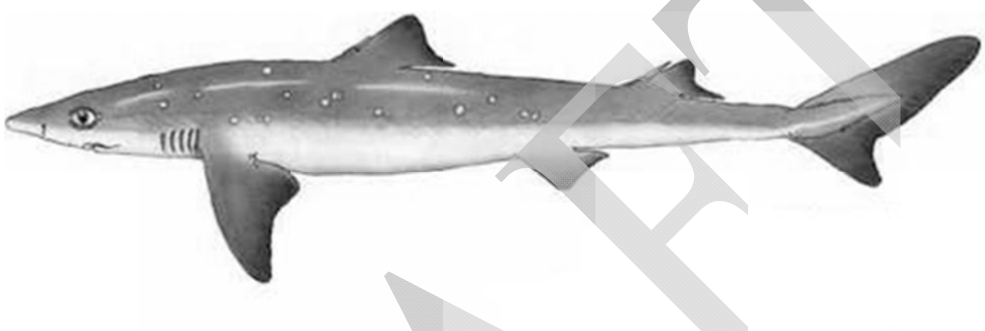
SPINY DOGFISH AMENDMENT 3 TIMELINE

Date	Time Allowance	Action
8/28-8/30/2012		**Public Hearings**
9/25/2012		**NEFMC adopts Amendment 3**
10/16/2012		**MAFMC adopts Amendment 3**
11/1/2012		Council submits Draft Amendment 3 to NMFS
11/22/2012	3 weeks	NERO reviews Amendment 3 Draft EA, provides comments to Council staff
11/29/2012	1 week	NERO submits proposed regulations for Council deeming
12/7/2012	2 weeks	Council submits revised Draft Amendment 3 to NMFS
12/12/2012	**5 days**	**Transmittal Date, MSA 95-day approval clock starts**
12/12/2012	5 days	NERO sends CZMA consistency letters
12/17/2012	**60 days**	**NOA for Amendment 3 publishes in the *Federal Register* with 60-day comment period**
12/17/2012	60 days	CZMA 60-day consistency review starts
1/1/2013	**30 days**	**NMFS publishes proposed rule with 30-day comment period**
2/1/2013		Proposed rule 30-day comment period ends
2/17/2013		CZMA 60-day comment period ends, 30 days until final action
2/17/2013		NOA comment period ends
3/1/2013	10 days	NEPA clears Final EA
3/17/2013		**NMFS approves/disapproves/partially approves Amendment 3 (95 days from Transmittal)**
3/18/2013		RA signs EA/FONSI
4/1/2013	**30 days**	**Final rule published with 30-day cooling off period**
4/1/2013		Small Entity Compliance Guides sent
5/1/2013		**Final rule for Amendment 3 becomes effective**

DRAFT

Amendment 3
to the
Spiny Dogfish
Fishery Management Plan

Includes Environmental Assessment (EA)



Aug 1, 2012

Prepared by the

Mid-Atlantic Fishery Management Council

in cooperation with the

National Marine Fisheries Service

Mid-Atlantic Fishery Management Council
Suite 201
800 N. State St
Dover, DE 19901
(302) 674 2331

1.0 EXECUTIVE SUMMARY

This amendment document was prepared by the Mid-Atlantic Fishery Management Council (Council) under consultation with the National Marine Fisheries Service (NMFS). The document's purpose is to present a range of alternatives for amending the fishery management plan (FMP) for the U.S. Atlantic spiny dogfish fishery along with a characterization of the environmental impacts of each of those alternatives. The alternatives consist of modifications to the FMP that are needed to maintain consistency with the Magnuson-Stevens Fishery Management and Conservation Act (MSA) and Sustainable Fisheries Act (SFA) regarding essential fish habitat (EFH). Amendment 3 will also address other issues that relate to more efficiently achieving the established management goals of the FMP. This document was developed in accordance with a number of applicable laws and statutes that are described in Section 8.0 (see the Table of Contents to locate document sections).

A comparison of the action alternatives relative to "no action" is a requirement under the implementation of the National Environmental Policy Act (NEPA), however in terms of the review of EFH for spiny dogfish "no action" would be inconsistent with the MSA. Therefore, "no action" under EFH in this amendment is actually a status quo or baseline alternative that would maintain existing EFH definitions with the FMP.

Potential Management Actions: Four management actions are contemplated in this amendment (each of which includes a set of alternatives):

1 Research Set-Aside (RSA)

Alternatives: 1A: no action (no RSAs)
1B: allow allocation of up to 3% of commercial quota as RSA
1C: allow allocation of up to 5% of commercial quota as RSA

Problem statement: In 2001, all of the Council's FMPs were adjusted to allow for the set-aside of annual quota to support research and data collection. At the time the adjustment was developed, the Spiny Dogfish FMP was in development and was left out of that process. Thus the existing FMP does not allow for the benefits associated with the RSA program.

Council recommendation: Pending

Impact analysis: The biological impacts of harvesting annual quotas are analyzed in the specification package submitted to NMFS each year. The set-aside will always be deducted from and not in addition to the Total Allowable Landings that is specified. Hence the biological and socio-economic impacts resulting from the harvest of set-aside quantities will always be fully accounted for. Moreover, if a research project requests an exemption from an existing fisheries regulation, an analysis must be prepared which analyzes the impact of that exemption.

2 Essential Fish Habitat (EFH) Definitions for all Life Stages of Spiny Dogfish:

Alternatives: 2A: No action (Review but do not update EFH definitions)
2B: Update EFH definitions as needed

Problem statement: In order for the plan to be fully compliant with the MSA, the EFH definitions must be reviewed every five years, and if necessary, updated. A review of the EFH definitions will be included in this amendment to keep the FMP compliant with the MSA. An optional update to the EFH definitions (Alt 2B) would base those definitions on data from a more recent timeframe.

Council recommendation: Pending

Impact analysis: To the degree that EFH is vulnerable to damage by fishing and/or non-fishing activities, management oversight of these activities in areas designated as EFH for a given life stage of any managed resource will allow for direct and indirect benefits for that resource. Alternative 2B identifies EFH for all life stages of spiny dogfish based upon updated data from a range of fishery independent sampling programs. By updating the EFH definitions, future impacts to EFH for spiny dogfish can be identified and mitigated. The areas under consideration as EFH under the action alternative overlap with areas already designated as EFH for other species. Figures 1 and 2 below show the differences in spatial coverage from the updated vs status quo EFH definitions.

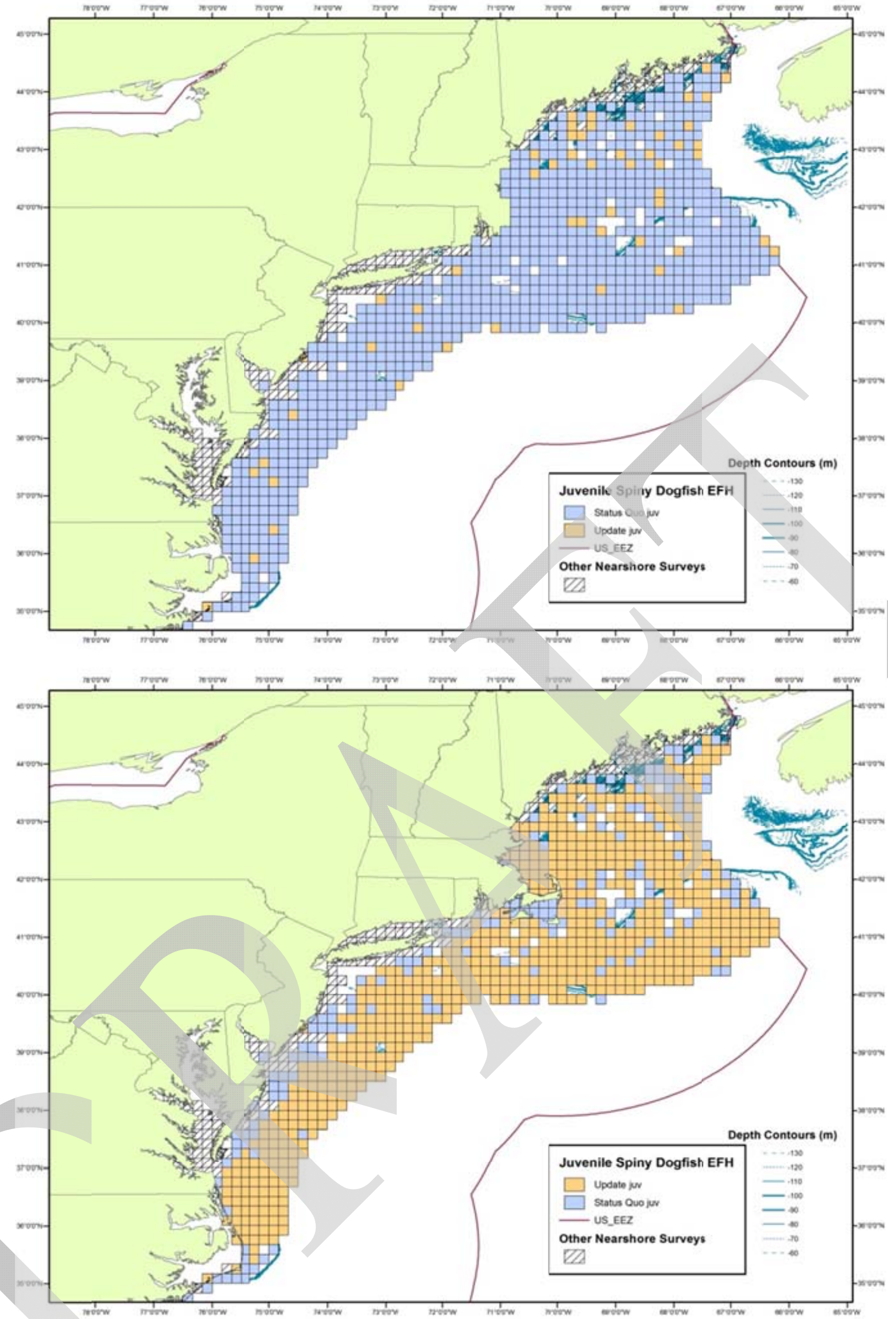


Figure 1. Comparison of Status Quo (1963-1996 trawl survey data) and Alternative 2B update (1980-2011 trawl survey data) for spatial extent of juvenile spiny dogfish EFH. Squares measure ten geographical minutes on each side (ten minute squares). Top of Figure 1 shows status quo extent overlaid on updated extent, and bottom shows updated extent overlaid on status quo extent.

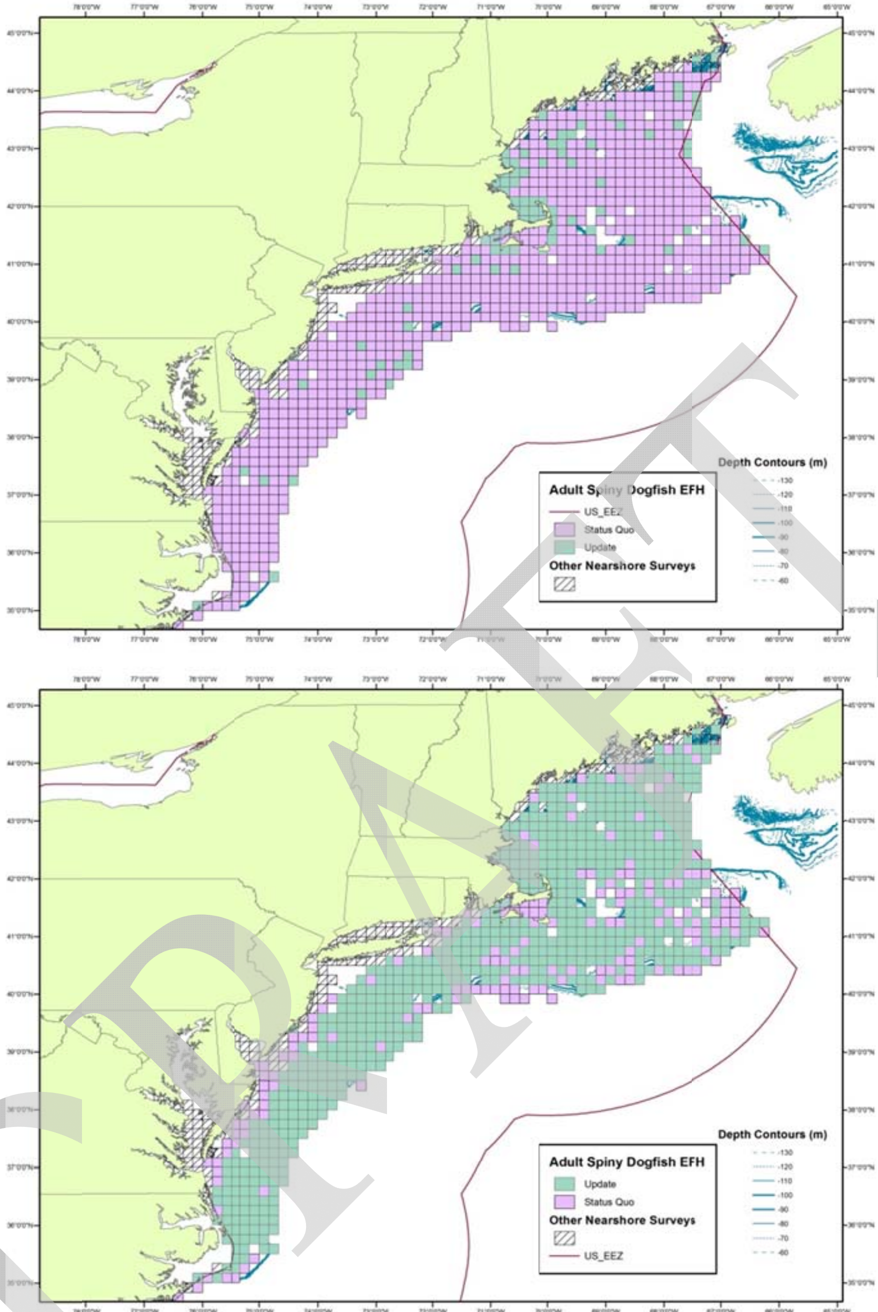


Figure 2. Comparison of Status Quo (1963-1996 trawl survey data) and Alternative 2B update (1980-2011 trawl survey data) for spatial extent of adult spiny dogfish EFH. Squares measure ten geographical minutes on each side (ten minute squares). Top of Figure 1 shows status quo extent overlaid on updated extent, and bottom shows updated extent overlaid on status quo extent.

3 Delayed Implementation of Commercial Quota at Start of New Fishing Year

Alternatives: 3A: No action
3B: Maintain Previous Year Quota until Effective Date for New Quota

Problem statement: Under the current FMP, if the effective date for the final rule is delayed beyond the start of the new fishing year (May 1), the previous year's daily possession limit is maintained in the regulations; however, the fishery operates without a commercial quota. In order to correct this, the FMP can be changed to keep in place all of the previous fishing year's management measures, including the quota, until they are replaced via rulemaking.

Council recommendation: Pending

Impact analysis: This is a purely administrative action that is not associated with any biological or socio-economic impacts.

4 Commercial Quota Allocation Scheme

Alternatives: 4A: No action (Maintain existing two-period seasonal allocation scheme)
4B: Eliminate Allocation of Commercial Quota
4C: Establish Geographic Allocation of the Commercial Quota Identical to that Currently In Place under the ASMFC Plan

Problem statement: There are numerous problems that exist in the absence of a Joint Council and Commission FMP for spiny dogfish. One of these is confusion and the potential for inadvertent possession violations that occurs when waters under the different jurisdictions are open / closed at different times. This is largely due to a mismatch in the way the annual quota is allocated. Under the Commission plan, the quota is geographically allocated, while under the federal plan, the quota is seasonally allocated. The federal FMP can be amended to minimize disruption of fishing operations that occur in both federal and state waters.

Council recommendation: Pending

Impact analysis: The impacts of the action alternatives under this issue are primarily socio-economic and positive in that eliminating the potential conflicts in the allocation schemes would benefit participants in the respective fisheries. Biological impacts are already accounted for in setting the annual quota and are not expected to change since any such change would likely be tied to a shift in the geographic distribution of fishing effort which is not expected. The action alternatives would achieve the same outcome except that if Alternative 4C is adopted and further modification to the Interstate FMP occurs, the plans would again be inconsistent.

Table 1. Qualitative summary of the expected impacts of various alternatives considered for Amendment 3. A minus sign (-) signifies an expected negative impact, a plus sign (+) a positive impact, and zero indicates a null impact. Brackets are used to convey a minor effect, such as slight positive [+].

Issue	Alternatives	Biological	EFH	Protected Resources	Economic	Social
Research Set-Aside	Alt. 1a No Action	0	0	0	0	0
	Alt. 1b 3% RSA	[+]	[+]	[+]	[+]	[+]
	Alt. 1c 5% RSA	[+]	[+]	[+]	[+]	[+]
Essential Fish Habitat	Alt. 2a No Action	[+]	+	0	0	0
	Alt. 2b Update EFH	[+]	+	0	0	0
Delayed Implementation of Commercial Quota	Alt. 3a No Action	0	0	0	0	0
	Alt. 3b Maintain Previous Year Measures	0	0	0	0	0
Commercial Quota Allocation	Alt. 4a No Action	0	0	0	[-]	-
	Alt. 4b No Allocation	0	0	0	0	[+]
	Alt. 4c Match ISFMP	0	0	0	0	[+]

Cumulative Impacts

When the proposed actions are considered in conjunction with all the other pressures placed on fisheries by past, present, and reasonably foreseeable future actions, they are not expected to result in any *significant* impacts, positive or negative; therefore, there are no significant cumulative effects associated with the action proposed in this document (see section 7.5).

Conclusions

A detailed discussion of the environmental impacts of the alternatives, as well as any cumulative impacts, considered in this specifications document are provided in section 7.0. The action alternatives are not associated with significant impacts to the biological, physical, social or economic, environment individually or in conjunction with other actions under NEPA; therefore, a "Finding of No Significant Impact" is determined.

INTENTIONALLY LEFT BLANK

2.0 LIST OF ACRONYMS

ABC	Annual Biological Catch
ACL	Annual Catch Limit
ALWTRP	Atlantic Large Whale Take Reduction Plan
AM	Accountability Measure
ASAP	Age Structured Assessment Program
ASMFC	Atlantic States Marine Fisheries Commission
CEA	Cumulative Effects Assessment
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CV	Coefficient of Variation
CZMA	Coastal Zone Management Act
DPS	Distinct Population Segment
DPSWG	Data Poor Stocks Working Group
EA	Environmental Assessment
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
EFP	Exempted Fishing Permit
EIS	Environmental Impact Statement
EO	Executive Order
ESA	Endangered Species Act of 1973
F	Fishing Mortality Rate
FR	Federal Register
FMP	Fishery Management Plan
FONSI	Finding of No Significant Impact
HPTRP	Harbor Porpoise Take Reduction Plan
IRFA	Initial Regulatory Flexibility Analysis
LNG	Liquefied Natural Gas
LOF	List of Fisheries
LWTRP	Large Whale Take Reduction Plan
MAFMC	Mid-Atlantic Fishery Management Council
MMPA	Marine Mammal Protection Act
MRFSS	Marine Recreational Fisheries Statistical Survey
MSA	Magnuson-Stevens Fishery Conservation and Management Act
MSY	Maximum Sustainable Yield
NAO	NOAA Administrative Order
NEFSC	Northeast Fisheries Science Center
NEFOP	Northeast Fisheries Observer Program
NEPA	National Environmental Policy Act
NERO	Northeast Regional Office
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
OFL	Overfishing Limit
OY	Optimal Yield
PRA	Paperwork Reduction Act
RFA	Regulatory Flexibility Act
RIR	Regulatory Impact Review
RSA	Research Set-Aside
SARC	Stock Assessment Review Committee
SAW	Stock Assessment Workshop
SFA	Sustainable Fisheries Act
SBA	Small Business Administration
SSB	Spawning Stock Biomass
SSC	Scientific and Statistical Committee
TED	Turtle Excluder Device
US	United States
VECs	Valued Ecosystem Components
VTR	Vessel Trip Report

3.0 TABLE OF CONTENTS

List of Figures

List of Tables

INTENTIONALLY LEFT BLANK

4.0 INTRODUCTION AND BACKGROUND

4.1 Purpose and Need for the Actions

The document's purpose is to present a range of alternatives for amending the fishery management plan (FMP) for the U.S. Atlantic spiny dogfish fishery along with a characterization of the environmental impacts of each of those alternatives. The alternatives consist of modifications to the FMP that are needed to maintain consistency with the Magnuson-Stevens Fishery Management and Conservation Act (MSA) and Sustainable Fisheries Act (SFA) regarding essential fish habitat (EFH). Another purpose for Amendment 3 is to improve the efficiency with which the FMP achieves its established management goals.

5.0 ALTERNATIVES

There are four management issues, each with its own set of alternatives under consideration in this document. An analysis of "no action" (i.e., Alternatives 1a, 2a, 3a, and 4a) is a requirement under the implementation of NEPA. "No action", with regard to a review of spiny dogfish EFH definitions (Alternative 2a) would be inconsistent with the MSA. Therefore, for the purposes of this document, "no action" under EFH is actually a status quo or baseline alternative that would extend the existing EFH definitions following the required EFH review.

5.1 ISSUE1. ALLOWANCE FOR RESEARCH SET-ASIDE (RSA)

Alternative 1A: No Action. (No RSA)
Under this alternative, the specification of management measures for spiny dogfish would continue without an option for the set-aside of commercial quota for research purposes.

For the two action alternatives under this issue, the current procedure followed by the Council and NMFS Northeast Regional Office (NERO) for specifying RSA would be followed. The difference between the two alternatives lies only in the maximum set-aside percentages allowed. Under either of the action alternatives, the FMP would identify an upper limit (either 3% or 5% of the annual spiny dogfish commercial quota) on the total research set-aside amount allowed in a given fishing year. Specification of RSA would be incorporated into the Council's quota specification package submitted to NMFS and the current procedure for requesting research proposals and approval of proposals would be followed.

Alternative 1B: Allowance for Allocation of up to 3% of Commercial Quota as RSA.
Under this alternative, the specification of management measures for spiny dogfish would include an option for the set-aside of up to 3% of the commercial quota for research purposes.

Alternative 1C: Allowance for Allocation of up to 5% of Commercial Quota as RSA
Under this alternative, the specification of management measures for spiny dogfish would include an option for the set-aside of up to 5% of the commercial quota for research purposes.

5.2 ISSUE 2. ESSENTIAL FISH HABITAT (EFH) DEFINITIONS FOR ALL LIFE STAGES OF SPINY DOGFISH

The Spiny Dogfish FMP is overdue for a review of its EFH designations. Section 600.815(a)(9) of the final rule to revise the regulations implementing the EFH provisions of the MSA (the "EFH Final Rule") states that Councils should conduct such reviews as recommended by the Secretary, but at least once every five years. EFH designations are used by NMFS when consulting with other agencies on federal activities, and up-to-date designations lead to more effective consultation and therefore more effective protection of EFH. Given that spiny dogfish are not associated with any particular bottom habitat, fishing gear impacts are not a significant concern.

The alternative to "no action" under Issue 2 represents the option to update the textual descriptions and geographical identifications of EFH for all life stages of spiny dogfish with the latest information available.

The EFH Final Rule also requires: 1) identification of non-fishing related activities that may adversely affect EFH, 2) habitat conservation and enhancement recommendations, 3) revisions to the description of prey species and their habitats, and 4) a list of habitat-related research and information needs. This information is contained in Section 7.2 of this document.

Alternative 2A: No Action. (Do Not Update EFH Definitions for Spiny Dogfish)
Under this alternative, a mandatory review of EFH definitions for spiny dogfish would not be followed by modifications to those definitions. The definitions would remain as established in the original FMP. Specifically, the definitions would be maintained as:

Juveniles:
1) North of Cape Hatteras, EFH is the waters of the Continental shelf from the Gulf of Maine through Cape Hatteras, North Carolina in areas that encompass the highest 90% of all ranked ten-minute squares for the area where juvenile dogfish were collected in the NEFSC trawl surveys. 2) South of Cape Hatteras, EFH is the waters over the Continental Shelf from Cape Hatteras, North Carolina through Cape Canaveral, Florida, to depths of 1280 ft. 3) Inshore, EFH is the "seawater" portions of the estuaries where dogfish are common or abundant on the Atlantic coast, from Passamaquoddy Bay, Maine to Cape Cod Bay, Massachusetts. Generally, juvenile dogfish are found at depths of 33 to1,280 ft in water temperatures ranging between 37˚F and 82˚F.

Adults:
1) North of Cape Hatteras, EFH is the waters of the Continental shelf from the Gulf of Maine through Cape Hatteras, North Carolina in areas that encompass the highest 90% of all ranked ten-minute squares for the area where adult dogfish were collected in the NEFSC trawl surveys.
2) South of Cape Hatteras, EFH is the waters over the Continental Shelf from Cape Hatteras, North Carolina through Cape Canaveral, Florida, to depths of 1476 ft.
3) Inshore, EFH is the "seawater" portions of the estuaries where dogfish are common or abundant on the Atlantic coast, from Passamaquoddy Bay, Maine to Cape Cod Bay, Massachusetts. Generally, adult dogfish are found at depths of 33 to 1,476 ft in water temperatures ranging between 37˚F and 82˚F.

Status quo EFH for spiny dogfish juveniles and adults as they appear in the FMP are depicted in Figures 3 and 4 below.

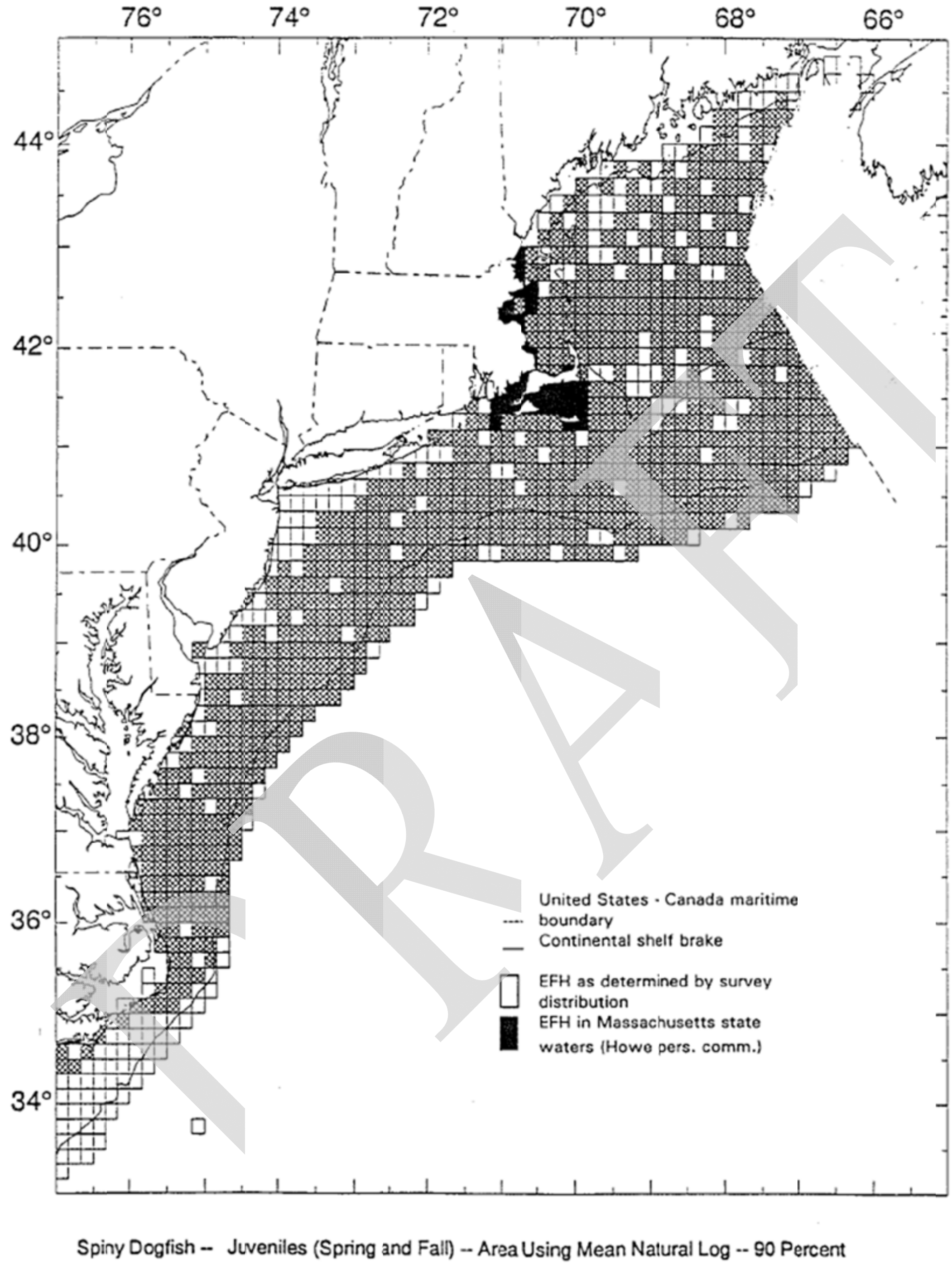


Figure 3. Status Quo EFH for juvenile spiny dogfish which comprises the top 90% of the ranked areas where female and male juvenile spiny dogfish were collected by the NEFSC trawl survey between 1963 and 1996. This depiction of EFH would be maintained under the No Action

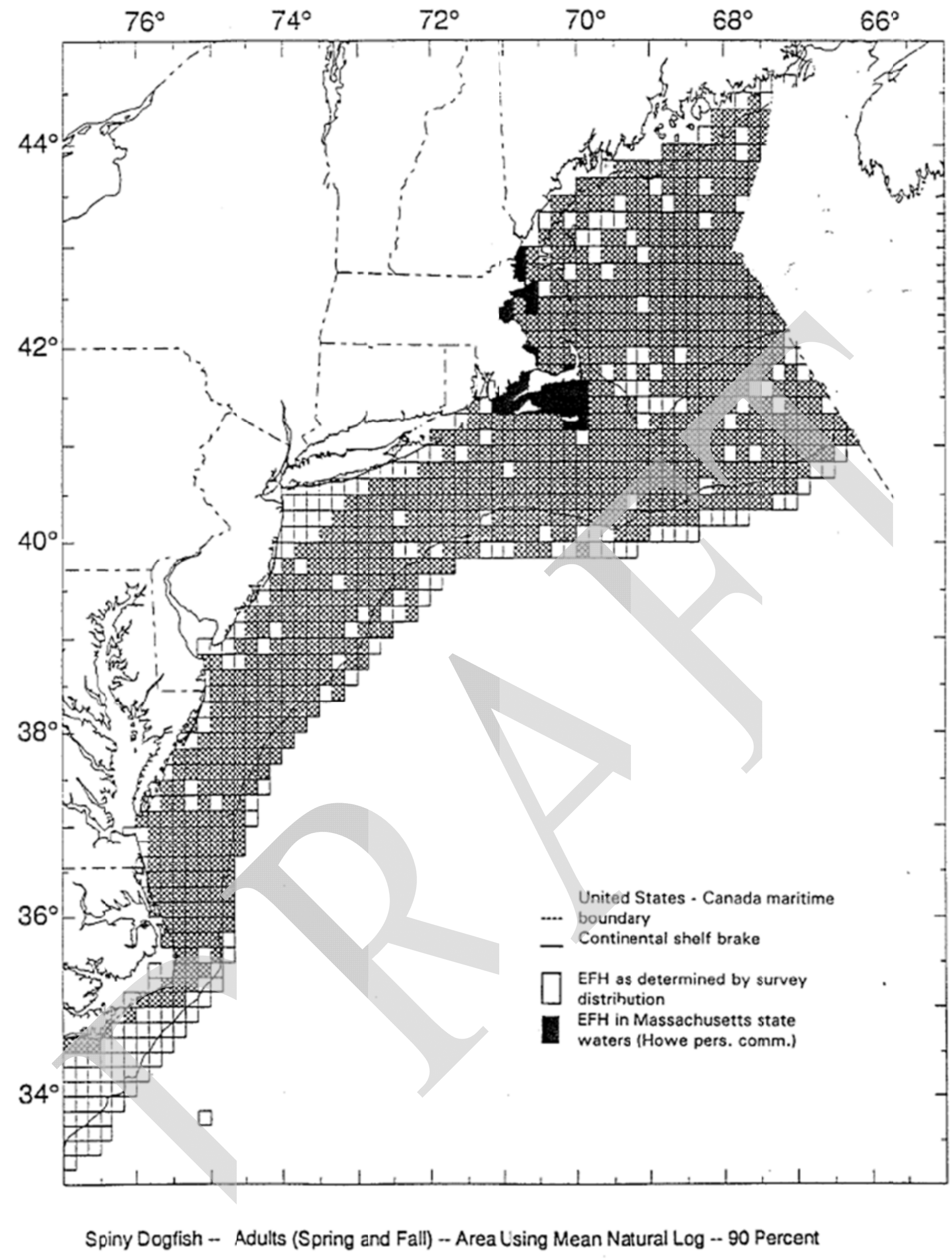


Figure 4. Status Quo EFH for adult spiny dogfish which comprises the top 90% of the ranked areas where female and male adult spiny dogfish were collected by the NEFSC trawl survey between 1963 and 1996. This depiction of EFH would be maintained under the No Action Alternative

Alternative 2B: Update EFH Definitions using Latest Biological Survey data

Under this alternative, the text and maps used to establish the EFH definitions for spiny dogfish would be updated to include federal and other biological survey data that have been collected in a more recent timeframe (through 2011). While collectively defining EFH for juveniles and adults as in the original EFH designations, maps associated with the update would break down the EFH definitions by sex to be consistent with differences in the distribution of male and female spiny dogfish by life stage. The definitions would continue to define EFH as 90% of the cumulative mean catch from the Northeast Fishery Science Center Trawl Catches, but would also include presence (>10% of samples) in state and other (NEAMAP, SEAMAP) survey catches. Maintaining the use of the 90th percentile in the spatial analysis is used to account for inter-year variability as well as large north-south and inshore-offshore movements undertaken by spiny dogfish in a given year, as well as the revised text descriptions of EFH (indicated in Table 2) together with the revised EFH maps would comprise the EFH designation for each of the life stages. “Preferred” depth, temperature, and salinity ranges would be updated based on the latest EFH Source document for spiny dogfish (NMFS 2007).

EFH maps based on Alternative 2B are provided in Figures 5 through 10 below.

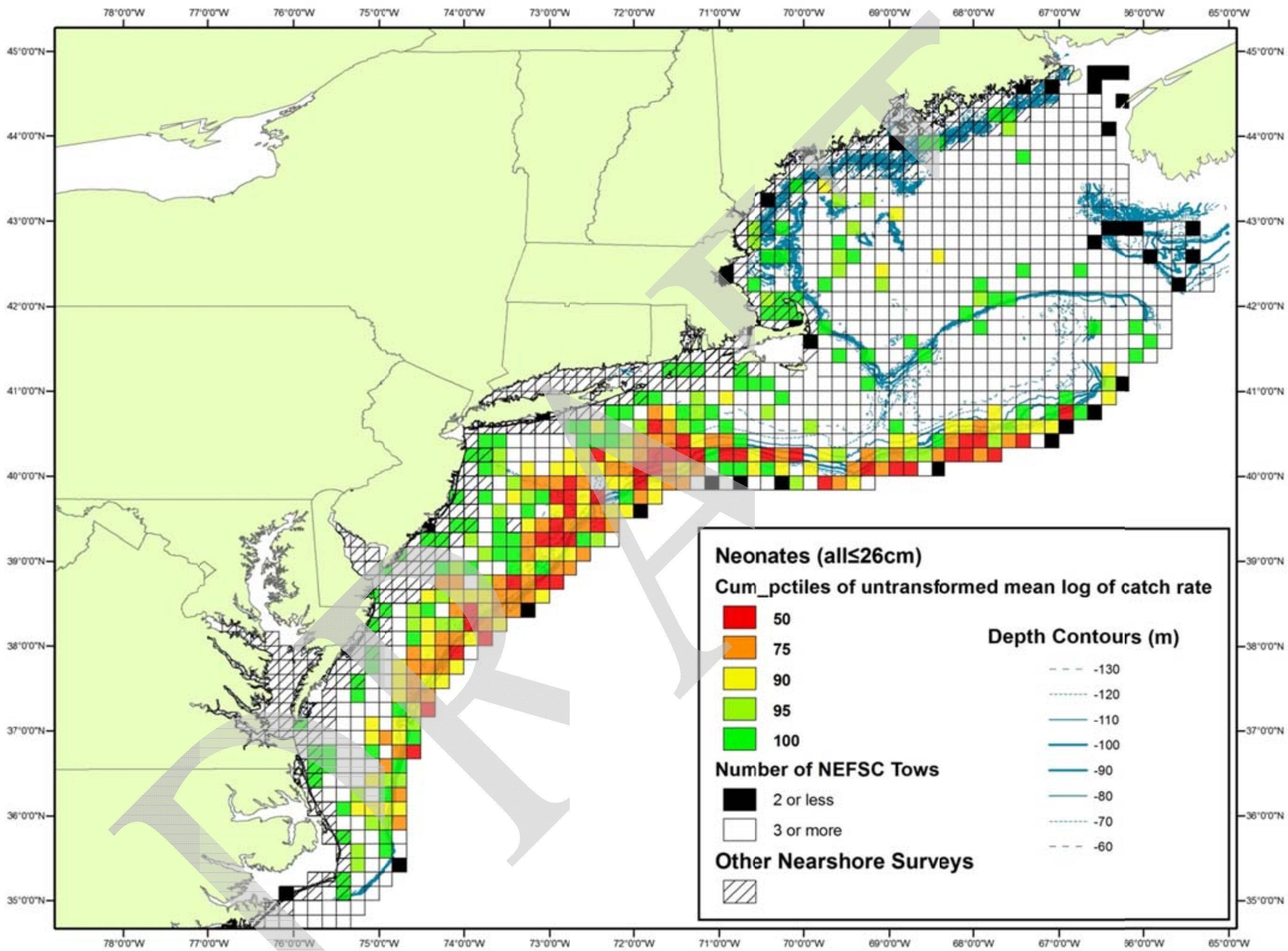


Figure 5.EFH for spiny dogfish neonates (length ≤ 26 cm) showing 50th to 100th percentiles of the ranked ten minute squares where neonate spiny dogfish were collected by the NEFSC trawl survey between 1981 and 2011. This depiction of EFH would apply under the Action Alternative (2B).

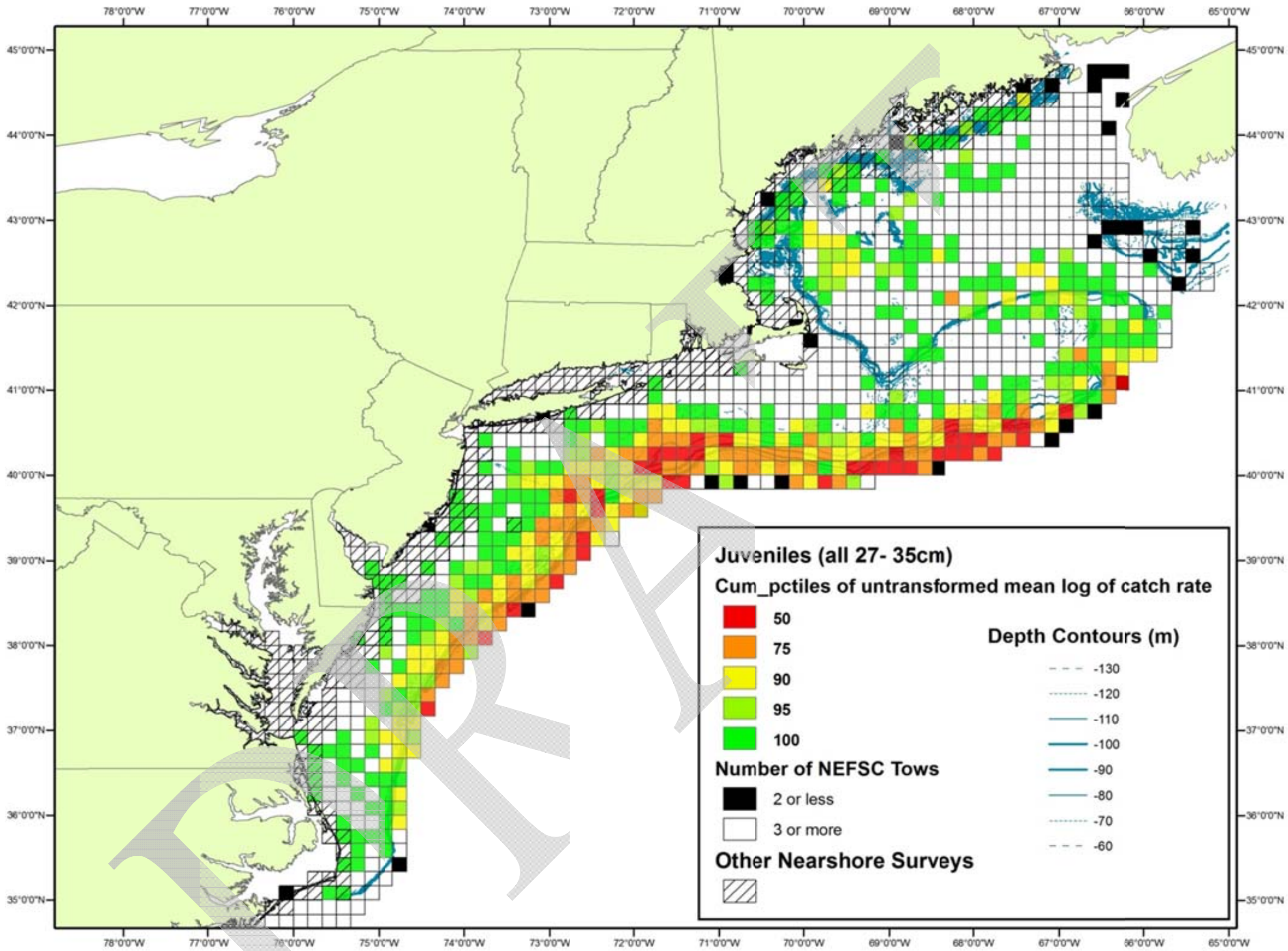


Figure 6. EFH for spiny dogfish juveniles (length 27 – 35 cm) showing 50th to 100th percentiles of the ranked ten minute squares where juvenile spiny dogfish were collected by the NEFSC trawl survey between 1981 and 2011. This depiction of EFH would apply under the Action Alternative (2B).

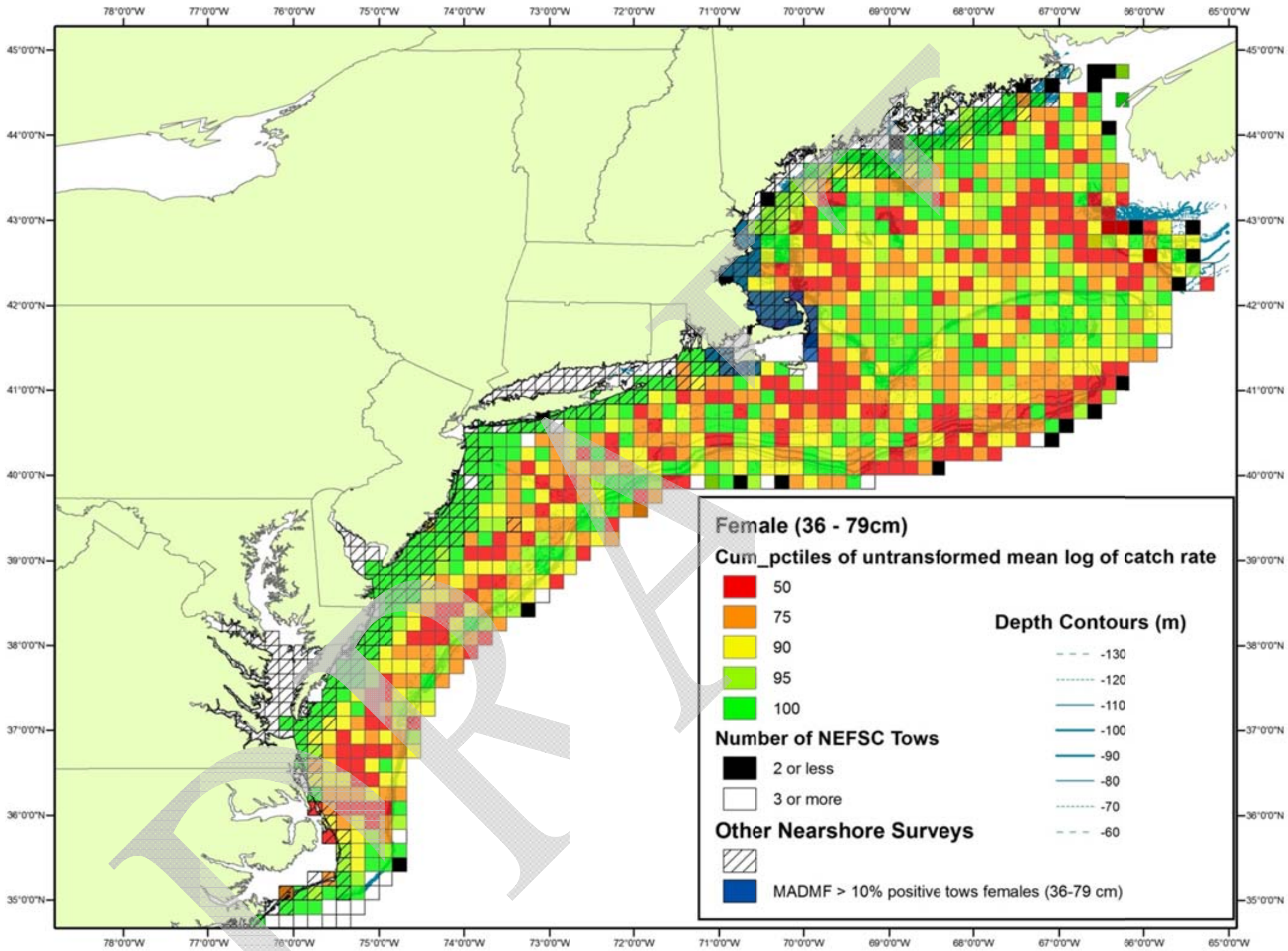


Figure 7. EFH for female spiny dogfish sub-adults (length 36 – 79 cm) showing 50th to 100th percentiles of the ranked ten minute squares where female sub-adult spiny dogfish were collected by the NEFSC trawl survey between 1981 and 2011. This depiction of EFH would apply under the Action Alternative (2B).

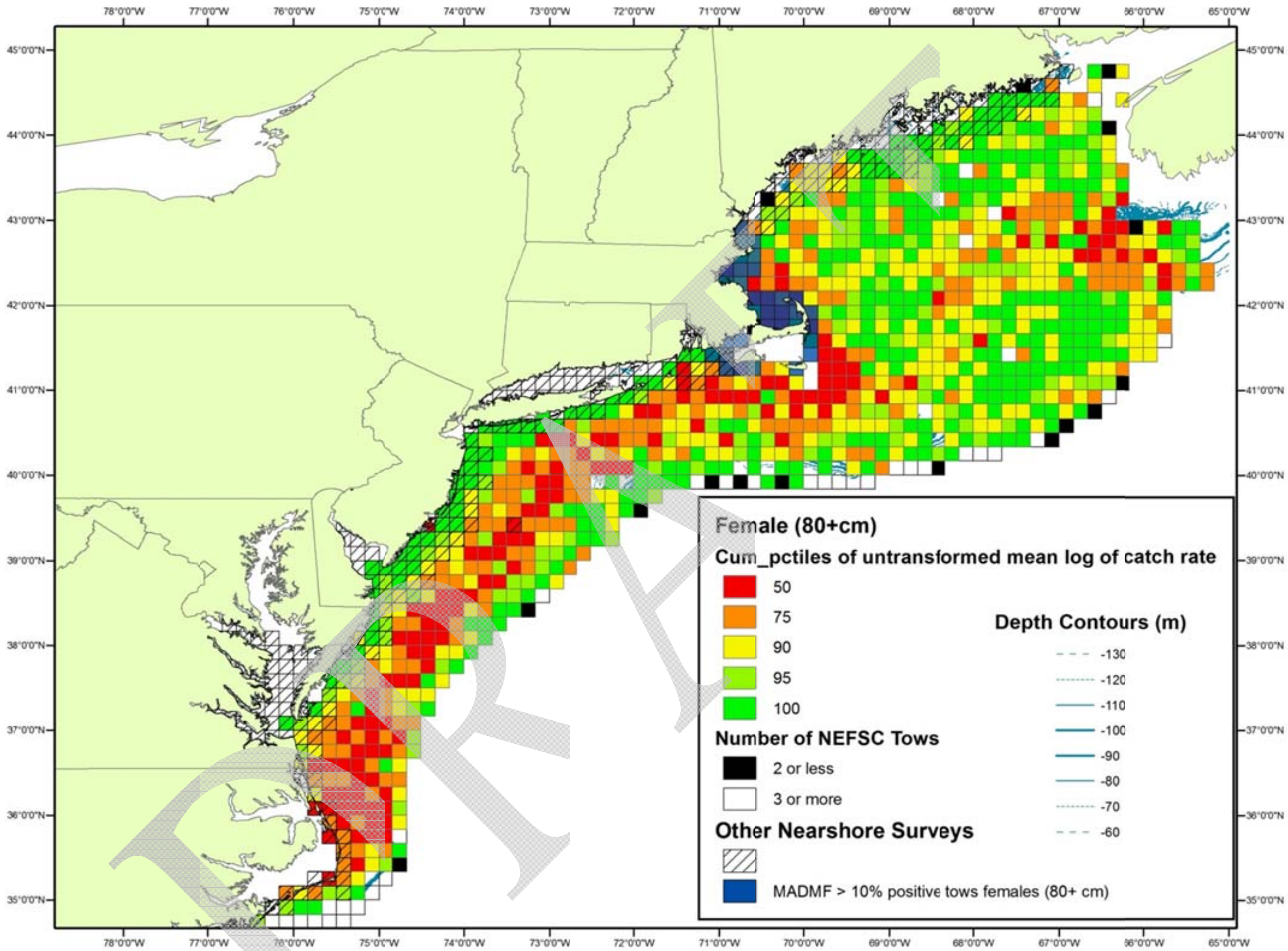


Figure 8. EFH for female spiny dogfish adults (length 80+ cm) showing 50th to 100th percentiles of the ranked ten minute squares where female adult spiny dogfish were collected by the NEFSC trawl survey between 1981 and 2011. This depiction of EFH would apply under the Action Alternative (2B).

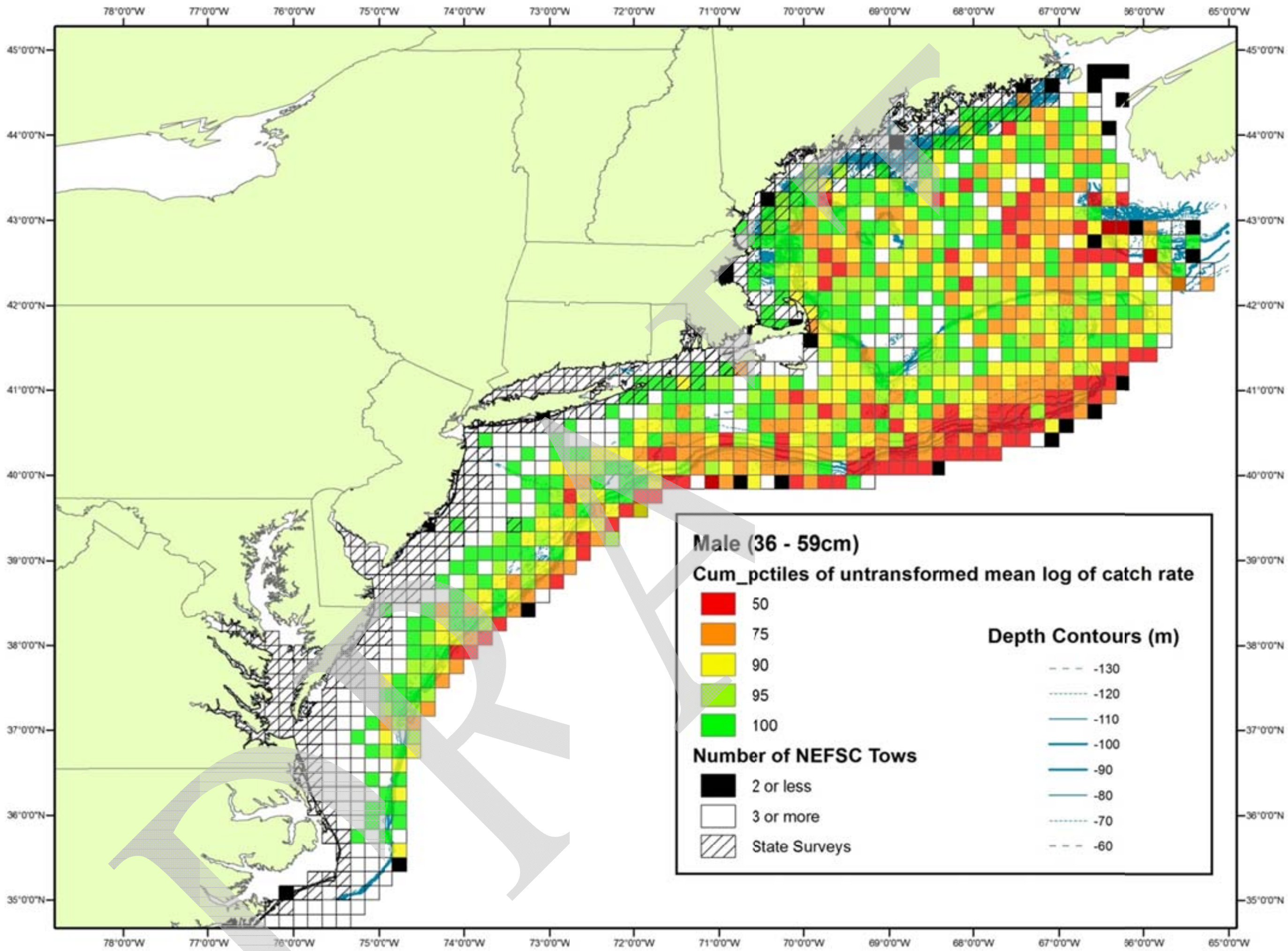


Figure 9. EFH for male spiny dogfish sub-adults (length 36-59 cm) showing 50th to 100th percentiles of the ranked ten minute squares where male sub-adult spiny dogfish were collected by the NEFSC trawl survey between 1981 and 2011. This depiction of EFH would apply under the Action Alternative (2B).

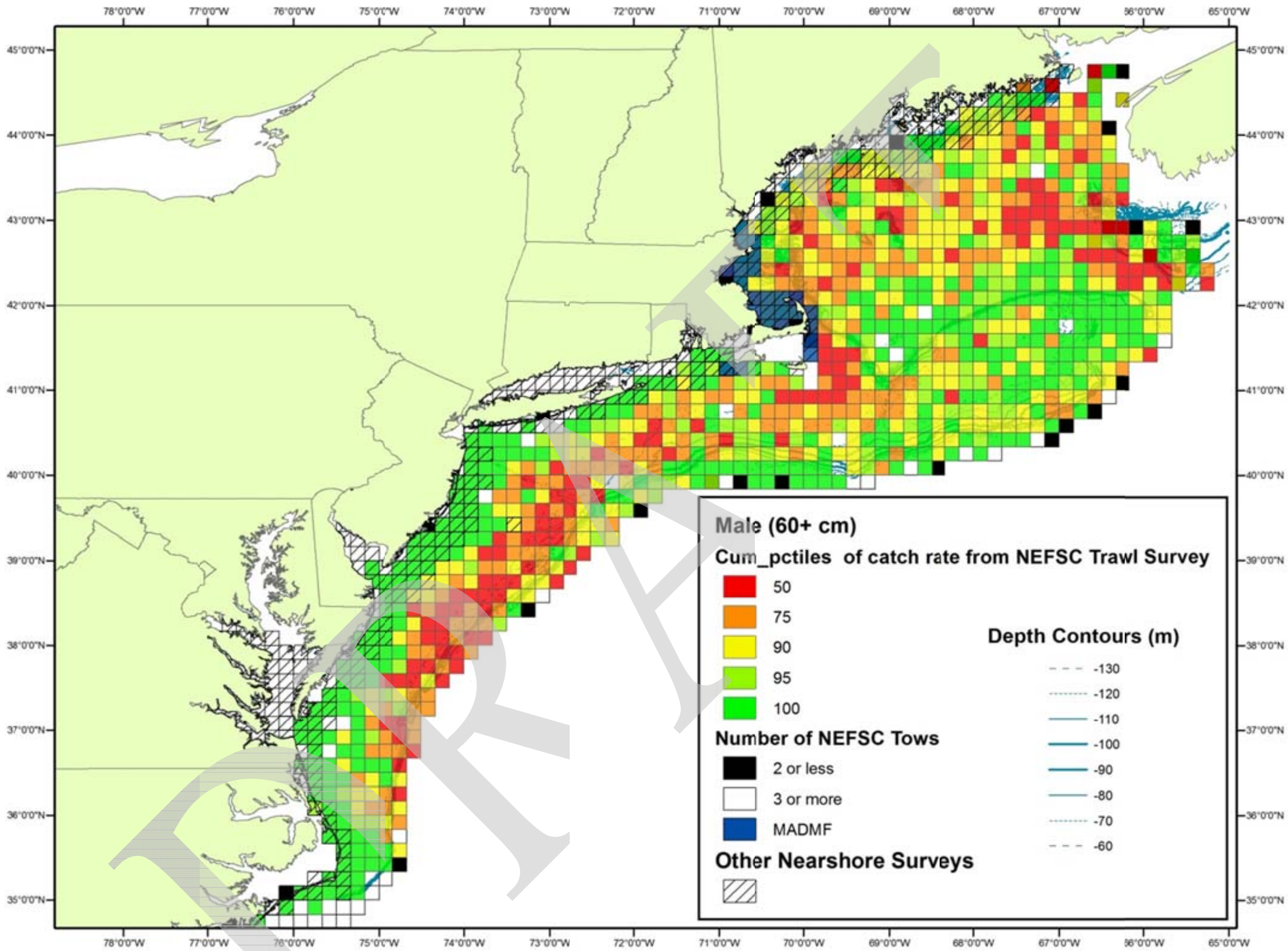


Figure 10. EFH for male spiny dogfish adults (length 60+ cm) showing 50th to 100th percentiles of the ranked ten minute squares where male adult spiny dogfish were collected by the NEFSC trawl survey between 1981 and 2011. This depiction of EFH would apply under the Action Alternative (2B).

Table 2. Comparison of the text definitions for EFH under the status quo (Alt 2A) and update (Alt 2B).

	Lifestage Definition		EFH North of Cape Hatteras		South of Cape Hatteras		Inshore	
	Status Quo (Alt 2A)	Update (Alt 2B)	Status Quo (Alt 2A)	Update (Alt 2B)	Status Quo (Alt 2A)	Update (Alt 2B)	Status Quo (Alt 2A)	Update (Alt 2B)
Juveniles	Not provided	Spiny dogfish of both sexes less than 36 cm FL, Male spiny dogfish less than 60 com FL, Female spiny dogfish less than 80 cm FL	EFH is the waters of the Continental shelf from the Gulf of Maine through Cape Hatteras, North Carolina in areas that encompass the highest 90% of all ranked ten-minute squares for the area where juvenile dogfish were collected in the NEFSC trawl surveys	The area associated with 90% of the cumulative geometric mean catches of juvenile spiny dogfish based on Northeast Fishery Science Center (NEFSC) trawl data.	the waters over the Continental Shelf from Cape Hatteras, North Carolina through Cape Canaveral, Florida, to depths of 1280 ft	the waters over the Continental Shelf from Cape Hatteras, North Carolina through Cape Canaveral, Florida, to depths of 1280 ft	"seawater" portions of the estuaries where [juvenile] dogfish are common or abundant on the Atlantic coast, from Passamaquoddy Bay, Maine to Cape Cod Bay, Massachusetts	The areas where state and other (NEAMAP, SEAMAP) research surveys indicate ≥ 10% frequency of occurrence.
Adults	Not provided	Male spiny dogfish greater than or equal to 60 cm FL, Female spiny dogfish greater than or equal to 80 cm FL	EFH is the waters of the Continental shelf from the Gulf of Maine through Cape Hatteras, North Carolina in areas that encompass the highest 90% of all ranked ten-minute squares for the area where adult dogfish were collected in the NEFSC trawl surveys	The area associated with 90% of the cumulative geometric mean catches of juvenile spiny dogfish based on Northeast Fishery Science Center (NEFSC) trawl data.	the waters over the Continental Shelf from Cape Hatteras, North Carolina through Cape Canaveral, Florida, to depths of 1476 ft	the waters over the Continental Shelf from Cape Hatteras, North Carolina through Cape Canaveral, Florida, to depths of 1476 ft	"seawater" portions of the estuaries where [adult] dogfish are common or abundant on the Atlantic coast, from Passamaquoddy Bay, Maine to Cape Cod Bay, Massachusetts	The areas where state and other (NEAMAP, SEAMAP) research surveys indicate ≥ 10% frequency of occurrence

5.3 ISSUE 3. DELAYED IMPLEMENTATION OF COMMERCIAL QUOTA

Alternative 3A: No action. (No Commercial Quota Until Final Rule Effective)
Under this alternative, the fishery would continue to potentially open the start of the fishing year (May 1) without a commercial quota and continue to operate until the effective date for the final rule for the commercial quota for that fishing year. The daily possession limit from the previous year, however, would be maintained until replaced by the possession limit specified for the new fishing year.

Alternative 3B: Maintain Existing Quota until Effective Date for New Quota
Under this alternative, if the effective date for the commercial quota in a given fishing year falls after May 1, then the commercial quota from the previous year would remain in effect until the effective date for the quota specified for the new fishing year.

5.4 ISSUE 4. COMMERCIAL QUOTA ALLOCATION

The action alternatives under this issue are envisioned as alleviating conflicts that currently exist as a result of the different federal and interstate allocation schemes for the coastwide commercial quota. The seasonal allocation scheme in the federal FMP was originally put in place to serve as a proxy for geographic allocation. The roughly 58% / 42% split between Period 1 (May 1 – Oct 31) and Period 2 (Nov 1 – Apr 30), respectively was reflective of the proportional landings of the managed resource among northern and southern states during the fishery of the 1990s. In 2008, the Commission implemented Addendum II (ASMFC 2008) which explicitly allocated the coastwide quota such that 58% went to the "northern region" (ME-CT), and 42% went to the "southern region" (NY - NC). In 2011, the Commission further modified their plan through Addendum III (ASMFC 2011) such that the southern region was dissolved and its 42% was divided state-by-state according to Table 3 below.

Table 3. Percent allocation of the coastwide annual quota (from Addendum III to the ISFMP).

Northern Region (ME-CT)	Southern Region					
	NY	NJ	DE	MD	VA	NC
58%	2.707%	7.644%	0.896%	5.920%	10.795%	14.036%

It is always possible that the Commission could further refine their geographic allocation scheme in subsequent addenda. For example, state-by-state allocation of the northern region share has been discussed, but no action is currently pending.

Alternative 4A: No Action. (Maintain Seasonal Allocation of the Commercial Quota)
Under this alternative, the existing scheme, which allocates 51.9% of the annual commercial quota to Period 1 (May 1 – Oct 31) and 42.1% to Period 2 (Nov 1 – Apr 30), would be maintained.

Alternative 4B: Eliminate Allocation of the Commercial Quota.
Under this alternative, a commercial quota would be specified for a given fishing year, but that quota would not be allocated either periodically or geographically.

Alternative 4C: Match the Geographic Allocation of the Commercial Quota under the Commission's Interstate Fishery Management Plan.
Under this alternative, minimizing conflicts resulting from the two allocation schemes would be accomplished by matching the Commission's geographic allocation of the quota in the federal FMP, specifically by dividing the coastwide quota according to the percentages in Table 3.

6.0 DESCRIPTION OF THE AFFECTED ENVIRONMENT AND FISHERIES

6.1 Description of the Managed Resource

6.1.1 Spiny Dogfish Biology and Ecological Relationships

The spiny dogfish, *Squalus acanthias*, is a small coastal shark with a circumboreal distribution. In addition to being the most abundant shark in the western North Atlantic, it is also one of the most highly migratory species of the Atlantic coast (Bigelow and Schroeder 1953). Rago et al. (1994) report that their general distribution in the Northwest Atlantic is between Labrador and Florida but are most abundant from Nova Scotia to Cape Hatteras, North Carolina. Seasonal inshore-offshore movements and coastal migrations are thermally induced (Bigelow and Schroeder 1953, Jensen 1965). Generally, spiny dogfish spend summers in inshore waters and overwinter in deeper offshore waters. They are usually epibenthic, but occur throughout the water column and are found in a depth range from nearshore shallows to offshore shelf waters approaching 3,000 ft (Collette and MacPhee 2002).

Length and age at 50% maturity of spiny dogfish in the Northwest Atlantic is estimated to be 23.4 in and 6 years for males and 30.6 in and 12 years for females (Nammack et al. 1985). Litter size ranges from 2 to 15 pups (average of 6) with fecundity increasing with length (Soldat 1979). Nammack et al. (1985) reported maximum ages of in the Northwest Atlantic for males and females to be 35 and 40 years, respectively. Maximum length is estimated to be 49 inches for females and less than 36 inches for males. An estimate of M is 0.092, which was the value assumed for spiny dogfish greater than 12 in the NEFSC 1994, 1998 and 2003 assessments.

Bowman et al. (1984) observed a high degree of variability in the diet of spiny dogfish across seasons, areas and years. They considered this to be a reflection of the species omnivorous nature and the high degree of temporal and spatial variability of both dogfish and their prey. Their diet appears broadly related to abundance trends in some of their major prey items (e.g., herrings, Atlantic mackerel, codfishes, hakes, and squid). Spiny dogfish are potential competitors with virtually every marine predator within the Northwest Atlantic Ocean ecosystem. These include a wide variety of predatory fish, marine mammals and seabirds.

6.1.2 Spiny Dogfish Stock Status

Reports on "Stock Status," including annual assessment updates, Stock Assessment Workshop (SAW) reports, Stock Assessment Review Committee (SARC) panelist reports and peer-review panelist reports are available online at the NEFSC website: http://www.nefsc.noaa.gov. EFH Source Documents, which include details on stock characteristics and ecological relationships, are available at the following website: http://www.nefsc.noaa.gov/nefsc/habitat/efh/.

Figure 11 below provides a snapshot of several relevant characteristics of the spiny dogfish stock that influence management of the commercial fishery. Among these are: 1) Spiny dogfish are slow growing and, therefore, recovery of an overly exploited stock can require prolonged recovery if the stock were to be depleted. 2) Males and females grow at different rates and to different maximum sizes such that the largest fish in the population are almost all female and these are more valuable to the commercial fishery. 3) Litter size, or fecundity, increases with age such that productivity can be markedly hampered by an absence of large females in the stock. 4) Maturity is delayed (12-21 years) in females such that the immature stock is susceptible to mortality for a prolonged period before contributing to stock production.

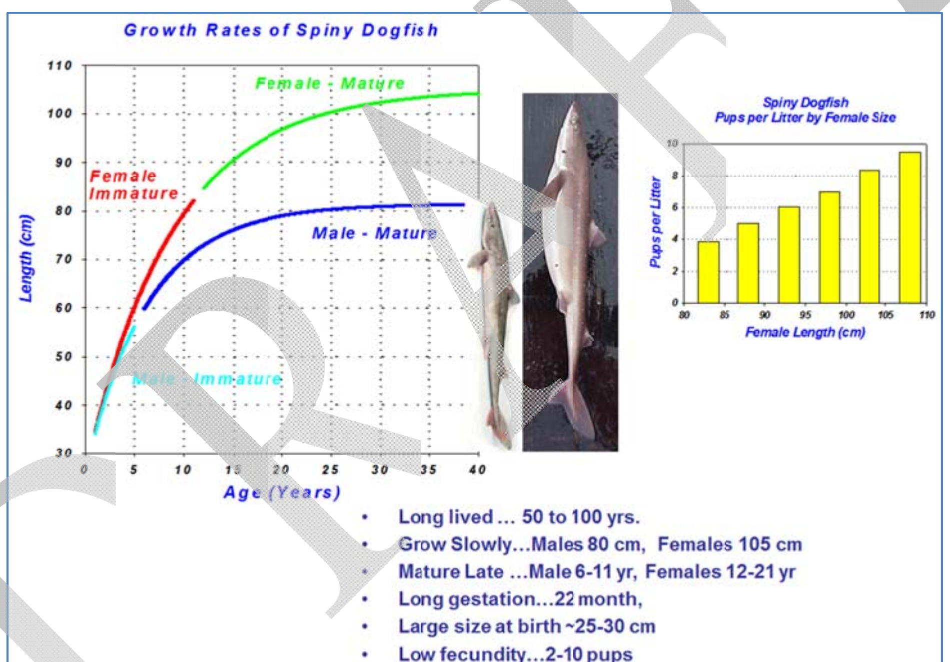


Figure 11. Summary of biological characteristics spiny dogfish relevant to the species' commercial fisheries exploitation (from Rago 2010 unpubl.).

Historical Stock Condition

At the onset of the domestic commercial fishery in the early 1990's, population biomass for the Northwest Atlantic stock of spiny dogfish was at its highest estimated level (approx. 1.2 billion lb). A large scale unregulated fishery developed and quickly depleted the stock of mature female spiny dogfish such that in 1997 a stock assessment showed that the stock was *overfished* (NEFSC 1997). The Spiny Dogfish FMP was developed in 1998 and implemented in 2000 in order to halt further depletion of mature female spiny dogfish and allow the stock to recover to a sustainable level. Because the directed commercial fishery concentrated on mature females, rebuilding required elimination of that directed fishery. The rebuilding program was highly successful and in 2010 the Northeast Regional Office (NERO) of NMFS communicated the *rebuilt* status of the stock to the Councils.

Current Stock Condition

Not Overfished
The Bmsy reference point defines when the stock is rebuilt (above Bmsy) and overfished (below ½ Bmsy). For spiny dogfish, Bmsy (proxy) is the spawning stock biomass that maximizes recruitment (SSBmax) in a Ricker type (dome-shaped) stock-recruitment model. SSBmax is estimated to be 159,288 mt (351 M lb) with ½ of that target corresponding to the biomass threshold (79,644 mt; 175.5 M lb). In September 2011, the Northeast Fisheries Science Center (NEFSC) updated their assessment of the spiny dogfish stock using catch data (2010), and results from the 2011 trawl survey. The updated estimate of SSB for 2011 is 169,415 mt (373.496 M lb), about 6% above SSB_{max} (159,288 mt). In updating the assessment, the NEFSC estimated a *100% probability that the stock is not overfished.*

Overfishing not Occurring
A review by the Council's SSC in 2011 was conducted to establish its endorsement of a fishing mortality reference point that defines when overfishing is occurring (Fmsy). The updated fishing mortality reference point provided by the NEFSC is $F_{msy} = 0.2439$. All accountable sources of removals contribute to the estimate of fishing mortality (F) under the current assessment. For the most recent assessment year (2010), these include U.S. commercial landings (12.346 M lb), Canadian commercial landings (6 mt), U.S. dead discards (8.997 M lb), and U.S. recreational landings (46,297 lb). Total removals in 2010 were approximately 21.330 M lb corresponding to an F estimate of 0.09, well below $F_{msy} = 0.2439$. In updating the assessment, the NEFSC estimated a *100% probability that overfishing was not occurring* ($F_{2010} < F_{threshold}$).

6.1.2.1 Commercial Fishery

Calendar year harvest estimates from 1989 -2010 are provided in Table 4 and Figure 12. These include landings from U.S. commercial and recreational sectors as well as the Canadian commercial fishery. A thorough characterization of the historic (pre-FMP) fishery for spiny dogfish is given in Section 2.3 of the FMP (MAFMC 1999).

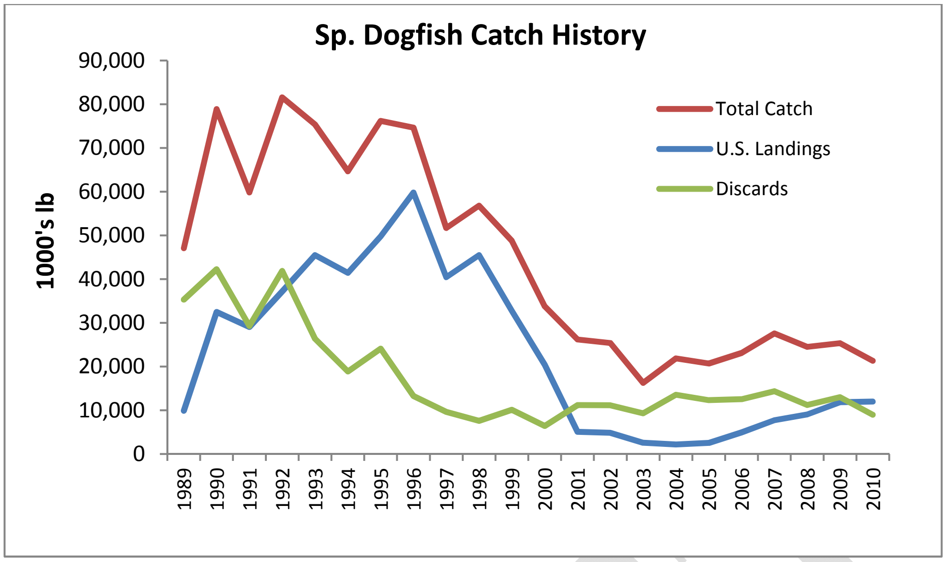


Figure 12. History of spiny dogfish landings and discards and total catch from 1989 – 2010. From NMFS 2011.

Table 4. Landings of spiny dogfish (1,000s lb) in the Northwest Atlantic Ocean for calendar years 1989 to 2010.

Year	US Comm	US Rec	Canada	Total (NW Atl.Stock)
1989	9,903	922	368	11,193
1990	32,476	395	2,886	35,757
1991	29,050	289	677	30,016
1992	37,166	474	1,914	39,554
1993	45,510	265	3,164	48,939
1994	41,442	342	4,012	45,796
1995	49,776	150	2,108	52,034
1996	59,825	55	950	60,830
1997	40,457	146	983	41,586
1998	45,477	86	2,326	47,889
1999	32,750	117	4,610	37,477
2000	20,408	11	6,043	26,462
2001	5,057	62	8,422	13,541
2002	4,848	452	7,901	13,201
2003	2,579	88	2,870	5,537
2004	2,165	231	5,207	7,603
2005	2,529	99	5,004	7,632
2006	4,958	207	5,377	10,542
2007	7,723	185	5,256	13,164
2008	9,057	472	3,466	12,995
2009	11,854	75	249	12,178
2010	12,347	35	13	12,395

Source: NMFS Commercial Fisheries Database, MRFSS data, and NAFO data.

Coastwide Landings Relative to Limits (Quotas)

Table 5 provides the coastwide quotas and landings for the spiny dogfish fishery since the establishment of the FMP in 2000. Toward the end of the federal rebuilding schedule that ended in 2010, substantial increases in stock biomass allowed for an increase in the federal quota in 2009 to 12 M lb while still maintaining the rebuilding fishing mortality rate. Under the interstate FMP, quota increases began earlier in 2006 – 2008 (Table 5). Note that in 2010-2012, the commercial quota implemented in state waters was lower than for federal waters. Both quotas were based on the same technical advice; however, the state water quota reflects reductions for overages in accordance with Addendum 2 to the ISFMP. Effective in the 2012 fishing year, accountability measures apply in federal waters in accordance with Amendment 2 to the federal FMP.

Table 5. Jurisdictional (federal and state) quotas and coastwide landings for fishing years 2000 - 2011.

	Quota (M lb)		
Fishing year (May 1 - Apr 30)	Federal	States'	Landings (M lb)
2000	4.0	n/a	8.2
2001	4.0	n/a	5.1
2002	4.0	n/a	4.8
2003	4.0	8.8	3.2
2004	4.0	4.0	1.5
2005	4.0	4.0	2.6
2006	4.0	6.0	6.6
2007	4.0	6.0	6.5
2008	4.0	8.0	9.0
2009	12.0	12.0	11.8
2010	15.0	14.4	14.5
2011	20.0	19.5	20.1
2012	35.7	34.2	n/a

Landings by Gear

Certain commercial gear types are associated with the retention of spiny dogfish in federal waters. The catch of spiny dogfish by gear from 1996 - 2011 is given in Table 6. In the past five years, spiny dogfish landings came mostly from sink gillnets (71.2%), bottom otter trawls (17.2%), hook and line (11.2%), as well as unknown or other gear (0.3%).

Table 6. Commercial gear types associated with spiny dogfish harvest for calendar years 1996-2011. Note that vessels with state issued permits only are not required to complete VTRs so total VTR landings are less than total dealer-reported landings.

YEAR	GILL NET	TRAWL, BOTTOM	HOOK AND LINE	OTHER*	TOTAL
1996	29,579,961	6,037,302	3,732,568	145,104	39,494,935
1997	24,878,433	4,134,679	3,540,179	97,497	32,650,788
1998	24,794,310	4,892,602	3,413,065	47,220	33,147,197
1999	17,527,898	4,529,311	5,396,759	50,270	27,504,238
2000	6,147,934	5,750,119	4,200,552	15,678	16,114,283
2001	853,473	348,285	2,620,863	2,300	3,824,921
2002	644,303	348,885	808,597	55,631	1,857,416
2003	262,022	121,372	194,133	250	577,777
2004	904,811	339,833	74,693	3,282	1,322,619
2005	1,083,057	531,236	182,620	2,411	1,799,324
2006	2,252,631	1,052,690	373,964	6,472	3,685,757
2007	1,861,738	410,407	341,601	6,219	2,619,965
2008	2,619,441	531,572	336,444	24,114	3,511,571
2009	6,144,699	1,904,194	766,083	22,338	8,837,314
2010	5,892,778	1,533,946	1,225,233	10,004	8,661,961
2011	10,757,661	2,381,889	1,542,412	53,513	14,735,475
Average pct by gear for latest five years (2007-2011)	71.2%	17.2%	11.2%	0.3%	100.0%

* combined landings which may include unknown, mid-water trawl, beam trawl, seine, pots and traps, and dredge

Landings by Area

The Northeast Region is divided into 46 statistical areas for federal fisheries management (Figure 13). According to VTR data, six statistical areas collectively accounted for 73.04 % of spiny dogfish landings in 2010, with each contributing greater than 5.0 % of the total (Table 7). These areas also represented 73.5% of the trips that landed spiny dogfish suggesting that resource availability as expressed by catch per trip is fairly consistent through the range where harvest occurs.

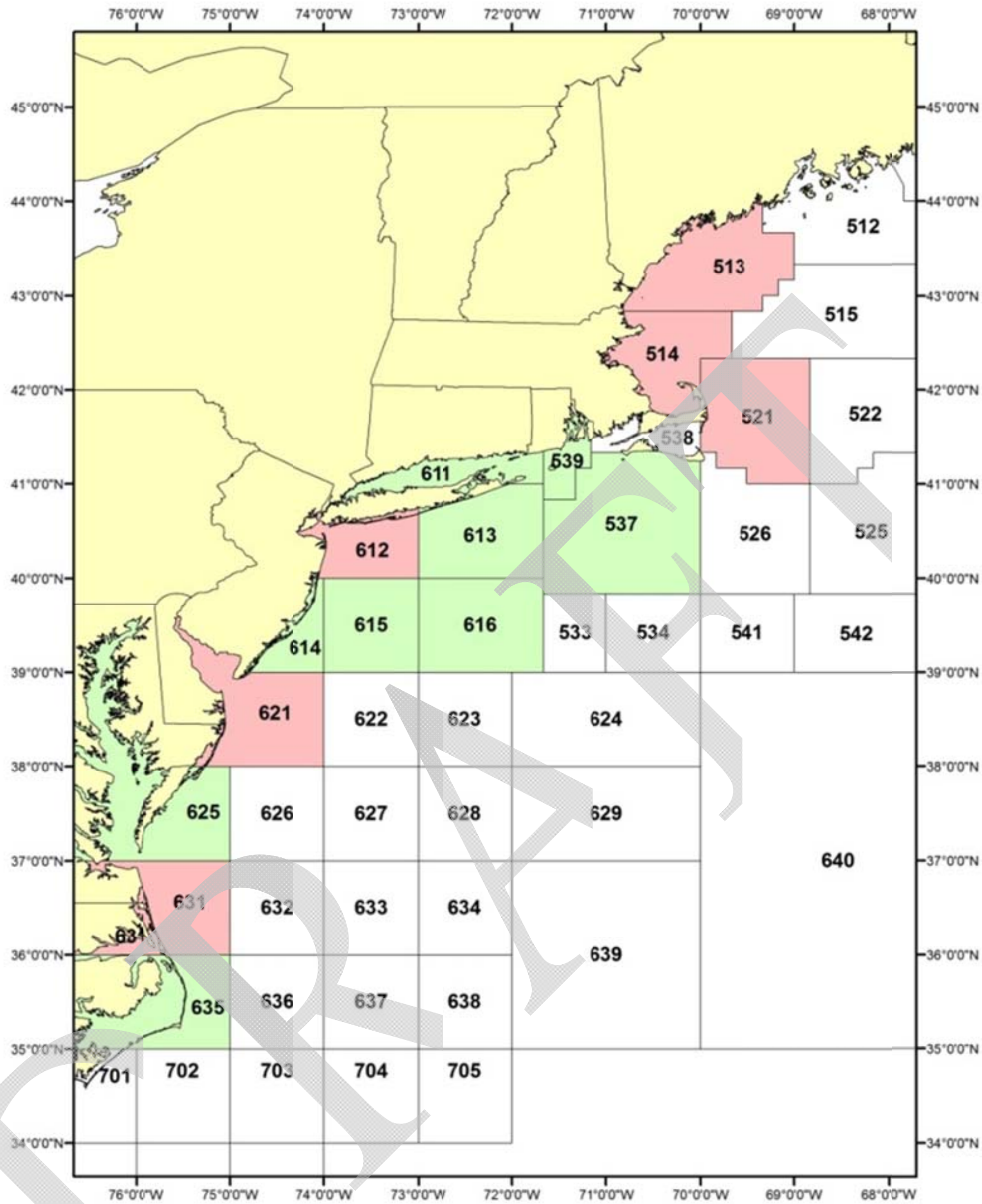


Figure 13. NMFS Northeast statistical areas. Shaded areas indicate where spiny dogfish harvest occurs. Red areas comprise 5% or more of harvest and green areas 1% to 5% of harvest.

Table 7. Statistical areas that accounted for at least 5 % of the spiny dogfish catch and/or trips in FY2010 VTR data. Shading (red or green) is provided for reference with Figure 4.

Statistical Area	Catch (%)	Trips (%)
514	26.91%	25.11%
521	17.21%	15.34%
513	15.56%	12.86%
631	4.25%	7.64%
612	5.96%	6.63%
621	3.60%	5.47%
537	4.67%	4.97%
539	4.01%	3.55%
635	1.94%	3.41%
615	2.61%	3.25%
613	3.04%	2.90%
616	1.81%	2.54%
625	1.76%	2.15%
611	2.31%	1.46%
614	1.09%	1.10%

Source: Vessel Trip Report database

Canadian Commercial Spiny Dogfish Landings

Historic Canadian commercial landings have been low relative to landings from the U.S. commercial fishery (Table 4). In 2001, following the implementation of the U.S. Federal FMP, Canadian landings exceeded U.S. landings for the first time. In 2008, Canadian landings were about 3.5 M lb, but in 2009 landings dropped precipitously to about 250,000 lb. In 2010, the increased availability of U.S. spiny dogfish continued to constrain demand for Canadian product (pers. comm. Barndollar[1] and Marder[2] 2011) even though Canada has allowed a directed fishery under a 2,500 mt (5.512 M lb) quota with no trip limits. In 2010 Canadian landings dropped further to 13,000 lb.

Recreational Landings

As previously stated, no significant recreational fishery exists for spiny dogfish. Some retention of recreationally caught spiny dogfish does occur, however. Recreational landings by state for 2010 are provided in Table 8 below.

[1] Steve Barndollar was on the MAFMC's Spiny Dogfish Advisory Panel and is the owner of Seatrade Int'l, one of the primary processors of U.S. and Canadian spiny dogfish on the Atlantic Coast. He attended the Spiny Dogfish Monitoring Committee meeting in September 2011.

[2] Brian Marder is the owner of Marder Trawling, Inc., a major processor of U.S. and Canadian spiny dogfish on the Atlantic Coast. He attended the Spiny Dogfish Monitoring Committee meeting in September 2011.

Table 8. Recreational landings (lb) of spiny dogfish by state for 2010.

State	Landings (lb)	Pct of Total
NORTH CAROLINA	16,052	46.43%
SOUTH CAROLINA	7,531	21.78%
NEW JERSEY	4,650	13.45%
DELAWARE	3,521	10.18%
MARYLAND	1,041	3.01%
NEW HAMPSHIRE	977	2.83%
MASSACHUSETTS	443	1.28%
VIRGINIA	359	1.04%
TOTAL	**34,574**	**100.00%**

Source: Marine Recreational Fisheries Statistical Survey Data

6.1.3 Non-Target Species

Discards of non-target species in the directed spiny dogfish fishery are difficult to characterize since defining the directed fishery can be done a number of ways. Gear-specific landings data suggest that catch composition varies among gears and that some gear (e.g., bottom longline) are more likely to produce catches that are predominantly spiny dogfish, while other gear (e.g., bottom trawls) are characterized by a more diverse catch. Discards have been tabulated for observed trips in 2010 where any dogfish were retained and are summarized in Table 9. On gillnet trips, spiny dogfish comprised 53.44% of total observed discards, with other major discard species including lobster (15.76%), cod (5.95%), and winter skate (5.35%). All other species combined (56) comprised 19.50% of total discards. On observed bottom longline trips, a total of 17 species besides spiny dogfish were accounted for in the discards. Spiny dogfish comprised 76.9% of total discards, little skate comprised 5.89% and no other species comprised more than 5%. On observed trawl trips, spiny dogfish comprised 41.35% of discards, with a total of 99 other discard species. Among these were little skate (10.73%), and red hake (5.45%) and no other species comprising more than 5%. .

Table 9. Discards associated with the dominant gear types used to harvest spiny dogfish in 2010 as reported in northeast fisheries observer program (NEFOP) data when spiny dogfish were landed. Species comprising 1% or more of the discards by gear are shown. Stock status for each discard species is also indicated (see below)

Hook and Line			Gill Net, Sink			Trawl, Otter, Bottom		
Discard Species	**Discards (lb)**	**Pct Of Total for this Gear**	**Discard Species**	**Discards (lb)**	**Pct Of Total for this Gear**	**Discard Species**	**Discards (lb)**	**Pct Of Total for this Gear**
DOGFISH, SPINY [a,b]	4,694	76.85%	DOGFISH, SPINY [a,b]	11,288	53.44%	DOGFISH, SPINY [a,b]	146,003	41.35%
SKATE, LITTLE [a,b]	360	5.89%	LOBSTER [a,b]	3,329	15.76%	SKATE, LITTLE [a,b]	37,892	10.73%
SKATE, THORNY [a,d]	269	4.41%	COD, ATLANTIC [d,e]	1,257	5.95%	HAKE, RED [a,b]	19,251	5.45%
HALIBUT, ATL. [a,e]	189	3.10%	SKATE, WINTER [a,b]	1,130	5.35%	HAKE, SILVER [a,b]	15,189	4.30%
WOLFFISH, ATL. [n/a]	176	2.87%	RAVEN, SEA [n/a]	819	3.88%	SKATE, WINTER [a,b]	14,459	4.10%
OCEAN POUT [a,e]	101	1.65%	SKATE, THORNY [a,d]	362	1.71%	SKATE, NK [n/a]	14,146	4.01%
SKATE, WINTER [a,b]	81	1.32%	FLOUNDER, WINTER [d,e]	350	1.65%	FISH, NK [n/a]	12,504	3.54%
SCULPIN [n/a]	72	1.18%	MONKFISH [a,b]	291	1.38%	BUTTERFISH [a,d]	11,321	3.21%
OTHER (10 sp.)	168	2.75%	CRAB, JONAH [n/a]	270	1.28%	HAKE, NK [n/a]	7,198	2.04%
			SKATE, LITTLE [a,b]	230	1.09%	FLOUNDER, WINTER [d,e]	6,312	1.79%
			POLLOCK [a,b]	214	1.01%	DOGFISH, SMOOTH [a, b]	5,807	1.64%
			BLUEFISH [a,b]	210	1.00%	SCUP [a,b]	5,614	1.59%
			OTHER (48 sp.)	1,373	5.18%	CRAB, LADY [n/a]	4,958	1.40%
						FLOUNDER, FOURSPOT [n/a]	4,008	1.14%
						HAKE, RED/WHITE MIX [a,b, / d, e]	3,937	1.12%
						FLOUNDER, SUMMER [a,b]	3,554	1.01%
						OTHER (84 sp.)	40,914	11.59%
Total	**6,108**	**100%**	**Total**	**21,122**	**100%**	**Total**	**353,066**	**100%**

[a] not overfished, [b] overfishing not occurring, [c] overfished vs. not overfished is unknown, [d] overfished, [e] overfishing is occurring, [f] overfishing unknown, [n/a] not applicable

Source: Northeast Fishery Observer Program, 3rd Quarter 2011 NMFS Fish Stock Sustainability Index

6.2 Habitat (Including Essential Fish Habitat)

This section describes the physical environment, identifies EFH and then addresses the vulnerability of EFH utilized by the managed resource to physical disturbance by fishing and non-fishing activities, as well as the vulnerability of other species' EFH to disturbance by the spiny dogfish fishery.

6.2.1 Physical Environment

A report entitled "Characterization of Fishing Practices and the Marine Benthic Ecosystems of the Northeast U.S. Shelf, and an Evaluation of the Potential Effects of Fishing on Essential Fish Habitat" was developed by NMFS (Stevenson et al. 2004). This document provides additional descriptive information on the physical and biological features of regional subsystems and habitats in the Northeast Shelf Ecosystem. It also includes a description of fishing gears used in the NMFS Northeast region, maps showing the regional distribution of fishing activity by different gear types during 1995-2001, and a summary of gear impact studies published prior to 2002 that indicate how and to what degree fishing practices used in the NMFS Northeast region affect benthic habitats and species managed by the New England and Mid-Atlantic fishery management councils. It is available by request through the NMFS Northeast Regional Office or electronically at: http://www.nefsc.noaa.gov/nefsc/publications.

The Northeast Shelf Ecosystem has been described as 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 (Sherman et al. 1996). The Gulf of Maine, Georges Bank, and Mid-Atlantic Bight are distinct subsystems within this region.

The Gulf of Maine is an enclosed coastal sea, characterized by relatively cold waters and deep basins, with a patchwork of sediment types. Georges Bank is a relatively shallow coastal plateau that slopes gently from north to south and has steep submarine canyons on its eastern and southeastern edge. It is characterized by highly productive, well-mixed waters and fast-moving currents. The Mid-Atlantic Bight is comprised of the sandy, relatively flat, gently sloping continental shelf from southern New England to Cape Hatteras, NC. Pertinent aspects of the physical characteristics of each of these subsystems are described below. The description provided is based on several review documents (Cook 1988; Pacheco 1988; Stumpf and Biggs 1988; Abernathy 1989; Townsend 1992; Mountain et al. 1994; Beardsley et al. 1996; Brooks 1996; Sherman et al. 1996; NEFMC 1998; Steimle et al. 1999).

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

Topographic highlights of the area include three basins that exceed 800 feet in depth; Jordan to the north, Wilkinson to the west, and Georges just north of Georges Bank. The average depth in the Gulf of Maine is 450 feet. The Gulf of Maine's geologic features, when coupled with the vertical variation in water properties, result in a great diversity of habitat types (Watling et al. 1988). An in-depth review of GOM habitat types has been prepared by Brown (1993).

Georges Bank: Georges Bank is a shallow (10 to 500 foot depth), elongate (100 miles wide by 200 miles long) extension of the continental shelf formed by the Wisconsinian glacial episode. It is characterized by a steep slope on its northern edge and a broad, flat, gently sloping southern flank. It is separated from the rest of the continental shelf to the west by the Great South Channel. The nature of the sea bed sediments varies widely, ranging from clay to gravel (Valentine and Lough 1991). Surficial sediments composed of a gravel-sand mix have been noted as important postlarval habitat for Atlantic cod, haddock, winter flounder, yellowtail flounder and other species. American plaice adults have been demonstrated to associate with gravel-sand sediments for a variety of potential reasons. Gravel-sand sediments have been noted as habitat for sea scallops, where movement of sand is relatively minor (Langton and Uzmann 1990; Valentine and Lough 1991). The gravel-sand mixture is usually a transition zone between coarse gravel and finer sediments.

Georges Bank is characterized by high levels of primary productivity, and historically, high levels of fish production. It has a diverse biological community that is influenced by many environmental conditions. Several studies have attempted to identify demersal fish assemblages over large spatial scales on Georges Bank. Overholtz and Tyler (1985) found five depth-related groundfish assemblages for Georges Bank and Gulf of Maine that were persistent temporally and spatially. Depth and salinity were identified as major physical influences explaining assemblage structure.

Mid-Atlantic Bight: The Mid-Atlantic Bight includes the shelf and slope waters from Georges Bank south to Cape Hatteras, and east to the Gulf Stream. Like the rest of the continental shelf, the Mid-Atlantic Bight was shaped largely by sea level fluctuations caused by past ice ages. The shelf's basic morphology and sediments are derived from the retreat of the last ice sheet, and the subsequent rise in sea level. Since that time, currents and waves have modified this basic structure.

The shelf slopes gently from shore out to between 75 and 150 miles offshore where it transforms to the slope (300 to 600 ft water depth) at the shelf break. In both the Mid-Atlantic and on Georges Bank, numerous canyons incise the slope, and some cut up onto the shelf itself. The primary morphological features of the shelf include shelf valleys and channels, shoal massifs, scarps, and sand ridges and swales.

The sediment type covering most of the shelf in the Mid-Atlantic Bight is sand, with some relatively small, localized areas of sand-shell and sand-gravel. On the slope, silty sand, silt, and clay predominate. Sand provides suitable habitat properties for a variety of fishes, invertebrates, and microorganisms. Invertebrates, such as surfclams, razor clams, and ocean quahogs, burrow between the grains to support their characteristic sessile behavior. Dunes and ridges provide refuge from currents and predators and habitat for ambush predators. Several species inhabit sand habitats (e.g. amphipods, polychaetes) that are important prey for flounder. Yellowtail and winter flounder distribution has been correlated to sand (Langton and Uzmann 1990). In general, flatfish are more closely associated with sand and finer sediments than are other demersal fishes.

Canyons occur near the shelf break along Georges Bank and the Mid-Atlantic Bight, cutting into the slope and occasionally up into the shelf as well. They exhibit a more diverse fauna, topography, and hydrography than the surrounding shelf and slope environments. The relative biological richness of canyons is in part due to the diversity of substrate types found in the canyons, and the greater abundance of organic matter.

Faunal assemblages were described at a broad geographic scale for Mid-Atlantic Bight continental shelf demersal fishes, based on NMFS bottom trawl survey data between 1967 and 1976 (Colvocoresses and Musick 1983). There were clear variations in species abundance, yet they demonstrated consistent patterns of community composition and distribution among demersal fishes of the Mid-Atlantic shelf. The boundaries between fish assemblages generally followed isotherms and isobaths.

Coastal Features

Coastal and estuarine features in the Northeast Shelf Ecosystem include salt marshes, mud flats, intertidal zones, and submerged aquatic vegetation, all of which provide critical to habitats for inshore and offshore fishery resources. Coastal areas and estuaries are important for nutrient recycling and primary productivity, and many economically important finfish and shellfish species use these as spawning areas and nurseries for juvenile life stages.

Rocky intertidal zones are periodically submerged, high energy environments found in the northern portion of the Northeast system. Specially adapted residents may include sessile invertebrates, finfish species, and algae, e.g., kelp and rockweed (which also function as habitat). Fishery resources may depend upon particular habitat features of the rocky intertidal zones that provide specific prey items and refuge from predators. Sandy beaches are most extensive along the Northeast coast. Different zones of the beach present habitat conditions ideal for a variety of marine and terrestrial organisms. For example, the intertidal zone is suitable habitat for many invertebrates and transient fish which forage in these areas during high tide. Several invertebrate and fish species are adapted for living in the high energy subtidal zone adjacent to sandy beaches.

Dump Sites

The Council has been requested via previous public comments to include mention that numerous old dump sites for municipal and industrial waste exist in the management area, specifically the "106-Mile Dump Site" formerly utilized east of Delaware's ocean coastline, beyond the Continental Shelf. Detailed information on the 106-Mile Dump Site can be found in the 1995 EPA report to Congress on the 106-Mile Dump Site available at: http://www.epa.gov/adminweb/history/topics/mprsa/Monitoring,%20Research%20and%20Surveillance%20of%20the%20106%20Mile%20Deepw.pdf . It generally concluded that sewage sludge and/or related contaminants did not reach important areas for commercial fisheries and that the 106-Mile Dump Site was not the prime source of the generally low chemical contamination in tilefish, the primary commercially important finfish species resident in the shelf/slope areas adjacent to the 106-Mile Dump Site (EPA 1995).

6.2.2 Essential Fish Habitat

6.2.2.1 Habitat Requirements by Life History Stage

The following information on juveniles and adult dogfish habitat requirements was taken directly from the document "Essential Fish Habitat Source Document: Spiny Dogfish, *Squalus acanthias*, Life History and Habitat Characteristics, Second Edition" (Stehlik 2007). The document is referred to hereafter as the EFH source document.

Juvenile Habitat: During spring, juveniles were captured from 3-17°C; most were found between about 6-13°C. They were captured at depths between 11-500 m, with the majority found below 50 m. They were found in a salinity range of about 24-36 ppt, with the majority between 33-35 ppt. During the autumn, the juveniles were found over a temperature range of 5-18°C; most were found at about 8-14°C. Their depth range during that season was from 11-400 m;

most were found below 40 m. They were found in a salinity range of 31-36 ppt, with the majority between 32-34 ppt.

During the spring they were found in waters with bottom temperatures of 2-14°C; most were found from 6-11°C, with a large peak in catch at 7°C. Their depth range was from 6-75 m, with the majority found at < 36 m. During the autumn, they were found over a temperature range of 3-21°C. Their temperature distribution was somewhat bimodal, with one peak from about 6-11°C and a smaller peak between 12-15°C. Their autumn depth ranged from 6-85 m, with the majority between 16-45 m.

Adult Habitat: During the spring adult spiny dogfish were found over a temperature range of 3-14°C; most were found from 6-10°C. They were spread over a depth range between 1-500 m. They were found in a salinity range of 29-36 ppt, with the highest catches and occurrences, relative to the trawls, at 34-35 ppt. During the autumn, they were found over a temperature range of 5-18°C, with the majority between 6-16°C. Their autumn depth ranged from 11-400 m, with some higher catches between 21-40 m. They were found over a salinity range of 30-35 ppt, with the majority between 32-34 ppt.

In the spring they were found in waters with bottom temperatures of 1- 16°C; most were found from 6-11°C. Their depth range was from 11 m to about 85 m, with the majority found from about 16-50 m. During the fall they were found over a temperature range of 5-20°C, with most from about 6-15°C. They were spread over a depth range of 6-85 m, with the majority < 65 m.

Most spiny dogfish observed from spring through fall were found in the Eastern Basin of Long Island Sound in depths > 27 m over sand and transitional bottom. Of 553 spiny dogfish caught from April to August, only eight were caught in depths < 18 m (Gottschall et al. 2000). They were also found in deep water across the Mattituck Sill in the Central Basin, but their occurrence decreased from east to west. In late fall, as their overall abundance increased, their abundance was similar on mud and transition bottoms, but they were less abundant on sand. Abundance generally increased with depth, but most spiny dogfish were taken in depths > 18 m (90% of total catch), with the largest catches occurring > 27 m (Gottschall et al. 2000).

In the Hudson-Raritan Estuary trawl survey, spiny dogfish were caught from the months of November through January at bottom depths of 13-20 m, at bottom water temperatures between 7.1-11.3°C, at bottom dissolved oxygen levels between 8.2-11.2 mg/L, and at bottom salinities between 30.7-32.2 ppt (NOAA/NMFS/NEFSC, James J. Howard Marine Sciences Laboratory, Highlands, NJ, unpublished data). The catch locations were in areas of silt, mud, and occasional sand and gravel.

In Chesapeake Bay and tributaries from the 1988-1999 VIMS trawl surveys, spiny dogfish adults were found in colder waters (< 12ºC), and prefer saltier waters of the Bay mouth (> 22 ppt) at depths > 6 m (Geer 2002). They were also found in areas of high dissolved oxygen (> 7.5 mg/l) (Geer 2002).

6.2.2.2 Current EFH Definitions:

Juveniles:
1) <u>North of Cape Hatteras</u>, EFH is the waters of the Continental shelf from the Gulf of Maine through Cape Hatteras, North Carolina in areas that encompass the highest 90% of all ranked

ten-minute squares for the area where juvenile dogfish were collected in the NEFSC trawl surveys.
2) South of Cape Hatteras, EFH is the waters over the Continental Shelf from Cape Hatteras, North Carolina through Cape Canaveral, Florida, to depths of 1280 ft.
3) Inshore, EFH is the "seawater" portions of the estuaries where dogfish are common or abundant on the Atlantic coast, from Passamaquoddy Bay, Maine to Cape Cod Bay, Massachusetts.
Generally, juvenile dogfish are found at depths of 33 to1,280 ft in water temperatures ranging between 37˚F and 82˚F.

Adults:
1) North of Cape Hatteras, EFH is the waters of the Continental shelf from the Gulf of Maine through Cape Hatteras, North Carolina in areas that encompass the highest 90% of all ranked ten-minute squares for the area where adult dogfish were collected in the NEFSC trawl surveys.
2) South of Cape Hatteras, EFH is the waters over the Continental Shelf from Cape Hatteras, North Carolina through Cape Canaveral, Florida, to depths of 1476 ft.
3) Inshore, EFH is the "seawater" portions of the estuaries where dogfish are common or abundant on the Atlantic coast, from Passamaquoddy Bay, Maine to Cape Cod Bay, Massachusetts.
Generally, adult dogfish are found at depths of 33 to 1,476 ft in water temperatures ranging between 37˚F and 82˚F.

An electronic version of the EFH source document are available at the following website: http://www.nefsc.noaa.gov/nefsc/habitat/efh/.

6.2.2.1 Factors Affecting Spiny Dogfish EFH

Fishing Activities
In the above and proposed EFH definitions (i.e., Alt 2A, 2B respectively) and in the species' EFH Source Document (Stehlik 2007) spiny dogfish are not associated with any particular benthic habitat, sediment, structure or SAV. Since EFH for spiny dogfish consists of the "waters of the continental shelf…", it is more accurate to ascribe potential disturbances to spiny dogfish EFH as consistent with potential disturbances to the pelagic habitat.

Non-Fishing Activities
Chemical or thermal disturbance of pelagic habitat by non-fishing activities is perhaps the most defensible theoretical threat to spiny dogfish habitat. In that vein, the following text and tables are provided that are taken from Johnson et al. (2008) which addressed the impacts of non-fishing activities on EFH. Note that some of the information has been truncated to focus the reader only on impacts to pelagic habitat. A full report is available here: http://www.nefsc.noaa.gov/publications/tm/tm209/

A technical workshop was hosted by the Northeast Region Essential Fish Habitat Steering Committee on January 10-12, 2005 in Mystic, CT, to seek the views and recommendations of approximately 40 scientists, resource managers, and other marine resource professionals on threats to fishery habitat from non-fishing activities in the northeast coastal region. The participants of the workshop, entitled *Technical Workshop on Impacts to Coastal Fishery Habitat from Non-fishing Activities*, were federal and state environmental managers and regulators, as well as individuals from academic institutions and other organizations that have expertise and knowledge of various human-induced impacts on coastal environmental resources.

The specific goals/tasks of the workshop included:

(1) Identify all known and potential adverse effects for each category of non-fishing activity by life history strategies or stages (i.e., benthic/demersal and pelagic) and ecosystem strata (i.e., riverine, estuarine, and marine). This list of activities may also include adverse impacts to identified prey species or other specific life history requirements for species.

(2) Create a matrix of non-fishing impacts for life history strategies/stages and ecosystem strata and ask the participants of the workshop to score the severity of each impact by using a relative scoring method.

(3) Develop a suite of conservation measures and best management practices (BMPs) intended to avoid and minimize the adverse effects on fishery habitat and resources.

(4) Identify possible information and data limitations and research needs in assessing impacts on fishery habitat or measures necessary to avoid and minimize those impacts.

Conservation measures were, to the extent possible, based on methods and technologies that have been evaluated through a scientific, peer-reviewed process. The intent was to develop recommendations that provide resource managers and regulators with specific methods and technologies yet have flexibility in their applications for various locations or project types. Ideally, providing a suite of conservation measures appropriate for various activities would give the end user several options of recommendations to consider.

Based upon the results of the workshop and effects scoring, some recommended research needs were developed. Identified research needs included basic life history requirements for some species and habitat types, physiological and biochemical responses of organisms to various physical and chemical perturbations and stressors, and technological advances in understanding or solutions to impact assessment and mitigation. Refer to Section 6.4.3.6 for a discussion on research needs, as recommended by workshop participants.

The format of the two-day workshop consisted of ten breakout sessions which represented the primary categories of non-fishing activities believed to threaten fishery resources and habitats in the Northeast region. For each of the breakout sessions, a matrix of activities and known or potential adverse effects to fishery habitat, prepared by the workshop organizers, was reviewed by the workshop participants. The participants were encouraged to openly discuss and evaluate the relevance and significance for each of the activities and effects and to provide any additional activities and effects not included in the matrix. A large number of non-fishing activities occur within the coastal region and have a wide range of effects and intensities on fishery habitat. Each activity type and effect identified was evaluated in the context of life history strategies or stages (i.e., benthic and demersal) and ecosystem type or strata (i.e., riverine, estuarine/ nearshore, and marine/offshore), in order to identify the importance of those factors. Following an open discussion, the participants were asked to score, by life history strategies/stages and ecosystem strata, the various activities and adverse effects on the impact matrix. In addition, participants were asked to include specific and relevant "conservation recommendations" and BMPs to avoid and minimize adverse effects to fishery habitat and resources.

On the last day of the workshop, the participants engaged in an informal discussion on the significance of cumulative effects and how multiple and additive effects can influence impacts to fishery habitat and resources. While the discussions were general in nature and few specifics of cumulative effects were discussed, there was a general agreement that cumulative effects are important and should play a larger role in assessment of habitat impacts. The scores provided by the participants in the impact matrices for most breakout sessions were relatively consistent throughout. While the variability in scores for some impact categories was high, we believe that the mean and median values for most effects' scores provide an accurate reflection of professional judgment by the participants. The relatively high variability in the scores of some activity types and effects may be due to varying interpretations of ecosystem strata and life history strategies or stages by the participants.

Because one workshop goal was to assess the severity or degree of threat for known and potential impacts to fishery habitats, the workshop organizers strived to develop a semi-quantitative scoring system that could measure the relative impacts for each activity and effect based upon the professional judgment of the participants. Developing defined values for measuring the significance of adverse effects for an activity is difficult and can depend upon the type of habitat being affected; the characteristic, intensity, and duration of the activity and disturbance; and a number of natural physical, chemical, and biological processes that may be occurring in the area and at the time of the activity. For this reason, the workshop organizers chose a semi-quantitative scoring system with a range from 0 to 5, with a 1 being the lowest impact and a 5 being the highest impact. A "0" was used if an impact is not expected to occur or is not applicable, and a "UN" (unknown) was used if the participant does not know the degree of impact for a particular activity.

The results of the workshop scoring in each session are listed in Tables 10 through 19. "High," "medium," and "low" index scores are notated as H, M, and L, respectively. As might be expected, there were positive correlations between the highest scoring effects and the ecosystem types in which those activities generally occur. For example, the high scoring effects in the alteration of freshwater systems and agriculture and silviculture sessions were generally all in the riverine ecosystem. Except for the offshore dredging and disposal session, there were fewer effects that were scored high in the marine/offshore ecosystem compared to the riverine and estuarine/nearshore ecosystems. This suggests the participants viewed the intensity of effects from non-fishing impacts to decrease as the distance from the activity increases. As one might expect, many of the far field effects that scored high were those activities that affect the water column (e.g., ocean noise, impacts to water quality) or effects that are capable of being transported by currents (oil spills or drilling mud releases). In addition, the global effects and other impacts session had high scores more evenly distributed across all ecosystems because of the nature of the impacts discussed in this session (e.g., climate change, atmospheric deposition, ocean noise). The number of activities and threats identified in the coastal development session were greater than other sessions because of the cross cutting nature of activities associated with human coastal development. Because of this, some activity types and effects assessed in the coastal development session were discussed to some degree in other sessions.

Some sessions had index scores with relatively high variability. For example, the scores for all activity types of the offshore dredging and disposal session had relatively low mean values and high standard deviations for effects in the estuarine/nearshore ecosystem. About half of the participants in this session either did not provide a score for impacts in the riverine or estuarine/nearshore ecosystems, or they marked them as "not-applicable." Participants who provided a score for these two ecosystems generally scored them relatively high. This suggests a difference in participants' interpretation of where "offshore" activities are located. Specifically, some individuals may consider the "offshore" area to be within close enough proximity of the nearshore and estuarine environments to adversely affect these areas, while others may perceive the "offshore" area to be too far removed to have a noticeable effect. There were activities in other sessions, such as beach nourishment in coastal development, with scores with high standard deviations. The high variability in perceived threats may be a reflection of regional perspectives. While the majority of the participants involved in this workshop were from the New England region, about one-quarter of the participants were from the Mid-Atlantic or southeast regions where beach nourishment projects are much more common. The associated impacts to benthic habitats from beach nourishment are also generally thought to be greater in the New England (where cobble or hard bottom habitats may be present) and south Atlantic (where live bottom habitats may be present) regions than in the Mid-Atlantic. However, because the responses of the workshop participants were anonymous, it was not possible to test this hypothesis.

Many of the effects that were scored as high in the workshop sessions were those that are well documented in the literature as having adverse effects on coastal resources. For example, nutrient enrichment and siltation/sedimentation effects were scored as high in nearly all workshop sessions, demonstrating the widely accepted views that these impacts translate to general reductions in the quality and quantity of fishery resources and habitats. Some of the more unexpected results of the workshop session scores are those effects that had high mean and/or median values but may be a topic that does not have a wealth of research documenting those impacts. Some of these results may be based upon a collective judgment by the participants that these activities or effects require additional scientific investigations to resolve the perceived risks and concerns. In several of these effects or activities, the authors of the associated report chapters were unable to locate information in the scientific literature regarding those threats. For example, release of pharmaceuticals and endocrine disruptors were two effects that were scored high in the workshop session, and yet the potential scope and intensity of adverse effects that these chemicals have on fishery resources has not been thoroughly investigated.

Those activities and effects considered by the workshop participants to have "high" threats to fishery habitat warrant further investigations, including research in characterizing and quantifying these impacts on fishery resources, as well as investigating methods for avoiding and/or minimizing the impacts.

6.3.4.5 Potential impacts to spiny dogfish EFH from non-fishing activities

Based on the both the old and new EFH descriptions (see Section 5), only those non-fishing activities that occur in marine/offshore pelagic habitats have the potential to adversely impact EFH for spiny dogfish. Relevant high, medium, and low potential effects for all the activity types evaluated in Johnson et al. (2008) are shown in the last two columns (highlighted in grey) of Tables 10-19.

Table 10. Habitat Impact Categories in Coastal Development Workshop Session (N=14).

Activity Type	Potential Effects	Habitat Impact Categories					
		Life History/Ecosystem Type					
		Benthic/Demersal Stages			Pelagic Stages		
		Riverine	Estuarine/ Nearshore	Marine/ Offshore	Riverine	Estuarine/ Nearshore	Marine/ Offshore
Nonpoint Source Pollution and Urban Runoff	Nutrient loading/eutrophication	H	H	M	H	H	M
	Loss/alteration of aquatic vegetation	H	H	L	H	H	L
	Release of petroleum products	M	M	M	M	M	M
	Alteration of water alkalinity	M	M	L	M	M	L
	Release of metals	H	H	M	M	H	M
	Release of radioactive wastes	M	M	L	M	M	L
	Release of pesticides	H	H	M	H	H	M
	Release of pharmaceuticals	H	M	L	H	H	L
	Alteration of temperature regimes	H	M	L	H	M	L
	Sedimentation/turbidity	H	H	L	H	H	L
	Altered hydrological regimes	M	M	L	M	M	L
	Introduction of pathogens	M	M	L	M	M	L
Road Construction and Operation	Release of sediments in aquatic habitat	H	M	L	M	M	L
	Increased sedimentation/turbidity	H	H	L	H	H	L
	Impaired fish passage	H	M	L	H	H	L
	Altered hydrological regimes	H	H	L	H	H	L
	Altered temperature regimes	H	M	L	H	M	L
	Altered stream morphology	H	M	L	H	M	L
	Altered stream bed characteristics	H	M	L	H	M	L
	Reduced dissolved oxygen	H	H	L	H	H	L
	Introduction of exotic invasive species	M	M	L	M	M	L
	Loss/alteration of aquatic vegetation	H	H	L	H	H	L
	Altered tidal regimes	H	H	L	H	M	L
	Contaminant releases	M	M	L	M	M	L
	Fragmentation of habitat	H	M	L	H	H	L
	Altered salinity regimes	M	M	L	M	M	L
Flood Control/ Shoreline Protection	Altered hydrological regimes	H	H	L	H	M	L
	Altered temperature regimes	M	M	L	M	M	L
	Altered stream morphology	H	M	L	H	M	L
	Altered sediment transport	H	H	L	H	H	L
	Alteration/loss of benthic habitat	H	H	L	M	M	L
	Reduction of dissolved oxygen	M	M	L	M	M	L
	Impaired fish passage	H	M	L	H	M	L
	Alteration of natural communities	H	M	L	M	M	L
	Impacts to riparian habitat	H	M	L	H	M	L
	Loss of intertidal habitat	H	H	L	M	H	L
	Reduced ability to counter sea level rise	H	H	L	M	H	L
	Increased erosion/accretion	H	H	L	H	H	L
Beach Nourishment	Altered hydrological regimes	M	M	L	M	M	L
	Altered temperature regimes	L	L	L	L	L	L
	Altered sediment transport	M	M	L	M	M	L
	Alteration/loss of benthic habitat	M	M	L	L	M	L
	Alteration of natural communities	M	M	M	L	M	L
	Increased sedimentation/turbidity	M	M	L	M	M	L

Table 10 (Continued). Habitat Impact Categories in Coastal Development Workshop Session (N=14)

Activity Type	Potential Effects	Habitat Impact Categories					
		Life History/Ecosystem Type					
		Benthic/Demersal Stages			Pelagic Stages		
		Riverine	Estuarine/ Nearshore	Marine/ Offshore	Riverine	Estuarine/ Nearshore	Marine/ Offshore
Wetland Dredging and Filling	Alteration/loss of habitat	H	H	L	H	H	L
	Loss of submerged aquatic vegetation	H	H	L	M	H	L
	Altered hydrological regimes	H	H	L	H	H	L
	Reduction of dissolved oxygen	M	M	L	M	M	L
	Release of nutrients/eutrophication	M	M	L	M	M	L
	Release of contaminants	M	M	L	M	M	L
	Altered tidal prism	M	M	L	M	M	L
	Altered current patterns	M	M	L	M	M	L
	Altered temperature regimes	M	M	L	M	M	L
	Loss of wetlands	H	H	L	H	H	L
	Loss of fishery productivity	H	H	L	H	H	L
	Introduction of invasive species	M	M	L	M	M	L
	Loss of flood storage capacity	H	H	L	H	H	L
	Increased sedimentation/turbidity	M	M	L	M	M	L
Overwater Structures	Shading impacts to vegetation	M	M	L	M	M	L
	Altered hydrological regimes	M	M	L	M	M	L
	Contaminant releases	M	M	L	M	M	L
	Benthic habitat impacts	M	M	L	M	M	L
	Increased erosion/accretion	M	M	L	M	M	L
	Eutrophication from bird roosting	M	M	L	M	M	L
	Shellfish closures because of bird roosting	H	M	L	M	M	L
	Changes in predator/prey interactions	H	H	L	H	H	L
Pile Driving and Removal	Energy impacts	M	M	L	M	M	L
	Benthic habitat impacts	M	M	L	M	M	L
	Increased sedimentation/turbidity	M	M	L	M	M	L
	Contaminant releases	M	M	L	M	M	L
	Shading impacts to vegetation	M	M	L	M	M	L
	Changes in hydrological regimes	M	M	L	M	M	L
	Changes in species composition	M	M	L	M	M	L
Marine Debris	Entanglement	M	M	L	M	M	L
	Ingestion	L	M	L	M	M	M
	Contaminant releases	L	M	L	L	M	M
	Introduction of invasive species	M	M	L	M	M	M
	Introduction of pathogens	L	M	L	L	M	M
	Conversion of habitat	L	M	L	L	M	L

Table 11. Habitat Impact Categories in Energy-related Activities Workshop Session (N=13)

Activity Type	Potential Effects	Habitat Impact Categories					
		Life History/Ecosystem Type					
		Benthic/Demersal Stages			Pelagic Stages		
		Riverine	Estuarine/ Nearshore	Marine/ Offshore	Riverine	Estuarine/ Nearshore	Marine/ Offshore
Petroleum Exploration, Production, and Transportation	Underwater noise	M	M	M	M	M	M
	Habitat conversion	H	H	H	H	H	M
	Loss of benthic habitat	M	H	M	M	M	M
	Contaminant discharge	M	H	M	M	H	M
	Discharge of debris	M	M	M	M	M	L
	Oil spills	H	H	H	H	H	H
	Siltation/sedimentation/turbidity	M	M	M	M	M	M
	Resuspension of contaminants	M	H	M	M	M	L
	Impacts from clean-up activities	H	H	M	M	H	M
Liquified Natural Gas	Habitat conversion	H	H	M	M	M	M
	Loss of benthic habitat	H	H	M	M	M	L
	Discharge of contaminants	H	H	H	H	H	H
	Discharge of debris	M	M	M	M	M	L
	Siltation/sedimentation/turbidity	M	H	M	M	M	M
	Resuspension of contaminants	M	H	M	M	H	L
	Entrainment/impingement	M	M	M	M	H	M
	Alteration of temperature regimes	M	M	L	M	M	L
	Alteration of hydrological regimes	M	M	L	M	M	L
	Underwater noise	M	M	M	H	H	M
	Release of contaminants	H	H	M	H	H	M
	Exclusion zone impacts	M	M	L	M	M	L
	Physical barriers to habitat	M	M	M	M	M	L
	Introduction of invasive species	H	H	M	H	M	M
	Vessel impacts	H	H	L	M	M	L
	Benthic impacts from pipelines	H	H	M	M	M	M
Offshore Wind Energy Facilities	Loss of benthic habitat	M	H	H	L	M	M
	Habitat conversion	M	H	H	L	M	M
	Siltation/sedimentation/turbidity	L	M	M	L	M	M
	Resuspension of contaminants	L	M	L	L	M	L
	Alteration of hydrological regimes	L	M	M	L	M	M
	Altered current patterns	L	M	M	L	M	M
	Alteration of electromagnetic fields	L	L	L	L	L	L
	Underwater noise	L	L	M	L	M	H
	Alteration of community structure	M	H	M	L	H	M
	Erosion around structure	L	M	M	L	L	L
	Spills associated w/ service structure	M	H	M	L	M	M

Table 11 (Continued). Habitat Impact Categories in Energy-related Activities Workshop Session (N=13)

Activity Type	Potential Effects	Habitat Impact Categories					
		Life History/Ecosystem Type					
		Benthic/Demersal Stages			Pelagic Stages		
		Riverine	Estuarine/ Nearshore	Marine/ Offshore	Riverine	Estuarine/ Nearshore	Marine/ Offshore
Wave/Tidal Energy Facilities	Habitat conversion	H	H	M	M	M	M
	Loss of benthic habitat	H	H	M	M	M	L
	Siltation/sedimentation/turbidity	M	H	M	M	M	L
	Resuspension of contaminants	M	M	L	M	M	L
	Alteration of hydrological regimes	M	M	M	M	H	L
	Altered current patterns	M	M	M	M	H	M
	Entrainment/impingement	M	M	L	H	H	M
	Impacts to migration	M	M	L	H	M	L
	Electromagnetic fields	L	L	L	L	L	L
Cables and Pipelines	Loss of benthic habitat	H	H	M	L	M	L
	Habitat conversion	H	H	M	M	M	M
	Siltation/sedimentation/turbidity	M	H	M	M	M	M
	Resuspension of contaminants	H	H	M	M	M	M
	Altered current patterns	M	M	M	L	M	L
	Alteration of electromagnetic fields	L	L	L	L	L	L
	Underwater noise	L	L	L	L	M	M
	Alteration of community structure	M	M	M	M	M	M
	Erosion around structure	L	M	M	L	M	M
	Biocides from hydrostatic testing	M	M	M	M	M	M
	Spills associated w/ service structure	H	H	M	M	M	M
	Physical barriers to habitat	H	H	H	L	L	L
	Impacts to submerged aquatic vegetation	M	H	M	M	M	L
	Water withdrawal	M	M	L	H	H	L
	Impacts from construction activities	M	H	H	M	M	M
	Impact from maintenance activities	M	M	M	L	M	M
	Thermal impacts associated with cables	L	L	L	L	L	L
	Impacts associated with armoring of pipe	M	M	M	L	L	L
	Impacts to migration	H	H	H	L	L	L

Table 12. Habitat Impact Categories in Alteration of Freshwater Systems Workshop Session (N=13)

Activity Type	Potential Effects	Habitat Impact Categories					
		Life History/Ecosystem Type					
		Benthic/Demersal Stages			Pelagic Stages		
		Riverine	Estuarine/ Nearshore	Marine/ Offshore	Riverine	Estuarine/ Nearshore	Marine/ Offshore
Dam Construction/ Operation	Impaired fish passage	H	H	L	H	H	L
	Altered hydrological regimes	H	H	L	H	M	L
	Altered temperature regimes	H	H	L	H	M	L
	Altered sediment/woody debris transport	H	M	L	H	M	L
	Altered stream morphology	H	M	L	H	M	L
	Altered stream bed characteristics	H	M	L	H	M	L
	Reduced dissolved oxygen	H	M	L	H	M	L
	Alteration of extent of tide	H	H	L	H	H	L
	Alteration of wetlands	H	H	L	H	H	L
	Change in species communities	H	M	L	H	M	L
	Bank erosion because of drawdown	M	L	L	M	L	L
	Riparian zone development	H	M	L	H	M	L
	Acute temperature shock	H	M	L	H	M	L
Dam Removal	Release of contaminated sediments	H	H	L	H	M	L
	Alteration of wetlands	H	M	L	H	M	L
Stream Crossings	Impacts to fish passage	H	M	L	H	M	L
	Alteration of hydrological regimes	H	M	L	H	M	L
	Bank erosion	H	L	L	M	L	L
	Habitat conversion	H	M	L	H	M	L
Water Withdrawal/ Diversion	Entrainment and impingement	M	M	L	H	M	L
	Impaired fish passage	H	H	L	H	H	L
	Altered hydrological regimes	H	M	L	H	M	L
	Reduced dissolved oxygen	H	M	L	H	M	L
	Altered temperature regimes	H	H	L	H	M	L
	Release of nutrients/eutrophication	H	M	L	H	M	L
	Release of contaminants	H	M	L	H	M	L
	Altered stream morphology	H	L	L	H	M	L
	Altered stream bed characteristics	H	M	L	H	M	L
	Siltation/sedimentation/turbidity	H	M	L	H	M	L
	Change in species communities	H	M	L	H	H	L
	Alteration in groundwater levels	H	L	L	H	L	L
	Loss of forested/palustrine wetlands	H	L	L	H	L	L
	Impacts to water quality	H	M	L	H	M	L
	Loss of flood storage	M	L	L	M	L	L

Table 12 (Continued). Habitat Impact Categories in Alteration of Freshwater Systems Workshop Session (N=13)

Activity Type	Potential Effects	Habitat Impact Categories					
		Life History/Ecosystem Type					
		Benthic/Demersal Stages			Pelagic Stages		
		Riverine	Estuarine/ Nearshore	Marine/ Offshore	Riverine	Estuarine/ Nearshore	Marine/ Offshore
Dredging and Filling, Mining	Reduced flood water retention	H	M	L	H	M	L
	Reduced nutrient uptake and release	M	M	L	M	M	L
	Reduced detrital food source	H	M	L	M	M	L
	Altered hydrological regimes	H	M	L	H	M	L
	Increased storm water runoff	H	M	L	H	M	L
	Loss of riparian and riverine habitat	H	M	L	H	M	L
	Altered stream morphology	H	M	L	H	L	L
	Altered stream bed characteristics	H	M	L	H	M	L
	Siltation/sedimentation/turbidity	H	M	L	H	M	L
	Reduced dissolved oxygen	H	M	L	H	M	L
	Altered temperature regimes	H	M	L	H	M	L
	Release of nutrients/eutrophication	H	M	L	H	H	L
	Release of contaminants	H	M	L	H	M	L
	Loss of submerged aquatic vegetation	H	H	L	H	H	L
	Change in species communities	H	H	L	H	M	L

THIS SPACE INTENTIONALLY LEFT BLANK.

Table 13. Habitat Impact Categories in Marine Transportation Workshop Session (N=18)

Activity Type	Potential Effects	Habitat Impact Categories					
		Life History/Ecosystem Type					
		Benthic/Demersal Stages			Pelagic Stages		
		Riverine	Estuarine/ Nearshore	Marine/ Offshore	Riverine	Estuarine/ Nearshore	Marine/ Offshore
Construction and Expansion of Ports and Marinas	Loss of benthic habitat	H	H	H	M	M	M
	Siltation/sedimentation/turbidity	H	H	M	M	M	M
	Contaminant releases	H	H	M	M	H	M
	Altered hydrological regimes	H	H	L	H	H	L
	Altered tidal prism	M	H	L	M	H	L
	Altered current patterns	M	M	L	M	M	L
	Altered temperature regimes	H	M	L	H	M	L
	Loss of wetlands	H	H	L	H	H	L
	Underwater blasting/noise	M	M	L	M	M	M
	Loss of submerged aquatic vegetation	H	H	M	H	H	M
	Conversion of substrate/habitat	H	H	M	M	M	M
	Loss of intertidal flats	H	H	L	L	M	L
	Loss of water column	M	M	L	H	H	L
	Altered light regime	M	M	L	M	M	L
	Derelict structures	M	M	L	M	M	L
Operations and Maintenance of Ports and Marinas	Contaminant releases	H	H	M	M	M	M
	Storm water runoff	H	H	M	M	M	L
	Underwater noise	M	M	L	M	M	L
	Alteration of light regimes	M	M	L	M	M	L
	Derelict structures	M	M	L	L	L	L
	Mooring impacts	M	M	L	L	L	L
	Release of debris	M	M	L	M	L	L
Operation and Maintenance of Vessels	Impacts to benthic habitat	H	H	L	M	M	L
	Resuspension of bottom sediments	M	M	L	M	M	L
	Erosion of shorelines	M	M	L	M	M	L
	Contaminant spills and discharges	M	H	M	M	H	M
	Underwater noise	M	M	M	M	M	M
	Derelict structures	M	M	L	L	L	L
	Increased air emissions	L	L	L	L	L	L
	Release of debris	M	M	L	L	L	L
Navigation Dredging	Conversion of substrate/habitat	H	H	M	M	M	L
	Loss of submerged aquatic vegetation	H	H	M	H	H	L
	Siltation/sedimentation/turbidity	H	H	M	H	M	L
	Contaminant releases	H	H	M	M	M	M
	Release of nutrients/eutrophication	M	M	M	M	M	L
	Entrainment and impingement	M	M	M	M	M	L
	Underwater blasting/noise	M	M	L	M	M	L
	Altered hydrological regimes	H	H	L	H	M	L
	Altered tidal prism	M	M	L	M	M	L
	Altered current patterns	M	M	L	M	M	L
	Altered temperature regimes	H	H	L	M	M	L
	Loss of intertidal flats	H	H	L	H	H	L
	Loss of wetlands	H	H	L	H	H	L
	Contaminant source exposure	M	M	M	M	M	L

Table 14. Habitat Impact Categories in Offshore Dredging and Disposal Workshop Session (N=22)

Activity Type	Potential Effects	Habitat Impact Categories					
		Life History/Ecosystem Type					
		Benthic/Demersal Stages			Pelagic Stages		
		Riverine	Estuarine/ Nearshore	Marine/ Offshore	Riverine	Estuarine/ Nearshore	Marine/ Offshore
Offshore Mineral Mining	Loss of benthic habitat types	L	L	H	L	L	M
	Conversion of substrate/habitat	L	L	H	L	L	L
	Siltation/sedimentation/turbidity	L	L	M	L	L	M
	Changes in bottom topography	L	L	M	L	L	L
	Changes in sediment composition	L	L	H	L	L	L
	Sediment transport from site (erosion)	L	L	M	L	L	L
	Impacts to water quality	L	L	M	L	L	M
	Release of contaminants	L	L	M	L	L	M
	Change in community structure	L	L	H	L	L	M
	Changes in water flow	L	L	M	L	L	M
	Noise impacts	L	L	L	L	L	M
Petroleum Extraction	Contaminant releases	L	L	H	L	L	H
	Drilling mud impacts	L	L	H	L	L	H
	Siltation/sedimentation/turbidity	L	L	M	L	L	M
	Release of debris	L	L	M	L	L	L
	Noise impacts	L	L	M	L	L	M
	Changes in light regimes	L	L	M	L	L	M
	Habitat conversion	L	L	M	L	L	M
	Pipeline installation	L	L	M	L	L	L
Offshore Dredge Material Disposal	Burial/disturbance of benthic habitat	L	M	H	L	L	M
	Conversion of substrate/habitat	L	L	H	L	L	M
	Siltation/sedimentation/turbidity	L	L	M	L	L	M
	Release of contaminants	L	L	M	L	L	M
	Release of nutrients/eutrophication	L	L	M	L	L	M
	Altered hydrological regimes	L	L	M	L	L	M
	Altered current patterns	L	L	M	L	L	M
	Changes in bottom topography	L	L	M	L	L	L
	Changes in sediment composition	L	L	H	L	L	L
	Changes in water bathymetry	L	L	M	L	L	L
Fish Waste Disposal	Introduction of pathogens	L	L	H	L	L	H
	Release of nutrients/eutrophication	L	L	H	L	L	H
	Release of biosolids	L	L	H	L	L	M
	Loss of benthic habitat types	L	L	H	L	L	L
	Behavioral affects	L	L	M	L	L	M
Vessel Disposal	Release of contaminants	L	L	M	L	L	M
	Conversion of substrate/habitat	L	L	H	L	L	M
	Changes in bathymetry	L	L	M	L	L	L
	Changes in hydrodynamics	L	L	M	L	L	M
	Changes in community structure	L	L	H	L	L	M
	Impacts during deployment	L	L	M	L	L	M
	Release of debris	L	L	M	L	L	L

Table 15. Habitat Impact Categories in Chemical Effects: Water Discharge Facilities Workshop Session (N=19)

Activity Type	Potential Effects	Habitat Impact Categories					
		Life History/Ecosystem Type					
		Benthic/Demersal Stages			Pelagic Stages		
		Riverine	Estuarine/ Nearshore	Marine/ Offshore	Riverine	Estuarine/ Nearshore	Marine/ Offshore
Sewage Discharge Facilities	Release of nutrients/eutrophication	H	H	H	H	H	H
	Release of contaminants	H	H	H	H	H	H
	Impacts to submerged aquatic	H	H	M	H	H	M
	Reduced dissolved oxygen	H	H	M	H	H	M
	Siltation/sedimentation/turbidity	H	H	M	H	H	M
	Impacts to benthic habitat	H	H	M	M	M	M
	Changes in species composition	H	H	M	H	H	M
	Trophic level alterations	H	H	M	H	H	M
	Introduction of pathogens	H	H	M	M	H	M
	Introduction of harmful algal blooms	H	H	H	H	H	M
	Bioaccumulation/biomagnification	H	H	H	H	H	M
	Behavioral avoidance	M	H	M	M	H	M
	Release of pharmaceuticals	M	M	M	M	M	M
Industrial Discharge Facilities	Alteration of water alkalinity	H	M	M	M	M	L
	Release of metals	H	H	M	M	M	M
	Release of chlorine compounds	H	H	M	H	H	M
	Release of pesticides	H	H	M	H	H	M
	Release of organic compounds	H	H	H	M	H	M
	Release of petroleum products	H	H	M	M	H	M
	Release of inorganic compounds	H	H	M	H	H	M
	Release of organic wastes	M	M	M	M	M	M
	Introduction of pathogens	M	M	M	M	M	M
Combined Sewer Overflows	Potential for all of the above effects	H	H	H	H	H	H

Table 16. Habitat Impact Categories in Physical Effects: Water Intake and Discharge Facilities Workshop Session (N=11)

Activity Type	Potential Effects	Habitat Impact Categories					
		Life History/Ecosystem Type					
		Benthic/Demersal Stages			Pelagic Stages		
		Riverine	Estuarine/ Nearshore	Marine/ Offshore	Riverine	Estuarine/ Nearshore	Marine/ Offshore
Discharge Facilities	Scouring of substrate	M	M	L	L	L	L
	Turbidity/sedimentation	H	H	M	M	M	L
	Alteration of sediment composition	H	H	M	L	L	L
	Reduced dissolved oxygen	H	H	M	H	H	L
	Alteration of salinity regimes	H	H	L	H	H	M
	Alteration of temperature regimes	H	H	M	H	H	M
	Conversion/loss of habitat	M	M	M	M	M	M
	Habitat exclusion/avoidance	H	H	L	H	H	L
	Restrictions to migration	H	H	L	H	H	L
	Acute toxicity	M	H	M	H	H	M
	Behavioral changes	M	M	L	M	M	L
	Cold shock	M	M	M	H	M	L
	Stunting of growth in fishes	M	M	L	M	M	L
	Attraction to flow	H	H	M	H	H	M
	Alteration of community structure	H	H	M	H	H	M
	Changes in local current patterns	M	M	L	M	M	L
	Physical/chemical synergies	M	H	M	M	M	M
	Increased need for dredging	H	H	L	H	H	L
	Ballast water discharge	H	H	M	M	M	M
	Gas-bubble disease/mortality	M	M	L	M	H	L
	Release of radioactive wastes	H	H	M	H	H	M
Intake Facilities	Entrainment/impingement	H	H	H	H	H	H
	Alteration of hydrological regimes	H	H	M	H	H	L
	Flow restrictions	H	H	L	H	H	L
	Construction related impacts	H	M	M	M	M	M
	Conversion/loss of habitat	H	H	M	H	H	M
	Seasonal loss of habitat	M	M	L	M	M	M
	Backwash (cleaning of system)	M	M	L	M	M	L
	Alteration of community structure	H	H	L	H	H	L
	Increased need for dredging	H	H	M	H	H	L
	Ballast water intake	H	H	M	H	H	M

Table 17. Habitat Impact Categories in Agriculture and Silviculture Workshop Session (N=11)

Activity Type	Potential Effects	Habitat Impact Categories					
		Life History/Ecosystem Type					
		Benthic/Demersal Stages			Pelagic Stages		
		Riverine	Estuarine/ Nearshore	Marine/ Offshore	Riverine	Estuarine/ Nearshore	Marine/ Offshore
Cropland, Rangelands, Livestock, and Nursery Operations	Release of nutrients/eutrophication	H	H	L	H	H	L
	Bank/soil erosion	H	H	L	M	M	L
	Altered temperature regimes	M	M	L	M	M	L
	Siltation/sedimentation/turbidity	H	H	L	H	H	L
	Altered hydrological regimes	M	M	L	M	M	L
	Entrainment and impingement	M	L	L	H	L	L
	Impaired fish passage	M	L	L	H	M	L
	Reduced soil infiltration	M	L	L	M	L	L
	Release of pesticides	H	H	L	H	M	L
	Reduced dissolved oxygen	H	M	L	H	M	L
	Soil compaction	M	M	L	M	L	L
	Loss/alteration of wetlands	H	H	L	M	M	L
	Land-use change (post agriculture)	H	M	L	H	M	L
	Introduction of invasive species	M	M	L	M	L	L
	Introduction of pathogens	H	M	L	M	M	L
	Endocrine disruptors	H	H	L	H	H	L
	Change of community structure	M	M	L	M	M	L
	Change in species composition	H	M	L	M	M	L
Silviculture and Timber Harvest Activities	Reduced soil infiltration	M	M	L	M	L	L
	Siltation/sedimentation/turbidity	H	M	L	H	M	L
	Altered hydrological regimes	M	M	L	M	M	L
	Impaired fish passage	M	L	L	H	M	L
	Bank/soil erosion	H	M	L	H	M	L
	Altered temperature regimes	H	M	L	H	M	L
	Release of pesticides	H	H	L	H	H	L
	Release of nutrients/eutrophication	H	H	L	H	H	L
	Reduced dissolved oxygen	H	M	L	H	M	L
	Loss/alteration of wetlands	H	M	L	H	M	L
	Soil compaction	M	L	L	M	L	L
Timber and Paper Mill Processing Activities	Chemical contaminant releases	H	H	L	H	H	L
	Entrainment and impingement	M	L	L	H	M	L
	Thermal discharge	H	L	L	M	L	L
	Reduced dissolved oxygen	H	M	L	H	M	L
	Conversion of benthic substrate	H	M	L	M	L	L
	Loss/alteration of wetlands	M	M	L	M	M	L
	Alteration of light regimes	M	L	L	M	L	L

Table 18. Habitat Impact Categories in Introduced/Nuisance Species and Aquaculture Workshop Session (N=14)

Activity Type	Potential Effects	Habitat Impact Categories					
		Life History/Ecosystem Type					
		Benthic/Demersal Stages			Pelagic Stages		
		Riverine	Estuarine/ Nearshore	Marine/ Offshore	Riverine	Estuarine/ Nearshore	Marine/ Offshore
Introduced/ Nuisance Species	Habitat alterations	H	H	M	M	M	M
	Trophic alterations	M	H	M	M	M	M
	Gene pool alterations	H	H	M	H	H	M
	Alterations of communities	H	H	M	M	H	M
	Introduced diseases	M	H	M	M	H	M
	Changes in species diversity	H	H	H	H	H	M
	Alteration in health of native species	M	M	M	M	M	M
	Impacts to water quality	M	M	M	M	M	M
Aquaculture	Discharge of organic waste	M	H	M	M	M	M
	Seafloor impacts	M	H	M	M	M	M
	Introduction of exotic invasive species	H	H	M	M	H	M
	Food web impacts	H	H	M	H	H	M
	Gene pool alterations	H	H	M	H	M	M
	Impacts to water column	M	M	M	M	H	M
	Impacts to water quality	M	H	L	M	H	M
	Changes in species diversity	M	H	M	M	H	M
	Sediment deposition	H	H	M	L	L	L
	Introduction of diseases	M	H	M	M	M	M
	Habitat replacement/exclusion	H	H	M	M	M	L
	Habitat conversion	H	H	M	M	H	M

Table 19. Habitat Impact Categories in Global Effects and Other Impacts Workshop Session (N=17)

Activity Type	Potential Effects	Habitat Impact Categories					
		Life History/Ecosystem Type					
		Benthic/Demersal Stages			Pelagic Stages		
		Riverine	Estuarine/ Nearshore	Marine/ Offshore	Riverine	Estuarine/ Nearshore	Marine/ Offshore
Climate Change	Alteration of hydrological regimes	H	H	M	H	H	H
	Alteration of temperature regimes	H	H	H	H	H	H
	Changes in dissolved oxygen	H	H	M	H	H	M
	Nutrient loading/eutrophication	M	H	M	M	M	M
	Release of contaminants	H	H	M	M	M	M
	Bank/soil erosion	H	M	L	M	M	L
	Alteration in salinity	M	H	M	M	H	M
	Alteration of weather patterns	H	H	M	H	H	H
	Alteration of alkalinity	M	M	M	M	M	M
	Changes in community structure	H	H	H	H	H	H
	Changes in ocean/coastal use	M	M	M	M	M	M
	Changes in ecosystem structure	M	H	L	M	H	L
	Loss of wetlands	H	H	L	H	H	L
Ocean Noise	Mechanical injury to organisms	M	M	H	M	M	H
	Impacts to feeding behavior	M	M	M	M	M	M
	Impacts to spawning behavior	M	M	M	M	M	M
	Impacts to migration	M	M	M	M	M	M
	Exclusion of organisms to habitat	M	M	M	M	M	M
	Changes in community structure	M	M	M	M	M	M
Atmospheric Deposition	Nutrient loading/eutrophication	H	H	M	H	H	M
	Mercury loading/bioaccumulation	H	H	M	H	H	H
	Polychlorinated biphenyls and other	H	H	M	H	H	M
	Alteration of ocean alkalinity	M	M	M	M	M	M
	Alteration of climatic cycle	M	M	M	M	M	M
Military/ Security Activities	Exclusion of organisms to habitat	L	L	M	L	M	M
	Noise impacts	M	M	M	M	M	H
	Chemical releases	M	H	M	M	M	M
	Impacts to tidal/intertidal habitats	M	M	L	L	M	L
	Blasting injuries from ordinances	M	M	M	M	M	M
Natural Disasters and Events	Loss/alteration of habitat	H	H	M	H	H	M
	Impacts to habitat from debris	M	M	M	M	M	L
	Impacts to water quality	M	H	M	H	H	M
	Impacts from emergency response	M	M	L	M	M	L
	Alteration of hydrological regimes	M	M	M	M	M	L
	Changes in community composition	M	H	M	M	M	M
	Underwater landslides	L	L	M	L	L	M
Electromag-netic Fields	Changes to migration of organisms	M	M	M	M	M	M
	Behavioral changes	M	M	M	M	M	M
	Changes in predator/prey	L	M	M	M	M	M

6.3.4.6 Conclusions, recommendations, and research needs

The purpose of this section is to synthesize the information included in Johnson et al. (2008) and to identify topics for future research. In addition, the participants of the technical workshop identified non-fishing activities and effects that are known or suspected to have adverse impacts on fisheries habitat. We have attempted to draw some conclusions, based upon the results of the impact and effects scores, on those activities and effects that deserve further scrutiny and discussion. While many of these activities and effects clearly have direct, adverse impacts on the quantity and quality of fisheries habitat, their effects at the population and ecosystem level are generally poorly understood or unknown. For example, the Gulf of Maine contains a number of ports and harbors that are documented to be the most contaminated sites in U.S. coastal waters for polycyclic aromatic hydrocarbons, chlorinated hydrocarbons, and trace metals (Buchsbaum 2005). Although the effects of these pollutants at the cellular, physiological and whole organism level have been documented, little information on the effects at the population and ecosystem level is available.

There were some notable results from the technical workshop on non-fishing impacts, particularly in the geographic areas that were scored high for some impact types and effects. As one might expect, the workshop participants considered impacts on fisheries habitats from non-fishing activities to be generally focused in the nearshore coastal areas. Except for the Offshore Dredging and Disposal session, the majority of the high-scoring impact types and effects in each session were in the riverine and estuarine/nearshore ecosystems. These results are not particularly surprising considering the proximity of riverine and nearshore habitats to industrial facilities and shipping and human coastal development. However, one should not conclude from these results that species inhabiting offshore habitats are not susceptible to non-fishing impacts. Estuarine and wetland dependent fish and shellfish species account for about 75 percent of the total annual seafood harvest of the U.S. (Dahl 2006). Rivers, estuaries and coastal embayments are essential for fisheries because they serve as nurseries for the juvenile stages of species harvested offshore or for the prey of commercially important species (Deegan and Buchsbaum 2005).

One interesting result from the Energy-Related Activities workshop session was the high scores for oil spill effects in all ecosystems and life history stages/strategies for the Petroleum Exploration and Production impact type. Currently, there are no petroleum exploration or production activities along the east coast of the U.S. However, based upon the workshop results, the workshop participants considered oil spills to have a high potential for adverse effects to coastal ecosystems in the northeast region of the U.S. Should petroleum exploration and production be proposed in the northeast region, considerable work would likely be necessary to assess the potential effects these activities may have on coastal ecosystems.

Although nearly all impact types and effects were scored high for the riverine ecosystem in the Alterations to Freshwater Systems workshop session, several were also scored as high in the estuarine/nearshore ecosystem. For example, impaired fish passage and altered temperature regimes were scored high for riverine and estuarine/nearshore ecosystem in both dam construction/operation and water withdrawal impact types, suggesting that the participants viewed these activities and effects to have broad ecosystem impacts.

Most impact types and effects in the both the chemical and physical effects workshop sessions were scored high in the both riverine and estuarine/nearshore ecosystems. However, some of these impact types and effects were also scored high in the marine/offshore ecosystem. For the chemical effects session, the release of nutrients/eutrophication, release of contaminants, introduction of harmful algal blooms, contaminant bioaccumulation/biomagnification, and all effects under combined sewer overflows impact type were scored high in all ecosystem types. The concern of the workshop participants regarding impacts to coastal resources due to eutrophication and pollution reflect some recently published assessments on threats to coastal habitats (USEPA 2004; Deegan and Buchsbaum 2005; Lotze et al. 2006). The National Coastal Condition Report (USEPA 2004) assessed the coastal water condition in the northeast to be the poorest in the nation, with 19 percent of estuarine waters in poor condition and another 42 percent in fair condition. One of the primary factors contributing to poor water condition in the northeast region is poor water quality, which is typically caused by high total nitrogen loading, low dissolved oxygen concentrations, and poor water clarity. In the northeast region, the contributing factors associated with nutrient enrichment are principally high human population density and, in the Mid-Atlantic states, agriculture (USEPA 2004). Harmful algal blooms (HABs) have been associated with eutrophication of coastal waters, which can deplete oxygen in the water, result in hypoxia or anoxia, and lead to large-scale fish kills (Deegan and Buchsbaum 2005). HABs may also contain species of algae that produce toxins, such as red tides, that can decimate large numbers of fish, contaminate shellfish species, and cause health problems in humans. The extent and severity of coastal eutrophication and HABs will likely continue, and may worsen, as coastal human population density increases. Considerable attention should be focused on the effects of eutrophication on populations of fisheries and the role of natural versus anthropogenic sources of nutrients in the occurrence of HABs.

For the physical effects session, entrainment and impingement effects were scored as high in all ecosystem types by the participants. Entrainment and impingement of eggs, larvae, and juvenile fish and shellfish is increasingly being identified as a potential threat to fishery populations from a wide variety of activities, including industrial and municipal water intake facilities, electric power generating facilities, and liquefied natural regassification facilities (Hanson *et al.* 1977; Travnichek *et al.* 1993; Richkus and McLean 2000; Deegan and Buchsbaum 2005). Future research is needed to assess the long-term effects of entrainment and impingement on fish stocks.

The participants of the Global Effects and Other Impacts workshop session scored most impact types and effects in the estuarine/nearshore ecosystem as high. However, several effects in the climate change impact were scored high for all ecosystems, including alteration of temperature and hydrological regimes, alteration in weather patterns and changes in community structure. Although the effects of climate change on fisheries have not been the focus of intense discussion and research, we believe that greater emphasis on this topic will be necessary as the effects of global warming become more pronounced (Bigford 1991; Lotze et al. 2006).

A number of activities and effects were identified during the workshop and preparation of this report that may be substantial threats to fisheries habitat, but lack a thorough understanding of the problem and implications to aquatic ecosystems. Some of these activities and effects are relatively recent issues, such as the effects of endocrine disrupting chemicals on aquatic organisms and threats to fisheries habitat from global warming, and will require additional research to better understand the mechanism and scope of the problem. However, other activities and effects such as sedimentation impacts on benthic habitats and biota have been the focus of considerable research and attention, but questions remain as to the lethal and sub-lethal thresholds of sedimentation on individual species and its effect on populations. For example, the demersal and adhesive eggs of winter flounder are known to be adversely effected by burial from sediments during navigation channel dredging (Berry *et al.* 2004; Klein-MacPhee *et al.* 2004; Wilber *et al*. 2005). However, a better understanding of the upper lethal limits for sediment depth and the duration of burial is needed. In addition, how does grain size and contaminated sediments affect egg and larvae survival, how do natural suspended sediment concentration levels effect egg and larvae survival rates, and what are the implications at the population level?

A number of energy-related activities were assessed for adverse effects on fisheries habitat in the technical workshop and in the Energy Related Activities chapter, including offshore liquefied natural gas platforms, wind turbines, and wave and tidal energy facilities. Although various impacts were discussed, there have not been any facilities of this type constructed in the northeast region of the U.S. at the time of this report. While we believe the assessments of these types of facilities are based upon the best available information, further monitoring and assessments will be necessary when, and if, they are constructed.

The workshop participants identified a number of chemical effects in several sessions that may have a high degree of impact on fisheries habitat, such as endocrine disrupting chemicals and pharmaceuticals in treated wastewater. Personal care products (PPCPs) can persist in treated wastewater and have been found in natural surface waters at very high concentrations (parts per thousand (USEPA 1999). Unfortunately, few PPCPs have associated aquatic toxicity data, and are extremely persistent in the environment and are introduced into surface waters in very high concentrations (USEPA 1999). Some of these PPCPs include steroid compounds, which may be endocrine disruptors. Endocrine disruptors can mimic the functions of sex hormones, androgen and estrogen, and can interfere with reproductive functions and potentially result in population-level impacts. Some chemicals shown to be estrogenic include PCB congeners, pesticides (e.g., dieldrin, DDT), and compounds used in some industrial manufacturing (e.g., phthalates, alkylphenols) (Thurberg and Gould 2005). In addition, some heavy metal compounds have also been implicated in disrupting endocrine secretions of marine organisms (Brodeur *et al.* 1997). Additional investigation into the effects of PPCPs and endocrine disruptors on aquatic organisms and their potential impacts at the population and ecosystem level are needed.

In addition, the workshop participants identified a number of adverse effects on aquatic ecosystems from introduced/nuisance species, particularly in the estuarine/nearshore ecosystem. Introduction of non-native invasive species into marine and estuarine waters are a significant threat to living marine resources in the U.S. (Carlton 2001). Non-native species introductions occur through a wide range of activities, including ballast water releases from ships, aquaculture operations, fish stocking and pest control programs, and aquarium discharges (Hanson et al. 2003; Niimi 2004). The rate of introductions has increased exponentially over the past 200 years and it does not appear that this rate will level off in the near future (Carlton 2001). Increased research focused towards reducing the rate of non-native species introductions is needed, in addition to a better understanding as to the potential effects of non-native species on commercial fisheries in the U.S.

Overfishing is likely the greatest factor in the decline of groundfish species in New England (Buchsbaum 2005), and is responsible for the majority of species depletions and extinctions worldwide (Lotze *et al.* 2006). However, habitat loss and degradation (including pollution, eutrophication, and sedimentation) closely follows exploitation as a causative agent in fishery declines, and may be equally or more important for some species such as Atlantic salmon

(Buchsbaum 2005; Lotze *et al.* 2006). Cumulative effects likely play a role in a large majority of historic changes in fish stocks. Worldwide, nearly half of all marine and estuarine species depletions and extinctions have been attributed to multiple human impacts, most notably exploitation and habitat loss (Lotze *et al.* 2006). It is imperative that reduced exploitation, habitat protection, and improved water quality must be applied holistically, and the cumulative effects of multiple human interactions should be considered in both management and conservation strategies (Lotze *et al.* 2006).

There is no direct evidence for which of the above mentioned impacts may have the greatest potential to adversely impact spiny dogfish EFH. In terms of conservation recommendations, the Council would recommend collaborative efforts by all responsible parties to mitigate any negative effects for the above types of activities and recommends further research to identify which of the above activities, or other non-fishing activities, could pose the most risk to habitats utilized by spiny dogfish.

6.2.3 Fishery Impact Considerations (Spiny Dogfish Fishery Impact on EFH for Other Species)

UNDER CONSTRUCTION

6.3 ESA Listed Species and MMPA Protected Species

There are numerous species that inhabit the environment within the Spiny Dogfish FMP management unit, and that therefore potentially occur in the operations area of the spiny dogfish fisheries, that are afforded protection under the Endangered Species Act of 1973 (ESA; i.e., for those designated as threatened or endangered) and/or the Marine Mammal Protection Act of 1972 (MMPA), and are under NMFS' jurisdiction. Seventeen species are classified as endangered or threatened under the ESA, three others are candidate species under the ESA, while the remainder are protected by the provisions of the MMPA.

6.3.1 Species Present in the Area

Table 20 lists the species, protected either by the ESA, the MMPA, or both, that may be found in the environment that would be utilized by the fishery. Table 20 also includes three candidate fish species as identified under the ESA. Candidate species are those petitioned species that are actively being considered for listing as endangered or threatened under the ESA, as well as those species for which NMFS has initiated an ESA status review that it has announced in the Federal Register.

Table 20. Species protected under the Endangered Species Act and Marine Mammal Protection Act that may occur in the operations area for the groundfish fishery.[a]

Species	Status
Cetaceans	
North Atlantic right whale (*Eubalaena glacialis*)	**Endangered**
Humpback whale (*Megaptera novaeangliae*)	**Endangered**
Fin whale (*Balaenoptera physalus*)	**Endangered**
Sei whale (*Balaenoptera borealis*)	**Endangered**
Blue whale (*Balaenoptera musculus*)	**Endangered**
Sperm whale (*Physeter macrocephalus*	**Endangered**
Minke whale (*Balaenoptera acutorostrata*)	**Protected**
Pilot whale (*Globicephala spp*.)	**Protected**
Risso's dolphin (*Grampus griseus*)	**Protected**
Atlantic white-sided dolphin (*Lagenorhynchus acutus*)	**Protected**
Common dolphin (*Delphinus delphis*)	**Protected**
Spotted dolphin (*Stenella frontalis*)	**Protected**
Bottlenose dolphin (*Tursiops truncatus*)[b]	**Protected**
Harbor porpoise (*Phocoena phocoena*)	**Protected**
Sea Turtles	
Leatherback sea turtle (*Dermochelys coriacea*)	**Endangered**
Kemp's ridley sea turtle (*Lepidochelys kempii*)	**Endangered**
Green sea turtle (*Chelonia mydas*)	**Endangered[c]**
Loggerhead sea turtle (*Caretta caretta*) Northwest Atlantic DPS	**Threatened**
Hawksbill sea turtle (*Eretmochelys imbricate*)	**Endangered**
Fish	
Shortnose sturgeon (*Acipenser brevirostrum*)	**Endangered**
Atlantic salmon (*Salmo salar*)	**Endangered**
Atlantic sturgeon *(Acipenser oxyrinchus)*	
Gulf of Maine DPS	**Threatened**
New York Bight DPS	**Endangered**
Chesapeake Bay DPS	**Endangered**
Carolina DPS	**Endangered**
South Atlantic DPS	**Endangered**
Cusk *(Brosme brosme)*	**Candidate**
Alewife (*Alosa pseudo harengus*)	**Candidate**
Blueback herring (*Alosa aestivalis*)	**Candidate**
Pinnipeds	
Harbor seal (*Phoca vitulina*)	**Protected**
Gray seal (*Halichoerus grypus*)	**Protected**
Harp seal (*Phoca groenlandicus*)	**Protected**
Hooded seal (*Cystophora cristata*)	**Protected**

Notes:

[a] MMPA-listed species occurring on this list are only those species that have a history of interaction with similar gear types within the action area of the Northeast Multispecies Fishery, as defined in the 2012 List of Fisheries.

[b] Bottlenose dolphin (*Tursiops truncatus*), Western North Atlantic coastal stock is listed as depleted.

[c] Green turtles in U.S. waters are listed as threatened except for the Florida breeding population which is listed as endangered. Due to the inability to distinguish between these populations away from the nesting beach, green turtles are considered endangered wherever they occur in U.S. waters.

A status review for Atlantic sturgeon was completed in 2007 which indicated that five distinct population segments (DPS) of Atlantic sturgeon exist in the United States (ASSRT 2007). On October 6, 2010, NMFS proposed listing these five DPSs of Atlantic sturgeon along the U.S. East Coast as either threatened or endangered species (75 FR 61872 and 75 FR 61904). A final listing was published on February 6th, 2012 (77 FR 5880 and 75 FR 5914). The GOM DPS of Atlantic sturgeon has been listed as threatened, and the New York Bight, Chesapeake Bay, Carolina, and South Atlantic DPSs of Atlantic sturgeon have been listed as endangered. Atlantic sturgeon from any of the five DPSs could occur in areas where the multispecies fishery operates.

Candidate species receive no substantive or procedural protection under the ESA; however, NMFS recommends that project proponents consider implementing conservation actions to limit the potential for adverse effects on candidate species from any proposed project. NMFS has initiated review of recent stock assessments, bycatch information, and other information for these candidate and proposed species. The results of those efforts are needed to accurately characterize recent interactions between fisheries and the candidate/proposed species in the context of stock sizes. Any conservation measures deemed appropriate for these species will follow the information reviews. Please note that once a species is proposed for listing the conference provisions of the ESA apply (see 50 CFR 402.10).

6.3.2 Species Potentially Affected by the Spiny Dogfish Fishery

The spiny dogfish fishery has the potential to affect the sea turtle, cetacean, and pinniped species discussed below. A number of documents contain background information on the range-wide status of sea turtle and marine mammal species that occur in the area and are known or suspected of interacting with fishing gear (demersal gear including trawls, gillnets, and bottom longlines). These documents include sea turtle status reviews and biological reports (NMFS and USFWS 1995; Turtle Expert Working Group 1998, 2000, 2007, 2009; NMFS and USFWS 2007a, 2007b, recovery plans for ESA-listed cetaceans and sea turtles (NMFS 1991, 2005; NMFS and USFWS 1991a, 1991b; NMFS and USFWS 1992), the marine mammal stock assessment reports (e.g., Waring et al. 1995---2011), and other publications (e.g., Clapham et al. 1999, Perry et al. 1999, Best et al. 2001, Perrin et al. 2002).

6.3.2.1 Sea Turtles

Loggerhead, leatherback, Kemp's ridley, and green sea turtles occur seasonally in southern New England and Mid-Atlantic continental shelf waters north of Cape Hatteras, North Carolina. Turtles generally move up the coast from southern wintering areas as water temperatures warm in the spring (James et al. 2005, Morreale and Standora 2005, Braun-McNeill and Epperly 2004, Morreale and Standora 1998, Musick and Limpus 1997, Shoop and Kenney 1992, Keinath et al. 1987). A reversal of this trend occurs in the fall when water temperatures cool. Turtles pass Cape Hatteras by December and return to more southern waters for the winter (James et al. 2005, Morreale and Standora 2005, Braun-McNeill and Epperly 2004, Morreale and Standora 1998, Musick and Limpus 1997, Shoop and Kenney 1992, Keinath et al. 1987). Hard-shelled species typically occur as far north as Cape Cod whereas the more cold-tolerant leatherbacks occur in more northern Gulf of Maine waters in the summer and fall (Shoop and Kenney 1992, STSSN database http://www.sefsc.noaa.gov/seaturtleSTSSN.jsp).

On March 16, 2010, NMFS and USFWS published a proposed rule (75 FR 12598) to divide the worldwide population of loggerhead sea turtles into nine DPSs, as described in the 2009 Status Review. Two of the DPSs were proposed to be listed as threatened and seven of the

DPSs, including the Northwest Atlantic Ocean DPS, were proposed to be listed as endangered. NMFS and the USFWS accepted comments on the proposed rule through September 13, 2010 (June 2, 2010, 75 FR 30769). On March 22, 2011 (76 FR 15932), NMFS and USFWS extended the date by which a final determination on the listing action will be made to no later than September 16, 2011. This action was taken to address the interpretation of the existing data on status and trends and its relevance to the assessment of risk of extinction for the Northwest Atlantic Ocean DPS, as well as the magnitude and immediacy of the fisheries bycatch threat and measures to reduce this threat. New information or analyses to help clarify these issues were requested by April 11, 2011.

On September 22, 2011, NMFS and USFWS issued a final rule (76 FR 58868), determining that the loggerhead sea turtle is composed of nine DPSs (as defined in Conant et al., 2009) that constitute species that may be listed as threatened or endangered under the ESA. Five DPSs were listed as endangered (North Pacific Ocean, South Pacific Ocean, North Indian Ocean, Northeast Atlantic Ocean, and Mediterranean Sea), and four DPSs were listed as threatened (Northwest Atlantic Ocean, South Atlantic Ocean, Southeast Indo-Pacific Ocean, and Southwest Indian Ocean). Note that the Northwest Atlantic Ocean (NWA) DPS and the Southeast Indo-Pacific Ocean DPS were original proposed as endangered. The NWA DPS was determined to be threatened based on review of nesting data available after the proposed rule was published, information provided in public comments on the proposed rule, and further discussions within the agencies. The two primary factors considered were population abundance and population trend. NMFS and USFWS found that an endangered status for the NWA DPS was not warranted given the large size of the nesting population, the overall nesting population remains widespread, the trend for the nesting population appears to be stabilizing, and substantial conservation efforts are underway to address threats.

The September 2011 final rule also noted that critical habitat for the two DPSs occurring within the U.S. (NWA DPS and North Pacific DPS) will be designated in a future rulemaking. Information from the public related to the identification of critical habitat, essential physical or biological features for this species, and other relevant impacts of a critical habitat designation was solicited.

This proposed action only occurs in the Atlantic Ocean. As noted in Conant et al. (2009), the range of the four DPSs occurring in the Atlantic Ocean are as follows: NWA DPS – north of the equator, south of 60° N latitude, and west of 40° W longitude; Northeast Atlantic Ocean (NEA) DPS – north of the equator, south of 60° N latitude, east of 40° W longitude, and west of 5° 36’ W longitude; South Atlantic DPS – south of the equator, north of 60° S latitude, west of 20° E longitude, and east of 60° W longitude; Mediterranean DPS – the Mediterranean Sea east of 5° 36’ W longitude. These boundaries were determined based on oceanographic features, loggerhead sightings, thermal tolerance, fishery bycatch data, and information on loggerhead distribution from satellite telemetry and flipper tagging studies. Sea turtles from the NEA DPS are not expected to be present over the North American continental shelf in U.S. coastal waters, where the proposed action occurs (P. Dutton, NMFS, personal communication, 2011). Previous literature (Bowen et al. 2004) has suggested that there is the potential, albeit small, for some juveniles from the Mediterranean DPS to be present in U.S. Atlantic coastal foraging grounds. These data should be interpreted with caution however, as they may be representing a shared common haplotype and lack of representative sampling at Eastern Atlantic rookeries. Given that updated, more refined analyses are ongoing and the occurrence of Mediterranean DPS juveniles in U.S. coastal waters is rare and uncertain, if even occurring at all, for the purposes of this assessment we are making the determination that the Mediterranean DPS is not likely to be present in the action area. Sea turtles of the South Atlantic DPS do not inhabit the action area of this subject fishery (Conant et al. 2009). As such, the remainder of this assessment will only focus on the NWA DPS of loggerhead sea turtles, listed as threatened.

In general, sea turtles are a long-lived species and reach sexual maturity relatively late (NMFS SEFSC 2001; NMFS and USFWS 2007a, 2007b, 2007c, 2007d). Sea turtles are injured and killed by numerous human activities (NRC 1990; NMFS and USFWS 2007a, 2007b, 2007c, 2007d). Nest count data are a valuable source of information for each turtle species since the number of nests laid reflects the reproductive output of the nesting group each year. A decline in the annual nest counts has been measured or suggested for four of five western Atlantic loggerhead nesting groups through 2004 (NMFS and USFWS 2007a), however, data collected since 2004 suggests nest counts have stabilized or increased (TEWG 2009). Nest counts for Kemp's ridley sea turtles as well as leatherback and green sea turtles in the Atlantic demonstrate increased nesting by these species (NMFS and USFWS 2007b, 2007c, 2007d).

6.3.2.2 Large Cetaceans

The most recent Marine Mammal Stock Assessment Report (SAR) (Waring et al. 2010) reviewed the current population trend for each of these cetacean species within U.S. Economic Exclusion Zone (EEZ) waters. The SAR also estimated annual human-caused mortality and serious injury. Finally, it described the commercial fisheries that interact with each stock in the U.S. Atlantic. The following paragraphs summarize information from the SAR.

The western North Atlantic baleen whale species (North Atlantic right, humpback, fin, sei, and minke whales) follow a general annual pattern of migration. They migrate from high latitude summer foraging grounds, including the Gulf of Maine and Georges Bank, to and latitude winter calving grounds (Perry et al. 1999, Kenney 2002). However, this is a simplification of species movements as the complete winter distribution of most species is unclear (Perry et al. 1999, Waring et al. 2011). Studies of some of the large baleen whales (right, humpback, and fin) have demonstrated the presence of each species in higher latitude waters even in the winter (Swingle et al. 1993, Wiley et al. 1995, Perry et al. 1999, Brown et al. 2002). Blue whales are most often sighted along the east coast of Canada, particularly in the Gulf of St. Lawrence. They occur only infrequently within the U.S. EEZ (Waring et al. 2002).

Available information suggests that the North Atlantic right whale population increased at a rate of 1.8 percent per year between 1990 and 2005. The total number of North Atlantic right whales is estimated to be at least 361 animals in 2005 (Waring et al. 2011). The minimum rate of annual human-caused mortality and serious injury to right whales averaged 2.8 mortality or serious injury incidents per year during 2004 to 2008 (Waring et al. 2011). Of these, fishery interactions resulted in an average of 0.8 mortality or serious injury incidents per year.

The North Atlantic population of humpback whales is conservatively estimated to be 7,698 (Waring et al. 2011). The best estimate for the GOM stock of humpback whale population is 847 whales (Waring et al. 2011). Based on data available for selected areas and time periods, the minimum population estimates for other western North Atlantic whale stocks are 3,269 fin whales, 208 sei whales (Nova Scotia stock), 3,539 sperm whales, and 6,909 minke whales (Waring et al. 2009). Current data suggest that the GOM humpback whale stock is steadily increasing in size (Waring 2011). Insufficient information exist to determine trends for these other large whale species.

Recent revisions to the Atlantic Large Whale Take Reduction Plan (ALWTRP) (72 FR 57104, October 5, 2007) continue to address entanglement risk of large whales (right, humpback, and fin whales, and acknowledge benefits to minke whales) in commercial fishing gear. The revisions seek to reduce the risk of death and serious injury from entanglements that do occur.

6.3.2.3 Small Cetaceans

There is anthropogenic mortality of numerous small cetacean species (dolphins, pilot whales, and harbor porpoise) in Northeast multispecies fishing gear. Seasonal abundance and distribution of each species off the coast of the Northeast U.S. varies with respect to life history characteristics. Some species such as white-sided dolphin and harbor porpoise primarily occupy continental shelf waters. Other species such as the Risso's dolphin occur primarily in continental shelf edge and slope waters. Still other species like the common dolphin and the spotted dolphin occupy all three habitats. Waring et al. (2009) summarizes information on the western North Atlantic stocks of each species.

6.3.2.4 Pinnipeds

Harbor seals have the most extensive distribution of the four species of seal expected to occur in the area. Harbor seals sighting have occurred far south as 30° N (Katona et al. 1993, Waring et al. 2009). Gray seals are the second most common seal species in U.S. EEZ waters. They occur primarily in waters off of New England (Katona et al. 1993; Waring et al. 2009). Pupping for both species occurs in both U.S. and Canadian waters of the western North Atlantic. Although there are at least three gray seal pupping colonies in U.S., the majority of harbor seal pupping likely occurs in U.S. waters and the majority of gray seal pupping likely occurs in Canadian waters. Observations of harp and hooded seals are less common in U.S. EEZ waters. Both species form aggregations for pupping and breeding off eastern Canada in the late winter/early spring. They then travel to more northern latitudes for molting and summer feeding (Waring et al. 2006). Both species have a seasonal presence in U.S. waters from Maine to New Jersey, based on sightings, stranding, and fishery bycatch information (Waring et al. 2009).

6.3.2.5 Atlantic Sturgeon

Atlantic sturgeon is an anadromous species that spawns in relatively low salinity, river environments, but spends most of its life in the marine and estuarine environments from Labrador, Canada to the Saint Johns River, Florida (Holland and Yelverton 1973, Dovel and Berggen 1983, Waldman et al. 1996, Kynard and Horgan 2002, Dadswell 2006, ASSRT 2007). Tracking and tagging studies have shown that subadult and adult Atlantic sturgeon that originate from different rivers mix within the marine environment, utilizing ocean and estuarine waters for life functions such as foraging and overwintering (Stein et al. 2004a, Dadswell 2006, ASSRT 2007, Laney et al. 2007, Dunton et al. 2010). Fishery-dependent data as well as fishery-independent data demonstrate that Atlantic sturgeon use relatively shallow inshore areas of the continental shelf; primarily waters less than 50 m (Stein et al. 2004b, ASMFC 2007, Dunton et al. 2010). The data also suggest regional differences in Atlantic sturgeon depth distribution with sturgeon observed in waters primarily less than 20 m in the Mid-Atlantic Bight and in deeper waters in the Gulf of Maine (Stein et al. 2004b, ASMFC 2007, Dunton et al. 2010). Information on population sizes for each Atlantic sturgeon DPS is very limited. Based on the best available information, NMFS has concluded that bycatch, vessel strikes, water quality and water availability, dams, lack of regulatory mechanisms for protecting the fish, and dredging are the most significant threats to Atlantic sturgeon.

Comprehensive information on current abundance of Atlantic sturgeon is lacking for all of the spawning rivers (ASSRT 2007). Based on data through 1998, an estimate of 863 spawning adults per year was developed for the Hudson River (Kahnle et al. 2007), and an estimate of 343 spawning adults per year is available for the Altamaha River, GA, based on data collected in 2004-2005 (Schueller and Peterson 2006). Data collected from the Hudson River and Altamaha River studies cannot be used to estimate the total number of adults in either subpopulation, since mature Atlantic sturgeon may not spawn every year, and it is unclear to what extent mature fish in a non-spawning condition occur on the spawning grounds. Nevertheless, since the Hudson and Altamaha Rivers are presumed to have the healthiest Atlantic sturgeon subpopulations within the United States, other U.S. subpopulations are predicted to have fewer spawning adults than either the Hudson or the Altamaha (ASSRT 2007). It is also important to note that the estimates above represent only a fraction of the total population size as spawning adults comprise only a portion of the total population (e.g., this estimate does not include subadults and early life stages).

6.3.2.6 Species Not Likely to be Affected

NMFS has determined that the action being considered in this EA is not likely to adversely affect shortnose sturgeon, the Gulf of Maine distinct population segment (DPS) of Atlantic salmon, hawksbill sea turtles, blue whales, or sperm whales, all of which are listed as endangered species under the ESA. Further, the action considered in this EA is not likely to adversely affect North Atlantic right whale critical habitat. The following discussion provides the rationale for these determinations.

Shortnose sturgeon are benthic fish that mainly occupy the deep channel sections of large rivers. They occupy rivers along the western Atlantic coast from St. Johns River in Florida, to the Saint John River in New Brunswick, Canada. Although, the species is possibly extirpated from the Saint Johns River system. The species is anadromous in the southern portion of its range (i.e., south of Chesapeake Bay), while some northern populations are amphidromous (NMFS 1998). Since sectors would not operate in or near the rivers where concentrations of shortnose sturgeon are most likely found, it is highly unlikely that sectors would affect shortnose sturgeon.

The wild populations of Atlantic salmon are listed as endangered under the ESA. Their freshwater range occurs in the watersheds from the Androscoggin River northward along the Maine coast to the Dennys River. Juvenile salmon in New England rivers typically migrate to sea in spring after a one- to three-year period of development in freshwater streams. They remain at sea for two winters before returning to their U.S. natal rivers to spawn (Kocik and Sheehan 2006). Results from a 2001-2003 post-smolt trawl survey in the nearshore waters of the Gulf of Maine indicate that Atlantic salmon post-smolts are prevalent in the upper water column throughout this area in mid to late May (Lacroix, Knox, and Stokesbury 2005). Therefore, commercial fisheries deploying small-mesh active gear (pelagic trawls and purse seines within 10 m of the surface) in nearshore waters of the Gulf of Maine may have the potential to incidentally take smolts. However, it is highly unlikely that the action being considered will affect the Gulf of Maine DPS of Atlantic salmon given that operation of the multispecies fishery does not occur in or near the rivers where concentrations of Atlantic salmon are likely to be found. Additionally, multispecies gear operates in the ocean at or near the bottom rather than near the surface where Atlantic salmon are likely to occur. Thus, this species will not be considered further in this EA.

North Atlantic right whales occur in coastal and shelf waters in the western North Atlantic (NMFS 2005). Section 4.4.2.2 discusses potential fishery entanglement and mortality interactions with North Atlantic right whale individuals. The western North Atlantic population in the U.S. primarily ranges from winter calving and nursery areas in coastal waters off the southeastern U.S. to summer feeding grounds in New England waters (NMFS 2005). North Atlantic Right Whales use five well-known habitats annually, including multiple in northern waters. These northern areas include the Great South Channel (east of Cape Cod); Cape Cod and Massachusetts Bays; the Bay of Fundy; and Browns and Baccaro Banks, south of Nova Scotia. NMFS designated the Great South Channel and Cape Cod and Massachusetts Bays as Northern Atlantic right whale critical habitat in June 1994 (59 FR 28793). NMFS has designated additional critical habitat in the southeastern U.S. Multispecies gear operates in the ocean at or near the bottom rather than near the surface. It is not known whether the bottom-trawl, or any other type of fishing gear, has an impact on the habitat of the Northern right whale (59 FR 28793). As discussed in the FY 2010 and FY 2011 sector EAs and further in Section 5.0, sectors would result in a negligible effect on physical habitat. Therefore, FY 2012 sector operations would not result in a significant impact on Northern right whale critical habitat. Further, mesh sizes used in the multispecies fishery do not significantly impact the Northern right whale's planktonic food supply (59 FR 28793). Therefore, Northern right whale food sources in areas designated as critical habitat would not be adversely affected by sectors. For these reasons, Northern right whale critical habitat will not be considered further in this EA.

The hawksbill turtle is uncommon in the waters of the continental U.S. Hawksbills prefer coral reefs, such as those found in the Caribbean and Central America. Hawksbills feed primarily on a wide variety of sponges, but also consume bryozoans, coelenterates, and mollusks. The Culebra Archipelago of Puerto Rico contains especially important foraging habitat for hawksbills. Nesting areas in the western North Atlantic include Puerto Rico and the Virgin Islands. There are accounts of hawksbills in south Florida and individuals have been sighted along the east coast as far north as Massachusetts; however, east coast sightings north of Florida are rare (NMFS 2009a). Operations in the NE multispecies fishery would not occur in waters that are typically used by hawksbill sea turtles. Therefore, it is highly unlikely that fishery operations would affect this turtle species.

Blue whales do not regularly occur in waters of the U.S. EEZ (Waring et al. 2002). In the North Atlantic region, blue whales are most frequently sighted from April to January (Sears 2002). No blue whales were observed during the Cetacean and Turtle Assessment Program surveys of the mid- and North Atlantic areas of the outer continental shelf (Cetacean and Turtle Assessment Program 1982). Calving for the species occurs in low latitude waters outside of the area where the sectors would operate. Blue whales feed on euphausiids (krill) that are too small to be captured in fishing gear. There were no observed fishery-related mortalities or serious injuries to blue whales between 1996 and 2000 (Waring et al. 2002). The species is unlikely to occur in areas where the sectors would operate, and sector operations would not affect the availability of blue whale prey or areas where calving and nursing of young occurs. Therefore, the Proposed Action would not be likely to adversely affect blue whales.

Unlike blue whales, sperm whales do regularly occur in waters of the U.S. EEZ. However, the distribution of the sperm whales in the U.S. EEZ occurs on the continental shelf edge, over the continental slope, and into mid-ocean regions (Waring et al. 2007). Sperm whale distribution is typically concentrated east-northeast of Cape Hatteras in winter and shifts northward in spring when whales are found throughout the MA Bight (Waring et al. 2006). Distribution extends further northward to areas north of GB and the Northeast Channel region in summer and then south of New England in fall, back to the MA Bight (Waring et al. 1999). In contrast, the sectors would operate in continental shelf waters. The average depth over which sperm whale sightings occurred during the Cetacean and Turtle Assessment Program surveys was 5,879 ft (1,792 m) (Cetacean and Turtle Assessment Program 1982). Female sperm whales and young males almost always inhabit open ocean, deep water habitat with bottom depths greater than 3,280 ft (1,000 m) and at latitudes less than 40° N (Whitehead 2002). Sperm whales feed on large squid and fish that inhabit the deeper ocean regions (Perrin et al. 2002). There were no observed fishery-related mortalities or serious injuries to sperm whales between 2001 and 2005 (Waring et al. 2007). Sperm whales are unlikely to occur in water depths where the sectors would operate, sector operations would not affect the availability of sperm whale prey or areas where calving and nursing of young occurs. Therefore, the Proposed Action would not be likely to adversely affect sperm whales.

Although marine turtles and large whales could be potentially affected through interactions with fishing gear, NMFS has determined that the continued authorization of the multispecies fishery, and therefore the FY 2011 sectors, would not have any adverse effects on the availability of prey for these species. Sea turtles feed on a variety of plants and animals, depending on the species. However, none of the turtle species are known to feed upon groundfish. Right whales and sei whales feed on copepods (Horwood 2002, Kenney 2002). The multispecies fishery will not affect the availability of copepods for foraging right and sei whales because copepods are very small organisms that will pass through multispecies fishing gear rather than being captured in it. Humpback whales and fin whales also feed on krill as well as small schooling fish such as sand lance, herring and mackerel (Aguilar 2002, Clapham 2002). Multispecies fishing gear operates on or very near the bottom. Fish species caught in multispecies gear are species that live in benthic habitat (on or very near the bottom) such as flounders. As a result, this gear does not typically catch schooling fish such as herring and mackerel that occur within the water column. Therefore, the continued authorization of the spiny dogfish fishery or the approval of the FY 2012 Spiny Dogfish FMP specifications will not affect the availability of prey for foraging humpback or fin whales.

6.3.3 Interactions Between Gear and Protected Resources

NMFS categorizes commercial fisheries based on a two-tiered, stock-specific fishery classification system that addresses both the total impact of all fisheries on each marine mammal stock as well as the impact of individual fisheries on each marine mammal stock. NMFS bases the system on the numbers of animals per year that incur incidental mortality or serious injury due to commercial fishing operations relative to a marine mammal stock's Potential Biological Removal (PBR) level.[3] Tier 1 takes into account the cumulative mortality and serious injury to marine mammals caused by commercial fisheries. Tier 2 considers marine mammal mortality and serious injury caused by the individual fisheries. This EA uses Tier 2 classifications to indicate how each type of gear proposed for use in the Proposed Action may affect marine mammals (NMFS 2009b). Box 6.3.3.1 identifies the classifications used in the final List of Fisheries (for FY 2010 (75 FR 68468; November 8, 2010; NMFS 2010b), which are broken down into Tier 2 Categories I, II, and III. A proposed List of Fisheries for FY 2012 was published on June 28, 2011 (76 FR 37716), but the List of Fisheries for FY 2012 has not yet been adopted and is not discussed further in this document.

[3] PBR is the maximum number of animals, not including natural mortalities, which may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population.

Table 21. Descriptions of the Tier 2 Fishery Classification Categories

Category	Category Description
Category I	A commercial fishery that has frequent incidental mortality and serious injury of marine mammals. This classification indicates that a commercial fishery is, by itself, responsible for the annual removal of 50 percent or more of any stock's PBR level.
Category II	A commercial fishery that has occasional incidental mortality and serious injury of marine mammals. This classification indicates that a commercial fishery is one that, collectively with other fisheries, is responsible for the annual removal of more than 10 percent of any marine mammal stock's PBR level and that is by itself responsible for the annual removal of between 1 percent and 50 percent, exclusive of any stock's PBR.
Category III	A commercial fishery that has a remote likelihood of, or no known incidental mortality and serious injury of marine mammals. This classification indicates that a commercial fishery is one that collectively with other fisheries is responsible for the annual removal of: a. Less than 50 percent of any marine mammal stock's PBR level, or b. More than 1 percent of any marine mammal stock's PBR level, yet that fishery by itself is responsible for the annual removal of 1 percent or less of that stock's PBR level. In the absence of reliable information indicating the frequency of incidental mortality and serious injury of marine mammals by a commercial fishery, the Assistant Administrator would determine whether the incidental serious injury or mortality is "remote" by evaluating other factors such as fishing techniques, gear used, methods used to deter marine mammals, target species, seasons and areas fished, qualitative data from logbooks or fisher reports, stranding data, and the species and distribution of marine mammals in the area or at the discretion of the Assistant Administrator.

Interactions between gear and a given species occur when fishing gear overlaps both spatially and trophically with the species' niche. Spatial interactions are more "passive" and involve inadvertent interactions with fishing gear when the fishermen deploy gear in areas used by protected resources. Trophic interactions are more "active" and occur when protected species attempt to consume prey caught in fishing gear and become entangled in the process. Spatial and trophic interactions can occur with various types of fishing gear used by the multispecies fishery through the year. Many large and small cetaceans and sea turtles are more prevalent within the operations area during the spring and summer. However they are also relatively abundant during the fall and would have a higher potential for interaction with sector activities that occur during these seasons. Although harbor seals may be more likely to occur in the operations area between fall and spring, harbor and gray seals are year-round residents. Therefore, interactions could occur year-round. The uncommon occurrences of hooded and harp seals in the operations area are more likely to occur during the winter and spring, allowing for an increased potential for interactions during these seasons.

Although interactions between protected species and gear deployed by the Northeast multispecies fishery would vary, interactions generally include:

- Becoming caught on hooks (bottom longlines)
- Entanglement in mesh (gillnets and trawls)
- Entanglement in the float line (gillnets and trawls)
- Entanglement in the groundline (gillnets, trawls, and bottom longlines)
- Entanglement in anchor lines (gillnets and bottom longlines), or
- Entanglement in the vertical lines that connect gear to the surface and surface systems (gillnets, traps/pots, and bottom longlines).

NMFS assumes the potential for entanglements to occur is higher in areas where more gear is set and in areas with higher concentrations of protected species.

Table 22 lists the marine mammals known to have had interactions with gear used by the Northeast multispecies fishery. This gear includes sink gillnets, traps/pots, bottom trawls, and bottom longlines within the Northeast multispecies region, as excerpted from the List of Fisheries for FY 2011 ([75 FR 68468; November 8, 2010], also see Waring et al. 2009). Sink gillnets have the greatest potential for interaction with protected resources, followed by bottom trawls. There are no observed reports of interactions between longline gear and marine mammals in FY 2009 and FY 2010. However, interactions between the pelagic longline fishery and both pilot whales and Risso's dolphins led to the development of the Pelagic Longline Take Reduction Plan.

INTENTIONALLY LEFT BLANK

Table 22. Marine Mammals Impacts Based on Groundfishing Gear and Northeast Multispecies Fishing Areas (Based on 2010 List of Fisheries)

Fishery: Category	Fishery: Type	Estimated Number of Vessels/Persons	Marine Mammal Species and Stocks Incidentally Killed or Injured
Category I	MA gillnet	5,495	Bottlenose dolphin, Northern Migratory coastal [a] Bottlenose dolphin, Southern Migratory coastal [a] Bottlenose dolphin, Northern NC estuarine system [a] Bottlenose dolphin, Southern NC estuarine system [a] Bottlenose dolphin, WNA offshore Common dolphin, WNA Gray seal, WNA Harbor porpoise, GOM/Bay of Fundy Harbor seal, WNA Harp seal, WNA Humpback whale, Gulf of Maine Long-finned pilot whale, WNA Minke whale, Canadian east coast Risso's dolphin, WNA Short-finned pilot whale, WNA White-sided dolphin, WNA
	Northeast sink gillnet	7,712	Bottlenose dolphin, WNA, offshore Common dolphin, WNA Fin whale, WNA Gray seal, WNA Harbor porpoise, GOM/Bay of Fundy Harbor seal, WNA Harp seal, WNA Hooded seal, WNA Humpback whale, GOM Minke whale, Canadian east coast North Atlantic right whale, WNA Risso's dolphin, WNA White-sided dolphin, WNA
Fishery: Category	Fishery: Type	Estimated Number of Vessels/Persons	Marine Mammal Species and Stocks Incidentally Killed or Injured
Category II	MA bottom trawl	1,182	Bottlenose dolphin, WNA offshore Common dolphin, WNA [a] Long-finned pilot whale, WNA [a] Short-finned pilot whale, WNA [a] White-sided dolphin, WNA
	Northeast bottom trawl	1,635	Common dolphin, WNA Harbor porpoise, GOM/ Bay of Fundy Harbor seal, WNA Harp seal, WNA Long-finned pilot whale, WNA Short-finned pilot whale, WNA White-sided dolphin, WNA [a]
	Atlantic mixed species trap/pot [c]	1,912	Fin whale, WNA Humpback whale, GOM
Category III	Northeast/MA bottom longline/hook-and-line	1,183	None documented in recent years

Notes:

[a] Fishery classified based on serious injuries and mortalities of this stock, which are greater than 50 percent (Category I) or greater than 1 percent and less than 50 percent (Category II) of the stock's PBR.

[b] Although not included in the 2010 List of Fisheries, Waring et al. (2009) indicates that nine gray seal mortalities in 2007 were attributed to incidental capture in the northeast bottom trawl.

[c] This fishery is classified by analogy.

Marine mammals are taken in gillnets, trawls, and trap/pot gear used in the Northeast multispecies area. Documented protected species interactions in Northeast sink gillnet fisheries include harbor porpoise, white-sided dolphin, harbor seal, gray seal, harp seal, hooded seal, long-finned pilot whale, offshore bottlenose dolphin, Risso's dolphin, and common dolphin. Not mentioned here are possible interactions with sea turtles and sea birds. Multispecies fishing vessels would be required to adhere to measures in the Atlantic Large Whale Take Reduction Plan (ALWTRP) to minimize potential impacts to certain cetaceans. ALWTRP was developed to address entanglement risk to right, humpback, and fin whales, and to acknowledge benefits to minke whales in specific Category I or II commercial fishing efforts that utilize traps/pots and gillnets. The ALWTRP calls for the use of gear markings, area restrictions, weak links, and sinking groundline. Fishing vessels would be required to comply with the ALWTRP in all areas where gillnets were used. Fishing vessels would also need to comply with the Bottlenose Dolphin Take Reduction Plan and Harbor Porpoise Take Reduction Plan (HPTRP) within the Northeast multispecies area. The Bottlenose Dolphin Take Reduction Plan restricts night time use of gillnets in the MA gillnet region. The HPTRP aims to reduce interactions between the harbor porpoise and gillnets in the Gulf of Maine. The HPTRP implements seasonal area closures and the seasonal use of pingers (acoustic devices that emit a sound) to deter harbor porpoises from approaching the nets.

Data from sector trips in FY 2010 and FY 2009 indicate no overall significant increase in take of protected resources or sea turtles. There may be a decrease in annual take in sink gillnet gear, and the data suggest an overall decrease in the winter take, and in the fall for turtles. However, this decrease in take corresponds well to the decrease in ACL. Within individual stat areas there does appear to be some trends in take of protected resources (includes all species).

Sea turtles have been caught and injured or killed in multiple types of fishing gear, including gillnets, trawls, and hook and line gear. However, impact due to inadvertent interaction with trawl gear is almost twice as likely to occur when compared with other gear types (NMFS 2009c). Interaction with trawl gear is more detrimental to sea turtles as they can be caught within the trawl itself and will drown after extended periods underwater. A study conducted in the MA region showed that bottom trawling accounts for an average annual take of 616 loggerhead sea turtles, although Kemp's ridleys and leatherbacks were also caught during the study period (Murray 2006). Sea turtles generally occur in more temperate waters than those in the Northeast multispecies area. Gillnets are considered more detrimental to marine mammals such as pilot whales, dolphins, porpoises, and seals, as well as large marine whales; however, protection for marine mammals would be provided through various Take Reduction Plans outlined above.

Atlantic sturgeon are known to be captured in sink gillnet, drift gillnet, and otter trawl gear (Stein et al. 2004a, ASMFC TC 2007). Of these gear types, sink gillnet gear poses the greatest known risk of mortality for bycaught sturgeon (ASMFC TC 2007). Sturgeon deaths were rarely reported in the otter trawl observer dataset (ASMFC TC 2007). However, the level of mortality after release from the gear is unknown (Stein et al. 2004a). In a review of the Northeast Fishery Observer Program (NEFOP) database for the years 2001-2006, observed bycatch of Atlantic sturgeon was used to calculate bycatch rates that were then applied to commercial fishing effort to estimate overall bycatch of Atlantic sturgeon in commercial fisheries. This review indicated sturgeon bycatch occurred in statistical areas abutting the coast from Massachusetts (statistical area 514) to North Carolina (statistical area 635) (ASMFC TC 2007). Based on the available data, participants in an ASMFC bycatch workshop concluded that sturgeon encounters tended to occur in waters less than 50 m throughout the year, although seasonal patterns exist (ASMFC TC 2007). The ASMFC analysis determined that an average of 650 Atlantic sturgeon mortalities occurred per year (during the 2001 to 2006 timeframe) in sink gillnet fisheries. Stein et al. (2004a), based on a review of the NMFS Observer Database from 1989-2000, found clinal variation in the bycatch rate of sturgeon in sink gillnet gear with lowest rates occurring off of Maine and highest rates off of North Carolina for all months of the year.

In an updated, preliminary analysis, the Northeast Fisheries Science Center (NEFSC) was able to use data from the NEFOP database to provide updated estimates for the 2006 to 2010 timeframe. Data were limited by observer coverage to waters outside the coastal boundary (fzone>0) and north of Cape Hatteras, NC. Sturgeon included in the data set were those identified by federal observers as Atlantic sturgeon, as well as those categorized as unknown sturgeon. At this time, data were limited to information collected by the NEFOP; limited data collected in the At-Sea Monitoring Program were not included, although preliminary views suggest the incidence of sturgeon encounters was low.

The preliminary analysis apportioned the estimated weight of all sturgeon takes to specific fishery management plans. The analysis estimates that between 2006 and 2010, a total of 15,587 lbs of Atlantic sturgeon were captured and discarded in bottom otter trawl (7,740 lbs) and sink gillnet (7,848 lbs) gear. The analysis results indicate that 7.1% (550 lbs) of the weight of sturgeon discards in bottom otter trawl gear could be attributed to the large mesh bottom trawl fisheries if a correlation of FMP species landings (by weight) was used as a proxy for fishing effort. Additionally, the analysis results indicate that 4.0% (314 lbs) of the weight of sturgeon discards in sink gillnet gear could be attributed to the large mesh gillnet fisheries if a correlation of FMP species landings (by weight) was used as a proxy for fishing effort.

These additional data support the conclusion from the earlier bycatch estimates that the spiny dogfish fishery may interact with Atlantic sturgeon. Since the Atlantic sturgeon DPSs have been listed as endangered and threatened under the ESA, the ESA Section 7 consultation for the spiny dogfish fishery will be reinitiated, and additional evaluation will be included in the resulting Biological Opinion to describe any impacts of the fisheries on Atlantic sturgeon and define any measures needed to mitigate those impacts, if necessary. It is anticipated that any measures, terms and conditions included in an updated Biological Opinion will further reduce impacts to the species. The Biological Opinion is expected to be completed prior to the 2012 spiny dogfish fishing year (May1).

6.4 Human Communities

UNDER CONSTRUCTION

A detailed description of historical fisheries for spiny dogfish is presented in Section 2.3 of the FMP. The information presented in this section is intended to briefly characterize recent fisheries trends.

6.4.1 Commercial Vessel and Dealer Activity

TO BE REPLACED WITH LONG-TERM PERMIT ACTIVITY

According to unpublished NMFS permit file data, 2,942 vessels were issued federal spiny dogfish permits in 2010, while 326 of these vessels contributed to overall landings. The distribution of permitted and active vessels by home port state is given in Table 23. Most of the active vessels were from Massachusetts (31.6%), New Jersey (14.7%), New Hampshire (11.3%), Rhode Island (9.8%), New York (8.0%), North Carolina (6.7%), and Virginia (5.8%). The remaining 39 vessels from all other states comprised 12.0% of the total.

Table 23. Federally permitted dogfish vessel activity by home port state in FY2010. Active vessels are defined as vessels identified in the dealer reports as having landed spiny dogfish in FY2010.

State	Permitted Vessels	Pct of Total	State	Active Vessels	Pct of Total
MA	1,087	36.95%	MA	103	31.60%
NJ	422	14.34%	NJ	48	14.72%
ME	341	11.59%	NH	37	11.35%
NY	292	9.93%	RI	32	9.82%
RI	194	6.59%	NY	26	7.98%
NC	160	5.44%	NC	22	6.75%
NH	142	4.83%	VA	19	5.83%
VA	138	4.69%	ME	16	4.91%
CT	50	1.70%	MD	13	3.99%
MD	47	1.60%	CT	8	2.45%
DE	29	0.99%	Other	2	0.61%
PA	18	0.61%	**Total**	**326**	**100.00%**
FL	16	0.54%			
Other	6	0.20%			
Total	**2,942**	**100.00%**			

Source: NMFS permit data, Commercial Fisheries Database

NMFS permit data indicate that 495 dealers possessed federal spiny dogfish dealer permits in 2010 while dealer reports indicate 75 of those dealers actually bought spiny dogfish. The distribution of permitted and active dealers by state is given in Table 24. Most of the active dealers were from the states of Massachusetts (29.3%), New York (17.3%), North Carolina (14.7%), Rhode Island (13.3%), Virginia (7.8), New Jersey, (5.3%), New Hampshire (5.3%) with the remaining six dealers in other states comprising 8.0% of the total.

Table 24. Federally permitted spiny dogfish dealers by state in FY2010. Active dealers are defined as dealers identified in the federal dealer reports as having bought spiny dogfish in FY2010.

State	Permitted Dealers	Pct of Total
MA	134	27.07%
NY	97	19.60%
NJ	65	13.13%
RI	46	9.29%
ME	35	7.07%
NC	33	6.67%
VA	32	6.46%
MD	18	3.64%
NH	14	2.83%
CT	5	1.01%
DE	5	1.01%
PA	4	0.81%
FL	3	0.61%
Other	4	0.81%
Total	**495**	**100.00%**

State	Active Dealers	Pct of Total
MA	22	29.33%
NY	13	17.33%
NC	11	14.67%
RI	10	13.33%
VA	5	6.67%
NJ	4	5.33%
NH	4	5.33%
MD	3	4.00%
Other	3	4.00%
Total	**75**	**100.00%**

Source: NMFS permit data, Commercial Fisheries Database

Landings by State

Commercial harvest has historically been dominated by Massachusetts (Table 25). Starting in 2007, dogfish landings from Virginia were greater than or approximately equivalent to those of Massachusetts. State-by-state landings since 2007 are influenced by the regional allocation of commercial quota through the ASMFC's Interstate FMP. Currently, that FMP allocates 58% of the annual quota to a northern region (Maine –Connecticut), and the remaining 42% among states from New York – North Carolina (NY 2.707%; NJ 7.644%; DE 0.896%; MD 5.920%; VA 10.795%, NC 14.036%).

In fishing year 2010, Massachusetts accounted for 44.3% of coastwide landings. North Carolina (13.0%), Virginia (11.9%), New Hampshire (8.4%), and New Jersey (8.3%) were also important landings states. No other states contributed more than 5% of annual landings.

Table 25. Commercial landings (1,000s lb) of spiny dogfish by state from fishing years 1989 through 2010.

Year	ME	NH	MA	RI	CT	NY	NJ	DE	MD	VA	NC	Total
1989	4,962	0	5,100	47	24	13	1,434	0	714	18	0	9,903
1990	6,251	185	20,304	2,968	9	44	4,754	0	5,150	62	41	32,475
1991	2,059	0	13,523	1,901	22	74	2,382	6	3,338	165	1,463	29,049
1992	1,818	405	17,457	2,116	9	140	1,493	0	1,877	220	8,635	37,165
1993	3,408	1,639	26,189	1,554	170	100	707	0	1,893	379	8,806	45,509
1994	1,788	2,610	23,181	603	85	475	1,422	63	2,233	665	6,929	41,447
1995	1,683	2,094	28,789	414	408	815	2,581	0	7,752	1,065	9,525	50,068
1996	904	1,135	27,208	1,518	619	1,381	5,833	0	4,820	4,832	10,304	60,055
1997	437	999	21,417	682	282	312	3,831	0	2,105	3,945	5,924	40,460
1998	288	1,935	24,866	1,906	241	1,704	7,091	2	2,199	5,004	3,928	45,476
1999	28	1,233	14,824	1,237	87	2,868	6,586	0	808	1,750	3,601	32,760
2000	1	2,279	5,545	130	12	145	5	0	0	72	12	20,407
2001	0	529	3,912	395	7	62	17	0	0	178	0	5,056
2002	1	349	3,800	455	6	49	1	0	2	114	0	4,839
2003	0	175	2,006	141	2	41	0	0	5	451	520	2,579
2004	3	0	1,094	129	60	42	7	0	1	39	20	2,160
2005	31	162	1,826	173	93	44	1	0	11	66	10	2,535
2006	180	633	2,744	518	62	11	3	0	16	2,286	144	5,212
2007	99	185	2,796	523	23	21	10	0	25	2,575	167	7,723
2008	49	1,370	3,559	239	10	23	50	0	114	2,479	1,416	9,057
2009	594	1,885	3,881	940	92	192	1,342	14	175	1,487	1,708	11,752
2010	229	1,214	6,442	708	107	468	1,208	8	542	1,731	1,887	14,543

Source: NMFS Commercial Fisheries Database.

Landings by Month

Under the federal FMP, the annual commercial quota is allocated seasonally to two half-year periods. Period 1 (May 1 – Oct 31) is allocated 57.9% of the quota and Period 2 is allocated 42.1% of the quota. This allocation scheme was implemented as part of the rebuilding plan in order to match seasonal availability of the resource with the historic landings patterns by communities over the fishing year. Spiny dogfish migratory behavior makes them available to the northern end of the fishery (i.e., MA) during Period 1 and the southern end of the fishery (i.e., (VA and NC) during Period 2.

In fishing year 2010, spiny dogfish were landed in all months with peak landings occurring in June-August of Period 1 and Nov – Jan of Period 2 (Table 26).

Table 26. Spiny dogfish landings (lb) by month in FY2010.

TO BE REPLACED WITH LONG-TERM TEMPORAL ACTIVITY

	Month	Landings(lb)	Pct of Total
Period 1	May	204,979	1.41%
	Jun	1,700,034	11.69%
	Jul	3,891,882	26.76%
	Aug	3,025,937	20.81%
	Sep	492	0.00%
	Oct	8,955	0.06%
	Total	8,832,279	60.73%
Period 2	Nov	1,185,693	8.15%
	Dec	1,124,308	7.73%
	Jan	2,312,203	15.90%
	Feb	388,917	2.67%
	Mar	699,245	4.81%
	Apr	370	0.00%
	Total	5,710,736	39.27%
	Grand Total	14,543,015	100.00%

Source: NMFS Commercial Fisheries Database

6.4.2 Commercial Fishery Value

Unpublished NMFS dealer reports indicate that the total ex-vessel value of commercially landed spiny dogfish in calendar year 2010 was about $2.674 million, and in fishing year 2010 was about $3.119 million. The approximate price/lb of spiny dogfish was $0.22 and $0.21 in those timeframes, respectively (Table 27).

Table 27. Ex-vessel value and price per pound of commercially landed spiny dogfish, Maine - North Carolina combined, 2000-2010.

Calendar Year	Value ($1,000)	Price ($/lb)	Fishing Year	Value ($1,000)	Price ($/lb)
2000	4,342	0.21	2000	1,989	0.24
2001	1,137	0.22	2001	1,147	0.23
2002	989	0.20	2002	970	0.20
2003	364	0.14	2003	415	0.12
2004	311	0.14	2004	260	0.17
2005	479	0.19	2005	545	0.21
2006	1,188	0.23	2006	1,434	0.22
2007	1,508	0.20	2007	1,360	0.20
2008	2,207	0.24	2008	2,157	0.24
2009	2,544	0.21	2009	2,360	0.22
2010	2,674	0.22	2010	3,119	0.21

Source: NMFS Commercial Fisheries Database

In FY2010, 143 vessels with federal dogfish permits were reported in the dealer data to have had dogfish revenues greater than 5% of total revenue (dogfish revenue range $23 to 73,634, average = $11,933; dogfish rev / total rev range 5.0% to 100%, average = 10.0%).

6.4.3 Port and Community Description

TO BE UPDATED USING P/C DESCRIPTIONS TAKEN FROM LONG-TERM TOP PORTS

U.S. fishing communities directly involved in the harvest or processing of dogfish are found in coastal states from Maine through North Carolina. This EA is most concerned with the top dogfish ports which are identified in Table 28. Spiny dogfish landings were reported from a total of 68 unique ports in the dealer data. Landings by port for FY2010 are given in Table 28. Gloucester, MA accounted for the largest share of total FY2010 landings (16.79%), followed by Chatham, MA (10.95%), Hatteras, NC (9.32%), VA Beach/Lynnhaven, VA (7.04%), Point Pleasant, NJ (5.59%), and New Bedford, MA (4.19%).

Spiny dogfish revenue was calculated as a % of total port revenue and was both greater than $100,000 and greater than 1% of port revenue in Virginia Beach/Lynnhaven, VA (29.54%), Hatteras, NC (6.97%), Rye, NH (5.33%), Chatham, MA (2.06%), and Ocean City, MD (1.32%). Port descriptions for these ports from the NEFSC's "Community Profiles for the Northeast US Fisheries" are provided in Appendix 1. A complete set of profiles is online: http://www.nefsc.noaa.gov/read/socialsci/community_profiles/

Table 28. Commercial landings (lb) and value of spiny dogfish by port for fishing year 2010.

Port	Landings (lb)	Pct of Total	Value ($)	Pct of Total	Total Port Value ($)	Dogfish Value / Port Value
GLOUCESTER, MASSACHUSETTS	2,437,614	16.79%	511,986	16.50%	53,347,408	0.96%
CHATHAM, MASSACHUSETTS	1,590,193	10.95%	281,041	9.06%	13,634,909	2.06%
VIRGINIA BEACH/LYNNHAVEN, VIRGINIA	1,021,543	7.04%	208,372	6.71%	705,394	29.54%
HATTERAS, NORTH CAROLINA	1,353,608	9.32%	206,196	6.64%	2,956,349	6.97%
NEW BEDFORD, MASSACHUSETTS	607,930	4.19%	168,290	5.42%	312,914,202	0.05%
POINT PLEASANT, NEW JERSEY	812,216	5.59%	161,905	5.22%	26,084,624	0.62%
OTHER VIRGINIA, VIRGINIA	259,017	1.78%	161,002	5.19%	44,988,422	0.36%
OCEAN CITY, MARYLAND	529,926	3.65%	115,718	3.73%	8,741,828	1.32%
RYE, NEW HAMPSHIRE	451,640	3.11%	105,189	3.39%	1,975,089	5.33%
All Others (59)	5,455,628	37.57%	1,183,690	38.14%	469,836,037	0.25%
Total	**14,519,315**	**100.0%**	**3,103,389**	**100.0%**	**935,184,262**	**0.33%**

Source: Unpublished NMFS dealer reports

7.0 ENVIRONMENTAL CONSEQUENCES – ANALYSIS OF DIRECT AND INDIRECT IMPACTS

This section presents an analysis of the impacts of the proposed actions (Section 5.0) on the VECs (Section 6.0). Table 29, below, is provided to re-iterate the management measures that correspond to each of the alternatives. There are no impacts for most of the alternatives. Amendment 3 is focused primarily on administrative improvements in the Spiny Dogfish FMP. These improvements will provide an option for the Councils to encourage spiny dogfish research (Alternative 1B, 1C), bring the FMP into full compliance with the MSA (Alternative 2B), close regulatory loopholes (Alternative 3B) and reduce administrative conflicts with the Interstate FMP (Alternatives 4B, 4C).

Table 29. Qualitative summary of the expected impacts of various alternatives considered for Amendment 3. A minus sign (-) signifies an expected negative impact, a plus sign (+) a positive impact, and zero indicates a null impact. Brackets are used to convey a minor effect, such as slight positive [+].

Issue	Alternatives	Biological	EFH	Protected Resources	Economic	Social
Research Set-Aside	Alt. 1a No Action	0	0	0	0	0
	Alt. 1b 3% RSA	[+]	[+]	[+]	[+]	[+]
	Alt. 1c 5% RSA	[+]	[+]	[+]	[+]	[+]
Essential Fish Habitat	Alt. 2a No Action	[+]	+	0	0	0
	Alt. 2b Update EFH	[+]	+	0	0	0
Delayed Implementation of Commercial Quota	Alt. 3a No Action	0	0	0	0	0
	Alt. 3b Maintain Previous Year Measures	0	0	0	0	0
Commercial Quota Allocation	Alt. 4a No Action	0	0	0	[-]	-
	Alt. 4b No Allocation	0	0	0	0	[+]
	Alt. 4c Match ISFMP	0	0	0	0	[+]

7.1 RESEARCH SET-ASIDE

Alternatives: 1A: no action (no RSAs)
1B: allow allocation of up to 3% of commercial quota as RSA
1C: allow allocation of up to 5% of commercial quota as RSA

Impacts
No direct impacts to the VECs are associated with the alternatives under this issue. However, it could also be argued that slight positive indirect impacts will occur for any of the VECs since research that is done using spiny dogfish RSA could provide findings that indirectly improve management of the stock and these improvements could, in turn, benefit the managed resource, habitat, protected resources, and the social/economic environment. Among the action alternatives, the larger set aside amount (5% under 1C) is provided to allow for a larger awards of RSA since the low value of spiny dogfish (~$ 0.20/lb) may constrain interest in participating in a project that will depend on marginal gains from directed fishing for spiny dogfish. The smaller (3% under Alternative 1B) may still be enough to provide all the landings that are requested at the RSA auction. In other words, the marginal benefit to participating in the RSA program may be somewhat enhanced as larger RSA awards are provided. Acknowledging that such indirect impacts are speculative at this stage, a determination of slight positive benefits to all VECs is made at this time for both the action alternatives (1B, 1C) and no impacts are expected for the no-action alternative (1A).

[A MORE SPECIFIC / QUANTITATIVE COMPARISON OF ALT 1B AND 1C IS IN DEVELOPMENT]

Specific to any particular RSA deduction, the biological impacts of harvesting annual quotas are analyzed in the specification package submitted to NMFS. The set-aside will always be deducted from and not in addition to the Total Allowable Landings that are specified. Hence the biological and socio-economic impacts resulting from the harvest of set-aside quantities will be fully accounted for in the accompanying specifications package. If a research project requests an exemption from an existing fisheries regulation, an analysis must be prepared which analyzes the impact of that exemption.

7.2 ESSENTIAL FISH HABITAT

Alternatives: 2A: No action (Review but do not update EFH definitions)
2B: Update EFH definitions as needed

Impacts
To the degree that EFH is vulnerable to damage by fishing and/or non-fishing activities, management oversight of these activities in areas designated as EFH for a given life stage would allow for indirect benefits for the spiny dogfish resource. Alternative 2B identifies EFH for all life stages of spiny dogfish based upon updated data from a range of fishery independent sampling programs as well as a more recent EFH source document (Stehlik 2007). While it makes sense that appropriate EFH definitions will correspond to more appropriately characterizing potential impacts to EFH, the difference between the status quo definition (2A) and the updated definitions is fairly subtle. There is a very broad area defined by the 90th percentile of ranked ten minute squares for both juvenile and adult life stages. Additionally, the updated temperature, salinity and depth preferences that are part of the EFH definitions under Alternative 2B are very similar to the status quo.

Perhaps the greatest improvement to the EFH definitions under Alternative 2B is the breakdown of juvenile and adult dogfish into sex and length specific groupings. This make the EFH definitions consistent with the demographic components that are used in the stock assessment for spiny dogfish and thus it may be possible, if a consultation were to be triggered, to link habitat loss to specific components of the spiny dogfish stock.

7.3 DELAYED IMPLEMENTATION OF THE COMMERCIAL QUOTA

Alternatives: 3A: No action
3B: Maintain Previous Year Quota until Effective Date for New Quota

Under the current FMP, if the effective date for the final rule is delayed beyond the start of the new fishing year (May 1), the previous year's daily possession limit is maintained in the regulations; however, the fishery operates without a commercial quota. This would be maintained under Alternative 3A while Alternative 3B would correct this. The only conceivable impact this would have is to prevent a run-away fishery from landing more than the annual quota during the window from the start of the fishing year (May 1) and the effective date for the new quota. This is a highly unlikely scenario given that daily possession limits would be maintained and landings would occur in the jurisdiction of the states where state and/or regional harvest limits would be in place. Because no real environmental impacts are associated with this alternative, it is determined to be a purely administrative action.

7.4 COMMERCIAL QUOTA ALLOCATION SCHEME

Alternatives: 4A: No action (Maintain existing two-period seasonal allocation scheme)
4B: Eliminate Allocation of Commercial Quota
4C: Establish Geographic Allocation of the Commercial Quota Identical to that Currently In Place under the ASMFC Plan

Under the status quo, where the federal quota is divided up into two six-month periods, the periods serve to prevent the entire quota from being landed in the first six months of the fishing year (Table 30). This was initially put in place when the rebuilding plan for spiny dogfish was implemented to prevent states in the north from harvesting the then very small bycatch quota (4 M lb) before the resource became available to states in the south (Table 31). This indirect route to regional allocation of the quota was circumvented when the ASFMC explicitly allocated the coastwide quota among regions (Addendum II; ASMFC 2008) and later among a mix of states and regions (Addendum III; ASMFC 2011). Since then, there have been numerous instances in which the either federal waters are open after a state has closed its fishery or state waters are open after federal waters have closed (INSERT TABLE OR REFERENCE FOR DIFFERENT CLOSURE DATES FOR FED AND VARIOUS STATES SINCE 2008). The ASMFC and NMFS have attempted to coordinate their closure announcements to minimize confusion, but have not always been successful.

A perpetuation of the confusion and conflict would occur under the no action alternative (4A). Added to that is the potential for inadvertent possession violations that occurs when waters under the different jurisdictions are open / closed at different times.

Either of the action alternatives is expected to alleviate the confusion. The impacts of the action alternatives under this issue are primarily socio-economic and positive in that eliminating the potential conflicts in the allocation schemes would benefit participants in the respective fisheries. Biological impacts are already accounted for in setting the annual quota and are not expected to change since any such change would likely be tied to a shift in the geographic distribution of fishing effort which is not expected. The action alternatives would achieve the same outcome except that if Alternative 4C is adopted and further modification to the Interstate FMP occurs, the plans would again be inconsistent.

Table 30. Fishing year (May 1 – Apr 30) landings since 2000 by Period where Period 1 is May 1 – Oct 31 and Period 2 is Nov 1 – Apr 30.

FISHING YEAR	PERIOD 1 LANDINGS (LB)	PERIOD 2 LANDINGS (LB)	TOTAL LANDINGS (LB)	PCT PERIOD 1	PCT PERIOD 2
2000	7,709,445	455,143	8,164,588	94.4%	5.6%
2001	2,584,100	2,437,448	5,021,548	51.5%	48.5%
2002	3,052,858	1,710,363	4,763,221	64.1%	35.9%
2003	2,367,790	818,340	3,186,130	74.3%	25.7%
2004	988,508	387,137	1,375,645	71.9%	28.1%
2005	1,903,641	488,601	2,392,242	79.6%	20.4%
2006	2,476,141	4,106,545	6,582,686	37.6%	62.4%
2007	4,073,393	2,317,910	6,391,303	63.7%	36.3%
2008	5,470,534	3,534,893	9,005,427	60.7%	39.3%
2009	7,865,311	4,071,729	11,937,040	65.9%	34.1%
2010	8,830,401	5,693,392	14,523,793	60.8%	39.2%

Table 31. Fishing year (May 1 – Apr 30) landings since 2000 by "Region' defined as "North" (ME – CT) and "South" (NY-NC)

FISHING YEAR	NORTH LANDINGS (LB)	SOUTH LANDINGS (LB)	TOTAL LANDINGS (LB)	PCT NORTH	PCT SOUTH
2000	7,966,598	197,990	8,164,588	97.6%	2.4%
2001	4,781,321	240,227	5,021,548	95.2%	4.8%
2002	4,610,294	152,927	4,763,221	96.8%	3.2%
2003	2,287,919	898,211	3,186,130	71.8%	28.2%
2004	1,286,974	88,671	1,375,645	93.6%	6.4%
2005	2,270,204	122,038	2,392,242	94.9%	5.1%
2006	4,137,037	2,445,649	6,582,686	62.8%	37.2%
2007	3,625,164	2,766,139	6,391,303	56.7%	43.3%
2008	5,209,955	3,795,472	9,005,427	57.9%	42.1%
2009	7,560,207	4,376,833	11,937,040	63.3%	36.7%
2010	8,700,089	5,823,704	14,523,793	59.9%	40.1%

Other considerations relate to the potential for different coastwide quotas under the two plans (Table 32).

Table 32. Potential scenarios under the different quota allocation schemes

Scenario	Same Quota	Larger ASMFC Quota	Larger Federal Quota
Alt 4A (status quo)	**Negative**: Harvest of the Period 1 quota shuts down federal waters outside states that have not yet harvested their allocation	**Negative**: Vessels with federal permits have to drop their open access federal permits to fish in state waters	**Neutral:** If a region or state announces a closure, federal permit holders have to land spiny dogfish in other states that remain open if that is possible
Alt 4B (coastwide quota)	**Positive**: States will close each region/state as the region/state quota is filled, and the federal and interstate fishery will close when the total coast-wide quota is filled	**Negative, but unlikely** (Only if the ASMFC quota is much larger) - Northern states could harvest the entire federal coastwide quota before the spiny dogfish move south in the winter and southern states fully harvest their fisheries. This would cause vessels in southern states to relinquish their Federal permits and fish only in state waters	**Neutral:** If a region or state announces a closure, federal permit holders have to land spiny dogfish in other states that remain open if that is possible
Alt 4C (match ASMFC state/regional allocation)	**Positive**: States will close each region/state as the region/state quota is filled, and the federal and interstate fishery will close when the total coast-wide quota is filled	**Negative**: Vessels with federal permits have to drop their open access federal permits to fish in state waters	**Neutral:** If a region or state announces a closure, federal permit holders have to land spiny dogfish in other states that remain open if that is possible

7.5 Cumulative Effects Analysis

THIS SECTION WILL BE RETOOLED BASED ON GUIDANCE FROM NERO NEPA

A cumulative effects analysis (CEA) is required by the Council on Environmental Quality (CEQ) (40 CFR part 1508.7). The purpose of 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. CEQ guidelines recognize that it is not practical to analyze the cumulative effects of an action from every conceivable perspective, but rather, the intent is to focus on those effects that are truly meaningful. A formal cumulative impact assessment is not necessarily required as part of an EA under NEPA as long as the significance of cumulative impacts have been considered (U.S. EPA 1999). The following remarks address the significance of the expected cumulative impacts as they relate to the federally managed spiny dogfish fishery.

7.5.1 Consideration of the VECs

In section 6.0 (Description of the Affected Environment), the VECs that exist within the spiny dogfish fishery environment are identified. Therefore, the significance of the cumulative effects will be discussed in relation to the VECs listed below.

1. Managed resource (spiny dogfish)
2. Non-target species
3. Habitat including EFH for the managed resource and non-target species
4. ESA listed and MMPA protected species
5. Human communities

7.5.2 Geographic Boundaries

The analysis of impacts focuses on actions related to the harvest of spiny dogfish. The core geographic scope for each of the VECs is focused on the Western Atlantic Ocean (section 6.0). The core geographic scopes for the managed resources are the range of the management units (section 6.1). For non-target species, those ranges may be expanded and would depend on the biological range of each individual non-target 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 spiny dogfish and non-target species in the Western Atlantic Ocean. The core geographic scope for endangered and protected resources can be considered the overall range of these VECs in the Western Atlantic Ocean. For human communities, the core geographic boundaries are defined as those U.S. fishing communities directly involved in the harvest or processing of the managed resources, which were found to occur in coastal states from Maine through North Carolina (section 6.4).

7.5.3 Temporal Boundaries

The temporal scope of past and present actions for VECs is primarily focused on actions that have occurred after FMP implementation (1990). For endangered and other protected resources, the scope of past and present actions is on a species-by-species basis (section 6.3) and is largely focused on the 1980s and 1990s through the present, when NMFS began generating stock assessments for marine mammals and sea turtles that inhabit waters of the U.S. EEZ. The temporal scope of future actions for all five VECs extends about three years (2014) into the future. This period was chosen because the dynamic nature of resource management and lack of information on projects that may occur in the future make it very difficult to predict impacts beyond this timeframe with any certainty.

7.5.4 Actions Other Than Those Proposed in this Amendment

The impacts of each of the alternatives considered in this specifications document are given in section 7.1 through 7.4. Table 33 presents meaningful past (P), present (Pr), or reasonably foreseeable future (RFF) actions to be considered other than those actions being considered in this specifications document. These impacts are described in chronological order and qualitatively, as the actual impacts of these actions are too complex to be quantified in a meaningful way. When any of these abbreviations occur together (i.e., P, Pr, RFF), it indicates that some past actions are still relevant to the present and/or future actions.

Past and Present Actions

The historical management practices of the Council have resulted in positive impacts on the health of the spiny dogfish stock (section 6.1). Actions have been taken to manage the commercial fisheries for this species through amendment actions. In addition, the annual specifications process is intended to provide the opportunity for the Council and NMFS to regularly assess the status of the fishery and to make necessary adjustments to ensure that there is a reasonable expectation of meeting the objectives of the FMP. The statutory basis for federal fisheries management is the MSA. To the degree with which this regulatory regime is complied, the cumulative impacts of past, present, and reasonably foreseeable future federal fishery management actions on the VECs should generally be associated with positive long-term outcomes. Constraining fishing effort through regulatory actions can often have negative short-term socioeconomic impacts. These impacts are usually necessary to bring about long-term sustainability of a given resource, and as such, should, in the long-term, promote positive effects on human communities, especially those that are economically dependent upon the spiny dogfish stock.

Non-fishing activities that introduce chemical pollutants, sewage, changes in water temperature, salinity, dissolved oxygen, and suspended sediment into the marine environment pose a risk to all of the identified VECs. Human-induced non-fishing activities tend to be localized in nearshore areas and marine project areas where they occur. Examples of these activities include, but are not limited to agriculture, port maintenance, beach nourishment, coastal development, marine transportation, marine mining, dredging and the disposal of dredged material. Wherever these activities co-occur, they are likely to work additively or synergistically to decrease habitat quality and, as such, may indirectly constrain the sustainability of the managed resources, non-target species, and protected resources. Decreased habitat suitability would tend to reduce the tolerance of these VECs to the impacts of fishing effort. Mitigation of this outcome through regulations that would reduce fishing effort could then negatively impact human communities. The overall impact to the affected species and its habitat on a population level is unknown, but likely neutral to low negative, since a large portion of this species has a limited or minor exposure to these local non-fishing perturbations.

In addition to guidelines mandated by the MSA, NMFS reviews these types of effects through the review processes required by Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act for certain activities that are regulated by federal, state, and local authorities. The jurisdiction of these activities is in "waters of the U.S." and includes both riverine and marine habitats.

Reasonably Foreseeable Future Actions

For many of the proposed non-fishing activities to be permitted under other federal agencies (such as beach nourishment, offshore wind facilities, etc.), those agencies would conduct examinations of potential impacts on the VECs. The MSA (50 CFR 600.930) imposes an obligation on other federal agencies to consult with the Secretary of Commerce on actions that may adversely affect EFH. The eight Fishery Management Councils are engaged in this review process by making comments and recommendations on any federal or state action that may affect habitat, including EFH, for their managed species and by commenting on actions likely to substantially affect habitat, including EFH.

In addition, under the Fish and Wildlife Coordination Act (Section 662), “whenever the waters of any stream or other body of water are proposed or authorized to be impounded, diverted, the channel deepened, or the stream or other body of water otherwise controlled or modified for any purpose whatever, including navigation and drainage, by any department or agency of the U.S., or by any public or private agency under federal permit or license, such department or agency first shall consult with the U.S. Fish and Wildlife Service (USFWS), Department of the Interior, and with the head of the agency exercising administration over the wildlife resources of the particular state wherein the” activity is taking place. This act provides another avenue for review of actions by other federal and state agencies that may impact resources that NMFS manages in the reasonably foreseeable future.

In addition, NMFS and the USFWS share responsibility for implementing the ESA. ESA requires NMFS to designate "critical habitat" for any species it lists under the ESA (i.e., areas that contain physical or biological features essential to conservation, which may require special management considerations or protection) and to develop and implement recovery plans for threatened and endangered species. The ESA provides another avenue for NMFS to review actions by other entities that may impact endangered and protected resources whose management units are under NMFS’ jurisdiction.

7.5.5 Magnitude and Significance of Cumulative Effects

In determining the magnitude and significance of the cumulative effects, the additive and synergistic effects of the proposed action, as well as past, present, and future actions, must be taken into account. The following section discusses the effects of these actions on each of the VECs.

Table 33. Impacts of Past (P), Present (Pr), and Reasonably Foreseeable Future (RFF) Actions on the five VECs (not including those actions considered in this specifications document).

Action	Description	Impacts on Managed Resource	Impacts on Non-target Species	Impacts on Habitat and EFH	Impacts on Protected Species	Impacts on Human Communities
[P, Pr] Original FMP and subsequent Amendments and Frameworks to the FMP	Established commercial management measures	**Indirect Positive** Regulatory tool available to rebuild and manage stocks	**Indirect Positive** Reduced fishing effort	**Indirect Positive** Reduced fishing effort	**Indirect Positive** Reduced fishing effort	**Indirect Positive** Benefited domestic businesses
[P, Pr] Spiny dogfish Specifications	Establish annual quotas, trip limits	**Indirect Positive** Regulatory tool to specify catch limits, and other regulation; allows response to annual stock updates	**Indirect Positive** Reduced effort levels and gear requirements	**Indirect Positive** Reduced effort levels and gear requirements	**Indirect Positive** Reduced effort levels and gear requirements	**Indirect Positive** Benefited domestic businesses
[P, Pr] Developed and Applied Standardized Bycatch Reporting Methodology	Established acceptable level of precision and accuracy for monitoring of bycatch in fisheries	**Neutral** May improve data quality for monitoring total removals of managed resource	**Neutral** May improve data quality for monitoring removals of non-target species	**Neutral** Will not affect distribution of effort	**Neutral** May increase observer coverage and will not affect distribution of effort	**Potentially Indirect Negative** May impose an inconvenience on vessel operations
[Pr, RFF] Omnibus Amendment ACLs/AMs Implemented	Establish ACLs and AMs for all three plan species	**Potentially Indirect Positive** Pending full analysis	**Potentially Indirect Positive** Pending full analysis	**Potentially Indirect Positive** Pending full analysis	**Potentially Indirect Positive** Pending full analysis	**Potentially Indirect Positive** Pending full analysis
[P, Pr, RFF] Agricultural runoff	Nutrients applied to agricultural land are introduced into aquatic systems	**Indirect Negative** Reduced habitat quality	**Indirect Negative** Reduced habitat quality	**Direct Negative** Reduced habitat quality	**Indirect Negative** Reduced habitat quality	**Indirect Negative** Reduced habitat quality negatively affects resource
[P, Pr, RFF] Port maintenance	Dredging of coastal, port and harbor areas for port maintenance	**Uncertain – Likely Indirect Negative** Dependent on mitigation effects	**Uncertain – Likely Indirect Negative** Dependent on mitigation effects	**Uncertain – Likely Direct Negative** Dependent on mitigation effects	**Uncertain – Likely Indirect Negative** Dependent on mitigation effects	**Uncertain – Likely Mixed** Dependent on mitigation effects

Table 31 (Continued). Impacts of Past (P), Present (Pr), and Reasonably Foreseeable Future (RFF) Actions on the five VECs (not including those actions considered in this specifications document).

Action	Description	Impacts on Managed Resource	Impacts on Non-target Species	Impacts on Habitat and EFH	Impacts on Protected Species	Impacts on Human Communities
P, Pr, RFF Offshore disposal of dredged materials	Disposal of dredged materials	**Indirect Negative** Reduced habitat quality	**Indirect Negative** Reduced habitat quality	**Direct Negative** Reduced habitat quality	**Indirect Negative** Reduced habitat quality	**Indirect Negative** Reduced habitat quality negatively affects resource viability
P, Pr, RFF Beach nourishment	Offshore mining of sand for beaches	**Indirect Negative** Localized decreases in habitat quality	**Indirect Negative** Localized decreases in habitat quality	**Direct Negative** Reduced habitat quality	**Indirect Negative** Localized decreases in habitat quality	**Mixed** Positive for mining companies, possibly negative for fishing industry
	Placement of sand to nourish beach shorelines	**Indirect Negative** Localized decreases in habitat quality	**Indirect Negative** Localized decreases in habitat quality	**Direct Negative** Reduced habitat quality	**Indirect Negative** Localized decreases in habitat quality	**Positive** Beachgoers like sand; positive for tourism
P, Pr, RFF Marine transportation	Expansion of port facilities, vessel operations and recreational marinas	**Indirect Negative** Localized decreases in habitat quality	**Indirect Negative** Localized decreases in habitat quality	**Direct Negative** Reduced habitat quality	**Indirect Negative** Localized decreases in habitat quality	**Mixed** Positive for some interests, potential displacement for others
P, Pr, RFF Installation of pipelines, utility lines and cables	Transportation of oil, gas and energy through pipelines, utility lines and cables	**Uncertain – Likely Indirect Negative** Dependent on mitigation effects	**Uncertain – Likely Indirect Negative** Dependent on mitigation effects	**Uncertain – Likely Direct Negative** Reduced habitat quality	**Potentially Direct Negative** Dependent on mitigation effects	**Uncertain – Likely Mixed** Dependent on mitigation effects

Table 31 (Continued). Impacts of Past (P), Present (Pr), and Reasonably Foreseeable Future (RFF) Actions on the five VECs (not including those actions considered in this specifications document).

Action	Description	Impacts on Managed Resource	Impacts on Non-target Species	Impacts on Habitat and EFH	Impacts on Protected Species	Impacts on Human Communities
[RFF] Offshore Wind Energy Facilities (within 3 years)	Construction of wind turbines to harness electrical power (Several proposed from ME through NC, including NY/NJ, DE, and VA)	**Uncertain – Likely Indirect Negative** Dependent on mitigation effects	**Uncertain – Likely Indirect Negative** Dependent on mitigation effects	**Potentially Direct Negative** Localized decreases in habitat quality possible	**Uncertain – Likely Indirect Negative** Dependent on mitigation effects	**Uncertain – Likely Mixed** Dependent on mitigation effects
[Pr, RFF] Liquefied Natural Gas (LNG) terminals (within 3 years)	Transport natural gas via tanker to terminals offshore and onshore (1 terminal built in MA; 1 under construction; proposed in RI, NY, NJ and DE)	**Uncertain – Likely Indirect Negative** Dependent on mitigation effects	**Uncertain – Likely Indirect Negative** Dependent on mitigation effects	**Potentially Direct Negative** Localized decreases in habitat quality possible	**Uncertain – Likely Indirect Negative** Dependent on mitigation effects	**Uncertain – Likely Mixed** Dependent on mitigation effects
[RFF] Convening Gear Take Reduction Teams (within next 3 years)	Recommend measures to reduce mortality and injury to marine mammals	**Indirect Positive** Will improve data quality for monitoring total removals	**Indirect Positive** Reducing availability of gear could reduce bycatch	**Indirect Positive** Reducing availability of gear could reduce gear impacts	**Indirect Positive** Reducing availability of gear could reduce encounters	**Indirect Negative** Reducing availability of gear could reduce revenues
[RFF] Strategy for Sea Turtle Conservation for the Atlantic Ocean and the Gulf of Mexico Fisheries (w/in next 3 years)	May recommend strategies to prevent the bycatch of sea turtles in commercial fisheries operations	**Indirect Positive** Will improve data quality for monitoring total removals	**Indirect Positive** Reducing availability of gear could reduce bycatch	**Indirect Positive** Reducing availability of gear could reduce gear impacts	**Indirect Positive** Reducing availability of gear could reduce encounters	**Indirect Negative** Reducing availability of gear could reduce revenues

7.5.5.1 Managed Resources

Those past, present, and reasonably foreseeable future actions, whose effects may impact the managed resources and the direction of those potential impacts, are summarized in Table 33. The indirectly negative actions described in Table 33 are localized in nearshore areas and marine project areas where they occur. Therefore, the magnitude of those impacts on the managed resource is expected to be limited due to a lack of exposure to the population at large. Agricultural runoff may be much broader in scope, and the impacts of nutrient inputs to the coastal system may be of a larger magnitude, although the impact on productivity of the managed resources is unquantifiable. As described above (section 7.5.4), NMFS has several means under which it can review non-fishing actions of other federal or state agencies that may impact NMFS' managed resources prior to permitting or implementation of those projects. This serves to minimize the extent and magnitude of indirect negative impacts those actions could have on resources under NMFS' jurisdiction.

Past fishery management actions taken through the FMP and annual specification process have had a positive cumulative effect on the managed resource. It is anticipated that the future management actions, described in Table 34, will result in additional indirect positive effects on the managed resources through actions which reduce and monitor bycatch, protect habitat, and protect ecosystem services on which spiny dogfish productivity depends. The 2012 fishing year will be the first year of implementation for an Amendment which requires specification of ACLs/AMs and catch accountability. This represents a major change to the current management program and is expected to lead to improvements in resource sustainability over the long-term. These impacts could be broad in scope. Overall, the past, present, and reasonably foreseeable future actions that are truly meaningful to spiny dogfish have had a positive cumulative effect.

Commercial quotas for the managed resource have been specified to ensure the stock is managed in a sustainable manner, and measures are consistent with the objectives of the FMP under the guidance of the MSA. The impacts from annual specification of management measures established in previous years on the managed resource are largely dependent on how effective those measures were in meeting their intended objectives (i.e., preventing overfishing, achieve OY) and the extent to which mitigating measures were effective. The proposed action in this document would positively reinforce the past and anticipated positive cumulative effects on the spiny dogfish stock, by achieving the objectives specified in the FMP. Therefore, the proposed action would not have any significant effect on the managed resources individually or in conjunction with other anthropogenic activities (see Table 34).

Table 34. Summary of the effects of past, present, and reasonably foreseeable future actions on the managed resource.

Action	Past to the Present	Reasonably Foreseeable Future
Original FMP and subsequent Amendments and Frameworks to the FMP	**Indirect Positive**	
Spiny dogfish Specifications	**Indirect Positive**	
Developed and Implement Standardized Bycatch Reporting Methodology	**Neutral**	
Amendment to address ACLs/AMs implemented	**Potentially Indirect Positive**	
Agricultural runoff	**Indirect Negative**	
Port maintenance	**Uncertain – Likely Indirect Negative**	
Offshore disposal of dredged materials	**Indirect Negative**	
Beach nourishment – Offshore mining	**Indirect Negative**	
Beach nourishment – Sand placement	**Indirect Negative**	
Marine transportation	**Indirect Negative**	
Installation of pipelines, utility lines and cables	**Uncertain – Likely Indirect Negative**	
National Offshore Aquaculture Act of 2007	**Potentially Indirect Negative**	
Offshore Wind Energy Facilities (within 3 years)		**Uncertain – Likely Indirect Negative**
Liquefied Natural Gas (LNG) terminals (within 3 years)	**Uncertain – Likely Indirect Negative**	
Convening Gear Take Reduction Teams (within 3 years)		**Indirect Positive**
Strategy for Sea Turtle Conservation for the Atlantic Ocean and the Gulf of Mexico Fisheries (within next 3 years)		**Indirect Positive**
Summary of past, present, and future actions excluding those proposed in this specifications document	**Overall, actions have had, or will have, positive impacts on the managed resources * See section 7.5.5.1 for explanation.**	

7.5.5.2 Non-Target Species or Bycatch

Those past, present, and reasonably foreseeable future actions, whose effects may impact non-target species and the direction of those potential impacts, are summarized in Table 33. The effects of indirectly negative actions described in Table 33 are localized in nearshore areas and marine project areas where they occur. Therefore, the magnitude of those impacts on non-target species is expected to be limited due to a lack of exposure to the population at large. Agricultural runoff may be much broader in scope, and the impacts of nutrient inputs to the coastal system may be of a larger magnitude, although the impact on productivity of non-target resources and the oceanic ecosystem is unquantifiable. As described above (section 7.5.4), NMFS has several means under which it can review non-fishing actions of other federal or state agencies that may impact NMFS' managed resources prior to permitting or implementation of those projects. At this time, NMFS can consider impacts to non-target species (federally-managed or otherwise) and comment on potential impacts. This serves to minimize the extent and magnitude of indirect negative impacts those actions could have on resources within NMFS' jurisdiction.

Past fishery management actions taken through the FMP and annual specification process have had a positive cumulative effect on non-target species. Implementation and application of a standardized bycatch reporting methodology would have a particular impact on non-target species by improving the methods which can be used to assess the magnitude and extent of a potential bycatch problem. Better assessment of potential bycatch issues allows more effective and specific management measures to be developed to address a bycatch problem. It is anticipated that future management actions, described in Table 35, will result in additional indirect positive effects on non-target species through actions which reduce and monitor bycatch, protect habitat, and protect ecosystem services on which the productivity of many of these non-target resources depend. The impacts of these future actions could be broad in scope, and it should be noted the managed resource and non-target species are often coupled in that they utilize similar habitat areas and ecosystem resources on which they depend. Overall, the past, present, and reasonably foreseeable future actions that are truly meaningful have had a positive cumulative effect on non-target species.

Commercial quotas and trip limits for the managed resource have been specified to ensure the stock is managed in a sustainable manner, and measures are consistent with the objectives of the FMP under the guidance of the MSA. The proposed actions in this document have impacts that range from neutral to positive or negative impacts, and would not change the past and anticipated positive cumulative effects on non-target species and thus, would not have any significant effect on these species individually or in conjunction with other anthropogenic activities (Table 35).

Table 35. Summary of the effects of past, present, and reasonably foreseeable future actions on the non-target species.

<table>
<tr><th>Action</th><th colspan="2">Past to the Present</th><th>Reasonably Foreseeable Future</th></tr>
<tr><td>Original FMP and subsequent Amendments and Frameworks to the FMP</td><td colspan="2">Indirect Positive</td><td></td></tr>
<tr><td>Spiny dogfish Specifications</td><td colspan="2">Indirect Positive</td><td></td></tr>
<tr><td>Developed and Implement Standardized Bycatch Reporting Methodology</td><td colspan="2">Neutral</td><td></td></tr>
<tr><td>Amendment to address ACLs/AMs implemented</td><td></td><td colspan="2">Potentially Indirect Positive</td></tr>
<tr><td>Agricultural runoff</td><td colspan="3">Indirect Negative</td></tr>
<tr><td>Port maintenance</td><td colspan="3">Uncertain – Likely Indirect Negative</td></tr>
<tr><td>Offshore disposal of dredged materials</td><td colspan="3">Indirect Negative</td></tr>
<tr><td>Beach nourishment – Offshore mining</td><td colspan="3">Indirect Negative</td></tr>
<tr><td>Beach nourishment – Sand placement</td><td colspan="3">Indirect Negative</td></tr>
<tr><td>Marine transportation</td><td colspan="3">Indirect Negative</td></tr>
<tr><td>Installation of pipelines, utility lines and cables</td><td colspan="3">Uncertain – Likely Indirect Negative</td></tr>
<tr><td>National Offshore Aquaculture Act of 2007</td><td colspan="3">Potentially Indirect Negative</td></tr>
<tr><td>Offshore Wind Energy Facilities (within 3 years)</td><td></td><td></td><td>Uncertain – Likely Indirect Negative</td></tr>
<tr><td>Liquefied Natural Gas (LNG) terminals (within 3 years)</td><td></td><td colspan="2">Uncertain – Likely Indirect Negative</td></tr>
<tr><td>Convening Gear Take Reduction Teams (within 3 years)</td><td></td><td></td><td>Indirect Positive</td></tr>
<tr><td>Strategy for Sea Turtle Conservation for the Atlantic Ocean and the Gulf of Mexico Fisheries (within next 3 years)</td><td></td><td></td><td>Indirect Positive</td></tr>
<tr><td>Summary of past, present, and future actions excluding those proposed in this specifications document</td><td colspan="3">Overall, actions have had, or will have, positive impacts on the non-target species
* See section 7.5.5.2 for explanation.</td></tr>
</table>

7.5.5.3 Habitat (Including EFH)

Those past, present, and reasonably foreseeable future actions, whose effects may impact habitat (including EFH) and the direction of those potential impacts, are summarized in Table 33. The direct and indirect negative actions described in Table 33 are localized in nearshore areas and marine project areas where they occur. Therefore, the magnitude of those impacts on habitat is expected to be limited due to a lack of exposure to habitat at large. Agricultural runoff may be much broader in scope, and the impacts of nutrient inputs to the coastal system may be of a larger magnitude, although the impact on habitat and EFH is unquantifiable. As described above (section 7.5.4), NMFS has several means under which it can review non-fishing actions of other federal or state agencies that may impact NMFS' managed resources and the habitat on which they rely prior to permitting or implementation of those projects. This serves to minimize the extent and magnitude of direct and indirect negative impacts those actions could have on habitat utilized by resources under NMFS' jurisdiction.

Past fishery management actions taken through the FMP and annual specification process have had a positive cumulative effect on habitat and EFH. The actions have constrained fishing effort at a large scale and locally, and have implemented gear requirements, which may reduce habitat impacts. As required under these FMP actions, EFH and HAPCs were designated for the managed resources. It is anticipated that the future management actions, described in Table 36, will result in additional direct or indirect positive effects on habitat through actions which protect EFH for federally-managed species and protect ecosystem services on which these species' productivity depends. These impacts could be broad in scope. All of the VECs are interrelated; therefore, the linkages among habitat quality and EFH, managed resources and non-target species productivity, and associated fishery yields should be considered. For habitat and EFH, there are direct and indirect negative effects from actions which may be localized or broad in scope; however, positive actions that have broad implications have been, and it is anticipated will continue to be, taken to improve the condition of habitat. There are some actions, which are beyond the scope of NMFS and Council management such as coastal population growth and climate changes, which may indirectly impact habitat and ecosystem productivity. Overall, the past, present, and reasonably foreseeable future actions that are truly meaningful to habitat have had a neutral to positive cumulative effect.

Commercial quotas and trip limits for the managed resource have been specified to ensure the stock is managed in a sustainable manner, and measures are consistent with the objectives of the FMP under the guidance of the MSA. The proposed actions in this document would not change the past and anticipated cumulative effects on habitat and thus, would not have any significant effect on habitat individually or in conjunction with other anthropogenic activities (Table 36).

Table 36. Summary of the effects of past, present, and reasonably foreseeable future actions on the habitat.

Action	Past to the Present		Reasonably Foreseeable Future
Original FMP and subsequent Amendments and Frameworks to the FMP	**Indirect Positive**		
Spiny dogfish Specifications	**Indirect Positive**		
Developed and Implement Standardized Bycatch Reporting Methodology	**Neutral**		
Amendment to address ACLs/AMs implemented		**Potentially Indirect Positive**	
Agricultural runoff	**Direct Negative**		
Port maintenance	**Uncertain – Likely Direct Negative**		
Offshore disposal of dredged materials	**Direct Negative**		
Beach nourishment – Offshore mining	**Direct Negative**		
Beach nourishment – Sand placement	**Direct Negative**		
Marine transportation	**Direct Negative**		
Installation of pipelines, utility lines and cables	**Uncertain – Likely Direct Negative**		
National Offshore Aquaculture Act of 2007	**Direct Negative**		
Offshore Wind Energy Facilities (within 3 years)			**Potentially Direct Negative**
Liquefied Natural Gas (LNG) terminals (within 3 years)		**Potentially Direct Negative**	
Convening Gear Take Reduction Teams (within 3 years)			**Indirect Positive**
Strategy for Sea Turtle Conservation for the Atlantic Ocean and the Gulf of Mexico Fisheries (within next 3 years)			**Indirect Positive**
Summary of past, present, and future actions excluding those proposed in this specifications document	**Overall, actions have had, or will have, neutral to positive impacts on habitat, including EFH * See section 7.5.5.3 for explanation.**		

7.5.5.4 ESA Listed and MMPA Protected Species

Those past, present, and reasonably foreseeable future actions, whose effects may impact the protected resources and the direction of those potential impacts, are summarized in Table 33. The indirectly negative actions described in Table 33 are localized in nearshore areas and marine project areas where they occur. Therefore, the magnitude of those impacts on protected resources, relative to the range of many of the protected resources, is expected to be limited due to a lack of exposure to the population at large. Agricultural runoff may be much broader in scope, and the impacts of nutrient inputs to the coastal system may be of a larger magnitude, although the impact on protected resources either directly or indirectly is unquantifiable. As described above (section 7.5.4), NMFS has several means, including ESA, under which it can review non-fishing actions of other federal or state agencies that may impact NMFS' protected resources prior to permitting or implementation of those projects. This serves to minimize the extent and magnitude of indirect negative impacts those actions could have on protected resources under NMFS' jurisdiction.

Past fishery management actions taken through the FMP and annual specification process have had a positive cumulative effect on ESA listed and MMPA protected species through the reduction of fishing effort (potential interactions) and implementation of gear requirements. It is anticipated that the future management actions, specifically those recommended by the ALWTRT and the development of strategies for sea turtle conservation described in Table 37, will result in additional indirect positive effects on the protected resources. These impacts could be broad in scope. Overall, the past, present, and reasonably foreseeable future actions that are truly meaningful to protected resources have had a positive cumulative effect.

Commercial quotas and trip limits for the managed resource have been specified to ensure the stock is managed in a sustainable manner, and measures are consistent with the objectives of the FMP under the guidance of the MSA. The proposed actions in this document would not change the past and anticipated cumulative effects on ESA listed and MMPA protected species and thus, would not have any significant effect on protected resources individually or in conjunction with other anthropogenic activities (Table 37).

NMFS will implement any appropriate measures outlined in the BO to mitigate harm to Atlantic sturgeon. Further, the encounter rates and mortalities for Atlantic sturgeon that have been calculated as part of the preliminary analysis of NEFOP data (as discussed in Sec 7.4) include encounters and mortalities by all fisheries utilizing sink gillnet and otter trawl gear, including the groundfish, monkfish, bluefish, skate, and other fisheries. Based upon the above estimates, the rates of encounters and mortalities by the spiny dogfish fishery are lower than the estimates in most of those fisheries. Finally, this EA evaluates a temporary action, one that is only in place for FY 2012. Therefore, cumulative impacts resulting from the approval of the spiny dogfish fishery specifications are not likely to be significant.

Table 37. Summary of the effects of past, present, and reasonably foreseeable future actions on the protected resources.

<table>
<tr><th>Action</th><th colspan="2">Past to the Present</th><th>Reasonably Foreseeable Future</th></tr>
<tr><td>Original FMP and subsequent Amendments and Frameworks to the FMP</td><td colspan="2">Indirect Positive</td><td></td></tr>
<tr><td>Spiny dogfish Specifications</td><td colspan="2">Indirect Positive</td><td></td></tr>
<tr><td>Developed and Implement Standardized Bycatch Reporting Methodology</td><td colspan="2">Neutral</td><td></td></tr>
<tr><td>Amendment to address ACLs/AMs implemented</td><td></td><td colspan="2">Potentially Indirect Positive</td></tr>
<tr><td>Agricultural runoff</td><td colspan="3">Indirect Negative</td></tr>
<tr><td>Port maintenance</td><td colspan="3">Uncertain – Likely Indirect Negative</td></tr>
<tr><td>Offshore disposal of dredged materials</td><td colspan="3">Indirect Negative</td></tr>
<tr><td>Beach nourishment – Offshore mining</td><td colspan="3">Indirect Negative</td></tr>
<tr><td>Beach nourishment – Sand placement</td><td colspan="3">Indirect Negative</td></tr>
<tr><td>Marine transportation</td><td colspan="3">Indirect Negative</td></tr>
<tr><td>Installation of pipelines, utility lines and cables</td><td colspan="3">Potentially Direct Negative</td></tr>
<tr><td>National Offshore Aquaculture Act of 2007</td><td colspan="3">Potentially Indirect Negative</td></tr>
<tr><td>Offshore Wind Energy Facilities (within 3 years)</td><td></td><td></td><td>Uncertain – Likely Indirect Negative</td></tr>
<tr><td>Liquefied Natural Gas (LNG) terminals (within 3 years)</td><td></td><td colspan="2">Uncertain – Likely Indirect Negative</td></tr>
<tr><td>Convening Gear Take Reduction Teams (within 3 years)</td><td></td><td></td><td>Indirect Positive</td></tr>
<tr><td>Strategy for Sea Turtle Conservation for the Atlantic Ocean and the Gulf of Mexico Fisheries (within next 3 years)</td><td></td><td></td><td>Indirect Positive</td></tr>
<tr><td>Summary of past, present, and future actions excluding those proposed in this specifications document</td><td colspan="3">Overall, actions have had, or will have, positive impacts on protected resources
* See section 7.5.5.4 for explanation.</td></tr>
</table>

7.5.5.5 Human Communities

Those past, present, and reasonably foreseeable future actions, whose effects may impact human communities and the direction of those potential impacts, are summarized in Table 33. The indirectly negative actions described in Table 33 are localized in nearshore areas and marine project areas where they occur. Therefore, the magnitude of those impacts on human communities is expected to be limited in scope. It may, however, displace fishermen from project areas. Agricultural runoff may be much broader in scope, and the impacts of nutrient inputs to the coastal system may be of a larger magnitude. This may result in indirect negative impacts on human communities by reducing resource availability; however, this effect is unquantifiable. As described above (section 7.5.4), NMFS has several means under which it can review non-fishing actions of other federal or state agencies prior to permitting or implementation of those projects. This serves to minimize the extent and magnitude of indirect negative impacts those actions could have on human communities.

Past fishery management actions taken through the FMP and annual specification process have had both positive and negative cumulative effects by benefiting domestic fisheries through sustainable fishery management practices, while at the same time potentially reducing the availability of the resource to all participants. Sustainable management practices are, however, expected to yield broad positive impacts to fishermen, their communities, businesses, and the nation as a whole. It is anticipated that the future management actions, described in Table 38, will result in positive effects for human communities due to sustainable management practices, although additional indirect negative effects on the human communities could occur through management actions that may implement gear requirements or area closures and thus, reduce revenues. Overall, the past, present, and reasonably foreseeable future actions that are truly meaningful to human communities have had an overall positive cumulative effect.

Commercial quotas and trip limits for the managed resource have been specified to ensure the stock is managed in a sustainable manner, and measures are consistent with the objectives of the FMP under the guidance of the MSA. The impacts from annual specification measures established in previous years on the managed resources are largely dependent on how effective those measures were in meeting their intended objectives and the extent to which mitigating measures were effective. Overages may alter the timing of commercial fishery revenues (revenues realized a year earlier), and there may be impacts on some fishermen caused by unexpected reductions in their opportunities to earn revenues in the commercial fisheries in the year during which the overages are deducted.

Despite the potential for neutral to positive short-term effects on human communities, the expectation is that there would be a positive long-term effect on human communities due to the long-term sustainability of spiny dogfish. Overall, the proposed actions in this document would not change the past and anticipated cumulative effects on human communities and thus, would not have any significant effect on human communities individually, or in conjunction with other anthropogenic activities (Table 38).

Table 38. Summary of the effects of past, present, and reasonably foreseeable future actions on human communities.

Action	Past to the Present	Reasonably Foreseeable Future
Original FMP and subsequent Amendments and Frameworks to the FMP	**Indirect Positive**	
Spiny dogfish Specifications	**Indirect Positive**	
Developed and Implement Standardized Bycatch Reporting Methodology	**Potentially Indirect Negative**	
Amendment to address ACL/AMs implemented	**Potentially Indirect Positive**	
Agricultural runoff	**Indirect Negative**	
Port maintenance	**Uncertain – Likely Mixed**	
Offshore disposal of dredged materials	**Indirect Negative**	
Beach nourishment – Offshore mining	**Mixed**	
Beach nourishment – Sand placement	**Positive**	
Marine transportation	**Mixed**	
Installation of pipelines, utility lines and cables	**Uncertain – Likely Mixed**	
National Offshore Aquaculture Act of 2007	**Uncertain – Likely Mixed**	
Offshore Wind Energy Facilities (within 3 years)		**Uncertain – Likely Mixed**
Liquefied Natural Gas (LNG) terminals (within 3 years)	**Uncertain – Likely Mixed**	
Convening Gear Take Reduction Teams (within 3 years)		**Indirect Negative**
Strategy for Sea Turtle Conservation for the Atlantic Ocean and the Gulf of Mexico Fisheries (within next 3 years)		**Indirect Negative**
Summary of past, present, and future actions excluding those proposed in this specifications document	**Overall, actions have had, or will have, positive impacts on human communities * See section 7.5.5.5 for explanation.**	

7.5.6 Preferred Action on all the VECS

The Council has identified its preferred action alternatives in section 5.0. The cumulative effects of the range of actions considered in this document can be considered to make a determination if significant cumulative effects are anticipated from the preferred action.

The direct and indirect impacts of the proposed actions on the VECs are described in sections 7.1 through 7.4. The magnitude and significance of the cumulative effects, which include the additive and synergistic effects of the proposed action, as well as past, present, and future actions, have been taken into account throughout this section 7.5. The action proposed in this annual specifications document builds off action taken in the original FMP and subsequent amendments and framework documents. When this action is considered in conjunction with all the other pressures placed on fisheries by past, present, and reasonably foreseeable future actions, it is not expected to result in any significant impacts, positive or negative. Based on the information and analyses presented in these past FMP documents and this document, there are no significant cumulative effects associated with the action proposed in this document (Table 39).

Table 39. Magnitude and significance of the cumulative effects; the additive and synergistic effects of the preferred action, as well as past, present, and future actions.

VEC	Status in 2011	Net Impact of P, Pr, and RFF Actions	Impact of the Preferred Actions	Significant Cumulative Effects
Managed Resource	Complex and variable (Section 6.1)	Positive (Sections 7.5.4 and 7.5.5.1)		**None**
Non-target Species	Complex and variable (Section 6.1)	Positive (Sections 7.5.4 and 7.5.5.2)		**None**
Habitat	Complex and variable (Section 6.2)	Neutral to positive (Sections 7.5.4 and 7.5.5.3)		**None**
Protected Resources	Complex and variable (Section 6.3)	Positive (Sections 7.5.4 and 7.5.5.4)		**None**
Human Communities	Complex and variable (Section 6.4)	Positive (Sections 7.5.4 and 7.5.5.5)		**None**

8.0 APPLICABLE LAWS

8.1 National Environmental Policy Act of 1969 (NEPA)

8.1.1 Finding of No Significant Environmental Impact (FONSI)

National Oceanic and Atmospheric Administration Administrative Order (NAO) 216-6 (May 20, 1999) contains criteria for determining the significance of the impacts of a proposed action. In addition, the Council on Environmental Quality (CEQ) regulations at 40 C.F.R. 1508.27 state that the significance of an action should be analyzed both in terms of "context" and "intensity." Each criterion listed below is relevant to making a finding of no significant impact and has been considered individually, as well as in combination with the others. The significance of this action is analyzed based on the NAO 216-6 criteria and CEQ's context and intensity criteria. These include:

1) Can the proposed action reasonably be expected to jeopardize the sustainability of any target species that may be affected by the action?

The proposed action is intended to prevent overfishing and maintain spiny dogfish biomass above the biomass target. This action is not expected to jeopardize the sustainability of any target species that may be affected by the action. As discussed in Section 6.1.2, the spiny dogfish stock is rebuilt, is not overfished, and overfishing is not occurring.

2) Can the proposed action reasonably be expected to jeopardize the sustainability of any non-target species?

The proposed action is not expected to jeopardize the sustainability of any non-target species. The proposed measure is not expected to significantly alter fishing methods or activities. There is limited directed fishing for spiny dogfish using gear that incidentally catches other species. The proposed action should not significantly increase directed dogfish fishing in the EEZ. As such, the incidental catch of non-target species should not increase significantly.

3) Can the proposed action reasonably be expected to cause substantial damage to the ocean and coastal habitats and/or essential fish habitat as defined under the Magnuson-Stevens Act and identified in FMPs?

The proposed action is not expected to cause substantial damage to the ocean, coastal habitats, and/or EFH as defined under the MSA and identified in the FMP. There has been an overall decline in bottom trawling activity for groundfish in the Northeast region in recent years and management measures (closed areas) are in place for minimizing the adverse habitat impacts of bottom trawling and dredging. Therefore, fishing activity in the limited spiny dogfish trawl fishery is not expected to increase existing levels of minimal adverse impacts to EFH and do not require any mitigation.

4) Can the proposed action be reasonably expected to have a substantial adverse impact on public health or safety?

No changes in fishing behavior that would affect safety are anticipated. The overall effect of the proposed action would not adversely impact public health or safety.

5) Can the proposed action reasonably be expected to adversely affect endangered or threatened species, marine mammals, or critical habitat of these species?

The proposed action is not reasonably expected to have an adverse impact on endangered or threatened species, marine mammals, or critical habitat for these species. While there may be some adverse impacts by maintaining fishing effort through the proposed action, that impact is not expected to be significant. Because the abundance of dogfish has increased greatly, effort is unlikely to increase significantly. In addition, measures in place to protect endangered or threatened species, marine mammals, and critical habitat for these species would remain in place.

For the reasons described in Section 7.4, NMFS has determined that the continued operation of the Spiny Dogfish FMP during the reinitiation period is not likely to jeopardize the continued existence of any Atlantic sturgeon DPS. This is based on the short time period encompassed by the reinitiation period and consequently, the scale of any interactions with Atlantic sturgeon that may occur during this period. NMFS will implement any appropriate measures outlined in the BO to mitigate harm to Atlantic sturgeon. Further, the encounter rates and mortalities for Atlantic sturgeon that have been calculated as part of the preliminary analysis of NEFOP data include encounters and mortalities by all fisheries utilizing sink gillnet and otter trawl gear, including the groundfish, monkfish, bluefish, skate, and other fisheries. Based upon the above estimates, the rates of encounters and mortalities by the spiny dogfish fishery are lower than the estimates in most of those fisheries. Finally, this EA evaluates mostly administrative changes to the FMP that should not impact effort. Therefore, impacts resulting from the approval of Amendment 3 are not likely to be significant.

6) Can the proposed action be expected to have a substantial impact on biodiversity and/or ecosystem function within the affected area (e.g., benthic productivity, predator-prey relationships, etc.)?

The proposed action is not expected to have a substantial impact on biodiversity and ecosystem function within the affected area. The action is not expected to alter fishing methods or activities or fishing effort or the spatial and/or temporal distribution of current fishing effort.

7) Are significant social or economic impacts interrelated with natural or physical environmental effects?

The proposed action is not expected to have a substantial impact on the natural or physical environment. The proposed action is not expected to alter fishing methods or activities, fishing effort or the spatial and/or temporal distribution of current fishing effort. Therefore, there are no social or economic impacts interrelated with natural or physical environmental effects.

8) Are the effects on the quality of the human environment likely to be highly controversial?

The impacts of the proposed measures on the human environment are described in Section7 of the EA. The proposed actions merely adjust several administrative ascpects of the Spiny Dogfish FMP. Therefore, the measures contained in this action are not expected to be highly controversial.

9) Can the proposed action reasonably be expected to result in substantial impacts to unique areas, such as historic or cultural resources, park land, prime farmlands, wetlands, wild and scenic rivers or ecologically critical areas?

This fishery is not known to be prosecuted in any unique areas such as historic or cultural resources, park land, prime farmlands, wetlands, wild and scenic rivers or ecologically critical areas. Therefore, the proposed action is not expected to have a substantial impact on any of these areas.

10) Are the effects on the human environment likely to be highly uncertain or involve unique or unknown risks?

The impacts of the proposed action on the human environment are described in Section 7.0 of the EA. The proposed action is not expected to alter fishing methods or activities, and is not expected to increase fishing effort or the spatial and/or temporal distribution of current fishing effort. The measures contained in this action are not expected to have highly uncertain, unique, or unknown risks on the human environment.

11) Is the proposed action related to other actions with individually insignificant, but cumulatively significant impacts?

As discussed in Section 7.5, the proposed action is not expected to have cumulatively significant impacts when considered with the impacts from other fishing and non-fishing activities. The improvements in the condition of the stock are expected to generate cumulative positive impacts overall. The proposed action, together with past and future actions are not expected to result in significant cumulative impacts on the biological, physical, and human components of the environment.

12) Is the proposed action likely to adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural or historical resources?

The dogfish fishery takes place on ocean waters and would not affect any human communities on the adjacent shorelines. There are no known districts, sites, or highways in the area of the proposed action. The proposed action is not likely to affect objects listed in the National Register of Historic Places or cause significant impact to scientific, cutural, or historical resources. Several shipwrecks located within the Stellwagen Bank

National Marine Sanctuary are listed on the National Register of Historic Places. The current regulations allow fishing within the Stellwagen Bank National Marine Sanctuary. However, vessels typically avoid fishing near the wrecks to avoid tangling their gear. Therefore, this action would not result in any adverse effects to these wrecks. Due to the minimal impact on the human environment, the proposed action would not adversely affect scientific, cultural, or historical resources.

13) Can the proposed action reasonably be expected to result in the introduction or spread of a nonindigenous species?

There is no evidence or indication that this fishery has ever resulted in the introduction or spread of nonindigenous species. The proposed action is not expected to significantly alter fishing methods or activities, and is not expected to significantly increase fishing effort or the spatial and/or temporal distribution of current fishing effort. Therefore, it is highly unlikely that the proposed action would be expected to result in the introduction or spread of a non-indigenous species.

14) Is the proposed action likely to establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration?

The proposed action is not expected to alter fishing methods or activities, and is not expected to affect fishing effort or the spatial and/or temporal distribution of fishing effort. The proposed action will not result in significant effects, nor does it represent a decision in principle about a future consideration.

15) Can the proposed action reasonably be expected to threaten a violation of Federal, State, or local law or requirements imposed for the protection of the environment?

The proposed action is not expected to alter fishing methods or activities such that they threaten a violation of Federal, State, or local law or requirements imposed for the protection of the environment. The proposed action has been found to be consistent with other applicable laws (see Sections 9.2 - 9.10 below).

16) Can the proposed action reasonably be expected to result in cumulative adverse effects that could have a substantial effect on the target species or non-target species?

The impacts of the proposed action on the biological, physical, and human environment are described in Section 7.0. The cumulative effects of the proposed action on target and non-target species are detailed in Section 7.6. The proposed action is not expected to increase fishing effort or the spatial and/or temporal distribution of current fishing effort. Administrative improvements in the management of the stock through implementation of this amendment are expected to generate positive impacts overall.

DETERMINATION

In view of the information presented in this document and the analysis contained in the supporting Environmental Assessment, it is hereby determined that the proposed actions in this specification package will not significantly impact the quality of the human environment as described above and in the Environmental Assessment. In addition, all beneficial and adverse impacts of the proposed action have been addressed to reach the conclusion of no significant impacts. Accordingly, preparation of an Environmental Impact Statement for this action is not necessary.

______________________________________ ____________________

Regional Administrator, Northeast Region, NMFS Date

8.2 Marine Mammal Protection Act

The MAFMC has reviewed the impacts of Amendment 3 on marine mammals and has concluded that the amendment is consistent with the provisions of the MMPA, and will not alter existing measures to protect the species likely to inhabit the spiny dogfish management unit. For further information on the potential impacts of the fishery and the proposed management action on marine mammals, see Section 7.4 of this document.

8.3 Endangered Species Act

Section 7 of the Endangered Species Act 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. The MAFMC has concluded, using information available, that the Amendment 3 is not likely to jeopardize any ESA-listed species or alter or modify any critical habitat, based on the discussion of impacts in this document (Section 7.4).

8.4 Coastal Zone Management Act

The Coastal Zone Management Act (CZMA) of 1972, as amended, provides measures for ensuring stability of productive fishery habitat while striving to balance development pressures with social, economic, cultural, and other impacts on the coastal zone. It is recognized that responsible management of both coastal zones and fish stocks must involve mutually supportive goals. The Council has developed Amendment 3 and will submit it to NMFS; NMFS must determine whether this action is consistent to the maximum extent practicable with the CZM programs for each state (Maine through North Carolina).

8.5 Administrative Procedures Act

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

The Administrative Procedure Act requires solicitation and review of public comments on actions taken in the development of a fishery management plan and subsequent amendments and framework adjustments.

[UPDATE]

8.6 Data Quality Act

Utility of Information Product

[UPDATE]

8.7 Paperwork Reduction Act

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

8.8 Impacts Relative to Federalism/E.O. 13132

This amendment does not contain policies with federalism implications sufficient to warrant preparation of a federalism assessment under Executive Order (EO) 13132.

8.9 Regulatory Flexibility Act/E.O. 12866

[UPDATE]

10.0 LITERATURE CITED

[UPDATE]

ASMFC. 2007. Estimation of Atlantic Sturgeon Bycatch in Coastal Atlantic Commercial Fisheries of New England and the Mid-Atlantic. Special Report to the ASMFC Atlantic Sturgeon Management Board.

ASSRT. 2007. Status Review of Atlantic Sturgeon (*Acipenser oxyrinchus oxyrinchus).* Prepared by the Atlantic Sturgeon Status Review Team for the National Marine Fisheries Service, National Oceanic and Atmospheric Administration. February 23, 2007.

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

Dadswell, M. 2006. A review of the status of Atlantic sturgeon in Canada, with comparisons to populations in the United States and Europe. Fisheries 31:218-229.

Dovel, W. L., and T. J. Berggren. 1983. Atlantic sturgeon of the Hudson estuary, New York. New York Fish and Game Journal 30:140–172.

Dunton, K.J., A. Jordaan, K.A. McKown, D.O. Conover, and M.G. Frisk. 2010. Abundance and distribution of Atlantic sturgeon (*Acipenser oxyrinchus*) within the Northwest Atlantic Ocean determined from five fishery-independent surveys. Fish. Bull. 108:450-465.

Holland, B. F., Jr., and G. F. Yelverton. 1973. Distribution and biological studies of anadromous fishes offshore North Carolina. N.C. Dep. Nat. Econ. Res. Spec. Sci. Rep. 24. 132 pp.

Kynard, B., and M. Horgan. 2002a. Ontogenetic behavior and migration of Atlantic sturgeon, Acipenser oxyrinchus oxyrinchus, and shortnose sturgeon, A. brevirostrum, with notes on social behavior. Environmental Biology of Fishes 63:137–150.

Laney, R.W., J.E. Hightower, B.R. Versak, M.F. Mangold, W.W. Cole Jr., and S.E. Winslow. 2007. Distribution, habitat use, and size of Atlantic sturgeon captured during cooperative winter tagging cruises, 1988-2006. In Anadromous sturgeons: habitats, threats, and management (J. Munro, D. Hatin, J.E. Hightower, K. McKown, K.J. Sulak, A.W. Kahnle, and F. Caron (eds.)), p. 167-182. Am. Fish. Soc. Symp. 56, Bethesda, MD.

Laney, R.W. 1997. The relationship of submerged aquatic vegetation (SAV) ecological value to species managed by the Atlantic States Marine Fisheries Commission (ASMFC): summary for the ASMFC SAV Subcommittee. pp. 11-35 *in* C.D. Stephan and T.E. Bigford, eds. Atlantic Coastal Submerged Aquatic Vegetation: a review of its ecological role, anthropogenic impacts, state regulation, and value to Atlantic coastal fish stocks. Atlantic States Marine Fisheries Commission, Washington, D.C. Habitat Management Series #1.

MAFMC. 2011. Amendment 2 to the Spiny Dogfish Fishery Management Plan (Omnibus ACL/AM Amendment). Dover, DE. 552 p. + append.

_____ 1999. Spiny Dogfish Fishery Management Plan (includes Final Environmental Impact Statement and Regulatory Impact Review).

NMFS. 1998. Endangered Species Act Section 7 consultation, biological opinion and conference. Consultation in accordance with Section 7(a) of the Endangered Species Act Regarding the Federal Monkfish Fishery. National Marine Fisheries Service, Northeast Regional Office, Gloucester, MA. December 21, 1998.

NEFSC 2011. Update on the Status of Spiny Dogfish in 2011 and Initial Evaluation of Alternative Harvest Strategies. 44 p. Unpubl. Report.

_____ . 2002. Workshop on the effects of fishing gear on marine habitats off the northeastern United States, October 23-25, 2001, Boston, Massachusetts. U.S. Natl. Mar. Fish. Serv. Northeast Fish. Cent. Woods Hole Lab. Ref. Doc. 02-01. 86 p.

_____. 1998. Report of the 26th Northeast Regional Stock Assessment Workshop: Stock Assessment Review Committee Consensus Summary of Assessments. NEFSC Ref. Doc. 98-03.

Stein, A. B., K. D. Friedland, and M. Sutherland. 2004. Atlantic sturgeon marine bycatch and mortality on the continental shelf of the Northeast United States. North American Journal of Fisheries Management 24: 171-183.

Stevenson, D.K., L.A. Chiarella, C.D. Stephan, R.N. Reid, K. Wilhelm, J.E. McCarthy and M. Pentony. 2004. Characterization of the fishing practices and marine benthic ecosystems of the Northeast U.S. shelf, and an evaluation of the potential effects of fishing on essential fish habitat. NOAA Technical Memorandum NMFS-NE-181, 179 p.

11.0 LIST OF AGENCIES AND PERSONS CONSULTED

[UPDATE]

This document was prepared by the Mid-Atlantic Fishery Management Council in consultation with the National Marine Fisheries Service and the New England Fishery Management Council.

Additional (final) copies of this EA can be obtained via the NMFS NERO website:
http://www.nero.noaa.gov/nero/regs/com2011.html
or by request from
James L. Armstrong
Suite 201
800 N. State ST.
Dover, DE 19901

Members of the Spiny Dogfish Monitoring Committee include:

James Armstrong, MAFMC Staff (Monitoring Committee Chair)
Angel Willey, Maryland DNR
Tobey Curtis, NMFS NERO
Clark Gray, North Carolina Division of Marine Fisheries
Phil Haring, New England Fishery Management Council
Dan McKiernan, Massachusetts Division of Marine Fisheries
Jack Musick, Virginia Institute of Marine Sciences
Paul Rago, NEFSC Population Dynamics Branch
Eric Schneider, Rhode Island Division of Fish and Wildlife
Chris Hickman, North Carolina ex-officio industry advisor
Eric Brazer, Massachusetts ex-officio industry advisor

Members of the Joint Spiny Dogfish Committee include:

Red Munden (Chair) MAFMC
Erling Berg MAFMC
Pete Himchak MAFMC
Mike Luisi MAFMC
Preston Pate MAFMC
Jack Travelstead MAFMC
Frank Blount NEFMC
David Pierce NEFMC

In addition, the following organizations/agencies were consulted during the development of the spiny dogfish specifications, either through direct communication/correspondence and/or participation in Council public meetings:

NOAA Fisheries, National Marine Fisheries Service, Northeast Regional Office, Gloucester MA
Northeast Fisheries Science Center, Woods Hole, MA
Atlantic States Marine Fisheries Commission

APPENDIX 1

[UPDATE]

Relevant Port and Community Descriptions

(The contents of this appendix are taken from the NEFSC's "Community Profiles for the Northeast US Fisheries" for Virginia Beach/Lynnhaven, VA; Hatteras, NC; Rye, NH; Chatham, MA; Ocean City, MD for which spiny dogfish comprised greater than 1% of total port ex-vessel revenue according to the federal dealer report database. They are also available on the internet at:
http://www.nefsc.noaa.gov/read/socialsci/community_profiles/)