

**Deep-Sea Red Crab**

**Stock Assessment and Fishery Evaluation (SAFE Report)**

**and**

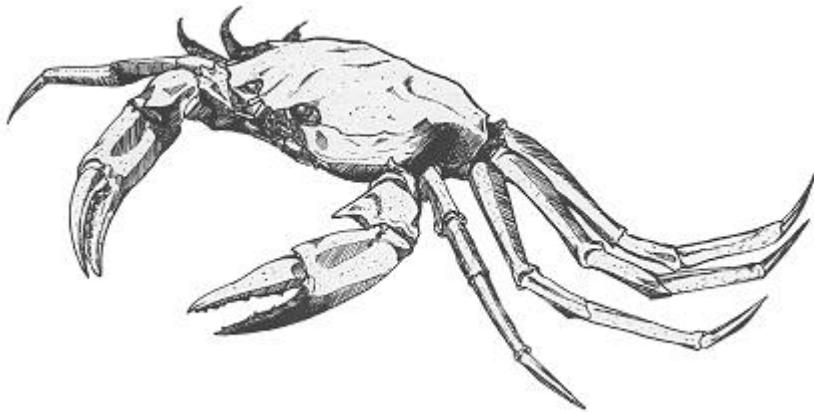
**2005 Fishing Year Specifications**  
**(March 1, 2005 – February 28, 2006)**

**including the**

**Environmental Assessment (EA),**

**Regulatory Impact Review (RIR), and**

**Initial Regulatory Flexibility Analysis (IRFA)**



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

**October 2004**

NEFMC Approval Date: September 16, 2004  
NEFMC Submission Date: October 22, 2004



## TABLE OF CONTENTS

<b>1.0</b>	<b>EXECUTIVE SUMMARY .....</b>	<b>I</b>
<b>2.0</b>	<b>INTRODUCTION.....</b>	<b>1</b>
<b>3.0</b>	<b>PURPOSE AND NEED OF ACTION.....</b>	<b>2</b>
<b>4.0</b>	<b>STOCK ASSESSMENT AND FISHERY EVALUATION (AFFECTED ENVIRONMENT) .....</b>	<b>2</b>
4.1	Biological Factors .....	3
4.1.1	Status of Resource.....	3
4.1.2	Bycatch .....	6
4.1.3	Canadian Red Crab Fishery .....	16
4.2	Economic and Social Factors .....	17
4.2.1	Update of Commercial Landings and DAS Usage .....	18
4.2.2	Description of the fishery since implementation of the FMP .....	22
4.3	Ecological Factors.....	23
4.3.1	Essential Fish Habitat (EFH) .....	23
4.3.2	Protected Species and Marine Mammals .....	24
<b>5.0</b>	<b>PROPOSED 2005 SPECIFICATIONS AND ALTERNATIVES.....</b>	<b>25</b>
5.1	No Action Alternative: Status quo DAS Allocation (780 fleet DAS) (Proposed Action) .....	25
5.2	Alternative method using bootstrap analyses to identify and evaluate DAS options	26
5.2.1	Option 1 .....	27
5.2.2	Option 2 .....	28
5.2.3	Option 3 .....	28
5.2.4	Option 4 .....	28
<b>6.0</b>	<b>ENVIRONMENTAL CONSEQUENCES AND ASSESSMENT OF IMPACTS .....</b>	<b>29</b>
6.1	Biological Impacts .....	29
6.1.1	Proposed Action.....	29
6.1.2	Other DAS options under consideration .....	29
6.2	Economic and Social Impacts.....	30
6.2.1	Proposed Action.....	32
6.2.2	Other DAS options under consideration .....	32
6.3	Impacts on Essential Fish Habitat.....	33
6.3.1	Proposed Action.....	33
6.3.2	Other DAS options under consideration .....	33
6.3.3	Essential Fish Habitat (EFH) Assessment .....	34
6.4	Impacts on Protected Species.....	34
6.4.1	Proposed Action.....	34
6.4.2	Other DAS options under consideration .....	35
6.5	Cumulative Impacts .....	35
6.5.1	Introduction.....	35
6.5.2	Past, Present and Reasonable Foreseeable Future Actions .....	35
6.5.3	Direct and Indirect Impacts on the red crab resource and non-target species	36

6.5.4	Non-fishing impacts on red crab.....	37
6.5.5	Social and economic impacts.....	37
6.5.6	EFH and protected species impacts .....	37
6.5.7	Summary .....	38
6.6	Finding of No Significant Impacts (FONSI) .....	38
<b>7.0</b>	<b>REGULATORY IMPACT REVIEW AND INITIAL REGULATORY FLEXIBILITY ANALYSIS .....</b>	<b>41</b>
7.1	Introduction.....	41
7.2	Problems and Objectives.....	41
7.3	Framework for Analysis .....	42
7.4	Description of the alternatives .....	42
7.5	Data.....	42
7.6	Description of the Economic Characteristics of the Fishery .....	44
7.7	Social Impacts.....	46
7.8	Impacts of the Alternatives.....	47
7.9	Summary of Economic Impacts.....	47
7.10	Determination of Significance under E.O. 12866.....	47
7.11	Initial Regulatory Flexibility Analysis.....	48
7.11.1	Introduction and Methods.....	48
7.11.2	Reasons the Action is Being Considered .....	49
7.11.3	Management Objectives and Legal Basis .....	49
7.11.4	Description of the Affected Entities .....	49
7.11.5	Description of the Reporting, Record-Keeping, and Compliance Requirements .....	50
7.11.6	Identification of Relevant Federal Rules .....	50
7.11.7	Description of the Alternatives .....	50
7.11.8	Analyses of Impacts of Alternatives .....	50
<b>8.0</b>	<b>CONSISTENCY WITH APPLICABLE LAWS.....</b>	<b>52</b>
8.1	Magnuson-Stevens Fishery Conservation and Management Act (MSA) .....	52
8.2	National Environmental Policy Act (NEPA) .....	52
8.3	Marine Mammal Protection Act (MMPA) .....	52
8.4	Endangered Species Act (ESA) .....	53
8.5	Administrative Procedure Act (APA).....	53
8.6	Paperwork Reduction Act (PRA).....	53
8.7	Coastal Zone Management Act (CZMA) .....	53
8.8	Data Quality Act (DQA) .....	54
8.9	Regulatory Flexibility Act (RFA) .....	55
8.10	Executive Order 12866 (Regulatory Planning and Review).....	56
8.11	Executive Order 13132 (Federalism) .....	56
<b>9.0</b>	<b>REFERENCES.....</b>	<b>56</b>
<b>10.0</b>	<b>LIST OF PREPARERS AND AGENCIES CONSULTED .....</b>	<b>57</b>

**APPENDIX I:** EFH text descriptions for all benthic (demersal) life stages for federally-managed species in the Northeast region.

## LIST OF FIGURES

Figure 1 – Statistical areas where discards were reported to the NMFS Observer Database from 2001 through July 2004 .....	7
Figure 2 – Location of observed tows with red crab bycatch, as compared to the location of all observed tows with reported bycatch in the NMFS Observer Database from 2001 through July 2004. ....	8
Figure 3 – Discards of red crab per haul on directed monkfish tows versus tows that did not direct on monkfish from the NMFS Observer Database.....	12
Figure 4 – Red crab discards on tows that targeted monkfish, as compared to all other tows that reported red crab discards in the NMFS Observer Database (2001-July 2004).....	13
Figure 5 – Observed tows targeting monkfish from the NMFS Observer Database (2001-July 2004) that reported red crab discards .....	14
Figure 6 – NAFO fishing areas. Limited red crab fishing occurs in parts of Zone 4 and Zone 5.....	17
Figure 7 – Total DAS used each quarter in FY2003 .....	19
Figure 8 – Total pounds landed each quarter in FY2003 (shown in bars), as well as the average pounds of red crab landed per DAS per quarter (shown in line). .....	20
Figure 9 – Location of red crab trips reported to the VTR database in FY2003 and part of FY2004 (as of August 19, 2004).....	21

## LIST OF TABLES

Table 1 - Current Overfishing Definition Reference Points and Status for Red Crab.....	4
Table 2 – Summary of NMFS Red Crab Carapace Width (Source: NMFS Commercial Fish Data, July 25, 2004) Based on measurements of landed crabs.....	5
Table 3 – Summary of records in the NMFS Observer Database from 2001 through July 2004. ....	7
Table 4 – Annual Comparison of discard records for the entire NMFS Observer Database versus records of red crab discards only. .....	7
Table 5 - Comparison of discard records by gear type for the entire NMFS Observer Database versus records of red crab discards only. ....	9
Table 6 – Comparison of discard records by statistical area for the entire NMFS Observer Database versus records of red crab discards only. ....	10
Table 7 – Summary of red crab discards by targeted species per tow from the NMFS Observer Database from 2001 through July 2004.....	11
Table 8 – Red crab discards on monkfish directed tows by year from the NMFS observer database.....	15
Table 9 - Red crab discards on monkfish directed tows by area from the NMFS observer database .....	15
Table 10 – Discards of all crab species reported to the NMFS Observer Database.....	15
Table 11 – Annual Landings in the Canadian Red Crab Fishery ( <i>Source: DFO</i> ) .....	16
Table 12 – DAS usage and total landings for the red crab fleet for FY2003 and FY2004. ....	18
Table 13 – Total number of trips, DAS used, landings, and average landings per DAS used for the limited access Red crab fishery. ....	19
Table 14 – Comparison of the four DAS options based on the bootstrap analysis method .....	28
Table 15 – Summary statistics for the four DAS options based on the bootstrap analysis method .....	28



## **1.0 EXECUTIVE SUMMARY**

The Red Crab FMP became effective on October 21, 2002. The primary management regime implemented by the regulations was a limited access program for the deep-sea red crab fishery. That program includes a specific days-at-sea (DAS) allocation for the limited access fleet to harvest the annual target total allowable catch (TAC). The regulations also require the Council to review the status of the deep-sea red crab stock and the fishery every year, as well as prepare a biennial Stock Assessment and Fishery Evaluation (SAFE Report). Section 4.0 of this document serves as the SAFE Report as well as the description of the Affected Environment. In addition to fulfilling the biennial SAFE Report requirement, this action also considers alternative fleet DAS allocations to maintain the target TAC for the red crab fishery.

The proposed action is described in Section 5.0. In summary this action proposes to maintain the same target TAC and fleet DAS allocation as proposed under the Red Crab FMP as well as the specifications for the 2004 fishing year. Therefore, for fishing year 2005, the proposed action includes a target TAC of 5.928 million pounds and a fleet DAS allocation of 780, the same specifications as fishing years 2004 and 2003.

The impacts of this action are described in Section 6.0. In summary, the impacts of this action are expected to be the same as described in the FMP. Overall, there are no significant impacts of this fishery action on the red crab resource, non-target species, social/economic resources, EFH, or protected species. The number of vessels that participate in this fishery is small, the amount of gear is limited, and the impacts on the ecosystem are not significant.



## **2.0 INTRODUCTION**

This document contains the New England Fishery Management Council's recommended specifications for the 2005 red crab fishery, as required by the Magnuson-Stevens Fishery Conservation and Management Act and the Red Crab FMP/EIS, as well as the biennial Stock Assessment Fishery Evaluation (SAFE Report). It also contains the supporting analysis required under other applicable law, namely the National Environmental Policy Act (Environmental Assessment, EA), the Regulatory Flexibility Act (the Initial Regulatory Flexibility Analysis, IRFA) and Executive Order 12866 and other applicable laws.

NMFS issued regulations on October 10, 2002, implementing measures contained in the Red Crab FMP/EIS effective October 21, 2002. Included in the measures was a limited access program for the directed fishery with a target TAC of 5.928 million pounds and a day-at-sea (DAS) allocation of 780 fleet days to harvest the TAC. The TAC was set at 95% of the maximum sustainable yield (MSY). It is important to recognize that the estimation of MSY for the red crab stock, and, therefore the TAC, is based on an assessment of virgin stock size that was derived from a survey conducted in 1974 before the stock was fished commercially. There have been to date no additional comprehensive surveys or assessments completed. Therefore, there is a degree of uncertainty associated with the MSY and TAC established for this fishery. MSY was estimated at 6.24 million pounds based on the biomass of male crabs only. In order to determine how many fleet DAS are necessary to harvest the target TAC implemented by the FMP, an approximate "value" of each average fishing day was calculated. According to records of actual landings during the period (May 18-November 14, 2001), the average catch per day was estimated to be between 6,000 and 7,600 pounds per DAS for the entire fleet. Therefore, the FMP estimated that 780 fleet DAS were necessary to harvest the target TAC of 5.928 million pounds of red crab. Each year, the Red Crab Plan Development Team (PDT) reviews the available data on vessel productivity to determine if the DAS allocated to the fleet needs to be adjusted to more accurately reflect the DAS needed to attain, but not exceed, the target.

Specific permitting and reporting requirements were implemented by the FMP, including an Interactive Voice Response (IVR) system for limited access vessels. A number of measures were implemented including trip limits set at 75,000 pounds per trip, unless a vessel could document one trip that occurred during the permit qualification period that had a higher trip limit. Incidental catch trip limits were set at 500 pounds per trip for non-limited access vessels. The FMP also implemented a limit on the number of traps permitted per vessel to 600 traps, and a prohibition on possession of female crabs. All of these management measures were intended to prevent overfishing in the red crab fishery. As explained above, there is a provision in the FMP that requires the Council to review the annual TAC and DAS allocation, and prepare a biennial SAFE Report. Therefore, this annual specifications package includes the first SAFE Report under this FMP, and a review of the target TAC and fleet DAS allocation for FY2005; all other measures under the FMP will remain in effect.

The 2003 fishing year (March 1, 2003 through February 29, 2004) was the first full year the FMP has been in place. The DAS allocation and TAC provisions need to be reviewed each year to determine if adjustments are necessary. In September 2003, the Council approved to maintain

the same target TAC and fleet DAS allocation for the 2004 fishing year specifications (a target TAC of 5.928 million pounds and 780 fleet DAS).

Based on the analyses in this document, the specifications for FY2005 include a total DAS allocation of 780 for the entire limited access red crab fleet. This allocation was selected because it is expected to manage the fishery at optimum yield (OY of 5.928 million lbs.), or 95% of the estimated maximum sustainable yield (MSY of 6.24 million lbs.).

The Council recently initiated a framework action to the Red Crab FMP that proposes to modify the annual specification process defined above to a multi-year specification process. The Council considered several alternatives to implement this adjustment and selected final measures at the September 2004 Council meeting. This proposed framework adjustment would not affect the 2005 fishing year specifications, as the action will become effective after the 2005 specifications have been implemented.

### **3.0 PURPOSE AND NEED OF ACTION**

The Red Crab FMP/EIS was implemented on October 21, 2002, which initiated a management plan for the deep-sea red crab fishery located off the coast of the Northeast United States. The need for this action is to comply with provisions within the FMP, which require the Council to review the status of the stock and the fishery every year, as well as prepare a biennial Stock Assessment and Fishery Evaluation (SAFE Report). The purpose of this action is to consider alternative fleet DAS allocations to maintain the target TAC for the red crab fishery. This document presents the updated stock and fishery information, and evaluates the impacts of various fleet DAS alternatives.

### **4.0 STOCK ASSESSMENT AND FISHERY EVALUATION (AFFECTED ENVIRONMENT)**

This section serves as the Stock Assessment and Fishery Evaluation (SAFE Report), which is a biennial requirement under the FMP. This section also serves as the Affected Environment supporting this action. A complete description of the affected environment was part of the Red Crab FMP/EIS (NEFMC, March 2002:Section 8.0). Any new information collected about the status of the stock or the economic and social changes that have occurred since the implementation of the FMP are described in this section. Keep in mind, the trends in the fishery are only preliminary because there has not been a sufficient amount of time to collect a considerable amount of data and monitor the resource and fishery since the FMP was implemented.

## **4.1 Biological Factors**

### **4.1.1 Status of Resource**

#### **4.1.1.1 Overfishing Definition**

The Red Crab FMP/EIS established criteria to determine whether the red crab stock was either in an overfished condition, subject to overfishing, or both. The approved overfishing and overfished definitions are as follows:

*Definition of Overfishing:* Overfishing is defined as any rate of exploitation such that the ratio of current exploitation to an idealized exploitation under MSY conditions exceeds a value of 1.0. The actual measure of exploitation used will be determined by the availability of suitable data (CPUE data, landings, etc.).

*Definition of Overfished:* The red crab stock will be considered to be in an overfished condition if one of the following three conditions are met:

Condition 1 – The current biomass of red crab is below  $\frac{1}{2} B_{msy}$  in the New England Council's management area.

Condition 2 – The annual fleet average CPUE, measured as marketable crabs landed per trap haul, continues to decline below a baseline level ( $\frac{1}{2} CPUE_0$ ) for three or more consecutive years.

Condition 3 – The annual fleet average CPUE, measured as marketable crabs landed per trap haul, falls below a minimum threshold level ( $\frac{1}{4} CPUE_0$ ) in any single year.

Application of both of these definitions is dependent upon the availability of suitable data on which to determine whether overfishing is occurring or the stock is overfished. The FMP/EIS established two types of proxies that could be used to assess whether overfishing is occurring. The first, in its simplest form, relies upon a comparison of current landings, adjusted for current fleet average CPUE, with MSY, adjusted for the expected CPUE under MSY conditions. If CPUE data are not available, the second proxy allows for a straightforward comparison of current landings to MSY (i.e., if the ratio  $L:MSY > 1.0$ , then overfishing is considered to be occurring; otherwise, overfishing is not considered to be occurring). Using this proxy, it will always be possible to make at least a crude assessment of whether overfishing is occurring in the red crab fishery, as landings are always known and the FMP developed an estimate of MSY.

In order to make an assessment as to whether the red crab stock is overfished, either an estimate of current biomass or fleet average per trap haul CPUE is required. At the time the FMP/EIS was developed, it was expected that NMFS and the industry would implement a voluntary subsampling protocol to collect trap-level data for a representative sample of trap hauls on each red crab fishing trip. The purpose of this subsampling was to collect data on per trap CPUE, derived from the number and size of all crabs (male, female, and juvenile) brought up in the sampled trap, and the composition of any bycatch also brought up in the sampled trap. Averaged across all trips by all participating vessels, the intent was to be able to estimate an annual fleet-wide per trap CPUE, which could be used in assessing the status of the red crab stock. Unfortunately, this subsampling program has yet to be initiated, although progress is being made

in the development of an appropriate protocol through a study currently in progress by Dr. Richard Wahle of the Bigelow Laboratory, in collaboration of Dr. Yong Chen and Jon Williams.

#### **4.1.1.2 Current Stock Status**

Based on the reported landings in FY 2003 (the only full year of fishing to occur since implementation of the FMP), the ratio of landings to MSY can be calculated to be:

$$L : MSY = 4,091,660 \text{ lb} : 6,240,000 \text{ lb} = 0.656$$

Because the ratio of L:MSY is less than 1.0, overfishing is not considered to be occurring on the red crab stock, based on FY 2003 data.

To assess whether the stock is considered to be overfished, current data on either stock status or fleet per trap CPUE are necessary. Because none of these data are currently available, stock status with respect to being in an overfished condition cannot be determined at this time.

Definition	Criteria	Reference Point	Proxy	Value	Status
Overfishing	f	$f:f_{MSY} > 1$	$\frac{L}{CPUE} : \frac{MSY}{CPUE_{MSY}}$	Not Available	Overfishing <u>Not</u> Occurring
			$\frac{L}{MSY}$	0.656	
Overfished	B	$B < \frac{1}{2} B_{MSY}$	None	Not Available	Unknown
	CPUE	$CPUE < \frac{1}{2} CPUE_0$	N/A	Not Available	
		$CPUE < \frac{1}{4} CPUE_0$	N/A	Not Available	

Table 1 - Current Overfishing Definition Reference Points and Status for Red Crab.

#### **4.1.1.3 Description of Resource and Current Data Collection Efforts**

Red crabs are patchily distributed along the continental shelf edge and slope of the western Atlantic at depths of 200-1800 meters between Emerald Bank, Nova Scotia and the Gulf of Mexico, as well as parts of the Gulf of Maine. The physical environment is described in more detail in Section 8.2.1 of the Red Crab FMP. Overall, the continental slope north of Cape Hatteras contains many submarine canyons and small gullies.

The biological environment is described in more detail in Section 8.1 of the Red Crab FMP. In general, red crabs may live for fifteen years or more and they are slow growing (Serchuk and Wigley, 1982). Based on a comparison of information from the late 1970s with current port sampling data, size at recruitment appears to have decreased from 4.5 inches (Serchuk, 1977) to very close to 4.0 inches (Table 2).

Since 2001, about 1,100 red crabs have been sampled dockside. These port sample data are used to monitor the size and sex distribution of catch. Overall, the mean size landed is smaller than stated mean size at recruitment to the fishery according to the 1977 stock assessment (114 mm). Furthermore, about one-third of the male crabs landed are smaller than 102 mm (about 4 inches),

the recruit size stated in the FMP (Table 2). These results may suggest that the availability of large males for harvest may be down, or the industry is landing smaller red crabs than the FMP anticipated. Either way the size and sex distribution of the catch is important to monitor. In addition, a small percentage of the total landings sampled were female; the FMP prohibits the landing of female red crabs, but there is a small level of toleration (less than 1% of the total landings per trip). These results may suggest that the level of female red crabs landed is higher than expected.

Year	Gender	Mean Width		% < 4" (102mm)	# of Samples
		mm	inches		
2001	Unk	107.8	4.2	27.2	81
2002	Unk	105.3	4.1	34.4	308
	M	110.7	4.4	18.6	86
	F	103.2	4.1	20.0	5
2003	M	105.0	4.1	36.7	509
	F	104.8	4.1	50.0	6
2004	M	107.3	4.2	28.4	102
	F	98.0	3.9	100.0	2

**Table 2 – Summary of NMFS Red Crab Carapace Width (Source: NMFS Commercial Fish Data, July 25, 2004) Based on measurements of landed crabs.**

Data are currently being collected to update the single red crab assessment completed in 1977. Dr. Richard Wahle (Bigelow Laboratories), Dr. Yong Chen (University of Maine) and Jon Williams (F/V Krystle James) have received funding from several sources to gather demographic information on the red crab resource in order to develop an updated stock assessment of the resource. The researchers have used both trawl and camera based sampling methods to determine whether the abundance, size structure, and sex composition of the population has changed since the 1974 survey. Preliminary findings suggest that the overall population density estimates of red crab are higher than the previous survey, but the proportion of harvestable crabs (males larger than 114 mm carapace width) is less than the 1974 survey. In addition, this research team has tagged approximately 8,000 red crabs. The tag return rate has been very low so far, but based on the crabs with tags that have been returned, there is very little evidence of growth (Wahle et al, 2004). All of these research projects are ongoing, and the results of this work will be incorporated into the next red crab stock assessment, planned for June 2006. Reduced size of harvestable crabs is an important issue to monitor in order to prevent recruitment overfishing

In addition, a recent study assessed the genetic subdivisions of deep-sea red crabs in the North Atlantic and the Gulf of Mexico (Weinberg et al., 2003). Genetic differences between red crabs in the Gulf of Mexico and southern New England were large enough to conclude that they are different fishery stocks. More locations need to be sampled, from between the Gulf of Mexico and southern New England, to get a better understanding of the pattern of divergence.

The Northeast Fisheries Science Center conducted studies of biodiversity on the continental slope off Georges Bank during May 2004 in water depths from 400 m to 1200 m. The study utilized hydroacoustic, video and net sampling to characterize species composition and habitat characteristics in submarine canyons and nearly continental slope areas. Red crab were

important components of benthic communities in water depths greater than 800 m. The data are not available yet, but when they are, the Red Crab PDT will review them and include whatever qualitative information is applicable in the next SAFE Report. In addition, NMFS has been involved in monkfish industry based surveys, which took place in 2001 and 2004. The findings from the 2001 survey were summarized in the 2004 Red Crab Specification Document, and the 2004 survey data are not available for this document. In general, there is evidence of overlap between the offshore monkfish fishery and where red crabs are distributed. This overlap will continue to be monitored in order to assess the potential level of red crab bycatch in the offshore monkfish fishery.

## **4.1.2 Bycatch**

### **4.1.2.1 Bycatch of red crab in other fisheries**

In order to assess the potential bycatch of red crab in other fisheries the entire observer database was queried to determine where, when, and by what gear types red crab was reported as bycatch. From 2001 to 2004 (as of July 2004) there are about 367,000 records in the observer database for species “kept” or discarded (about 47 million pounds total) (Table 3). The observer database records are widely distributed throughout the region. The database was then queried to separate discard from kept records. The statistical areas with discard records from 2001 through July 2004 are identified in Figure 1. Some areas had more records than others; for example statistical areas 514, 521, 522, 615, 621, and 626 had over 10,000 records per area for the entire time series. About 216,000 of the total 367,000 records are for “discarded” catch only, (about 14 million pounds, or 30% of the entire database in terms of weight).

Red crab was reported as discards for about 1,520 of those records (about 49,000 pounds, approximately 0.35% of the total weight of reported discards) (Table 4). The majority of red crab discards was reported in statistical areas 521 and 522, east of Cape Cod along the northern edge of Georges Bank (Figure 2). This area does not overlap with where the red crab fleet currently fishes. The FMP describes the red crab abundance in the Gulf of Maine as not dense enough for a directed fishery. Red crabs are more densely distributed along the continental shelf in depths of 400-800 meters.

	Total # of Records	Total Pounds of all Fish Reported
Entire Observer Database (2001-July 2004)	367,451	46,738,451
Discard Records Only ("kept" records removed)	216,680	14,053,671
Red Crab Discard Records Only	1,517	48,735

Table 3 – Summary of records in the NMFS Observer Database from 2001 through July 2004.

	Total # of Records	Pounds of Total Discards	# of Records with RC discards	Pounds of Red Crab Discards
2001	25,809	1,922,866	277	16,911
2002	49,163	2,785,759	320	16,155
2003	105,545	6,783,221	657	10,549
2004	36,026	2,561,825	263	5,120
<b>TOTAL</b>	<b>216,543</b>	<b>14,053,671</b>	<b>1,517</b>	<b>48,735</b>

Table 4 – Annual Comparison of discard records for the entire NMFS Observer Database versus records of red crab discards only.

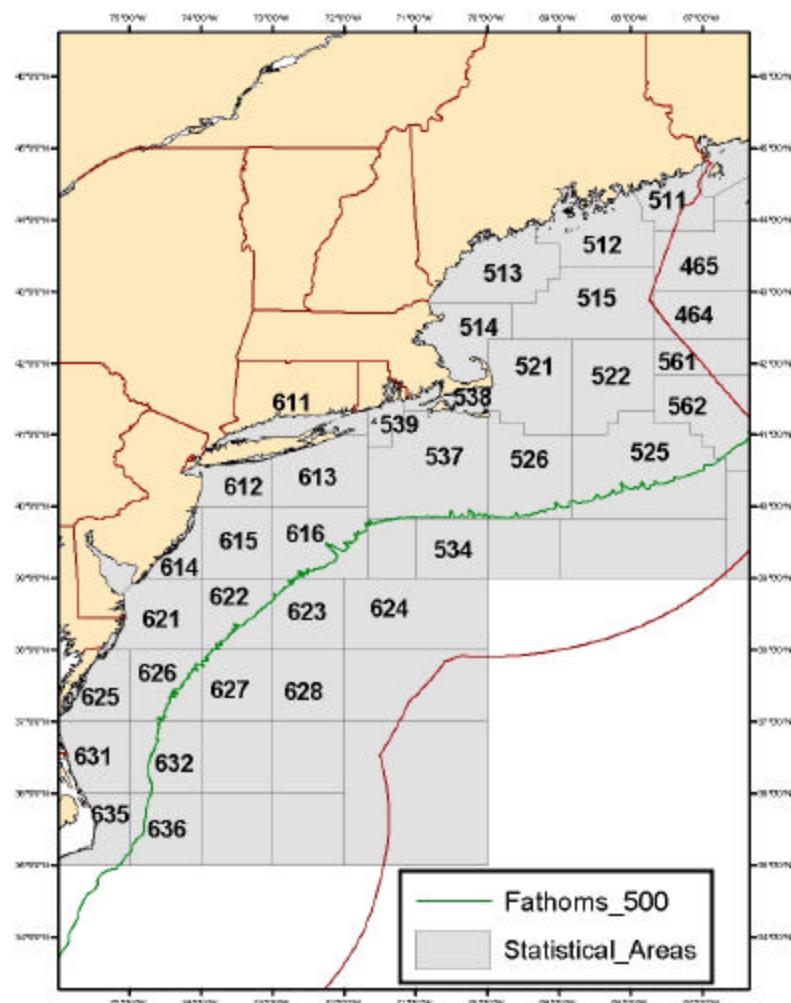
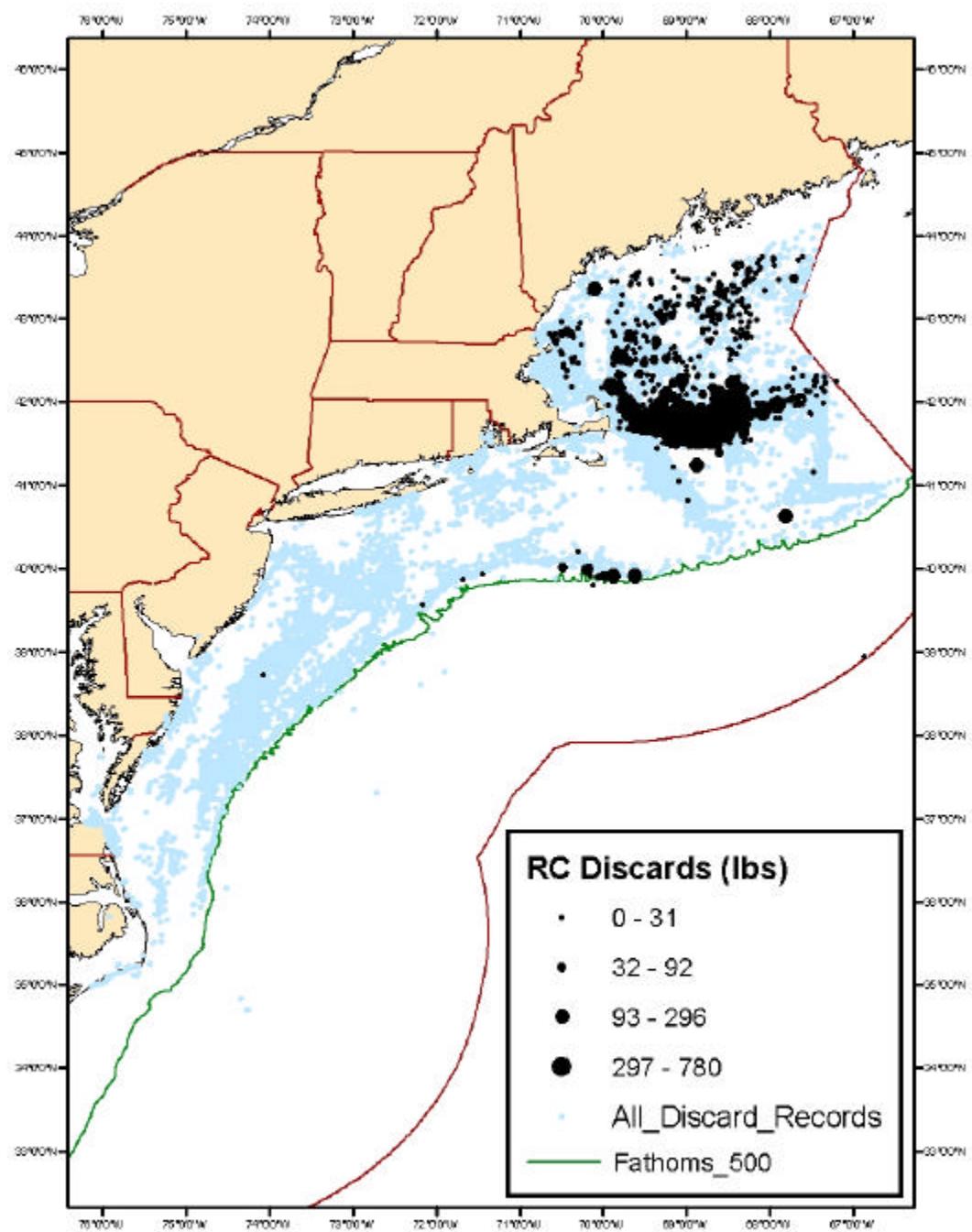


Figure 1 – Statistical areas where discards were reported to the NMFS Observer Database from 2001 through July 2004



**Figure 2 – Location of observed tows with red crab bycatch, as compared to the location of all observed tows with reported bycatch in the NMFS Observer Database from 2001 through July 2004.**

When interpreting these bycatch results it is very important to keep in mind that some areas, fisheries and gear types are observed more than others. Therefore, it would require more investigation before a region-wide bycatch estimate could be made. In the meantime, the following tables and figures are intended to describe the spatial distribution of red crab bycatch from the data available. Table 5 is a summary of all the reported discards in the observer database from 2001 through July 2004 by gear type, as compared to the total red crab discards. Almost all of the red crab discards reported to the observer database were from bottom otter trawl gear. Only a few tows with sink gillnet gear reported red crab discards. The majority of red crab discards were reported in statistical areas 521 and 522 (Table 6). However, in terms of catch per tow reported with red crab bycatch, statistical areas 525 and 526 had more red crab discards per record reported for those areas. The majority of the statistical areas with reported discards in the observer database did *not* have red crab discards, according to the tows that were observed during this time period.

Gear Types	Total # of Records	Pounds of Total Discards	# of Records with RC discards	Pounds of Red Crab Discards
Bottom Longline	447	40,048		
Hand Line, Other	1	15		
Bottom Otter Trawl (fish)	131,804	10,298,099	1,512	48,716
Bottom Otter Trawl (scallop)	75	2,688		
Bottom Otter Trawl (shrimp)	953	5,987		
Sink Gillnet	18,156	757,787	4	18
Anchored-Floating Gillnet	10	2,099		
Drift-Floating Gillnet	34	587		
Drift-Sink Gillnet	1,092	56,126		
Scallop Dredge	63,266	2,823,292	1	1
Paired Midwater Otter Trawl	2	3,100		
Scottish Seine	519	22,717		
Midwater Otter Trawl	184	41,126		
<b>TOTAL</b>	<b>216,543</b>	<b>14,053,671</b>	<b>1,517</b>	<b>48,735</b>

Table 5 - Comparison of discard records by gear type for the entire NMFS Observer Database versus records of red crab discards only.

<b>Stat. Area</b>	Total # of Records	Pounds of Total Discards	# of Records with RC discards	Pounds of Red Crab Discards	<b>Stat. Area</b>	Total # of Records	Pounds of Total Discards	# of Records with RC discards	Pounds of Red Crab Discards
<b>464</b>	103	10,181	2	3	<b>614</b>	315	13,112		
<b>465</b>	546	15,769			<b>615</b>	12,322	509,540		
<b>511</b>	77	3,631			<b>616</b>	9,638	628,423	2	8
<b>512</b>	2,437	78,967	61	225	<b>621</b>	15,560	873,335	1	1
<b>513</b>	5,706	196,746	72	612	<b>622</b>	6,448	463,046		
<b>514</b>	25,411	1,023,083	55	792	<b>623</b>	169	32,409		
<b>515</b>	7,110	269,312	154	903	<b>624</b>	7	1,199		
<b>521</b>	39,844	2,328,788	442	20,410	<b>625</b>	1,574	77,376		
<b>522</b>	27,006	1,931,371	669	24,513	<b>626</b>	12,101	501,323		
<b>525</b>	7,454	1,414,968	2	260	<b>627</b>	32	6,355		
<b>526</b>	9,657	491,354	6	425	<b>628</b>	7	136		
<b>534</b>	10	130	1	25	<b>631</b>	1,306	82,877		
<b>537</b>	4,702	512,529	11	237	<b>632</b>	431	39,473		
<b>538</b>	1,306	57237			<b>635</b>	335	10,120		
<b>539</b>	2,810	183,106			<b>636</b>	25	967		
<b>561</b>	9,289	655,215	38	311	<b>640</b>	12	193	1	5
<b>562</b>	7,102	1,216,091			<b>700</b>	42	333		
<b>611</b>	434	30,809			<b>701</b>	37	177		
<b>612</b>	2,150	167,852			<b>703</b>	37	1,758		
<b>613</b>	3,981	227,038			<b>707</b>	10	345		

Table 6 – Comparison of discard records by statistical area for the entire NMFS Observer Database versus records of red crab discards only.

The observer database was queried further to determine if particular fisheries have higher red crab discard rates. Every tow in the observer database has a field that identifies the primary targeted species of that tow. Since the observer database does not sample all fisheries equally, it would take more time and data to determine the expected discard rates from each fishery. In the meantime, Table 7 summarizes the red crab discards by the species identified as the primary target species from observed tows. The majority of red crab discards reported to the observer database are from tows that were primarily targeting groundfish. Keep in mind that fisheries are not sampled equally in the observer database, and groundfish trips are generally observed more often than other fisheries. According to this dataset, directed monkfish tows have the second highest total of red crab discards.

Primary Target Species per Tow	# of Records with RC discards	Pounds of Red Crab Bycatch	Percent of total red crab discards for each directed species	RC Catch per tow for each targeted species
Cod	102	1,378	2.8%	13.5
Winter Flounder	31	354	0.7%	11.4
Summer Flounder	1	0.1	0.0%	0.1
Witch Flounder	67	1,471	3.0%	22.0
Yellowtail Flounder	4	16	0.0%	4.0
American Plaice	82	1,131	2.3%	13.8
Flounders (NK)	214	4,971	10.2%	23.2
Haddock	45	635	1.3%	14.1
White Hake	15	113	0.2%	7.5
Pollock	5	118	0.2%	23.6
Weakfish	1	60	0.1%	60.0
Skates	4	18	0.0%	4.5
Winter Skate	1	5	0.0%	5.0
Whiting	1	2	0.0%	2.0
Groundfish (unclassified)	534	27,591	56.6%	51.7
Other Fish	1	10	0.0%	10.0
Lobster	7	118	0.2%	16.9
Scallop	1	1	0.0%	1.0
Squid	2	2	0.0%	1.0
Monkfish	400	10,738	22.0%	26.8
<b>Total</b>	<b>1,517</b>	<b>48,735</b>		<b>32.1</b>

Table 7 – Summary of red crab discards by targeted species per tow from the NMFS Observer Database from 2001 through July 2004.

In addition to the red crab bycatch information from the observer database and the monkfish industry-based surveys, some anecdotal reports suggest that there may be a considerable level of red crab bycatch in the offshore monkfish fishery. The mortality of red crab bycatch may be high as well, due to the fact that red crabs are “bleeders”, meaning once they are injured, they bleed to death. Preliminary results suggest that observed directed monkfish tows did have higher red crab discard rates than tows that did not direct on monkfish in 2003 and 2004 (Figure 3). These two years are the only years with a considerable number of observed directed monkfish

tows in the observer database. Figure 4 spatially compares the directed monkfish tows with red crab discards from tows that did not target monkfish. There are directed monkfish tows offshore as well as within the Gulf of Maine that caught red crab as bycatch. One tow in particular in the Gulf of Maine caught almost 800 pounds of red crab discards. The level of observer coverage on tows that directed on monkfish has changed over time. Figure 5 displays the directed monkfish observed tows with reported red crab discards, by year. Tows offshore were not observed until 2004, and the level of observer coverage increased in 2003 and 2004.

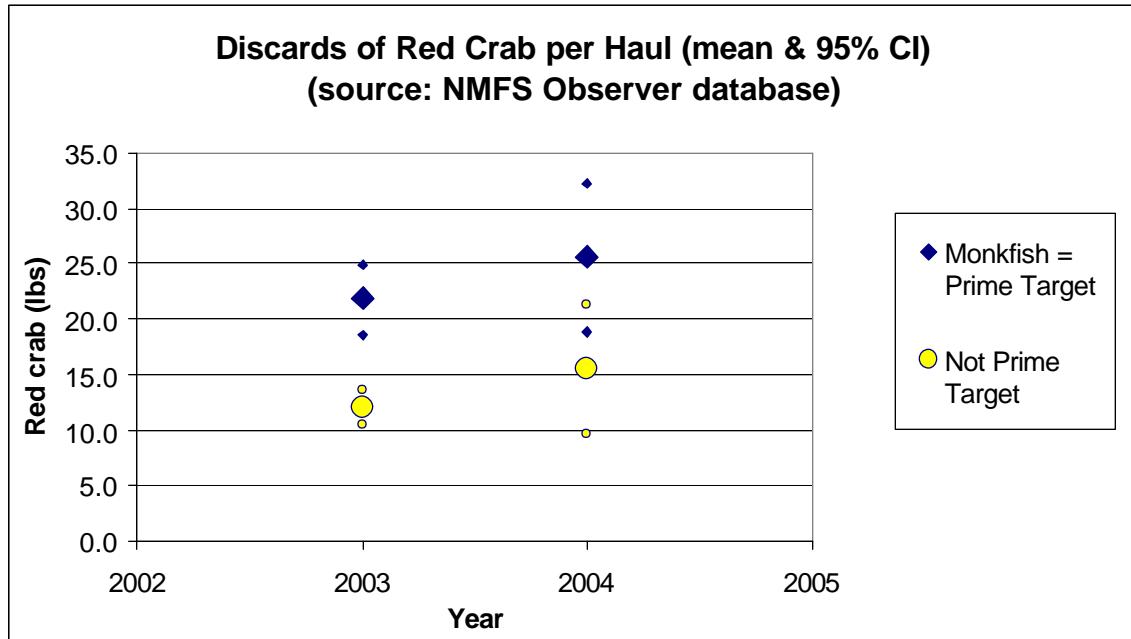


Figure 3 – Discards of red crab per haul on directed monkfish tows versus tows that did not direct on monkfish from the NMFS Observer Database.

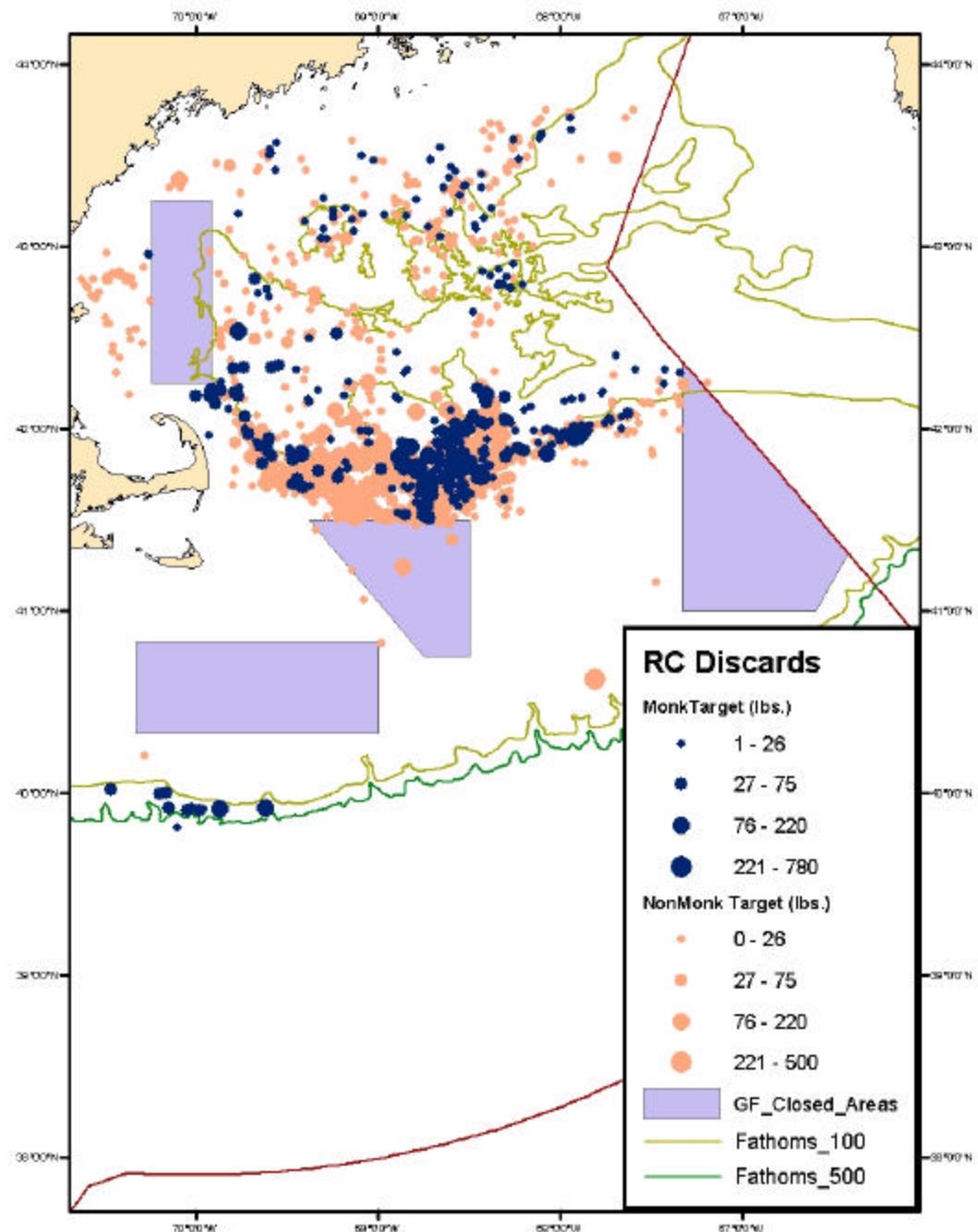
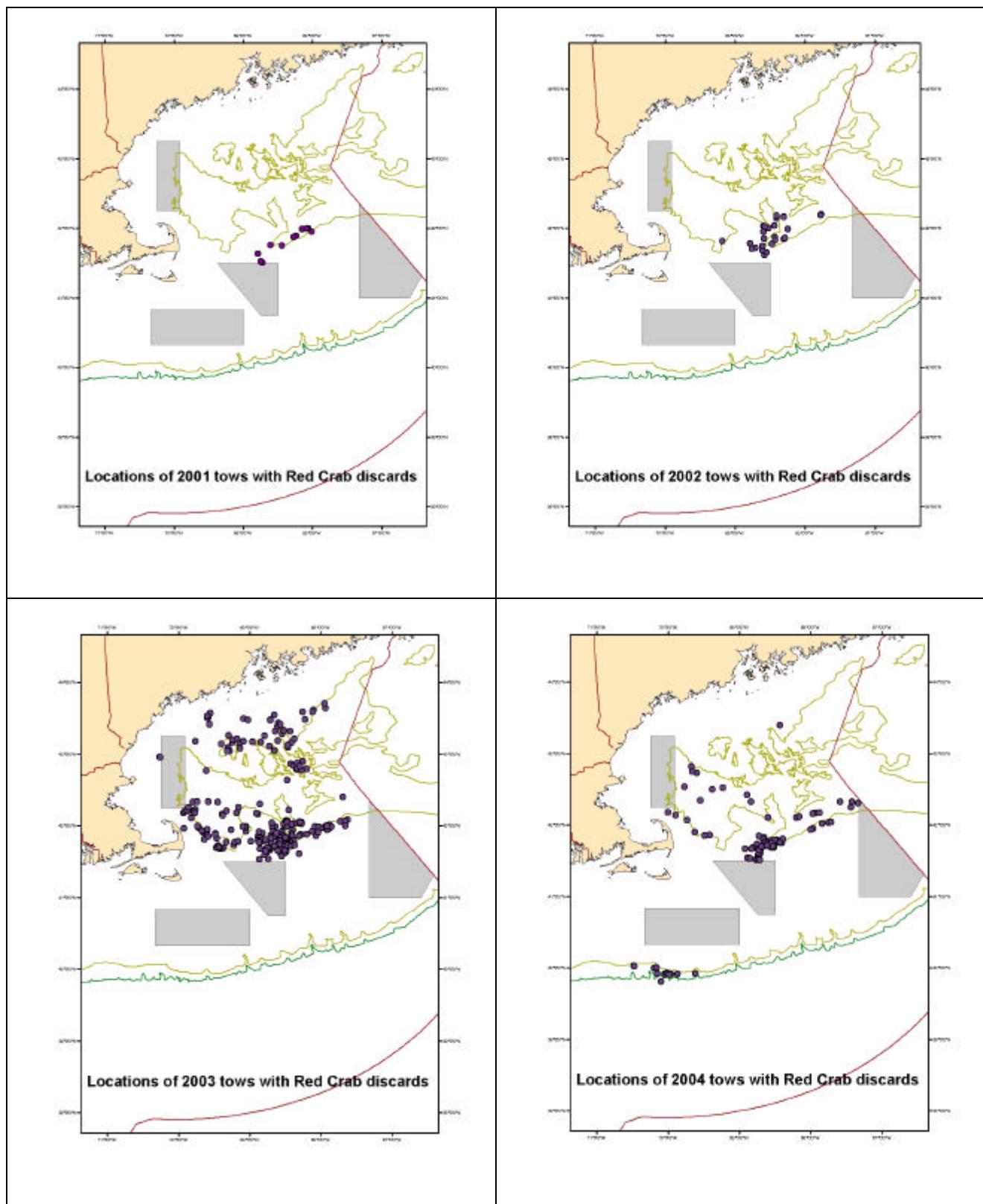


Figure 4 – Red crab discards on tows that targeted monkfish, as compared to all other tows that reported red crab discards in the NMFS Observer Database (2001-July 2004)



**Figure 5 – Observed tows targeting monkfish from the NMFS Observer Database (2001-July 2004) that reported red crab discards**

As shown in Figure 5, the number of observed monkfish tows has increased in recent years. The total pounds of red crab discards from observed monkfish tows was about 5,725 in 2003; however, the catch per observed tow is lower in 2003 and 2004 than in 2002 (Table 8). In 2002 only 27 directed monkfish tows with red crab discards were observed, but a substantial amount of red crab discards were observed on those tows. Red crab discards do seem to vary by area. The number of directed monkfish observed tows with red crab discards was highest in statistical area 522. However, the statistical areas with the highest red crab discards per tow were 526 and 514 (Table 9).

	# of Directed MF tows with RC discards	Pounds of Red Crab Discards	RC Catch per tow
2001	12	243	20.25
2002	27	2,208	81.78
2003	261	5,725	21.93
2004	100	2,562	25.62
<b>TOTAL</b>	<b>400</b>	<b>10,738</b>	<b>26.85</b>

Table 8 – Red crab discards on monkfish directed tows by year from the NMFS observer database.

Statistical Area	# of Directed MF tows with RC discards	Pounds of Red Crab Discards	RC Catch per tow by area
512	14	39	2.79
513	20	89	4.45
514	4	230	57.50
515	39	283	7.26
521	77	2,326	30.21
522	223	6,956	31.19
526	5	425	85.00
534	1	25	25.00
537	9	235	26.11
561	8	130	16.25
<b>TOTAL</b>	<b>400</b>	<b>10,738</b>	<b>26.85</b>

Table 9 - Red crab discards on monkfish directed tows by area from the NMFS observer database

As compared to other crab species in the observer database, red crab discards are higher than most crab species, except for Jonah and rock crab (Table 10). However, the average catch per tow of red crab discards was higher than both Jonah and rock crab discards per tow.

Species of Crab	# of Records	Lbs. of Crab Reported as Discards	Catch per tow
Jonah Crab	8,506	241,272	28.4
Rock Crab	5,537	78,457	14.2
Unknown Crab	1,902	82,830	43.5
Red Crab	1,518	48,728	32.1
Horseshoe Crab	1,045	40,157	38.4
Spider Crab	925	16,316	17.6
Queen Snow Crab	153	720	4.7
Blue Crab	84	195	2.3
Green Crab	66	1,193	18.1
Cancer Crab	9	144	16.0

Table 10 – Discards of all crab species reported to the NMFS Observer Database

#### **4.1.2.2 Bycatch of other species in the red crab fishery**

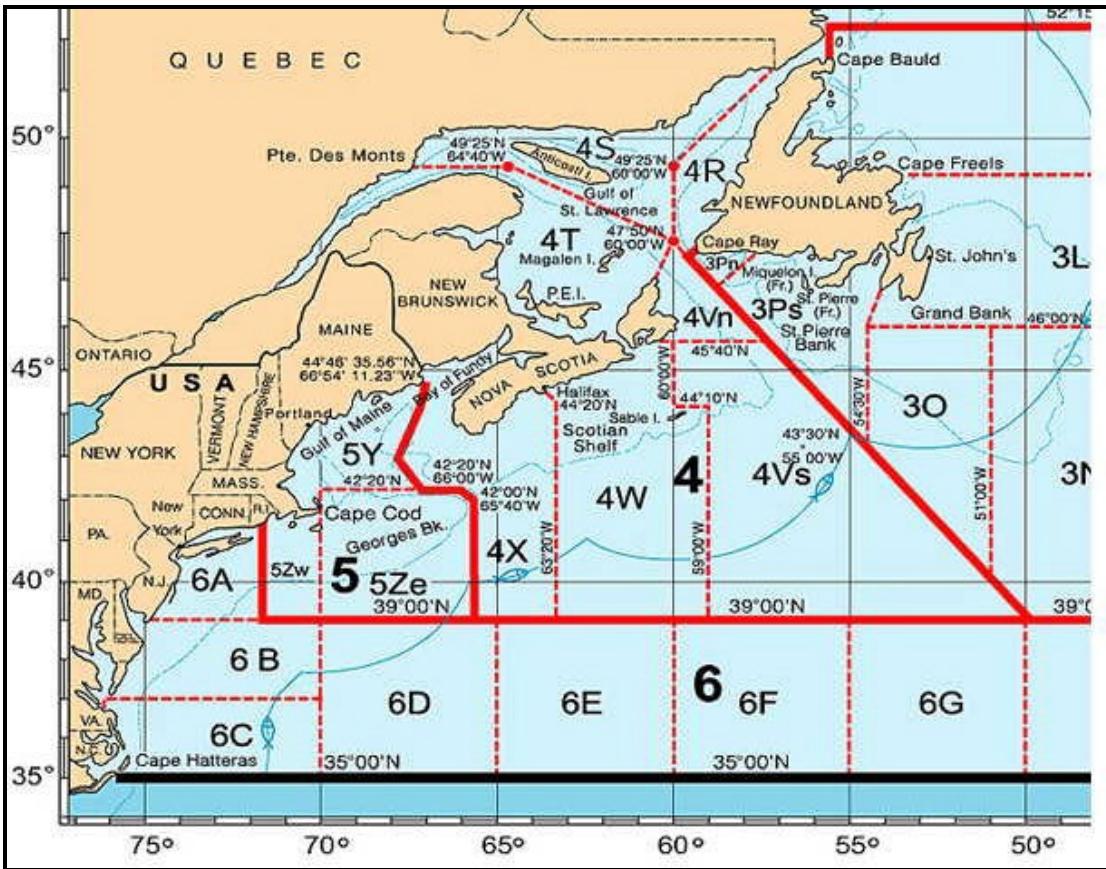
There is very little bycatch of other species in the red crab fishery. Unfortunately, there is no bycatch information available in the NMFS observer database for the red crab fishery, because no red crab trips have been observed since 2001. However, one industry member reported that very few species are caught as bycatch in the red crab fishery. Another industry member explained that red crab trips can be quite boring for the crew in terms of catch, because all that ever comes up in the traps is red crab! He further explained the fishery as very clean. Each vessel is required to fill in estimated discards per trip to the vessel trip report (VTR) database. All red crab trips reported to the VTR database for FY2003 and part of FY2004 (as of August 19, 2004) were queried to determine the level of reported bycatch in the red crab fishery. To date, the only species reported as bycatch by the limited access red crab fleet are red crab, lobster and blue crab. The vast majority of reported discards from this time period were red crab.

#### **4.1.3 Canadian Red Crab Fishery**

Since the northern edge of red crab distribution is in deep waters off Nova Scotia, it is important to also monitor the Canadian red crab fishery and trends in stock status within Canadian waters. The fishery in Canada began in the late 1960s, but has been sporadic over the years. In 1998, there were five exploratory licenses for deep-sea red crab in Canada. The fishery is managed with size and effort controls with a TAC, and there is 100% dockside monitoring. The fishing grounds are considered fully exploited with evidence of stock depletion. According to the Canadian Department of Fisheries and Oceans (DFO), landings and effort (number of trips) have increased slightly in recent years (2001, 2002 and 2003), but the fishery is described as prone to short periods of abundance followed by periods of low abundance. Table 11 describes the landings of red crab by the limited number of license holders in Canada. Most of the recent effort is from NAFO areas 4X, 5ze and 4W (Figure 6).

Year	Landings in metric tons ( <i>in pounds</i> )
1996	683.2 (1,506,198 lb.)
1997	343.7 (757,729 lb.)
1998	25.7 (56,659 lb.)
1999	32.0 (70,548 lb.)
2000	54.6 (120,372 lb.)
2001	123.5 (272,271 lb.)
2002	66.5 (146,607 lb.)
2003 (PRELIMINARY DATA)	74.9 (165,126 lb.)

Table 11 – Annual Landings in the Canadian Red Crab Fishery (*Source: DFO*)



**Figure 6 – NAFO fishing areas. Limited red crab fishing occurs in parts of Zone 4 and Zone 5.**

Source: NAFO website <http://www.nafo.ca/About/FRAMES/AbFrMand.html>

#### 4.2 Economic and Social Factors

Red crabs have not been a commercially exploited species for very long in the Northeast. During the 1960s and 1970s the resource was considered an underutilized species, and several US vessels began experimenting in the early 1970s to develop a deep-sea red crab fishery in this region. The directed red crab fishery is entirely a trap fishery. The primary fishing zone for red crab, as reported by the fishing industry, is in a depth of 400-800 meters along the continental shelf in the Northeast region, and is limited to waters north of 35° 15.3N (Cape Hatteras, NC) and south of the Hague Line. The fishery has fluctuated over the years in terms of the number of vessels pursuing red crab and the annual landings. On March 1, 2000 a control date was established. The FMP was later implemented on October 21, 2002, which limited the number of vessels that could harvest red crab in a directed fishery. Under the FMP, five vessels were granted limited access red crab permits, and only four of those vessels have reported landings since 2002.

For the current 2004 fishing year, five vessels were once again granted directed red crab permits, and about 1,100 incidental red crab permits were issued. One of the five limited access vessels has opted out of the fishery for the 2004-fishing year; therefore, the remaining four vessels equally divide the DAS from the fifth vessel.

#### **4.2.1 Update of Commercial Landings and DAS Usage**

The 2004 Specifications document described the commercial landings and DAS usage for the directed red crab fleet since implementation of the FMP. This section will update those data with the complete landings and DAS usage information for the full 2003-fishing year (March 1, 2003 through February 29, 2004). Part of FY2004 has been included, but these preliminary data are not used in the assessment of specifications for FY2005.

In FY2004, the fleet was allocated 780 DAS. Since one vessel opted out of the fishery, the remaining four vessels received an equal portion of the total 780 fleet DAS allocated (195 DAS per vessel). Table 12 describes the DAS usage and total landings for the fleet for FY2003 and FY2004 to date. According to the DAS database, four of the five vessels that received a limited access permit used a total of 548 days for FY2003, instead of the full 780 that were awarded (70% of total days used). While this total DAS usage figure seems low for the entire fleet, it is important to keep in mind that a fifth vessel was awarded DAS and never fished in 2003. Therefore, the 156 DAS allocated to that vessel were not used. If those DAS were not included in the total (780 DAS – 156 DAS) then about 88% of the total DAS were used in FY2003 (548 out of 624 DAS). According to the weighout database, the DAS used in FY2003 resulted in 4,091,660 lbs. landed by the entire directed fleet (69% of the total TAC).

Fishing year 2004 began on March 1<sup>st</sup>, 2004 and to date (as of August 19, 2004), the four limited access vessels participating in the fishery have used 302 DAS and landed approximately 1,156,863 pounds of red crab. Since the fleet has only used 39% of the annual DAS allocated for FY2004 (302/780), it is likely that the fleet will fish more DAS in the remainder of the fishing year. There are also incidental catch red crab permits, which allow a vessel to land 500 lbs of whole red crab per trip. According to the VTR database, only 2 vessels with incidental red crab permits reported a very small amount of red crab landings.

<b>Fishing Year</b>	<b>Number of calendar days in fishing year</b>	<b>Number of DAS allocated</b>	<b>DAS usage from DAS database</b>	<b>Red Crab landings (lbs.) from weighout database</b>	<b>Total RC landings per used DAS for the entire fleet</b>
<b>2003 (03/01/03 – 02/29/04)</b>	365	780	548	4,091,660	7,467
<b>2004 (03/01/04 – Present)*</b>	172	780	302	1,156,863	3,831

**Table 12 – DAS usage and total landings for the red crab fleet for FY2003 and FY2004.**

\* Note that this fishing year is not complete yet, so values will likely increase (March 1, 2004- Present is as of August 19, 2004).

The total landings and DAS used by quarter for fishing year 2003 are described in Table 13 as well as Figure 7 and Figure 8. The average landings per DAS-used does seem to vary by quarter; but the FMP has not been implemented long enough to accurately evaluate seasonal trends at this time. The industry has reported that catch per unit of effort increases in the summer and fall, and that is also when average landings per DAS are highest according to these data. Average landings per DAS are 10,227 on trips in September through November, and drop to 4,697 on trips in December through February. However, more data are needed to evaluate the affects of seasonality on the CPUE of individual vessels in this fishery.

	<b>Number of Trips</b>	<b>DAS Used</b>	<b>Landings</b>	<b>Average Landings/DAS</b>
<b>Mar-May</b>	11	104	630,089	6,059
<b>Jun-Aug</b>	17	124	1,084,826	8,749
<b>Sep-Nov</b>	22	158	1,615,840	10,227
<b>Dec-Feb</b>	15	162	760,905	4,697
<b>TOTAL</b>	<b>65</b>	<b>548</b>	<b>4,091,660</b>	<b>7,467</b>

Table 13 – Total number of trips, DAS used, landings, and average landings per DAS used for the limited access Red crab fishery.

Source: NMFS Days-at-sea database and NMFS Dealer Weighout database

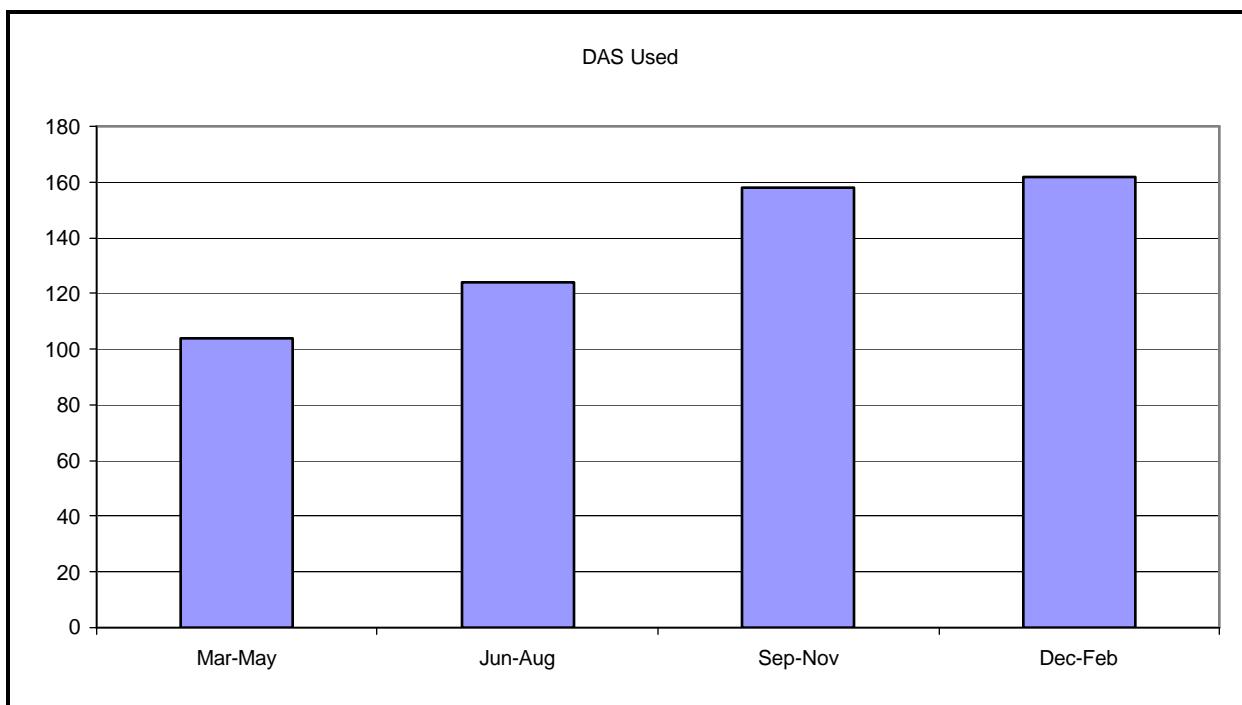
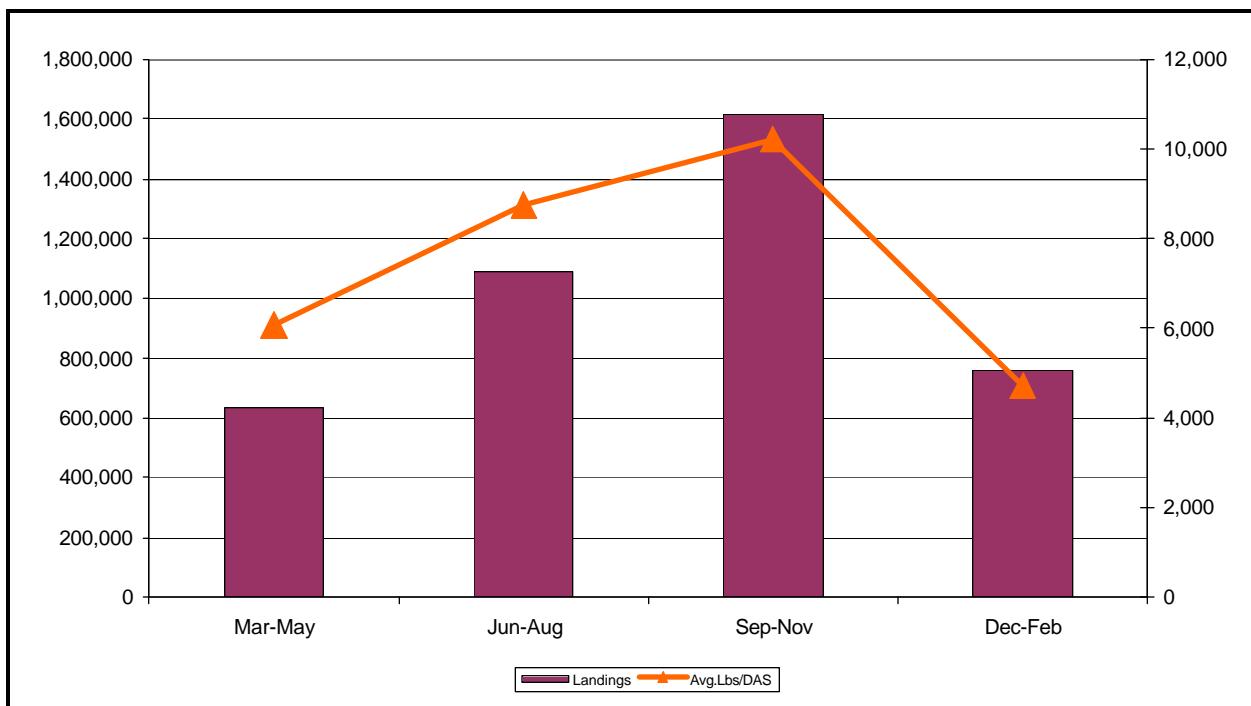


Figure 7 – Total DAS used each quarter in FY2003

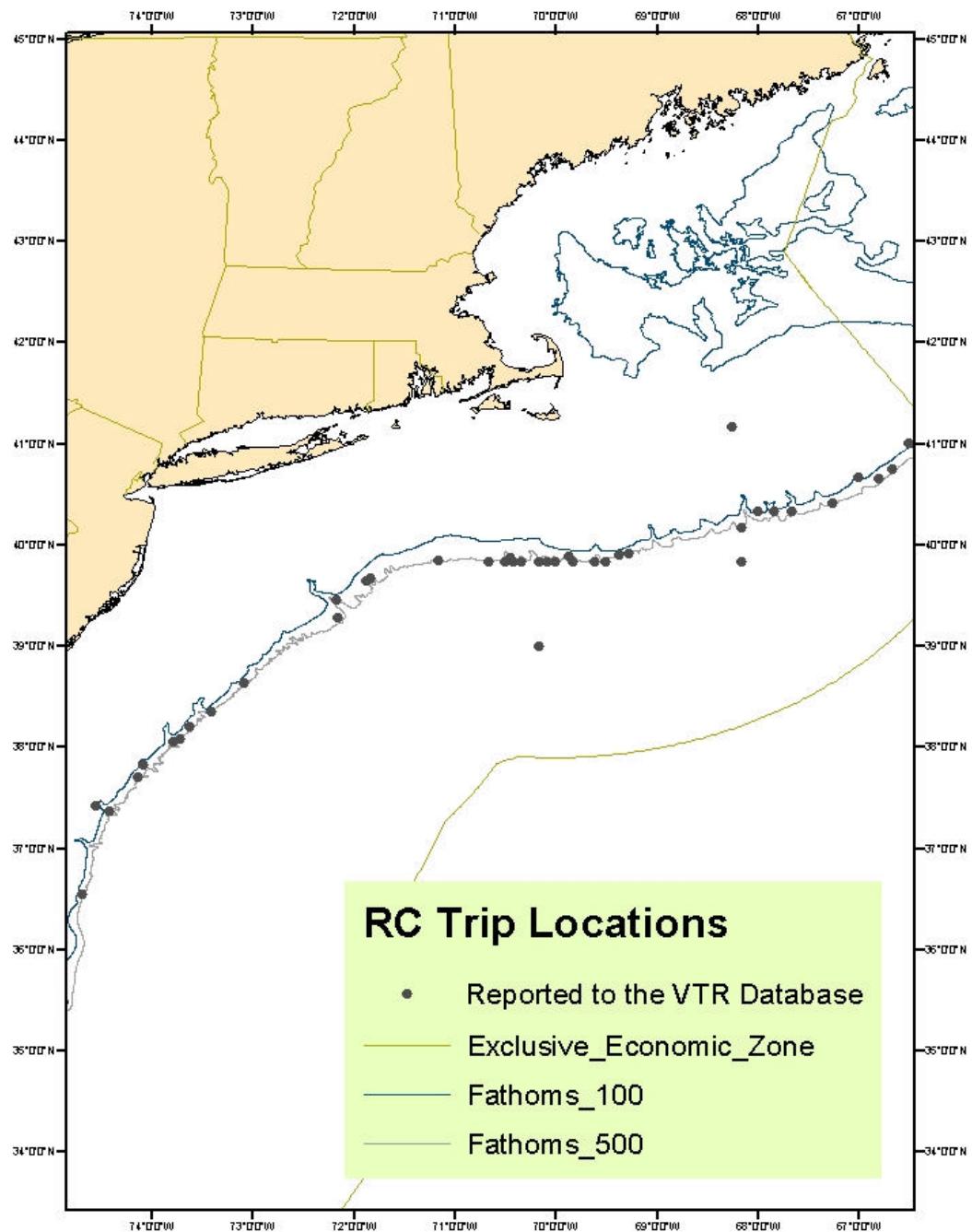
Source: NMFS Day-at-sea database



**Figure 8 – Total pounds landed each quarter in FY2003 (shown in bars), as well as the average pounds of red crab landed per DAS per quarter (shown in line).**

*Source: NMFS DAS database and Dealer Weighout database*

In addition to reporting to the IVR database, each vessel also submits a vessel trip report (VTR) to NMFS after each fishing trip. The VTR database is useful to help determine where vessels are generally fishing. Captains are required to fill in a location for each trip. Figure 9 displays the vessel locations for all red crab trips reported to the VTR database in FY2003 and part of FY2004 (as of August 19, 2004). According to these data, effort is primarily concentrated along the continental shelf between depths of 100 to 500 fathoms.



**Figure 9 – Location of red crab trips reported to the VTR database in FY2003 and part of FY2004 (as of August 19, 2004).**

*Note: some reported trip locations overlap*

#### **4.2.2 Description of the fishery since implementation of the FMP**

A report on the social and economic baseline information for the red crab fishery was completed in 2001 during the development of the Red Crab FMP (Appendix B within the FMP). A detailed survey was completed, and Red Crab Advisors supplied information such as demographics of the fleet, dependence on the fishery, community infrastructure, and crew information. The Red Crab PDT plans to wait several years to repeat this process in the next SAFE Report, and update the social and economic baseline description of the fishery since implementation of the FMP. In the meantime, this SAFE Report includes updated social and economic information from informal interviews with some Red Crab Advisors.

#### ***Harvesting Sector***

Since implementation of the FMP, four vessels have harvested the total red crab landings. Although this is a small fishery in terms of the number of vessels that participate, the individuals that are involved in this fishery have a very high dependence on the red crab resource. The handful of vessels that received limited access permits were surveyed during the development of the FMP, and the majority of harvesters reported that revenues from the red crab fishery make up the vast majority of their annual income. Since implementation of the FMP, vessel owners still report red crab as the primary fishery that supports their annual income. One of the vessels is involved in the offshore lobster fishery, but in general, this fleet directs exclusively on red crab. Overall, there have been some changes in terms of ownership and ports, but the vessels and primary participants involved in this fishery have not changed since implementation of the FMP.

Six ports were identified in the FMP as primary ports of vessel operations and mooring including: Fall River, Gloucester, and New Bedford, MA; Bristol, ME; and Portsmouth and Tiverton, RI. According to the industry, all limited access vessels now land exclusively in Fall River, MA. The average number of crew per vessel has not changed since implementation of the FMP, and some of the crew members are the same. One vessel reported that their crew turnover is very low. Most crew in this fleet are from New England, but there are some crew members from Mexico and Seattle, WA.

The average length of vessels prior to the FMP was 105 feet, ranging from 72 to 150 feet in length. Since implementation of the FMP none of the vessels have upgraded length, tonnage or horsepower. During the development of the FMP the fleet reported that on average vessels landed 63,000 pounds of red crab per trip and received an average of approximately \$42,000 per trip in gross revenue. The weight data for 2003 report that average pounds per trip ranged from about 43,000 to 77,000. Gross revenues per trip averaged between \$34,000 and \$71,000. The gear used by the limited access fleet has not changed since implementation of the FMP; one vessel uses a rectangular wooden trap, and the other three vessels use a conical trap. In general, the overall capacity of the individual vessels with limited access permits is the same as before the FMP was implemented. The major change in capacity since implementation of the FMP is that vessels that were not granted a limited access permit are no longer harvesting red crab in this region. The industry members still involved in the red crab fishery believe that this resource could not have withstood the level of effort working in this region prior to implementation of the FMP.

Industry reported that fishing costs have increased. Fuel and oil based products are more expensive, and insurance rates have increased by about 50% in the last year. These increases have been somewhat offset by an increase in price per pound paid for red crab. The average price per pound is about ten cents higher this fishing year than in 2003. Vessel owners reported that they are receiving about 94-cents per pound for red crab (whole and butchered product). The price is consistent throughout the year.

### **Processing Sector**

The processing sector for red crabs was relatively small prior to the FMP, and now all crabs are processed at one facility in Nova Scotia, Canada. This processor then sells the entire red crab product to several large food chains. The crab is primarily sold as generic crabmeat, and cocktail claws. This processor is also involved in lobster, snow crab, and mussels, but red crab is a major component of overall operations. Red crab is the only species they process in the winter, and they have invested a lot in terms of their facility operations in order to process this species.

Since all vessels now land in Fall River, the processor reported that it is more convenient for them, but overall costs are probably the same. Generally, the processor sends one or two trucks to Fall River to pick up the red crab product after each trip. On average, they have about a 2% dead loss of the live crabs during the transport from Fall River to Nova Scotia. Once the crab is at the plant, about 100 individuals are employed to process the crab; 25-30 individuals kill and butcher the crab, and about 60 more cook and pack the crab. Since implementation of the FMP, the processor has worked with the industry and their clients to reduce costs. For example, they have developed a creative way to change the packing of red crab, which has reduced costs and enabled the processor to pay the vessels approximately ten cents more a pound.

## **4.3 Ecological Factors**

### **4.3.1 Essential Fish Habitat (EFH)**

#### **4.3.1.1 Red Crab**

The EFH designation for red crab has not changed since implementation of the FMP. Section 3.7.4 of the FMP describes the EFH text and map definition for each life stage. EFH for red crab is based primarily on known depth affinities from Cape Hatteras to the Hague line. Figures 5 through 8 of the FMP, display where red crab EFH is spatially; but in general, EFH for red crab eggs is benthic habitats on the continental slope between 200-400 meters, larvae is from 200-1800 meters, juvenile EFH is from 700-1800 meters, and adult EFH is defined as 200-1300 meters. Additional information about red crab EFH can be found in Appendix A of the FMP, which is the EFH source document prepared for red crab. Table 1 in that document summarizes the life history and habitat characteristics of red crab for each life stage. Characteristics such as growth, substrate, temperature, salinity, prey and predator species are provided, but some information is unknown about this species. The designations for red crab EFH are being re-evaluated as part of the next Omnibus Habitat Amendment, a multi-year process to review and update all EFH designations, as well as other requirements related to essential fish habitat regulations. This Amendment is not expected to be implemented before 2007.

The camera sled that Wahle and others have developed has documented some new information about red crab habitat. Although the results are preliminary, the video documents red crabs

scurrying out of burrow-like structures on the ocean floor. The researchers have also documented that more juvenile crabs live in deeper waters than larger crabs, confirming previous observations that red crab sizes are segregated by depth (Wigley et al. 1974). In a comparison of surveys conducted in July and again in August 2003 at the same sites, Wahle and coworkers observed a significant upslope movement of small crabs.

#### **4.3.1.2 Other Northeast Region Species**

The area where the Red Crab fishery takes place is primarily between 400 and 800 meters along the continental shelf from Maine to North Carolina. There are a handful of species in this region that overlap with this fishery, but not many. Table 1 in Appendix 1 summarizes the EFH text descriptions for all benthic (demersal) life stages for federally-managed species in the Northeast region. The species with EFH that potentially overlap with the red crab fishery (based on depth) are in bold face. The only species that have benthic EFH defined in waters that potentially overlap with the primary red crab fishing zone (400-800 meters) are halibut, redfish, witch flounder, spiny dogfish, golden crab, and most skate species.

#### **4.3.2 Protected Species and Marine Mammals**

The protected species and marine mammals that may be found in the environment utilized by the deep-sea red crab fishery are described in Section 8.7.1 of the Red Crab FMP/EIS. The list of species protected by either the Endangered Species Act or the Marine Mammal Protection Act that may be found in the environment utilized by the deep-sea red crab fishery are cetaceans (14 different species), sea turtles (5 different species), fish (2 species), and birds (2 species).

However, since the red crab fishery is limited to the narrow shelf edge of the continental shelf, the extent of interaction between the fishery and protected species is not expected to be significant, and the fishery is not expected to adversely affect these populations. Section 8.7.4.6 of the Red Crab FMP concludes that the Red Crab FMP will affect, but is not likely to jeopardize the continued existence of right whales, humpback whales, fin whales, blue whales, sei whales, sperm whales, or leatherback turtles. Furthermore, the Council has determined that the red crab fishery will not affect the endangered roseate tern, piping plover, loggerhead, ridley, and hawksbill sea turtles, shortnose sturgeon or Atlantic salmon.

In terms of the right whale, the Biological Opinion for the Red Crab FMP concluded that the FMP would maintain satisfactory control over any expanding effort that might occur in a fishery that is restricted by the distribution of the target species to the fringe of the right whale's range. NOAA Fisheries is currently considering regulations to implement a strategy to reduce mortalities to North Atlantic right whales. The red crab fleet is already in compliance with offshore management regulations, which require a weak link at the buoy that breaks away knotless at 3,780 lb (1,714.6 kg). Additionally, NOAA Fisheries is currently preparing an Environmental Impact Statement for the Atlantic Large Whale Take Reduction Plan (ALWTRP) to solicit comments on current management measures and provisions in the plan as well as additional modifications to reduce interactions of right, humpback, fin and minke whales with commercial fisheries. Participants in the red crab fishery are already part of the process, but if the strategy to reduce mortalities to North Atlantic right whales changes, then red crab regulations will have to be modified. The specifications for FY2005 are not expected to have adverse impacts on North Atlantic right whales, or any other protected species in the region.

The most recent change to the ALWTRP, which became effective on September 25, 2003, allows lobster trap and anchored gillnet gear in a dynamic area management (DAM) zone once a closure is triggered, but specifies additional gear modifications designed to reduce the risk of entanglements of Northern right whales. A DAM zone may be identified and a closure triggered within defined areas north of 40° N. latitude. The agency is also preparing to publish a proposed rule for a Bottlenose Dolphin Take Reduction Plan, an action that could affect the operations of the red crab fishery, particularly in waters south of Long Island.

## **5.0 PROPOSED 2005 SPECIFICATIONS AND ALTERNATIVES**

Since there is no new biological information to consider, the maximum sustainable yield (MSY) and optimum yield (OY) for FY2005 will remain the same as FY2004; thus, total allowable catch (TAC) will remain the same as well. The FMP defines target yield to equal OY, and OY equals 95% of MSY; therefore, MSY and OY will remain the same for FY2005. Maximum sustainable yield for FY2005 is still estimated to be 6.24 million pounds; therefore OY and TAC are still 5.928 million pounds. However, the days-at-sea allocations for each vessel in this fishery may need to be adjusted based on the updated analyses of the catch per unit effort, or average pounds landed per day for the fishery. A range of DAS alternatives were compared, and after completion of the analyses, the Council has determined that 780 fleet DAS is the appropriate level of effort for FY2005. **Therefore, the proposed action for the 2005 fishing year specifications include a target TAC of 5.928 million pounds and a fleet DAS allocation of 780, the same specifications as FY2004 and FY2003.**

In addition to the No Action alternative (780 DAS), the Council considered an alternative method using bootstrap analyses, which identified four additional DAS options. The options under consideration ranged from 744 fleet DAS to 776 fleet DAS (Table 14). Table 15 summarizes the bootstrap analyses for each option under consideration. These options were selected to represent a reasonable range of possible fleet DAS allocations appropriate to attain the target TAC of 5,928,000 pounds, and to present these alternatives to the Council in such a way as to clearly identify the likely risk of exceeding the target TAC associated with each option. Increasing the number of DAS allocated to the fleet increases the probability that the fleet will successfully attain the target TAC, but it also increases the probability that the fleet will exceed the target TAC. The intent of the DAS program under Red Crab FMP was to provide the fleet with an adequate opportunity to harvest the target TAC without exceeding the TAC, so this alternative method compared the probabilities of exceeding the TAC associated with each option as an indicator of the level of risk the Council is willing to accept that the TAC would be exceeded.

### **5.1 No Action Alternative: Status quo DAS Allocation (780 fleet DAS) (Proposed Action)**

It is important to note that while this alternative is termed the “No Action” alternative, there really is no true “No Action” alternative, because the FMP requires the Council and NMFS to set annually the fleet DAS allocation for the coming year. Even though this alternative would maintain the same annual fleet DAS allocation that was allocated in FY2004, implementing it requires an affirmative action on the part of the Council and NMFS to determine what the 2005 DAS allocation should be, and NMFS must prepare a proposed and final rule to establish the

annual specifications for 2005. If this alternative were selected, the limited access fleet would be awarded 780 total DAS for FY2005. If all five limited access vessels participate in the fishery, each vessel would be awarded 156 DAS, and if only four vessels participate, then each vessel would receive 195 DAS. In terms of annual DAS allocation, the No Action and Status quo are the same for this action. It should be noted, that if specifications are not in place by the start of a fishing year, the FMP does permit fishing to continue under the specifications from the previous year. However, DAS used by a vessel on or after March 1 would be counted against any DAS allocation the vessel ultimately receives for that fishing year.

## **5.2 Alternative method using bootstrap analyses to identify and evaluate DAS options**

The Red Crab PDT devised a possible approach for developing and evaluating the alternatives to be identified. The previous method in the 2004 Specifications Document developed alternatives based on various measures of central tendency of CPUE to estimate DAS allocation, but the various alternatives could not be evaluated for the relative risk of exceeding the TAC. The new approach simulates the 2005 fishery for any given DAS allocation by bootstrapping daily CPUE observed in fishing year 2003. This analysis results in a frequency distribution and cumulative percent frequency of annual landings for a given DAS allocation in the 2005 fishery. The cumulative percent frequency of simulated annual landings can be used to define the probability of exceeding the TAC for a specific DAS allocation in FY2005 given the assumption that CPUE in 2005 will be similar to CPUE in 2003. Four DAS alternatives were developed based on various probabilities of exceeding the target TAC.

The PDT used FY2003 data in this analysis because it is the first complete fishing year since implementation of the FMP; FY2002 was only about four months long, and FY2004 is not complete yet. Two simulation approaches were applied: bootstrapping “within fleet” CPUE and bootstrapping “within vessel” CPUE. The within fleet simulation treated the fleet as homogeneous with respect to CPUE, and the simulation used a total annual fleet DAS allocation and bootstrapped all CPUE. The within vessel bootstrap treated the fleet’s CPUE as heterogeneous with respect to CPUE. The within vessel simulation used an individual vessel’s DAS allocation and bootstrapped each vessel’s actual 2003 CPUE history.

An ANOVA of 2003 CPUE found significant vessel effects, DAS charged effects, quarter effects, and vessel effect-DAS charged interactions. Vessels differ in number of trips, DAS charged, and seasonal distribution of effort. The PDT recommended initially using the within fleet simulation because this method could account for a shift in the seasonal usage of DAS by vessel. Because vessels did not use all of their allocated DAS in 2003, full usage of DAS allocation in 2005 would result in a different seasonal distribution of effort. Results for within fleet simulation is not sensitive to individual vessels changing seasonal fishing patterns, while the within vessel simulation is because each vessel’s CPUE is a function of its fishing power and seasonal usage of DAS. The PDT will reconsider using the within vessel approach in the future when more complete fishing years are available for analysis.

The simulations contain some important assumptions: vessels were assumed to fish their entire individual allocation, daily CPUE values per trip were assumed to be equal to the mean trip CPUE (because daily CPUE is unknown), and CPUE in FY2003 will be the same as in FY2005. Daily CPUE’s were assumed to be independent. The assumption that CPUE in 2005 will be

similar to CPUE in 2003 is the most tenuous assumption in this evaluation. CPUE could differ from 2003 as a result of changes in red crab abundance, spatial/ temporal distribution of red crab, or availability/ catchability. Technological improvements in the fisheries and changes in temporal-spatial distribution of effort could also influence CPUE. None of these potential effects are addressed in the fishery simulations.

When the Red Crab Committee and Advisory panel reviewed the alternative method of selecting DAS alternatives, prior to the final Council meeting in September 2004, several important issues were raised. Overall, the Committee determined that the bootstrap model was useful for comparing various DAS options, but they had concerns over the limitations of the model and some of the assumptions that were used. Furthermore, the Advisory Panel identified several reasons why the nature of the fishery was not captured in the model. Therefore, the Committee concluded that the model was not yet sufficiently robust to determine the appropriate DAS allocation for FY2005.

The Red Crab Oversight Committee identified several specific reasons why the options generated by the bootstrap method should not be used in place of the No Action alternative. First, the model assumes that all allocated DAS will be used, but that has not happened since the FMP has been in place, and the industry explained that at least one vessel is only fishing for red crab on a part-time basis. Second, the model assumes that fishing behavior in FY2003 will be reflective of fishing effort in FY2005, but there is credible evidence that fishing effort has changed from FY2003 to FY2004. Third, the model does not include carry-over DAS, but most, if not all of the vessels maintain a balance of carry-over DAS. Fourth, the model does not account for seasonal effects or variations between vessels. Preliminary data does suggest that there are strong seasonal and vessel effects in this fishery. Lastly, the model was based entirely on one fishing year (FY2003); and the advisors voiced that it is impossible to predict how the seasonal pattern in 2003, or any other year, will match the fishing patterns and CPUE in future fishing years. These are the primary issues raised by the Committee as justification for maintaining the No Action alternative in terms of fleet DAS for FY2005.

The Committee also noted that the target TAC has not been reached since implementation of the FMP, and recognized the strong commitment of the industry not to exceed the target TAC. The Committee voiced that after the scheduled stock assessment in 2006 and several more years of additional effort data, more information will be available and it may be justified to re-examine the use of a bootstrap method, which uses past fishing history (in the form of mean landings per DAS per vessel) to predict the probability that the fleet would exceed the target TAC given a specific DAS allocation. Furthermore, it is also possible that the target TAC will be adjusted after the scheduled 2006 stock assessment, based on new research and additional information about the status of the resource and fishery.

### **5.2.1 Option 1**

#### ***Fleet DAS allocation with approximately a 1% chance of exceeding the TAC***

Based on the within fleet bootstrap analysis of fishing year 2003, this option would allocate 744 fleet DAS, 36 less DAS than the No Action alternative. That level of effort would be expected to have a 1% probability of exceeding the target TAC of 5.928 million pounds. If all five limited

access vessels participate in the fishery, each vessel would be awarded 148 DAS, and if only four vessels participate, then each vessel would receive 186 DAS.

### 5.2.2 Option 2

#### *Fleet DAS allocation with approximately a 25% chance of exceeding the TAC*

Based on the within fleet bootstrap analysis of fishing year 2003, this option would allocate **761** fleet DAS, 19 less DAS than the No Action alternative. That level of effort would be expected to have a 25% probability of exceeding the target TAC of 5.928 million pounds. If all five limited access vessels participate in the fishery, each vessel would be awarded 152 DAS, and if only four vessels participate, then each vessel would receive 190 DAS.

### 5.2.3 Option 3

#### *Fleet DAS allocation with approximately a 50% chance of exceeding the TAC*

Based on the within fleet bootstrap analysis of fishing year 2003, this option would allocate **769** fleet DAS, 11 less DAS than the No Action alternative. That level of effort would be expected to have a 51% probability of exceeding the target TAC of 5.928 million pounds. If all five limited access vessels participate in the fishery, each vessel would be awarded 153 DAS, and if only four vessels participate, then each vessel would receive 192 DAS.

### 5.2.4 Option 4

#### *Fleet DAS allocation with about 75% chance of exceeding the TAC*

Based on the within fleet bootstrap analysis of fishing year 2003, this option would allocate **776** fleet DAS, 4 less DAS than the No Action alternative. That level of effort would be expected to have a 74% probability of exceeding the target TAC of 5.928 million pounds. If all five limited access vessels participate in the fishery, each vessel would be awarded 155 DAS, and if only four vessels participate, then each vessel would receive 194 DAS.

	Option 1	Option 2	Option 3	Option 4
Fleet DAS	744	761	769	776
Probability of exceeding TAC of 5.928 million pounds	1%	25%	51%	74%
Individual DAS (if 5 vessels participate)	148	152	153	155
Individual DAS (if 4 vessels participate)	186	190	192	194

Table 14 – Comparison of the four DAS options based on the bootstrap analysis method

	Option 1	Option 2	Option 3	Option 4
Fleet DAS	744	761	769	776
Mean annual landings	5,737,305	5,868,697	5,930,264	5,983,813
Standard Error	85,618.55	86,023.21	87,399.87	87,048.97
Landings 2.5 <sup>th</sup> percentile	5,573,593	5,703,845	5,761,737	5,815,601
Landings at 10 <sup>th</sup> percentile	5,625,921	5,757,934	5,819,082	5,871,418
Landings at 25 <sup>th</sup> percentile	5,679,100	5,808,601	5,870,864	5,924,461
Landings at 50 <sup>th</sup> percentile	5,736,541	5,866,362	5,929,281	5,983,720
Landings at 75 <sup>th</sup> percentile	5,794,353	5,928,287	5,988,371	6,042,466
Landings at 90 <sup>th</sup> percentile	5,848,210	5,980,659	6,043,838	6,097,641
Landings at 97.5 <sup>th</sup> percentile	5,904,099	6,038,846	6,101,909	6,154,183

Table 15 – Summary statistics for the four DAS options based on the bootstrap analysis method

## **6.0 ENVIRONMENTAL CONSEQUENCES AND ASSESSMENT OF IMPACTS**

The following section is based on and refers to information contained in the Red Crab FMP/EIS as well as Section 7.0 of this document, *Regulatory Impact Review and Initial Regulatory Flexibility Analysis*.

A range of DAS allocation alternatives have been analyzed. The range was identified based on various probabilities of exceeding the annual TAC using a bootstrap analysis. The bootstrap analysis used the mean CPUE per trip in FY2003 for the entire fleet combined in order to project the fishing effort necessary to harvest the TAC in FY2005.

### **6.1 Biological Impacts**

#### **6.1.1 Proposed Action**

The biological impacts on the red crab resource, non-target species, protected species and EFH are not expected to change as a result of this action, since the proposed action allocates the same DAS as under the FMP and in FY2004. The proposed MSY and OY will remain the same, 6.24 and 5.928 million pounds respectively. Table 12 describes the DAS usage and total landings for the fleet for FY2003 and FY2004 to date. In summary, the fleet has not landed the full TAC or used all allocated DAS since implementation of the FMP. The direct and indirect effects of the FMP were expected to protect the resource from overexploitation and maintain a sustainable fishery, and since this alternative proposes to maintain the status quo. The proposed alternative is expected to have the same affect.

#### **6.1.2 Other DAS options under consideration**

The range of DAS options in this specifications package are expected to have the same, if not less biological impacts as those assessed under the FMP, because all the options, except the No Action alternative, are less than the total fleet DAS allocated in FY2004. Furthermore, the fleet has not used the total DAS allocation since implementation of the FMP. Since this FMP is managed under a target TAC, rather than a hard TAC, there is no guarantee that the fishery will not exceed the quota; however, the DAS management program implemented under the FMP was designed to manage the red crab resource at a level that produces the maximum sustainable yield, while harvesting the target TAC. Therefore, if DAS are adjusted, the level of red crab harvest will adjust accordingly, assuming a constant harvest rate. For example, under Option 4, 776 DAS would be allocated compared to 744 under Option 1. If you assume a constant harvest rate, then Option 1 would result in an approximate 4.6% decrease in red crab landings, and Option 4 would result in an approximate 0.5% decrease in landings, relative to the No Action/Status Quo alternative of 780 fleet DAS. Using the same rationale, Option 2 would decrease landings by approximately 2.3% and Option 3 would decrease landings by approximately 1.3%, relative to the No Action/Status Quo alternative. Therefore, the difference between the alternatives in terms of biological impacts is very small, and in all cases will be lower than the level of effort allocated under the FMP as well as the 2004 specifications.

The only measure being evaluated in this action that may vary from the impacts already assessed in the FMP is DAS limits. The FMP describes that alone, DAS allocation is unlikely to have any direct effects on the red crab resource. However, since there are only a certain number of vessels that participate in the directed red crab fishery, the amount of red crab harvested is constrained.

Therefore, the DAS program is the principle fishing effort control mechanism by limiting the amount of time a red crab vessel may harvest red crab.

In terms of the biological impacts on other non-target species and the ecosystem, based on analysis in the FMP/EIS, it is not likely that any of the alternatives in this document will have an impact. There is very little known about the interactions of the deep-sea red crab with other species and their associated communities. The FMP explains that initial reports from industry members indicate that there is very little, if any, bycatch of other species in the directed red crab fishery. There are no records of observed red crab trips in the observer database, and the trips that are recorded in the VTR database have very little bycatch information. The FMP did identify that the bycatch of red crab in other fisheries may be a more significant issue. Section 4.1.2.1 describes the bycatch of red crab in other fisheries from the data available. There is some anecdotal information that there may be considerable bycatch of red crab in the offshore monkfish fishery, but there are not sufficient data to conclude that red crab bycatch is a significant concern for that fishery at this time. More research through observers is needed to determine the level of red crab bycatch in other fisheries, as well as the level of bycatch of other fisheries in the red crab fishery.

## **6.2 Economic and Social Impacts**

There are some economic and social impacts that apply to both the proposed action and the other options considered. These comments are made first, rather than repeating them several times, keeping the individual discussions for each of the options rather short. Some economic factors will not be affected by any of the alternatives considered in this action, thus will not be discussed for each. Employment is one issue that does not change based on which alternative is selected. It will not be affected by a minor change in the number of DAS that are allocated, since the existing crew would absorb any change in effort. Under a target TAC, there should be no substantial change in harvest product levels to cause changes in processing levels.

No changes are proposed for the incidental fleet and therefore, no effects on this fleet are expected. Incidental catch vessels in calendar year 2003 landed less than 250 pounds. This is a very small percentage of the TAC, and therefore more than accounted for by the setting of OY at 95% of MSY.

Given the small number of vessels participating in this fishery in the controlled access program, the analysis will concentrate on the calculation of fleet DAS, rather than individual DAS. The alternatives can all be viewed in relative terms, and since fleet DAS are divided up equally among vessels, no one vessel would be better off than another. Of course, the number of vessels that have valid permits would determine the individual allocation of DAS. The allocation of the fleet DAS among the number of vessels in the fishery is a simple calculation dividing the fleet DAS equally among those participating vessels that remain in the fishery. Each vessel that remains in the fleet would benefit if one or more vessels opted out of the fishery.

The long-term impact of each alternative is related to the number of vessels that enter the fishery, in each year. All vessels authorized to receive a controlled access red crab permit must, on an annual basis, declare if they are going to opt out of the directed fishery for the next fishing year at least six months prior to the start of the fishing year. This will allow the annual allocation of

DAS to be calculated based on the actual number of participants in the fishery. The small number of vessels in the fishery means that each vessel's participation has a large impact on the appropriate number of DAS that the fleet will utilize in catching the target TAC. The advance knowledge and planning for efficient harvest will have economic benefits from harvesting to processing to marketing.

One provision in the FMP that is important when considering economic impacts is the ability to carry over unused DAS to the next fishing year. Any DAS allocated to a vessel in one fishing year could be carried over to the next fishing year, up to a maximum of 10 DAS or 10 percent of the total allocated DAS, whichever would be less. Given the average length of red crab trips, this would amount to an additional trip for any vessel that had a balance of that magnitude. The partial end of the year DAS carryover ensures that at least some unused fishing effort is not wasted, while providing no incentive to hoard DAS. It also limits the potential annual fishing capacity to roughly 10% above the baseline.

The principle mechanism to control effort in the fishery is through the use of vessel DAS. The objective would be to allow the appropriate number of DAS to harvest, but not exceed, the target TAC. The effectiveness is not directly dependent on the number of vessels participating, but on the calculation of the total number of days that would allow for the target catch to be landed. Vessels are able to maximize their outputs from a given level of inputs, assuming the biomass increases over time. A high degree of flexibility is afforded to participants in the fishery concerning when and how long to fish. The continuous annual adjustment in target TAC enables the Council to respond to changes in stock condition without costly and time-consuming management process.

A decrease in effort always results in a short-term decrease in catch rate, but importantly, may lead to an increase in the long term. In standard yield-effort relationships, the short-term catch will always increase with increasing levels of effort. It is only over the long term, when excess fishing decreases fish stocks, yield will ultimately decline. The use of days-at-sea as a management option would allow more continuity of effort and supplies to the market, and avoids any response to short term fluctuations.

As expected, the highest number of fleet DAS (no action alternative at 780 DAS) would generate the highest level of landings and revenue in the short term. The level of landings and revenue is directly related to the allocated number of DAS. Option 1 (744 DAS) would generate the lowest level of landings and revenue in the short term.

It is not possible to quantify the net benefits of each of the options, but it is possible to determine the comparable net benefits of allocations. The most important question to evaluate the alternatives, becomes, what is the number of DAS that limited access vessels need in the red crab fishery, to be profitable? Public comments in the development of the FMP indicated that 5 vessels were in favor of the preferred alternative and felt that they would remain profitable at 183 DAS per vessel in the preferred alternative.

If this is still the case, and there are 4 vessels participating in the fishery, this would imply that as long as fleet DAS are greater than or equal to 732, these vessels would remain profitable. In this

case, all of the options would allow for profitable operations. Under these assumptions, if 5 vessels were to participate in the fishery, 915 fleet DAS would be necessary for all to remain profitable. None of the alternatives would meet this requirement. The number of vessels is obviously a key variable in determining how each vessel would fare.

### **6.2.1 Proposed Action**

Under the proposed action of 780 fleet DAS, the economic impacts are not expected to change from the FMP. However, if one vessel opts out of the fishery, as one did in FY2004, the four remaining vessels will receive more individual DAS for 2005 than assessed under the FMP, so the economic impacts of this action are expected to be positive for the individuals that remain in the fishery if they utilize the additional individual DAS awarded, as compared to the DAS allocated to each vessel under the FMP.

### **6.2.2 Other DAS options under consideration**

Based on the within fleet bootstrap analysis of fishing year 2003, this alternative method for identifying DAS allocations generated a range of DAS options from 744 fleet DAS to 774 fleet DAS. In summary, Option 1 would generate the lowest level of landings and revenue; this option would allocate 36 less fleet days than the No Action/Status Quo Alternative. Furthermore, Option 2 would allocate 19 less DAS, Option 3 would allocate 11 less DAS, and Option 4 would allocate 4 less DAS than the No Action/Status Quo Alternative.

#### **Option 1**

An allocation of 744 fleet DAS is expected to have a 1% probability of exceeding the target TAC of 5.928 million pounds, based on the bootstrap analyses. If all five limited access vessels participate in the fishery, each vessel would be awarded 148 DAS, and if only four vessels participate, then each vessel would receive 186 DAS.

This option would generate the lowest level of landings and revenue; given the assumption that increasing effort would bring in greater landings. This option would allocate 36 less fleet DAS than under the No Action alternative. If five vessels participate in FY2004, then each vessel will receive 7 less DAS than under the No Action, but if only four vessels participate, then each vessel will receive 9 less DAS than under the No Action alternative. However, they would actually receive 30 DAS more than the 156 they were each allocated in FY2003. Option 1 is the most risk-averse. No matter how many vessels participate, the difference between the most and least risk-averse position is barely one trip per year.

#### **Option 2**

Based on the within fleet bootstrap analysis of fishing year 2003, this option would allocate 761 fleet DAS. That level of effort is expected to have a 25% probability of exceeding the target TAC of 5.928 million pounds, based on the bootstrap analyses. If all five limited access vessels participate in the fishery, each vessel would be awarded 152 DAS, and if only four vessels participate, then each vessel would receive 190 DAS.

This option would allocate 19 less fleet DAS than under the No Action alternative. If five vessels participate in FY2004, then each vessel will receive about 4 less DAS than under the No Action, but if only four vessels participate, then each vessel will receive about 5 less DAS than

under the No Action alternative. This small number of days would not even constitute another trip for any of the vessels.

### **Option 3**

Based on the within fleet bootstrap analysis of fishing year 2003, this option would allocate **769** fleet DAS. That level of effort is expected to have a 51% probability of exceeding the target TAC of 5.928 million pounds, based on the bootstrap analyses. This would translate into 153 DAS per vessel if 5 vessels were fishing up to 192 DAS per vessel if only four vessels were fishing.

This option would allocate 11 less fleet DAS than under the No Action alternative. This is a minor amount of fleet DAS that would translate into only a couple of days extra for either 4 or 5 vessels.

### **Option 4**

Based on the within fleet bootstrap analysis of fishing year 2003, this option would allocate **776** fleet DAS. That level of effort is expected to have a 74% probability of exceeding the target TAC of 5.928 million pounds, based on the bootstrap analyses. If all five limited access vessels participate in the fishery, each vessel would be awarded 155 DAS, and if only four vessels participate, then each vessel would receive 194 DAS.

This option would allocate 4 less fleet DAS than under the No Action alternative. This is a minor amount of fleet DAS that would translate into the loss of a day or less for either 4 or 5 vessels.

## **6.3 Impacts on Essential Fish Habitat**

### **6.3.1 Proposed Action**

Pots are the gear type used in the red crab fishery, and this gear type has been determined to have minimal and less than temporary impacts on EFH. Please refer to the Red Crab FMP that includes the gear effects evaluation and adverse impacts determination. Since the proposed action would implement the same measures as under the FMP, and the impacts on EFH from the FMP were considered to be negligible, there are no impacts on EFH as a result of this action.

### **6.3.2 Other DAS options under consideration**

The Council has determined that the potentially adverse effects of fishing on EFH from this fishery have been minimized to the extent practicable. Because the other DAS options under consideration would use fewer DAS than the proposed action and impacts on EFH from the proposed action are considered to be negligible, these measures are not expected to have adverse impacts on EFH.

The only other fishery management action in this region under New England Council authority that may impact red crab EFH is Monkfish Amendment 2, and those impacts have been assessed in the Final Monkfish Amendment 2 EIS. The majority of the monkfish fishery does not overlap with Red Crab EFH, but this Amendment proposes to allow the offshore monkfish fishing fleet to expand with restrictions. It is uncertain where this fleet will expand, but even if it does

expand into areas that have been designated as red crab EFH, red crab EFH has not been identified as vulnerable to bottom tending gears. Therefore, the impacts of this potential monkfish effort would be minimal.

### **6.3.3 Essential Fish Habitat (EFH) Assessment**

The EFH Assessment is provided pursuant to 50 CFR 600.929 of the EFH Final Rule to initiate EFH consultation with the National Marine Fisheries Service. This section is completed after final measures are proposed.

#### ***Description of the proposed action:***

See Section 5.0 of this document for a description of the action proposed in this annual specifications package. The activity described by this proposed action, the annual specifications for the red crab fishery, occurs in a limited area and narrow depth range (400 to 800 meters) along the continental slope of the United States, from the southern flank of Georges Bank south to Cape Hatteras, North Carolina. The range of this activity occurs across designated EFH for eleven species managed by the New England, Mid-Atlantic, or the South Atlantic Fishery Management Councils. The list of species with EFH that potentially overlap with the primary red crab fishing zone are halibut, redfish, witch flounder, spiny dogfish, golden crab, and most skate species.

#### ***Analysis of the effects of the proposed action:***

This action proposes to continue the target TAC and DAS allocations implemented through the Red Crab FMP, as well as FY2004; all other measures under the FMP will remain in effect. The EFH Assessment in the Red Crab FMP/EIS determined that there are no adverse impacts to the EFH of any species in the region for the following reasons: 1) this fishery has a small number of limited access vessels (five or less), 2) the gear for the limited access fleet is restricted to pots (which do not have adverse impacts on EFH), and 3) the number of pots per vessel is limited. Since this action will not change the amount of overall fishing effort in the region, this action is not expected to cause additional adverse impacts on the EFH of any managed species relative to the baseline conditions presented in the Red Crab FMP/EIS.

#### ***Conclusions:***

Habitat impacts generated from these alternatives are minor and no more than temporary in nature. As such, the need to implement management measures to minimize the impacts of the Deep-sea red crab fishery on essential fish habitat does not exist and does not increase adverse effects on essential fish habitat beyond the baseline condition under the FMP. Therefore, only an abbreviated EFH consultation is required.

#### ***Proposed mitigation:***

None required.

### **6.4 Impacts on Protected Species**

#### **6.4.1 Proposed Action**

Impacts of this action on protected species are not expected to be different than those discussed in the FMP/EIS. Section 5.0 of the FMP/EIS should be referenced for an assessment of the

impacts of the proposed action on protected species, and Section 8.7.1 of the FMP/EIS describes all the marine mammals and other protected species that may be found in the management area of the red crab resource. Section 5.3.10.6 of the FMP/EIS, evaluates the impacts of DAS limits on protected species more specifically. The FMP assessed that the proposed TAC of 5.928 million pounds will cut landings back to 1999 levels (a 25% reduction from 2001), thus the existing entanglement threat to protected species would not likely increase. The Biological Assessment for the Red Crab FMP concluded that the FMP would affect, but is not likely to jeopardize the continued existence of protected and endangered species found in this region.

#### **6.4.2 Other DAS options under consideration**

The other DAS options under consideration are not expected to have impacts on protected species; they propose less DAS than the No Action alternative, thus are not likely to jeopardize the continued existence of protected and endangered species found in this region.

### **6.5 Cumulative Impacts**

#### **6.5.1 Introduction**

Cumulative effects result from the proposed action's incremental impacts when these impacts are added to the impacts of other past, present, and reasonable foreseeable future actions. These impacts can result from individually minor but collectively significant actions taking place over a period of time. The Red Crab FMP/EIS has already assessed the cumulative impacts of the management plan using the eight principles of cumulative effects analysis from the Council on Environmental Quality's (CEQ) 1997 handbook (See Section 12.10.7.2 of the FMP/EIS). Since the FMP was implemented several fishery actions have been implemented in this region, but none have cumulative impacts on this resource, because they do not overlap with the red crab fishery or affect individuals involved in this fishery. The cumulative impacts of this action are assessed using several valued ecological components (VEC's), which include the red crab resource and non-target species, non-fishing impacts, economic and social impacts, and EFH and protected resources. The cumulative impacts assessed in this section are constrained to the geographical and temporal range of the red crab fishery, specifically deep waters along the Northeast Atlantic continental shelf (400 to 800 meters) and for the next several years until the next SAFE Report and specification package is prepared.

#### **6.5.2 Past, Present and Reasonable Foreseeable Future Actions**

Since the FMP there has only been one specification package for FY2004, and that action allocated the same number of fleet DAS as the FMP. Therefore, there are no other actions in the past that need to be assessed from the perspective of the red crab management plan. The only present fishery action being proposed that may overlap with the red crab fishery is Monkfish Amendment 2. The Council is not aware of any non-fishery actions currently being proposed that could have cumulative impacts on the red crab resource or fishery.

In terms of future actions in the Red Crab FMP, the Council recently considered alternatives to modify the annual review and specification process in Framework 1. Framework 1 will not impact this action, because it will not be implemented until after these specifications are approved, but it will have limited impacts on the red crab fishery. Framework 1 is an administrative action that is not expected to have any cumulative impacts on the red crab

resource. The Council has initiated a five-year review of the EFH designations in this region. The updated EFH Omnibus Amendment may have indirect cumulative impacts on the red crab resource if red crab EFH designations change, the gear impact determination of red crab gear changes, or new information suggests that red crab EFH is more vulnerable to fishing impacts than previously thought. The only other future fishery related action that may have cumulative impacts on the red crab resource and fishery is a process that NOAA Fisheries recently initiated. NOAA Fisheries is considering modifying the measures that regulate fishing impacts on right whales. If gear modifications or area/time closures are proposed, this could potentially have cumulative impacts on the red crab resource and fishery. All cumulative impacts of that action will be assessed in that EIS, including the impacts on the red crab fishery and resource. Overall, the cumulative impacts assessed under the Red Crab FMP/EIS are summarized in the following paragraphs and the cumulative impacts of this action are not expected to be different since this action does not implement anything new as compared to the FMP.

### **6.5.3 Direct and Indirect Impacts on the red crab resource and non-target species**

The Red Crab FMP/EIS assessed all the principles identified by the CEQ guidance including the direct and indirect impacts on the natural and human environment, the cause and effect relationships of the measures being proposed, the synergistic interactions, the spatial and temporal boundaries of the action, and the capacity of the resource to accumulate additional effects. Below is a summary of the cumulative impacts assessment from the FMP/EIS (See Section 12.10.7 of the FMP/EIS for more details). The FMP determined that the long-term results of the FMP would have a positive effect on the red crab resource and ecosystem, its environment, and the directed red crab fishery because the FMP was implemented to prevent overfishing, prevent overcapitalization and stabilize the fishery, as well as prevent or minimize the likelihood of adverse impacts to the ecosystem associated with the red crab fishery. Likewise the direct and indirect effects of the FMP were expected to protect the resource from overexploitation and maintain a sustainable fishery. In addition to the direct and indirect effects, there are sometimes synergistic interactions with other species and management plans that have cumulative impacts, but the red crab fishery is a single-species fishery with very little interaction with other fisheries, thus the majority of the participants are only affected by the regulations in the Red Crab FMP. The spatial and temporal boundaries of the red crab fishery are within federal waters of the United States Exclusive Economic Zone, primarily in deep waters (400-800 meters) on the continental shelf. There is not sufficient research on the red crab resource, more specifically the capacity and resilience of the stock to fishing impacts, but researchers in the region believe that the stock is sensitive to overfishing, and its capacity to absorb cumulative effects may be lower than other species in the ecosystem. Therefore, the cumulative impacts of other fisheries and other sources of mortality need to be monitored closely.

There are other sources of mortality on red crab that should be kept in mind when evaluating this action. Bycatch of red crab in the red crab fishery as well as other fisheries may be an issue, and Section 4.1.2 of this document assesses the data available to describe the potential level of red crab bycatch. However, the mortality rate of red crabs released as bycatch in other fisheries, as well as the red crab fishery is unknown. The FMP describes red crabs as relatively fragile and describes them as “bleeders”, which means that if they get injured during handling and lose a limb, they bleed to death. Some of these issues are taken into account in the definition of OY

(95% of MSY), but it is important to keep these other sources of mortality in mind when managing this resource until more data is available to accurately assess the resource.

#### **6.5.4 Non-fishing impacts on red crab**

The Council is not aware of any non-fishery actions currently being proposed that could have cumulative impacts on the red crab resource or fishery. In Section 8.2.3 of the Red Crab FMP, the primary threats to the chemical, physical, and biological ecosystem of the red crab resource was described. In summary, there are several chemical threats identified to have detrimental impacts on offshore habitats including oil, heavy metals, pesticides, and suspended particles. Biological threats include invasion of nonindigenous species, increased levels of nutrients, and pathogens that could cause shell disease. Several physical threats identified in the FMP are sand and gravel mining, oil exploration, offshore discharging, and disposal of dredged materials. Despite all these threats to offshore habitats, red crab live very deep in the water column, so there are very few, if any, direct impacts to the red crab resource. The only non-fishing activities identified in the FMP as having potential significant concerns are offshore oil and mineral exploration, the installation of fiber optic and electrical cables, and contamination by toxic chemicals. At this time, there are no known proposals for any of these activities. On a case-by-case basis, one of these projects may not have a significant effect, but there may be cumulative effects to the red crab resource if multiple projects are approved.

#### **6.5.5 Social and economic impacts**

The cumulative social and economic impacts of this action are not expected to be different than those described in the FMP in conjunction with specifications set in 2004, since this action proposes to implement the same number of fleet DAS. If anything, the social and economic impacts will be positive, because there are only four vessels participating in the fishery in 2005, therefore each vessel will receive more DAS than they did under the FMP, about 34 additional DAS. In terms of present and future actions, the Council also recently approved Framework 1 to the Red Crab FMP, which proposes to implement the same DAS in FY2006 and FY2007, as this specifications package proposes. Therefore, the potential economic impacts based on the number of allocated DAS, will be the same for the next several years, the length of time this cumulative impacts assessment is limited to.

#### **6.5.6 EFH and protected species impacts**

Only a handful of fisheries occur in deep waters that potentially overlap with the red crab fishery, specifically tilefish, monkfish, and offshore lobster fisheries. All of these fisheries are under management plans that assess the impacts of that fishery on the red crab resource and EFH for red crab. Furthermore, only about half a dozen species have EFH defined in deep, benthic waters that potentially overlap with the red crab fishery, including halibut, redfish, witch flounder, spiny dogfish, golden crab, and several skate species. The Red Crab FMP is the primary past action that has had indirect impacts on EFH because the FMP described and identified EFH for red crab. One present action that may impact the red crab resource and EFH is Monkfish Amendment 2. This Amendment is proposing to restore offshore monkfish trawl effort in the Southern Management Area. Only a handful of vessels will qualify for this offshore fishery, but it is possible that effort in deeper waters may increase. Whether this effort will overlap with red crab EFH is uncertain. Amendment 2 is also proposing offshore closures in two submarine canyons to all vessels on a monkfish DAS to protect deep-water corals. Portions of

the closures overlap with red crab EFH; therefore, red crab EFH in these areas will directly benefit from monkfish fishing not being permitted in these areas. It is important to note that once these closures are implemented in the Monkfish FMP/EIS, it is possible that these areas will also be recommended as closures in the future for the Red Crab FMP as well, in order to maximize benefits to deep-water corals in the region, which could have cumulative impacts on the red crab fishery.

The red crab regulations implemented a limited access fishery, eliminating the threat of expanding effort in this fishery. As a result, the potential impacts on protected species from additional red crab effort was also reduced. This action does not propose to change the measures implemented under the FMP; therefore, there are no cumulative impacts of this action on protected species. When considering the impacts on protected species, it is important to keep in mind that this fishery is small (four active vessels) as compared to other fisheries in the region; furthermore, the fleet is limited by DAS controls (maximum of 780 for the entire fleet) as well as trap limits (maximum of 600 per vessel).

### **6.5.7 Summary**

There are no significant cumulative impacts of this fishery action on the red crab resource, non-target species, social/economic resources, EFH, or protected species from this fishery action that occurred in the past, present, or reasonable foreseeable future. Since the Red Crab FMP was implemented, any potential impacts on the red crab resource, non-target species, socio/economic resources, EFH and protected species are expected to decrease as a result of implementing a limited access directed fishery. The number of vessels that participate in this fishery is small, the amount of gear is limited, and the impacts on the ecosystem are not significant. Overall, this action is not considered a “significant regulatory action” since it impacts a small sector of the economy, with less than \$6.0 million revenues (See Section 7.0 *Regulatory Impact Review and Initial Regulatory Flexibility Analysis* for more details on the economic impacts of the proposed action).

### **6.6 Finding of No Significant Impacts (FONSI)**

Based on guidance in Section 6.01(b) of NOAA Administrative Order NAO 216-6, May 20, 1999, and the analysis of impacts and alternatives in this document and the Red Crab FMP/EIS, the proposed 2005 specifications that maintain the total DAS allocation under the FMP are not deemed to be significant. The proposed action, which does not increase the total DAS allocated to vessels, is a constraint on the amount of red crab that fishing vessels may harvest, thus this measure will not likely impact the target species, non-target species, or the ecosystem biota. These specifications would not impact physical structures or the habitat of any endangered species. They do not threaten or violate a Federal, State, or local law or requirements imposed for the protection of the environment. Based on public comments the Council received when considering the specifications, the action is also not deemed to be controversial.

NOAA Administrative Order 216-6 provides guidance for the determination of significance of the impacts resulting from the management measures contained in fishery management plans, their amendments, and framework adjustments. The nine criteria to be considered are addressed below:

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

The proposed action is not expected to jeopardize the sustainability of the target species affected by this action – red crab. The intent of the action is to continue measures necessary to manage the fishery at OY; therefore, the action would not jeopardize the sustainability of the target species. The impacts of the proposed action on the red crab resource are discussed in Section 6.1.1 of this document. In addition, the Red Crab FMP/EIS contains additional biological assessment information on days-at-sea limits (Section 5.3.8 of the FMP/EIS).

*2. Can the proposed action be reasonably 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 red crab fishery is a single species fishery that does not have significant bycatch levels of non-target species (Red Crab FMP/EIS). Since this action proposes to maintain the status quo in 2005, the expected impacts on non-target species have not changed.

*3. Can the proposed action be reasonably expected to allow substantial damage to the ocean and coastal habitats and/or EFH as defined under the Magnuson-Stevens Fishery Conservation and Management Act and identified in FMPs?*

Impacts of the specifications on ocean and coastal habitats and/or EFH were assessed in Section 5.0 of the Red Crab FMP/EIS, and apply to the proposed specifications for fishing year 2005. This action is not expected to allow substantial damage to the ocean and coastal habitats and/or EFH as defined under the Magnuson-Stevens Fishery Conservation and Management Act and identified in the FMP. In general, this fishery takes place in very deep waters of the continental shelf, which do not overlap with a significant number of EFH designations for the regions. Furthermore, pots are the only gear type utilized to harvest red crab by the limited access fleet, and this gear type does not have adverse impacts on EFH.

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

When developing management measures, the Council usually receives extensive comments from affected members of the public regarding the safety implications of measures under consideration. The proposed specifications are not expected to have substantial adverse impacts on public health or safety. The Council has received no comments suggesting that such impacts could be expected from maintaining the status quo through the 2005 fishing year.

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

Impacts of the red crab fishery on endangered and threatened species and marine mammals were assessed in Section 5.0 of the FMP/EIS for each management measure. Section 5.3.10.6 of the FMP/EIS explains that the DAS limits under the FMP will not likely increase the existing entanglement threat to endangered species, and the same applies for this action, which maintains the same DAS limits as the FMP. The activities to be conducted under the proposed action are

within the scope of the FMP and do not change the basis for the determinations made in previous consultations.

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

Cumulative effects related to the proposed action are discussed in Section 6.5 of this document. Because this action maintains the status quo for the red crab fishery through the 2005 fishing year, cumulative effects are not expected to be significant, and there is no change from the original analysis of cumulative impacts as assessed in the FMP.

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

The proposed action is not expected to have a substantial impact on biodiversity and ecosystem function within the affected area. There is insufficient information available on the ecosystem function of the red crab resource, and how it impacts other aspects of the environment. There is little indication that red crab constitutes a major prey item for any species in the region (Steimle et al., 2001). Red crabs are most likely opportunistic omnivores due to the limited availability of food at the water depths where red crabs live (Gray, 1969). The proposed action will likely continue to ensure biodiversity and ecosystem stability over the long-term.

*8. Are significant social or economic impacts interrelated with significant natural or physical environmental effects?*

A discussion of the impacts of the proposed action is presented in Section 6.0 and Section 7.0 of this document, as well as Section 5.0 of the Red Crab FMP/EIS. There are no significant social or economic impacts, nor are there any significant natural or physical environmental effects expected to result from the proposed action. The industry members present at the Red Crab Committee meeting when this document was reviewed did not indicate that any of the measures proposed in this document, or the FMP had negative economic or social impacts.

*9. To what degree are the effects on the quality of human environment expected to be highly controversial?*

The annual specifications presented in this document are not expected to be highly controversial. The Red Crab Advisory Panel, the Red Crab Oversight Committee, and the New England Council approved the No Action Alternative for this package unanimously. According to the Advisory Panel, all limited access permit holders support this action.

### **FONSI Statement**

In view of the analysis presented in this document, the EA/RIR/IRFA for the 2005 specifications, and in the EIS for the Red Crab Fishery Management Plan, the 2005 specifications will not have a significant effect on the human environment, with specific reference to the criteria contained in Section 6.02 of NOAA Administrative Order NAO 216-6, Environmental Review Procedures for Implementing the National Environmental Policy Act, May 20, 1999. The impacts and alternatives in this document were analyzed with regard to both context and intensity and are deemed not to be significant. Accordingly, the preparation of a Supplemental Environmental Impact Statement for the proposed action is not necessary.

## **7.0 REGULATORY IMPACT REVIEW AND INITIAL REGULATORY FLEXIBILITY ANALYSIS**

This red crab specifications package for the 2005 fishing year has been prepared primarily in response to the requirements of the Magnuson-Stevens Fishery Conservation and Management Act (MSA). This chapter addresses the components of the Regulatory Impact Review (RIR) and Initial Regulatory Flexibility Act Analysis (IRFAA).

### **7.1 Introduction**

An RIR is required by NMFS for all regulatory actions, which are part of the “public interest.” The Regional Fishery Management Council (in this case, the New England Council) prepares the RIR with assistance from NMFS when proposing a regulatory action. The RIR is a required component of the process of preparing and reviewing FMPs, amendments or annual specifications and provides a comprehensive review of the economic impacts associated with proposed regulatory actions. The RIR addresses many concerns posed by the regulatory philosophy and principles of Executive Order (E.O.) 12866. The RIR serves as the basis for assessing whether or not any proposed regulation is a “significant regulatory action” under criteria specified by E.O. 12866.

The RIR must provide the following information: (1) a comprehensive review of the level and incidence of economic impacts associated with a proposed regulatory action or actions; (2) a review of the problems and policy objectives prompting the regulatory proposals; and (3) an evaluation of the major alternatives which could be used to meet these objectives. In addition, an RIR must ensure that the regulatory agency systematically and comprehensively considers all available alternatives such that the public welfare can be enhanced in the most efficient and cost effective manner.

The RIR includes a description of each alternative, including the “no action” alternative, and an economic analysis of the expected effects of each selected alternative relative to the baseline.

Under the Regulatory Flexibility Act (RFA) of 1980 as amended by Public Law 104-121, new FMPs or amendments also require an assessment of whether or not proposed regulations will have a significant economic impact on a substantial number of small business entities. The primary purposes of the RFA are to relieve small businesses, small organizations, and small government agencies from burdensome regulations and recordkeeping requirements, to the extent possible.

The following section provides an assessment and discussion of the potential economic impacts, as required of an RIR and the RFA, of various proposed management and regulatory actions and alternatives.

### **7.2 Problems and Objectives**

The problems which should be resolved or addressed by the proposed management action are covered in Section 3.0. The Red Crab FMP/EIS requires that the Council and the Regional Administrator will review annually the best available data on the fishery to develop specifications.

### **7.3 Framework for Analysis**

This section provides an overview and description of the procedures used to assess the potential economic impacts of the options considered, as well as the No Action / Status quo alternative.

Under different circumstances and data availability, an analysis of economic impacts would be assessed in terms of changes in landings, prices, revenues, and net returns for each of the regulatory options and the status quo. Net returns would be estimated by deducting from the estimated ex-vessel revenues total operating costs, all fixed costs, and repair and maintenance costs. The impacts on landings, revenues, operating and total costs, and net returns would also be assessed. However, in the absence of projected landings for each of the alternatives, prices, economic impacts and net benefits could not be quantitatively assessed.

### **7.4 Description of the alternatives**

A detailed description of the alternatives considered in this document is presented in Section 4.0.

### **7.5 Data**

#### **Data Used for the Analysis**

This section describes the data sources available for management of the red crab fishery and the limitations for use in economic analyses. Although the analysis of the potential economic impacts was largely qualitative, it is still necessary to point out problems with the data.

Although not a big problem, red crab is sometimes caught on other directed fishing trips (lobster and hagfish, for example), and data necessary for adequately assessing the multi-species nature of the fishery were not available.

#### **Red Crab Data**

Several basic types of data were available: (1) data from the Interactive Voice Reporting (IVR); (2) data from the dealer weight-outs purchase reports; (3) data from the vessel logbooks (VTRs); (4) data from the NMFS observer program, (5) data from several NMFS port samples, (6) a voluntary survey from the Council's industry advisors which was conducted prior to the completion of the FMP, representing the majority of the current directed red crab fleet, and (7) an informal questioning and meeting with many of the industry advisors and participants in the fishery. The development of the Red Crab FMP/EIS was unique because many of the Red Crab Advisors are active members of the red crab industry, and their expertise continues to be an integral part of the development of the FMP. A report was issued summarizing the baseline and demographic information on the social and economic aspects of this fishery, and was included in the FMP/EIS, as Appendix B.

Data has been collected since the implementation of the FMP. This is due to the issuance of federal permits for all vessels, operators or dealers who catch, possess, and/or land red crab in the U.S. EEZ and the corresponding reporting requirements. Additionally, vessels are required to declare their intent prior to each fishing year so that the annual allocation of DAS can be adjusted based on the number of vessels that will actually participate in the fishery.

#### **Ex-Vessel Price Data**

The FMP reported the ex-vessel price of red crab, according to the dealer weightout database, ranged from \$.76 to \$.91 per pound for individual vessels in 2002. This range in ex-vessel price

among vessels was partly due to their different methods of processing and marketing, whether landed whole or with some degree of processing having taken place at sea. The dealer weightout database shows an ex-vessel price ranging from \$.80 to \$.92 per pound for individual vessels in 2003.

Vessel owners reported in 2004 that they are now receiving about 94-cents per pound for red crab (whole and butchered product). The price is consistent throughout the year.

The average landings per DAS does vary by quarter; but the FMP has not been implemented long enough to accurately evaluate seasonal trends at this time. The increase in catch per unit of effort in the summer and fall is documented, but does not seem to translate into a price differential. Average landings per DAS are 10,227 on trips in September through November, and drop to 4,697 on trips in December through February, according to the data available for FY2003.

### **Cost and Revenue Data**

In most other fisheries, vessels land other species along with their target species (joint in inputs) or fish for other species during other parts of the year independent of their target species (nonjoint in outputs). In the red crab directed fishery, these complications for assessing fixed costs are minimal. The best information for cost data still comes from the voluntary survey, dated September 2001, where we have estimates of fixed and variable costs as well as an estimate of the gross revenue per day needed to break even. For the non-directed fleet (those who are regulated under the incidental catch restriction), we have no cost information. There were only 2 vessels that landed red crab under the incidental catch restriction in FY2003.

The reported gross revenue per day for the limited access fleet, for the period 1998-2000, required to break even ranged from \$4,000 to \$5,000. Based on the prices for 2002, this would require minimum landings ranging from 3,846 pounds to 6,667 pounds per day. An average trip lasting 8 days means vessels would have to land between 31,000 pounds and 53,000 pounds per trip to break even. The current regulation for trip limits, remains at a trip limit of 75,000 pounds (or the highest recorded landing prior to the control date). The current trip limit would not prohibit a red crab vessel from breaking even, that is, covering their variable costs.

Vessel owners and operators were also questioned on the fixed and variable costs associated with the red crab fishery during 1998-2000. The average variable cost/trip is approximately \$15,000. Vessels must cover their variable costs in the short run in order to continue fishing. In the long term, vessels must cover their fixed costs to remain profitable. It appears from this information that red crab vessels would be able to allocate some of their trip revenue to cover their fixed costs. On average, red crab vessels spent approximately \$12,600 per trip on trip expenses, such as fuel, oil and lubrication, water, ice, bait, food and groceries, gear expenses and repairs, and others. They listed their annual expenses to maintain their business, vessel, and participation in the fishery as an average \$397,000 per year.

Total variable and fixed costs were calculated. Variable costs include all per trip expenses, plus half of the annual vessel repair costs divided by the average number of fishing trips taken per year. Fixed costs include all annual expenses plus the other half of the annual vessel repair costs.

Based on the responses, the variable costs average \$15,000 per trip and the fixed costs average \$470,000 per year. See Appendix B of the FMP/EIS for a complete discussion of the revenues and costs of red crab vessels.

Industry reported that fishing costs have increased since implementation of the FMP, and also since the voluntary survey was conducted. Fuel, bait, rope, and any oil-based products are more expensive, and insurance rates have increased by about 50% in the last year. These increases have been somewhat offset by an increase in price per pound paid for red crab.

The weight data for FY2003 report that average pounds per trip ranged from about 43,000 to 77,000. Gross revenues per trip averaged between \$34,000 and \$71,000 in FY2003. These values are higher than industry originally reported as necessary to break even on an average trip. The recent change in costs and revenues for the industry argue for another voluntary survey to be done, in an effort to keep current of the changes happening in the cost structure of the industry.

## **7.6 Description of the Economic Characteristics of the Fishery**

The FMP/EIS includes a description of the baseline economic characteristics of the fishery, including that of the harvest sector, the processing sector, the wholesale and retail sector, fishery-dependent service industries, and the markets for red crab. It also identifies and characterizes the baseline conditions of the social and cultural entities involved in the fishery, including vessel owners/operators, vessel crew, processors, fishery-dependent service industries, and fishing communities. A description of the affected human environment (red crab fishermen and fishing communities) is included in the section of the FMP/EIS labeled “Description of the Resource and the Affected Environment (sections 8.4 and 8.5)”. A description of the available baseline social and economic information on the red crab fishery is provided in Appendix B of the FMP/EIS. A summary of the baseline characteristics and a description of any changes that have occurred since the implementation of the FMP is provided below.

### **Harvesting Sector**

Harvesters' economic dependence upon commercial fishing and red crab fishing is presented in Appendix B of the FMP/EIS. Most respondents of the survey reported 100% dependence on the red crab fishery for their annual income.

Some, but not all, of the red crab directed fleet hold permits in other fisheries. This specification package will not eliminate any participants from the fishery; it may simply change the number of days that they are eligible to land red crab.

According to the survey, the number of crew employed by each vessel ranged from 5 to 20 and averaged 8.2 crew per vessel. Most vessels reported spending a significant portion of the year on the water. Days on the water from all fishing activities ranged from 200 to 300 days annually prior to the development of the FMP, with an average for all vessels of 266 (n = 7) days per year. All red crab fishing trips were reported to be at least a week in duration, ranging from 7 to 10 days and averaging 8.2 days per trip. Vessels report that a working day on a red crab trip averages just less than 18 hours, ranging from 17 to 20 hours per day.

Since implementation of the FMP, four vessels have harvested the total red crab landings. Although this is a small fishery in terms of the number of vessels that participate, the individuals that are involved in this fishery have a very high dependence on the red crab resource. The handful of vessels that received limited access permits were surveyed during the development of the FMP, and the majority of harvesters reported that revenues from the red crab fishery make up the vast majority of their annual income. Since implementation of the FMP, vessel owners still report red crab as the primary fishery that supports their annual income. One of the vessels is involved in the offshore lobster fishery, but in general, this fleet directs exclusively on red crab. Overall, there have been some changes in terms of ownership and ports, but the vessels and primary participants involved in this fishery have not changed since implementation of the FMP.

According to the industry, all limited access vessels now land exclusively in Fall River, MA. This is an important change that has occurred since the survey was conducted. Earlier, six ports were identified in the FMP as primary ports of vessel operations and mooring including: Fall River, Gloucester, and New Bedford, MA; Bristol, ME; and Portsmouth and Tiverton, RI. This has made it more convenient for the processor, but has not affected the operation of the fleet. The average number of crew per vessel has not changed since implementation of the FMP, and some of the crew members are still the same. One vessel reported that their crew turnover is very low. Most crew in this fleet are from New England, but there are some crew members from Mexico and Seattle, WA.

During the development of the FMP the fleet reported that on average vessels landed 63,000 pounds of red crab per trip and received an average of approximately \$42,000 per trip in gross revenue. The weighout data for 2003 report that average pounds per trip ranged from about 43,000 to 77,000. Gross revenues per trip averaged between \$34 and \$71 thousand in 2003.

Although it appears that gross revenues have increased, industry has also reported that fishing costs have increased. Fuel, bait, rope, oil based products and insurance rates have all increased in the last year. These increases have been somewhat offset by an increase in price per pound paid for red crab. The average price per pound is about ten cents higher this fishing year than in 2003. Vessel owners reported that they are receiving about 94-cents per pound for red crab (whole and butchered product). The price is consistent throughout the year.

### **Processing Sector**

From Appendix B to the FMP/EIS, the level of dependency on red crab by the processors was described. At the time of the interview, they all processed other fishery products in addition to red crab. On average, red crab accounted for 11.5% of their total fishery-related processing operations, with a maximum of 25% of total processing operations. Most processing employees work on other fishery-related products in addition to red crab. Since the goal of this action is not to affect the number of pounds landed, it is not expected to have an impact on the processing sector. Processors will continue to be assured of a steady supply of fresh product.

The processing sector for red crabs was relatively small prior to the FMP, and now all crabs are processed at one facility in New Brunswick, Canada. This processor then sells the entire red crab product to several large food chains. The crab is primarily sold as generic crabmeat, and cocktail claws. This processor is also involved in lobster, snow crab, and mussels, but red crab is

a major component of overall operations. Red crab is the only species they process in the winter, and they have invested a lot in terms of their facility operations in order to process this species.

Since all vessels now land in Fall River, the processor reported that it is more convenient for them, but overall costs are probably the same. Generally, the processor sends one or two trucks to Fall River to pick up the red crab product after each trip. On average, they have about a 2% dead loss of the live crabs during the transport from Fall River to Nova Scotia. Once the crab is at the plant, about 100 individuals are employed to process the crab; 25-30 individuals kill and butcher the crab, and about 60 more cook and pack the crab. Since implementation of the FMP, the processor has worked with the industry and their clients to reduce costs. For example, they have developed a creative way to change the packing of red crab, which has reduced costs and enabled the processor to pay the vessels approximately ten cents more a pound.

### **Wholesaling and Retail Sector**

The people and businesses that sell red crab product at the wholesale or retail level are a component of the fishing industry and of fishing communities. Assuming the DAS are allocated in a manner to achieve the target TAC, the amount of red crab coming into the markets will not be affected by this regulation. For a description of the baseline economic characteristics of the red crab fishery, particularly as they relate to business and markets, please see Appendix B of the FMP/EIS.

### **International Sector**

All of the live red crab landed in New England is shipped to Canada for processing. Respondents to the survey prior to the FMP indicated that most use only a single processor. This is still the case today, as all vessels in the fishery use the same processor, which is located in Canada. The respondents of the survey indicated that they choose to sell their red crab to a particular processor out of loyalty to that processor. Again, since the regulation does not aim to change the amount of red crab landed, there should be no change to the international sector as a result of this action.

### **Fishery-Dependent Service Industries**

For a description of the baseline economic characteristics of the red crab fishery, particularly fishery-dependent service industries please see Appendix B of the FMP/EIS. There should be no effect on these services due to this action. The current suppliers of these services would easily handle any change in services needed. Given the small number of fishing vessels involved, it is unlikely that a small change in services to red crab vessels would effect the fishery related revenue of the service industry.

## **7.7 Social Impacts**

There are no additional data since the FMP to evaluate the potential impacts of this measure on the social and cultural aspects of New England and Mid-Atlantic fishing communities. The small size, few participants, and the distributed nature of the fishery, suggests that any social or cultural impacts to these fishing communities will be negligible. Since the size of the fishery is so small, and so few vessels participate, the impact of any change in the red crab fishery is overwhelmed in the community by the influence of larger fisheries, which generate greater revenue.

## **7.8 Impacts of the Alternatives**

A detailed assessment of the various impacts of the alternatives considered in this action is presented in Section 6.0.

## **7.9 Summary of Economic Impacts**

The No Action Alternative would grant vessels the ability to use the greatest number of DAS among the alternatives. Vessels currently in the fishery have not harvested the target TAC since the FMP was implemented. Given the nature of the fishery, the relationship between fleet DAS and the target TAC is not strong enough to predict the exact number of DAS to harvest the target TAC. The choices under consideration (from 744 fleet DAS to 780 fleet DAS) do not vary a great deal. No matter how many vessels participate, the difference between the most and least risk-averse position is barely one trip per year.

Prior to the FMP, vessels reported the number of days absent among the red crab vessels varied from 200 to 300. They would only approach numbers in that range if at least one vessel opted out of the fishery.

As expected, the highest number of fleet DAS (No Action alternative) would generate the highest level of landings and revenue in the short term. In accordance with the FMP, this level of DAS may be adjusted in another year to further improve the estimate. The level of landings and revenue is directly related to the allocated number of DAS and the No-Action alternative provides the greatest fleet DAS.

Uncertainty about the status of the red crab stock, as well as the limited time-series available in the data has limited the confidence with which we can predict the economic outcomes of the various alternatives. We have assumed that the OY in the FMP is accurate. One of the most positive outcomes from the FMP has been the collection of data that have partially reduced the uncertainty about the future of the resource and its management.

## **7.10 Determination of Significance under E.O. 12866**

E.O. 12866 requires that the Office of Management and Budget review proposed regulatory programs that are considered to be significant. A “significant regulatory action” is one that is likely to: (1) have an annual effect on the economy of \$100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, 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; (3) materially alter the budgetary impact of entitlements, grants, user fees, or loan programs, or the rights and obligations of recipients thereof; or (4) raise novel legal or policy issues arising out of legal mandates, the President’s priorities, or the principles set forth in this Executive Order.

A regulatory program is “economically significant” if it is likely to result in the effects described above. The RIR is designed to provide information to determine whether the proposed regulation is likely to be “economically significant.” Given the economic impacts described in this document, this regulation is not likely to result in an affect on the economy approaching \$100 million. For calendar year 2003, red crab vessels generated less than \$4 million in gross revenue. The proposed measures will not adversely affect productivity, competition, the

environment, public health or safety, or state, local or tribal governments or communities over the long term. Furthermore, the proposed action will not interfere with an action planned by another agency since no other agency regulates the harvest of deep-sea red crabs. The proposed specifications do not materially alter the budgetary impact of entitlements, grants, user fees, or loan programs, or the rights and obligations of recipients. Lastly, the proposed specifications do not raise any novel legal and/or policy issues because it extends the types of fishing regulations already in place in many other federally-managed fisheries.

NOAA Fisheries has determined that, given the information presented above, there will be net benefits derived from the implementation of this annual adjustment. Because none of the factors defining “significant regulatory action” are triggered by this proposed rule, the rule has been determined to be not significant for the purposes of E.O. 12866.

## **7.11 Initial Regulatory Flexibility Analysis**

### **7.11.1 Introduction and Methods**

The Regulatory Flexibility Act (RFA) requires federal rule makers to examine the impacts of proposed and existing rules on small businesses, small organizations, and small governmental jurisdictions. In reviewing the potential impacts of proposed regulations, the IRFA determines whether the proposed action would have a “significant economic impact on a substantial number of small entities.” The Small Business Administration (SBA) size standards define whether a business entity is small and, thus, eligible for Government programs and preferences reserved for “small business” concerns. Size standards have been established for all for-profit economic activities or industries in the North American Industry Classification System (NAICS). The SBA defines a small business in the commercial fishing and recreational fishing sector, as a firm with receipts (gross revenues) of up to \$3.5 million. The SBA has issued an interim final rule (IFR), which adjusts for inflation in its criteria for defining a small business. In related businesses that deal in canned and cured fish and seafood or prepared fish or frozen fish and seafood, a small business is one that employs 500 employees or fewer. In fish and seafood wholesalers, a small business is defined as one that employs 100 or fewer employees. For fish and seafood markets, a small business is defined as a firm with receipts of up to \$6.0 million.

The objective of the Regulatory Flexibility Act is to require consideration of the capacity of those affected by regulations to bear the direct and indirect costs of regulation. If an action will have a significant impact on a substantial number of small entities, an Initial Regulatory Flexibility Analysis must be prepared to identify the need for action, alternatives, potential costs and benefits of the action, the distribution of these impacts, and a determination of net benefits.

If an action is determined to affect a substantial number of small entities, the analysis must include:

1. A description and estimate of the number of small entities and total number of entities in a particular affected sector, and a total number of small entities affected: and
2. Analysis of economic impact on small entities, including the direct and indirect compliance costs of completing paperwork or recordkeeping requirements, effect on the

competitive position of small entities, effect on the small entity's cash flow and liquidity, and ability of small entities to remain in the market.

The criterion for determining significance is based on 2 criteria: disproportionality and profitability. A disproportional effect would put certain classes at a substantial competitive disadvantage. Since different classes of entities are not an issue here (all of the vessels can be defined as small entities), there are no entities that are disproportionately affected.

This regulation will not cause increased costs or reduction in revenues from the 2004 annual specifications. In FY 2004, vessels were not constrained by their allocation of DAS. This regulation for FY 2005 will keep the same number of DAS as in FY 2004. If vessels in the red crab fleet choose to utilize all of their allotted DAS, this would amount to a positive change in their DAS, and therefore would have a positive impact on their profitability.

#### **7.11.2 Reasons the Action is Being Considered**

A complete description of the alternatives being considered in the annual specifications package for the 2005 Fishing Year are found in Section 0 of this document. In addition, the rationale for the proposed action can be found in Section 3.0 of this document. The Red Crab FMP/EIS required the annual specifications to be examined every year.

#### **7.11.3 Management Objectives and Legal Basis**

The purpose and need for this annual specifications action is found in Section 3.0. For a more thorough discussion of the objectives of red crab management, see Section 3.1 of the FMP. In general, the primary intent of the management program for red crab is to prevent overfishing of the resource, and prevent potential overcapitalization of the red crab fishery.

#### **7.11.4 Description of the Affected Entities**

The proposed measures could affect any vessel that has participated in the red crab fishery under the FMP. All these vessels readily fall within the definition of small business. The characteristics and composition of the red crab industry is unique. The vessels expected to participate in the fishery under this action will be equally impacted, but will be able to maintain their competitive relationship with each other. Since this action solely affects the allocation of DAS among the fleet and individual vessels, none of the alternatives have adverse impacts when compared to the fishing year 2004. The RFA asks agencies to implement less burdensome regulations on small entities if the objectives of the regulation are not compromised as a result. Vessels were impacted in the FMP due to the qualification criteria, but this action does not negatively impact any of the vessels that are qualified to participate in the fishery. The burden, in this case, on small entities, remains unchanged.

For the purposes of the RFA, we need to examine all vessels that reported landing at least one pound of red crab. Total reported landings in 2003 from the weightout data equaled 3,711,677 pounds. Incidental vessels landed less than 250 pounds while four additional vessels landed over 99% of the total. Less than 1 % of the total landed pounds was reported as "unknown, but tonnage vessel". For reasons of confidentiality, we will not report on the details of the individual vessels.

The RFA asks agencies to implement less burdensome regulations on small entities if the objectives of the regulation are not compromised as a result. In this case, the magnitude of the impact will be different for each of the alternatives, but will be equally shared among those limited access vessels that qualified under the FMP. It is important to acknowledge that there is nothing in the specifications that would favor one vessel over another.

#### **7.11.5 Description of the Reporting, Record-Keeping, and Compliance Requirements**

There are several sources of reporting on the red crab fishery--Vessel Trip Reports (VTR), Interactive Vessel Reporting (IVR), and dealer reporting (weighout database). This action proposes no changes to any of the reporting, recordkeeping, or compliance requirements of the FMP.

Red crab vessels are also required to “call-in” their days-at-sea usage to NOAA Enforcement after each trip, so that DAS can be monitored. Since there are only several vessels involved in this fishery, there are confidentiality issues in reporting their activity; therefore, the fishery information is presented in aggregate form to protect the vessels involved in this fishery.

#### **7.11.6 Identification of Relevant Federal Rules**

For a description of other applicable federal rules, see Section 12 of the Red Crab FMP as well as Section 8.0 of this document.

#### **7.11.7 Description of the Alternatives**

A detailed description of the alternatives considered in this document is presented in Section 4.0.

#### **7.11.8 Analyses of Impacts of Alternatives**

The RFA is intended to identify impacted vessels and to characterize the potential economic impact on directly affected entities. The term “regulated entity” in this case means those vessels that would be impacted by this rule. The FMP analyzed the impact of those vessels that qualified to be in the fishery and also analyzed those vessels that were excluded from the fishery. A discussion of the potential impacts on indirectly impacted entities, and the communities within which owners of impacted vessels reside was provided in the FMP. These communities are discussed in Section 7.1.8 (National Standard 8) of the FMP/EIS. An overall discussion of the impacts associated with each alternative considered in this action is presented in Section 6.0.

Under this action, the only vessels to be impacted are those who qualified previously under the FMP. Based upon the economic analysis, there is no burden on those vessels.

Generally, the percent of revenue change for impacted vessels would vary considerably based on the permits it held (i.e., based on the fisheries in which it was able to participate) and species it landed. Diversity in the fleet would help to balance loss in one fishery with revenue generated from other fisheries. The general purpose of the information presented below is to provide a general overview of the potential impacts on regulated entities associated with the management alternatives.

### **Economic Impacts on Vessels**

The effectiveness of these alternatives is not directly dependent on the number of vessels participating, but on the calculation of the total number of days that would allow for the target catch to be landed. They will be able to maximize their outputs from a given level of inputs, assuming the biomass increases over time. They would have the flexibility to plan for other sources of income. Based on public comments, red crab vessels would be profitable on an allocation of 183 days. Therefore, if 4 vessels continue to participate in this fishery, that allows for each of them to remain profitable under any of the alternatives.

The composition of the fleet would remain the same under any of the alternatives. Other benefits of the DAS measure would continue unchanged from the FMP, such that fishermen would retain the flexibility to operate each trip as efficiently as possible and to space their landings in an optimal manner.

### **Economic Impacts on Dealers**

A description of red crab dealers and their overall dependence on red crab is presented in Appendix B of the FMP/EIS. In the dealer data, in 2003 there were three distinct federal seafood dealer numbers who handled red crab. Of these three, one handled greater than 1 million pounds in a year. Another way to look at dependence is by absolute value. By this measure, two dealers depended on red crab revenues for over \$1,000,000. In calendar year 2003, there were three entries listed in the dealer data, although 27% of the red crab recorded landings were from an unknown dealer. It is thought that this unknown quantity is from one of the 2 known dealers. Because of this obvious inadequacy of the dealer data to provide information on dealers, we must rely on the voluntary survey for further information. Data in calendar year 2004, although obviously not complete, does not look to have this problem. Dealers would be regulated entities under the RFA only to the extent that they have to get a permit. Overall, it was felt that very few dealers would be affected by any of the alternatives.

### **Economic Impacts on Processors**

Processors would not be considered regulated entities for purposes of the RFA. Appendix B in the FMP provides an overview of the processing sector as it relates to the red crab fishery.

All of the vessels, dealers, and processors fall within the definition of small entities. Information on processors has changed since the survey was conducted. There is no current indication that there is participation in this fishery by large entities. Currently, there is only one processor who works with the red crab vessels. He specifies that he employs 100 people (less than the 500 employees defined as a small entity). This processor then sells the entire red crab product to several large food chains. This processor is also involved in lobster, snow crab, and mussels, but red crab is a major component of overall operations. Because of the small nature of the fishery, there are no disproportionate small versus large effects. There are no disproportionate costs of compliance among the affected small entities. The burden, in this case, on small entities, remains unchanged.

## **8.0 CONSISTENCY WITH APPLICABLE LAWS**

This document has been prepared primarily in response to the requirements of the Magnuson-Stevens Fishery Conservation and Management Act and the requirements of the Red Crab FMP that specify that the Council shall review the target TAC and DAS allocations annually, and prepare a biennial SAFE Report. This document also addresses the requirements of other applicable laws, namely the Administrative Procedure Act (APA), the Marine Mammal Protection Act (MMPA), the Endangered Species Act (ESA), the National Environmental Policy Act (NEPA), the Regulatory Flexibility Act (RFA), the Paperwork Reduction Act (PRA), the Coastal Zone Management Act (CZMA), Data Quality Act (DQA) and Executive Orders 12612 (Federalism) and 12866 (Regulatory Planning). These other applicable laws and administrative orders help ensure that the Council considers the full range of alternative actions and their expected impacts on the marine environment, living marine resources, and the human communities that could be affected. Since this action is not expected to change any of the impacts already assessed in the Red Crab FMP/EIS, and the proposed DAS allocation for FY2005 specified as 780 in this document is the same DAS that were allocated under the FMP and for FY2004, this document is in compliance with all applicable laws defined above. Section 12.0 of the Red Crab FMP/EIS specifies in detail how the requirements and guidelines of each law have been addressed in this fishery management program. The sections below briefly summarize what each law is and how this action is in compliance with the requirements of each law or executive order.

### **8.1 Magnuson-Stevens Fishery Conservation and Management Act (MSA)**

Section 301 of the Magnuson-Stevens Fishery Conservation and Management Act requires that fishery management plans contain conservation and management measures that are consistent with the ten National Standards. Section 7.1 of the Red Crab FMP specifies how the management plan is in compliance with each national standard individually. This action is not proposing any changes to the measures implemented by the regulations under the FMP (same TAC and DAS are being proposed for this fishing year as under the FMP); and since the FMP was found to be in compliance with MSA (July 31, 2002, approval date), this action is in compliance with the MSA.

### **8.2 National Environmental Policy Act (NEPA)**

NEPA is the national charter for environmental responsibility; it is a procedural statute that establishes a process by which federal agencies must evaluate the environmental effects of their actions (Bass et al, 2001). NEPA requires that all Federal agencies consider all reasonable foreseeable environmental effects of their proposed actions and to involve and inform the public in the decision-making process. Section 12.10 of the Red Crab FMP identifies how the FMP was developed in compliance with the requirements of NEPA. This annual specifications package is also in compliance with NEPA requirements; it describes and analyzes the impacts on the affected environment and human participants that may be impacted by this action, it assesses the cumulative impacts of this action in Section 6.5, and during the development of this action, there was opportunity for public review and input.

### **8.3 Marine Mammal Protection Act (MMPA)**

The Marine Mammal Protection Act establishes a moratorium on the taking of important marine mammals and marine mammal products, with some exceptions. If a fishery has the potential to

affect marine mammal populations, the potential impacts must be assessed. Section 5.0 of the Red Crab FMP/EIS should be referenced for the assessment of the impacts of the fishery management plan on protected species, and Section 8.7 of the FMP/EIS describes all the marine mammals and other protected species that may be found in the management area of the red crab resource. Section 6.4 of this document evaluates whether marine mammals may be jeopardized as a result of this action. Since this action does not propose to change any of the measures implemented under the FMP, and no impacts were identified under the FMP that jeopardize marine mammals, this action is in compliance with all the requirements of the MMPA.

#### **8.4 Endangered Species Act (ESA)**

The Endangered Species Act provides for the protection and conservation of endangered and threatened species of fish, wildlife, and plants. Section 7(a)(2) of the ESA requires Federal agencies to insure that any action carried out by that agency is not likely to jeopardize or adversely modify critical habitats for endangered species. Section 12.3 of the Red Crab FMP concludes that the Red Crab FMP is not likely to result in jeopardy to any ESA-listed species under NMFS jurisdiction, or alter or modify any critical habitat. Since this action does not propose to change any of the measures implemented under the FMP, and no impacts were identified under the FMP that jeopardize endangered species, this action is in compliance with all the requirements of the ESA.

#### **8.5 Administrative Procedure Act (APA)**

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

#### **8.6 Paperwork Reduction Act (PRA)**

The purpose of the Paperwork Reduction Act is to minimize paperwork burden for individuals, small businesses, nonprofit institutions, and other persons resulting from the collection of information by or for the Federal Government. It also ensures that the Government is not overly burdening the public with requests for information. Section 12.8 and Appendix D of the Red Crab FMP describe how the information collected during the development of the FMP was in compliance with the requirements of the PRA. This action has not added any additional paperwork burden for interested parties; therefore, PRA does not apply.

#### **8.7 Coastal Zone Management Act (CZMA)**

Section 307 of the Coastal Zone Management Act (CZMA) is known as the federal consistency provision. Federal Consistency review requires that “federal actions, occurring inside or outside of a state's coastal zone, that have a reasonable potential to affect the coastal resources or uses of that state's coastal zone, to be consistent with that state's enforceable coastal policies, to the maximum extent practicable”. The Council previously made determinations that the FMP was consistent with each states coastal zone management plan and policies, and each coastal state concurred in these consistency determinations (Section 12.2 of the Red Crab FMP). Since the specifications for the 2005 fishing year are similar to the specifications for the 2003 fishing year under the FMP, and the 2004 fishing year implemented by last year's specification package, the

Council has determined that the specifications for the 2005 fishing year are consistent with the coastal zone management plan and policies of the coastal states in this region. A copy of this specification package was sent to each coastal zone management office from Maine to North Carolina when the final submission document was submitted to NMFS (October 21, 2004). A list of the specific contacts and a copy of the letter are available upon request.

## **8.8 Data Quality Act (DQA)**

Pursuant to NOAA Fisheries guidelines implementing Section 515 of Public Law 106-554 (the Data Quality Act), all information products released to the public must first undergo a Pre-Dissemination Review to ensure and maximize the quality, objectivity, utility, and integrity of information (including statistical information) disseminated by Federal agencies. The following section addresses these requirements.

### **Utility**

Utility means that disseminated information is useful to its intended users. "Useful" means that the content of the information is helpful, beneficial, or serviceable to its intended users, or that the information supports the usefulness of other disseminated information by making it more accessible or easier to read, see, understand, obtain or use. The intended users of the information contained in this document are vessels participating in the direct red crab fishery. However, federally permitted red crab dealers and members of the general public may also benefit from this information. The information contained in this document will be helpful and beneficial to owners of vessels holding a limited access or incidental red crab permit since it will notify these individuals of changes in management measures for the fishery. This information will enable these individuals to adjust their fishing practices, and make appropriate business decisions based on the new management measures and corresponding regulations.

The information being provided in this specifications package concerning the status of the red crab fishery is updated information based on landings and effort information as of August 19, 2004. Information concerning changes to red crab management measures is new information that has been developed through a multi-stage process that involved members of the public. Therefore, the information pertaining to management measures contained in this document has been improved based on comments from the public, fishing industry, members of the Council, and NOAA Fisheries.

The media being used in the dissemination of the information contained in this document will be contained in a Federal Register notice announcing the proposed and final rules for this action. This information will be made available through printed publication and on the Internet website for the Northeast Regional Office (NERO) of NOAA Fisheries.

### **Integrity**

Integrity refers to security--the protection of information from unauthorized access or revision, to ensure that the information is not compromised through corruption or falsification. Prior to dissemination, NOAA information, independent of the specific intended distribution mechanism, is safeguarded from improper access, modification, or destruction, to a degree commensurate with the risk and magnitude of harm that could result from the loss, misuse, or unauthorized access to or modification of such information.

## **Objectivity**

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

Several sources of data were used in the development of this document, including the analysis of impacts. These data sources include, but are not limited to, landings data from vessel trip reports, landings data from individual voice reports, information concerning DAS usage from the DAS call-in system, data from the dealer weighouts purchase reports, data from a voluntary survey from the Council’s industry advisors conducted prior to the FMP, and ex-vessel price information. Although there are some limitations to the data used in the analysis of impacts of management measures, and in the description of the affected environment, these data are considered to be the best available.

The policy choices (i.e., management measures) to be contained in this specifications package are supported by the best available scientific information. Qualitative discussion is provided in cases where quantitative information was unavailable, utilizing appropriate proxies and reference points as necessary.

The review process for any action under an FMP involves the Northeast Regional Office (NERO) of NOAA Fisheries, the Northeast Fisheries Science Center (Center), and NOAA Fisheries Headquarters (Headquarters). The Council review process involves public meetings at which affected stakeholders have the opportunity to provide comments on the proposed changes to the FMP. Reviews by staff at NERO are conducted by those with expertise in fisheries management and policy, habitat conservation, protected species, and compliance with the applicable law. 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. Final approval of this specification package and clearance of the proposed and final rules is conducted by staff at NOAA Fisheries Headquarters, the Department of Commerce, and the U.S. Office of Management and Budget. This review process is standard for any action under an FMP, and provides input from individuals having various expertises that were not directly involved in the development of the action. Thus, the review process for any FMP amendment, including the red crab annual specifications for fishing year 2004, is performed by technically qualified individuals to ensure the action is valid, complete, unbiased, objective and relevant.

## **8.9 Regulatory Flexibility Act (RFA)**

The Regulatory Flexibility Act requires agencies to assess the impacts of their proposed regulations on small entities. The Regulatory Flexibility Act Analysis (RFFA) determines whether the proposed action would have a “significant economic impact on a substantial number of small entities.” Section 11.9 of the Red Crab FMP provides the RFFA for the management

plan, and it was determined to be in compliance with the regulations under the RFA. The Initial Regulatory Flexibility Act Analysis of this action is in Section 7.0, and since this action does not propose to change any of the regulations implemented under the FMP, this action is also in compliance with the RFA.

### **8.10 Executive Order 12866 (Regulatory Planning and Review)**

The purpose of E.O. 12866 is to enhance planning and coordination with respect to new and existing regulations. This order requires the Office of Budget and Management (OMB) to review regulatory programs that are considered to be “significant.” Section 12.5 of the Red Crab FMP describes how the management plan was in compliance with this order, and Section 11.0 is the Regulatory Impact Review (RIR), which includes an assessment of the costs and benefits of the FMP as required by E.O. 12866. This action does not propose to change any of the regulations implemented under the FMP, thus is in compliance with this order. Section 7.0 (RIR) is a summary of the costs and benefits of this action. Overall, this action is not considered a “significant regulatory action” since it impacts a small sector of the economy, with less than \$6.0 million revenues.

### **8.11 Executive Order 13132 (Federalism)**

The E.O. on federalism establishes nine fundamental federalism principles for Federal agencies to follow when developing and implementing actions with federalism implications. Section 12.4 of the Red Crab FMP describes how the management plan is in compliance with this order. Overall, since the FMP does not contain policies with federalism implications sufficient to warrant preparation of an assessment under E.O. 13132. Furthermore, this action does not contain policies with federalism implications, thus preparation of such an assessment under EO 13132 is not warranted.

## **9.0 REFERENCES**

Bass, R., A. Herson and K. Bogdan. 2001 (Second) Edition. *The NEPA Book: A step-by-step guide to how to comply with the National Environmental Policy Act*. Solano Press, California, 475 pp.

Council on Environmental Quality (CEQ) 1997. Considering Cumulative Effects Under the National Environmental Policy Act. Executive Office of the President. 64 pp.

Duggan, D.R. and P/Lawton. 1998. Scotian Shelf red crab. Canada DFO Science Stock Status Report C3-11, Dartmouth, Nova Scotia, 6pp.

Gray, G. Jr. Investigation of the basic life history of the red crab (*Geryon quinquedens*). RI Div. Of Conservation Completion Rept. P.L. 88-309, Project 3-46R.

*Magnuson-Stevens Fishery Conservation and Management Act* (PL 94-265) (16 U.S.C. 1802).

New England Fishery Management Council (NEFMC) 2002. *Red Crab Fishery Management Plan (FMP/EIS)*. Submitted to NMFS March 19<sup>th</sup>, 2002.

Serchuk, F.M. 1977. Assessment of Red Crab (*Geryon quinquedens*) populations in the Northwest Atlantic, September 1977. Northeast Fisheries Science Center Ref. Doc., 77-23:1-15.

Serchuk, F.M. and R.L. Wigley. 1982. Deep-sea red crab, *Geryon quinquedens*. In: M.D. Grosslein and T.R. Azarovitz (eds.), Fish Distribution: 125-129. (MESA New York Bight Atlas Monograph, 15. New York Sea Grant Institute, Albany, New York).

Steimle, F.W., C. Zetlin, and S. Chang. 2001. Essential Fish Habitat Source Document: Red Crab, *Chaceon (Geryon) quinquedens*, Life History and Habitat Characteristics. U.S. Department of Commerce NOAA Technical Memo. NMFS-NE-163. Woods Hole, MA. 27pp.

Wahle, R. A., Y. Chen, and J. Williams. 2004. Developing Stock Assessment methods for the Deep-sea Red Crab Fishery. Completion Report submitted to the Saltonstall-Kennedy Program. January 7, 2004.

Weinberg, J.R., T. Dahlgren, N. Trowbridge, and K. Halanych. 2003. Genetic Differences within and between species of Deep-sea Crabs (*Chaceon*) from the North Atlantic Ocean. *Biol.Bull.* 204: 318-326 (June 2003) Marine Biological Laboratory.

## **10.0 LIST OF PREPARERS AND AGENCIES CONSULTED**

### **New England Fishery Management Council Staff**

Deirdre V. Boelke

50 Water Street, Mill Number 2

Newburyport, MA 01950

Phone: (978) 465-0492

### **Red Crab Plan Development Team**

Deirdre V. Boelke, Chair

Jennifer Anderson, NOAA Fisheries, Northeast Region

Steve Correia, Massachusetts Division of Marine Fisheries

Robert Glenn, Massachusetts Division of Marine Fisheries

Martin Jaffe, NOAA Fisheries, Northeast Region

Barbara Rountree, NMFS Northeast Fisheries Science Center

Richard Wahle, Bigelow Laboratories, Boothbay Harbor, ME

Jim Weinberg, NMFS Northeast Fisheries Science Center

## **APPENDIX I**

EFH text descriptions for all benthic (demersal) life stages  
for federally-managed species in the Northeast region



**Table 1 - EFH text descriptions for all demersal life stages of federally-managed species in the Northeast region.**

**Species with EFH that potentially overlaps with red crab fishing activity are in bold face (based on depth).**

<b>Species</b>	<b>Life Stage</b>	<b>Geographic Area of EFH</b>	<b>Depth (meters)</b>	<b>Seasonal Occurrence</b>	<b>EFH Description</b>
American plaice	juvenile	GOME and estuaries from Passamaquoddy Bay to Saco Bay, ME and from Mass. Bay to Cape Cod Bay, MA	45 - 150		Bottom habitats with fine grained sediments or a substrate of sand or gravel
American plaice	adult	GOME and estuaries from Passamaquoddy Bay to Saco Bay, ME and from Mass. Bay to Cape Cod Bay, MA	45 - 175		Bottom habitats with fine grained sediments or a substrate of sand or gravel
Atlantic cod	juvenile	GOME, GB, eastern portion of continental shelf off southern NE and following estuaries: Passamaquoddy Bay to Saco Bay; Mass. Bay, Boston Harbor, Cape Cod Bay, Buzzards Bay	25 - 75		Bottom habitats with a substrate of cobble or gravel
Atlantic cod	adult	GOME, GB, eastern portion of continental shelf off southern NE and following estuaries: Passamaquoddy Bay to Saco Bay; Mass. Bay, Boston Harbor, Cape Cod Bay, Buzzards Bay	10 - 150		Bottom habitats with a substrate of rocks, pebbles, or gravel
Atlantic halibut	juvenile	GOME, GB	20 - 60		Bottom habitats with a substrate of sand, gravel, or clay
<b>Atlantic halibut</b>	<b>adult</b>	<b>GOME, GB</b>	<b>100 - 700</b>		<b>Bottom habitats with a substrate of sand, gravel, or clay</b>
Atlantic salmon	juvenile	Rivers from CT to Maine: Connecticut, Pawcatuck, Merrimack, Cocheco, Saco, Androscoggin, Presumpscot, Kennebec, Sheepscot, Ducktrap, Union, Penobscot, Narraguagus, Machias, East Machias, Pleasant, St. Croix, Denny's, Passagassawaukeag, Aroostook, Lamprey, Boyden, Orland Rivers, and the Turk, Hobart and Patten Streams; and the following estuaries for juveniles and adults: Passamaquoddy Bay to Muscongus Bay; Casco Bay to Wells Harbor; Mass. Bay, Long Island Sound, Gardiners Bay to Great South Bay. All aquatic habitats in the watersheds of the above listed rivers, including all tributaries to the extent that they are currently or were historically accessible for salmon migration.	10 - 61		Bottom habitats of shallow gravel/cobble riffles interspersed with deeper riffles and pools in rivers and estuaries, water velocities between 30 - 92 cm/s

<u>Species</u>	<u>Life Stage</u>	<u>Geographic Area of EFH</u>	<u>Depth (meters)</u>	<u>Seasonal Occurrence</u>	<u>EFH Description</u>
Atlantic sea scallop	juvenile	GOME, GB, southern NE and middle Atlantic south to Virginia-North Carolina border and following estuaries: Passamaquoddy Bay to Sheepscot R.; Casco Bay, Great Bay, Mass Bay, and Cape Cod Bay	18 - 110		Bottom habitats with a substrate of cobble, shells, and silt
Atlantic sea scallop	adult	GOME, GB, southern NE and middle Atlantic south to Virginia-North Carolina border and following estuaries: Passamaquoddy Bay to Sheepscot R.; Casco Bay, Great Bay, Mass Bay, and Cape Cod Bay	18 - 110		Bottom habitats with a substrate of cobble, shells, coarse/gravelly sand, and sand
Haddock	juvenile	GB, GOME, middle Atlantic south to Delaware Bay	35 - 100		Bottom habitats with a substrate of pebble and gravel
Haddock	adult	GB and eastern side of Nantucket Shoals, throughout GOME, *additional area of Nantucket Shoals, and Great South Channel	40 - 150		Bottom habitats with a substrate of broken ground, pebbles, smooth hard sand, and smooth areas between rocky patches
Goosefish	juvenile	Outer continental shelf in the middle Atlantic, mid-shelf off southern NE, all areas of GOME	25 - 200		Bottom habitats with substrates of a sandshell mix, algae covered rocks, hard sand, pebbly gravel, or mud
Goosefish	adult	Outer continental shelf in the middle Atlantic, mid-shelf off southern NE, outer perimeter of GB, all areas of GOME	25 - 200		Bottom habitats with substrates of a sandshell mix, algae covered rocks, hard sand, pebbly gravel, or mud
Ocean pout	juvenile	GOME, GB, southern NE, middle Atlantic south to Delaware Bay and the following estuaries: Passamaquoddy Bay to Saco Bay; Mass. Bay, and Cape Cod Bay	< 50	Late fall to spring	Bottom habitats in close proximity to hard bottom nesting areas
Ocean pout	adult	GOME, GB, southern NE, middle Atlantic south to Delaware Bay and the following estuaries: Passamaquoddy Bay to Saco Bay; Mass. Bay, Boston Harbor, and Cape Cod Bay	< 80		Bottom habitats, often smooth bottom near rocks or algae
Offshore hake	juvenile	Outer continental shelf of GB and southern NE south to Cape Hatteras, NC	170 - 350		Bottom habitats
Offshore hake	adult	Outer continental shelf of GB and southern NE south to Cape Hatteras, NC	150 - 380		Bottom habitats
Pollock	juvenile	GOME, GB, and the following estuaries: Passamaquoddy Bay to Saco Bay; Great Bay to Waquoit Bay; Long Island Sound, Great South Bay	0 - 250		Bottom habitats with aquatic vegetation or a substrate of sand, mud, or rocks
Pollock	adult	GOME, GB, southern NE, and middle Atlantic south to New Jersey and the following estuaries: Passamaquoddy Bay, Damariscotta R., Mass Bay, Cape Cod Bay, Long Island Sound	15 - 365		Hard bottom habitats including artificial reefs

<u>Species</u>	<u>Life Stage</u>	<u>Geographic Area of EFH</u>	<u>Depth (meters)</u>	<u>Seasonal Occurrence</u>	<u>EFH Description</u>
Red hake	juvenile	GOME, GB, continental shelf off southern NE, and middle Atlantic south to Cape Hatteras and the following estuaries: Passamaquoddy Bay to Saco Bay; Great Bay, Mass. Bay to Cape Cod Bay; Buzzards Bay to Conn. R.; Hudson R./ Raritan Bay, and Chesapeake Bay	< 100		Bottom habitats with substrate of shell fragments, including areas with an abundance of live scallops
Red hake	adult	GOME, GB, continental shelf off southern NE, and middle Atlantic south to Cape Hatteras and the following estuaries: Passamaquoddy Bay to Saco Bay; Great Bay, Mass. Bay to Cape Cod Bay; Buzzards Bay to Conn. R.; Hudson R./ Raritan Bay, Delaware Bay, and Chesapeake Bay	10 - 130		Bottom habitats in depressions with a substrate of sand and mud
<b>Redfish</b>	<b>juvenile</b>	<b>GOME, southern edge of GB</b>	<b>25 - 400</b>		<b>Bottom habitats with a substrate of silt, mud, or hard bottom</b>
Redfish	adult	GOME, southern edge of GB	50 - 350		Bottom habitats with a substrate of silt, mud, or hard bottom
White hake	adult	GOME, southern edge of GB, southern NE to middle Atlantic and the following estuaries: Passamaquoddy Bay to Great Bay; Mass. Bay to Cape Cod Bay	5 - 325		Bottom habitats with substrate of mud or fine grained sand
Silver hake	juvenile	GOME, GB, continental shelf off southern NE, middle Atlantic south to Cape Hatteras and the following estuaries: Passamaquoddy Bay to Casco Bay, Mass. Bay to Cape Cod Bay	20 – 270		Bottom habitats of all substrate types
Silver hake	adult	GOME, GB, continental shelf off southern NE, middle Atlantic south to Cape Hatteras and the following estuaries: Passamaquoddy Bay to Casco Bay, Mass. Bay to Cape Cod Bay	30 – 325		Bottom habitats of all substrate types
Windowpane flounder	juvenile	GOME, GB, southern NE, middle Atlantic south to Cape Hatteras and the following estuaries: Passamaquoddy Bay to Great Bay; Mass. Bay to Chesapeake Bay	1 - 100		Bottom habitats with substrate of mud or fine grained sand
Windowpane flounder	adult	GOME, GB, southern NE, middle Atlantic south to Virginia - NC border and the following estuaries: Passamaquoddy Bay to Great Bay; Mass. Bay to Chesapeake Bay	1 - 75		Bottom habitats with substrate of mud or fine grained sand
Winter flounder	juvenile	GB, inshore areas of GOME, southern NE, middle Atlantic south to Delaware Bay and the following estuaries: Passamaquoddy Bay to Chincoteague Bay	0.1 – 10 (1 - 50, age 1+)		Bottom habitats with a substrate of mud or fine grained sand

<u>Species</u>	<u>Life Stage</u>	<u>Geographic Area of EFH</u>	<u>Depth (meters)</u>	<u>Seasonal Occurrence</u>	<u>EFH Description</u>
Winter flounder	adult	GB, inshore areas of GOME, southern NE, middle Atlantic south to Delaware Bay and the following estuaries: Passamaquoddy Bay to Chincoteague Bay	1 - 100		Bottom habitats including estuaries with substrates of mud, sand, grave
<b>Witch flounder</b>	<b>juvenile</b>	<b>GOME, outer continental shelf from GB south to Cape Hatteras</b>	<b>50 - 450 to 1500</b>		<b>Bottom habitats with fine grained substrate</b>
Witch flounder	adult	GOME, outer continental shelf from GB south to Chesapeake Bay	25 - 300		Bottom habitats with fine grained substrate
Yellowtail flounder	juvenile	GB, GOME, southern NE continental shelf south to Delaware Bay and the following estuaries: Sheepscot R., Casco Bay, Mass. Bay to Cape Cod Bay	20 - 50		Bottom habitats with substrate of sand or sand and mud
Yellowtail flounder	adult	GB, GOME, southern NE continental shelf south to Delaware Bay and the following estuaries: Sheepscot R., Casco Bay, Mass. Bay to Cape Cod Bay	20 - 50		Bottom habitats with substrate of sand or sand and mud
<b>Red crab</b>	<b>juvenile</b>	<b>Southern flank of GB and south the Cape Hatteras, NC</b>	<b>700 - 1800</b>		<b>Bottom habitats of continental slope with a substrate of silts, clays, and all silt-clay-sand composites</b>
<b>Red crab</b>	<b>adult</b>	<b>Southern flank of GB and south the Cape Hatteras, NC</b>	<b>200 - 1300</b>		<b>Bottom habitats of continental slope with a substrate of silts, clays, and all silt-clay-sand composites</b>
Black sea bass	juvenile	Demersal waters over continental shelf from GOME to Cape Hatteras, NC, also includes estuaries from Buzzards Bay to Long Island Sound; Gardiners Bay, Barnegat Bay to Chesapeake Bay; Tangier/ Pocomoke Sound, and James River	1 - 38	Found in coastal areas (April to December, peak June to November) between VA and MA, but winter offshore from NJ and south; estuaries in summer and spring	Rough bottom, shellfish and eelgrass beds, manmade structures in sandy-shelly areas, offshore clam beds, and shell patches may be used during wintering
Black sea bass	adult	Demersal waters over continental shelf from GOME to Cape Hatteras, NC, also includes estuaries: Buzzards Bay, Narragansett Bay, Gardiners Bay, Great South Bay, Barnegat Bay to Chesapeake Bay; Tangier/ Pocomoke Sound, and James River	20 - 50	Wintering adults (November to April) offshore, south of NY to NC; inshore, estuaries from May to October	Structured habitats (natural and manmade), sand and shell substrates preferred
Ocean quahog	juvenile	Eastern edge of GB and GOME throughout the Atlantic EEZ	8 - 245		Throughout substrate to a depth of 3 ft within federal waters, occurs progressively further offshore between Cape Cod and Cape Hatteras

<u>Species</u>	<u>Life Stage</u>	<u>Geographic Area of EFH</u>	<u>Depth (meters)</u>	<u>Seasonal Occurrence</u>	<u>EFH Description</u>
Ocean quahog	adult	Eastern edge of GB and GOME throughout the Atlantic EEZ	8 - 245	Spawn May to December with several peaks	Throughout substrate to a depth of 3 ft within federal waters, occurs progressively further offshore between Cape Cod and Cape Hatteras
Atlantic surfclam	juvenile	Eastern edge of GB and the GOME throughout Atlantic EEZ	0 - 60, low density beyond 38		Throughout substrate to a depth of 3 ft within federal waters, burrow in medium to coarse sand and gravel substrates, also found in silty to fine sand, but not in mud
Atlantic surfclam	adult	Eastern edge of GB and the GOME throughout Atlantic EEZ	0 - 60, low density beyond 38	Spawn summer to fall	Throughout substrate to a depth of 3 ft within federal waters
Scup	juvenile	Continental shelf from GOME to Cape Hatteras, NC includes the following estuaries: Mass. Bay, Cape Cod Bay to Long Island Sound; Gardiners Bay to Delaware Inland Bays; and Chesapeake Bay	(0 - 38)	Spring and summer in estuaries and bays	Demersal waters north of Cape Hatteras and inshore on various sands, mud, mussel, and eelgrass bed type substrates
Scup	adult	Continental shelf from GOME to Cape Hatteras, NC includes the following estuaries: Cape Cod Bay to Long Island Sound; Gardiners Bay to Hudson R./Raritan Bay; Delaware Bay and Inland Bays; and Chesapeake Bay	(2 - 185)	Wintering adults (November to April) are usually offshore, south of NY to NC	Demersal waters north of Cape Hatteras and inshore estuaries (various substrate types)
Spiny dogfish	juvenile	GOME through Cape Hatteras, NC across the continental shelf; continental shelf waters south of Cape Hatteras, NC through Florida; also includes estuaries from Passamaquoddy Bay to Saco Bay; Mass. Bay and Cape Cod Bay	10 - 390		Continental shelf waters and estuaries
Spiny dogfish	adult	<b>GOME through Cape Hatteras, NC across the continental shelf; continental shelf waters south of Cape Hatteras, NC through Florida; also includes estuaries from Passamaquoddy Bay to Saco Bay; Mass. Bay and Cape Cod Bay</b>	<b>10 - 450</b>		<b>Continental shelf waters and estuaries</b>
Summer flounder	juvenile	Over continental shelf from GOME to Cape Hatteras, NC; south of Cape Hatteras to Florida; also includes estuaries from Waquoit Bay to James R.; Albemarle Sound to Indian R.	0.5 – 5 in estuary		Demersal waters, on muddy substrate but prefer mostly sand; found in the lower estuaries in flats, channels, salt marsh creeks, and eelgrass beds

<u>Species</u>	<u>Life Stage</u>	<u>Geographic Area of EFH</u>	<u>Depth (meters)</u>	<u>Seasonal Occurrence</u>	<u>EFH Description</u>
Summer flounder	adult	Over continental shelf from GOME to Cape Hatteras, NC; south of Cape Hatteras to Florida; also includes estuaries from Buzzards Bay, Narragansett Bay, Conn. R. to James R.; Albemarle Sound to Broad R.; St. Johns R., and Indian R.	0 - 25	Shallow coastal and estuarine waters during warmer months, move offshore on outer continental shelf at depths of 150 m in colder months	Demersal waters and estuaries
Tilefish	juvenile	US/Canadian boundary to VA/NC boundary (shelf break, submarine canyon walls, and flanks: GB to Cape Hatteras)	76 - 365	All year, may leave GB in winter	Rough bottom, small burrows, and sheltered areas; substrate rocky, stiff clay, human debris
Tilefish	adult	US/Canadian boundary to VA/NC boundary (shelf break, submarine canyon walls, and flanks: GB to Cape Hatteras)	76 - 365	All year, may leave GB in winter	Rough bottom, small burrows, and sheltered areas; substrate rocky, stiff clay, human debris
Red drum	juvenile	Along the Atlantic coast from Virginia through the Florida Keys	< 50	Found throughout Chesapeake Bay from September to November	Utilize shallow backwaters of estuaries as nursery areas and remain until they move to deeper water portions of the estuary associated with river mouths, oyster bars, and front beaches
Red drum	adult	Along the Atlantic coast from Virginia through the Florida Keys	< 50	Found in Chesapeake in spring and fall and also along eastern shore of VA	Concentrate around inlets, shoals, and capes along the Atlantic coast; shallow bay bottoms or oyster reef substrate preferred, also nearshore artificial reefs
Spanish mackerel, cobia, and king mackerel	juvenile	South Atlantic and Mid-Atlantic Bights			Sandy shoals of capes and offshore bars, high profile rock bottoms and barrier island oceanside waters from surf zone to shelf break, but from the Gulf Stream shoreward
Spanish mackerel, cobia, and king mackerel	adult	South Atlantic and Mid-Atlantic Bights			Sandy shoals of capes and offshore bars, high profile rock bottoms and barrier island oceanside waters from surf zone to shelf break, but from the Gulf Stream shoreward
Golden crab	juvenile	<b>Chesapeake Bay to the south through the Florida Straight (and into the Gulf of Mexico)</b>	<b>290 - 570</b>		<b>Continental slope in flat areas of foraminifera ooze, on distinct mounds of dead coral, ripple habitat, dunes, black pebble habitat, low outcrop, and soft bioturbated habitat</b>

<u>Species</u>	<u>Life Stage</u>	<u>Geographic Area of EFH</u>	<u>Depth (meters)</u>	<u>Seasonal Occurrence</u>	<u>EFH Description</u>
Golden crab	adult	Chesapeake Bay to the south through the Florida Straight (and into the Gulf of Mexico)	290 - 570		Continental slope in flat areas of foraminifera ooze, on distinct mounds of dead coral, ripple habitat, dunes, black pebble habitat, low outcrop, and soft bioturbated habitat
Barndoor skate	juvenile	Eastern GOME, GB, Southern NE, Mid-Atlantic Bight to Hudson Canyon	10 - 750, mostly < 150		Bottom habitats with mud, gravel, and sand substrates
Barndoor skate	adult	Eastern GOME, GB, Southern NE, Mid-Atlantic Bight to Hudson Canyon	10 - 750, mostly < 150		Bottom habitats with mud, gravel, and sand substrates
Clearnose skate	juvenile	GOME, along shelf to Cape Hatteras, NC; includes the estuaries from Hudson River/Raritan Bay south to the Chesapeake Bay mainstem	0 – 500, mostly < 111		Bottom habitats with substrate of soft bottom along continental shelf and rocky or gravelly bottom
Clearnose skate	adult	GOME, along shelf to Cape Hatteras, NC; includes the estuaries from Hudson River/Raritan Bay south to the Chesapeake Bay mainstem	0 – 500, mostly < 111		Bottom habitats with substrate of soft bottom along continental shelf and rocky or gravelly bottom
Little skate	juvenile	GB through Mid-Atlantic Bight to Cape Hatteras, NC; includes the estuaries from Buzzards Bay south to the Chesapeake Bay mainstem	0 - 137, mostly 73 - 91		Bottom habitats with sandy or gravelly substrate or mud
Little skate	adult	GB through Mid-Atlantic Bight to Cape Hatteras, NC; includes the estuaries from Buzzards Bay south to the Chesapeake Bay mainstem	0 - 137, mostly 73 - 91		Bottom habitats with sandy or gravelly substrate or mud
Rosette skate	juvenile	Nantucket shoals and southern edge of GB to Cape Hatteras, NC	33 - 530, mostly 74 - 274		Bottom habitats with soft substrate, including sand/mud bottoms, mud with echinoid and ophiuroid fragments, and shell and pteropod ooze
Rosette skate	adult	Nantucket shoals and southern edge of GB to Cape Hatteras, NC	33 - 530, mostly 74 - 274		Bottom habitats with soft substrate, including sand/mud bottoms, mud with echinoid and ophiuroid fragments, and shell and pteropod ooze
Smooth skate	juvenile	Offshore banks of GOME	31 – 874, mostly 110 - 457		Bottom habitats with a substrate of soft mud (silt and clay), sand, broken shells, gravel and pebbles
Smooth skate	adult	Offshore banks of GOME	31 – 874, mostly 110 - 457		Bottom habitats with a substrate of soft mud (silt and clay), sand, broken shells, gravel and pebbles

<u>Species</u>	<u>Life Stage</u>	<u>Geographic Area of EFH</u>	<u>Depth (meters)</u>	<u>Seasonal Occurrence</u>	<u>EFH Description</u>
Thorny skate	juvenile	GOME and GB	18 - 2000, mostly 111 - 366		Bottom habitats with a substrate of sand, gravel, broken shell, pebbles, and soft mud
Thorny skate	adult	GOME and GB	18 - 2000, mostly 111 - 366		Bottom habitats with a substrate of sand, gravel, broken shell, pebbles, and soft mud
Winter skate	juvenile	Cape Cod Bay, GB, southern NE shelf through Mid-Atlantic Bight to North Carolina; includes the estuaries from Buzzards Bay south to the Chesapeake Bay mainstem	0 - 371, mostly < 111		Bottom habitats with substrate of sand and gravel or mud
Winter skate	adult	Cape Cod Bay, GB southern NE shelf through Mid-Atlantic Bight to North Carolina; includes the estuaries from Buzzards Bay south to the Chesapeake Bay mainstem	0 - 371, mostly < 111		Bottom habitats with substrate of sand and gravel or mud

Mixed or Unknown Species

<u>Species</u>	<u>Life Stage</u>	<u>Geographic Area of EFH</u>	<u>Depth</u>	<u>Seasonal Occurrence</u>	<u>EFH Description</u>
White hake	juvenile	GOME, southern edge of GB, southern NE to middle Atlantic and the following estuaries: Passamaquoddy Bay to Great Bay; Mass. Bay to Cape Cod Bay	5 - 225	May to September	Pelagic stage - pelagic waters; demersal stage - bottom habitat with seagrass beds or substrate of mud or fine grained sand