared in the net pen or any forage fish around commercial aquaculture net pens which could increase the risk of incidental take occurring during routine operations of the site, causing a potential for adverse effects to the species which should be considered in addition to any management or conservation plans in place. Any effects from commercial aquaculture operations in the EEZ to protected species will be addressed through ESA consultations and MMPA authorizations and will be considered on a project-specific basis. Siting and gear configuration should be considered when identifying and quantifying the level of impacts to VECs and other resources during individual project reviews.

Additionally, indirect impacts could result if the in-water aquaculture structures displace an animal and interfere with feeding and migration behaviors. If gear failure occurs due to weather or other unanticipated events this could increase the potential for interactions with protected species.

In addition to gear interactions and displacement, effects may include impacts due to vessel traffic during construction, operations, and decommissioning. There could also be changes in water quality and environmental conditions that could reduce the quality of habitat for protected species. These include changes to the acoustic or optical environment as well as pollutant discharges.

Pathogens from farmed salmon are also a concern as pathogens can be transferred to wild populations of protected species populations.

5.6 HUMAN COMMUNITIES

For this action, the human community includes the fishing community, aquaculture developers, and the broader public. As noted above and highlighted in the aquaculture permitting section (11.0), more precise impacts to human communities will be assessed through project-level NEPA reviews. Thus, this framework describes general conditions of these communities along with the type, direction, and magnitude of impacts that Atlantic salmon aquaculture in Federal waters off New England are likely to induce on these communities. As highlighted below, many of these impacts are a matter of scale, i.e., number of aquaculture projects installed, and the scale of future development is uncertain at present. Cumulative effects will be important to assess in future permitting processes.

The analyses underpinning the high-level overview of fishing activities are drawn from vessel trip reports (VTRs), combined with federal dealer data in the case of commercial fisheries. The commercial data are processed as detailed in Benjamin, Lee, and DePiper (2018), which explicitly addresses the uncertainty surrounding VTR latitude-longitude positions. Recreational VTRs are processed as point data, given the lack of information available to assess spatial precision of this information. Trips with no VTR are not reflected in this summary. Within the analysis region for this action, the major caveats due to this gap in reporting are commercial federal lobster vessels with only lobster permits and commercial and recreational Atlantic Highly Migratory Species permitted vessels, which are all underrepresented in the VTR data. VTR and dealer report data summarized below are current as of November 15, 2022.

5.6.1 Commercial and Recreational Fisheries and Fishing Communities

Federal waters where Atlantic salmon aquaculture projects are more likely to be located are described in Section 5.1. For commercial fisheries, by revenue, Atlantic sea scallop, American lobster, Atlantic herring, Haddock, Cod, Monkfish, Pollock, Jonah crab, surfclam, and winter flounder represent the highest revenue species landed within this broad area over the past 14 years. These species also ranked highest in total poundage landed, although in a different order. Major fishery management plans in the GOM include Monkfish (NEFMC-Mid-Atlantic Fishery Management Council, MAFMC), Atlantic

Herring, Sea Scallop, Lobster (Atlantic States Marine Fisheries Commission, ASMFC), and Northeast Multispecies (large mesh groundfish). These are NEFMC plans unless otherwise noted. Although all major gear types are active within the region, scallop dredge, bottom trawl, midwater trawl, purse seine, and lobster pots represent the majority of fishing effort over the past 14 years. The spatial distribution of these landings are not uniform.

Cod, haddock, and pollock represent the vast majority of recreational harvest on charter/party vessels in the region, with Atlantic mackerel, Acadian redfish, cunner, wolffish, spiny dogfish, and black sea bass also caught in relatively high numbers. The spatial distribution of these landings are not uniform, indicating that impacts are better assessed at the project level.

The direct impact of Atlantic salmon aquaculture in federal waters on both commercial and recreational fisheries is likely negative, although the magnitude is highly uncertain over the long term. Aquaculture has the potential to displace wild capture commercial fishing from productive grounds. Because fishing activities are not uniformly distributed, impacts are better assessed at the project level. Although anglers on private recreational vessels could also be displaced by aquaculture, this mode lacks spatially-explicit data from which to assess harvest. However, the target species would be expected to be similar to that of party/charter boats in this region.

In addition, if aquaculture has negative impacts on managed species and essential fish habitats as described in Sections 5.4 and 5.5, this could induce indirect negative impacts on commercial and recreational fisheries dependent on those species. Again, assessing the likelihood and magnitude of such potential impacts is better undertaken at the project level due to variation in siting, oceanography, and numerous other factors that factor into estimating project effects (Taranger et al. 2015; Naylor et al. 2005).

Commercial and recreational fishermen that harvest fish from the area analyzed for this action are associated with multiple fishing communities. Most commercial landings and revenue derived from the portion of federal waters most conducive to Atlantic salmon aquaculture are derived from Massachusetts, particularly the ports of New Bedford, Gloucester, Boston, and Chatham. Maine (predominantly Rockland), Rhode Island (predominantly Point Judith and Newport), and New Hampshire (predominantly Newington) generate a magnitude of revenue similar to each other from these waters, with the caveat that lobster landings, the vast majority of which is landed in Maine, are underrepresented in the VTR data underpinning the analysis. The majority of recreational party/charter trips in the region originate from ports in New Hampshire (predominantly Hampton and Seabrook) and Massachusetts (predominantly Gloucester, Newburyport, and Plymouth). Historically, various ports in Maine and ports in Rhode Island (predominantly Point Judith) have hosted a similar number of angler trips to one another, with a smaller number of trips originating in ports within Connecticut, New York, and more southerly states. Any displacement has potential ripple effects throughout the economies of these ports. However, it is unlikely that aquaculture will be developed at a scale that would cause substantial impacts to these communities in the near future, given there has never been a prohibition on the activity in federal waters off of New England.

There is some potential that aquaculture companies rearing Atlantic salmon could contract with owners of commercial fishing vessels to transport salmon to and from the aquacultural facilities in federal waters, creating positive economic impacts for these fishing vessels. However, as noted in Section 5.3, the vertical integration of Atlantic salmon aquaculture businesses (Asche et al. 2013; Knott and Neis 2017; Kvaløy and Tveterås 2008) likely means that the aquaculture business itself will provide the carrier vessel. In the Gulf of Maine there is the potential that at least some of the capital and labor for these carrier services could be sourced from Canadian arms of multinational aquaculture companies.

Over time, aquaculture development may lead to port infrastructure upgrades that could have broader benefits for other port users, including commercial and recreational fishermen. This does not seem likely

in the reasonably foreseeable future, however, given aquaculture businesses would likely site projects based on available port infrastructure versus developing new or upgrading existing infrastructure.

Overall, the magnitude of these impacts will depend on the scale of aquaculture development. Offshore aquaculture is not expected to expand substantially in the near future given there has never been a prohibition on the activity in federal waters off of the coast of New England, and no development has occurred to date. However, permitting requirements are substantial, as outlined in Section 11.0. Assuming a limited scale, any impacts would likely be local in nature and would not be anticipated to affect managed species at the stock level. Thus, the indirect impacts to commercial fisheries are also anticipated to be localized and indeterminate, and again, better assessed through project-specific analyses. In addition, given that aquaculture currently occurs in state waters within the Gulf of Maine, the risk of these indirect impacts to commercial fisheries already exists in the region and the issue becomes one of scale instead of scope.

5.6.2 Fishery Reporting Mechanisms

Federal vessel and dealer reporting of farmed Atlantic salmon is considered under Alternative 2. Commercial fishing vessels with federal permits for species managed by the NEFMC and the Mid-Atlantic Fishery Management Council (MAFMC) are required to submit Vessel Trip Reports (VTRs) documenting all fishing activity and catches. Vessels that only possess an American Lobster and no other GARFO-issued permit are exempt from VTR reporting requirements. Since 2020, commercial fishermen are required to submit VTRs electronically as eVTRs instead of on paper for all species managed by either Council ([Omnibus Commercial eVTR Framework](#)). This also includes for-hire party/charter vessels with permits for species managed by the NEFMC and MAFMC. For trips fishing under a commercial permit, eVTRs must be completed and submitted within 48 hours of offloading fish ([eVTR Reporting Instructions](#)).

Data reported on eVTRs include: vessel name, U.S. Coast Guard documentation or state registration, NMFS vessel permit number, date and time sailed, date and time landed, trip type (commercial, recreational, party or charter), number of crew, number of anglers, gear code, mesh/ring size, gear quantity, gear size, fishing depth, number of hauls, chart area (based on where gear are hauled back or retrieved), latitude/longitude, tow/soak time, species code, haul weight for commercial trips or count of recreational and party/charter trips for kept and discarded species (including protected species), dealer information, date sold, and offloading port or landing port ([eVTR Reporting Instructions](#)).

All seafood dealers issued a GARFO federal permit must submit trip-level reports on a weekly basis using an approved electronic system (e.g., Standard Atlantic Fisheries Information System (SAFIS)). Data included on dealer reports include: dealer name and permit number, vessel name and permit number or hull number of the vessel where the fish are purchased, date of purchase or receipt, vessel Trip Report Serial Number (provided from the vessel when vessels have federal permits), amount of each species by market category and unit of measure being reported, disposition or how the fish will be used, price per unit of each species or total value by species per unit by market category, and port and state where the fish were landed ([NOAA's Seafood Dealer Reporting in the Greater Atlantic Region](#)). For surfclams and ocean quahogs under the ITQ allocation, cage tag numbers must also be reported.

eVTR and dealer reporting systems may be used in an aquaculture context by expanding upon the disposition reporting requirements to consider farmed, wild, mortalities that may be used in other ways but not for consumption, for example.

Currently, there is bycatch reporting of any wild caught Atlantic salmon and any other ESA- or MMPA-listed species. Any Atlantic salmon interactions must be [reported](#) on vessel trip reports, while interactions

with other species are typically required to report on VTRs, though sometimes have additional or other requirements (e.g., marine mammal interactions have a separate reporting form).

5.6.3 Aquaculture Businesses and Broader Community Impacts

Farmed Atlantic salmon is a global commodity, with 2.7 million metric tons being produced worldwide in 2020 (FAO 2021; Anderson, Asche, and Garlock 2018; Kumar and Engle 2016). Historically, Maine has developed the vast majority of Atlantic salmon aquaculture in New England, although production data are currently suppressed due to confidentiality concerns. In 2010, the last year production data are available, Maine produced around 25 million pounds of farmed Atlantic salmon (Marine Resources 2022). As of 2020, there were 600 acres of active Atlantic salmon aquacultural leases in Maine waters (Marine Resources 2022). Given these facts, increased aquacultural production in Federal waters is not likely to significantly impact either the price or the availability of farm raised Atlantic salmon either regionally or globally. Any direct impacts of aquaculture development on human communities are likely to be localized and result from the employment and wages of the aquaculture business itself.

The direct impact of Atlantic salmon aquaculture development in Federal waters on human communities is likely to be positive, as farmed Atlantic salmon is, together with shrimp, the highest value aquaculture product in the U.S. (Shamshak et al. 2019; Anderson, Asche, and Garlock 2018; Kumar and Engle 2016). Aquaculture activity could induce positive economic impacts through increased activity for aquaculture support businesses and suppliers. This could include employment of commercial fishing vessels and crews to transport harvested Atlantic salmon to port and federally permitted dealers independent of the aquacultural business itself. However, as noted in section 5.3, Atlantic salmon aquaculture businesses tend to be vertically integrated, often owning their own specialized vessels for harvesting and transporting product and serving as their own dealer and processor (Asche et al. 2013; Knott and Neis 2017; Kvaløy and Tveterås 2008). This vertical integration can extend to the entire supply chain (Asche et al. 2013), and in the Gulf of Maine, there is the potential that at least some of the capital and labor could be sourced from Canadian arms of multinational aquaculture companies. Thus, the induced impacts on suppliers and other support businesses are highly uncertain in magnitude. The magnitude of impact will depend on the ultimate scale of development. Whether direct or indirect, the scale of aquaculture in Federal waters is likely to result in impacts significant at the port/community, not the regional level, for the foreseeable future.

There is also potential for negative indirect impacts to human communities as a result of Atlantic salmon aquaculture in Federal waters. If any of the negative impacts described for Fishery and Ecosystem Component Species (Section 5.4), Physical Environment and EFH (Section 5.5), or Protected Species (Section 5.6) occur, they can induce negative impacts on the human communities that either value or otherwise rely on the resources impacted. However, assessing the likelihood and magnitude of such potential impacts is better undertaken at the project level due to the heterogeneous role of technology, siting, oceanography, and numerous other factors in this calculation (Taranger et al. 2015; Naylor et al. 2005). Nevertheless, given that Atlantic salmon aquaculture is already conducted in state waters within the Gulf of Maine, the risk of these impacts to human communities already exists in the region, and as noted above, the issue becomes one of scale instead of scope.

6.0 ENVIRONMENTAL IMPACTS OF ALTERNATIVES

6.1 INTRODUCTION

The impacts of the alternatives under consideration are evaluated herein relative to the valued ecosystem components (VECs) described in the Affected Environment (Section 5.0) and to each other. These VECs include Atlantic salmon, the target species of this FMP, the physical environment and EFH, NEFMC-managed fishery and ecosystem component species, protected species other than Atlantic salmon, and human communities. This analysis considers the direct effects of the alternatives considered here, in addition to the potential future effects of Atlantic salmon aquaculture projects that might be permitted in the EEZ.

Direct impacts

This framework expressly authorizes possession of farmed Atlantic salmon under conditions consistent with conservation and management under the Atlantic Salmon FMP. Because this action is administrative, direct impacts on the biological and physical environment are not expected to result from this authorization, as detailed below. Human community impacts associated with these administrative requirements are expected to be minimal.

Potential future effects

This framework creates a path to facilitate the legal operation of Atlantic salmon aquaculture in the EEZ, which could have direct impacts on the biological and physical environment or human communities. Thus, this analysis speaks generally about the reasonably foreseeable impacts of offshore aquaculture projects in the Gulf of Maine to forecast the potential impacts of aquaculture operations. These impacts will be evaluated in more detail as specific projects undergo permitting and environmental review.

As described in Sections 4.0 through 5.0, a range of possible impacts of aquaculture projects are expected. The magnitude of impacts is expected to vary, given the details of individual projects, the total number of projects developed, and the extent to which impacts are mitigated through project siting and design adjustments that are intended to reduce impacts. Since the number of potential Atlantic salmon aquaculture projects that might be developed is unknown, the magnitude of potential future impacts is difficult to predict.

However, Atlantic salmon aquaculture projects in the EEZ might still be permitted, regardless of which alternative is adopted by the Council in this framework.

Evaluation criteria

This action evaluates the potential impacts using the criteria in Table 5.

Table 6. General definitions for impacts and qualifiers relative to resource condition (i.e., baseline).

VEC	Resource Condition	Impact of Action		
		Positive (+)	Negative (-)	No Impact (0)
Target and Non-target Species	Overfished status defined by the MSA	Alternatives that would maintain or are projected to result in a stock status above an overfished condition*	Alternatives that would maintain or are projected to result in a stock status below an overfished condition*	Alternatives that do not impact stock / populations
ESA-listed Protected Species (endangered or threatened)	Populations at risk of extinction (endangered) or endangerment (threatened)	Alternatives that contain specific measures to ensure no interactions with protected species (e.g., no take)	Alternatives that result in interactions/take of listed resources, including actions that reduce interactions	Alternatives that do not impact ESA listed species
MMPA Protected Species (not also ESA listed)	Stock health may vary but populations remain impacted	Alternatives that will maintain takes below Potential Biological Removal (PBR) and approaching the Zero Mortality Rate Goal	Alternatives that result in interactions with/take of marine mammal species that could result in takes above PBR	Alternatives that do not impact MMPA Protected Species
Physical Environment / Habitat / EFH	Many habitats degraded from historical effort (see condition of the resources table for details)	Alternatives that improve the quality or quantity of habitat	Alternatives that degrade the quality, quantity or increase disturbance of habitat	Alternatives that do not impact habitat quality
Human Communities (Socioeconomic)	Highly variable but generally stable in recent years (see condition of the resources table for details)	Alternatives that increase revenue and social well-being of fishermen and/or communities	Alternatives that decrease revenue and social well-being of fishermen and/or communities	Alternatives that do not impact revenue and social well-being of fishermen and/or communities
Impact Qualifiers				
A range of impact qualifiers is used to indicate any existing uncertainty	Negligible		To such a small degree to be indistinguishable from no impact	
	Slight (sl) as in slight positive or slight negative		To a lesser degree / minor	
	Moderately (M) positive or negative		To an average degree (i.e., more than “slight”, but not “high”)	
	High (H), as in high positive or high negative		To a substantial degree (not significant unless stated)	
	Significant (in the case of an EIS)		Affecting the resource condition to a great degree.	
	Likely		Some degree of uncertainty associated with the impact	
*Actions that will substantially increase or decrease stock size, but do not change a stock status may have different impacts depending on the particular action and stock. Meaningful differences between alternatives may be illustrated by using another resource attribute aside from the MSA status, but this must be justified within the impact analysis.				

6.2 IMPACTS ON ATLANTIC SALMON

This action would expressly authorize possession of farmed Atlantic salmon. Under Alternative 1 (No Action), the facilitation of authorized possession of farmed salmon would not occur. Aquaculture operators would be individually responsible for demonstrating that any salmon in their possession are farmed fish, and not in violation of the regulations that prohibit possession of salmon in the EEZ. Under Alternative 2, possession of farmed Atlantic salmon would be authorized via an LOA and would require vessel and dealer reporting. Under Alternative 3, which is the proposed action, possession of farmed Atlantic salmon would be authorized via an LOA.

Direct impacts

All alternatives, including the No Action alternative, relate to administrative provisions for authorizing possession of farmed Atlantic salmon in the EEZ. Therefore, no direct impacts to wild Atlantic salmon are expected to result from any of the alternatives considered in this action. Permitting and related environmental review for these projects will occur under separate processes, which will consider, among other issues, effects on the wild Atlantic salmon resource. Consultation under ESA Section 7 will ensure that impacts to wild Atlantic salmon from any future aquaculture projects are minimized.

Data and information developed pursuant to the LOA required under Alternatives 2 and 3 could indirectly support management of wild Atlantic salmon as compared to Alternative 1. Under Alternative 1, there would be no administrative system created for authorizing possession of farmed fish. This means that unless required as a part of the aquaculture permitting process, there could be less project-specific information available to ensure the conservation objectives of the Atlantic salmon FMP are being met.

Alternatives 2 and 3 could be beneficial to Atlantic salmon relative to Alternative 1 in that they would create administrative mechanisms (i.e., an LOA requirement) around authorized possession of farmed salmon. Information gathered as part of the LOA process could help ensure the conservation objectives of the Atlantic salmon FMP are considered relative to aquaculture project authorization and operations. Alternative 2 could be beneficial to Atlantic salmon relative to Alternative 3 in that it creates additional data streams via federal vessel and dealer reporting that can be used to evaluate potential impacts of aquaculture projects.

Potential future effects

Atlantic salmon aquaculture operations could result in some level of negative impacts to wild Atlantic salmon if avoidance, minimization, and mitigation measures associated with aquaculture projects are not sufficient, which could thereby inhibit recovery of the wild species. These impacts could include escapement; disease; use of drugs, biologics, and other chemicals; water quality impacts; benthic sediment and community impacts; and location-specific interactions with Atlantic salmon EFH. For example, there is concern that non-native farmed Atlantic salmon can escape and become established in the wild, competing with wild Atlantic salmon for food, habitat, mates, and other resources. Interbreeding could result in the loss of fitness in the population due in part to the loss of genetic diversity, if breeding occurs between wild and farmed Atlantic salmon. Farmed Atlantic salmon are often more susceptible to diseases because they are kept at higher densities, which both increases their rate of contact and may induce stress. Pathogens may be transferred from farmed to wild Atlantic salmon as a result.

These aquaculture projects could be permitted, and these impacts could occur, regardless of which alternative is adopted under this framework. Individual salmon aquaculture projects would undergo project specific NEPA analyses including cumulative effects analysis to evaluate the range of potential impacts. NMFS would be a cooperating agency for any EA or EIS related to future proposals to permit Atlantic salmon aquaculture in the EEZ and would raise issues related to conservation of trust resources, including managed fisheries species. Given that the number, size, and location of future aquaculture operations are unknown, the extent of potential impacts is highly uncertain.

6.3 IMPACTS ON OTHER MANAGED AND ECOSYSTEM COMPONENT SPECIES

This action would expressly authorize possession of farmed Atlantic salmon. Under Alternative 1 (No Action), the facilitation of authorized possession of farmed salmon would not occur. Aquaculture operators would be individually responsible for demonstrating that any salmon in their possession are farmed fish, and not in violation of the regulations that prohibit possession of salmon in the EEZ. Under Alternative 2, possession of farmed Atlantic salmon would be authorized via an LOA and would require vessel and dealer reporting. Under Alternative 3, which is the proposed action, possession of farmed Atlantic salmon would be authorized via an LOA.

Direct impacts

All alternatives, including the No Action alternative, relate to administrative provisions for authorizing possession of farmed Atlantic salmon in the EEZ. Therefore, no direct impacts on other managed and ecosystem component species are expected to result from Alternatives 1, 2, or 3. All alternatives are expected to have the same direction and magnitude of impacts on other managed species and ecosystem component species. Permitting and related environmental review for these projects will occur under separate processes, which will evaluate the potential future effects described below.

Potential future effects

Atlantic salmon aquaculture projects could result in negative impacts to other managed and ecosystem component species if avoidance, minimization, and mitigation measures are not sufficient. Potential impacts include escapement of farmed species which could become established and outcompete native species for food and other resources, and the spread of disease and pathogens from farmed species to other managed and ecosystem component species which could negatively affect them, especially species that are either overfished and/or experiencing overfishing (Table 6). The use of drugs or other chemicals could degrade water quality affecting both farmed species and other species near the farm. There may also be impacts to benthic sediments and biological communities, or other location-specific effects on EFH, which could alter the function of these habitats for managed species. Additional information can be found in Sections 5.4 (NEFMC-managed fishery and ecosystem components), 5.5 (physical environment and EFH), and 5.7.1 (commercial and recreational fisheries and fishing communities).

The extent of potential indirect impacts is highly uncertain given that the number, size, and location of future aquaculture operations are unknown. Individual Atlantic salmon aquaculture projects would undergo project specific NEPA analyses including cumulative effects analysis to evaluate the range of potential impacts. NMFS would be a cooperating agency for any EA or EIS related to future proposals to permit Atlantic salmon aquaculture in the EEZ and would raise issues related to conservation of trust resources, including managed fisheries species.

6.4 IMPACTS ON THE PHYSICAL ENVIRONMENT AND ESSENTIAL FISH HABITAT

Under Alternative 1 (No Action), the facilitation of authorized possession of farmed Atlantic salmon would not occur. Aquaculture operators would be individually responsible for demonstrating that any salmon in their possession are farmed fish, and not in violation of the regulations that prohibit possession of salmon in the EEZ. Under Alternative 2, conditions for possession of farmed Atlantic salmon would be authorized via an LOA and would require vessel and dealer reporting. Under Alternative 3, conditions possession of farmed Atlantic salmon would be authorized via an LOA.

Direct impacts

All alternatives, including the No Action alternative, relate to administrative provisions for authorizing possession of farmed Atlantic salmon in the EEZ. Therefore, no direct impacts on the physical environment and essential fish habitat are expected to result from Alternatives 1, 2, and 3. All alternatives are expected to have the same direction and magnitude of impacts on the physical environment and EFH.

Potential future effects

Atlantic salmon aquaculture projects could result in negative impacts to essential fish habitats if avoidance, minimization, and mitigation measures are not sufficient. The impacts of Atlantic salmon aquaculture development in federal waters on the physical environment and EFH could include release of excess nutrients, introduction of non-native species, transmission of fish diseases, habitat conversion from the presence of aquaculture structures, and so on. Assuming that soft bottom habitats are preferred sites for installation of aquaculture facilities, the presence of structures from aquaculture facilities could alter benthic habitat from soft to hard sediment, which could affect nearby benthic species, especially those dependent on soft bottom habitats. Different species are likely to be affected negatively or positively by the addition of artificial substrates and structures to their environment and by the removal or alteration of existing benthic habitats. It is unclear whether these structures would increase fish production or simply cause spatial aggregation.

The extent of potential indirect impacts is highly uncertain and will depend upon the size and location of the aquaculture farm, experience level of farm operators, methods used, etc. Individual Atlantic salmon aquaculture projects would undergo project specific NEPA analyses including cumulative effects analysis to evaluate the range of potential impacts. NMFS would be a cooperating agency for any EA or EIS related to future proposals to permit Atlantic salmon aquaculture in the EEZ and would raise issues related to conservation of essential fish habitats. EFH consultations will be used as a means to evaluate and mitigate impacts.

6.5 IMPACTS ON PROTECTED SPECIES

Under Alternative 1 (No Action), the facilitation of authorized possession of farmed salmon would not occur. Aquaculture operators would be individually responsible for demonstrating that any salmon in their possession are farmed fish, and not in violation of the regulations that prohibit possession of salmon in the EEZ. Under Alternative 2, possession of farmed Atlantic salmon would be authorized via a Letter of Authorization (LOA) and would require vessel and dealer reporting. Under Alternative 3, possession of farmed Atlantic salmon would be authorized via an LOA.

Direct impacts

All alternatives, including the No Action alternative, relate to administrative provisions for authorizing possession of farmed Atlantic salmon in the EEZ. Alternatives 1, 2, and 3 are not expected to have any direct impacts on protected species of whales, dolphins, seals, sea turtles, and listed fishes. All alternatives are expected to have the same direction and magnitude of impacts on protected species. Impacts to Atlantic salmon, which is considered a protected species as it is listed under the ESA, are discussed separately in section 6.2.

Potential future effects

Atlantic salmon aquaculture projects could result in negative impacts to protected species including whales, dolphins, seals, turtles, and listed fishes if avoidance, minimization, and mitigation measures are not sufficient.

In general, the impacts on protected species of placing offshore net pen aquaculture gear in the water could be negligible to highly negative, with the latter degree of impacts resulting from a direct protected species interaction with the aquaculture gear, which could lead to serious injury or mortality.

Additionally, indirect impacts negative could result if the in-water aquaculture structures displace an animal and interfere with feeding and migration behaviors. Special conditions placed on the permit could significantly reduce these risks but would not eliminate the potential for these events to occur.

The direct impacts to protected species of expanding Atlantic salmon aquaculture into federal waters are going to be mostly site and project specific. Given that the number, size, and location of future aquaculture operations are unknown, the extent of potential impacts is highly uncertain. Individual salmon aquaculture projects would undergo project specific NEPA analyses including cumulative effects analysis to evaluate the range of potential impacts. Agency consultations, including under ESA Section 7, will be used as a means to evaluate and mitigate potential impacts.

6.6 IMPACTS ON HUMAN COMMUNITIES

For this action, the human community includes the fishing community, aquaculture developers, and the broader public. In general, because Atlantic salmon aquaculture already exists in state waters, the expansion of Atlantic salmon aquaculture into federal waters represents a change in the scale of potential impacts but does not create novel categories of potential impacts. These effects will be evaluated during the project permitting process. Also, this action only applies to the possession of farmed Atlantic salmon in federal waters, and the regulatory framework for aquaculture falls outside of the fishery management council process.

As such, at the level of this framework, the differences in impacts between Alternatives 1, 2, and 3 reduces to differences in administrative costs. Both Alternatives 2 and 3 would be expected to result in slightly positive impacts compared to Alternative 1 with respect to ultimate net benefits, as they outline a clear process by which exemptions to the current possession prohibition on Atlantic salmon can be attained. Alternative 3 presents a streamlined administrative process which would be expected to reduce the costs of compliance when compared to Alternative 2. These additional compliance costs are described below for federally permitted vessels. Under Alternative 1, operators will still be required to document that any Atlantic salmon in their possession are from an aquaculture operation, to remain in compliance with the prohibition in the Atlantic salmon FMP, but no procedures or policies around such documentation would be created by the Council.

There will be broader impacts to human communities of expanding Atlantic salmon aquaculture into federal waters, and these impacts will be project specific. Given that the number, size, and location of future aquaculture operations are unknown, the overall extent of potential impacts is highly uncertain. The type of impacts to commercial and recreational fisheries that could result from offshore aquaculture installations are detailed in section 5.7.1 and could include effort displacement, or indirect effects that result from impacts to target species or their habitats.

Apart from EFH consultations, which are required under MSA, and voluntary Council coordination and consultation on aquaculture development via its Aquaculture Policy, development of aquaculture in Federal waters for Atlantic salmon and for other species is likely to be managed outside of the Fishery Management Council process. This framework pertains specifically to authorizing possession of farmed Atlantic salmon and is expected to facilitate authorization and operation of these projects. However, delineating the potential impacts of this framework on Atlantic salmon aquaculture in federal waters is difficult because the measures here are additive to multiple existing permitting requirements. This lends uncertainty to any potential assessment of impacts.

6.6.1 Alternative 1 – No Action

Under Alternative 1 (No Action), the facilitation of authorized possession of farmed salmon would not occur. Although this would not necessarily preclude aquaculture for Atlantic salmon in Federal waters, it

would leave the process of gaining Federal exemption to the Atlantic salmon prohibition uncertain. Aquaculture operators would be individually responsible for demonstrating that any salmon in their possession are farmed fish, and not in violation of the regulations that prohibit possession of salmon in the EEZ.

Direct impacts

For the commercial fishing industry, the direct impacts under Alternative 1 would likely be negligible to slight negative, assuming few commercial fishing vessels engage in aquaculture activities. Uncertainty around the permitting process would be expected to increase the administrative burden on any commercial fishing businesses that might contract with Atlantic salmon aquaculture businesses to transport salmon to and from the aquacultural facilities in federal waters. Commercial fishing businesses would need to work with the NMFS to secure the needed authorizations. This administrative burden would likely be highest for the first company to attempt to procure these authorizations, as there is little precedent which that company could use to build upon. Subsequent companies would likely face much lower administrative burden for attaining the required authorizations, due to the precedent that would then be set. However, the perceived or real administrative burden faced by the first business to attempt to secure the relevant exemptions could be high enough to dissuade businesses from fully engaging in the process. Given the vertically integrated nature of most aquacultural businesses, as detailed in Section 4.3.2 businesses (Asche et al. 2013; Knott and Neis 2017; Kvaløy and Tveterås 2008), the aquaculture business itself will likely provide the carrier vessel. This suggests that the no action alternative would have negligible to slight negative impacts on commercial fishing businesses, assuming few commercial fishing vessels engage in aquaculture activities.

For the recreational fishing industry, the direct impacts under Alternative 1 would likely be negligible since these vessels are unlikely to engage in aquaculture activities and would therefore not bear an administrative burden of documenting possession of farmed salmon.

For aquaculture businesses, although Alternative 1 would not necessarily preclude aquaculture for Atlantic salmon in federal waters, it would leave the process of gaining federal exemption to the Atlantic salmon prohibition uncertain. The uncertainty around the permitting process would be expected to increase the administrative burden on human communities, particularly on seafood dealers who would need to work with the NMFS to develop the parameters necessary to secure the needed authorizations. This administrative burden would likely be highest for the first company to attempt to procure these authorizations, as there is little precedent which that company could use to build upon. Subsequent companies would likely face much lower administrative burden for attaining the required authorizations, due to the precedent that would then be set. However, the perceived or real administrative burden faced by the first business to attempt to secure the relevant exemptions could be high enough to dissuade businesses from fully engaging in the process.

Potential future effects

For commercial and recreational fisheries, there could be uncertainty around areas to avoid if aquaculture operations are not sited appropriately to avoid productive fishing grounds or important vessel transit areas. Displacement of fishing activity could potentially indirectly affect other ocean users if fishermen are displaced to new areas. Also, if commercially and recreationally important fish species are attracted to or avoid areas where fish farms are present, then that could indirectly affect where fishermen harvest the fish and their overall fishing behavior.

6.6.2 Alternative 2 – Explicitly Authorize Conditions for Possession of Farmed Salmon via LOA, Vessel, and Dealer Reporting

Under Alternative 2, conditions for possession of farmed Atlantic salmon would be authorized via a Letter of Authorization (LOA) and would require vessel and dealer reporting. Under this alternative, reporting the harvest and sale of farmed Atlantic salmon is intended to be consistent with requirements for wild caught federally managed species.

Direct impacts

Overall, the direct impacts of Alternative 2 on commercial fishing would likely be negligible to slight negative, in that requesting the LOA and completing vessel and dealer reports represents an administrative burden. These impacts are expected to be positive relative to Alternative 1, No Action, in that the administrative procedures are clarified under the authorization proposed under Alternative 2.

In terms of the LOA requirement, commercial fishing vessels sometimes request LOAs for various purposes, such as when participating in specific fishery programs. Alternative 2 expands the types of activities for which commercial fishing vessels may request an exemption to include possession of farmed Atlantic salmon. The issuance of a salmon possession LOA is not expected to create a novel or substantial administrative burden for these businesses because LOAs are already an administrative mechanism employed by the Council, and the requirements for the LOA would be clearly defined via the Council's framework.

In terms of vessel permits and reporting, for the commercial fishing industry, owners of vessels that currently have federal fishing permits would not induce any additional administrative costs if they needed to obtain a federal salmon vessel permit to support their participation in an aquaculture project, since a vessel owner applies for all federal fishing permits through a single transaction. Familiarity with existing federal permitting and reporting systems could provide a comparative advantage for commercial vessels with current federal permits over commercial vessels without such permits. Non-federally permitted vessels would face the additional costs associated with gaining federal vessel permits and submitting reports in accordance with regulations defined within 50 CFR §648.7(b)(1). This regulation includes submitting reports for all species, not just federally managed species.

The vertical integration of Atlantic salmon aquaculture businesses (Asche et al. 2013; Knott and Neis 2017; Kvaløy and Tveterås 2008) likely means that the aquaculture business itself will provide the carrier vessel and view the procurement of a federal vessel permit as a comparatively small additional cost of business. The LOA is also likely to be viewed as a comparatively small additional cost of business, in a similar manner to the permit requirement. Overall, these additional costs of business are unlikely to serve as a deciding factor in whether Atlantic salmon aquaculture in federal waters is expected to be a worthwhile business endeavor.

For seafood dealers, Alternative 2 requires reporting in a manner that is consistent with the harvest and sale of wild caught federally managed species needing a regulatory exemption. This means that dealers with existing federal permits would not induce any additional administrative costs. Non-federally permitted dealers would face the additional costs associated with gaining a federal permit and submitting reports in accordance with regulations defined within 50 CFR §648.7(a)(1), which includes submitting reports for all species, not just federally-managed species. Although this could provide a comparative advantage for dealers with current federal permits over dealers without such permits, in reality, and as noted above, vertical integration likely means that the aquaculture business itself would serve as the dealer and view the procurement of a federal dealer permit as a comparatively small additional cost of business. The LOA requirement would have no impact on dealers which are distinct entities from the aquaculture business.

For the recreational fishing industry, the direct impacts under Alternative 2 would likely be negligible since these vessels are unlikely to engage in aquaculture activities and would therefore not bear an administrative burden of obtaining an LOA or salmon vessel permit or reporting salmon harvest.

Alternative 2 would be expected to be slightly more positive than Alternative 1 given an explicit pathway by which an exemption from the prohibition on the possession of Atlantic salmon is likely to decrease the administrative costs of compliance but be slightly negative compared to Alternative 3 due to the lower administrative costs of the latter.

Potential future effects

For commercial and recreational fisheries, there could be uncertainty around areas to avoid if aquaculture operations are not sited appropriately to avoid productive fishing grounds or important vessel transit areas. Displacement of fishing activity could potentially indirectly affect other ocean users if fishermen are displaced to new areas. Also, if commercially and recreationally important fish species are attracted to or avoid areas where fish farms are present, then that could indirectly affect where fishermen harvest the fish and their overall fishing behavior.

6.6.3 Alternative 3 – Explicitly Authorize Conditions for Possession of Farmed Salmon via LOA (Preferred Alternative)

Under Alternative 3, which is the proposed action, conditions for possession of farmed Atlantic salmon would be authorized via an LOA.

Direct impacts

Overall, the direct impacts of Alternative 3 on commercial fishing would likely be negligible to slight negative, given administrative requirements, but positive relative to Alternative 1, No Action. As noted for Alternative 2, commercial fishing vessels sometimes request LOAs for various purposes, such as when participating in specific fishery programs. Alternative 2 expands the types of activities for which commercial fishing vessels may request an exemption to include possession of farmed Atlantic salmon. The issuance of a salmon possession LOA is not expected to create a novel or substantial administrative burden for these businesses because the requirements for the LOA would be clearly defined via the Council's framework.

For Atlantic salmon aquaculture businesses, which are likely to be vertically integrated, the LOA is likely to be viewed as a comparatively small additional cost of business. This additional cost of business is unlikely to serve as a deciding factor in whether Atlantic salmon aquaculture in federal waters is expected to be a worthwhile business endeavor. The LOA requirement would have no impact on dealers which are distinct entities from the aquacultural business.

For the recreational fishing industry, the direct impacts under Alternative 2 would likely be negligible since these vessels are unlikely to engage in aquaculture activities and would therefore not bear an administrative burden of obtaining an LOA.

Under Alternative 1, there are no established procedures for documenting that salmon aboard a vessel are farmed, and under Alternative 2, there are additional requirements in the form of vessel and dealer permits and reports. Thus, Alternative 3 would be expected to be slightly more positive compared to Alternatives 1 and 2, due to lower administrative business costs. Since these costs are not anticipated to play a deciding role in whether an aquacultural business engages in Atlantic salmon aquaculture in federal waters, the streamlined exemption requirements are not likely to significantly impact business decision making for these entities. However, this streamlining does potentially decrease the costs of state dealers engaging in the buying and selling of Atlantic salmon, as this would represent an entry cost not faced by federally permitted dealers. The exact reporting requirements differ by state, and thus would be project

specific. Nevertheless, this alternative would be expected to be slightly more positive than Alternatives 1 and 2 due to the lower administrative costs of Alternative 3.

Potential future effects

For commercial and recreational fisheries, there could be uncertainty around areas to avoid if aquaculture operations are not sited appropriately to avoid productive fishing grounds or important vessel transit areas. Displacement of fishing activity could potentially indirectly affect other ocean users if fishermen are displaced to new areas. Also, if commercially and recreationally important fish species are attracted to or avoid areas where fish farms are present, then that could indirectly affect where fishermen harvest the fish and their overall fishing behavior.

6.7 CUMULATIVE EFFECTS ANALYSIS

6.7.1 Introduction

A cumulative effects analysis (CEA) is required by the Council on Environmental Quality (CEQ; 40 CFR part 1508.1(g)(3)) and NOAA policy and procedures for NEPA, found in NOAA Administrative Order 216-6A (Companion Manual, January 13, 2017). The purpose of the CEA is to consider the combined effects of many actions on the human environment over time that would be missed if each action were evaluated separately. The intent is to focus on those effects that are truly meaningful. The following remarks address the significance of the expected cumulative impacts as they relate to the federally managed Atlantic salmon fishery.

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

6.7.1.1 Consideration of the Valued Ecosystem Components (VECs)

The valued ecosystem components for the Atlantic salmon fishery are generally the “place” where the impacts of management actions occur and are identified in section 5.0.

- *Target Species*
- *Other managed and ecosystem component species*
- *Physical environment and Essential Fish Habitat*
- *Protected species*
- *Human communities*

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

6.7.1.2 Geographic Boundaries

The analysis of impacts focuses on actions related to the harvest of farmed Atlantic salmon. The Western Atlantic Ocean is the core geographic scope for all of the VECs. The core geographic scope for Atlantic salmon, the managed species of this FMP, is their management unit (Section 5.2). For other managed and ecosystem component species, that range may be expanded and would depend on the range of each species in the Western Atlantic Ocean. For habitat, the core geographic scope is focused on EFH within the EEZ but includes all habitat utilized by Atlantic salmon, and other managed and ecosystem

component species in the Western Atlantic Ocean. The core geographic scope for each protected species is the individual species ranges in the Western Atlantic Ocean. For human communities, the core geographic boundaries are defined as those U.S. fishing communities in coastal states from Maine to Rhode Island directly involved in the harvest or processing of Atlantic salmon. Maine, New Hampshire, Massachusetts, and Rhode Island are the states adjacent to the affected environment for this action, as described in Section 5.1.

6.7.1.3 Temporal Boundaries

Overall, while the effects of the historical Atlantic salmon fishery are important determinants of current stock status, and thus indirectly considered in the analysis, the temporal scope of past and present actions for Atlantic salmon, other managed and ecosystem component species and other fisheries, the physical environment and EFH, and human communities is primarily focused on actions that occurred after FMP implementation (1987). An assessment using this timeframe demonstrates the changes to resources and the human environment that have resulted through management under the Council process and through the FMP's prohibition on possession of wild salmon in the EEZ. For protected species, the scope of past and present actions is focused on the 1980s and 1990s (when NMFS began generating stock assessments for marine mammals and sea turtles that inhabit waters of the U.S. EEZ) through the present.

The temporal scope of future actions for all VECs extends about five years (2028) into the future beyond the implementation of this action which we consider to be within a reasonably foreseeable timeframe. The dynamic nature of resource management for these species and lack of information on federal waters aquaculture projects that may occur in the future make it difficult to predict impacts beyond this timeframe with any certainty. The impacts discussed in Section 6.7.3 are focused on the cumulative effects of the proposed action (i.e., the suite of preferred alternatives) in combination with the relevant past, present, and reasonably foreseeable future actions over these time scales.

6.7.2 Relevant Actions Other Than Those Proposed in this Document

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

6.7.2.1 Fishery Management Actions

6.7.2.1.1 Atlantic salmon FMP Actions

The Council has taken several omnibus actions to manage the Atlantic salmon resource. Past, present, and reasonably foreseeable future actions related to Atlantic salmon management include the establishment of the original FMP and all subsequent amendments and frameworks. Key actions are described below.

Target species fishery related actions:

The Atlantic salmon FMP was implemented in 1987 and has been amended several times, most recently in 2020 via Atlantic Salmon Amendment 5. The documents pertaining to previous management actions are available on the Atlantic salmon FMP [webpage](#). The Atlantic salmon FMP prohibits possession of wild Atlantic salmon and any directed or incidental catch in federal waters. Atlantic salmon is overfished and returns remain at historically low levels. The Gulf of Maine distinct population segment of the species is listed as endangered under the Endangered Species Act.

There have only been five amendments to the Atlantic salmon FMP: 1) Omnibus Habitat Amendment 1 in 1999 which implemented EFH provisions; 2) Northeast Region Standardized Bycatch Reporting Methodology in 2007, which established bycatch reporting and monitoring mechanisms for all 13 Northeast Region FMPs; 3) Omnibus Essential Fish Habitat Amendment 2 in 2018 (details below); 4) Standardized Bycatch Reporting Methodology in 2014, which established standards of precision for bycatch estimation for all Northeast Region fisheries; and 5) Industry-Funded Monitoring Omnibus Amendment in 2020, which allowed the NEFMC flexibility to increase monitoring to assess the amount and type of catch. These actions were all omnibus actions that were expected to have positive impacts on Atlantic salmon due to the increased conservation and monitoring measures implemented.

The only additional update planned at this time is a review of Atlantic salmon EFH and Habitat Area of Particular Concern designations. The FMP is expected to make a positive contribution to Atlantic salmon conservation.

Beyond the Council's Atlantic Salmon FMP, salmon conservation is fostered via the [Atlantic Salmon Recovery Plan](#), which is administered by NOAA and USFWS, as a requirement of the Endangered Species Act.

Physical habitat and EFH:

The EFH Omnibus Amendment 2 (Atlantic Salmon Amendment 3), effective April 2018, reviewed and updated EFH designations, identified Habitat Areas of Particular Concern, and updated the status of current knowledge of gear impacts. It also implemented new spatial management measures throughout New England for minimizing the adverse impact of fishing on EFH that affects all species managed by the NEFMC, including Atlantic salmon.

Protected Resources:

In addition to wild Atlantic salmon, protected resources in the affected environment for the Atlantic salmon FMP include large whales, dolphins, seals, sea turtles, small cetaceans, pinnipeds, Atlantic sturgeon. Protected species other than Atlantic salmon are not expected to be affected by this action or likely future updates to the FMP.

Human communities:

All actions taken under the Atlantic salmon FMP have had effects on human communities. Given the status of the Atlantic salmon stock, and the prohibition on possession in the FMP, there is no fishery in the EEZ for wild Atlantic salmon. Ongoing adjustments to the FMP have not changed this fishery since the plan was implemented.

6.7.2.1.2 Other Fishery Management Actions

In addition to the Atlantic salmon FMP, there are many other FMPs and associated fishery management actions for other species that impacted these VECs over the temporal scale described in Section 6.7.1.3. Those FMPs managed by the NEFMC include Sea Scallop, Northeast Multispecies, Atlantic Herring, Northeast Skate Complex, and Monkfish. The SBRM and IFM amendments described above apply to these FMPs and provide for fisheries dependent monitoring, including catch of any wild Atlantic salmon. Bycatch of salmon in other fisheries is extremely rare (see section 5.2.1). Omnibus amendments are also frequently developed to amend multiple FMPs at once. Actions associated with other FMPs and omnibus amendments have included measures to regulate fishing effort for other species, measures to protect habitat and forage species, and fishery monitoring and reporting requirements.

There are management plans underway for several protected resources. For example, Take Reduction Plans (TRPs) are in place to reduce serious injury to, or mortality, of protected species, including the Atlantic Large Whale Take Reduction Plan (ALWTRP) for gillnet and pot/trap fisheries, the Bottlenose Dolphin Take Reduction Plan (BDTRP) for gillnet fisheries, and the Harbor Porpoise Take Reduction

Plan (HPTRP) for gillnet fisheries. On September 26, 2022, NOAA Fisheries released a final Action Plan to reduce Atlantic sturgeon bycatch in Federal large mesh gillnet fisheries. This plan provides a suite of recommendations to NOAA Fisheries, the NEFMC, and the MAFMC that should be considered, refined, and implemented to reduce Atlantic sturgeon bycatch in subject fisheries by 2024. In 2023, the Councils expect to develop an action in response to the sturgeon action plan that should result in future positive impacts on Atlantic sturgeon.

6.7.2.2 Non-Fishing Impacts

6.7.2.2.1 Other Human Activities

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

Examples of non-fishing activities include point source and non-point source pollution, shipping, dredging/deepening, wind energy development, oil and gas development, construction, and other activities. Specific examples include at-sea disposal areas, oil and mineral resource exploration, aquaculture, construction of offshore wind farms, and bulk transportation of petrochemicals. Episodic storm events and the restoration activities that follow can also cause impacts. The impacts from these activities primarily stem from habitat loss due to human interaction and alteration or natural disturbances. These activities are widespread and can have localized impacts on habitat related to accretion of sediments, pollutants, habitat conversion, and shifting currents and thermoclines.

For protected species, primary concerns associated with non-fishing activities include vessel strikes, hopper dredge interactions (especially for sea turtles and sturgeon), and underwater noise. These activities have both direct and indirect impacts on protected species. Wherever these activities co-occur, they are likely to work additively or synergistically to decrease habitat quality and as such may indirectly constrain the productivity of managed species, non-target species, and protected species. Decreased habitat suitability tends to reduce the tolerance of these VECs to the impacts of fishing effort. Non-fishing activities can cause target, non-target, and protected species to shift their distributions away from preferred areas and may also lead to decreased reproductive ability and success (from current changes, spawning disruptions, and behavior changes), disrupted or modified food web interactions, and increased disease. While localized impacts may be more severe, the overall impact on the affected species and their habitats on a population level is unknown, but likely to have impacts that mostly range from no impact to slight negative, depending on the species and activity.

Non-fishing activities permitted by other Federal agencies (e.g., beach nourishment, offshore wind facilities) require examinations of potential impacts on the VECs. The MSA imposes an obligation on other Federal agencies to consult with the Secretary of Commerce on actions that may adversely affect EFH (50 CFR 600.930). NMFS and the eight regional fishery management councils engage in this review process by making comments and recommendations on federal or state actions that may affect habitat for their managed species. Agencies need to respond to, but do not necessarily need to adopt these recommendations. Habitat conservation measures serve to potentially minimize the extent and magnitude of indirect negative impacts federally permitted activities could have on resources under NMFS' jurisdiction. In addition to guidelines mandated by the MSA, NMFS evaluates non-fishing effects during the review processes required by Section 404 of the CWA and Section 10 of the RHA for certain

activities that are regulated by Federal, state, and local authorities. Non-fishing activities must also meet the mandates under the ESA, specifically Section 7(a)(2)³, which ensures that agency actions do not jeopardize the continued existence of endangered species and their critical habitat.

In recent years, offshore wind energy has become a highly relevant activity in the Greater Atlantic region. This activity is expected to impact all VECs, as described below.

Impacts of offshore wind energy development on Biological Resources (Target species, Managed and other Ecosystem Component species, Protected Species) and the Physical Environment / EFH

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

The full build out of offshore wind farms will result in broad habitat alteration. The wind turbines will alter hydrodynamics of the area, which may affect primary productivity and physically change the distribution of prey and larvae. It is not clear how these changes will affect the reproductive success of marine resources. Scour and sedimentation could have negative effects on egg masses that attach to the bottom. Benthic habitat will be altered due to the placement of scour protection at wind turbine foundations, and over cables that are not buried to target depth in the sediment, converting soft substrates into hard substrates. This could alter species composition and predator/prey relationships by increasing favorable habitat for some species and decreasing habitat for others. The placement of wind turbines will also establish new vertical structure in the water column, which could serve as reefs for bottom species, fish aggregating devices for pelagic species, and substrate for the colonization of other species, e.g., mussels. Various authors have studied these types of (e.g., Bergström et al. 2013; Dannheim et al. 2019; Degraer et al. 2019; Langhamer 2012; Methratta & Dardick 2019; Stenberg et al. 2015).

Elevated levels of sound produced during site assessment activities, construction, and operation of offshore wind facilities will impact the soundscape.⁴ Temporary, acute, noise impacts from construction activity could impact reproductive behavior and migration patterns; the long-term impact of operational noise from turbines may also affect behavior of fish and prey species, through both vibrations in the immediate area surrounding them in the water column, and through the foundation into the substrate. Depending on the sound frequency and source level, noise impacts to species may be direct or indirect (Finneran 2015; 2016; Madsen et al. 2006; Nowacek et al. 2007; NRC 2000; 2003; 2005; Piniak 2012; Popper et al. 2014; Richardson et al. 1995; Thomsen et al. 2006). Exposure to underwater noise can directly affect species via behavioral modification (avoidance, startle, spawning) or injury (sound

³ “Each Federal agency shall, in consultation with and with the assistance of the Secretary, ensure that any action authorized, funded, or carried out by such agency (hereinafter in this section referred to as an “agency action”) is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of critical habitat.”

⁴ See NMFS Ocean Noise Strategy Roadmap:
https://cetsound.noaa.gov/Assets/cetsound/documents/Roadmap/ONS_Roadmap_Final_Complete.pdf

exposure resulting in internal damage to hearing structures or internal organs; Bailey et al. 2014; Bailey et al. 2010; Bergström et al. 2014; Ellison et al. 2011; Ellison et al. 2018; Forney et al. 2017; Madsen, et al. 2006; Nowacek, et al. 2007; NRC 2003; 2005; Richardson, et al. 1995; Romano et al. 2004; Slabbekoorn et al. 2010; Thomsen, et al. 2006; Wright et al. 2007). Indirect effects are likely to result from changes to the acoustic environment of the species, which may affect the completion of essential life functions (e.g., migrating, breeding, communicating, resting, foraging; Forney, et al. 2017; Richardson, et al. 1995; Slabbekoorn, et al. 2010; Thomsen, et al. 2006).⁵

Wind farm survey and construction activities and turbine/cable placement will substantially affect NMFS scientific research surveys, including stock assessment surveys for fisheries and protected species⁶ and ecological monitoring surveys. Disruption of such scientific surveys could increase scientific uncertainty in survey results and may significantly affect NMFS' ability to monitor the health, status, and behavior of marine resources and protected species and their habitat use within this region. Based on existing regional Fishery Management Councils' acceptable biological catch control rule processes and risk policies (e.g., 50 CFR §§ 648.20 and 21), increased assessment uncertainty could result in lower commercial quotas and recreational harvest limits that may reduce the likelihood of overharvesting and mitigate associated biological impacts on fish stocks. However, this would also result in lower associated fishing revenue and reduced recreational fishing opportunities, which could result in indirect negative impacts on fishing communities. It is possible that new survey technologies will be developed that mitigate these impacts, but it is uncertain whether they will be developed, and (or) how quickly they can be adopted. NOAA and the Bureau of Ocean Energy Management (BOEM) published a survey mitigation strategy in December 2022.⁷

Impacts of Offshore Wind Energy Development on Socioeconomic Resources

One offshore wind pilot project off Virginia installed two turbines in 2020. Several potential offshore wind energy sites have been leased or identified for future wind energy development in federal waters from Massachusetts to North Carolina. According to BOEM, about 22 gigawatts (close to 2,000 wind turbines based on current technology) of Atlantic offshore wind development via 17 projects are reasonably foreseeable along the east coast (BOEM 2020).

BOEM has recently begun a planning process for the Gulf of Maine via a regional intergovernmental renewable energy task force (<https://www.boem.gov/Gulf-of-Maine>). It is not clear at this time where development might occur in the Gulf of Maine. Given the water depth in the region, floating turbines will be the primary type of wind turbine foundations to be deployed in the area. As of February 2023, BOEM has issued a draft Call for Information area for the Gulf of Maine. BOEM plans to finalize and seek comments on the call area later in the year, targeting lease issuance towards the end of 2024. Given the water depth in the region, floating turbines will likely be the primary type of wind turbine foundations to be deployed in the area.

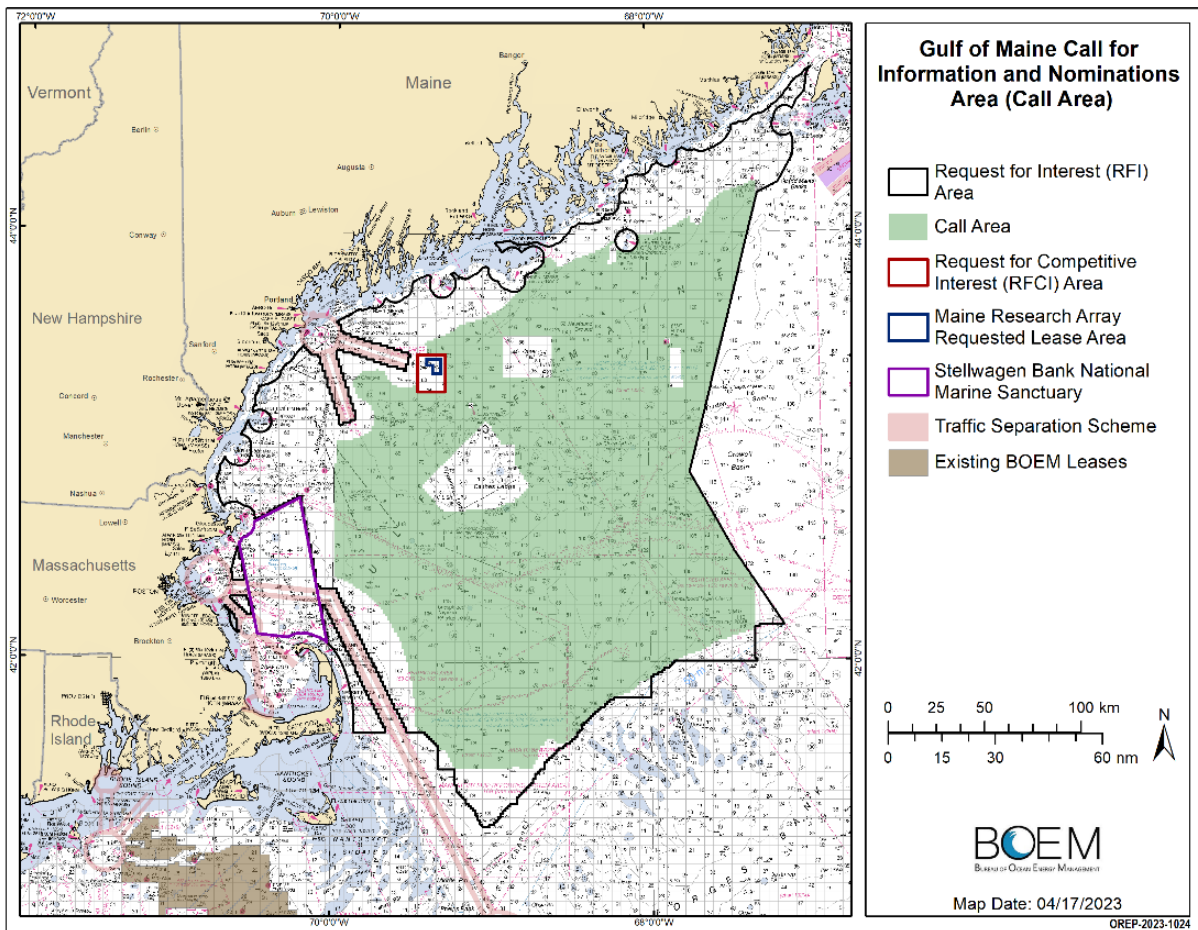
Lease areas in the New York Bight were auctioned in February 2022, and lease areas are under development in the Central Atlantic, but these locations are beyond the geographic scope of future Atlantic salmon aquaculture operations.

Overall, as the number of wind farms increases, so too would the level and scope of impacts to affected habitats, marine resources, and human communities.

⁵ See NMFS Ocean Noise Strategy Roadmap (footnote #2)

⁶ Changes in required flight altitudes due to proposed turbine height would affect aerial survey design and protocols (BOEM 2020a).

⁷ <https://www.fisheries.noaa.gov/resource/document/federal-survey-mitigation-strategy-northeast-us-region>

Map 3. Gulf of Maine call area.

<https://www.boem.gov/renewable-energy/state-activities/maine/gulf-maine>

Offshore wind energy development is underway in parts of the outer continental shelf that overlap with where Atlantic salmon could be found, specifically with the active southern New England lease areas (Map 4) and also the Gulf of Maine call area (Map 3). As of April 2023, two projects, South Fork Wind and Vineyard Wind 1, have been permitted and are under construction. Multiple other projects are undergoing environmental review, with draft EIS documents and construction and operations plans available for Revolution Wind, Sunrise Wind, New England Wind, and SouthCoast Wind. Other projects are earlier in the site assessment and planning phases. The social and economic impacts of offshore wind energy on fisheries could be generally negative due to the overlap of wind energy areas with productive fishing grounds. Impacts may vary by year based on species availability.

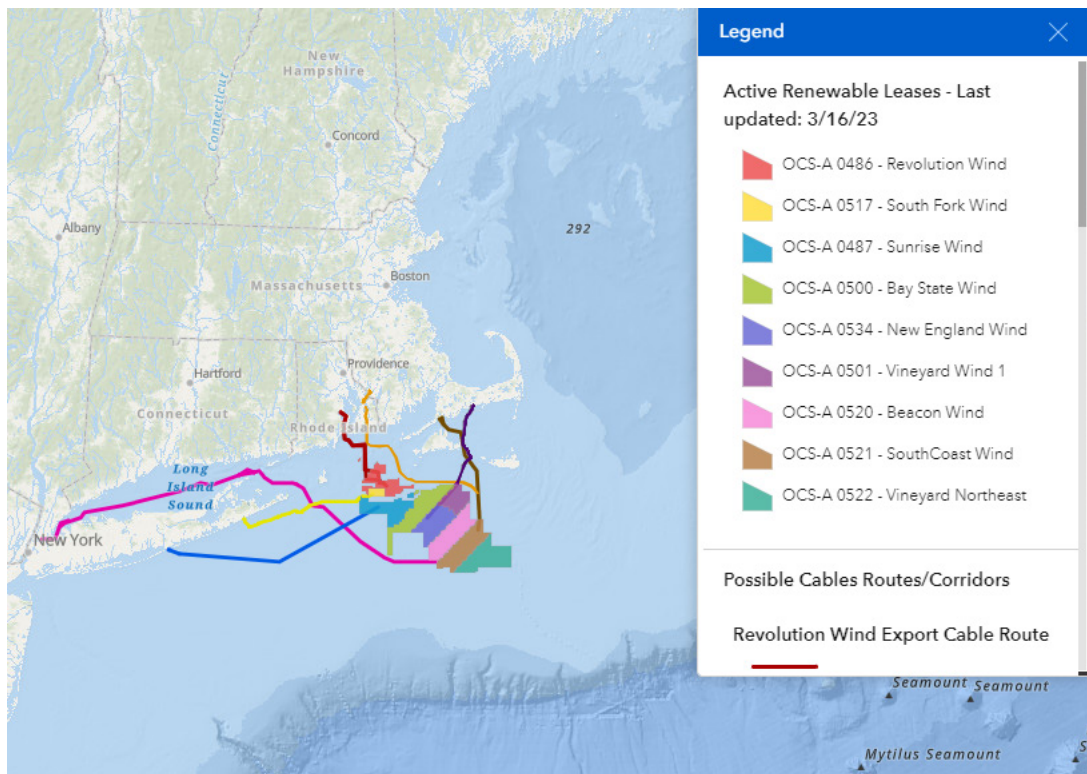
Because the areas under development for offshore wind energy are expected to support multiple types of fishing in the future in the absence of offshore wind energy development, any restriction of fishing access to this region as a result of offshore wind energy development would be perceived as a negative overall effect to the fishery. In some cases, effort could be displaced to another area, which could compensate for potential economic losses if vessel operators choose not to operate in the wind energy areas.

Turbine structures could increase the presence of and recreational fishing for structure affiliated species, including some groundfish species such as cod. This could potentially lead to social and economic benefits in terms of increased for-hire fishing revenues and angler satisfaction in certain wind development areas.

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

It remains unclear how fishing or transiting to and from fishing grounds (if those grounds are within a wind farm) might be affected by the presence of a wind farm. While no offshore wind developers have expressed an intent to exclude fishing vessels from wind turbine arrays once construction is complete, it could be difficult for operators to tow bottom-tending mobile gear or transit amongst the wind turbines, depending on the spacing and orientation of the array and weather conditions.⁸ If vessel operators choose to avoid fishing or transiting within wind farms, effort displacement and additional steaming time could result in negative social and economic impacts to affected communities, including increased user conflicts, decreased catch and associated revenue, safety concerns, and increased fuel costs. If vessels elect to fish within wind farms, effects could be both positive due to potential increased recreational catch and negative due to reduced commercial fishery catch and associated revenue, user conflicts, gear damage/loss, and increased risk of allision or collision.

Map 4. Active renewable energy leases in Southern New England.



<https://experience.arcgis.com/experience/bbba111b6a60466eaedd4a3567771939/>

Offshore Wind Energy Summary

The overall impact of offshore wind energy on the affected species and their habitats at a population level is unknown, but likely to range from no impact to moderate negative, depending on the number and

⁸ The United States Coast Guard has considered transit and safety issues related to the Massachusetts and Rhode Island lease areas in a recent port access route study and has recommended uniform 1 mile spacing in east-west and north-south directions between turbines to facilitate access for fishing, transit, and search and rescue operations. Future studies in other regions could result in different spacing recommendations (USCG 2020).

locations of projects that occur. The individual project phases (site assessment, construction, operation, and decommissioning) as well as different aspects of the technology (foundations, cables/pipelines, turbines) will have varying impacts on resources. Mitigation efforts, such as habitat conservation measures, time of year construction restrictions, layout modifications, and fishery compensation funds could lessen the magnitude of negative impacts as well. The overall impact on social and economic resources is likely slight positive to moderate negative, potentially positive due to a potential increase in jobs and recreational fishing opportunities, but negative due to displacement and disruption of commercial fishing effort.

6.7.2.2.2 Global Climate Change

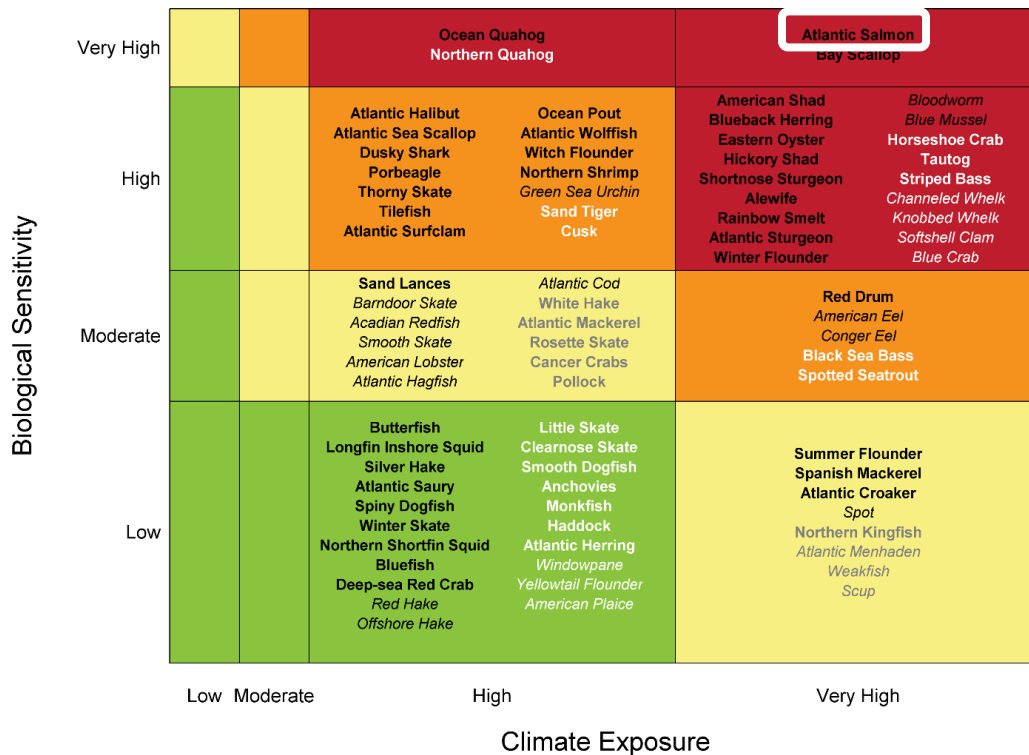
Global climate change affects all components of marine ecosystems, including human communities. Physical changes that are occurring and will continue to occur to these systems include sea-level rise, changes in sediment deposition; changes in ocean circulation; increased frequency, intensity and duration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

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

Based on this assessment, Atlantic salmon scored as having a very high climate vulnerability and very high biological sensitivity to climate change. Overall vulnerability results for additional Greater Atlantic species, including most of the other managed and ecological component species identified in this action, are in Figure 1 (Hare et al. 2016). While the effects of climate change may benefit some habitats and the populations of species through increased availability of food and nutrients, reduced energetic costs, or decreased competition and predation, a shift in environmental conditions outside the normal range can result in negative impacts for those habitats and species unable to adapt. This, in turn, may lead to higher mortality, reduced growth, smaller size, and reduced reproduction or populations. Thus, already stressed populations are expected to be less resilient and more vulnerable to climate impacts. Climate change is expected to have impacts that range from positive to negative depending on the species. However, future mitigation and adaptation strategies to climate change may mitigate some of these impacts. The science of predicting, evaluating, monitoring, and categorizing these changes continues to evolve. The social and economic impacts of climate change will depend on stakeholder and community dependence on fisheries, and their capacity to adapt to change. Commercial and recreational fisheries may adapt in different ways, and methods of adaptation will differ among regions. In addition to added scientific uncertainty, climate change will introduce implementation uncertainty and other challenges to effective conservation and management.

Regarding climate change, the incremental effects of this proposed action would be negligible to slight negative as the size, number, location, etc. of salmon aquaculture operations is highly uncertain.

Figure 1. Overall climate vulnerability score for Greater Atlantic species. Atlantic salmon is very highly sensitive and very highly exposed to climate change.



Note: Overall climate vulnerability is denoted by color: low (green), moderate (yellow), high (orange), and very high (red). Certainty in score is denoted by text font and text color: very high certainty (>95%, black, bold font), high certainty (90–95%, black, italic font), moderate certainty (66–90%, white or gray, bold font), low certainty (<66%, white or gray, italic font).

Source: Hare et al. 2016.

6.7.3 Magnitude and Significance of Cumulative Effects

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

Table 1 summarizes the likely impacts of management alternatives contained in this action. The CEA baseline as described in Section 6.7.2 represents the sum of past, present, and reasonably foreseeable future actions and conditions of each VEC. When an alternative has a positive impact on the VEC, for example, reduced fishing mortality on a managed species, it has a positive cumulative effect on the stock size of the species when combined with “other” actions that were also designed to increase stock size. In contrast, when an alternative has negative effects on a VEC, such as increased mortality, the cumulative effect on the VEC would be negative and tend to reduce the positive effects of the other actions. The resultant positive and negative cumulative effects are described below for each VEC. As in Section 6.7.2.2, non-fishing impacts on the VECs generally range from no impact to highly negative.

6.7.3.1 Magnitude and Significance of Cumulative Effects on Atlantic Salmon

Past fishery management actions taken through the Atlantic salmon FMP have prevented overfishing on the stock. However, the rate of fishing encounters would likely be very low, even without the possession prohibition, as evidenced by limited occurrence of wild Atlantic salmon in fisheries bycatch. Thus, work towards achieving conservation objectives under the Endangered Species Act including measures in the Atlantic salmon recovery plan are expected to have a larger influence on the status of the resource.

Although the stock remains in poor condition, these actions have generally had a positive cumulative effect on the Atlantic salmon. It is anticipated that the future management actions described in Section 6.7.2.1 will have additional indirect positive effects on the target species through actions which reduce and monitor bycatch, protect habitat, and protect the ecosystem services on which the productivity of the target species depends.

The proposed action is not expected to result in increased levels of fishing effort or changes to the character of that effort relative to current conditions. Specifically, the Atlantic salmon FMP allows no directed fishing on the species, and that will continue under the aquaculture authorization considered here. In addition, this authorization is not expected to affect fishing under other FMPs. Therefore, the impacts of fishing on Atlantic salmon are not expected to change relative to current conditions under the preferred alternative. The proposed action would positively reinforce the past and anticipated positive cumulative effects on Atlantic salmon by helping to achieve the objectives specified in the FMP.

No direct effects on wild Atlantic salmon are anticipated from the proposed action. In combination with all past, present, and reasonably foreseeable future actions, *the cumulative effects are expected to yield non-significant slight positive impacts on wild Atlantic salmon.*

6.7.3.2 Magnitude and Significance of Cumulative Effects on Other Managed and Ecosystem Component Species

The combined impacts of past federal fishery management actions on other managed and ecosystem component species have been mixed. Current regulations continue to manage towards sustainable stocks, controlling effort on both target and discard/bycatch species. As noted in Section 6.3, the proposed action is not expected to affect this trend. Future actions are anticipated to continue rebuilding other managed and ecosystem component species stocks and limit the take of incidentally caught Atlantic salmon, particularly because there is no commercial catch of wild Atlantic salmon permitted. Continued management of directed stocks will also control catch of other managed and ecosystem component species.

As noted in Section 6.3, the proposed action is not expected to result in increased levels of fishing effort or changes to the character of that effort relative to current conditions. Therefore, impacts of the fisheries on managed and other ecosystem component species are not expected to change relative to the current condition under the preferred alternatives (i.e., slight positive for other managed and ecosystem

component species). The proposed action would positively reinforce past and anticipated cumulative effects on other managed and ecosystem component species by supporting the objectives in the Atlantic salmon FMP.

When the direct and indirect effects of the proposed action are considered in combination with all other actions past, present, and reasonably foreseeable future actions, *the cumulative effects are expected to yield non-significant slight positive to no impacts on other managed and ecosystem component species.*

6.7.3.3 Magnitude and Significance of Cumulative Effects on Physical Environment

Past fishery management actions have had positive cumulative effects on habitat through large scale and local constraints on fishing effort, which may reduce impacts on seafloor features and EFH. As required under these FMP actions, EFH and Habitat Areas of Particular Concern were designated for the managed resources. It is anticipated that the future management actions will result in additional direct or indirect positive effects on habitat through actions which protect EFH and protect ecosystem services on which these species' productivity depends.

Many additional non-fishing activities (Section 6.7.2.2) are concentrated near-shore and likely work either additively or synergistically to decrease habitat quality. The effects of these actions, combined with impacts resulting from years of commercial fishing activity, have negatively affected habitat. These impacts could be broad in scope. The VECs are interrelated; therefore, the linkages among habitat quality, managed resources and non-target species productivity, and associated fishery yields should be considered. Some actions, such as coastal population growth and climate change may indirectly impact habitat and ecosystem productivity; however, these actions are beyond the scope of NMFS and Council management. Reductions in overall fishing effort and protection of sensitive habitats have mitigated some negative effects.

As noted in Section 6.4, the proposed action is not expected to result in increased levels of fishing effort or changes to the character of that effort relative to current conditions. Continued fishing effort under various Council FMPs will continue to impact habitats. Therefore, the impacts of the fishery on the physical environment are not expected to change relative to the current condition under the proposed action (i.e., slight negative for physical environment).

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

6.7.3.4 Magnitude and Significance of Cumulative Effects on Protected Species Other Than Atlantic Salmon

Given their life history dynamics, large changes in protected species abundance over long time periods, and the multiple and wide-ranging fisheries management actions that have occurred, the cumulative impacts on protected species were evaluated over a long-time frame (i.e., from the early 1970s when the MMPA and ESA were implemented through the present).

Past fishery management actions taken through the Atlantic salmon FMP have has at most slight positive indirect effects on protected species other than Atlantic salmon positively or negatively; given that the FMP consists of the no take provision, EFH designation, and Habitat Area of Particular Concern Designation. These habitat designations may have supported conservation of estuarine and riverine habitats on which some protected species rely. It is anticipated that future management actions will result in additional indirect positive effects on protected species. These impacts could be broad in scope.

The proposed action would not modify current levels of fishing effort in terms of the overall amount of effort, timing, and location. The FMP will continue to prohibit possession of wild Atlantic salmon. As described in Section 6.5, the proposed action is expected to have no direct impacts on protected species.

When the direct and indirect effects of the proposed action are considered in combination with all other actions (i.e., past, present, and reasonably foreseeable future actions), *the cumulative effects on protected species are expected to be negative.*

6.7.3.5 Magnitude and Significance of Cumulative Effects on Human Communities

Past fishery management actions taken through the Atlantic salmon FMP have had both positive and negative cumulative effects on human communities. They have benefitted domestic fisheries through sustainable fishery management but can also reduce participation in fisheries. The impacts from prohibition of possession of Atlantic salmon are largely dependent on how effective those measures are in meeting their intended objectives and the extent to which mitigating measures are effective. There is no directed commercial fishing allowed for wild Atlantic salmon.

It is anticipated that the future management actions described in Section 6.7.2.1 will result in slight positive effects for human communities due to sustainable management practices, although additional indirect negative effects on some human communities could occur if impacts from Atlantic salmon aquaculture are not avoided, minimized, and/or mitigated. Overall, the past, present, and reasonably foreseeable future actions that are truly meaningful to human communities have had overall slight positive cumulative effects. Despite the potential for negative short-term effects on human communities due to reduced revenue, positive long-term effects are expected due to the long-term sustainability of the managed stocks.

As described in Section 6.6, the proposed action is unlikely to result in changes to levels of fishing effort or the character of that effort relative to current conditions. Authorizing Atlantic salmon aquaculture in a manner consistent with the conservation goals identified by the original Atlantic salmon FMP and NASCO standards is expected to have a negligible to slight negative impact on human communities.

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

6.7.4 Proposed Action on all the VECs

The Council's proposed action is described in Section 4.0. The direct and indirect impacts of the proposed action on the VECs are described in Sections 6.2 to 6.6 and are summarized in the Executive Summary (Section 1.0). The magnitude and significance of the cumulative effects, including additive and synergistic effects of the proposed actions, as well as past, present, and future actions, have been taken into account (Section 6.7.3).

When considered in conjunction with all other pressures placed on the fisheries by past, present, and reasonably foreseeable future actions, the proposed action (authorization of farmed Atlantic salmon in the EEZ) is not expected to result in any significant impacts, positive or negative.

The proposed action is consistent with other management measures that have been implemented in the past for the Atlantic salmon fishery and are part of a broader management scheme for the fishery. This management scheme has helped to rebuild stocks and ensure long-term sustainability, while minimizing environmental impacts.

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

There are no significant cumulative effects associated with the preferred alternative based on the information and analyses presented in this document and in past FMP documents (Table 7). Cumulatively, through 2028, it is anticipated that the preferred alternative will result in non-significant impacts on all VECs, ranging from slight negative to slight positive.

Table 7. Summary of Cumulative Effects of the Preferred Alternatives.

	Target Species (Wild Atlantic Salmon)	Other Managed and Ecosystem Component Species	Habitat/EFH	Protected Species (Other Than Atlantic Salmon)	Human Communities
Direct/Indirect Impacts of Preferred Alternative	Direct effects: None Potential future effects: Highly uncertain, potentially negative	Direct effects: None Potential future effects: Highly uncertain, potentially negative	Direct effects: None Potential future effects: Highly uncertain, potentially negative	Direct effects: None Potential future effects: Highly uncertain, potentially highly negative	Direct effects: Negligible to slight negative Potential future effects: Highly uncertain
Combined Cumulative Effects Assessment Baseline Conditions	Positive	Positive	Mixed	Mixed	Positive
Cumulative Effects	Slight positive	Slight positive to no impact	Slight negative	Negative	Slight positive

7.0 APPLICABLE LAWS/EXECUTIVE ORDERS

7.1 MAGNUSON-STEVENSON FISHERY CONSERVATION AND MANAGEMENT ACT

7.1.1 National Standards

Section 301 of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) requires that regulations implementing any fishery management plan or amendment be consistent with ten national standards. Below is a summary of how this action is consistent with the National Standards and other required provisions of the Magnuson-Stevens Act.

National Standard 1 - The proposed action is consistent with National Standard 1 because it will likely prevent overfishing, while maintaining prohibition of commercial and recreational fishing for Atlantic salmon. The primary goal of managing the Atlantic salmon fishery is to maintain long-term sustainable catch levels and the first objective of the Atlantic salmon FMP is to complement restoration and management programs of the various Atlantic coastal states of the United States for Atlantic salmon and to complement the management and conservation program NASCO and the U.S. participation in NASCO. The Atlantic salmon FMP established a management program for Atlantic salmon in the EEZ to complement existing state management programs in inland and coastal waters and to complement federal management authority over salmon of domestic origin on the high seas (beyond 12 miles). The measures implemented through this action should further achieve the goals/objectives and reduce the possibility of overfishing the Atlantic salmon resource. The Atlantic salmon resource is currently overfished, and overfishing is not occurring (Section 5.2.1).

National Standard 2 - This action is consistent with National Standard 2 because it was informed by stock assessments and other scientific data sources. The authorization of Atlantic salmon aquaculture is supported by the best available scientific information. The supporting science and analyses, upon which the proposed action is based, are summarized and described in Section 4.0 of this document.

National Standard 3 - The proposed action is consistent with National Standard 3, because the Atlantic salmon resource is managed throughout its range, as a single unit stock. All commercial and recreational harvest of wild Atlantic salmon is prohibited.

National Standard 4 - The proposed action is consistent with National Standard 4, because it does not discriminate between residents of different states. The action does have different impacts on different participants, for example those operating a salmon aquaculture project would have specific administrative requirements, and participants that hold other federal permits would need to ensure compliance with requirements of those permits if participating in salmon aquaculture.

National Standard 5 – The Atlantic Salmon FMP prohibits all take of wild Atlantic salmon. Therefore, efficiency of harvest is not a consideration for the plan. This proposed action which creates an administrative authorization for possession of farmed salmon is consistent with National Standard 5.

National Standard 6 - The proposed action is consistent with National Standard 6 because the measures proposed account for variations in the fishery. The 2020 stock assessment determined that Atlantic salmon remains overfished and at historically low levels. The action is intended to authorize salmon aquaculture operations in the EEZ which could introduce variations into the Atlantic salmon fishery, and there is some uncertainty in the estimate of current stock size. The proposed action further enhances operational flexibility based on the purpose and need for this action.

National Standard 7 - The proposed action is consistent with National Standard 7 because the Council considered the costs and benefits associated with the proposed authorization of possession, which supports Atlantic salmon aquaculture in the EEZ. Any costs incurred as a result of the management action proposed in this document are necessary to achieve the goals and objectives of the Atlantic salmon FMP and are viewed to be outweighed by the benefits of taking the management action. Consistent with National Standard 7, the management measures proposed in this document are not duplicative and were developed in close coordination with NMFS, USACE, EPA, and other interested entities and agencies to minimize duplicity.

National Standard 8 - The proposed action is consistent with National Standard 8 because the importance of fishery resources to fishing communities is considered, and it provides for their sustained participation while minimizing adverse economic impacts. A description of the fishing communities that operate within areas where Atlantic salmon aquaculture is likely to occur is in Section 5.2. Relative to the No Action alternative, the measures proposed are expected to have minimal impacts on communities engaged in and dependent on fisheries occurring in this area. Given the depleted state of the resource and the uncertainty in recruitment, a precautionary approach is required to ensure long-term sustainability of Atlantic salmon.

National Standard 9 - The proposed action is consistent with National Standard 9 because the action is not expected to allow harvest of wild Atlantic salmon, and therefore, is not expected to change bycatch levels of non-target species. The action is designed to ensure that the prohibition on possession of wild salmon can be readily enforced, while allowing a clear mechanism for legal possession of farmed salmon. The overall impact on non-target species will be negligible, and a change in discarding is not expected.

National Standard 10 - The proposed action is consistent with National Standard 10 because none of the measures are expected to create unsafe conditions and situations at sea.

7.1.2 Other MSA Requirements

This action is also consistent with the fourteen additional required provisions for FMPs. Section 303 (a) of MSA contains required provisions for FMPs.

1. *Contain the conservation and management measures, applicable to foreign fishing and fishing by vessels of the United States...*

Foreign fishing is not allowed under the Atlantic salmon FMP and so specific measures are not included that specify and control allowable foreign catch. The proposed action is designed to prevent overfishing and not inhibit rebuilding wild salmon overfished stocks by vessels of the U.S. consistent with the National Standards.

2. *Contain a description of the fishery...*

All the information required by this provision can be found in the original Atlantic Salmon FMP. There is no directed fishery for Atlantic salmon in the US EEZ.

3. *Assess and specify the present and probable future condition of, and the maximum sustainable yield and optimum yield from the fishery...*

The present and probable future condition of the Atlantic salmon resource was updated through the 2020 stock assessment. Information related to the Atlantic salmon stock assessment are summarized in Section 4.2 of this document.

4. *Assess and specify-- (A) the capacity and the extent to which fishing vessels of the United States, on an annual basis, will harvest the optimum yield specified under paragraph (3); etc.*

This MSA provision relates directly to the Atlantic salmon fishery specification process because commercial and recreational fishing would continue to be prohibited.

5. *Specify the pertinent data which shall be submitted to the Secretary with respect to commercial, recreational, and charter fishing in the fishery...*

Data regarding the type of aquaculture gear anticipated to be used in the future and a description of commercial and recreational fisheries that could be affected where Atlantic salmon could occur in the Gulf of Maine are included in the Affected Environment (Sections 4.3 and 4.5, respectively) of this document.

6. *Consider and provide for temporary adjustments, after consultation with the Coast Guard and persons utilizing the fishery, regarding access to the fishery for vessels otherwise prevented from harvesting because of weather or other ocean conditions...*

The Proposed Action does not alter any adjustments made in the Atlantic salmon FMP that address opportunities for vessels that would otherwise be prevented from harvesting because of weather or other ocean conditions affecting safety aboard fishing vessels. Therefore, consultation with the U.S. Coast Guard was not required relative to this issue. The safety of fishing vessels and life at-sea is a high priority issue for the Council and was considered throughout the development of this action.

7. *Describe and identify essential fish habitat for the fishery...*

Section 4.8 contains the description of the Atlantic salmon essential fish habitat and Section 5.6 contains the analysis of impacts of the alternatives on EFH.

8. *In the case of a fishery management plan that, after January 1, 1991, is submitted to the Secretary for review under section 304(a) assess and specify the nature and extent of scientific data which is needed for effective implementation of the plan;*

The U.S. Atlantic Salmon Assessment Committee monitors the population status of U.S. Atlantic salmon and report their findings annually. This assessment represents the best available information regarding the status of the Atlantic salmon resource currently. No new data is required for the implementation of this action.

9. *Include a fishery impact statement for the plan or amendment which shall assess, specify, and analyze the likely effects if any, including the cumulative conservation economic, and social impacts, of the conservation and management measures and possible mitigation measures for participants in the fisheries and fishing communities affected by the plan or amendment. The impacts and potential mitigation measures are considered throughout this document in the discussion of alternatives that were considered and their potential impacts. Fishery impacts from measures proposed in this action are evaluated in Section 6.6 of this document.*

10. *Specify objective and measurable criteria for identifying when the fishery to which the plan applies is overfished...*

The status determination criteria for Atlantic salmon were established in the Atlantic salmon FMP. The 2020 assessment concluded that Atlantic salmon is overfished and overfishing is not occurring (See Section 5.2.1).

11. *Establish a standardized reporting methodology to assess the amount and type of bycatch occurring in the fishery...*

In 2015, NMFS approved a Standardized Bycatch Reporting Methodology (SBRM) amendment submitted by the Councils. NMFS led the development of an omnibus amendment to establish provisions for industry-funded monitoring across all New England and Mid-Atlantic Council-managed FMPs (Amendment 4 to the Atlantic salmon FMP). The amendment's final measures were published in April 2018 and are effective.

12. *Assess the type and amount of fish caught and released alive during recreational fishing under catch and release fishery management programs and the mortality of such fish...*

The Atlantic salmon FMP does not include a catch and release recreational fishery management program because recreational fishing for wild Atlantic salmon is not permitted.

13. *Include a description of the commercial, recreational, and charter fishing sectors which participate in the fishery...*

Commercial and recreational fishing for Atlantic salmon is currently prohibited and this action does not make any changes to this provision given Atlantic salmon remains overfished.

14. *To the extent that rebuilding plans or other conservation and management measures which reduce the overall harvest in a fishery are necessary, allocate any harvest restrictions or recovery benefits fairly and equitably among the commercial, recreational, and charter fishing sectors in the fishery.*

As noted under the discussion of National Standard 4, while conservation measures may have a differential impact on different sectors of the industry, that differential impact is not the purpose of the regulations and is done in a manner that is intended to achieve the conservation and management goals of the FMP. This action retains the prohibition on commercial and recreational fishing for Atlantic salmon.

15. *Establish a mechanism for specifying annual catch limits (ACL) in the plan (including a multiyear plan), implementing regulations, or annual specifications, at a level such that overfishing does not occur in the fishery, including measures to ensure accountability.*

The Atlantic salmon FMP includes a prohibition of commercial and recreational fishing for Atlantic salmon because the stock is overfished and remains at low levels. A rebuilding plan for wild salmon that prohibits catch remains in place. Future Council actions for this FMP will address the mechanism for specifying any ACLs should Atlantic salmon becomes rebuilt and the need to ensure accountability in the fishery.

7.2 NATIONAL ENVIRONMENTAL POLICY ACT

The National Environmental Policy Act (NEPA) provides a mechanism for identifying and evaluating the full spectrum of environmental issues associated with federal actions and for considering a reasonable range of alternatives to avoid or minimize adverse environmental impacts. The Council on Environmental Quality has issued regulations specifying the requirements for NEPA documents (40 CFR 1500 – 1508), as has NOAA in its policy and procedures for NEPA (NAO 216-6A).

This EA is being prepared using the 2020 CEQ NEPA Regulations as modified by the Phase I 2022 revisions. The effective date of the 2022 revisions was May 20, 2022, and reviews begun after this date are required to apply the 2020 regulations as modified by the Phase I revisions unless there is a clear and fundamental conflict with an applicable statute. This EA began in early 2022 and accordingly proceeds under the 2020 regulations as modified by the Phase I revisions.

7.2.1 Environmental Assessment

The required elements of an Environmental Assessment (EA) are specified in 40 CFR 1508.9(b). They are included in this document as follows:

- The need for this action is in Section 3.2;
- The alternatives that were considered are in Section 4.0;
- The environmental impacts of the proposed action are in Section 6.0; and,
- The agencies and persons consulted on this action are in Sections 7.2.3.

While not required for the preparation of an EA, this document includes the following additional sections that are based on requirements for an Environmental Impact Statement (EIS).

- An executive summary is in Section 1.0;
- A table of contents is in Section 2.0;
- Background and purpose are in Section 0;
- A summary of the document is in the executive summary, Section 1.0;
- A brief description of the affected environment is in Section 5.0;
- Cumulative impacts of the proposed action are in Section 6.7;
- A list of preparers is in Section 7.2.4.

7.2.2 Point of Contact

Questions concerning this document may be addressed to:

Mr. Thomas A. Nies, Executive Director
New England Fishery Management Council
50 Water Street, Mill 2
Newburyport, MA 01950 (978) 465-0492

7.2.3 Agencies Consulted

The following agencies, in alphabetical order, were consulted in preparing this document:

- Mid-Atlantic Fishery Management Council
- New England Fishery Management Council, including representatives from:
 - Connecticut Department of Environmental Protection
 - Maine Department of Marine Resources
 - Massachusetts Division of Marine Fisheries
 - New Hampshire Department of Fish and Game
 - Rhode Island Department of Environmental Management
- National Marine Fisheries Service, NOAA, Department of Commerce
- United States Fish and Wildlife Service, Department of Interior
- United States Geological Survey
- United States Environmental Protection Agency
- United States Army Corps of Engineers

7.2.4 List of Preparers

The following personnel participated in preparing this document:

- ***New England Fishery Management Council.*** Michelle Bachman, Jennifer Couture, Chris Kellogg, Thomas Nies, Cate O’Keefe
- ***National Marine Fisheries Service.*** David Bean, Sharon Benjamin, Dr. Geret DePiper, Ellen Keane, Kevin Madley, Ashleigh McCord, David Packer, Douglas Potts, Christopher Schillaci, Alison Verkade
- ***State agencies.*** Julia Livermore (RI DEM), Carl Wilson (ME DMR)
- ***Academic.*** Dr. Peter Auster (University of Connecticut, Mystic Aquarium)
- ***U.S. Geological Survey.*** Dr. Page Valentine
- ***Mid-Atlantic Fishery Management Council.*** Jessica Coakley

- *U.S. EPA.* Nathan Chien, Eric Nelson
- *U.S. Army Corps of Engineers.* Richard Kristoff.

7.2.5 Opportunity for Public Comment

This action was developed from 2022-2023, and there were over 11 public meetings related to this action (Table 8). Opportunities for public comment occurred at Advisory Panel, Committee, and Council meetings. This action was developed through the Council’s Habitat Committee as there is not a standing Atlantic Salmon Committee or Plan Development Team, and the Council considers aquaculture-related issues through the Habitat Committee. There were more limited opportunities to comment at PDT meetings. Meeting discussion documents and summaries are available at www.nefmc.org.

Table 8. Public meetings related to Framework 1.

Date	Meeting Type	Location
August 18, 2022	Habitat Committee	Wakefield, MA
September 12, 2022	Habitat Advisory Panel	Webinar
September 28, 2022	Council - Initiation	Gloucester, MA
November 8, 2022	Habitat Plan Development Team	Webinar
November 18, 2022	Habitat Joint Advisory Panel and Committee	Webinar
January 4, 2023	Habitat Plan Development Team	Webinar
January 12, 2023	Habitat Committee	Webinar
February 7, 2023	Habitat Plan Development Team	Webinar
March 21, 2023	Habitat Joint Advisory Panel	Webinar
March 23, 2023	Habitat Committee	Wakefield, MA and webinar
April 18, 2023	Council – planned final action	Mystic, CT

7.3 MARINE MAMMAL PROTECTION ACT (MMPA)

Section 6.4 contains an assessment of the impacts of the proposed action on marine mammals. The New England Fishery Management Council has reviewed the impacts of the proposed action on marine mammals and has concluded that the management actions proposed are consistent with the provisions of the MMPA. The proposed action will not alter the effectiveness of existing MMPA measures to protect those species, such as take reduction plans, based on the overall reductions in fishing effort and the effectiveness of other management measures that have been implemented through the Atlantic Salmon FMP. A final determination of consistency with the MMPA will be made by NMFS during rulemaking for this action.

7.4 ENDANGERED SPECIES ACT (ESA)

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

Sections 6.2 (Atlantic salmon) and 6.5 (other ESA-listed protected species) should be referenced for an assessment of the impacts of the proposed action on these resources. Given the procedural and administrative nature of the proposed action, impacts to ESA-listed species are not expected. Therefore, the proposed action is not expected to affect endangered or threatened species or critical habitat in any manner not considered in previous consultations on the Atlantic Salmon FMP.

Although sections 6.2 and 6.5 provides a general assessment of potential future effects of aquaculture operations on ESA listed species, until a specific aquaculture operation is proposed, effects to ESA-listed species and designated critical habitat cannot be fully determined. Specific projects, operations, or facilities proposed for permitting, prior to any authorization or issuance of a permit, will undergo consultation, pursuant to section 7 of the ESA.

7.5 ADMINISTRATIVE PROCEDURES ACT (APA)

Sections 551-553 of the Administrative Procedure Act established procedural requirements applicable to informal rulemaking by federal agencies. The purpose is to ensure public access to the federal rulemaking process, and to give public notice and opportunity for comment. The Council did not request relief from notice and comment rule making for this action and expects that NOAA Fisheries will publish proposed and final rule making for this action.

7.6 PAPERWORK REDUCTION ACT

The purpose of the Paperwork Reduction Act is to minimize the paperwork burden for individuals, small businesses, nonprofit institutions, and other persons resulting from the collection of information by or for the Federal Government. It also ensures that the Government is not overly burdening the public with information requests. This action does not include any revisions to the current PRA collection requirements; therefore, no review under the Paperwork Reduction Act is necessary.

7.7 COASTAL ZONE MANAGEMENT ACT (CZMA)

Section 307 of the CZMA is known as the federal consistency provision. Federal Consistency review requires that “federal actions, occurring inside or outside of a state's coastal zone, that have a reasonable potential to affect the coastal resources or uses of that state's coastal zone, to be consistent with that state's enforceable coastal policies, to the maximum extent practicable.” The Council previously made determinations that the FMP was consistent with each state’s coastal zone management plan and policies, and each coastal state concurred in these consistency determinations (in the Atlantic salmon FMP). Since the proposed action does not propose any substantive changes from the FMP, the Council has determined that this action is consistent with the coastal zone management plan and policies of the coastal states in this region. Once the Council has adopted final measures and submitted Framework 1 to NMFS, NMFS will request consistency reviews by CZM state agencies directly.

7.8 INFORMATION QUALITY ACT (IQA)

Section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001 (Public Law 106-554, also known as the Data Quality Act or Information Quality Act) directed the Office of Management and Budget (OMB) to issue government-wide guidelines that “provide policy and procedural guidance to federal agencies for ensuring and maximizing the quality, objectivity, utility, and integrity of information (including statistical information) disseminated by federal agencies.” OMB directed each federal agency to issue its own guidelines, establish administrative mechanisms allowing affected persons to seek and obtain correction of information that does not comply with the OMB guidelines, and report periodically to OMB on the number and nature of complaints. The NOAA Section 515 Information Quality Guidelines require a series of actions for each new information product subject to the Data Quality Act. Information must meet standards of utility, integrity and objectivity. This section provides information required to address these requirements.

Utility of Information Product

Framework 1 and the proposed authorization of Atlantic salmon aquaculture include: a description of the management issues to be addressed, statement of goals and objectives, a description of the proposed action and other alternatives/options considered, analyses of the impacts of the proposed specifications and other alternatives/options on the affected environment, and the reasons for selecting the preferred specifications. These proposed modifications implement the FMP’s conservation and management goals consistent with the Magnuson-Stevens Fishery Conservation and Management Act as well as all other existing applicable laws.

Utility means that disseminated information is useful to its intended users. “Useful” means that the content of the information is helpful, beneficial, or serviceable to its intended users, or that the information supports the usefulness of other disseminated information by making it more accessible or easier to read, see, understand, obtain or use. The information presented in this document is helpful to the intended users (the affected public) by presenting a clear description of the purpose and need of the proposed action, the measures proposed, and the impacts of those measures. A discussion of the reasons for selecting the proposed action is included so that intended users may have a full understanding of the proposed action and its implications. The intended users of the information contained in this document are interested parties of the Atlantic salmon resource and members of the general public. The information contained in this document may be useful to owners of vessels interested in salmon aquaculture in the EEZ as well as dealers and processors since it serves to notify these individuals of any potential changes to management measures for the fishery. This information will enable these individuals to adjust their fishing practices and make appropriate business decisions based on the new management measures and corresponding regulations.

The information being provided in FW 1 concerning the status of the overfished Atlantic salmon stock is updated based on the 2020 stock assessment; landings and effort information is not provided given that commercial and recreational fishing is prohibited. Information presented in this document is intended to support Framework 1 and the proposed authorization of Atlantic salmon, which have been developed through a multi-stage process involving all interested members of the public. Consequently, the information pertaining to management measures contained in this document has been improved based on comments from the public, fishing industry, members of the Council, and NOAA Fisheries.

Until a proposed rule is prepared and published, this document is the principal means by which the information herein is publicly available. The information provided in this document is based on the most recent available information from the relevant data sources, including detailed and relatively recent information on the herring resource and, therefore, represents an improvement over previously available information. This document will be subject to public comment through proposed rulemaking, as required under the Administrative Procedure Act and, therefore, may be improved based on comments received.

This document is available in several formats, including printed publication, and online through the NEFMC's web page (www.nefmc.org). The *Federal Register* notice that announces the proposed rule and the final rule and implementing regulations will be made available in printed publication, on the website for the Greater Atlantic Regional Fisheries Office (www.greateratlantic.fisheries.noaa.gov), and through the Regulations.gov website. The *Federal Register* documents will provide metric conversions for all measurements.

Integrity of Information Product

Integrity refers to security – the protection of information from unauthorized access or revision, to ensure that the information is not compromised through corruption or falsification. Prior to dissemination, information associated with this action, independent of the specific intended distribution mechanism, is safeguarded from improper access, modification, or destruction, to a degree commensurate with the risk and magnitude of harm that could result from the loss, misuse, or unauthorized access to or modification of such information. All electronic information disseminated by NMFS adheres to the standards set out in Appendix III, “Security of Automated Information Resources,” of OMB Circular A-130; the Computer Security Act; and the Government Information Security Act. All confidential information (e.g., dealer purchase reports) is safeguarded pursuant to the Privacy Act; Titles 13, 15, and 22 of the U.S. Code (confidentiality of census, business, and financial information); the Confidentiality of Statistics provisions of the Magnuson-Stevens Act; and NOAA Administrative Order 216-100, Protection of Confidential Fisheries Statistics.

Objectivity of Information Product

Objective information is presented in an accurate, clear, complete, and unbiased manner, and in proper context. The substance of the information is accurate, reliable, and unbiased; in the scientific, financial, or statistical context, original and supporting data are generated and the analytical results are developed using sound, commonly accepted scientific and research methods. “Accurate” means that information is within an acceptable degree of imprecision or error appropriate to the *kind* of information at issue and otherwise meets commonly accepted scientific, financial, and statistical standards.

For purposes of the Pre-Dissemination Review, this document is a “Natural Resource Plan.” Accordingly, the document adheres to the published standards of the MSA; the Operational Guidelines, Fishery Management Plan Process; the Essential Fish Habitat Guidelines; the National Standard Guidelines; and NOAA Administrative Order 216-6, Environmental Review Procedures for Implementing NEPA. This information product uses information of known quality from sources acceptable to the relevant scientific and technical communities. The analyses herein were prepared using data from accepted sources and have been reviewed by members of the Habitat Plan Development Team.

Despite current data limitations, the conservation and management measures considered for this action were selected based upon the best scientific information available. The analyses important to this decision used information from the 2020 stock assessment. The data used in the analyses provide the best available information on the likely affected commercial and recreational fisheries, NEFMC-managed fishery and ecosystem components, protected species, and the physical environment and EFH based on where Atlantic salmon could potentially occur.

Specialists (including professional members of PDTs, technical teams, committees, and Council staff) who worked with these data are familiar with the most current analytical techniques and with the available data and information. The proposed action is supported by the best available scientific information. The policy choice is clearly articulated in Section 4.0, the management alternatives considered in this action.

The supporting science and analyses, upon which the policy choice was based, are summarized and described in Section 6.0 of this document. All supporting materials, information, data, and analyses

within this document have been, to the maximum extent practicable, properly referenced according to commonly accepted standards for scientific literature to ensure transparency. The review process used in preparation of this document involves the responsible Council, the NEFSC, GARFO, and NOAA Fisheries Service Headquarters. The NEFSC's technical review is conducted by senior-level scientists specializing in population dynamics, stock assessment, population biology, and social science.

The Council review process involves public meetings where affected stakeholders have opportunities to comment on the document. Review by staff at GARFO is conducted by those with expertise in fisheries management and policy, habitat conservation, protected species, and compliance with the applicable law.

Final approval of the action proposed in this document and clearance of any rules prepared to implement resulting regulations is conducted by staff at NOAA Fisheries Service Headquarters, the Department of Commerce, and the U.S. Office of Management and Budget. In preparing this action for the Atlantic Salmon FMP, NMFS, the Administrative Procedure Act, the Paperwork Reduction Act, the Coastal Zone Management Act, the Endangered Species Act, the Marine Mammal Protection Act, the Information Quality Act, and Executive Orders 12630 (Property Rights), 12866 (Regulatory Planning), 13132 (Federalism), and 13158 (Marine Protected Areas). The Council has determined that the proposed action is consistent with the National Standards of the MSA and all other applicable laws.

7.9 EXECUTIVE ORDER 13158 (MARINE PROTECTED AREAS)

Executive Order (EO) 13158 on Marine Protected Areas (MPAs) requires each federal agency whose actions affect the natural or cultural resources that are protected by an MPA to identify such actions, and, to the extent permitted by law and to the maximum extent practicable, in taking such actions, avoid harm to the natural and cultural resources that are protected by an MPA. The EO directs federal agencies to refer to the MPAs identified in a list of MPAs that meet the definition of MPA for the purposes of the EO. The EO requires that the Departments of Commerce and the Interior jointly publish and maintain such a list of MPAs. A list of MPA sites has been developed and is available at: <http://marineprotectedareas.noaa.gov/nationalsystem/nationalsystemlist/>. No further guidance related to this EO is available at this time.

In the Northeast U.S., the only MPAs are the Stellwagen Bank National Marine Sanctuary (SBNMS), the Tilefish Gear Restricted Areas in the canyons of Georges Bank, and the National Estuarine Research Reserves and other coastal sites. The only MPA that overlaps the Atlantic salmon footprint is the SBNMS.

This action is not expected to more than minimally affect the biological/habitat resources of the SBNMS MPA, which was comprehensively analyzed in the Omnibus Habitat Amendment 2 (NEFMC 2016). Fishing gears regulated by the Atlantic salmon FMP are unlikely to damage shipwrecks and other cultural artifacts because fishing vessel operators avoid contact with cultural resources on the seafloor to minimize costly gear losses and interruptions to fishing.

7.10 EXECUTIVE ORDER 13132 (FEDERALISM)

Executive Order 131321 on federalism established nine fundamental federalism principles for Federal agencies to follow when developing and implementing actions with federalism implications. However, no federalism issues or implications have been identified relative to the measures proposed in this action, thus preparation of an assessment under EO 13132 is unwarranted. The affected states have been closely involved in the development of the proposed action through their representation on the Council (all affected states are represented as voting members of at least one Regional Fishery Management Council).

No comments were received from any state officials relative to any federalism implications that may be associated with this action.

7.11 EXECUTIVE ORDER 12898 (ENVIRONMENTAL JUSTICE)

Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations provides guidelines to ensure that potential impacts on these populations are identified and mitigated, and that these populations can participate effectively in the NEPA process (EO 12898 1994). NOAA guidance NAO 216-6A, Companion Manual, Section 10(A) requires the consideration of EO 12898 in NEPA documents. Agencies should also encourage public participation, especially by affected communities, during scoping, as part of a broader strategy to address environmental justice issues. Minority and low-income individuals or populations must not be excluded from participation in, denied the benefits of, or subjected to discrimination because of their race, color, or national origin.

Environmental justice is measured at the community level. Here, community is defined as a fishing community. Indicators of vulnerability for purposes of environmental justice can include but are not limited to income, race/ethnicity, household structure, education levels, and age. The NOAA Fisheries [Community Social Indicators](#), especially the poverty, population composition, and personal disruption indices can help identify the communities where environmental justice may be of concern. Atlantic salmon is prohibited from being landed, thus, it is not possible to identify communities that may be more vulnerable to changes in federal actions.

Although the impacts of the Proposed Action may affect communities with environmental justice concerns, the proposed actions should not have disproportionately high effects on low income or minority populations. The proposed actions would apply to all participants in the affected area, regardless of minority status or income level. There is no commercial or recreational Atlantic salmon fishery given the prohibition of Atlantic salmon. The proposed action would authorize Atlantic salmon aquaculture. Without more data, it is difficult to fully determine how this action may impact various population segments. The public comment process is an opportunity to identify issues that may be related to environmental justice, but none have been raised relative to this action. The public has never requested translations of documents pertinent to the Atlantic salmon fishery.

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

7.12 REGULATORY FLEXIBILITY ACT (RFAS)

The purpose of the Regulatory Flexibility Analysis (RFA) is to reduce the impacts of burdensome regulations and record-keeping requirements on small businesses. To achieve this goal, the RFA requires government agencies to describe and analyze the effects of regulations and possible alternatives on small business entities. Based on this information, the Regulatory Flexibility Analysis determines whether the preferred alternative would have a “significant economic impact on a substantial number of small entities.”

The Chief Counsel for Regulation of the Department of Commerce certified to the Chief Counsel for Advocacy of the Small Business Administration (SBA) that this proposed rule, if adopted, would not have a significant economic impact on a substantial number of small entities.

7.12.1 Description and estimate of the number of small entities to which the rule applies

The Atlantic Salmon Aquaculture framework potentially regulates entities across three different industries: finfish aquaculture, commercial fishing, and seafood dealers. Information on these potentially regulated entities is included by industry below.

7.12.1.1 Finfish aquaculture

Atlantic salmon aquaculture falls under the Finfish Farming and Fish Hatcheries industry classification (NAICS 112511). The Small Business Administration has established size standards for major industry sectors in the U.S., including finfish aquaculture. The SBA classifies a finfish aquaculture entity as a small business if it is independently owned and operated, is not dominant in its field of operation (including its affiliates), and has combined annual receipts not in excess of \$3.75 million for all its affiliated operations worldwide (61 CFR 3286). Historically, Maine has represented the vast majority of Atlantic salmon aquaculture in New England, although all data on this industry has been suppressed due to confidentiality concerns since 2010. This means that there are less than three finfish aquaculture businesses currently active in New England. Given the lack of data for this industry, it is not possible to identify the number of small businesses potentially regulated by this proposed action.

7.12.1.2 Commercial Fishing

For RFA purposes, it is the ownership entity that is ultimately regulated by the proposed action. Ownership entities are identified on June 1st of each year based on the list of all permit numbers, for the most recent complete calendar year, that have applied for any type of Northeast Federal fishing permit. The current ownership dataset is based on calendar year 2021 permits and contains gross sales associated with those permits for calendar years 2019 through 2021. For RFA purposes only, NMFS has established a small business size standard for businesses, including their affiliates, whose primary industry is commercial fishing (see 50 CFR § 200.2). A business primarily engaged in commercial fishing (NAICS code 11411) is classified as a small business if it is independently owned and operated, is not dominant in its field of operation (including its affiliates) and has combined annual receipts not in excess of \$11 million for all its affiliated operations worldwide. The determination as to whether the entity is large or small is based on the average annual revenue for the three years from 2020 through 2022. The SBA has established size standards for all other major industry sectors in the U.S., including for-hire fishing (NAICS code 487210). These entities are classified as small businesses if combined annual receipts are not in excess of \$8.0 million for all its affiliated operations. As with commercial fishing businesses, the annual average of the three most recent years (2019-2021) is utilized in determining annual receipts for businesses primarily engaged in for-hire fishing. Although recreational fishermen are not potentially regulated by the Atlantic Salmon Aquaculture Framework, the fishermen are included in this section if they are a blended business holding both recreational and commercial permits.

Ownership data collected from permit holders indicates that there are 5,271 distinct business entities that hold at least one permit regulated by the proposed action. All 5,271 business entities identified could be directly regulated by this proposed action. Of these, 4,060 are commercial fishing entities, 110 are for-hire entities, and 1,101 did not have revenues (were inactive in 2021). Of the 4,060 commercial fishing entities, 4,049 are categorized as small entities and 11 are categorized as large entities, per the NMFS guidelines. All 110 for-hire entities are categorized as small businesses.

7.12.1.3 Seafood Dealers

The U.S. SBA size standard for Fish and Seafood Merchant Wholesalers dealers (NAICS code 424460) is based on number of employees, with an entity being classified as a small business if it is independently owned and operated, is not dominant in its field of operation (including its affiliates), and has an average of less than 100 employees for all its affiliated operations worldwide in the preceding completed 24 months (61 CFR 3286). In 2021, there were a total of 901 federal dealer permits authorizing the purchase of species federally managed within the Greater Atlantic Region. NOAA does not record number of employees for each of, nor business affiliation across, these entities. However, the Census Bureau's County Business Patterns data on NAICS code 424460 can provide a sense of the number of large and small businesses that would be expected. The County Business Patterns can be used to calculate a percentage of size classes in each state in which a Greater Atlantic Region federal dealer permit resides. Assuming an equal probability of the permit being associated with a business of each size class, the number of permits per state multiplied by the percentage of that state's businesses in each category provides a weighted number of permits across each size category. Summing this weighted number of permits in each category across states and dividing by the sum across states and categories creates a weighted average probability for each size category.

Mathematically, if I represents all the states in the dealer permit data, P_i represents the number of permits in each state i in I and S_i , L_i , and U_i represent the percentage of small, large, and unclassified businesses in each state, the weighted percentage of small permits can be calculated as:

$$\sum_i P_i * S_i / \sum_i P_i.$$

The percentage of large and unclassified permits can be calculated in a similar manner. This breaks down into the following percentage of permits that would be expected to fall within each size category: 0.96 percent small, less than 0.01 percent large, and 0.04 percent of unknown classification.

7.12.2 Summary of the Proposed Action and significant alternatives

The purpose for this Atlantic Salmon Aquaculture Framework action is to authorize possession of farmed salmon consistent with the conservation objectives of the Atlantic Salmon FMP. The need for this action is to develop conservation and management measures that facilitate legal possession of aquaculture-raised Atlantic salmon within NEFMC jurisdiction (i.e., to exempt aquaculture-raised salmon from the prohibition against possessing wild salmon in a manner that facilitates legal and efficient operations).

The action alternatives below focus on identifying vessels authorized to possess Atlantic salmon in the EEZ by issuing a Letter of Authorization. Alternative 2 also includes production reporting via Vessel Trip Reports and Federal Dealer Reports.

Monitoring measures were initially considered but deemed not necessary for inclusion as part of this framework's authorization of salmon aquaculture. In terms of SBRM requirements, finfish bycatch is not anticipated to result from these operations, and protected species monitoring is part of permit requirements of other federal agencies. Thus, it seems unnecessary for vessels operating under the salmon aquaculture authorization to carry at-sea observers or monitors. Exemption from VMS requirements is also appropriate.

Annual reporting requirements were also considered, however reporting criteria and requirements are included within other federal agencies permit conditions, and thus not further considered here. This includes reporting any fish escapement events (near time or close, as required by EPA), any water quality events in exceedance of National Pollution Discharge Elimination System (NPDES) thresholds (as required by EPA), information about the source of Atlantic salmon, methods used by the operator to allow

the salmon reared at the facility to be distinguished from wild Atlantic salmon, any enforcement violations, etc.

7.12.2.1 Alternative 1 - No action

Under Alternative 1 (No Action), possession of Atlantic salmon (wild and farmed) would remain prohibited in federal waters of the EEZ off the Northeastern U.S. Federal regulations associated with the Atlantic salmon FMP at 50 CFR §648.40 related to the prohibition on possession state that ‘evidence that such fish were harvested...from aquaculture enterprises will be sufficient to rebut this presumption’, i.e., rebut that salmon were taken in violation of the regulations. Under No Action, the Council would not establish a specific authorization program for aquaculture operators to help ensure operational consistency with the Atlantic salmon FMP and would not establish any reporting or monitoring requirements. Aquaculture operators and related parties such as dealers may be required to individually ensure that they can provide evidence sufficient to demonstrate such fish were harvested or transferred from aquaculture enterprises.

7.12.2.2 Alternative 2 - Authorize Possession of Farmed Atlantic Salmon in the EEZ via Letter of Authorization, Vessel, and Dealer Reporting

Under Alternative 2, possession of farmed salmon would be explicitly authorized consistent with the conservation objectives of the Atlantic Salmon FMP, requiring adherence to certain reporting and enforcement provisions. These provisions include authorization for vessels that would be used to transport Atlantic salmon within the EEZ and vessel and dealer reporting requirements. The reporting requirements would enable NOAA Fisheries and the Council to track harvest and landings of farm-raised Atlantic salmon such that there is accounting of farmed salmon. As outlined below, this would include a requirement that operators of each permitted vessel submit an electronic Vessel Trip Report (VTR) in accordance with regulations at 50 CFR §648.7(b)(1) when salmon are transferred from the aquaculture farm to shore, i.e., per trip, including landings disposition. Regarding dealer reporting, federally permitted dealers purchasing Atlantic salmon would be required to submit reports in accordance with regulations at 50 CFR §648.7(a)(1), i.e., twice weekly. Because this alternative requires a federal salmon permit, vessels would be required to sell to a dealer with a federal salmon permit to be consistent with other Council-managed species.

7.12.2.3 Alternative 3 - Authorize Possession of Farmed Atlantic Salmon in the EEZ via Letter of Authorization

Under Alternative 3, possession of farmed salmon would be explicitly authorized consistent with the conservation objectives of the Atlantic Salmon FMP. This alternative includes authorization for vessels that would be used to transport Atlantic salmon within the EEZ. Measures are the same as for Alternative 2, except that production reporting requirements through VTRs and federal dealer reporting are not included. Because this alternative does not require a federal salmon permit, the harvester would not necessarily be required to sell to a dealer with a federal salmon permit (like what is required under Alternative 2). Dealer requirements depend on the state of landing which could require a state permitted vessel or state permitted dealer to sell farmed salmon, a requirement to obtain a state or federal dealer permit to sell the salmon to retail, or a requirement that the dealer would need to be a state dealer to process salmon and sell to wholesale for additional processing.

7.12.3 Description and estimate of economic impacts on small entities, by entity size and industry

In general, because Atlantic salmon aquaculture already exists in state waters, the expansion of Atlantic salmon aquaculture into federal waters represents a change in the scale of potential impacts but does not create novel categories of potential impacts. These effects will be evaluated during the project permitting process. Also, this action only applies to the possession of farmed Atlantic salmon in federal waters, and the regulatory framework for aquaculture generally falls outside of the fishery management council process.

As such, at the level of this framework, the differences between Alternatives 1, 2, and 3 is the difference in administrative costs. Both Alternatives 2 and 3 would be expected to result in slightly positive impacts compared to Alternative 1 with respect to ultimate net benefits, as they outline a clear process by which exemptions to the current possession prohibition on Atlantic salmon can be attained. Alternative 3 presents a streamlined administrative process which would be expected to reduce the costs of compliance when compared to Alternative 2.

7.12.3.1 Alternative 1 - No action

For the commercial fishing industry, the direct impacts under Alternative 1 would likely be negligible to slight negative, assuming few commercial fishing vessels engage in aquaculture activities. Uncertainty around the permitting process would be expected to increase the administrative burden on any commercial fishing businesses that might contract with Atlantic salmon aquaculture businesses to transport salmon to and from the aquacultural facilities in federal waters. Commercial fishing businesses would need to work with the National Marine Fisheries Service to secure the needed authorizations. This administrative burden would likely be highest for the first company to attempt to procure these authorizations, as there is little precedent which that company could use to build upon. Subsequent companies would likely face much lower administrative burden for attaining the required authorizations. However, the perceived or real administrative burden faced by the first business to attempt to secure the relevant exemptions could be high enough to dissuade businesses from fully engaging in the process. The distribution of these impacts across large and small businesses will ultimately depend on the exact needs of the aquaculture company (e.g., vessel hold size, other needed equipment) and the opportunity cost of available commercial fishing vessels (i.e., how the fishing vessel could otherwise be employed). As such, these impacts across business size classes are better assessed as individual projects are permitted.

For the recreational fishing industry, which are all classified as small businesses, the direct impacts under Alternative 1 would likely be negligible, since these vessels are unlikely to engage in aquaculture activities and would therefore not bear an administrative burden of documenting possession of farmed salmon.

Seafood dealers would likely face negligible to slightly negative impacts from Alternative 1, for the same reasons as the commercial fishing industry: administrative burden. This burden is likely highest for the first company to attempt to procure authorizations for the legal purchase of Atlantic salmon, and should decrease substantially thereafter due to the precedent that would then be set. The distribution of these impacts across business size would depend on the exact needs of the aquaculture company (e.g., storage and processing capacity), and thus are better assessed at the project level.

In reality, the majority of the impacts from Alternative 1 are likely to accrue to finfish aquaculture businesses. This is because Atlantic salmon aquaculture businesses tend to be vertically integrated, often owning their own specialized vessels for harvesting and transporting product and serving as their own dealer and processor (Asche et al. 2013; Knott and Neis 2017; Kvaløy and Tveterås 2008). For aquaculture businesses, although Alternative 1 would not necessarily preclude aquaculture for Atlantic

salmon in federal waters, it would leave the process of gaining federal exemption to the Atlantic salmon prohibition uncertain, adding to the already onerous permitting process (see Section 11.0). The impacts of Alternative 1 on aquaculture entities are thus expected to be slightly negative. Due to uncertainty in the number of potential future projects, their distribution across companies, and confidentiality concerns, it is not possible to identify the number or size of businesses to which these negative impacts are likely to accrue.

7.12.3.2 Alternative 2 - Authorize Possession of Farmed Atlantic Salmon in the EEZ via Letter of Authorization, Vessel, and Dealer Reporting

Overall, the direct impacts of Alternative 2 on commercial fishing businesses would likely be negligible to slight positive. In terms of the LOA requirement, commercial fishing vessels sometimes request LOAs for various purposes, such as when participating in specific fishery programs. Alternative 2 expands the types of activities for which commercial fishing vessels may request an exemption to include possession of farmed Atlantic salmon. The issuance of a salmon possession LOA is not expected to create a novel or substantial administrative burden for these businesses because LOAs are already an administrative mechanism employed by the Council, and the requirements for the LOA would be clearly defined via the Council's framework. In terms of vessel permits and reporting, for the commercial fishing industry, owners of vessels that currently have federal fishing permits would not induce any additional administrative costs if they needed to obtain a federal salmon vessel permit to support their participation in an aquaculture project, since a vessel owner applies for all federal fishing permits through a single transaction. Familiarity with existing federal permitting and reporting systems could provide a comparative advantage for commercial vessels with current federal permits over commercial vessels without such permits. Non-federally permitted vessels would face the additional costs associated with gaining federal vessel permits and submitting reports in accordance with regulations defined within 50 CFR §648.7(b)(1). This regulation includes submitting reports for all species, not just federally managed species. The distribution of these impacts across large and small businesses will ultimately depend on the exact needs of the aquaculture company (e.g., vessel hold size, other needed equipment) and the opportunity cost of available commercial fishing vessels (i.e., how the fishing vessel could otherwise be employed). As such, these impacts across business size classes are better assessed as individual projects are permitted.

For seafood dealers, Alternative 2 is likely to provide for negligible to slightly positive direct impacts due to a decrease in the overall regulatory burden when compared to status quo. Alternative 2 requires reporting in a manner that is consistent with the harvest and sale of wild caught federally managed species needing a regulatory exemption. This means that dealers with existing federal permits would not induce any additional administrative costs. Non-federally permitted dealers would face the additional costs associated with gaining a federal permit and submitting reports in accordance with regulations defined within 50 CFR §648.7(a)(1), which includes submitting reports for all species, not just federally-managed species. This could provide a comparative advantage for dealers with current federal permits over dealers without such permits. The distribution of these impacts across business size would depend on the exact needs of the aquaculture company (e.g., storage and processing capacity), and thus are better assessed at the project level. The LOA requirement would have no impact on dealers which are distinct entities from the aquaculture business.

For the recreational fishing industry, which are all classified as small businesses, the direct impacts under Alternative 2 would likely be negligible since these vessels are unlikely to engage in aquaculture activities and would therefore not bear an administrative burden of obtaining an LOA or salmon vessel permit or reporting salmon harvest.

The vertical integration of Atlantic salmon aquaculture businesses (Asche et al. 2013; Knott and Neis 2017; Kvaløy and Tveterås 2008) likely means that the aquaculture business itself will provide the carrier vessel and serve as the dealer of record. These aquaculture businesses are likely to view the procurement of a federal vessel permit and dealer permit as a comparatively small additional cost of business. The LOA is also likely to be viewed as a comparatively small additional cost of business, in a similar manner to the permit requirements. Overall, these additional costs of business are unlikely to serve as a deciding factor in whether Atlantic salmon aquaculture in federal waters is expected to be a worthwhile business endeavor. This suggests that the impact on aquaculture businesses is likely to be negligible to slightly positive when compared to status quo due to the overall anticipated decrease in administrative burden. Due to uncertainty in the number of potential future projects, their distribution across companies, and confidentiality concerns, it is not possible to identify the number or size of businesses to which this negative impact are likely to accrue.

7.12.3.3 Alternative 3 - Authorize Possession of Farmed Atlantic Salmon in the EEZ via Letter of Authorization

The direct impacts of Alternative 3 on commercial fishing would likely be negligible to slightly positive when compared to status quo. Commercial fishing vessels sometimes request LOAs for various purposes, such as when participating in specific fishery programs. Alternative 2 expands the types of activities for which commercial fishing vessels may request an exemption to include possession of farmed Atlantic salmon. The issuance of a salmon possession LOA is not expected to create a novel or substantial administrative burden for these businesses because the requirements for the LOA would be clearly defined via the Council's framework. The distribution of these impacts across large and small businesses will ultimately depend on the exact needs of the aquaculture company (e.g., vessel hold size, other needed equipment) and the opportunity cost of available commercial fishing vessels (i.e., how the fishing vessel could otherwise be employed). As such, these impacts across business size classes are better assessed as individual projects are permitted.

The direct impacts on aquaculture businesses are likely to be negligible to slightly positive when compared to status quo. For Atlantic salmon aquaculture businesses, which are likely to be vertically integrated, the LOA is likely to be viewed as a comparatively small additional cost of business. This additional cost of business is unlikely to serve as a deciding factor in whether Atlantic salmon aquaculture in federal waters is expected to be a worthwhile business endeavor. Due to uncertainty in the number of potential future projects, their distribution across companies, and confidentiality concerns, it is not possible to identify the number or size of businesses to which this negative impact are likely to accrue.

The LOA requirement would have no impact on dealers which are distinct entities from the aquacultural business.

For the recreational fishing industry, which are all classified as small businesses, the direct impacts under Alternative 2 would likely be negligible since these vessels are unlikely to engage in aquaculture activities and would therefore not bear an administrative burden of obtaining an LOA.

7.12.3.4 Broader Aquaculture Impacts

There will be broader impacts to businesses of expanding Atlantic salmon aquaculture into federal waters. These impacts will be project specific but equal across alternatives assessed within the Atlantic Salmon Aquaculture Framework. Given that the number, size, and location of future aquaculture operations are unknown, the overall extent of potential impacts is highly uncertain.

The type of impacts to commercial and recreational fisheries that could result from offshore aquaculture installations could include effort displacement, or indirect effects that result from impacts to target species

or their habitats. Federal waters where Atlantic salmon aquaculture projects are more likely to be located are described in section 4.1. For commercial fisheries, by revenue, Atlantic sea scallop, American lobster, Atlantic herring, Haddock, Cod, Monkfish, Pollock, Jonah crab, surfclam, and winter flounder represent the highest revenue species landed within this broad area over the past 14 years. These species also ranked highest in total poundage landed, although in a different order. Major fishery management plans (FMPs) in the GOM include Monkfish (NEFMC-MAFMC), Atlantic Herring, Sea Scallop, Lobster (ASMFC), and Northeast Multispecies (large mesh groundfish). These are NEFMC plans unless otherwise noted. Although all major gear types are active within the region, scallop dredge, bottom trawl, midwater trawl, purse seine, and lobster pots represent the majority of fishing effort over the past 14 years. The spatial distribution of these landings are not uniform.

Cod, haddock, and pollock represent the vast majority of recreational harvest on charter/party vessels in the region, with Atlantic mackerel, Acadian redfish, cunner, wolffish, spiny dogfish, and black sea bass also caught in relatively high numbers. The spatial distribution of these landings are not uniform, indicating that impacts are better assessed at the project level.

The direct impact of Atlantic salmon in federal waters on both commercial and recreational fisheries is likely negative, although the magnitude is highly uncertain over the long term. Aquaculture has the potential to displace wild capture commercial fishing from productive grounds. Because fishing activities are not uniformly distributed, impacts across large and small businesses are better assessed at the project level. Although anglers on private recreational vessels could also be displaced by aquaculture, this mode lacks spatially-explicit data from which to assess harvest. However, the target species would be expected to be similar to that of party/charter boats in this region. All recreational fishing entities in the Greater Atlantic Region are classified as small businesses.

In addition, if aquaculture has negative impacts on managed species and essential fish habitats, this could induce indirect negative impacts on commercial and recreational fisheries dependent on those species. The direct impacts of Alternatives 1, 2, and 3 on other managed and ecosystem component species, the physical environment, and essential fish habitat are expected to be negligible. Atlantic salmon aquaculture projects could go forward under any of these alternatives, possibly resulting in negative impacts to other managed and ecosystem component species and fish habitat if avoidance, minimization, and mitigation measures are not sufficient. Negative impacts could include escapement; disease; use of drugs, biologics, and other chemicals; water quality impacts; benthic sediment and community impacts; and location-specific interactions with EFH, which could alter habitats used by managed species. Impacts include escapement of farmed species which could become established and outcompete native species for food and other resources; spread of disease and pathogens from farmed species to other managed and ecosystem component species which could negatively affect the stock status of species, especially species that are either overfished and/or experiencing overfishing (Table 8); and use of drugs and other chemicals which could degrade the water quality affecting both farmed species and other species near the farm. Additional information can be found in Sections 5.4 (NEFMC-managed fishery and ecosystem components), 5.5 (physical environment and EFH). The extent of potential indirect impacts is highly uncertain given that the number, size, and location of future aquaculture operations are unknown. Assessing the likelihood and magnitude of such potential impacts is better undertaken at the project level due to variation in siting, oceanography, and numerous other factors that alter estimates of project effects (Taranger et al. 2015; Naylor et al. 2005). Individual salmon aquaculture projects would undergo project specific analyses including cumulative effects to evaluate the range of potential impacts.

Commercial and recreational fishermen that harvest fish from the area analyzed for this action are associated with multiple fishing communities. Most commercial landings and revenue derived from the portion of federal waters most conducive to Atlantic salmon aquaculture are derived from Massachusetts, particularly the ports of New Bedford, Gloucester, Boston, and Chatham. Maine (predominantly Rockland), Rhode Island (predominantly Point Judith and Newport), and New Hampshire (predominantly

Newington) generate a magnitude of revenue similar to each other from these waters, with the caveat that lobster landings, the vast majority of which is landed in Maine, are underrepresented in the VTR data underpinning the analysis. The majority of recreational party/charter trips in the region originate from ports in New Hampshire (predominantly Hampton and Seabrook) and Massachusetts (predominantly Gloucester, Newburyport, and Plymouth). Historically, various ports in Maine and ports in Rhode Island (predominantly Point Judith) have hosted a similar number of angler trips to one another, with a smaller number of trips originating in ports within Connecticut, New York, and more southerly states. Any displacement has potential ripple effects throughout the economies of these ports. However, it is unlikely that aquaculture will be developed at a scale that would cause substantial impacts to these communities in the near future, given there has never been a prohibition on the activity in federal waters off of New England.

There is some potential that aquaculture companies rearing Atlantic salmon could contract with owners of commercial fishing vessels to transport salmon to and from the aquacultural facilities in federal waters, creating positive economic impacts for these fishing vessels. However, as noted elsewhere the vertical integration of Atlantic salmon aquaculture businesses (Asche et al. 2013; Knott and Neis 2017; Kvaløy and Tveterås 2008) likely means that the aquaculture business itself will provide the carrier vessel. In the Gulf of Maine there is the potential that at least some of the capital and labor for these carrier services could be sourced from Canadian arms of multinational aquaculture companies.

Over time, aquaculture development may lead to port infrastructure upgrades that could have broader benefits for other port users, including commercial and recreational fishermen. This does not seem likely in the reasonably foreseeable future, however, given aquaculture businesses would likely site projects based on available port infrastructure versus developing new or upgrading existing infrastructure.

Overall, the magnitude of these impacts will depend on the scale of aquaculture development. Offshore aquaculture is not expected to expand substantially in the near future given there has never been a prohibition on the activity in federal waters off of the coast of New England, and no development has occurred to date. However, permitting requirements are substantial, as outlined in Section 11.0. Assuming a limited scale, any impacts would likely be local in nature and would not be anticipated to affect managed species at the stock level. Thus, the indirect impacts to commercial fisheries are also anticipated to be localized and indeterminate, and again, better assessed through project-specific analyses. In addition, given that aquaculture currently occurs in state waters within the Gulf of Maine, the risk of these indirect impacts to commercial fisheries already exists in the region and the issue becomes one of scale instead of scope.

Apart from EFH consultations, which are required under MSA, and voluntary Council coordination and consultation on aquaculture development via its Aquaculture Policy, development of aquaculture in Federal waters for Atlantic salmon and for other species will be managed outside of the Fishery Management Council process. This framework pertains specifically to authorizing possession of farmed Atlantic salmon and is expected to facilitate authorization and operation of these projects. However, delineating the potential impacts of this framework on Atlantic salmon aquaculture in federal waters is difficult because the measures here are additive to multiple existing permitting requirements. This lends uncertainty to any potential assessment of impacts.

7.12.4 Summary and Conclusions

Both Alternatives 2 and 3 would be expected to result in slightly positive impacts compared to Alternative 1 with respect to ultimate net benefits, as they outline a clear process by which exemptions to the current possession prohibition on Atlantic salmon can be attained. Alternative 3 presents a streamlined administrative process which would be expected to reduce the costs of compliance when compared to Alternative 2. These positive impacts are likely to accrue primarily to finfish aquaculture businesses, as

Atlantic salmon aquaculture businesses tend to be vertically integrated, often owning their own specialized vessels for harvesting and transporting product and serving as their own dealer and processor (Asche et al. 2013; Knott and Neis 2017; Kvaløy and Tveterås 2008). Due to confidentiality concerns, it is not possible to identify the number or size of businesses to which this positive impact are likely to accrue.

7.13 EXECUTIVE ORDER 12866 (REGULATORY PLANNING AND REVIEW)

7.13.1 Determination of significance under E.O. 12866

The purpose of E.O. 12866 is to enhance planning and coordination with respect to new and existing regulations. This E.O. requires the Office of Management and Budget (OMB) to review regulatory programs that are considered to be “significant.” E.O. 12866 requires a review of proposed regulations to determine if the expected effects would be significant, where a significant action is any regulatory action that may:

- Have an annual effect on the economy of \$200 million or more, or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, territorial, or tribal governments or communities;
- Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;
- Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or
- Raise legal or policy issues for which centralized review would meaningfully further the President’s priorities or the principles set forth in this Executive order, as specifically authorized in a timely manner by the Administrator of OIRA in each case.

In deciding whether and how to regulate, agencies should assess all costs and benefits of available regulatory alternatives. Costs and benefits shall be understood to include both quantifiable measures (to the fullest extent that these can be usefully estimated) and qualitative measures of costs and benefits that are difficult to quantify, but nevertheless essential to consider. Section 6.6 presents detailed economic analyses for the proposed action alternatives. These analyses are summarized below. Together, the economic analysis included in Section 6.6 and in this RIR demonstrate that the proposed action is not economically significant under E.O. 12866, as it will not have an annual effect on the economy of \$200 million or more, or adversely affect in a material way the economy or a sector of the economy, productivity, jobs, the environment, public health, or safety, or State, local, or tribal governments or communities.

7.13.2 Goals and Objectives

Goals and objectives are explained in Section 3.3.

The Goal of the Atlantic Salmon Aquaculture Framework is to facilitate the implementation of Atlantic salmon aquaculture projects through the adjustment of the management measures prohibiting the possession and harvest of wild Atlantic salmon in the EEZ. If necessary, add or adjust management measures to ensure aquaculture projects in the EEZ are conducted in a manner consistent with the goals and objectives of the Atlantic Salmon Fishery Management Plan.

The objectives of the Atlantic Salmon Aquaculture Framework are as follows:

1. Clarify, add, or adjust management measures that differentiate authorized possession of aquaculture raised Atlantic salmon from unauthorized possession of wild caught Atlantic salmon in the EEZ. This will allow for the continued enforcement of the prohibition on the harvest and possession of wild caught Atlantic Salmon within the EEZ. It also may provide aquaculture operations with measures designed to help ensure legal possession of aquaculture-raised Atlantic salmon. Examples of possible adjustments or new management measure include:
 - a. Amending the FMP with additional language clarifying the terms of authorized possession,
 - b. Requiring aquaculture operations to obtain aquaculture operation and/or vessel specific authorizations from NMFS prior to possessing Atlantic salmon within the EEZ,
 - c. Requiring aquaculture operators to employ techniques that would allow farmed and wild Atlantic salmon to be differentiated (e.g., reporting, container tagging, notching, etc.) to aid in enforcement during vessel inspections, and/or
 - d. Developing protocols to ensure any aquaculture reared salmon are not landed by unauthorized entities.
2. Clarify, add, or adjust management measures to ensure that federal dealers are not restricted from purchasing, possessing, and/or selling Atlantic salmon harvested from authorized EEZ aquaculture operations. This section would include any dealer permitting requirements.
3. Identify specific concerns related to Atlantic salmon aquaculture in the EEZ that may require monitoring and develop management measures to address enforcement or management concerns.
4. Identify any specific concerns related to Atlantic salmon aquaculture in the EEZ that may require reporting to NMFS and develop measures, including reporting methods and frequency, to address enforcement or management concerns.
5. Avoid duplication of existing state and federal enforcement, monitoring, and reporting requirements and mechanisms, while meeting the Council's conservation and management objectives for Atlantic salmon.
6. Ensure adjustments to the FMP are done in a manner that applies generally to Atlantic salmon aquaculture operations and allows for flexibility associated with future changes in enforcement, monitoring, or reporting technologies and methods.

7.13.3 Description of the Proposed Management Action

A description of the proposed management action is available in Section 4.3.

The purpose for this action is to authorize possession of farmed salmon consistent with the conservation objectives of the Atlantic Salmon Fishery Management Plan (FMP). The need for this action is to develop conservation and management measures that facilitate legal possession of aquaculture-raised Atlantic salmon within NEFMC jurisdiction (i.e., to exempt aquaculture raised salmon from the prohibition against possessing wild salmon in a manner that facilitates legal and efficient operations).

7.13.4 Background, Purpose and Need

The background and purpose and need are explained in Section 3.0.

The need for Atlantic salmon (*Salmo salar*) conservation and management is a long-recognized issue. The New England coastal states manage salmon in their waters under various commissions, agreements, and programs established as early as the 1940s. The North Atlantic Salmon Conservation Organization (NASCO) is an international organization established by the Convention for the Conservation of Salmon in the North Atlantic Ocean, in 1984. The Convention created protected areas free from targeted salmon fishing beyond 12 miles from the coast. NASCO standards especially the Williamsburg Resolution, are

designed to minimize the impacts of salmon aquaculture, introductions, transfers, and transgenics on wild stocks (see <https://nasco.int/conservation/aquaculture-and-related-activities/>). Application of NASCO standards to individual Atlantic salmon aquaculture projects is addressed via the ESA Section 7 consultation process.

Despite state management and international cooperation under the 1984 Convention, a gap remained in terms of conservation and management measures between 3-12 miles from shore. Thus, the 1987 Council FMP for Atlantic Salmon was developed to address this gap and support restoration of the U.S. Atlantic salmon resource. The FMP prohibits a directed or incidental fishery in federal waters (3-200 miles), and the primary measure in the FMP is a prohibition on possession of salmon in federal waters. The FMP complements Atlantic salmon conservation measures enacted by the states. Amendment 1 (1999) included a framework process to allow salmon aquaculture if “it is consistent with the goals and objectives of the Atlantic Salmon FMP” (final rule).

The possible need for Council action related to Atlantic salmon aquaculture arose because of the proposed Blue Water Fisheries Project. Blue Water Fisheries is proposing a commercial-scale marine finfish aquaculture facility within federal waters; the specific site location remains to be determined but is generally planned to be ENE of Newburyport Harbor. The facility would be used to raise steelhead trout (*Oncorhynchus mykiss*) and Atlantic salmon. Lumpfish (*Cyclopterus lumpus*) culture is planned to be used to manage external parasites. The permitting process for this project is underway and an environmental impact statement (EIS) will be prepared, coordinated by NOAA Fisheries. A notice of intent has not yet been published for the EIS, so there is no specific timeline for this development.

Authorizing possession of farmed Atlantic salmon within the U.S. EEZ through this framework would facilitate operation of salmon aquaculture projects, including the Blue Water Fisheries project. This Council action is intended to align with the timing of the Blue Water Fisheries permitting process including EIS development.

7.13.5 Analysis of Alternatives

In general, because Atlantic salmon aquaculture already exists in state waters, the expansion of Atlantic salmon aquaculture into federal waters represents a change in the scale of potential impacts but does not create novel categories of potential impacts. These effects will be evaluated during the project permitting process. Also, this action only applies to the possession of farmed Atlantic salmon in federal waters, and the regulatory framework for aquaculture generally falls outside of the fishery management council process.

There will be broader impacts to businesses of expanding Atlantic salmon aquaculture into federal waters, and these impacts will be project specific but equal across alternatives assessed within the Atlantic Salmon Aquaculture Framework. Given that the number, size, and location of future aquaculture operations are unknown, the overall extent of potential impacts is highly uncertain.

The type of impacts to commercial and recreational fisheries that could result from offshore aquaculture installations could include effort displacement, or indirect effects that result from impacts to target species or their habitats. The direct impact of Atlantic salmon in federal waters on both commercial and recreational fisheries is likely negative, although the magnitude is highly uncertain over the long term. If aquaculture has negative impacts on managed species and essential fish habitats, this could induce indirect negative impacts on commercial and recreational fisheries dependent on those species. The direct impacts of Alternatives 1, 2, and 3 on other managed and ecosystem component species, the physical environment, and essential fish habitat are expected to be negligible. Atlantic salmon aquaculture projects could go forward under any of these alternatives, possibly resulting in negative impacts to other managed and ecosystem component species and fish habitat if avoidance, minimization, and mitigation measures

are not sufficient. Negative impacts could include escapement; disease; use of drugs, biologics, and other chemicals; water quality impacts; benthic sediment and community impacts; and location-specific interactions with EFH, which could alter habitats used by managed species. The extent of potential indirect impacts is highly uncertain given that the number, size, and location of future aquaculture operations are unknown. Assessing the likelihood and magnitude of such potential impacts is better undertaken at the project level due to variation in siting, oceanography, and numerous other factors that alter estimates of project effects (Taranger et al. 2015; Naylor et al. 2005). Individual salmon aquaculture projects would undergo project specific analyses including cumulative effects to evaluate the range of potential impacts.

There is some potential that aquaculture companies rearing Atlantic salmon could contract with owners of commercial fishing vessels to transport salmon to and from the aquacultural facilities in federal waters, creating positive economic impacts for these fishing vessels. However, as noted elsewhere the vertical integration of Atlantic salmon aquaculture businesses (Asche et al. 2013; Knott and Neis 2017; Kvaløy and Tveterås 2008) likely means that the aquaculture business itself will provide the carrier vessel. In the Gulf of Maine there is the potential that at least some of the capital and labor for these carrier services could be sourced from Canadian arms of multinational aquaculture companies. Over time, aquaculture development may lead to port infrastructure upgrades that could have broader benefits for other port users, including commercial and recreational fishermen. This does not seem likely in the reasonably foreseeable future, however, given aquaculture businesses would likely site projects based on available port infrastructure versus developing new or upgrading existing infrastructure.

Overall, the magnitude of these impacts will depend on the scale of aquaculture development. Offshore aquaculture is not expected to expand substantially in the near future given there has never been a prohibition on the activity in federal waters off of the coast of New England, and no development has occurred to date. However, permitting requirements are substantial, as outlined in Section 4.3.1. Assuming a limited scale, any impacts would likely be local in nature and would not be anticipated to affect managed species at the stock level. Thus, the indirect impacts to commercial fisheries are also anticipated to be localized and indeterminate, and again, better assessed through project-specific analyses. In addition, given that aquaculture currently occurs in state waters within the Gulf of Maine, the risk of these indirect impacts to commercial fisheries already exists in the region and the issue becomes one of scale instead of scope.

As such, at the level of this framework, the differences between Alternatives 1, 2, and 3 reduces to differences in administrative costs. Both Alternatives 2 and 3 would be expected to result in slightly positive impacts compared to Alternative 1 (No Action) with respect to ultimate net benefits, as they outline a clear process by which exemptions to the current possession prohibition on Atlantic salmon can be attained. Alternative 3 presents a streamlined administrative process which would be expected to reduce the costs of compliance when compared to Alternative 2.

7.13.5.1 Alternative 1 – No Action

Under Alternative 1 (No Action), possession of Atlantic salmon (wild and farmed) would remain prohibited in federal waters of the EEZ off the Northeastern U.S. Federal regulations associated with the Atlantic salmon FMP at 50 CFR §648.40 related to the prohibition on possession state that ‘evidence that such fish were harvested...from aquaculture enterprises will be sufficient to rebut this presumption’, i.e., rebut that salmon were taken in violation of the regulations. Under No Action, the Council would not establish a specific authorization program for aquaculture operators to help ensure operational consistency with the Atlantic salmon FMP and would not establish any reporting or monitoring requirements. Aquaculture operators and related parties such as dealers may be required to individually ensure that they can provide evidence sufficient to demonstrate such fish were harvested or transferred from aquaculture enterprises.

For the commercial fishing industry, the direct impacts under Alternative 1 would likely be negligible to slight negative, assuming few commercial fishing vessels engage in aquaculture activities. Uncertainty around the permitting process would be expected to increase the administrative burden on any commercial fishing businesses that might contract with Atlantic salmon aquaculture businesses to transport salmon to and from the aquacultural facilities in federal waters. Commercial fishing businesses would need to work with the National Marine Fisheries Service to secure the needed authorizations. This administrative burden would likely be highest for the first company to attempt to procure these authorizations, as there is little precedent which that company could use to build upon. Subsequent companies would likely face much lower administrative burden for attaining the required authorizations, due to the precedent that would then be set. However, the perceived or real administrative burden faced by the first business to attempt to secure the relevant exemptions could be high enough to dissuade businesses from fully engaging in the process.

Seafood dealers would likely face negligible to slightly negative impacts from Alternative 1, for the same reasons as the commercial fishing industry: administrative burden. This burden is likely highest for the first company to attempt to procure authorizations for the legal purchase of Atlantic salmon and decrease substantially thereafter due to the precedent that would then be set. The distribution of these impacts across business size would depend on the exact needs of the aquaculture company (e.g., storage and processing capacity), and thus are better assessed at the project level.

In reality, the majority of the impacts from Alternative 1 are likely to accrue to finfish aquaculture businesses. This is because Atlantic salmon aquaculture businesses tend to be vertically integrated, often owning their own specialized vessels for harvesting and transporting product and serving as their own dealer and processor (Asche et al. 2013; Knott and Neis 2017; Kvaløy and Tveterås 2008). For aquaculture businesses, although Alternative 1 would not necessarily preclude aquaculture for Atlantic salmon in federal waters, it would leave the process of gaining federal exemption to the Atlantic salmon prohibition uncertain, adding to the already onerous permitting process (see Section 4.3.1). The impacts of Alternative 1 on aquaculture entities are thus expected to be slightly negative. Due to uncertainty in the number of potential future projects, their distribution across companies, and confidentiality concerns, it is not possible to identify the number or size of businesses to which this negative impact is likely to accrue.

7.13.5.2 Alternative 2 - Authorize Possession of Farmed Atlantic Salmon in the EEZ via Letter of Authorization, Vessel, and Dealer Reporting

Under Alternative 2, conditions for the possession of farmed salmon would be explicitly authorized consistent with the conservation objectives of the Atlantic Salmon FMP, requiring adherence to certain reporting and enforcement provisions. These provisions include authorization for vessels that would be used to transport Atlantic salmon within the EEZ and vessel and dealer reporting requirements. The reporting requirements would enable NOAA Fisheries and the Council to track harvest and landings of farm-raised Atlantic salmon such that there is accounting of farmed salmon. As outlined below, this would include a requirement that operators of each permitted vessel submit an electronic Vessel Trip Report (VTR) in accordance with regulations at 50 CFR §648.7(b)(1) when salmon are transferred from the aquaculture farm to shore, i.e., per trip, including landings disposition. Regarding dealer reporting, federally permitted dealers purchasing Atlantic salmon would be required to submit reports in accordance with regulations at 50 CFR §648.7(a)(1), i.e., twice weekly. Because this alternative requires a federal salmon permit, vessels would be required to sell to a dealer with a federal salmon permit to be consistent with other Council-managed species.

Overall, the direct impacts of Alternative 2 on commercial fishing would likely be negligible to slight positive when compared to status quo. In terms of the LOA requirement, commercial fishing vessels sometimes request LOAs for various purposes, such as when participating in specific fishery programs.

Alternative 2 expands the types of activities for which commercial fishing vessels may request an exemption to include possession of farmed Atlantic salmon. The issuance of a salmon possession LOA is not expected to create a novel or substantial administrative burden for these businesses because LOAs are already an administrative mechanism employed by the Council, and the requirements for the LOA would be clearly defined via the Council's framework. In terms of vessel permits and reporting, for the commercial fishing industry, owners of vessels that currently have federal fishing permits would not induce any additional administrative costs if they needed to obtain a federal salmon vessel permit to support their participation in an aquaculture project, since a vessel owner applies for all federal fishing permits through a single transaction. Familiarity with existing federal permitting and reporting systems could provide a comparative advantage for commercial vessels with current federal permits over commercial vessels without such permits. Non-federally permitted vessels would face the additional costs associated with gaining federal vessel permits and submitting reports in accordance with regulations defined within 50 CFR §648.7(b)(1). This regulation includes submitting reports for all species, not just federally managed species. Ultimately a commercial fishing business will only engage in the process if they expect to gain from the transaction, suggesting a positive net benefit from the activity.

For seafood dealers, Alternative 2 is likely to provide for negligible to slightly positive direct impacts due to a decrease in the overall regulatory burden when compared to status quo. Alternative 2 requires reporting in a manner that is consistent with the harvest and sale of wild caught federally managed species needing a regulatory exemption. This means that dealers with existing federal permits would not induce any additional administrative costs. Non-federally permitted dealers would face the additional costs associated with gaining a federal permit and submitting reports in accordance with regulations defined within 50 CFR §648.7(a)(1), which includes submitting reports for all species, not just federally-managed species. This could provide a comparative advantage for dealers with current federal permits over dealers without such permits. Dealers will not engage in this activity unless they expect to gain from the transaction, suggesting a positive net benefit.

For the recreational fishing industry, the direct impacts under Alternative 2 would likely be negligible since these vessels are unlikely to engage in aquaculture activities and would therefore not bear an administrative burden of obtaining an LOA or salmon vessel permit or reporting salmon harvest.

The vertical integration of Atlantic salmon aquaculture businesses (Asche et al. 2013; Knott and Neis 2017; Kvaløy and Tveterås 2008) likely means that the aquaculture business itself will provide the carrier vessel and serve as the dealer of record. These aquaculture businesses are likely to view the procurement of a federal vessel permit and dealer permit as a comparatively small additional cost of business. The LOA is also likely to be viewed as a comparatively small additional cost of business, in a similar manner to the permit requirements. Overall, these additional costs of business are unlikely to serve as a deciding factor in whether Atlantic salmon aquaculture in federal waters is expected to be a worthwhile business endeavor. This suggests that the impact on aquaculture businesses is likely to be negligible to slightly positive when compared to status quo due to the overall anticipated decrease in administrative burden. Aquaculture businesses will not look to develop projects in federal waters unless they expect to gain from the transaction, thus suggesting a positive net benefit.

7.13.5.3 Alternative 3 - Authorize Possession of Farmed Atlantic Salmon in the EEZ via Letter of Authorization

Under Alternative 3, conditions for the possession of farmed salmon would be explicitly authorized consistent with the conservation objectives of the Atlantic Salmon FMP. This alternative includes authorization for vessels that would be used to transport Atlantic salmon within the EEZ. Measures are the same as for Alternative 2, except that production reporting requirements are not included. Because this alternative does not require a federal salmon permit, vessels would not necessarily be required to sell

to a dealer with a federal salmon permit (like what is required under Alternative 2). Dealer requirements depend on the state of landing which could require a state permitted vessel or state permitted dealer to sell farmed salmon, a requirement to obtain a state or federal dealer permit to sell the salmon to retail, or a requirement that the dealer would need to be a state dealer to process salmon and sell to wholesale for additional processing.

The direct impacts of Alternative 3 on commercial fishing would likely be negligible to slightly positive when compared to status quo. Commercial fishing vessels sometimes request LOAs for various purposes, such as when participating in specific fishery programs. Alternative 2 expands the types of activities for which commercial fishing vessels may request an exemption to include possession of farmed Atlantic salmon. The issuance of a salmon possession LOA is not expected to create a novel or substantial administrative burden for these businesses because the requirements for the LOA would be clearly defined via the Council's framework. Commercial fishing businesses will only engage in this process if they expect to gain from the transaction, indicating a positive net benefit. Given that Alternative 3 decreases administrative costs when compared to Alternative 1 and 2, the expected net benefits derived from this alternative are expected to be negligibly to slightly more positive than Alternatives 1 and 2.

The direct impact on aquaculture businesses is likely to be negligible to slightly positive when compared to status quo. For Atlantic salmon aquaculture businesses, which are likely to be vertically integrated, the LOA is likely to be viewed as a comparatively small additional cost of business. This additional cost of business is unlikely to serve as a deciding factor in whether Atlantic salmon aquaculture in federal waters is expected to be a worthwhile business endeavor. Given that Alternative 3 decreases administrative costs when compared to Alternative 1 and 2, the expected net benefits derived from this alternative are expected to be negligibly to slightly more positive than Alternatives 1 and 2.

The LOA requirement would have no impact on dealers which are distinct entities from the aquacultural business, representing a decrease in administrative costs when compared to Alternatives 1 and 2.

For the recreational fishing industry, which are all classified as small businesses, the direct impacts under Alternative 2 would likely be negligible since these vessels are unlikely to engage in aquaculture activities and would therefore not bear an administrative burden of obtaining an LOA.

7.13.6 Determination of Significance

The proposed action does not constitute a significant economic regulatory action under EO 12866 for the following reasons: the proposed action will not have an annual effect on the economy of \$200 million or more.

8.0 GLOSSARY

Adult stage – One of several marked phases or periods in the development and growth of many animals. In vertebrates, the life history stage where the animal is capable of reproducing, as opposed to the juvenile stage.

Adverse effect – Any impact that reduces quality and/or quantity of EFH. May include direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality and or quantity of EFH. Adverse effects to EFH may result from actions occurring within EFH or outside of EFH and may include sites-specific or habitat wide impacts, including individual, cumulative, or synergistic consequences of actions.

Aggregation – A group of animals or plants occurring together in a particular location or region.

Amendment – a formal change to a fishery management plan (FMP). The Council prepares amendments and submits them to the Secretary of Commerce for review and approval. The Council may also change FMPs through a "framework adjustment procedure".

Anadromous – refers to fish that leave the ocean to return to freshwater streams and rivers to breed.

Atlantic Salmon Assessment Committee – a team of state and federal biologists who collect data on Atlantic salmon throughout New England and assess the species' population status.

Availability – refers to the distribution of fish of different ages or sizes relative to that taken in the fishery.

Benthic community – Benthic means the bottom habitat of the ocean and can mean anything as shallow as a salt marsh or the intertidal zone, to areas of the bottom that are several miles deep in the ocean. Benthic community refers to those organisms that live in and on the bottom.

Biomass – The total mass of living matter in a unit area or the weight of a fish stock or portion thereof. Biomass can be listed for beginning of year (Jan 1), Mid-Year, or mean (average during the entire year). Also, biomass can be listed by age group (numbers at age * average weight at age) or summarized by groupings (e.g., age 1+, ages 4+ 5, etc.). See also spawning stock biomass, exploitable biomass, and mean biomass.

Biosecurity – Practices that minimize the risk of introducing an infectious disease and spreading it to the animals at a facility and the risk that diseased animals or infectious agents will leave a facility and spread to other sites and to other susceptible species.

Biota – All the plant and animal life of a region.

Bivalve – A class of mollusks having a soft body with platelike gills enclosed within two shells hinged together, e.g., clams, mussels.

Bottom tending mobile gear – All fishing gear that operates on or near the ocean bottom that is actively worked to capture fish or other marine species. Some examples of bottom tending mobile gear are otter trawls and dredges.

Bottom tending static gear – All fishing gear that operates on or near the ocean bottom that is not actively worked; instead, the effectiveness of this gear depends on species moving to the gear which is set in a particular manner by a vessel, and later retrieved. Some examples of bottom tending static gear are gillnets, traps, and pots.

Bycatch – (v.) the capture of nontarget species in directed fisheries which occurs because fishing gear and methods are not selective enough to catch only target species; (n.) fish which are harvested in a fishery but are not sold or kept for personal use, including economic discards and regulatory discards but not fish released alive under a recreational catch and release fishery management program.

Capacity – the level of output a fishing fleet can produce given specified conditions and constraints.

Maximum fishing capacity results when all fishing capital is applied over the maximum amount of available (or permitted) fishing time, if all variable inputs are utilized efficiently.

Catch – The total of fish killed in a fishery in a period. Catch is given in either weight or number of fish and may include landings, unreported landings, discards, and incidental deaths.

Coarse sediment – Sediment generally of the sand and gravel classes; not sediment composed primarily of mud; but the meaning depends on the context, e.g., within the mud class, silt is coarser than clay.

Continental shelf waters – The waters overlying the continental shelf, which extends seaward from the shoreline and deepens gradually to the point where the sea floor begins a slightly steeper descent to the deep ocean floor; the depth of the shelf edge varies but is about 200 meters in many regions.

CPUE – Catch per unit effort. This measure includes landings and discards (live and dead), often expressed per hour of fishing time, per day fished, or per day-at-sea.

Demersal species – Most often refers to fish that live on or near the ocean bottom. They are often called benthic fish, groundfish, or bottom fish.

Discards – animals returned to sea after being caught; see Bycatch (n.)

Distinct population segment (DPS) – under the Endangered Species Act, a vertebrate population or group of populations that is discrete from other populations of the species and significant in relation to the other species.

Environmental Impact Statement (EIS) – an analysis of the expected impacts of a fishery management plan (or some other proposed federal action) on the environment and on people, initially prepared as a "Draft" (DEIS) for public comment. The Final EIS is referred to as the Final Environmental Impact Statement (FEIS).

Essential Fish Habitat (EFH) – Those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. The EFH designation for most managed species in this region is based on a legal text definition and geographical area that are described in the Habitat Omnibus Amendment 2 (NEFMC 2016).

Exclusive Economic Zone (EEZ) – for the purposes of the Magnuson-Stevens Fishery Conservation and Management Act, the area from the seaward boundary of each of the coastal states to 200 nautical miles from the baseline.

Exempted fisheries – Any fishery determined by the Regional Director to have less than 5 percent regulated species as a bycatch (by weight) of total catch according to 50 CFR 648.80(a)(7).

Fathom – A measure of length, containing six feet; the space to which a man can extend his arms; used chiefly in measuring cables, cordage, and the depth of navigable water by soundings.

Fishing effort – the amount of time and fishing power used to harvest fish. Fishing power is a function of gear size, boat size and horsepower.

FMP (Fishery Management Plan) – a document that describes a fishery and establishes measures to manage it. This document forms the basis for federal regulations for fisheries managed under the regional Fishery Management Councils. The New England Fishery Management Council prepares FMPs and submits them to the Secretary of Commerce for approval and implementation.

Framework adjustments: adjustments within a range of measures previously specified in a fishery management plan (FMP). A change usually can be made more quickly and easily by a framework adjustment than through an amendment. For plans developed by the New England Council, the procedure requires at least two Council meetings including at least one public hearing and an evaluation of environmental impacts not already analyzed as part of the FMP.

Fry – small salmon that remain buried in the gravel for about 6 weeks and emerge from their gravel nest (aka redd) in mid-May.

Hatchery – a place where eggs are artificially controlled for commercial purposes.

ICES (International Council for the Exploration of the Sea) – the official research arm of NASCO. Provides scientific advice to NASCO members to inform science-based management recommendations for the conservation of North Atlantic salmon stocks.

Kelts – aka black salmon, when spawning has been completed.

Landings – The portion of the catch that is harvested for personal use or sold.

Larvae (or Larval) stage – One of several marked phases or periods in the development and growth of many animals. The first stage of development after hatching from the egg for many fish and invertebrates. This life stage looks fundamentally different than the juvenile and adult stages and is incapable of reproduction; it must undergo metamorphosis into the juvenile or adult shape or form.

Metric ton (mt) – A unit of weight equal to 1,000 kilograms (1kg = 2.2 lb). A metric ton is equivalent to 2,204.6 lb. A thousand metric tons is equivalent to 2.204M lb.

Minimum biomass level – the minimum stock size (or biomass) below which there is a significantly lower chance that the stock will produce enough new fish to sustain itself over the long term.

Mortality – Noun, either referring to fishing mortality (F) or total mortality (Z).

Multispecies – the group of species managed under the Northeast Multispecies Fishery Management Plan. This group includes whiting, red hake and ocean pout plus the regulated species (cod, haddock, pollock, yellowtail flounder, winter flounder, witch flounder, American plaice, windowpane flounder, white hake and redfish).

NASCO (North Atlantic Salmon Conservation Organization) – North Atlantic nations including the U.S. cooperatively manage Atlantic salmon stocks through conservation, restoration, and enhancement programs.

Northeast Shelf Ecosystem – The Northeast U.S. Shelf Ecosystem has been described as including the area from the Gulf of Maine south to Cape Hatteras, extending from the coast seaward to the edge of the continental shelf, including the slope sea offshore to the Gulf Stream.

Observer – Any person required or authorized to be carried on a vessel for conservation and management purposes by regulations or permits under this Act.

Overfishing Limit (OFL) – The annual amount of catch that corresponds to the estimate of the maximum fishing mortality threshold applied to a stock or stock complex's abundance and is expressed in terms of numbers or weight of fish.

Overfished – A condition defined when stock biomass is below minimum biomass threshold and the probability of successful spawning production is low.

Overfishing – A level or rate of fishing mortality that jeopardizes the long-term capacity of a stock or stock complex to produce MSY on a continuing basis.

Parr – refers to young salmon that undergo a physiological transformation called smoltification that prepares them for life in a marine habitat. These young salmon remain in rivers or streams for the first 1 to 2 years of life, preferring shallow, cool, fast-flowing water with shade.

PDT (Plan Development Team) – a group of technical experts responsible for developing and analyzing management measures under the direction of the Council. The Habitat PDT addresses aquaculture issues.

Proposed rule – a federal regulation is often published in the Federal Register as a proposed rule with a time for public comment. After the comment period closes, the proposed regulation may be changed or withdrawn before it is published as a final rule, along with its date of implementation and response to comments.

Sediment – Material deposited by water, wind, or glaciers.

Smolt – a young salmon after the parr stage when the fish becomes silvery and migrates to the sea for the first time.

Smoltification – fish imprint on the chemical nature of the stream or river to enable them to find their way back to where they were born. After smoltification is complete in the spring, smolts migrate to the ocean to grow, feed, and mature.

Stock – A grouping of fish usually based on genetic relationship, geographic distribution and movement patterns. A region may have more than one stock of a species (for example, Gulf of Maine cod and Georges Bank cod). A species, subspecies, geographical grouping, or other category of fish capable of management as a unit.

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10.0 APPENDIX A: ATLANTIC SALMON MANAGEMENT

The federal management program for Atlantic salmon developed under the Magnuson Stevens Act is summarized in Section 5.2.2.

10.1 STATE MANAGEMENT

Aquaculture projects being proposed in the EEZ are only required to obtain the necessary federal permits, however, states bordering the proposed project that have a coastal zone management program can request to review federal permit applications via the Coastal Zone Management Act (CZMA) if the state(s) can demonstrate the project could impact coastal waters (land, water use, natural resource). This section briefly describes how states manage aquaculture activities for aquaculture activities more broadly and salmon, both farmed and wild caught.

The New England coastal states manage salmon in their waters under various commissions, agreements, and programs established as early as the 1940s.

Maine

- Harvest or possession of wild sea-run salmon is prohibited. Harvest of landlocked salmon is allowed.
- Aquaculture projects require: 1) an environmental characterization describing the bottom characteristics, resident flora and fauna, tide levels, current speed and direction and 2) an environmental baseline to monitor the physical and ecological effects of aquaculture on sediments, marine organisms and water quality (for aquaculture leases with discharge of feeds, therapeutants, etc. into state waters)
- Require public hearings and/or a public comment period depending on whether the lease proposal is standard or experimental, respectively.
- Protective measures to minimize risk to wild salmon in Maine:
 - o Annual third-party audits to validate Containment Management System (CMS) plan.
 - o Annual reviews from state and federal agencies to monitor the protective measures in place per permit requirements (compliance measure) (USACE Special Conditions to be included in the RHA Section 10 Permit document)
- Maine Department of Marine Resources evaluates the lease proposal by impacts to navigation, commercial and recreational fishing, marine flora and fauna, etc.
- Since the 1970s, salmon have been grown in open net pens; salmon farmers worked with state and federal regulators and others to develop best management practices for operational and monitoring requirements to minimize environmental impact (vaccine use, integrated pest management, minimal to non-existent use of antibiotics and growth enhancers, feed efficiency improvements, thermal baths replaced chemical treatments for sea lice, other preventative treatments for parasites, adding invertebrates and seaweeds to net pens to reduce environmental impacts, etc.)
- Maine Atlantic Salmon Restoration and Conservation Program – an in-lieu fee compensation program for road and bridge construction projects that have unavoidable impacts to salmon and their habitat in stream; permit applicants can purchase credits instead of doing mitigation for which the money would be used to implement mitigation projects for salmon.
- Harvest data includes annual aquaculture harvest information by total harvest value and by species.
- Beginning in 2004, finfish harvest totals were submitted by leaseholders annually and/or monthly via inventory reports required by the state.
- Since 2011, farmed salmon production data cannot be reported because of DMR's confidentiality statutes (too few companies).

New Hampshire

- NH Department of Fish and Game conducts a site assessment to characterize benthic substrate, fish, aquatic plants, tidal information and flow rate, recreational and commercial fishing and other activities occurring in the area.

Massachusetts

- The MA Division of Marine Fisheries (DMF) and coastal municipalities manage aquaculture; license issuance varies by municipality; MA DMF requires an aquaculture permit and that any aquaculture be >25' from eelgrass and not contain significant numbers of shellfish.
- MA DMF conducts a site assessment to characterize benthic substrate, fish habitats, submerged aquatic vegetation, and other activities occurring in the area including recreational and commercial fishing.
- No commercial scale finfish operations in MA waters; shellfish aquaculture primarily

Rhode Island

- The RI Coastal Resources Management Council (CRMC) is the body responsible for permitting aquaculture in RI waters; other groups provide input to the RI CRMC though including towns, harbor commissions, the RI Fisheries Management Council, Department of Environmental Management, and the public.
- Conducts a site assessment for presence of eelgrass and submerged aquatic vegetation and determine shellfish density in the proposed lease area.
- Required to have an aquaculture permit and a dealer permit for shellfish.
- Finfish and land-based aquaculture are not legal in RI.

Connecticut

- Aquaculture leasing done by the municipalities for smaller town-managed waters and the state for larger shellfish leases (Department of Agriculture, Bureau of Aquaculture); CT DA/BA consults with CT Department of Energy and Environmental Protection, USACE, and local shellfish commissions (when projects are in town waters); state is responsible for the EIS and to ensure all aquaculture projects are consistent with any shellfish and harbor management plans.
- Any aquaculture must be >25' from submerged aquatic vegetation and salt marsh.
- Shellfish and seaweed primarily

10.2 INTERNATIONAL MANAGEMENT

The North Atlantic Salmon Conservation Organization ([NASCO](https://nasco.int/)) is an international organization established by the [Convention for the Conservation of Salmon in the North Atlantic Ocean](#) in 1984. The Convention created protected areas free from targeted salmon fishing beyond 12 miles from the coast. The Williamsburg Resolution is intended to minimize impacts from aquaculture, introductions and transfers, and transgenics on wild salmon stocks. The resolution was adopted in 2003 and amended in 2004 and 2006. Aquaculture projects located within waters regulated by the parties to the Convention are subject to the standards. The full set of standards and annexes and appendices are available here: <https://nasco.int/wp-content/uploads/2020/02/williamsburg.pdf>. The resolution recognizes the need for a cooperative, precautionary approach, and recognizes both the socio-economic benefits and the possible adverse impacts of salmon aquaculture. Articles are summarized below:

1. Parties shall cooperate.
2. Definitions are provided in Annex 1.
3. Parties shall require project proponents to provide information to demonstrate that projects will not have significant adverse impacts on wild salmon stocks.

4. Risk assessment methods should be developed and applied.
5. Measures shall be taken to minimize impacts associated with farming or ranching salmon, or salmon enhancement activities on wild salmon. Parties shall minimize risks of disease and parasite transmission on wild salmon.
6. Reproductively viable, non-indigenous salmonids or their gametes should not be introduced.
7. Stocking transgenic salmonids should be avoided.
8. Parties should develop river classification and zoning.
9. Mitigation should occur when adverse impacts are identified.
10. In some cases, full implementation may require stronger measures. Approaches should be adaptable to new technologies.
11. Parties should support research and data collection on these issues.
12. Educational information on risks should be developed and distributed.

Annexes and appendices address the following issues:

- Annex 2, General measures, describes siting and operation and aquaculture activities, control of diseases and parasites, and establishment of gene banks.
- Annex 3, Containment, describes siting, equipment, operations, reporting, and action planning.
- Annex 4, Stocking Guidelines, describes protocols for releasing salmon for enhancement, mitigation, restoration, or ranching. Some guidelines are specific to class of river, class referring to the extent to which salmon and their habitats have been affected by human activities.
- Annex 5, Transgenic Salmonids, aims to carefully examine and as needed constrain any use of transgenic fish.
- Annex 6 describes river classification and zoning systems.
- Annex 7 outlines research and data collection priorities.
- Appendix 1 describes North American protocols. Rivers and coastal waters off the New England states are located in Zone III. The protocols relate to which strains of salmon can be used and requirements for transfer of fish, and some are specific to each zone. Detailed guidelines for approval of introductions and transfers are also provided.
- Appendix 2 is a Memorandum of Understanding between Canada and the United States related to consulting on introductions and transfers that may affect both parties.

10.3 COOPERATIVE AGREEMENTS

Salmon conservation is fostered via the [Atlantic Salmon Recovery Plan](#), which is administered by NOAA and USFWS, as a requirement of the Endangered Species Act. Under ESA, recovery planning includes site-specific actions, objective and measurable criteria for delisting, and time and cost estimates to achieve recovery and intermediate steps towards recovery. The recovery plan focuses on rivers and estuaries, until marine threats are more fully understood. Diverse recovery actions include fostering habitat connectivity; freshwater, marine, and estuarine conservation actions to increase survival; maintaining a conservation hatchery and promoting genetic diversity; and outreach, funding, and coordination activities.

The Collaborative Management Strategy for the Gulf of Maine Atlantic Salmon Recovery Program facilitates implementation of the Recovery Plan. The strategy describes the working relationships between the two Federal agencies (USFWS and NOAA-Fisheries), the Maine Department of Marine Resources (MDMR), the Penobscot Indian Nation (PIN) and stakeholders. For more information see here: <https://www.fisheries.noaa.gov/new-england-mid-atlantic/endangered-species-conservation/collaborative-management-strategy-gulf-maine-atlantic-salmon-recovery-program>.

11.0 APPENDIX B: PERMITTING PROCESS FOR FINFISH AQUACULTURE

Finfish aquaculture permitting⁹ in federal waters is a complex process that involves multiple agencies. The permitting process addresses an array of environmental, social, and economic issues. The process is summarized in the [background document](#) prepared to complement the Council's Aquaculture Policy. The 2022 [Guide to Permitting Marine Aquaculture in the United States](#) is also a useful resource. Applicable laws include the Endangered Species Act (ESA), Magnuson Stevens Act (MSA), Clean Water Act (CWA), Rivers and Harbors Act (RHA), National Historic Preservation Act, Fish and Wildlife Coordination Act (FWCA), National Marine Sanctuaries Act (NMSA), Marine Mammal Protection Act (MMPA), National Environmental Policy Act (NEPA), and Coastal Zone Management Act (CZMA).

This section describes the primary roles and responsibilities of federal agencies involved in the aquaculture permitting process including permit types, permit terms/conditions, and compliance mechanisms, generally summarized in Figure 2. This section also includes permitting considerations addressed through this framework that are not directly addressed in other federal agency permitting processes (Table 9) and an overview of typical permitting conditions addressed through other federal agencies permitting processes (Table 10).

Lead Agency

Role of NOAA Fisheries:

- Under EO 13921 (May 7, 2020), NOAA leads development of an Environmental Impact Statement (EIS) for federal waters aquaculture projects where two or more agencies are involved in permitting.
- Under the MSA:
 - o NOAA conducts Essential Fish Habitat (EFH) consultations to provide conservation recommendations to avoid, reduce, offset any adverse effects on designated EFH.
 - o NOAA issues an Exempted Fishing Permit (EFP) under 50 CFR 600.745 to authorize the otherwise prohibited harvest of a species managed under an FMP for aquaculture. Section 600.745 (b)(1) states: "A NMFS Regional Administrator or Director may authorize, for limited testing, public display, data collection, exploratory fishing, compensation fishing, conservation engineering, health and safety surveys, environmental cleanup, and/or hazard removal purposes, the target or incidental harvest of species managed under an FMP or fishery regulations that would otherwise be prohibited." EFPs are considered more short-term while authorizations are longer-term. While both EFPs and LOAs are issued for one year at a time, an ongoing LOA program would not need to annually demonstrate the continuing need (testing, conservation engineering, etc.), be published in the Federal Register, nor would it have the requirement for the recipient to submit a final report of the project.
- Under the Marine Mammal Protection Act (MMPA), any take of marine mammals, which includes the harassment, hunting, capturing, or killing of, is prohibited except under certain circumstances. Section 118 establishes the Marine Mammal Authorization Program (MMAP), which provides an annual exemption for the incidental take of a non-endangered and non-threatened marine mammals in a commercial fishing operations having frequent or occasional

⁹ Shellfish or seaweed aquaculture permitting has slightly different requirements; this document focuses on finfish requirements given Atlantic salmon is the focal species for this action.

interactions with marine mammals (listed as Category I and Category II fisheries under the List of Fisheries (LOF), which is published annually and is available on the NOAA Fisheries website and in the Federal Register. To be eligible for the exemption, any commercial vessel or non-vessel gear (e.g., aquaculture facilities) engaging in a Category I or II fishery must obtain a MMAP certificate from NOAA Fisheries. The MMAP does not allow for directed take or harassment of marine mammals. This Certificate must always be present on the fishing vessel or on the person during fishing operations. The MMAP also requires that permit holders carry an observer during fishing operations if requested, and that they adhere to all other applicable Take Reduction Plan regulations. Regardless of Categorization (I, II, or III), commercial fisheries must report every incidental death or injury of marine mammals that results from commercial fishing operations (including aquaculture) within 48 hours of returning to port.

- Under ESA Section 7 for listed species, adverse modification to designated critical habitat, NOAA (and/or USFWS) conducts a formal and informal consultation, depending on the level of impact.
- Under the FWCA, NOAA Fisheries conducts a consultation that may result in project modification and/or mitigation measures to reduce effects on fish and/or wildlife resources.

Cooperating Agencies

Role of U.S. Army Corps of Engineers (USACE):

- USACE issues an RHA Section 10 permit to authorize aquaculture farm structures in the water that could impact navigation. The Section 10 permit has ‘special conditions’ to reduce the impacts of commercial salmon aquaculture on wild salmon stocks. The below conditions may be added to the permit as special conditions (i.e., are not necessarily required conditions):
 - *Genetic restrictions* – North American origin based on each fish’s DNA in accordance with the Microsatellite Protocol, genetic evaluation submitted to US Fish and Wildlife Service every January 1st, confirmation from USFWS that the stock is of North American origin before transferring any eggs (documentation includes hatchery info, testing results, chain of custody of fish)
 - *Prohibition of transgenic salmonids* – transgenic means that the salmon contains DNA from an unrelated organism that has been artificially introduced. Transgenic fish are not allowed to be used.
 - *Alternative salmonid species* – if stocking other salmonid species besides Atlantic salmon (e.g., steelhead), need certification from the Maine Fish Health Technical Committee and the Maine Department of Marine Resources to show compliance with disease management standards. Written approval required from USACE.
 - *Containment* – Requirement to have a marine containment management system (CMS) to prevent accidental/consequential fish escapement. The CMS plan includes a site plan/schematic; a management/auditing methods to describe/address inventory control procedures, predator control procedures, escape response procedures, unusual event management, severe weather procedures, and training; and a facility-specific list of critical control points where escapes could potentially occur (including specific location, control mechanisms, critical limits, monitoring procedures, appropriate corrective actions, verification procedures for monitoring, and a record keeping system).
 - CMS audited 1+ x/year and within 30 days of a reported escape (> 50 fish that are 2 kg or larger per fish and/or 25% reduction in cage biomass) – audit report includes any corrective action plan and other details.
 - Personnel at CMS facility properly trained.
 - Maintain complete records, etc. for CMS.

- If corrective actions are not implemented, all pens and fish will be removed from the water within 30 days.
- *Escape reporting* – permittees report any known/suspected escape of > 50 fish (with avg. weight of 2 kg or larger per fish) and/or a 25% reduction in biomass within 24 hours.
- *Marking* – Farmed salmon marked to designate they are commercially-reared origin in case of escapement; includes a QA/QC program to monitor compliance and a review/description of marking methods approved by USACE. If escaped fish are found within range of GOM Distinct Population Segment, then a third-party audit will be done.
- *Inspections* – USACE and USFWS allowed to inspect work, take fish samples to monitor compliance of genetic structure, transgenics, and marking.
- *Boundary markers* – for around lease area, structures in accordance with Coast Guard regulations.
- *Recreational and commercial boating* – may occur in project area except in net pen areas.
- *Annual environmental monitoring data* provided to NMFS.
- *Antibiotic chemicals* applied if approved by US Food and Drug Administration (FDA); prophylactic use of antibiotics prohibited.
- *No discharge of pollutants* from the facility other than fish excrement, ammonia excretions, unconsumed food, or FDA approved medications.
- *Mortalities, feed bags, fish food/waste materials* excluding fish excrements/unconsumed food removed to shore.
- *Requirement to report incidental take of marine mammals* allowed under MMPA.
- *Requirement from USACE to approve raising other species of fish in pens not covered under the current permit.*
- *Permit may be modified/suspended/revoked* if degradation of environmental resources including any federal and state water quality standards (based on review of environmental monitoring data) occurs.
- *If future operations by the United States require removal/relocation/alteration of farm (ex. Navigation)* then operator is required to do so without claim to the U.S.
- Section 404 of the CWA also requires a permit for placement of fill, including shells.

Role of EPA:

- Under NEPA, an EIS may be required.¹⁰
- Issues a CWA National Pollutant Discharge Elimination System (NPDES) permit for Concentrated Aquatic Animal Production Facilities (CAAP) for discharge of pollutants including feed, nutrients, pharmaceuticals, metabolic waste, etc. Even farmed fish could be considered a pollutant as they could be considered “biological materials” if inadvertently released. CAAPs include both onshore and open water aquaculture facilities. Common NPDES requirements, best management practices, and/or performance standards include:
 - Quality Assurance Plans or Standard Operating Procedures
 - Operations and Maintenance Plan
 - Containment Management System Plan
 - Feed Management Plan
 - Materials Storage Plan

¹⁰ An EIS may not always be required, especially if the feed and stocking rates of the facility are expected to fall below the thresholds that would classify them as a Concentrated Aquatic Animal Production Facility.

- Maintenance Plan
- Training Plan
- Waste collection/disposal Plan
- Transport/harvest discharge Plan
- EPA may also require the quantity of feed used be reported as a means to determine how much organic material is being released into the receiving waters, either as metabolic waste from the farmed fish or unconsumed feed that passes through the cage system.
- As part of the NPDES permitting process, EPA must conduct an Ocean Discharge Criteria evaluation to assess the potential for the facility's discharge to cause unreasonable degradation of the marine environment. Utilizes site and project-specific data to predict potential environmental impacts. In addition, the EPA must conduct consultations for its permitting actions with NOAA Fisheries and the U.S. Fish and Wildlife Service under Section 7(a) of the ESA and the 1996 Amendments to the Magnuson-Stevens Fishery Conservation and Management Act. The majority of permit requirements developed for an NPDES permit are done so to ensure the discharge(s) meet the limits that adequately protect water quality and affected environment as required under the CWA. Consultations with other federal agencies and the public help identify deficiencies in the permit or address specific environmental or species-specific concerns that require additional attention or safeguards.

Role of U.S. Fish and Wildlife Service:

- Under ESA Section 7 for listed species, adverse modification to designated critical habitat, USFWS (and/or NOAA Fisheries) conducts a formal consultation.
- Under the FWCA, USFWS conducts a consultation that may result in project modification and/or mitigation measures to reduce effects on fish and/or wildlife resources.

Role of U.S. Coast Guard (USCG)

- Ensure safe navigation.
- Authorize private aids to navigation.

Role of US Food and Drug Administration:

- Provides oversight on and regulations for use of drugs, pesticides, biologics, and animal health considerations for farmed aquatic animals.

Role of US Department of Agriculture:

- Through Animal and Plant Health Inspection Service Veterinary Services (APHIS VS) consult on prevention, detection, control, and eradication of animal diseases.
- Consultation occurs prior to stocking any animals in marine federal waters.

Role of Department of Defense:

- Through Military Aviation and Installation Assurance Siting Clearinghouse, consult on conflicts with military readiness operations.

Role of the Fishery Management Council:

- Can participate as a member of the public or any interested party via public comment opportunities available within the NEPA process and elsewhere in the permitting process. Formal public input and comment opportunities occur during the federal permitting and authorization

process, not necessarily during the state agency review process (given the overlap between federal and state permitting).

- Collaborate with NOAA Fisheries on issues of shared concern, such as protection of EFH or if a project proposes farming a Council-managed species such as Atlantic salmon.

Table 9. Permitting considerations for aquaculture projects addressed through this framework action that are not directly addressed in other federal agency permitting processes.

Issues addressed through this FW	Framework requirements	Relevant to NEMFC Atlantic salmon framework?	Alternatives
Enforcement	Letter of Authorization (LOA) for aquaculture companies	Yes, to ensure Office of Law Enforcement would be able to confirm authorized possession of farmed fish (versus wild).	Applies to Alternatives 2 and 3
Reporting	Atlantic salmon permit for authorized vessel owners and federal dealers	Yes, to ensure Office of Law Enforcement would be able to confirm authorized possession of farmed fish (versus wild) by regulated entities.	Applies to Alternative 2 only
	Electronic Vessel Trip Report (eVTR)	Yes, in accordance with current regulations mandating VTRs for each federally managed fishery trip.	Applies to Alternative 2 only
	Federal dealer reports (2x/week)	Yes, in accordance with current regulations mandating federal dealer reports 2x/week.	Applies to Alternative 2 only
Exemptions	SBRM requirement	Requirement to carry at-sea observers/monitors waived for vessel operating under Atlantic salmon permit and aquaculture LOA.	Not required under any alternatives
	VMS requirement	If authorized salmon aquaculture vessel uses VMS to comply with other federal fisheries' regulations, then vessel may declare out of fishery when servicing aquaculture facility.	Not required under any alternatives

Table 10. Considerations for aquaculture projects addressed through other federal agency permitting and therefore not included in framework alternatives. These are common requirements typically required through consultations with other federal agencies, but others can be added because of agency consultations and public input. Note: USACE only permits aquaculture structures. Other conditions are typically added based on consultations with NMFS.

General Consideration	Specific Consideration	Agencies involved	Via which permit?
<i>Reporting</i>	Drug/chemical use	EPA, USACE	NPDES, RHA Section 10 special conditions
	Escapement	EPA, USACE	NPDES, RHA Section 10 special conditions
	Production	EPA	NPDES
	Stocking (source, quantities, sizes)	EPA, USACE	NPDES, RHA Section 10 special conditions
	Marking of salmon (likely not applicable for other farmed fish)	EPA, USACE	NPDES, RHA Section 10 special conditions
	Discharge monitoring	EPA, USACE	NPDES, RHA Section 10 special conditions
	Protected species interactions	EPA, USACE	NPDES, RHA Section 10 special conditions
	Quantity of feed used	EPA	NPDES
<i>Monitoring</i>	Environmental monitoring (nutrients, solids, dissolved oxygen, pH, water temperature, etc.)	EPA, USACE	NPDES, RHA Section 10 special conditions
	Drugs and chemicals	EPA, USACE	NPDES, RHA Section 10 special conditions
	Metals	EPA	NPDES
	Sediment samples	EPA	NPDES
	Benthic assessments*	EPA, USACE	NPDES, RHA Section 10 special conditions
	Video and/or photo surveys	EPA	NPDES
<i>Compliance, Inspections, Audits</i>	Discharge monitoring review	EPA	NPDES
	Marking of farmed salmon (QA/QC procedures)	USACE	RHA Section 10 special conditions
	Limit violations, frequency, etc.	EPA, USACE	NPDES, RHA Section 10 special conditions
	Compliance with all permit conditions	EPA, USACE	NPDES, RHA Section 10 special conditions
	Effluent limits, monitoring	EPA	NPDES
	Best Management Plan	EPA, USACE	NPDES, RHA Section 10 special conditions
	Proper reporting	EPA, USACE	NPDES, RHA Section 10 special conditions
	Records	EPA, USACE	NPDES, RHA Section 10 special conditions

* The Corps may conduct a benthic survey through EFH consultation with NMFS.

Figure 2. Draft Environmental review and permitting process for federal waters finfish aquaculture projects in the Greater Atlantic Region.

