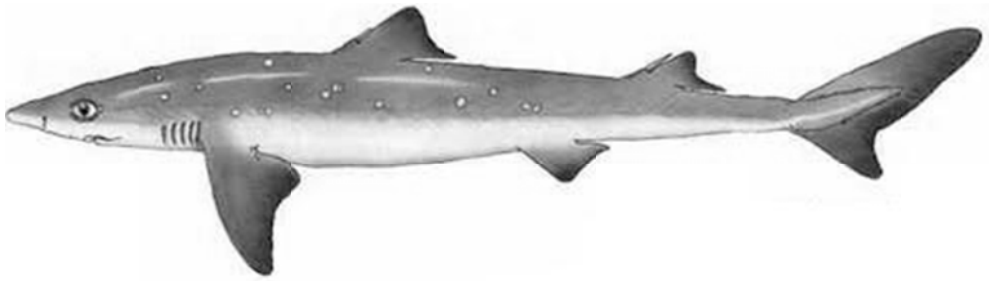
2011
Spiny Dogfish Specifications, Environmental Assessment, Regulatory Impact Review, and Initial Regulatory Flexibility Analysis



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Prepared by the

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in cooperation with the

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1.0 EXECUTIVE SUMMARY

Statutory/Regulatory Basis

Pursuant to the Magnuson Stevens Fishery Conservation and Management Act of 1976 (MSA) as amended, the Northwest Atlantic stock of spiny dogfish (*Squalus acanthias*) is jointly managed by the Mid-Atlantic (MAFMC) and New England Fishery Management Councils (NEFMC; Councils) through the Federal Spiny Dogfish Fishery Management Plan (FMP). In accordance with the FMP, this document has been prepared as part of the specification process through which the Councils recommend an annual commercial quota and other management measures for spiny dogfish (50 CFR § 648 Subpart L). Additionally, in accordance with the National Environmental Policy Act of 1969 (NEPA) and the National Oceanic and Atmospheric Administration (NOAA) Administrative Order (NAO) 216-6, the environmental impacts of the recommended management actions and the anticipated level of significance of these impacts are addressed.

Management History/Objectives

The Federal Spiny Dogfish FMP was developed in 1998 and implemented in 2000 in order to halt large scale depletion of reproductively mature female spiny dogfish and allow the stock to recover to a sustainable level. This was a necessary management response under the MSA because the biomass of mature females (i.e. spawning stock biomass, or SSB) was below the biomass threshold such that the stock was deemed "overfished" (NEFSC 1997). The directed dogfish fishery of the 1990s harvested primarily the largest (80+ cm) spiny dogfish in the stock, and the species' life history is such that these market-size fish are primarily mature females. The recovery plan intended to constrain fishing mortality (F) on mature females at a rate ($F_{rebuild}$ = 0.11) that would rebuild the stock as quickly as possible. Because the commercial fishery concentrated on mature females, achieving $F_{rebuild}$ required the elimination of the directed fishery. Accordingly, catch quotas and trip limits were reflective of a small bycatch fishery. Management measures consistent with achieving $F_{rebuild}$ were maintained in federal waters throughout the rebuilding period. Because SSB increased substantially in response to rebuilding efforts, an increase in federal spiny dogfish quota from 4 M lbs (the fishing year –FY 2000 through 2008 quota) to 12 M lbs in FY2009 was possible while continuing to achieve $F_{rebuild}$. In June 2010, the spiny dogfish stock was formally declared rebuilt (Attachment A). The commercial quota for FY2010 increased to 15 M lbs to achieve an F target of 0.167, a level associated with a 98% probability of preventing overfishing from occurring.

In state waters, 0-3 nautical miles (nm) from shore, spiny dogfish are managed under the Atlantic States Marine Fisheries Commission (ASMFC) Interstate FMP for Spiny Dogfish. Both the state and federal FMPs apply to a single spiny dogfish stock along the Atlantic coast of the United States (i.e., in both state and federal waters from 0-200 nm). Importantly, although the FMPs are independent, allowing for different quotas in state or federal jurisdictional waters, the quotas established under the FMPs in a given year are *not* additive. As such, when the quota implemented under the Interstate FMP is higher than the federal quota, the federal quota is generally exceeded through the landing of spiny dogfish taken from state waters. For FY 2009 and FY2010, state and federal quotas were set consistently at 12 and 15 M lb respectively. Previous inconsistencies in the state and federal FMPs are likely to have prolonged the timeframe for stock recovery, are confusing for fishermen, and create administrative burden.

Stock Status

In January 2010, a TRAC (Transboundary Resource Assessment Committee) was convened for a benchmark stock assessment of spiny dogfish. The benchmark assessment was unsuccessful; however, participants in the TRAC were able to evaluate spiny dogfish biological reference points, the metrics used to determine the status of the stock. Following that review, the biomass (SSB) target is 159,288 mt (351 M lb) with ½ of that target corresponding to the SSB threshold (79,644 mt; 175.5 M lb). The updated fishing mortality (F) reference points are $F_{target} = 0.207$ and $F_{threshold} = 0.325$. In accordance with the Framework Adjustment 2 to the FMP, biological reference points are automatically updated in the FMP upon review by an acceptable peer-review body, such as the TRAC reviewers. The TRAC reviewers noted that estimated SSB was above the defined SSB target in 2008 and 2009, consistent with a rebuilt stock. The Northeast Regional Office (NERO) communicated the rebuilt status of the stock to the Councils in June 2010 (Attachment A).

In September 2010, the Northeast Fisheries Science Center (NEFSC) further updated the status of the spiny dogfish stock using the most recent successful benchmark assessment approach (NEFSC 2006), 2009 catch data, and results from the 2010 trawl survey (Attachment B). The updated stochastic estimate of SSB for 2010 is 164,066 mt (362 M lbs), about 3% above SSB_{max} (159,288 mt). This corresponds to a *100% probability that the stock is not overfished*.

Several sources of removals contribute to the estimate of fishing mortality (F) for 2009. These include U.S. commercial landings (5,377 mt), Canadian commercial landings (113 mt), U.S. dead discards (5,897 mt), and U.S. recreational landings (34 mt). Total removals in 2009 were approximately 11,421 mt (23.871 M lbs) corresponding to an F estimate of 0.113, well below the overfishing threshold of F = 0.39 and essentially equivalent to $F_{rebuild} = 0.11$, specified for 2009. Therefore, *overfishing was not occurring* ($F_{2009} < F_{threshold}$).

Although biomass is above the target level, other information should also be considered for this stock. Low pup production from 1997 through 2003 has been implicated by survey catches of pups and is further supported by subsequent low survey catches of the size categories these age classes have grown into. As such, a decline in SSB is expected when these small year-classes recruit into the SSB (approximately 2015). Another potentially important factor is that the current survival rate for pups may be less than historic levels due to reduced maternal size and a skewed male to female sex ratio. Finally, as with all fish species, environmental variables are likely to be contributing to recruitment success, but no specific factor has been identified. The important point is that a simplistic comparison of current SSB to the SSB_{target} reference point may result in optimistic conclusions about the condition of the stock, and management measures should be appropriately precautionary.

Proposed Management Measures

The quota recommendations in this specification package are based upon the latest stock status information, given above. This information was reviewed by the MAFMC's Scientific and Statistical Committee at its September 2010 meeting and by the Councils at their October (MAFMC) and November (NEFMC) 2010 meetings. The “Preferred Alternative” consists of the

commercial quota and trip limit recommended by both the Mid-Atlantic and New England Councils.

In developing its recommendations for the 2011 fishing year (Attachment C), the MAFMC's Scientific and Statistical Committee (SSC) noted that long-term projections of SSB at the newly established F reference points resulted in biomass declining to levels near or below the biomass threshold. Because of this the SSC rejected the use of the existing reference points as they are currently defined, rejecting $F_{threshold}$ (0.325) outright and substituting F_{target} (0.207) to function as $F_{threshold}$. The SSC also noted that there are multiple sources of uncertainty in the model and the data and that spiny dogfish life history makes it vulnerable to overfishing. These factors determined how the SSC applied its risk policy in identifying the catch level that the Councils could recommend. Specifically, the SSC recommended 75% of the catch at $F_{threshold}$ (0.207), which corresponds to 15,200 mt (33.510 M lbs). Because of the problems with the existing F-reference points, the Council has requested that a formal review of these reference points be conducted by the NEFSC prior to the next specification cycle. The NEFSC has agreed to conduct this review and has recommended that the MAFMC's SSC as well as a member of the NEFMC's SSC comprise the review body.

In order to calculate a commercial quota consistent with the total catch recommended by the SSC, the Spiny Dogfish Monitoring Committee reduced total catch by all other sources of mortality (Canadian commercial landings, U.S. discards, U.S. recreational catch). The Committee used catch levels observed in 2009 as the basis for the reduction. The Monitoring Committee did not expect Canadian landings to return to historic levels, and expected a general decrease in commercial fishing effort, primarily for trawl gear which accounts for the majority of spiny dogfish discards. Starting with a total catch of 15,200 mt, a combined 6,044 mt are taken away to account for U.S. commercial and recreational discards (5,897 mt), Canadian commercial landings (113 mt), and U.S. recreational landings (34 mt). This leaves 9,156 mt (20.185 M lbs) for the commercial quota. The Monitoring Committee further reduced this to 20.0 M lbs to account for other sources of uncertainty.

The MAFMC and NEFMC are recommending a commercial quota of 20.0 M lbs and commercial trip limits of 3,000 lbs for FY2011. Although Framework Adjustment 1 established an allowance for management measures to be established in a given specification setting year for up to five subsequent years, the Councils are recommending that the specifications and management measures be set for fishing year 2011 only. This is primarily because of the formal review of the F-reference points for the stock that has been requested prior to the next specification cycle.

Alternative 1 – (Status Quo – Set quota to maintain current FY2010 level: 15.0 M lb): For FY2011, specify a commercial quota of 15.0 M lbs with trip limits of 3,000 lbs (vessels are prohibited from landing more than the specified amount in one calendar day). As per the FMP, the quota would be divided with quota Period 1 (May 1 through October 31) allocated 57.9% of the quota (8.685 M lbs), and quota Period 2 (November 1 through April 30) allocated 42.1% of the quota (6.315 M lbs).

According to CEQ regulations, the No Action Alternative should be used for the purposes of evaluating an environmental baseline. A "true" No Action Alternative for dogfish fishery

management, however, is not equivalent to status quo or baseline conditions. If the actions proposed in this document are not taken, some current management measures will remain in place (i.e. 3,000 lb trip limit), but the overall management program will not be identical to that of 2009 (i.e. there would be no specified quota for FY 2010). The "true" No Action Alternative for this fishery is infeasible and inconsistent with the FMP which requires specifications, or quotas, to be established for the fishery. Therefore, the "true" No Action Alternative is not analyzed in this document.

Alternative 2 – (Councils' Preferred Alternative – Set quota to achieve SSC recommendation - 75% of catch at Fmsy: 20.0 M lbs): For FY2011, specify a commercial quota of 20.0 M lbs with trip limits of 3,000 lbs (vessels are prohibited from landing more than the specified amount in one calendar day). As per the FMP, the quota would be divided with quota Period 1 (May 1 through October 31) allocated 57.9% of the quota (11.580 M lbs), and quota Period 2 (November 1 through April 30) allocated 42.1% of the quota (8.420 M lbs).

Alternative 3 – (Set quota to achieve existing F_{target} (0.207): 31.4 M lbs): For FY2011, specify a commercial quota of 31.4 M lbs with trip limits of 3,000 lbs (vessels are prohibited from landing more than the specified amount in one calendar day). As per the FMP, the quota would be divided with quota Period 1 (May 1 through October 31) allocated 57.9% of the quota (18.2 M lbs), and quota Period 2 (November 1 through April 30) allocated 42.1% of the quota (13.2 M lbs).

Impacts of the Management Actions

The 20.0 million lb quota under Alternative 2 is consistent with the SSC andMonitoring Committee's recommendations. None of the alternatives are expected to results in significant impacts to non-target species (including fish and protected resources) and habitat. The 20 million lb quota would result in greater economic benefits than Alternative 1 and lower short-term benefits compared to Alternative 3. Alternative 2 is not associated with significant direct or indirect impacts and has a positive cumulative impact in the context of other ongoing activities.

Further discussion on the impacts of the alternatives is presented in Section 7.0, and summarized in Table E-1 below. Table E-1 presents a qualitative summary of the direct and indirect impacts of the various management alternatives.

Table E-1. Qualitative summary of the expected impacts of various alternatives considered for the spiny dogfish specifications.

Proposed Federal Action		**Valued Ecosystem Component (VEC)**				
Spiny Dogfish Management Alternatives		**Target Species**	**Non-target/Bycatch Species**	**Habitat (including Essential Fish Habitat [EFH])**	**Protected Resources**	**Human Communities**
Alt. 1 Set quota to maintain status quo quota	Quota: 15 M lbs Trip Limits: 3,000 lbs	**Positive** Fishing mortality is minimized among the alternatives.	**Very Low Negative** Low level discarding will continue to occur with status quo fishing effort.	**Very Low Negative** Low level gear impacts on habitat will continue to occur with status quo fishing effort.	**Potential Low Negative** Low level encounters will continue to occur with status quo fishing effort.	**Positive** Overall revenue levels are expected to be maintained with status quo landings
Alt. 2 Set quota to achieve 75% of catch at Fmsy	Quota: 20.0 M lbs Trip Limits: 3,000 lbs	**Positive** Fishing mortality consistent with risk averse harvest policy.	**Low Negative** Discarding more likely to increase compared to Alt 1, less than Alt 3 (function of relative size of quotas)	**Low Negative** Habitat impacts more likely to increase compared to Alt 1, less than Alt 3 (function of relative size of quotas	**Negative** Encounters more likely to increase compared to Alt 1, less than Alt 3 (function of relative size of quotas	**Positive** Overall revenue increases expected
Alt. 3 Set quota to achieve F_{target} (0.207)	Quota: 31.4 M lbs Trip Limits: 3,000 lbs	**Low Negative** Highest fishing mortality rate among the alternatives, but not expected to result in overfishing.	**Negative** Discarding more likely to increase compared to Alts 1,2 (function of larger quota)	**Negative** Habitat impacts more likely to increase compared to Alts 1,2 (function of larger quota)	**Negative** Encounters more likely to increase compared to Alts 1,2 (function of larger quota)	**Positive** Overall revenue increases expected

2.0 LIST OF ACRONYMS

ACCSP	Atlantic Coastal Cooperative Statistics Program
ACFCMA	Atlantic Coastal Fisheries Cooperative Management Act
ASMFC	Atlantic States Marine Fisheries Commission
B	Biomass
CEQ	Council on Environmental Quality
EA	Environmental Assessment
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
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
FY	Fishing Year
HPTRP	Harbor Porpoise Take Reduction Plan
IRFA	Initial Regulatory Flexibility Analysis
M	Natural Mortality Rate
MC	Spiny Dogfish Monitoring Committee
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
MSRA	Magnuson-Stevens Fishery Conservation and Management Reauthorization Act
MSY	Maximum Sustainable Yield
mt	metric tons
NAO	NOAA Administrative Order
NE	New England
NEFMC	New England Fishery Management Council
NEFSC	Northeast Fisheries Science Center
NEPA	National Environmental Policy Act
nm	nautical mile
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
PBR	Potential Biological Removal
PRA	Paperwork Reduction Act
RFA	Regulatory Flexibility Act
RIR	Regulatory Impact Review
SARC	Stock Assessment Review Committee
SAW	Stock Assessment Workshop
SSB	Spawning Stock Biomass
SFA	Sustainable Fisheries Act
VECs	Valued Ecosystem Components
VTR	Vessel Trip Report

3.0 LIST OF TABLES AND FIGURES

Tables are located in sequential order at the end of the document.

4.0 INTRODUCTION AND BACKGROUND OF SPECIFICATION PROCESS

4.1 Purpose and Need for the Action

The purpose of this action is to analyze federal spiny dogfish specifications and management measures for FY2010 (May 1, 2010 - April 30, 2011) to ensure the sustainability of the stock. As required by the FMP, this action is needed to establish a commercial fishing quota and any other management measures that will ensure that the (appropriate) target fishing mortality rate for spiny dogfish is not exceeded in any given year. In addition to the commercial quota, the Councils may also recommend trip limits, minimum or maximum fish sizes, seasons, mesh-size restrictions, and other gear restrictions.

Basis of Specifications and Management Measures

The FMP established a procedure to develop specifications and management measures based on analyses of fishery and scientific information by the Spiny Dogfish Monitoring Committee. Furthermore, the Magnuson-Stevens Fishery Conservation and Management Reauthorization Act (MSRA) mandates review of management measures by the Councils' Science and Statistical Committees.

As announced in the Federal Register (75 FR 55743), the MAFMC's SSC met September 21, 2010 to determine the ABC for spiny dogfish for FY2011. A subsequent meeting to identify the appropriate commercial quota and trip limit for 2011 was held by the MAFMC's Spiny Dogfish Monitoring Committee (MC) on September 24, 2010 (75 FR 53952).

In developing its recommendations for the 2011 fishing year (Attachment C), the MAFMC's Scientific and Statistical Committee (SSC) noted that long-term projections of SSB at the newly established F reference points resulted in biomass declining to levels near or below the biomass threshold. Because of this the SSC rejected the use of the existing reference points as they are currently defined, rejecting $F_{threshold}$ (0.325) outright and substituting F_{target} (0.207) to function as $F_{threshold}$. The SSC also noted that there are multiple sources of uncertainty in the model and the data and that spiny dogfish life history makes it vulnerable to overfishing. These factors determined how the SSC applied its risk policy in identifying the catch level that the Councils could recommend. Specifically, the SSC recommended 75% of the catch at $F_{threshold}$ (redefined as 0.207), which corresponds to 15,200 mt (33.510 M lbs). Because of the problems with the existing F-reference points, the Council has requested that a formal review of these reference points be conducted by the NEFSC prior to the next specification cycle. The NEFSC has agreed to conduct this review and has recommended that the MAFMC's SSC as well as a member of the NEFMC's SSC comprise the review body.

In order to calculate a commercial quota consistent with the total catch recommended by the SSC, the Spiny Dogfish Monitoring Committee reduced total catch by all other sources of mortality (Canadian commercial landings, U.S. discards, U.S. recreational catch). The Committee used catch levels observed in 2009 as the basis for the reduction. The Monitoring Committee did not expect Canadian landings to return to historic levels, and expected a general decrease in commercial fishing effort, primarily for trawl gear

which accounts for the majority of spiny dogfish discards. Starting with a total catch of 15,200 mt, a combined 6,044 mt are taken away to account for U.S. commercial and recreational discards (5,897 mt), Canadian commercial landings (113 mt), and U.S. recreational landings (34 mt). This leaves 9,156 mt (20.185 M lbs) for the commercial quota. The Monitoring Committee further reduced this to 20.0 M lbs to account for other sources of uncertainty. The MC also recommended setting trip limits at 3,000 lbs which would maintain status quo. According to the specification process laid out in the FMP, the Joint Spiny Dogfish Committee reviewed the recommendation of the Monitoring Committee and endorsed the 20 M lb quota and 3,000 lb trip limit as their recommendation to the Councils.

The Councils received the recommendations of the various Committees and adopted the recommendations outlined in Section 5.0.

4.2 Management Objectives of the Spiny Dogfish FMP

The overall goal of the FMP is to conserve spiny dogfish in order to achieve optimum yield from the resource in the western Atlantic Ocean. The specification of an annual commercial quota and trip limits meets that overall goal by accomplishing the following objectives, which were adopted into the FMP:

1. Reduce fishing mortality to ensure that overfishing does not occur.

2. Promote compatible management regulations between state and Council jurisdictions and the US and Canada.

3. Promote uniform and effective enforcement of regulations.

4. Minimize regulations while achieving the management objectives stated above.

5. Manage the spiny dogfish fishery so as to minimize the impact of the regulations on the prosecution of other fisheries, to the extent practicable.

6. Contribute to the protection of biodiversity and ecosystem structure and function.

5.0 MANAGEMENT ALTERNATIVES

Three alternatives are presented for consideration as specifications and management measures for the dogfish fishery for FY2011. These alternatives were based on the Councils' recommendations and informed by the recent stock assessment update which indicated that the spiny dogfish stock is rebuilt, is not overfished, and that overfishing is not occurring. Box 5.0.1 below shows commercial quota, total catch, and F estimates under the three alternatives. In order to be consistent with the Monitoring Committee's calculations, total catch = the specified commercial quota + 6,044 mt (other sources of mortality). The corresponding fishing mortality estimates under each quota are taken from the projection tables provided in the NEFSC (unpubl. 2010; Attachment B) update on stock status. For Alternatives 1 and 2, the total catch is less than any of the projected scenarios and as such, fishing mortality under these scenarios is listed as less than (<) or

much less than (<<) the lowest fishing mortality rate given in the projection tables for 2011 (0.173). Alternative 1 represents the most conservative approach and would maintain the status quo quota (15 M lbs) while achieving F <<0.173 in FY2011. Alternative 2 is based on the recommendations of the MAFMC's SSC and is derived from total catch at 75% of Fmsy, where Fmsy is 0.207 as temporarily redefined by the SSC. Alternative 3 is based on achieving the Ftarget as currently defined in the FMP (0.207) for a rebuilt stock and the commercial quota is calculated directly from the projection scenario for Ftarget provided in NEFSC (unpubl. 2010; Table 9 in Attachment B). In basing expected discards on observed 2009 levels, Monitoring Committee departed from the discards in the projection tables in NEFSC (unpubl. 2010) where discards were assumed to be proportional to landings. In reviewing discard levels relative to landings, the Monitoring Committee observed that discards did not appear to be proportional to landings.

Although the No Action Alternative is required by NEPA for comparing the impacts of actions against baseline conditions, in this case Alternative 1 represents the status quo baseline conditions since the stock was declared rebuilt in 2010. No other alternatives were considered and analyzed in this EA.

Box 5.0.1. Calculation of commercial quota under the three management alternatives

	A	+ B		= C		
	Canadian landings (113 mt) + U.S. discards (5,897 mt) + U.S. recreational landings (34 mt)	U.S. Comm quota (mt)	U.S. Comm quota (M lbs)	Total catch (mt)	Total catch (M lbs)	Fishing Mortality Rate (F)
Alternative 1	6,044mt (13.325 M lbs)	6,804	15.000	12,848	28.325	<< 0.173
Alternative 2		9,156	20.000	15,200	33.510	< 0.173
Alternative 3*		14,223	31.356	20,267	44.681	0.207

* Calculated as C – A = B, where C is from Table 9 in Attachment B.

5.1 Alternative 1 – (Status Quo – Set quota to maintain current FY2010 level: 15.0 M lb)

For FY2011, specify a commercial quota of 15.0 M lbs with trip limits of 3,000 lbs (vessels are prohibited from landing more than the specified amount in one calendar day). As per the FMP, the quota would be divided with quota Period 1 (May 1 through October 31) allocated 57.9% of the quota (8.685 M lbs), and quota Period 2 (November 1 through April 30) allocated 42.1% of the quota (6.315 M lbs).

According to CEQ regulations, the No Action Alternative should be used for the purposes of evaluating an environmental baseline. A "true" No Action Alternative for dogfish fishery management, however, is not equivalent to status quo or baseline conditions. If the actions proposed in this document are not taken, some current management measures will remain in place (i.e. 3,000 lb trip limit), but the overall management program will not be identical to that of 2009 (i.e. there would be no specified quota for FY 2010). The "true" No Action Alternative for this fishery is infeasible and inconsistent with the FMP

which requires specifications, or quotas, to be established for the fishery. Therefore, the "true" No Action Alternative is not analyzed in this document.

5.2 Alternative 2 – (Councils' Preferred Alternative – Set quota to achieve SSC recommendation - 75% of catch at Fmsy: 20.0 M lbs)

For FY2011, specify a commercial quota of 20.0 M lbs with trip limits of 3,000 lbs (vessels are prohibited from landing more than the specified amount in one calendar day). As per the FMP, the quota would be divided with quota Period 1 (May 1 through October 31) allocated 57.9% of the quota (11.580 M lbs), and quota Period 2 (November 1 through April 30) allocated 42.1% of the quota (8.420 M lbs).

5.3 Alternative 3 – (Set quota to achieve existing Ftarget (0.207): 31.4 M lbs)

For FY2011, specify a commercial quota of 31.4 M lbs with trip limits of 3,000 lbs (vessels are prohibited from landing more than the specified amount in one calendar day). As per the FMP, the quota would be divided with quota Period 1 (May 1 through October 31) allocated 57.9% of the quota (18.2 M lbs), and quota Period 2 (November 1 through April 30) allocated 42.1% of the quota (13.2 M lbs).

6.0 DESCRIPTION OF THE AFFECTED ENVIRONMENT AND FISHERIES

The Valued Ecosystem Components (VECs) affected by the alternatives include the spiny dogfish resource, non-target/bycatch species, protected resources, habitat including Essential Fish Habitat (EFH), and human communities/socio-economic environment, all of which are described below.

6.1 Spiny Dogfish Stock and Fisheries

In the sections below, the biology of the stock, history and current status of the stock, as well as U.S. and Canadian catch information is presented. Currently, there is a small directed fishery for spiny dogfish due to the FY2009 quota increase. Discards are about equal to total landings but have been declining for the last 4 years.

6.1.1 Spiny Dogfish Biology and Ecological Relationships

A complete description of spiny dogfish biology and ecological relationships is given in Section 2.1 of the FMP. A summary is provided here.

The spiny dogfish, *Squalus acanthias*, is a small coastal shark with a circumboreal distribution (i.e., in the Northern region of the Atlantic Ocean). 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 (living near the surface of the ocean floor), 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 inches and 6 years for males and 30.6 inches 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 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. The current estimate of the natural mortality rate is 0.092, which was the value assumed for spiny dogfish greater than 12 inches 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 Status of the Spiny Dogfish Stock

Historic Stock Status

At the onset of the domestic 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 lbs). 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). A Federal 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, achieving $F_{rebuild}$ required the elimination of the directed fishery. Accordingly, an incidental catch quota (4.0 M lbs) and restrictive trip limits (600 lbs per trip in quota Period 1 and 300 lbs per trip in quota Period 2[1]) were established upon implementation of the FMP and maintained through FY2008. Rebuilding efforts were highly successful and the commercial quota was allowed to increase from 4.0 M lbs to 12 M lbs in FY2009 while still achieving $F_{rebuild}$.

In state waters, 0-3 nautical miles (nm) from shore, spiny dogfish are managed under the ASMFC Interstate FMP for Spiny Dogfish. Spiny dogfish management measures in state-jurisdictional waters are implemented through the Interstate FMP and have differed from federal measures until recently (Box 6.1.2.1). The Federal and Interstate FMPs apply to the entire spiny dogfish population along the Atlantic coast of the United States (i.e., in both state and federal waters from 0-200 nm). As such, when the state waters

[1] The annual commercial quota is distributed between two periods (Period 1 is May 1 - October 31 and Period 2 is November 1 - April 30) based on the historical percentage of commercial landings for each semi-annual period during the years 1990 through 1997. Period 1 is allocated 57.9% of the annual quota and Period 2 is allocated 42.1%. This is intended to preserve the traditional distribution of landings, both geographically and seasonally.

quota has been greater than the federal quota, the federal quota has been exceeded through the landing of spiny dogfish from state waters. For FY2010, state and federal quotas were set consistently at 15 M lb. Previous inconsistencies in the Interstate and Federal FMPs are likely to have prolonged the timeframe for stock recovery, are confusing for fishermen, and create administrative burden.

Current Stock Status

In January 2010, a TRAC (Transboundary Resource Assessment Committee) was convened for a benchmark stock assessment of spiny dogfish. The benchmark assessment was unsuccessful; however, participants in the TRAC were able to evaluate spiny dogfish biological reference points, the metrics used to determine the status of the stock. Following that review, the biomass (SSB) target is 159,288 mt (351 M lb) with ½ of that target corresponding to the SSB threshold (79,644 mt; 175.5 M lb). The updated fishing mortality (F) reference points are $F_{target} = 0.207$ and $F_{threshold} = 0.325$. In accordance with the Framework Adjustment 2 to the FMP, biological reference points are automatically updated in the FMP upon review by an acceptable peer-review body, such as the TRAC reviewers. The TRAC reviewers noted that estimated SSB was above the defined SSB target in 2008 and 2009, consistent with a rebuilt stock. The Northeast Regional Office (NERO) communicated the rebuilt status of the stock to the Councils in June 2010 (Attachment A).

In September 2010, the Northeast Fisheries Science Center (NEFSC) further updated the status of the spiny dogfish stock using the most recent successful benchmark assessment approach (NEFSC 2006), 2009 catch data, and results from the 2010 trawl survey. The updated stochastic estimate of SSB for 2010 is 164,066 mt (362 M lbs), about 3% above SSB_{max} (159,288 mt). This corresponds to a *100% probability that the stock is not overfished*.

Several sources of removals contribute to the estimate of fishing mortality (F) for 2009. These include U.S. commercial landings (5,377 mt), Canadian commercial landings (113 mt), U.S. dead discards (5,897 mt), and U.S. recreational landings (34 mt). Total removals in 2009 were approximately 11,421 mt (23.871 M lbs) corresponding to an F estimate of 0.113, well below the overfishing threshold of F = 0.39 and essentially equivalent to $F_{rebuild} = 0.11$, specified for 2009. Therefore, *overfishing was not occurring* ($F_{2009} < F_{threshold}$).

Although biomass is above the target level, other information should also be considered for this stock. Low pup production from 1997 through 2003 has been implicated by survey catches of pups and is further supported by subsequent low survey catches of the size categories these age classes have grown into. As such, a decline in SSB is expected when these small year-classes recruit into the SSB (approximately 2015). Another potentially important factor is that the current survival rate for pups may be less than historic levels due to reduced maternal size and a skewed male to female sex ratio. Finally, as with all fish species, environmental variables are likely to be contributing to recruitment success, but no specific factor has been identified. The important point is that a simplistic comparison of current SSB to the SSB_{target} reference point may result in optimistic conclusions about the condition of the stock, and management measures should be appropriately precautionary.

6.1.3 Spiny Dogfish Catch

A variety of domestic and foreign interests have historically participated in the harvest of the Northwest Atlantic spiny dogfish stock. Calendar year harvest estimates from 1962-2009 are provided in Table 1. These include landings from U.S. commercial and recreational sectors as well as Canadian, former USSR, and "other foreign" commercial fisheries. A thorough characterization of the historic (pre-FMP) fishery for spiny dogfish is given in Section 2.3 of the FMP (MAFMC 1999). Since the federal FMP was implemented in 2000, annual landings of spiny dogfish have declined considerably (Table 1).

6.1.3.1 Spiny Dogfish Commercial Catch

The spiny dogfish commercial catch currently comprises a combination of U.S. commercial landings and discards from state and federal waters, as well as Canadian commercial landings (Table 1). Canadian commercial discards are not currently estimated.

6.1.3.1.1 U.S. Commercial Spiny Dogfish Landings

From FY2000-2008, landings of spiny dogfish from the EEZ have been constrained by a 4.0 million pound federal quota. Substantial increases in SSB since 2000 allowed for an increase in the federal quota in FY2009 to 12 M lbs while still maintaining the rebuilding period F target ($F_{rebuild} = 0.11$). Under the interstate FMP, the state water quota was set at 4.0 M lbs in FY2006, 6.0 M lbs in FY2007, 8.0 M lbs in FY2008 and finally 12.0 M lbs in FY2009.

Commercial harvest has historically been dominated by Massachusetts (Table 2). 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 specifies that the annual commercial quota be allocated to two regions (north and south) and North Carolina. Specifically, 58% of the quota is allocated to the northern region (Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut), 26% to the southern region (New York, New Jersey, Delaware, Maryland, Virginia), and 16% to North Carolina.

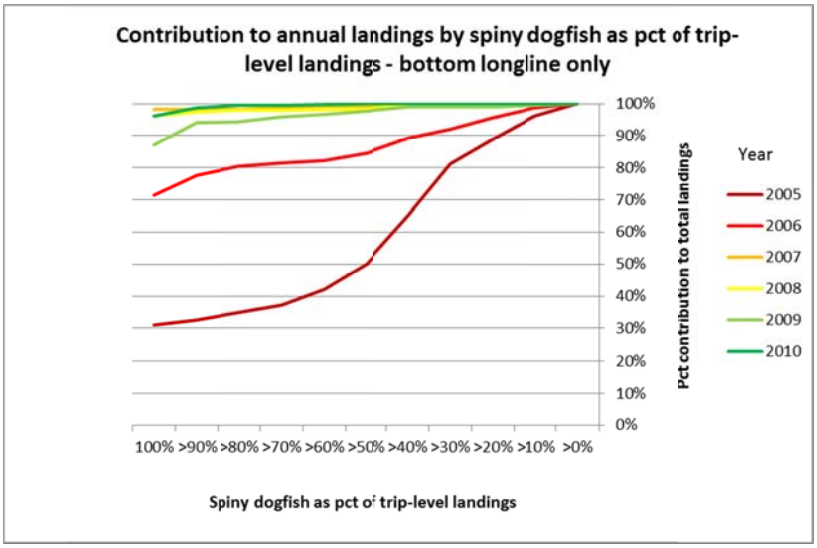
U.S. commercial landings in calendar year 2009 were 11.882 M lbs, which is about 19.7% of the 1996 high (60.055 M lbs; Table 1). Unpublished NMFS dealer reports indicate that the total ex-vessel value of commercially landed spiny dogfish in calendar year 2009 was about $2.544 million, and in fishing year 2009 was about $2.360 million making the approximate price/lb of spiny dogfish $0.21 in calendar year 2009 and $0.2 in fishing year 2009 (Table 3).

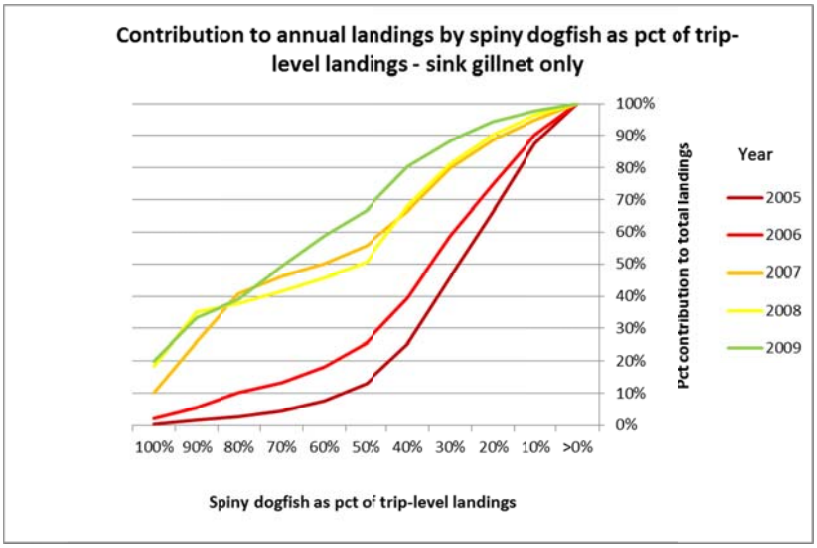
Commercial landings in FY2009 (11.882 M lbs) represented about a 31% increase from FY2008 landings (9.057 M lbs). Spiny dogfish were landed in all months except May in FY2009 with peak landings occurring in July-September of Period 1 and November-January of Period 2 (Table 4).

Certain commercial gear types are associated with the retention of spiny dogfish in federal waters. The catch of spiny dogfish by gear in FY2009 is given in Table 5. These data indicate that spiny dogfish landings came mostly from gill nets (67.42%), bottom otter trawls (13.13%), hook and line (11.93%), as well as unknown (5.78%) or other gear (1.92%).

Directed Fishing.

By design, low-level commercial landings of spiny dogfish were an artifact of activity in other fisheries during the rebuilding period (2000 – 2009). Beginning in 2009, however, increases in annual quota, and perhaps more importantly, an increase in the commercial trip limit, made directed effort on spiny dogfish in federal waters more likely. Overall landings as a function of proportional trip-level landings by gear was examined using federal vessel trip report (VTR) data from 2005 – 2010. Figure 1 illustrates the results of this exercise for the three major gear-types that are associated with spiny dogfish landings (bottom longline, sink gillnet, and bottom otter trawl. For all gear types, trips where spiny dogfish comprised the majority (>50%) of trip-level landings contributed more to overall landings in 2009-2010 than in 2005-2006. Differences among gear types, however, are evident. In 2009-2010, the bulk (e.g., 90%) of bottom otter trawl landings of spiny dogfish came from trips where spiny dogfish comprised at least 10-20% of the trip-level landings. For sink gillnets the bulk of landings (90%) came from trips where spiny dogfish were 30-40% of trip-level landings. In contrast, the bulk (90%) of bottom longline landings came from trips where spiny dogfish were at least 90% of trip-level landings. These findings suggest, but do not prove, that directed fishing has increased somewhat across gear types. However, it appears that directed fishing is very limited in the trawl fishery and most likely to occur in the bottom longline fishery with sink gillnets somewhere in the middle. The degree to which directed fishing is occurring becomes important in the analysis gear-specific impacts on habitat and non-target species (including protected resources).





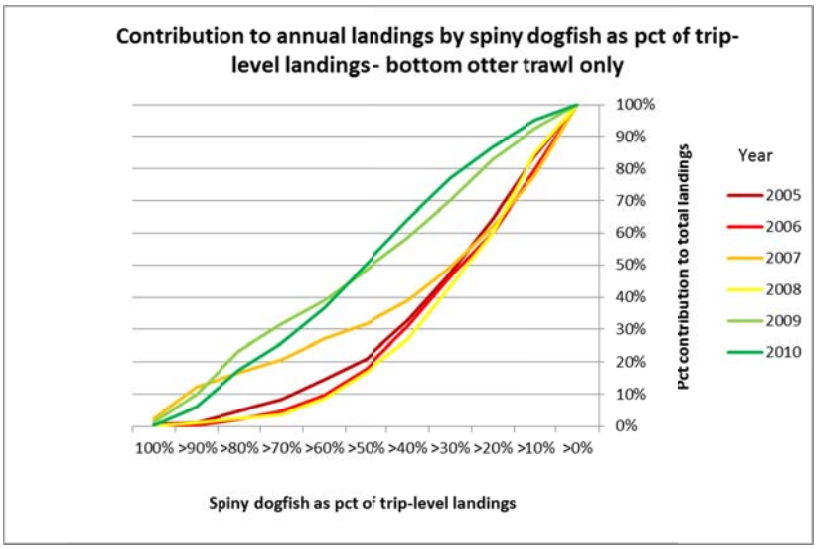


Figure 1. Total annual landing of spiny dogfish as a function of proportional trip-level landings by gear type.

6.1.3.1.2 U.S. Commercial Spiny Dogfish Discards

A method for estimating spiny dogfish discards as a function of landings from various commercial fishing sectors (catch-based method) was developed in NEFSC (2003). Following this method, dead discards are calculated as the product of total estimated discards by gear type and proportional mortality by gear type. Proportional mortalities by gear type were reviewed in NEFSC (2006) and are currently assumed to be 50% for trawls, 30% for gillnets, and 10% for hook gear. Dead discards from U.S. commercial fishing activity appear to have peaked at about 19,000 mt (41.9 M lbs) in 1991, and subsequently declined and stabilized at around 5,000 mt (11.0 M lbs) since 1997 . In 2009, dead discards from U.S. commercial fisheries were estimated to be about 5,324 mt (11.7 M lbs). Although landings of dogfish are dominated by gillnet and hook and line gear, the predominant discard gear is otter trawl. NEFSC (2010 unpubl.) includes estimates of dead discards by gear category: otter trawl – 3,505 mt (7.727 M lbs), sink gill net – 1,462 mt (3.223 M lbs), scallop dredge – 273 mt (0.602 M lbs), and line gear 84 mt (0.185 M lbs).

6.1.3.1.3 Canadian Commercial Spiny Dogfish Landings

Historic Canadian commercial landings have been low relative to landings from the U.S. commercial fishery (Table 1). In 2001, following the implementation of the FMP, Canadian commercial landings exceeded U.S. commercial landings for the first time. Canadian commercial landings have fluctuated since then (Table 1). In 2008, Canadian landings were about 1,572 mt (3.466 M lbs), but in 2009 landings dropped precipitously to 113 mt (0.249 M lbs). Although Canada has allowed a directed fishery under a 2,500 mt (5.512 M lbs) quota with no trip limits, market conditions in 2009 were unfavorable for the Canadian fishery.

6.1.3.2 U.S. Spiny Dogfish Recreational Catch

Estimates of the recreational catch (landings and discards) of spiny dogfish are generated from data obtained through the NMFS Marine Recreational Fishery Statistics Survey (MRFSS). A method for estimating spiny dogfish discards was developed in NEFSC (2003) and reviewed in NEFSC (2006). The estimated recreational discard mortality is 20% compared to the assumed discard mortality for commercially caught spiny dogfish from hook and line gear which is 10%. The higher mortality rate is based on spiny dogfish being generally caught with live bait, which can result in deep hooking, and also that dogfish are often mishandled by anglers. The 20% recreational mortality rate is in the upper range of recreational mortality rates applied by the NEFSC based on Malchoff (1995). Total recreational removals (landings [75 mt] + dead discards [574 mt]) for 2009 were estimated to be about 649 mt (1.430 M lbs) which is roughly consistent with levels reported in NEFSC (2006) since 2001. As indicated in Table 6, New Jersey accounted for the largest share of the recreational landings (34.42%), followed by Massachusetts (34.24%), Delaware (11.17%), New Hampshire (7.50%), Georgia (5.18%), Maryland (2.18%), and 1.92% from all other states.

6.2 Non-target Species

An analysis of discards associated with the harvest of spiny dogfish in 2009 was informed by the analysis in Section 6.1.3.1 regarding directed fishing. The general approach was to tabulate gear-specific discards from the Northeast Fisheries Observer Program (NEFOP) data that are associated with the bulk of spiny dogfish landings (e.g., 90%+ of total landings). The degree to which those landings come from trips consisting of mostly spiny dogfish makes is more likely that discards are a result of directed spiny dogfish effort. Accordingly, discards are likely to be associated with directed spiny dogfish effort in longline gear where 95% of the landings come from trips consisting of 90% dogfish or more by weight. Discards are less tied to directed spiny dogfish effort in the gillnet fishery where accounting for 90% of total landings includes trips consisting of 30% dogfish by weight. Lastly, the bottom trawl fishery, where 90% of the spiny dogfish landings include trips where dogfish are as little as 10% of the trip-level catch are more likely to be associated with incidentally caught dogfish such that discards of other species are least likely to be a function of directed spiny dogfish effort.

On observed trips in 2009 when spiny dogfish were landed at the proportions listed for the gear types above, spiny dogfish comprised 95.9% of the discards for bottom longlines, 72.8% for sink gillnets, and 23.0% for bottom otter trawls. Spiny dogfish was the number one discard species by weight for all gear types. There was very limited discarding in the bottom longline fishery with only five species among the discards besides dogfish. when any spiny dogfish were landed. Other species reported to be discarded included Atlantic cod in both sink gill nets (5.2%) and hook gear (1.8 %), as well as black sea bass and striped bass in hook gear (both 1.8%). All other species comprised less than 1% of discards in these two gear types. A wider variety of discarded species occurred in bottom otter trawl catches (Table 7).

6.3 Physical Environment and Essential Fish Habitat (EFH)

The affected environment for management actions proposed in this document encompasses all of the spiny dogfish EFH. Given the ubiquitous distribution of spiny dogfish (Northwest Atlantic between Labrador and Florida) this also includes EFH for most species managed by the New England and Mid-Atlantic Fishery Management Councils. A more complete description of essential fish habitat for spiny dogfish is given in Section 2.2.2 in the FMP. A summary of that description is given here.

For juvenile spiny dogfish, EFH is defined as: 1) North of Cape Hatteras, 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, the waters over the Continental Shelf from Cape Hatteras, North Carolina through Cape Canaveral, Florida, to depths of 1280 ft. 3) Inshore, 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 to 1280 ft in water temperatures ranging between 37ºF and 82ºF.

For 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 1476 ft in water temperatures ranging between 37ºF and 82ºF.

As stated in Section 6.1, there has been no large directed fishery for spiny dogfish in federal waters since FY2000. Commercial gear types used to harvest spiny dogfish include sink gill nets, hook gear, and to a much lesser extent bottom otter trawls (Table 6). Over two-thirds of the reported landings of spiny dogfish in FY 2008 were caught in sink gill nets, 15% with hook and line, and only 5% in bottom trawls. The quantity of dogfish caught in trawls and discarded was almost the same (500,000 lbs) as the quantity landed (Table 7). Of these three gear types, the bottom otter trawl is the only gear known to significantly affect benthic marine habitats (NRC 2002, Morgan and Chuenpagdee 2003, Stevenson et al. 2004).

Physical Environment

The Northeast U.S. Shelf Ecosystem has been described as including the area from the Gulf of Maine south to Cape Hatteras, extending from the coast seaward to the edge of the continental shelf, including the slope sea offshore to the Gulf Stream (Figure 2). The continental slope includes the area east of the shelf, out to a depth of 2000 m. Four distinct sub-regions comprise the NOAA Fisheries Northeast Region: the Gulf of Maine, Georges Bank, the Mid-Atlantic Bight, and the continental slope. Occasionally another sub-region, Southern New England, is described; however, we incorporated discussions of any distinctive features of this area into the sections describing Georges Bank and the Mid-Atlantic Bight.

The Gulf of Maine is an enclosed coastal sea, characterized by relatively cold waters and deep basins, with a patchwork of various sediment types. Georges Bank is a relatively shallow coastal plateau that slopes gently from north to south and has steep submarine canyons on its eastern and southeastern edge. It is characterized by highly productive, well-mixed waters and strong currents. The Mid-Atlantic Bight is comprised of the sandy, relatively flat, gently sloping continental shelf from southern New England to Cape Hatteras, NC. The continental slope begins at the continental shelf break and continues eastward with increasing depth until it becomes the continental rise. It is fairly homogenous, with exceptions at the shelf break, some of the canyons, the Hudson Shelf Valley, and in areas of glacially rafted hard bottom.

Pertinent physical characteristics of the three sub-regions that could potentially be affected by this action are described in this section. Information included in this document was extracted from Stevenson et al. (2004).

Gulf of Maine

Although not obvious in appearance, the Gulf of Maine (GOM) is actually an enclosed coastal sea, bounded on the east by Browns Bank, on the north by the Nova Scotian (Scotian) Shelf, on the west by the New England states, and on the south by Cape Cod

and Georges Bank (Figure 3). The GOM was glacially derived, and is characterized by a system of deep basins, moraines and rocky protrusions with limited access to the open ocean. This geomorphology influences complex oceanographic processes that result in a rich biological community.

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

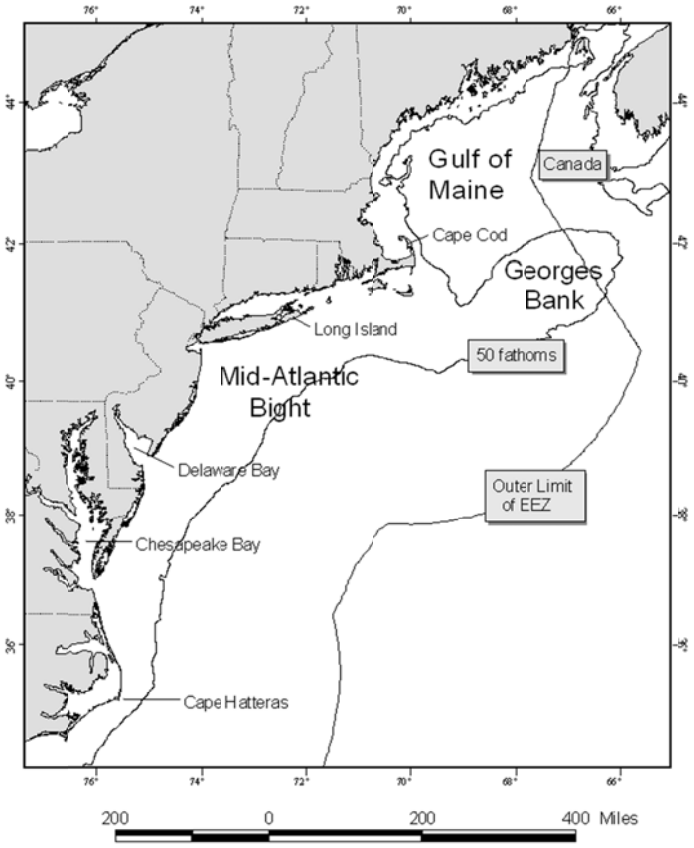


Figure 2. Northeast U.S Shelf Ecosystem.

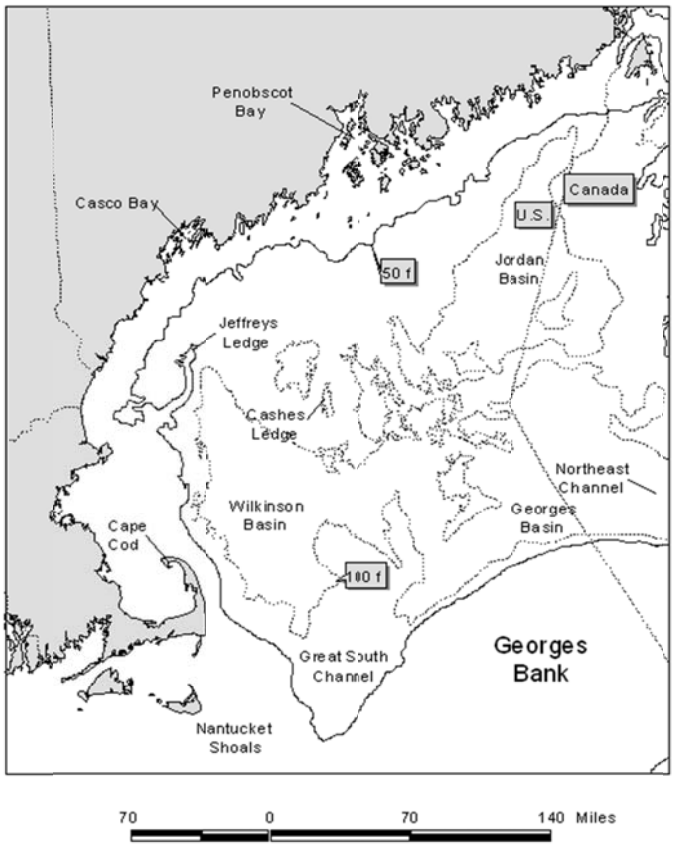


Figure 3. Gulf of Maine.

High points within the Gulf include irregular ridges, such as Cashes Ledge, which peaks at 9 m below the surface, as well as lower flat topped banks and gentle swells. Some of these rises are remnants of the sedimentary shelf that was left after most of it was removed by the glaciers. Others are glacial moraines and a few, like Cashes Ledge, are outcroppings of bedrock. Very fine sediment particles created and eroded by the glaciers have collected in thick deposits over much of the GOM, particularly in its deep basins (Figure 4). These mud deposits blanket and obscure the irregularities of the underlying bedrock, forming topographically smooth terrains. Some shallower basins are covered with mud as well, including some in coastal waters. In the rises between the basins, other materials are usually at the surface. Unsorted glacial till covers some morainal areas, as on Sewell Ridge to the north of Georges Basin and on Truxton Swell to the south of Jordan Basin. Sand predominates on some high areas and gravel, sometimes with boulders, predominates on others.

Coastal sediments exhibit a high degree of small-scale variability. Bedrock is the predominant substrate along the western edge of the GOM north of Cape Cod in a narrow band out to a depth of about 60 m. Rocky areas become less common with increasing depth, but some rock outcrops poke through the mud covering the deeper sea floor. Mud is the second most common substrate on the inner continental shelf. Mud predominates in coastal valleys and basins that often abruptly border rocky substrates. Many of these basins extend without interruption into deeper water. Gravel, often mixed with shell, is common adjacent to bedrock outcrops and in fractures in the rock. Large expanses of gravel are not common, but do occur near reworked glacial moraines and in areas where

the seabed has been scoured by bottom currents. Gravel is most abundant at depths of 20 - 40 m, except in eastern Maine where a gravel-covered plain exists to depths of at least 100 m. Bottom currents are stronger in eastern Maine where the mean tidal range exceeds 5 m. Sandy areas are relatively rare along the inner shelf of the western GOM, but are more common south of Casco Bay, especially offshore of sandy beaches.

Georges Bank

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

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

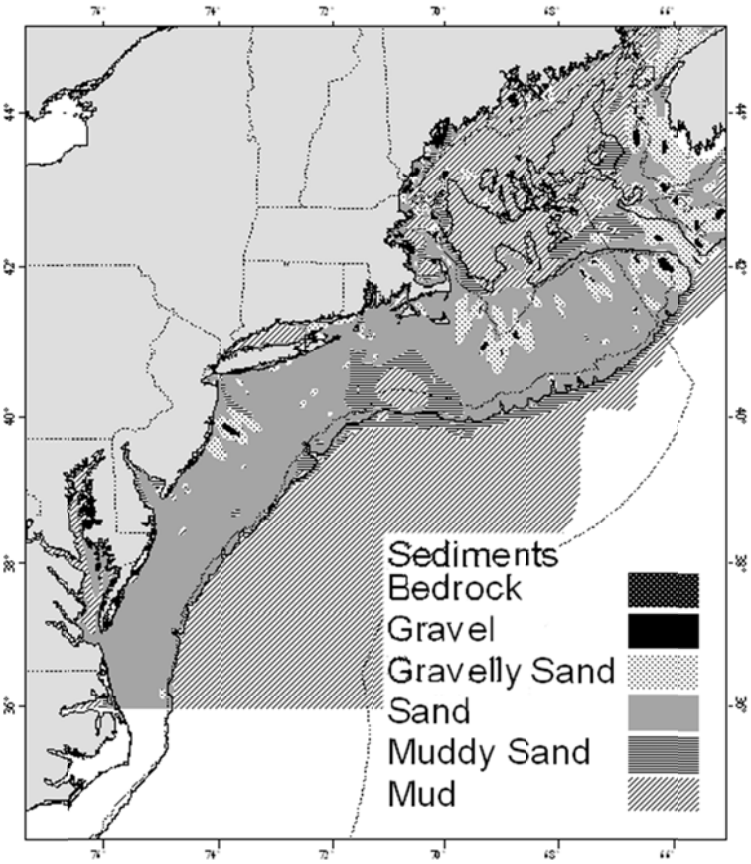


Figure 4. Northeast region sediments, modified from Poppe et al. (1989a and b).

The central region of the Bank is shallow, and the bottom is characterized by shoals and troughs, with sand dunes superimposed upon them. The two most prominent elevations on the ridge and trough area are Cultivator and Georges Shoals. This shoal and trough area is a region of strong currents, with average flood and ebb tidal currents greater than 4 km/h, and as high as 7 km/h. The dunes migrate at variable rates, and the ridges may also move. In an area that lies between the central part and Northeast Peak, Almeida *et al.* (2000) identified high-energy areas as between 35 - 65 m deep, where sand is transported on a daily basis by tidal currents, and a low-energy area at depths > 65 m that is affected only by storm currents.

The area west of the Great South Channel, known as Nantucket Shoals (Figure 3), is similar in nature to the central region of the Bank. Currents in these areas are strongest where water depth is shallower than 50 m. This type of traveling dune and swale morphology is also found in the Mid-Atlantic Bight, and further described in that section of the document. The Great South Channel separates the main part of Georges Bank from Nantucket Shoals. Sediments in this region include gravel pavement and mounds, some scattered boulders, sand with storm generated ripples, and scattered shell and mussel beds. Tidal and storm currents range from moderate to strong, depending upon location and storm activity (Valentine, pers. comm.).

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 (Figure 2). Like the rest of the continental shelf, the topography of the Mid-Atlantic Bight was shaped largely by sea level fluctuations caused by past ice ages. The shelf's basic morphology and sediments derive from the retreat of the last ice sheet, and the subsequent rise in sea level. Since that time, currents and waves have modified this basic structure.

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

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

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

Sand waves are usually found in patches of 5 - 10 with heights of about 2 m, lengths of 50 - 100 m and 1 - 2 km between patches. Sand waves are primarily found on the inner shelf, and often observed on sides of sand ridges. They may remain intact over several seasons. Megaripples occur on sand waves or separately on the inner or central shelf.

During the winter storm season, they may cover as much as 15% of the inner shelf. They tend to form in large patches and usually have lengths of 3 - 5 m with heights of 0.5 - 1 m. Megaripples tend to survive for less than a season. They can form during a storm and reshape the upper 50 - 100 cm of the sediments within a few hours. Ripples are also found everywhere on the shelf, and appear or disappear within hours or days, depending upon storms and currents. Ripples usually have lengths of about 1 - 150 cm and heights of a few centimeters.

Sediments are uniformly distributed over the shelf in this region (see Figure 4). A sheet of sand and gravel varying in thickness from 0 - 10 m covers most of the shelf. The mean bottom flow from the constant southwesterly current is not fast enough to move sand, so sediment transport must be episodic. Net sediment movement is in the same southwesterly direction as the current. The sands are mostly medium to coarse grains, with finer sand in the Hudson Shelf Valley and on the outer shelf. Mud is rare over most of the shelf, but is common in the Hudson Shelf Valley. Occasionally relic estuarine mud deposits are re-exposed in the swales between sand ridges. Fine sediment content increases rapidly at the shelf break, which is sometimes called the "mud line," and sediments are 70 - 100% fines on the slope. On the slope, silty sand, silt, and clay predominate.

The northern portion of the Mid-Atlantic Bight is sometimes referred to as southern New England. Most of this area was discussed under Georges Bank; however, one other formation of this region deserves note. The mud patch is located just southwest of Nantucket Shoals and southeast of Long Island and Rhode Island (Figure 3). Tidal currents in this area slow significantly, which allows silts and clays to settle out. The mud is mixed with sand, and is occasionally resuspended by large storms. This habitat is an anomaly of the outer continental shelf.
Artificial reefs are another significant Mid-Atlantic habitat, formed much more recently on the geologic time scale than other regional habitat types. These localized areas of hard structure have been formed by shipwrecks, lost cargoes, disposed solid materials, shoreline jetties and groins, submerged pipelines, cables, and other materials (Steimle and Zetlin 2000). While some of materials have been deposited specifically for use as fish habitat, most have an alternative primary purpose; however, they have all become an integral part of the coastal and shelf ecosystem. It is expected that the increase in these materials has had an impact on living marine resources and fisheries, but these effects are not well known. In general, reefs are important for attachment sites, shelter, and food for many species, and fish predators such as tunas may be attracted by prey aggregations, or may be behaviorally attracted to the reef structure.

6.4 Endangered and Other Protected Species

There are numerous species under NMFS' jurisdiction that inhabit the environment within the spiny dogfish management unit and are protected under the Endangered Species Act of 1973 (ESA) and/or the Marine Mammal Protection Act of 1972 (MMPA). Thirteen are classified as endangered or threatened under the ESA, while the remainder is protected by the provisions of the MMPA. The Council has determined that the following list of species protected either by the ESA and the MMPA may be found in the environment inhabited by spiny dogfish:

Cetaceans

Species	Status
Northern right whale (*Eubalaena glacialis*)	Endangered
Humpback whale (*Megaptera novaeangliae*)	Endangered
Fin whale (*Balaenoptera physalus*)	Endangered
Blue whale (*Balaenoptera musculus*)	Endangered
Sei whale (*Balaenoptera borealis*)	Endangered
Sperm whale (*Physeter macrocephalus*)	Endangered
Minke whale (*Balaenoptera acutorostrata*)	Protected
Beaked whales (*Ziphius* and *Mesoplodon* spp.)	Protected
Risso's dolphin (*Grampus griseus*)	Protected
Pilot whale (*Globicephala* spp.)	Protected
White-sided dolphin (*Lagenorhynchus acutus*)	Protected
Common dolphin (*Delphinus delphis*)	Protected
Spotted and striped dolphins (*Stenella* spp.)	Protected
Bottlenose dolphin (*Tursiops truncatus*)	Protected

Sea Turtles

Species	Status
Leatherback sea turtle (*Dermochelys coriacea*)	Endangered
Kemp's ridley sea turtle (*Lepidochelys kempii*)	Endangered
Green sea turtle (*Chelonia mydas*)	Endangered
Hawksbill sea turtle (*Eretmochelys imbricata*)	Endangered
Loggerhead sea turtle (*Caretta caretta*)	Threatened

Fish

Species	Status
Shortnose sturgeon (*Acipenser brevirostrum*)	Endangered
Atlantic salmon (*Salmo salar*)	Endangered

Species Not Likely to be Affected

Several ESA-listed species, while their distribution overlaps to some degree with the management unit of the spiny dogfish FMP, are not likely to be affected by the fishery since the fishery does not typically operate in areas where these species occur. These species include shortnose sturgeon, the Gulf of Maine Distinct Population of Atlantic Salmon, hawksbill sea turtles, blue whales, and fin whales.

Species Likely to be Affected

It is expected that all of the remaining species identified above have the potential to be affected by the dogfish fishery. The status of the marine mammal populations listed above has been discussed in detail in the U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments. Initial assessments were presented in Blaylock et al. (1995) and are updated in Waring et al. (2009). The most recent information on the stock assessment of various marine mammals through 2009 can be found at: http://www.nmfs.noaa.gov/pr/sars/. Three other useful websites on marine mammals are: http://www.nmfs.noaa.gov/pr/recovery, http://spo.nwr.noaa.gov/mfr611/mfr611.htm, and http://www.nmfs.noaa.gov/pr/species/mammals.

Summary information for the ESA-listed species likely to be affected by the spiny dogfish fishery, along with information on their interactions and overlap with the fishery, is presented below.

Sea turtles have a seasonal distribution in Mid-Atlantic waters north of Cape Hatteras, NC. In general, turtles move up the coast from southern wintering areas south of Cape Hatteras as water temperatures warm in the spring and then reverse direction in the fall as water temperatures decline; returning to waters south of Cape Hatteras for the winter (Keinath *et al.* 1987; Shoop and Kenney 1992; Musick and Limpus 1997; Morreale and Standora 1993; Morreale and Standora 1998; Braun-McNeill and Epperly 2004; James *et al.* 2005; Morreale and Standora 2005). Recreational anglers have reported sightings of sea turtles in waters defined as inshore waters (bays, inlets, rivers, or sounds; Braun-McNeill and Epperly 2004) as far north as New York as early as March-April, but in relatively low numbers (Braun-McNeill and Epperly 2004). Greater numbers of loggerheads, Kemp's ridleys, and greens are found in Virginia's inshore, nearshore, and offshore waters from May through November and in New York's inshore, nearshore, and offshore waters from June through October (Keinath *et al.* 1987; Morreale and Standora 1993 ; Braun-McNeill and Epperly 2004). Leatherback sea turtles have a similar seasonal distribution but have a more extensive range in the Gulf of Maine compared to the hardshelled species, which appear to be temperature limited to waters only as far north as Cape Cod (Shoop and Kenney 1992).

The distribution of ESA-listed right, humpback, fin, and sei whales in New England and Mid-Atlantic waters also varies seasonally with each species following the general pattern of migration between low latitude winter calving grounds and high latitude summer foraging grounds (Perry *et al.* 1999; Kenney 2002). Nevertheless, this is an oversimplification of cetacean movements. In the winter, only a portion of the known right whale population is seen on the calving grounds. The winter distribution of the remaining right whales remains uncertain (Waring *et al.* 2009). Results from winter surveys and passive acoustic studies suggest that animals may be dispersed in several areas including Cape Cod Bay (Brown *et al.* 2002) and offshore waters of the southeastern U.S. (Waring *et al.* 2009). During the spring and summer months, right whales use northern waters, including Gulf of Maine waters for foraging. Similarly, humpback whale sightings are most frequent in New England waters from mid-March through November between 41°N and 43°N latitude, from the Great South Channel north along the outside of Cape Cod to Stellwagen Bank and Jeffrey's Ledge (CeTAP 1982) and peak in May and August. Small numbers of individuals may be present in this area year-round, including the waters of Stellwagen Bank. Like right whales, humpback whales traverse Mid-Atlantic waters to and from the calving/mating grounds, but it may also be an important winter feeding area for juvenile humpback whales. During the 1978-1982 CeTAP surveys, fin whales accounted for 24% of all cetaceans and 46% of all large cetaceans sighted over the continental shelf between Cape Hatteras and Nova Scotia (CeTAP 1982). The single most important area for the species appeared to be from the Great South Channel, along the 50m isobaths past Cape Cod, over Stellwagen Bank, and past Cape Ann to Jeffrey's Ledge (Hain *et al.* 1992). In comparison, the sei whale is often found in the deeper waters characteristic of the continental shelf region (Hain *et al.* 1985; Waring *et al.* 2009*).* NMFS aerial surveys found substantial numbers of sei whales in this area, south of Nantucket, in the spring of 2001 (Waring *et al.* 2009). Indications are that,

at least during the feeding season, a major portion of the sei whale stock is centered in northerly waters, perhaps on the Scotian shelf (Mitchell and Chapman 1977; Waring *et al.* 2009). The southern portion of the species range during spring and summer includes the northern portions of the U.S. EEZ -the Gulf of Maine and Georges Bank (Waring *et al.* 2009*).*

The North Carolina gillnet fishery for spiny dogfish has historically caught both sea turtles and Atlantic bottlenose dolphins. To date, management measures consistent with the federal spiny dogfish rebuilding plan have eliminated widespread directed fishing for spiny dogfish, including the gillnet fishery for spiny dogfish in North Carolina. Additionally, protective measures under the Harbor Porpoise Take Reduction Plan (HPTRP) and Bottlenose Dolphin Take Reduction Plan (BDTRP) in combination with federal spiny dogfish harvest policy have been sufficient to reduce gillnet fishery interactions with harbor porpoises and bottlenose dolphins below Potential Biological Removal (PBR) levels.

The dominant gear types associated with the retention of spiny dogfish in 2009 (sink gillnet, bottom otter trawl, and bottom longline) are used by several fisheries identified in the List of Fisheries for 2011 (75 CFR 68468). Sink gill nets are deployed in two Category I fisheries: "Mid-Atlantic gillnet" and "Northeast sink gillnet". Hook gear that catches spiny dogfish is deployed by a Category III fishery: "Northeast/Mid-Atlantic bottom longline/hook and line". Category I fisheries are those identified in the List of Fisheries as associated with frequent incidental mortality and serious injury of marine mammals. Category III fisheries have a remote likelihood of, or no known incidental mortality and serious injury of marine mammals.

The Mid-Atlantic gillnet and Northeast sink gillnet fisheries are both included in the Atlantic Large Whale Take Reduction Plan (ALWTRP), as these gears, which are used in the spiny dogfish fishery, are known to interact with large whales. The ALWTRP contains a suite of management measures for gillnet, as well as pot/trap gear. More information on the ALWTRP can be found at http://www.nero.noaa.gov/whaletrp/.

In summary, the gears used in the spiny dogfish fishery have been known to interact with several ESA-listed and MMPA species. However, as long as the retention of spiny dogfish is generally a byproduct of the activity of other fisheries and a large directed fishery for spiny dogfish does not exist then interactions with protected species will continue to be analyzed under the management plans for those other fisheries.

6.5 Human Communities/ Socio-economic Environment

Human communities include the individuals that harvest the stock, as well as the ports and communities in which they reside, home port of the vessels, and otherwise indirectly support shore-side businesses. The following section discusses the participants involved in the spiny dogfish fishery, as well as their home ports and/or states.

6.5.1 Vessel Activity and Permit Information

According to unpublished NMFS permit file data, 3,020 vessels were issued federal spiny dogfish permits in FY2009, while 398 of these vessels contributed to overall landings.

The distribution of permitted and active vessels by home port state is given in Table 8. Most of the active vessels were from home ports in Massachusetts (36.9%), New Jersey (14.1%), Maine (11.9%), New York (9.8%), Rhode Island (6.7%), North Carolina (5.2%), New Hampshire (4.8%), and Virginia (4.7%). All other states comprised 4.2% of the total.

NMFS permit data indicate that 462 dealers possessed federal spiny dogfish dealer permits in FY2009 while dealer reports indicate 77 of those dealers actually bought spiny dogfish. The distribution of permitted and active dealers by state is given in Table 9. Most of the active dealers were from the states of Massachusetts (26.0%), New York (20.8%), Rhode Island (14.3%), North Carolina (10.4%), New Jersey, (9.1%), Virginia (7.8%), Maryland, (3.9%), New Hampshire (3.9%) with other states comprising 3.9% of the total.

Dogfish landings were reported from a total of 70 unique ports in the dealer data. Unknown ports accounted for 6.2% of the landings. Landings by port for FY2009 are given in Table 10. Gloucester, MA accounted for the largest share of total FY2009 landings (13.8%), followed by Chatham, MA (11.5%), Seabrook, NH (6.9%), Barnegat Light/Long Beach, NJ (7.4%), Rye, NH (4.5%), and Portsmouth, NH (4.6%).

Comparing spiny dogfish revenue to total revenue by port where ex-vessel dogfish revenue was $100,000 or more, spiny dogfish landings accounted for 9.5% of total revenue ($228,339 / $2,415,856) in Seabrook, NH, 7.1% ($149,695/ $2,117,372) in Rye, NH, and 3.4% ($130,779 / $3,859,063) in Portsmouth, NH, and 2.3% (293,866 / 12,549,241) in Chatham, MA (Table 10). Spiny dogfish revenue was less than 1% for other ports. This suggests that dependence on the harvest of spiny dogfish by fishing communities on the Atlantic Coast is fairly limited.

6.5.2 Port and Community Description

The Council contracted with Dr. Bonnie McCay and her associates at Rutgers University to describe the ports and communities associated with the fisheries in Mid-Atlantic (McCay et al. 1993). The Spiny Dogfish FMP contains details of McCay et al. (1993) with regard to the spiny dogfish fishery.

7.0 ENVIRONMENTAL CONSEQUENCES – ANALYSIS OF DIRECT AND INDIRECT IMPACTS

As discussed in Section 6.0 (Description of the Affected Environment and Fisheries), the VECs include the target species (spiny dogfish), non-target and bycatch species, protected resources, and human communities. This section describes and characterizes the impacts of the alternatives on these VECs as compared to the No Action Alternative. As stated in Section 5.4, the No Action Alternative is effectively the same as Alternative 1. A “true” No Action Alternative for dogfish fishery management, however, is not equivalent to status quo or baseline conditions.

If the actions proposed in this document are not taken, some current management measures will remain in place (i.e. 3,000 lb trip limit), but the overall management program will not be identical to that of FY2009 (i.e. there would be no specified quota for

FY 2010). The “true” No Action Alternative for this fishery is infeasible and inconsistent with the FMP which requires specifications, or quotas, to be established for the fishery. Therefore, the “true” No Action Alternative is not analyzed in this document. Since management measures consistent with achieving $F_{rebuild}$ (consistent with a 12 million lb quota for FY2010) have been in place since 2000, this is considered to be the baseline condition, and is referred to as Alternative 1.

7.1. Target Species (Spiny Dogfish) Impacts

The alternative management measures are described in Section 5.0 of this document. A 15.0 million lb quota as under Alternative 1 is projected to achieve F << 0.173 in FY2011. Alternative 1 represents a more precautionary response to stock condition in comparison with the larger quotas associated with Alternatives 2 and 3. Alternative 2 (preferred) proposes a 20.0 M lb quota and Alternative 3 proposes a 31.4 M lb quota. Stock biomass is expected to continue to grow in the near term under any alternative, however, long term biomass projections at F = 0.207 (Alternative 3) show a subsequent decline approaching the "overfished" threshold in approximately ten years, well beyond the scope of this analysis, but a negative impact to the resource if allowed. Alternative 3 is more likely to result in F_{target} (0.207, redefined by the SSC as $F_{threshold}$) being exceeded in FY2011 than Alternatives 1 and 2.

None of the alternatives propose to modify the status quo 3,000 lb trip limit. The trip limit is not associated with a particular fishing mortality rate and thus impacts on the stock are difficult to evaluate, however, it would be logical to expect that maintaining the status quo trip limit would result in null impacts to the stock.

In summary, stock size is expected to grow in FY2011 under all of the alternatives, the most under Alternative 1, the least under Alternative 3, with Alternative 2 in between. As such, Alternative 1 is likely to most positively impact the dogfish population by contributing to long term recovery of the female stock. Alternative 2 is slightly less and Alternative 3 is least likely to benefit the stock.

7.2 Non-target Species Impacts

The degree to which discarding of non-target species would change under any of the alternatives is related to how fishing effort would change if a given alternative is implemented. If the quota in the EEZ is increased (as under Alternatives 2 and 3), then it is likely that there will be some increase in dogfish fishing effort. If this occurs, then bycatch of non-target species would be expected to increase. Directed fishing is addressed in Section 6.1.3.1.1 and appears to be related to the type of gear used with much greater likelihood of directed effort with bottom longlines, less likelihood with bottom otter trawls, and gillnets somewhere in between. Additionally, because the abundance of dogfish has increased, larger catches are not necessarily associated with an increase in fishing effort. That a given trip would be made for the sole purpose of harvesting dogfish is also less likely the farther from shore that trip occurs. Nevertheless, in comparison to the Alternative 1, it is expected that directed dogfish fishing in the EEZ is more likely to increase than decrease under Alternatives 2 and 3, and to the greatest degree under Alternative 3.

The composition of the bycatch from dogfish fishing is expected to be similar to that described in Section 6.2 and Table 7. For bottom longline gear, species other than dogfish comprise a very small proportion of discards and increased effort is not expected to result in negative impacts. For gillnets, the species composition of the discards is broader including cod which is experiencing overfishing, however, overall decreases in fishing effort through Amendment 14 to the Northeast Multispecies FMP (~40%) are expected to overwhelm marginal increases in effort from directed fishing under Alternatives 2 and 3. The diversity of bycatch species in the trawl fishery is much greater than the other two gear types, however, it appears that directed trawl fishing for dogfish is uncommon, and thus impacts on those trawl bycatch species is not expected to be directly related to an increase in the quota. In conclusion, discards associated with spiny dogfish harvest are more likely to increase under Alternative 2 and 3 than under Alternative 1, and to the greatest extent under Alternative 3. These would be negative impacts, however the magnitude is likely marginal given that directed fishing for dogfish is more likely for gear types with the lowest incidence of bycatch.

7.3 Habitat Impacts

Habitat impacts associated with the harvest of spiny dogfish would potentially increase under Alternatives 2 or 3 since they represent increases in the quota over the status quo (Alternative 1). As such, adverse habitat impacts are not expected under Alternative 1 since the quota would remain the same. Because no change is proposed in the trip limit (3,000 lb), that aspect of the alternatives is not related to a change in habitat impacts under any alternative.

A major factor in habitat impacts is the type of fishing gear used to harvest dogfish. Commercial gear for spiny dogfish includes gill nets, hook gear and, to a much lesser degree, bottom otter trawls (Table 6). Currently, most of the reported landings of spiny dogfish are caught in sink gill nets, with only 13% from bottom trawls (Table 6). Of these three gear types, the bottom otter trawl is the only one known to significantly affect benthic marine habitats since it is a bottom-tending mobile gear, while bottom gill nets and hook gear (bottom long lines) are stationary and cause minor impacts to benthic habitats (NRC 2002, Morgan and Chuenpagdee 2003, NEFSC 2002). Benthic habitats for a number of federally-managed species in the Northeast region are moderately or highly vulnerable to adverse impacts associated with bottom otter trawls (Stevenson et al. 2004) and both regional Councils have implemented management measures in recent years to minimize these impacts, to the extent practicable, as required by the MSA.

Bottom otter trawls were an important component of the directed fishery during the 1990s, accounting for as much as 30% of the annual landings in 1999. Since the implementation of quota management in the federal Spiny Dogfish FMP in 1998, there has been no directed trawl fishery for dogfish. Directed fishing is addressed in Section 6.1.3.1.1 and appears to be related to the type of gear used with much greater likelihood of directed effort with bottom longlines, less likelihood with bottom otter trawls, and gillnets somewhere in between. Additionally, because the abundance of dogfish has increased, larger catches are not necessarily associated with an increase in fishing effort. That a given trip would be made for the sole purpose of harvesting dogfish is also less likely the farther from shore that trip occurs. Nevertheless, in comparison to the Alternative 1, it is expected that directed dogfish fishing in the EEZ is more likely to

increase than decrease under Alternatives 2 and 3, and to the greatest degree under Alternative 3.

There has been an overall decline in bottom trawling activity for groundfish in the Northeast region in recent years, and most recently under Amendment 14 to the Multispecies FMP. That added to the fact that management measures (closed areas) are in place for minimizing the adverse habitat impacts of bottom trawling and dredging, it is unlikely that any additional measures would be required to minimize the impacts of a directed dogfish fishery with an increased quota.

7.4 Impacts on Endangered Species and Other Protected Resources

The degree to which encounters with endangered and other protected species would change under any of the alternatives is related to how fishing effort would change if a given alternative is implemented. If the quota is increased over the Status Quo Alternative 1 level (as under Alternatives 2 and 3), then it is possible that there could be some increase in *directed* dogfish fishing in the EEZ. If this occurs, then encounters with protected resources could be attributable to activity by the dogfish fishery. Directed fishing is addressed in Section 6.1.3.1.1 and appears to be related to the type of gear used with much greater likelihood of directed effort with bottom longlines, less likelihood with bottom otter trawls, and gillnets somewhere in between. Additionally, because the abundance of dogfish has increased, larger catches are not necessarily associated with an increase in fishing effort. That a given trip would be made for the sole purpose of harvesting dogfish is also less likely the farther from shore that trip occurs. Nevertheless, in comparison to the Alternative 1, it is expected that directed dogfish fishing in the EEZ is more likely to increase than decrease under Alternatives 2 and 3, and to the greatest degree under Alternative 3.

The protected species that would be encountered from directed dogfish fishing would likely be similar to those which occurred in the historic North Carolina gill net fishery. As such, one might expect that encounters with coastal bottlenose dolphins, sea turtles, and harbor porpoises may occur (see Section 6.4). However, since the implementation of the Bottlenose Dolphin Take Reduction Plan and Harbor Porpoise Take Reduction Plan, more stringent rules are in place than existed when those previously mentioned encounters took place. Specifically, nets must be attended and no night time sets are allowed. Similarly, the Atlantic Large Whale Take Reduction Plan should reduce potential encounters with whales. Nevertheless, it is possible that protected resource encounters associated with spiny dogfish harvest may increase under Alternatives 2 and 3 as compared to Alternative 1, and to the greatest degree under Alternative 3.

It is likely with this potential for increased fishing, gear interactions with protected resources would also increase, resulting in negative impacts to this VEC. There is the potential for continued low negative impacts to protected resources under Alternative 1 . However, because the abundance of dogfish has increased greatly, effort is unlikely to increase significantly.

7.5 Human Community Impacts

As noted in Section 6.5, the dealer data associate a very limited number of fishing communities with a high (> 5%) proportion of spiny dogfish revenue to total commercial landings revenue. Additionally, none of the alternatives proposes to decrease revenue relative to the baseline by decreasing the quota. Alternative 1 would be expected to maintain current revenue levels and Alternatives 2 and 3 would be expected to increase revenue from dogfish landings. As such, positive or null economic impacts are expected under any of the scenarios under consideration. Total spiny dogfish revenue from the last complete fishing year (FY2009) was reported as $2.360 million. Using the average FY2009 price/lb ($0.22) landing the full FY2010 quota (and therefore also FY2011 quota under Alternative 1) corresponds to $3.300 million. Using the same approach, revenue would be expected to increase to $4.400 million under Alternative 2 and $6.898 under Alternative 3. Assuming the distribution of landings by port is consistent with FY2009 (Section 6.5), the increases in dogfish revenue should benefit those ports that are more heavily dependent on dogfish revenue than other communities, assuming all other revenue sources do not change. Additionally, increases or maintaining status quo revenues would benefit fishing vessel crews. In FY2009, 131 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 $17 to 45,758, average = $9,169; dogfish rev / total rev range 5.0% to 100%, average = 10.0%). Among the vessels, crew size ranged from 1 to 7 (average = 2.87). The economic benefits would be greatest under Alternative 3 and to a lesser extent Alternative 2, but fishermen would still benefit with the potential for maintained revenue under Alternative 1, relative to the Status Quo Alternative. If the No Action Status Quo Alternative remained in place, revenue from federal water landings would remain constant.

7.6 Cumulative Impacts

7.6.1 Introduction; Definition of Cumulative Effects

This section analyzes and discusses the significance of the cumulative impacts of the proposed alternatives. Cumulative impacts are defined under NEPA as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other action" (40 CFR § 1508.7). Consistent with NEPA, the MSA, as amended, requires that management actions be taken only after consideration of impacts to the biological, physical, economic, and social dimensions of the human environment. Additionally, the MSA promotes long-term positive impacts on the environment through guidance outlined in the National Standards. Under this regulatory regime, the cumulative impacts of past, present, and future federal fishery management actions on the spiny dogfish stock should generally be positive. This document analyzes the significance to the human environment of impacts that may result from the alternatives. Consideration is given to the relative probability that each alternative will achieve the management objectives of the FMP through biological/ecological, socioeconomic, and legal review by experts on Council staff and NMFS. In addition, this Cumulative Impacts Assessment specifically considers the proposed management alternatives in the context of the cumulative impacts of past, present and reasonably foreseeable future fishing and non-fishing actions. The analysis is

generally qualitative in nature because of the limitations of determining effects over time and over the large geographic areas under consideration.

Temporal and Geographic Scope of the Cumulative Impacts Assessment
In terms of past actions for fisheries, habitat and socioeconomic impacts, the temporal scope of this analysis is primarily focused on actions that have taken place since the early 1990s, when the directed U.S. spiny dogfish commercial fishery began its rapid expansion. For endangered and other protected species, the context is largely focused on the 1980s and 1990s, when NMFS began generating stock assessments for marine mammals and turtles that inhabit waters of the U.S. EEZ. In terms of future actions, the analysis considers the period between the effective date for these specifications (May 1, 2010) and the year by which the stock is currently expected to be fully recovered (2020).

The geographic scope of the analysis of impacts to fish species and habitat for this action is the range of the fisheries in the western Atlantic Ocean, as described in the Affected Environment and Environmental Consequences sections of the document (Sections 6.0 and 7.0). For endangered and protected species the geographic range is the total range of each species (information available online in latest stock assessments for each species). The geographic range for socioeconomic impacts is defined as those fishing communities bordering the range of the commercial spiny dogfish fishery (Sections 6.5) from the U.S.-Canada border to, and including, North Carolina.

7.6.2 Non-Fishing Activities

Cumulative impacts from non-fishing activities such as pollution, loss of coastal wetlands, marine transportation, and marine mining pose a risk to the spiny dogfish resource. These impacts are most likely to occur indirectly through habitat degradation. As indicated in the FMP, EFH for both juvenile and adult spiny dogfish is widespread, and includes generally all continental shelf waters from the Gulf of Maine to Cape Canaveral, Florida. Additionally, no habitat areas of particular concern (HAPC) have been identified to date for spiny dogfish. Nevertheless, the potential for adverse impacts to spiny dogfish and spiny dogfish EFH should coincide with wherever human induced disturbances are occurring. Activities of concern may include discharge of chemical pollutants and sewage; changes in water temperature, salinity and dissolved oxygen; an increase in suspended sediment and activities that involve dredging and the disposal of dredged material. Non-fishing activities generally tend to be concentrated in nearshore areas and only affect localized areas offshore. Wherever these activities co-occur, they can 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 could tend to reduce the tolerance of these VECs to the impacts of fishing effort. Impacts are generally negative in the immediate area of the activity. However, the overall impact to the affected species and their habitats on a population level is difficult to predict, but may be considered “low negative” or even “negligible”, since a large portion of these species have a limited or minor exposure to these local non-fishing perturbations due to the large range and various habitat regions the species occupies.

In addition to guidelines mandated by the MSA, NMFS reviews these types of effects through the review process 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. Such reviews and permitting by NMFS and other agencies often reduce, mitigate or avoid anticipated adverse effects.

7.6.3 Fishing Activities: Past, Present, and Reasonably Foreseeable Future Activities

7.6.3.1 Target Species Impacts

The federal Spiny Dogfish FMP eliminated the large-scale directed fishing for spiny dogfish in federal waters, greatly reducing fishing mortality and halting the decline in female spawning stock biomass. Following the initiation of federal management of spiny dogfish, increased activity by the Canadian dogfish fishery and inconsistent harvest policy in state waters constrained the federal recovery plan from succeeding in the manner that had been originally envisioned. Recovery to 90% of SSB_{max} was expected by the 2004 fishing year, however, the 2004 update to the status of the stock indicated that biomass was about 30% of SSB_{max}. The stock was officially determined to be rebuilt in 2010 and SSB (164,066 mt) was above the biomass target (159,288 mt) for the third year in a row. Long term projections indicate that no matter what fishing mortalities are achieved, biomass will oscillate - continuing to increase in the near term, then declining to a "low" around 2017, followed by another increase. The reason for this oscillation is a "hole" in female biomass that is the result of prolonged low production from 1997-2003. Nevertheless, as a result of past actions (implementation of the federal FMP and, more recently, extension of the rebuilding plan into state waters), fishing mortality on mature female dogfish dropped from around 0.30 in 1998 to about 0.11 in 2006 - 2008. Therefore, although long term stability of the stock has not been fully achieved, the additive effects of past management actions have directly benefited the spiny dogfish stock.

7.6.3.2 Non-target Species Impacts

The establishment of the federal Spiny Dogfish FMP, which eliminated the major directed spiny dogfish fishery in federal waters, is associated with positive impacts on non-target species. The current possession limit is 3,000 lbs per trip, and the proposed actions would maintain that trip limit. The abundance of dogfish has increased greatly and while larger quotas may result in greater directed fishing, increased landings do not necessarily correspond to increased fishing effort. There are no known plans to investigate methods to decrease spiny dogfish bycatch in other fisheries. Given that a major directed spiny dogfish fishery associated with the bycatch of non-target species is unlikely to develop in the near future, impacts on non-target species as a result of spiny dogfish harvest are not expected to be significant in future years.

7.6.3.3 Habitat Impacts

Commercial gear types historically used to harvest spiny dogfish include sink gill nets, bottom longlines, and to a much lesser extent, bottom otter trawls. Of these gear types, the bottom otter trawl is the only gear known to significantly affect benthic habitats since it is a bottom-tending mobile gear. Prior to the implementation of the federal Spiny Dogfish FMP, bottom otter trawls were an important component of the directed fishery,

for example, harvesting as much as 30% of the annual landings in 1999. In FY2009, however, bottom otter trawls contributed 13.1% of the total commercial landings (Table 6). Additional adverse habitat impacts would be expected with the increases in the quota as under Alternatives 2 or 3, but not under Alternative 1. Because the abundance of dogfish has increased greatly, larger catches would not necessarily be associated with an equivalent increase in fishing effort. Directed fishing is addressed in Section 6.1.3.1.1 and appears to be related to the type of gear used with much greater likelihood of directed effort with bottom longlines, less likelihood with bottom otter trawls, and gillnets somewhere in between. Additionally, because the abundance of dogfish has increased, larger catches are not necessarily associated with an increase in fishing effort. That a given trip would be made for the sole purpose of harvesting dogfish is also less likely the farther from shore that trip occurs. Nevertheless, in comparison to the Alternative 1, it is expected that directed dogfish fishing in the EEZ is more likely to increase than decrease under Alternatives 2 and 3, and to the greatest degree under Alternative 3.

7.6.3.4 Endangered and Other Protected Species Impacts

The North Carolina gillnet fishery for spiny dogfish caught both sea turtles and Atlantic bottlenose dolphins. Management measures consistent with the federal spiny dogfish rebuilding plan, have eliminated the directed gillnet fishery for spiny dogfish in North Carolina. Additionally, protective measures under the HPTRP in combination with federal spiny dogfish harvest policy have been sufficient to reduce the fishery interactions with harbor porpoises below PBR levels. The impacts of these past management actions can be characterized as indirect and positive in that they have reduced mortality for these species that was associated with the historic spiny dogfish fishery. The dominant gear types currently associated with the retention of spiny dogfish (sink gill nets and hook gear) are used by several fisheries identified in the List of Fisheries for 2011 (75 CFR 67468). Sink gill nets are deployed in two Category I fisheries: "Mid-Atlantic gillnet" and "Northeast sink gillnet". Widespread directed fishing for spiny dogfish was effectively been eliminated in federal waters since FY2000. However, with the proposed increase in quota, it is possible that encounters with protected resources could increase from status quo. But, given that the abundance of dogfish has increased greatly, larger catches are not necessarily associated with an increase in fishing effort. A major directed spiny dogfish fishery is unlikely to develop in the near future. As such, impacts on endangered and other protected species as a result of spiny dogfish harvest are not expected to be significant in future years.

7.6.3.5 Fishery and Socioeconomic Impacts

As a result of the implementation of the spiny dogfish FMP, negative effects have been incurred by the socioeconomic sector of the environment through loss of revenue to fishermen and decreased export revenue to wholesalers. These negative effects are expected to be ameliorated as recovery of the spiny dogfish stock proceeds. Under the alternatives revenue associated with spiny dogfish harvest should remain stable (Alternative 1) or increase (Alternatives 2 and 3; see Section 7.5) disregarding changes in market value. Nevertheless, a significant directed fishery is not expected to return for several more years given the protracted rebuilding period for the spiny dogfish stock.

7.6.4 Summary of Cumulative Effects/Conclusions

None of the alternatives under consideration is expected to have significant negative impacts on the spiny dogfish resource or the human communities involved. Maintaining the status quo quota and trip limit (Alternative 1) would continue stock rebuilding quickest among the alternatives under consideration. The fishing mortality rates associated with Alternatives 2 and 3 are also expected to allow for stock growth, albeit at a more modest rate. Additionally, there is a low likelihood that a major directed spiny dogfish fishery and corresponding low negative impact associated with increases in fishery interactions with non-target species, habitat, and protected resources would develop in federal waters in the upcoming fishing year. Socioeconomic benefits are expected because harvest levels in FY2011 are expected to equal to or greater than in FY2010 since no quota decreases are envisioned. In general, stock conditions have improved greatly from a cumulative effects perspective.

As discussed above, past, present, and reasonably foreseeable future fishing actions (i.e., the FMP, FW1 and other specifications) have had a positive impacts on the spiny dogfish stock, and negligible impacts on non-target/bycatch species, habitat, and protected resources. The federal management actions have had negative impacts on the human communities, due to limited annual quota and trip limits which effectively eliminated the large scale directed fishery.

Given the importance of spiny dogfish harvest in state jurisdictional waters in recent years, the incremental impact of proposed federal management actions must be considered in the context of anticipated state fishery activity. Until recently, (FY2004, 2005, 2009, 2010) divergent state water harvest policy has had a constraining effect on the federal spiny dogfish stock recovery plan. For most years since 2000, the ASMFC has increased their overall quota and trip limits above federal levels. However, in the upcoming fishing year, the ASMFC and federal action are expected to be consistent and should both help to achieve the federal rebuilding objectives.

As explained in Section 7.6.2, non-fishing actions generally tend to be concentrated in nearshore areas, and include the discharge of chemical pollutants and sewage; changes in water temperature, salinity and dissolved oxygen; an increase in suspended sediment and activities that involve dredging and the disposal of dredged material. The impacts to habitat and to the dogfish stock, non-target species, and protected species from non-fishing activities are likely negative in the immediate area of the action. However, the degree of negative impact to the population as a whole is difficult to predict, but likely low negative or even negligible, since a large portion of these species populations have a limited or minor exposure to these local non-fishing perturbations due to the large range and various habitat regions the species occupies. Also adverse effects are often reduced or even avoided as required by certain conditions placed on these activities during permitting.

The cumulative effects on the VECs are, by definition, a combination of the proposed action and the other above described fishing and non-fishing actions. Past and current fishing regulatory actions have resulted in positive impacts to the dogfish stock, which is supported by the increase in biomass of the stock. The preferred alternative would have a positive cumulative effect since the net result would be to continue rebuilding the dogfish

stock and allow further exploitation of the increased biomass at the same fishing effort. The cumulative impacts to non-target/bycatch species, habitat, and protected resources are all negligible since the impacts of the preferred alternative on these VECs are also negligible. Although past and current fishery management actions have had negative social and economic impacts to dogfish fishermen and the associated businesses, the preferred alternative offers the opportunity to increase revenues and therefore would result in positive cumulative impact to these entities. As described above, none of the impacts outlined in this assessment (direct, indirect or cumulative) are considered significant.

8.0 APPLICABLE LAWS

8.1 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. In addition to the findings resulting from the EA, NMFS solicited public comment on the proposed rule for this action, published in the *Federal Register* on ….. No comments were received concerning safety and public health issues.

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 during the rebuilding program, 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.

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 significantly 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 significantly 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?

On the contrary, the proposed action reflects agreement between both Councils and the ASMFC on the total quota and maximum possession limits. Individual state agencies may take actions that are more restrictive than the proposed action, and that could cause some controversy in specific states. Although there has been some controversy over the setting of dogfish specifications in the past, the effects of this action are not 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 action addresses the commercial quota and trip limit for spiny dogfish. 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 addresses the commercial quota and trip limit for the spiny dogfish fishery. 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. 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 7.6, 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 proposed action addresses the commercial quota and trip limit for the spiny dogfish fishery. This fishery is not known to be prosecuted in any areas that might affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or cause the loss or destruction of significant

scientific, cultural or historical resources. Therefore, the proposed action is not expected to affect on any of these areas.

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

The proposed action addresses the commercial quota and trip limit for the spiny dogfish fishery. 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 addresses the commercial quota and trip limit for the spiny dogfish fishery. 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. When new stock assessment or other biological information about these species becomes available in the future, then the specifications may be adjusted according to the FMP. 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 addresses the commercial quota and trip limit for the spiny dogfish fishery. 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 significantly increase fishing effort or the spatial and/or temporal distribution of current fishing effort. The improvements in the condition of the stock through implementation of quotas based on the fishing mortality target contained in the FMP 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 the proposed spiny dogfish specifications on marine mammals and has concluded that the proposed management actions are 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 proposed spiny dogfish specifications are 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 this specifications document 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. Development of this specifications document provided many opportunities for public review, input, and access to the rulemaking process. This proposed specifications document was developed as a result of a multi-stage process that involved review of the source document (2010 Specifications package) by affected members of the public. The public had the opportunity to review and comment on management measures during a meeting of the Council's Scientific and Statistical Committee on September 21, 2010, a Spiny Dogfish Monitoring Committee Meeting on September 24, 2010, a Joint Spiny Dogfish Committee meeting held on October 12, 2010, a MAFMC meeting held October 13, 2010, and an NEFMC meeting held on November 18, 2010. In addition, the public will have further opportunity to comment on this specifications package once NMFS publishes a proposed rule in the Federal Register (FR) requesting comments.

8.6 Data Quality Act

Utility of Information Product

The proposed document includes: A description of the proposed specifications, description of the alternatives considered, and the reasons for selecting the proposed management measures. This action proposes commercial quotas and other management measures for spiny dogfish in 2010. This proposed specifications document implements the FMP's conservation and management goals consistent with the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) as well as all other existing applicable laws.

This proposed specifications document was developed as a result of a multi-stage process that involved review of the source document (2010 Specifications package) by affected members of the public. The public had the opportunity to review and comment on management measures during a meeting of the Council's Scientific and Statistical Committee on September 21, 2010, a Spiny Dogfish Monitoring Committee Meeting on September 24, 2010, a Joint Spiny Dogfish Committee meeting held on October 12, 2010, a MAFMC meeting held October 13, 2010, and an NEFMC meeting held on November 18, 2010.

The Federal Register notice that announces the proposed rule and the implementing regulations will be made available in printed publication and on the website for the Northeast Regional Office. The notice provides metric conversions for all measurements.

Integrity of Information Product

The information product meets the standards for integrity under the following types of documents:

Other/Discussion (e.g., Confidentiality of Statistics of the Magnuson-Stevens Fishery Conservation and Management Act; NOAA Administrative Order 216-100, Protection of

Confidential Fisheries Statistics; 50 CFR 229.11, Confidentiality of information collected under the Marine Mammal Protection Act.)

Objectivity of Information Product

The category of information product that applies for this product is "Natural Resource Plans."

In preparing specifications documents, the Council must comply with the requirements of the Magnuson-Stevens Act, the National Environmental Policy Act, the Regulatory Flexibility Act, the Administrative Procedure Act, the Paperwork Reduction Act, the Coastal Zone Management Act, the Endangered Species Act, the Marine Mammal Protection Act, the Data Quality Act, and Executive Orders 12630 (Property Rights), 12866 (Regulatory Planning), 13132 (Federalism), and 13158 (Marine Protected Areas).

This specifications document has been developed to comply with all applicable National Standards, including National Standard 2. National Standard 2 states that the FMP's conservation and management measures shall be based upon the best scientific information available. Despite current data limitations, the conservation and management measures proposed to be implemented under this specifications document are based upon the best scientific information available. This information includes NMFS dealer weighout data for 2008, which was used to characterize the economic impacts of the management proposals. These data, as well as the NMFS Observer program database, were used to characterize historic landings, species co-occurrence in the spiny dogfish catch, and discarding. The specialists who worked with these data are familiar with the most recent analytical techniques and with the available data and information relevant to the spiny dogfish fishery. Marine Recreational Fisheries Statistical Survey (MRFSS) data were used to characterize the recreational fishery for this species.

The policy choices (i.e., management measures) proposed to be implemented by this specifications document are supported by the available scientific information and, in cases where information was unavailable, proxy reference points are based on observed trends in survey data. The management measures contained in the specifications document are designed to meet the conservation goals and objectives of the FMP, and prevent overfishing and rebuild overfished resources, while maintaining sustainable levels of fishing effort to ensure a minimal impact on fishing communities.

The supporting materials and analyses used to develop the measures in the proposed rule are contained in the specifications document and to some degree in previous specifications and/or FMPs as specified in this document.

The review process for this specifications package involves the Mid-Atlantic Fishery Management Council, the Northeast Fisheries Science Center, the Northeast Regional Office, and NOAA Fisheries headquarters. The Center's technical review is conducted by senior level scientists with specialties in population dynamics, stock assessment methods, demersal resources, population biology, and the social sciences. The Council review process involves public meetings at which affected stakeholders have opportunity to provide comments on the specifications document. Review by staff at the Regional Office is conducted by those with expertise in fisheries management and policy, habitat

conservation, protected species, and compliance with the applicable law. Final approval of the specifications document and clearance of the rule is conducted by staff at NOAA Fisheries Headquarters, the Department of Commerce, and the U.S. Office of Management and Budget.

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

8.9 Environmental Justice/Executive Order (E.O.) 12898

This EO provides that "each federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations." EO 12898 directs each federal agency to analyze the environmental effects, including human health, economic, and social effects of federal actions on minority populations, low-income populations, and Indian tribes, when such analysis is required by NEPA. Agencies are further directed to "identify potential effects and mitigation measures in consultation with affected communities, and improve the accessibility of meetings, crucial documents, and notices."

The proposed actions are not expected to affect participation in the spiny dogfish fishery. Since the proposed action represents no changes relative to the current opportunity to participate in this fishery, no negative economic or social effects are anticipated as a result (Section 7.0). Therefore, the proposed action under the preferred alternatives is not expected to cause disproportionately high and adverse human health, environmental or economic effects on minority populations, low-income populations, or Indian tribes.

8.10 Regulatory Flexibility Act/E.O. 12866

8.10.1 Regulatory Impact Review (RIR) and Initial Regulatory Flexibility Analysis (IRFA)

This section provides the analysis and conclusions to address the requirements of Executive Order 12866 and the Regulatory Flexibility Act (RFA). Since many of the

requirements of these mandates duplicate those required under the MSA and NEPA, this section contains references to other sections of this document. The following sections provide the basis for concluding that the proposed action is not significant under E.O. 12866 and will not have a significant economic impact on a substantial number of small entities under the RFA.

8.10.2 Description of Management Objectives

The goals and objectives of the management plan for the spiny dogfish resource are stated in Section 1.1.3 of the Spiny Dogfish FMP. The proposed action is consistent with, and does not modify those goals and objectives.

8.10.3 Description of the Fishery

Section 2.3 of the Spiny Dogfish FMP contains a detailed description of the historic spiny dogfish fishery. Updated fishery activity is given in Section 6.5 of this document.

8.10.4 Statement of the Problem

The purpose and need for this action is identified in Section 4.1 of this document. The Spiny Dogfish FMP requires that the Councils and the Regional Administrator review the best available stock and fishery data when developing specifications for the upcoming fishing year(s).

8.10.5 Description of the Alternatives

Alternative 1 – (Status Quo – Set quota to maintain current FY2010 level: 15.0 M lb): For FY2011, specify a commercial quota of 15.0 M lbs with trip limits of 3,000 lbs (vessels are prohibited from landing more than the specified amount in one calendar day). As per the FMP, the quota would be divided with quota Period 1 (May 1 through October 31) allocated 57.9% of the quota (8.685 M lbs), and quota Period 2 (November 1 through April 30) allocated 42.1% of the quota (6.315 M lbs).

According to CEQ regulations, the No Action Alternative should be used for the purposes of evaluating an environmental baseline. A "true" No Action Alternative for dogfish fishery management, however, is not equivalent to status quo or baseline conditions. If the actions proposed in this document are not taken, some current management measures will remain in place (i.e. 3,000 lb trip limit), but the overall management program will not be identical to that of 2009 (i.e. there would be no specified quota for FY 2010). The "true" No Action Alternative for this fishery is infeasible and inconsistent with the FMP which requires specifications, or quotas, to be established for the fishery. Therefore, the "true" No Action Alternative is not analyzed in this document.

Alternative 2 – (Councils' Preferred Alternative – Set quota to achieve SSC recommendation - 75% of catch at Fmsy: 20.0 M lbs)
For FY2011, specify a commercial quota of 20.0 M lbs with trip limits of 3,000 lbs (vessels are prohibited from landing more than the specified amount in one calendar day).

As per the FMP, the quota would be divided with quota Period 1 (May 1 through October 31) allocated 57.9% of the quota (11.580 M lbs), and quota Period 2 (November 1 through April 30) allocated 42.1% of the quota (8.420 M lbs).

Alternative 3 – (Set quota to achieve existing F_{target} (0.207): 31.4 M lbs)
For FY2011, specify a commercial quota of 31.4 M lbs with trip limits of 3,000 lbs (vessels are prohibited from landing more than the specified amount in one calendar day). As per the FMP, the quota would be divided with quota Period 1 (May 1 through October 31) allocated 57.9% of the quota (18.2 M lbs), and quota Period 2 (November 1 through April 30) allocated 42.1% of the quota (13.2 M lbs).

8.10.6 Economic Analysis

The economic impacts of the proposed actions are discussed in Section 7.0 of this document. None of the alternatives under consideration are expected to result in negative economic impacts. Higher quota and trip limits (Alternatives 2 and 3) are expected to increase revenue from the dogfish fishery. In general, no significant economic impacts are expected because the alternatives are consistent with the goals of the FMP and are unlikely to result in significant deviation (negatively) from the status quo.

8.10.7 Determination of Significance under E.O. 12866

NMFS Guidelines provide criteria to be used to evaluate whether a proposed action is significant. A significant regulatory action means any regulatory action that is likely to result in a rule that may:

1. *Have an annual effect on the economy of $100 million or more, or adversely effect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local or tribal governments or communities.*

The proposed action will not have an effect on the economy in excess of $100 million. The proposed action is not expected to have any adverse impacts on the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or state, local or tribal governments or communities.

2. *Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency.*

The proposed action will not create a serious inconsistency with, or otherwise interfere with, an action taken or planned by another agency. No other agency has indicated that it plans an action that will affect the spiny dogfish fishery in the EEZ.

3. *Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof.*

The proposed action will not materially alter the budgetary impact of entitlements, grants, user fees or loan programs, or the rights and obligations of their participants.

4. *Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.*

The proposed action does not raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in E.O. 12866.

8.10.8 Initial Regulatory Flexibility Analysis

The following sections contain analyses of the effect of the proposed action on small entities. Under Section 603(b) of the RFA, each initial regulatory flexibility analysis is required to address:

1. Reasons why the agency is considering the action,
2. The objectives and legal basis for the proposed rule,
3. The kind and number of small entities to which the proposed rule will apply,
4. The projected reporting, record-keeping and other compliance requirements of the proposed rule, and
5. All federal rules that may duplicate, overlap, or conflict with the proposed rule.

8.10.9 Reasons for Considering the Action

The purpose and need for this action is identified in Section 4.1 of this document. The Spiny Dogfish FMP requires that the Council and the Regional Administrator annually review the best available stock and fishery data when developing specifications for the upcoming fishing year.

8.10.10 Objectives and Legal Basis for the Action

The objective of the proposed action is to implement specifications for the spiny dogfish fishery, as required under the regulations implementing the Spiny Dogfish FMP, which are provided in 50 CFR 648, Subpart L.

8.10.11 Description and Number of Small Entities to Which the Rule Applies

All of the potentially affected businesses are considered small entities under the standards described in NOAA Fisheries guidelines because they have gross receipts that do not exceed $3.5 million annually. A discussion of vessel activity during the 2008 fishing year is given in Section 6.5.1 of this document.

8.10.12 Recordkeeping and Reporting Requirements

The proposed action does not introduce any new reporting, recordkeeping, or other compliance requirements.

8.10.13 Duplication, Overlap, or Conflict with Other Federal Rules

The proposed action does not duplicate, overlap or conflict with any other federal rules.

8.10.14 Economic Impacts on Small Entities

Section 7.0 of this document contains the economic analysis of the alternatives that were considered during the specification process.

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11.0 LIST OF AGENCIES AND PERSONS CONSULTED

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.

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TABLES

Table 1. Landings of spiny dogfish (1,000s lbs) in the Northwest Atlantic Ocean for calendar years 1980 to 2009.

Year	US Comm	US Rec	US Total	Canada	Former USSR	Other Foreign	Total (NW Atl.Stock)
1980	9,006	-	9,006	1,477	774	547	11,804
1981	15,135	3,291	18,426	1,243	1,138	1,010	21,817
1982	11,928	154	12,082	2,101	60	743	14,986
1983	10,795	148	10,943	-	791	231	11,965
1984	9,811	201	10,012	9	642	220	10,883
1985	8,880	196	9,076	29	1,530	701	11,336
1986	6,057	401	6,459	46	472	340	7,316
1987	5,960	675	6,634	617	256	51	7,558
1988	6,846	791	7,637	-	1,265	161	9,063
1989	9,903	922	10,825	366	373	192	11,755
1990	32,475	395	32,870	2,901	844	22	36,637
1991	29,049	289	29,338	644	481	35	30,498
1992	37,165	474	37,639	1,828	57	90	39,614
1993	45,509	265	45,774	3,111	-	60	48,944
1994	41,447	340	41,786	4,010	-	4	45,801
1995	50,068	141	50,209	2,090	-	31	52,330
1996	60,055	57	60,112	917	-	520	61,550
1997	40,460	146	40,606	983	-	472	42,061
1998	45,476	134	45,609	2,379	-	1,338	49,326
1999	32,760	119	32,880	5,439	-	1,221	39,540
2000	20,407	10	20,418	5,902	-	1,089	27,408
2001	5,056	61	5,117	8,278	-	666	14,061
2002	4,839	452	5,290	6,614	-	-	11,904
2003	2,579	87	2,667	2,800	-	-	5,467
2004	2,160	244	2,404	5,150	-	-	7,554
2005	2,535	79	2,615	4,034	-	-	6,649
2006	5,212	-	5,212	5,185	-	-	10,397
2007	7,723	185	7.908	5,132	-	-	13,040
2008	9,057	471	9,528	3,466	-	-	12,994
2009	11,882	75	11,957	293			12,250

Source: unpublished NMFS Dealer Reports, South Atlantic General Canvass, MRFSS data, and NAFO data.

Table 2. Commercial landings (1,000s lbs) of spiny dogfish by state from calendar years 1980 through 2009.

Year	ME	NH	MA	RI	CT	NY	NJ	DE	MD	VA	NC	Total
1980	1,365	15	6,161	1	0	229	580	0	11	641	3	9,006
1981	1,138	0	9,972	4	4	110	204	8	1,533	2,156	4	15,135
1982	623	0	6,361	3	3	104	5	3	1,974	2,846	6	11,928
1983	496	1	9,987	0	9	57	1	4	213	27	0	10,795
1984	1,247	0	8,164	24	5	77	9	6	259	19	0	9,811
1985	903	0	7,636	2	10	137	8	0	170	14	1	8,880
1986	770	0	4,774	5	19	295	53	0	129	12	0	6,057
1987	598	0	5,148	31	6	156	4	0	8	10	0	5,960
1988	482	1	5,828	1	94	86	10	0	24	19	302	6,846
1989	4,880	0	4,925	4	1	48	23	0	4	19	0	9,903
1990	6,366	185	17,807	1,301	24	18	4,544	0	2,182	7	41	32,475
1991	2,016	0	14,489	3,160	9	77	2,716	6	4,939	174	1,463	29,049
1992	1,719	402	18,376	2,028	22	156	2,535	0	3,063	229	8,635	37,165
1993	3,525	1,642	26,831	1,924	15	95	770	0	1,796	105	8,806	45,509
1994	1,813	2,598	23,214	530	170	237	1,130	0	1,429	447	9,878	41,447
1995	1,664	2,106	28,760	574	294	934	2,389	63	3,117	810	9,357	50,068
1996	911	1,080	26,959	1,129	706	1,328	4,635	0	7,151	2,483	13,674	60,055
1997	449	1,009	21,665	1,015	347	488	3,950	0	4,227	4,275	3,035	40,460
1998	274	1,893	24,911	1,769	267	1,457	6,305	2	2,399	3,190	3,008	45,476
1999	35	1,239	14,915	1,338	88	1,453	3,925	0	2,134	5,018	2,617	32,760
2000	8	2,335	5,762	306	30	1,906	5,222	0	450	1,545	2,845	20,407
2001	0	536	3,913	394	7	63	17	0	0	126	0	5,056
2002	1	349	3,799	438	0	50	1	0	2	196	3	4,839
2003	0	175	2,006	123	1	38	0	0	1	236	0	2,579
2004	3	0	1,208	149	50	53	7	0	6	261	423	2,160
2005	29	153	1997	147	84	48	1	0	6	63	8	2,535
2006	184	620	2797	549	81	15	0	0	21	941	4	5,212
2007	109	185	2,795	525	23	25	14	0	23	3,895	129	7,723
2008	49	1,374	3,578	237	10	22	50	0	111	3,491	134	9,057
2009	594	2,073	3,880	940	92	194	1,342	14	169	1,448	1,136	11,882

Source: unpublished NMFS Dealer Reports, South Atlantic General Canvass data.

Table 3. Ex-vessel value and price per pound of commercially landed spiny dogfish, Maine - North Carolina combined, 1996-2009.

Calendar Year	Value ($1,000)	Price ($/lb)	Fishing Year	Value ($1,000)	Price ($/lb)
1996	10,877	0.18	1996	10,371	0.18
1997	6,781	0.15	1997	5,717	0.14
1998	7,833	0.17	1998	8,338	0.17
1999	5,400	0.16	1999	5,510	0.17
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

Source: Unpublished NMFS Dealer Weighout and South Atlantic General Canvass data.

Table 4. Spiny dogfish landings (lbs) by month in FY2009.

	Month	Landings(lbs)	Pct of Total
Period 1	May	305,198	2.56%
	Jun	1,079,892	9.07%
	Jul	2,170,299	18.24%
	Aug	1,637,876	13.76%
	Sep	2,690,215	22.61%
	Oct	1,615	0.01%
	Total	**7,885,095**	66.26%
Period 2	Nov	2,174,762	18.27%
	Dec	671,127	5.64%
	Jan	1,168,370	9.82%
	Feb	591	0.00%
	Mar	0	0.00%
	Apr	885	0.01%
	Total	**4,015,735**	33.74%
	Grand Total	**11,900,830**	100.00%

Source: Unpublished NMFS dealer reports

Table 5. Commercial gear types associated with spiny dogfish harvest in FY2009.

Commercial Gear Type	Landings (lbs)	Pct Total
GILL NET	8,002,251	67.24%
TRAWL, OTTER, BOTTOM	1,562,292	13.13%
HOOK AND LINE	1,420,297	11.93%
UNREPORTED	687,731	5.78%
OTHER	228,259	1.92%
GILL NET	11,900,830	100.00%

Source: 2009 vessel trip reports

Table 6. Recreational landings (N) of spiny dogfish by state for 2009.

State	Landings (N)	Pct of Total
NEW JERSEY	4,995	34.42%
MASSACHUSETTS	4,968	34.24%
DELAWARE	1,621	11.17%
NEW HAMPSHIRE	1,088	7.50%
GEORGIA	751	5.18%
MARYLAND	316	2.18%
OTHER	771	5%
TOTAL	14,510	100.00%

Source: NMFS Marine Recreational Fisheries Statistical Survey

Table 7. Discards associated with the dominant gear types used to harvest spiny dogfish in FY2009 as reported in northest 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 (lbs)**	**Pct Of Total for this Gear**	**Discard Species**	**Discards (lbs)**	**Pct Of Total for this Gear**	**Discard Species**	**Discards (lbs)**	**Pct Of Total for this Gear**
DOGFISH, SPINY[a,b]	12,516	95.94%	DOGFISH, SPINY[a,b]	275,003	72.77%	DOGFISH, SPINY[a,b]	41,672	22.98%
SKATE, LITTLE[a,b]	408	3.13%	COD, ATLANTIC[d,e]	42,432	11.23%	SKATE, LITTLE[a,b]	25,658	14.15%
OTHER (4 sp.)	121	0.93%	BLUEFISH[a,b]	17,814	4.71%	HAKE, SILVER[a,b]	13,477	7.43%
			POLLOCK[a,b]	11,563	3.06%	SPONGE, NK [n/a]	11,922	6.57%
			MONKFISH[a,b]	10,541	2.79%	BUTTERFISH[c,b]	11,055	6.10%
			SKATE, WINTER[a,b]	9,651	2.55%	SCUP[a,b]	10,493	5.79%
			OTHER (30 sp.)	10,882	2.88%	COD, ATLANTIC[d,e]	9,481	5.23%
						HAKE, RED[a,f]	6,622	3.65%
						SKATE, WINTER[a,b]	6,276	3.46%
						FLOUNDER, WINTER[d,e]	3,948	2.18%
						FLOUNDER, SUMMER[a,b]	3,158	1.74%
						FLOUNDER, FOURSPOT [n/a]	2,832	1.56%
						FLOUNDER, AMERICAN PLAICE[a,b]	2,678	1.48%
						SCALLOP, SEA[a,b]	2,482	1.37%
						STARFISH, SEASTAR,NK [n/a]	2,419	1.33%
						ALEWIFE[c,f]	2,350	1.30%
						LOBSTER, AMERICAN[a,b]	2,301	1.27%
						FLOUNDER, YELLOWTAIL[d,c]	2,122	1.17%
						DEBRIS, FISHING GEAR [n/a]	1,991	1.10%
						OTHER (71 sp.)	10,882	2.88%
Total	**13,045**	**100%**	**Total**	**377,886**	**100%**	**Total**	**173,818**	**93%**

[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, 4th Quarter NMFS Fish Stock Sustainability Index

Table 8. Federally permitted dogfish vessel activity by home port state in FY2009. Active vessels are defined as vessels identified in the dealer reports as having landed spiny dogfish in FY2009.

State	Permitted Vessels	Pct of Total	State	Active Vessels	Pct of Total
MA	1,113	36.9%	MA	142	35.7%
NJ	427	14.1%	NJ	62	15.6%
ME	360	11.9%	RI	47	11.8%
NY	295	9.8%	NH	37	9.3%
RI	202	6.7%	NY	30	7.5%
NC	157	5.2%	VA	24	6.0%
NH	145	4.8%	ME	23	5.8%
VA	142	4.7%	NC	13	3.3%
CT	53	1.8%	MD	11	2.8%
MD	50	1.7%	CT	6	1.5%
DE	32	1.1%	DE	3	0.8%
PA	22	0.7%	TOTAL	398	100.0%
FL	16	0.5%			
All other states (5)	6	0.2%			
TOTAL	3,020	100.0%			

Source: NMFS permit database, Dealer weighout data

Table 9. Federally permitted spiny dogfish dealers by state in FY2009. Active dealers are defined as dealers identified in the federal dealer reports as having bought spiny dogfish in FY2009.

State	Permitted Dealers	Pct of Total	State	Active Dealers	Pct of Total
MA	124	26.8%	MA	20	26.0%
NY	91	19.7%	NY	16	20.8%
RI	42	9.1%	RI	11	14.3%
NC	32	6.9%	NC	8	10.4%
NJ	61	13.2%	NJ	7	9.1%
VA	32	6.9%	VA	6	7.8%
MD	17	3.7%	MD	3	3.9%
NH	13	2.8%	NH	3	3.9%
ME	33	7.1%	All others (2)	3	3.9%
CT	5	1.1%	Total	77	100.0%
DE	4	0.9%			
FL	3	0.6%			
All others (4)	5	1.1%			
Total	462	100.0%			

Source: NMFS permit database, Dealer weighout data

Table 10. Commercial landings (lbs) and value of spiny dogfish by port for fishing year 2009.

Port	Landings (lbs)	Pct of Total	Value ($)	Pct of Total	Total Port Value ($)	Dogfish Value / Port Value
GLOUCESTER, MASSACHUSETTS	1,621,777	13.8%	353,307	14.1%	51,794,606	0.7%
CHATHAM, MASSACHUSETTS	1,349,527	11.5%	293,866	11.7%	12,549,241	2.3%
SEABROOK, NEW HAMPSHIRE	802,759	6.9%	228,339	9.1%	2,415,856	9.5%
BARNEGAT LIGHT/LONG BEACH, NEW JERSEY	864,842	7.4%	186,760	7.4%	21,480,869	0.9%
RYE, NEW HAMPSHIRE	522,692	4.5%	149,695	6.0%	2,117,372	7.1%
PORTSMOUTH, NEW HAMPSHIRE	535,649	4.6%	130,779	5.2%	3,859,063	3.4%
All Others (75)	6,015,436	51.4%	1,169,139	46.5%	570,188,776	0.2%
TOTAL	**11,712,682**	**100.0%**	**2,511,885**	**100.0%**	**664,405,783**	**n/a**

Source: Unpublished NMFS dealer reports