UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
PROGRAM PLANNING AND INTEGRATION
Silver Spring, Maryland 20910

APR 13 2011

To All Interested Government Agencies and Public Groups:

Under the National Environmental Policy Act, an environmental review has been performed on the following action.

TITLE: Framework Adjustment 45 (FW 45) to the Northeast Multispecies Fishery Management Plan (FMP), RIN: 0648-BA27

LOCATION: Exclusive economic zone off the East Coast of the United States

SUMMARY: This action incorporates information from recent stock assessments to update the status determination criteria for pollock, extend the rebuilding program for Georges Bank yellowtail flounder, and specify annual catch limits for several stocks. In addition, this action eliminates unnecessary closure areas applicable to scallop vessels, maintains existing allocations of yellowtail flounder bycatch to the scallop fishery, delays the responsibility of the fishing industry to pay for dockside monitoring coverage through 2012, redistributes the fishing history of canceled permits to all remaining limited access NE multispecies permits for the purposes of calculating a sector's yearly allocation of each stock, approves the creation of new sectors, refines trip limits and area access for handgear vessels, revises monitoring requirements, and implements a spawning closure area to protect Gulf of Maine cod. Through emergency authority, this action also increases the 2011 Georges Bank yellowtail flounder catch limit based on increased flexibility allowed under the International Fisheries Agreement Clarification Act. These measures largely build upon existing measures and analyses, and are expected to continue efforts to rebuild overfished stocks, minimize costs to industry, and increase the economic efficiency of vessel operations.

RESPONSIBLE
OFFICIAL: Patricia A. Kurkul
Regional Administrator
National Marine Fisheries Service, National Oceanic and Atmospheric Administration (NOAA)
55 Great Republic Drive
Gloucester, MA 01930
(978) 281-9200

The environmental review process led us to conclude that this action will not have a significant impact on the environment. Therefore, an environmental impact statement was not prepared. A copy of the finding of no significant impact (FONSI), including the environmental assessment, is enclosed for your information.

Although NOAA is not soliciting comments on this completed EA/FONSI, we will consider any comments submitted that would assist us in preparing future NEPA documents. Please submit any written comments to the Responsible Official named above.

Sincerely,

Paul N. Doremus, Ph. D.
NOAA NEPA Coordinator

Enclosure

Framework Adjustment 45 to the Northeast Multispecies Fishery Management Plan
Environmental Assessment
Addendum

April 2011

The following changes are made to the Framework Adjustment 45 (FW 45) Environmental Assessment (EA) prepared by the New England Fishery Management Council (Council) and submitted to the National Marine Fisheries Service on January 21, 2011. The information and analysis contained in this addendum resulted from the need to further inform decision makers of impacts to Atlantic sturgeon and loggerhead sea turtles resulting from this action based on a public comment received on the proposed rule to implement this action that identified deficiencies in the FW 45 EA. Therefore, the additional information in this addendum was considered in conjunction with the information and analysis contained in the FW 45 EA in making the determination that this action will not have a significant impact on the quality of the human environment. This addendum is incorporated as a separate document to distinguish this new information from the information that was available to the Council when it adopted final management measures for this action.

1. For Section 7.4, substitute the introductory paragraph for this section with the following text: "There are numerous protected species that inhabit the environment within the Northeast Multispecies FMP management unit, and that, therefore, potentially occur in the operations area of the fishery. These species are afforded protection under the Endangered Species Act of 1973 (ESA; i.e., for those designated as threatened or endangered) and/or the Marine Mammal Protection Act of 1972 (MMPA), and are under NMFS' jurisdiction. As listed in Table 4.4.1-1, 13 marine mammal, sea turtle, and fish species are classified as endangered or threatened under the ESA; the remaining species in Table 4.4.1-1 are protected by the MMPA and are known to interact with the Northeast multispecies fishery. Non ESA-listed species protected by the MMPA that utilize this environment and have no documented interaction with the Northeast multispecies fishery will not be discussed in this statement."

2. For Section 7.4.1, replace the existing text with the following updated text:
"Table 29A lists the species, protected either by the ESA, the MMPA, or both, that may be found in the environment that would be utilized by the fishery. Table 29A also includes two candidate fish species and one proposed fish species (species being considered for listing as an endangered or threatened species), as identified under the ESA.

Candidate species are those petitioned species that are actively being considered for listing as endangered or threatened under the ESA, as well as those species for which NMFS has initiated an ESA status review that it has announced in the *Federal Register*. Atlantic sturgeon, Atlantic bluefin tuna, and cusk are known to occur within the action area of the Northeast multispecies fishery and have documented interactions with types of gear used in the Northeast multispecies fishery.

Table 29A
Species Protected Under the Endangered Species Act and/or Marine Mammal Protection Act that May Occur in the Operations Area for

the Fishing Year (FY) 2011 Northeast Multispecies Fishery[a]	
Species	**Status**
Cetaceans	
North Atlantic right whale (*Eubalaena glacialis*)	Endangered
Humpback whale (*Megaptera novaeangliae*)	Endangered
Fin whale (*Balaenoptera physalus*)	Endangered
Sei whale (*Balaenoptera borealis*)	Endangered
Blue whale (*Balaenoptera musculus*)	Endangered
Sperm whale (*Physeter macrocephalus*	Endangered
Minke whale (*Balaenoptera acutorostrata*)	Protected
Pilot whale (*Globicephala spp*.)	Protected
Risso's dolphin (*Grampus griseus*)	Protected
Atlantic white-sided dolphin (*Lagenorhynchus acutus*)	Protected
Common dolphin (*Delphinus delphis*)	Protected
Spotted dolphin (*Stenella frontalis*)	Protected
Bottlenose dolphin (*Tursiops truncatus*)[b]	Protected
Harbor porpoise (*Phocoena phocoena*)	Protected
Sea Turtles	
Leatherback sea turtle (*Dermochelys coriacea*)	Endangered
Kemp's ridley sea turtle (*Lepidochelys kempii*)	Endangered
Green sea turtle (*Chelonia mydas*)	Endangered[c]
Loggerhead sea turtle (*Caretta caretta*)	Threatened
Hawksbill sea turtle (*Eretmochelys imbricate*)	Endangered
Fish	
Shortnose sturgeon (*Acipenser brevirostrum*)	Endangered
Atlantic salmon (*Salmo salar*)	Endangered
Cusk *(Brosme brosme)*	Candidate
Atlantic sturgeon *(Acipenser oxyrinchus)*	Proposed
Atlantic bluefin tuna (*Thunnus thynnus*)	Candidate
Pinnipeds	
Harbor seal (*Phoca vitulina*)	Protected
Gray seal (*Halichoerus grypus*)	Protected
Harp seal (*Phoca groenlandicus*)	Protected
Hooded seal (*Cystophora cristata*)	Protected

Notes:

[a] MMPA-listed species occurring on this list are only those species that have a history of interaction with similar gear types within the action area of the Northeast Multispecies Fishery, as defined in the 2010 List of Fisheries.

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

[c] Green turtles in U.S. waters are listed as threatened except for the Florida breeding

population which is listed as endangered. Due to the inability to distinguish between these populations away from the nesting beach, green turtles are considered endangered wherever they occur in U.S. waters.

At this time, Atlantic sturgeon has been proposed for listing under the ESA. A status review for Atlantic sturgeon was completed in 2007. NMFS has concluded that the U.S. Atlantic sturgeon spawning populations comprise five Distinct Population Segments (DPSs) (ASSRT, 2007). The Gulf of Maine DPS of Atlantic sturgeon is proposed to be listed as threatened, and the New York Bight, Chesapeake Bay, Carolina, and South Atlantic DPSs of Atlantic sturgeon are proposed as endangered. On October 6, 2010 (75 FR 61872 and 75 FR 61904), NMFS proposed listing five populations of Atlantic sturgeon along the U.S. East Coast as either threatened or endangered species. A final listing rule is expected by October 6, 2011.

Comprehensive information on current abundance of Atlantic sturgeon is lacking for all of the spawning rivers (ASSRT, 2007). Based on data through 1998, an estimate of 870 spawning adults per year was developed for the Hudson River (Kahnle et al., 2007), and an estimate of 343 spawning adults per year is available for the Altamaha River, GA, based on data collected in 2004-2005 (Schueller and Peterson, 2006). Data collected from the Hudson River and Altamaha River studies cannot be used to estimate the total number of adults in either subpopulation, since mature Atlantic sturgeon may not spawn every year, and it is unclear to what extent mature fish in a non-spawning condition occur on the spawning grounds. Nevertheless, since the Hudson and Altamaha Rivers are presumed to have the healthiest Atlantic sturgeon subpopulations within the United States, other U.S. subpopulations are predicted to have fewer spawning adults than either the Hudson or the Altamaha (ASSRT, 2007). It is also important to note that the estimates above represent only a fraction of the total population size as spawning adults comprise only a portion of the total population (e.g., this estimate does not include subadults and early life stages).

Atlantic sturgeon from any of the five DPSs could occur in areas where the Northeast multispecies fishery operates, and the species has been captured in gear targeting multispecies (Stein et al. 2004a, ASMFC 2007). The proposed action to modify the Northeast multispecies fishery is expected to be completed before the anticipated date of a final listing determination for Atlantic sturgeon. However, the conference provisions of the ESA apply to actions proposed to be taken by Federal agencies once a species is proposed for listing (50 CFR 402.10). Therefore, this EA includes information on the anticipated effects of the action on Atlantic sturgeon.

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

3. For Section 7.4.2.1, add the following text after the second paragraph in this section:

“The loggerhead sea turtle is listed as threatened throughout its worldwide range. On July 12, 2007, NMFS and USFWS (Services) received a petition from Center for Biological Diversity and Turtle Island Restoration Network to list the ‘‘North Pacific populations of loggerhead sea turtle’’ as an endangered species under the ESA. In addition, on November 15, 2007, the Services received a petition from Center for Biological Diversity and Oceana to list the ‘‘Western North Atlantic populations of loggerhead sea turtle’’ as an endangered species under the ESA. NMFS published notices in the *Federal Register*, concluding that the petitions presented substantial scientific information indicating that the petitioned actions may be warranted (72 FR 64585, November 16, 2007; 73 FR 11849; March 5, 2008). In 2008, a Biological Review Team (BRT) was established to assess the global population structure to determine whether DPSs exist and, if so, the status of each DPS. The BRT identified nine loggerhead DPSs, distributed globally (Conant et al. 2009). On March 16, 2010, the Services announced 12-month findings on the petitions to list the North Pacific populations and the Northwest Atlantic populations of the loggerhead sea turtle as DPSs with endangered status and published a proposed rule to designate nine loggerhead DPSs worldwide, seven as endangered (North Pacific Ocean DPS, South Pacific Ocean DPS, Northwest Atlantic Ocean DPS, Northeast Atlantic Ocean DPS, Mediterranean Sea DPS, North Indian Ocean DPS, and Southeast Indo-Pacific Ocean DPS) and two as threatened (Southwest Indian Ocean DPS and South Atlantic Ocean DPS). On March 22, 2011, the timeline for the final determination was extended for six months until September 16, 2011 (76 FR 15932).”

4. Add new section 7.4.2.5 titled Atlantic Sturgeon DPSs, along with the following text:
"Atlantic sturgeon is an anadromous species that spawns in relatively low salinity, river environments, but spends most of its life in the marine and estuarine environments from Labrador, Canada to the Saint Johns River, Florida (Holland and Yelverton 1973, Dovel and Berggen 1983, Waldman et al. 1996, Kynard and Horgan 2002, Dadswell 2006, ASSRT 2007). Tracking and tagging studies have shown that subadult and adult Atlantic sturgeon that originate from different rivers mix within the marine environment, utilizing ocean and estuarine waters for life functions such as foraging and overwintering (Stein et al. 2004a, Dadswell 2006, ASSRT 2007, Laney et al. 2007, Dunton et al. 2010). Fishery-dependent data as well as fishery-independent data demonstrate that Atlantic sturgeon use relatively shallow inshore areas of the continental shelf; primarily waters less than 50 m (Stein et al. 2004b, ASMFC TC 2007, Dunton et al. 2010). The data also suggest regional differences in Atlantic sturgeon depth distribution with sturgeon observed in waters primarily less than 20 m in the Mid-Atlantic Bight and in deeper waters in the Gulf of Maine (Stein et al. 2004b, ASMFC TC 2007, Dunton et al. 2010). As noted in Section 7.4.1, information on population sizes for each Atlantic sturgeon DPS is very limited. Based on the best available information, NMFS has concluded that bycatch, vessel strikes, water quality and water availability, dams, lack of regulatory mechanisms for protecting the fish, and dredging are the most significant threats to Atlantic sturgeon."

5. Delete from section 7.4.3 the three sentences referring to Atlantic sturgeon.

6. For section 7.4.4, add the following text at the end of this section:
"Atlantic sturgeon are known to be captured in sink gillnet, drift gillnet, and otter trawl gear (Stein et al. 2004a, ASMFC TC 2007). Of these gear types, sink gillnet gear poses the greatest known risk of mortality for bycaught sturgeon (ASMFC TC 2007). Sturgeon deaths were rarely

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

In an updated analysis, the Northeast Fisheries Science Center (NEFSC) was able to use data from the NEFOP database to provide updated estimates for the 2006 to 2010 timeframe. Data were limited by observer coverage to waters outside the coastal boundary (fzone>0) and north of Cape Hatteras, NC. Sturgeon included in the data set were those identified by federal observers as Atlantic sturgeon, as well as those categorized as unknown sturgeon. At this time, data were limited to information collected by the NEFOP. Limited data collected in the At-Sea Monitoring Program were not included, although preliminary views suggest the incidence of sturgeon encounters was low. The frequency of encounters in the observer programs were expanded by total landings recorded in fishing vessel trip reports (VTR) rather than dealer data, since the dealer data does not include information on mesh sizes. Generally, the VTR data represent greater than 90 percent of total landings. Data were combined into division (identified as the first 2 digits in the statistical area codes), quarter, gear type (otter trawl (fish) and sink gillnet) and mesh categories. Mesh sizes were categorized for otter trawl as small (<5.5”) or large (greater than or equal to 5.5”) and small (<5.5”), large (between 5.5” and 8”) and extra large (>8”) in sink gillnets.

For each cell (year, division, quarter, gear, mesh), the ratio of sturgeon count to total kept weight of all species was calculated. This ratio was then applied to total weight in the cell recorded in the VTR data. No imputation was done at this time to estimate sturgeon in missing cells. Totals are presented for encounters as well as encounters where the observer recorded the fish as dead (a subset of total encounters). The two categories represent bounds of possible sturgeon mortalities. The results should not be considered definitive estimates of Atlantic sturgeon losses until further work can be done to account for missing cells. The NEFSC is undertaking additional analyses to account for the missing cells, and this will be available this fall.

Below, the data for encounter rates by month and statistical area for each gear strata are presented (Tables 31A – 31D). The expanded estimates of all sturgeon by quarter, division and year are in Tables 31E and 31F. Total estimated dead sturgeon are in Tables 31G and 31H. Composite estimates by year and gear type are provided in Table 31I. Estimated total annual takes ranged from 1536 to 3221; estimated annual mortalities ranged from 37 to 376 sturgeon.

Table 31A. Encounters of Atlantic Sturgeon and Unknown Sturgeon By Month, Area and Mesh Size In Otter Trawl Gear, 2006-2010 Combined.

Large mesh otter trawl

area	month 1	2	3	4	5	6	7	8	9	10	11	12
464	0		0		0					0	0	
465	0		0	0		0	0				0	0
511	0		0	0								0
512	0		0	0	0	0	0	0	0	0	0	0
513	0	0	0	0	0	0	0	0	0	0	0	0
514	3	0	0	0	0	0	0	0	0	0	0	0
515	0	0	0	0	0	0	0	0	0	0	0	0
521	0	0	0	0	0	0	0	0	0	0	0	0
522	0	0			0			0	0	0	0	
525				0	0			0				
526	0	0	0	0	0	0	0	0	0	0	0	0
537	0	0	0	0	0	0	0	0	0	0	0	0
538				0	0	0	0	0	0	0	0	
539	0	0	0	0	0	0	0	0	0	0	0	0
562					0			0				
611	0	0	0	0	0	0	0	0	0	0	0	0
612		**1**		0	**25**	**5**	**5**	0	**33**	**1**	0	0
613	0	0	0	**1**	0	0		0	0	0	0	0
614				**1**	0	0	0		0			
615	0		0		0	0	0	0	0		0	0
616	0	0	0	0						0	0	0
621	0	0	0		0	**2**	0	0	**18**	0	0	0
622	0	0	0	0							0	0
623			0	0								
625							0			0	0	0
626	0	0	0	0							0	0
627				0								
631	0	**2**										0
632		0										
635	0											0

small mesh otter trawl

area	month 1	2	3	4	5	6	7	8	9	10	11	12
465									0			
512							0		0		0	
513	0	0				0	0	0	0		0	
514	0	0	0				0	0	0	0	1	0
515	0		0			0	0		0		0	
521	0	0	0				0	0	0	0	0	0
522						0	0	0	0	0		
525	0	0	0	0	0	0	0	0	0	0	0	0
526	0	0	0				0	0	0	0	0	0
533				0								
534									0			
537	0	0	0	0	0	**1**	**1**	0	0	0	0	0
538				0	0	0	0	0	0	0		
539	0	0	0	0	0	1	0	0	0	0	0	0
562	0	0	0		0	0	0	0	0	0	0	0
611	0	0		0	1	0	0	0	0	0	0	0
612	0		0	**6**	**14**	**13**	0	0	**1**	0	0	0
613	0	0	0	0	0	0	**1**	0	0	**1**	**4**	0
614					**1**	**3**	0	0	0	0	0	
615	0	0	0	0	0	0	0	0	0	0	0	0
616	0	0	0	0	0	0	0	0	0	0	0	0
621	0	0	0	0	**3**	**1**	**1**	0	3	9	2	0
622	0	0	0	0	0	0	0	0	0	0	0	0
623	0	0	0	0				0	0	0	0	0
625	4		0			0				**1**	**12**	**2**
626	0	0	0	0		0	0	0	0	0	0	0
627	0	0		0			0	0	0	0		
631	**2**	**2**	**22**	**7**						**1**	**2**	**3**
632	0			0		0	0	0	0	0	0	0
633								0				
635	**10**	**4**	**8**	**1**						0	0	0
636	0	0		0		0	0	0	0	0	0	0

Table 31B. Encounters of Atlantic sturgeon and Unknown Sturgeon By Month and Area In Small Mesh Sink Gillnet Gear, 2006-2010 Combined.

small mesh sink gillnet

	month											
area	1	2	3	4	5	6	7	8	9	10	11	12
464			0									
513								0	0	0		
514	0	0	0				0	0				
515			0									
521	0	0	0		0	0	0	0	0	0	0	**1**
522	0											
526					0							
537	0		0	0	0				0		0	
539					**1**							
611					0		0				0	
612				0	0	0	0	**1**	**1**	0		
613				0		0	0	0	0	0	0	
614				**5**	0	0		**1**	0	0	0	
615						0			0	0		
621			0	0	0			0	0	0	0	
625		0	0	**1**	0	**1**	0	0	0	**1**	0	0
626			0	0								
631	**1**	**6**	**8**	**2**	0				0	0	0	0
632				0								
635	**2**	0	**12**	**2**	0	0	0	0	0	0	**1**	**1**
636	0	0	0	0							0	
637	0											
638				0								

Table 31C. Encounters of Atlantic Sturgeon and Unknown Sturgeon By Month and Area In Large Mesh Sink Gillnet Gear, 2006-2010 Combined.

large mesh sink gillnet

	month											
area	1	2	3	4	5	6	7	8	9	10	11	12
464		0	0						0			0
513	0		0	0	0	0	0	0	0	0	0	0
514	**6**	**5**	**2**	0	**1**	0	0	0	0	0	0	**2**
515	0	0	0	0	0	0	0	0	0	0	0	0
521	0	0		0	0	**1**	0	0	0	0	0	0
522		0			0							
525											0	
537	0	0		0	0		0					
538					0	0			0		0	
539		0		0	**4**	0	0	0	0	0	0	0
611				0	0			0			0	
612				**5**	0	0	**5**	**9**	0	0	**2**	0
613		0		0	4		0	0	0	0	0	0
614				**9**	**5**	**3**	**4**	**1**	0	0	0	0
615					0				0	0	0	0
621	0		0	**4**	0						0	0
625	**2**	**1**	0	**3**	**7**	**1**			0		**2**	**2**
631	**4**	**4**	0	0	**1**				0	0	0	**4**
632		0										
635	0	**1**	0	0	0	0	0	0	0	0	0	0
636	0	0	0	0								

Table 31D. Encounters of Atlantic Sturgeon and Unknown Sturgeon By Month and Area In Extra Large Mesh Sink Gillnet Gear, 2006-2010 Combined.

X-large sink gillnet

	month											
area	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
464												0
512										0		
513				0		0	0	0	0	0	0	0
514	0	0	0		0	0	0	0	1	0	0	0
515					0		0		0	0	0	0
521	**1**			0	0	0	**1**	0	**1**	**1**	**2**	**1**
522				0			0					0
526		0	0	0	0							
537	**1**	0	**1**	**1**	**5**	0	0	0	0	**1**	0	**1**
538					0							
539	0	0		0	**4**	0	0		0	0	0	0
611					0	**1**						
612	**5**	0	0	0	**1**	**3**	0			0	0	**1**
613	0	0		0	**2**	**1**		0	0	0	**7**	0
614	0			0	**5**	0					0	
615	0	0	0	0	**2**	**2**	0			0	0	**1**
616	0		0	0	0	0				0	0	0
621		0	0	0	**2**						0	
622					0							
625		**2**	**2**	**2**	**4**	0					**1**	**3**
626	0	0	0	**1**	**5**						0	0
631	**2**	**6**	**1**	**5**						0	0	**2**
635	0		**58**	**69**								

Table 31E. All Atlantic Sturgeon Encounters Expanded By VTR Landings By Division, Mesh Size and Year for Sink Gillnets (2006 Across Top Row to 2010 Across Bottom Row).

small mesh sink gillnet
All sturgeon
expanded to VTR landings

division	1	2	3	4	
51					
52	0				
53			0		
61		157	9	0	
62		4	0	9	
63	0	14	0	6	198
51	0	0	0	0	
52			0	0	
53		12	0	0	
61	0	0	24	0	
62	0	15	0	0	
63	83	0	0	0	135
51	0	0	0	0	
52	0			0	
53		0	0	0	
61	0	0	0	0	
62	0	0	0	0	
63	0	0	0	0	0
51	0		0		
52	0		0		
53	0	0			
61	0	0	0	0	
62	0	0	0	0	
63	98	0	0	0	98
51			0		
52					
53				0	
61			0	0	
62		0	0	0	
63	81	13	0	0	94

large mesh sink gillnet
All sturgeon
expanded to VTR landings

division	1	2	3	4	
51	54	0	0	0	
52	0	0	0	0	
53		11	0	0	
61		638	72	0	
62	206	114	0	20	
63	0	0		3	1117
51	29	0	0	0	
52	0	0	0	0	
53	0	27	0	0	
61		0	184	87	
62	0	15		0	
63	34	17		24	416
51	47	0	0	65	
52	0	79	0	0	
53	0	17	0	0	
61		0	0		
62	189	22		20	
63	17	0	0	22	478
51	34	0	0	0	
52	0	0	0	0	
53		0	0	0	
61		0	453	0	
62		193		22	
63	0	0		0	702
51	39	12	0	0	
52	0	0	0	0	
53		0	0	0	
61	0	46	0	0	
62	0	24			
63	0	0	0	0	121

x-large mesh sink gillnet
All sturgeon
expanded to VTR landings

division	1	2	3	4	
51	0	0	63	0	
52	0	0	22	44	
53	0	14	0	0	
61	17	62	0	0	
62	0	54		0	
63	13	10			299
51	0	0	0	0	
52	0	0	23	14	
53	0	47	0	14	
61	0	131	0	0	
62	41	128		28	
63	51	17			493
51	0	0	0	0	
52	0	0	0	0	
53	10	0	0	0	
61	0	67	0	84	
62	0	14		0	
63	15	11		0	200
51	0	0	0	0	
52	0	0	0	13	
53	10	104	0	40	
61	40	66	0	136	
62	9	8		26	
63	18	158			628
51	0	0	0	0	
52	12	0	0		
53	0	0			
61	28	66	0	0	
62	0	6			
63		20			132

Table 31F. All Atlantic Sturgeon Encounters Expanded By VTR Landings By Division, Mesh Size, and Year for Otter Trawls (2006 Across Top Row to 2010 Across Bottom Row).

small mesh otter trawl
All sturgeon
Expanded by ratio to VTR landings

	1	**2**	**3**	**4**	
51	0		0	0	
52	0	0	0	0	
53	0	0	0	0	
56					
61	0	996	0	184	
62	29	0	8	309	
63	20	0	0	0	1546

51	0		0	0	
52	0	0	0	0	
53	0	0	0	0	
56					
61	0	0	0	0	
62	0	0	0	449	
63	47			40	536

51	0	0	0	0	
52	0	0	0	0	
53	0	0	0	0	
56					
61	0	279	80	0	
62	0	21	0	19	
63	19		0	36	454

51	0		0	22	
52	0	0	0	0	
53	0	0	17	0	
56					
61	0	336	9	0	
62	0	9	48	24	
63	435	0	0	6	907

51	0		0	0	
52	0	0	0	0	
53	0	39	0	0	
56					
61	0	317	0	0	
62	0	0	0	0	
63	41	36	0	0	433

Large mesh otter trawl
All sturgeon
Expanded by ratio to VTR landings

	1	**2**	**3**	**4**	
51	33				
52	0	0	0	0	
53	0	0	0	0	
61		0	0		
62	0	28	0	0	
63	0	0	0		61

51	19	0	0	0	
52	0	0	0	0	
53	0	0	0	0	
56					
61	0	0	0	0	
62	0	0	252	0	
63	0			0	271

51		0		0	
52	0	0	0	0	
53	0	0	0	0	
61	44	218	108	22	
62	0	12	0	0	
63	0	0	0	0	404

51	0	0		0	
52	0	0	0	0	
53	0	0	0	0	
56		0		0	
61	0	113	23	0	
62	0	0	7	0	
63	0				143

51	0	0	0	0	
52	0	0	0	0	
53	0	0	0	0	
56		0	0		
61	0	437	601	0	
62	0	0	0	0	
63	172			0	1211

Table 31G. Dead Atlantic Sturgeon Encounters Expanded By VTR Landings By Division, Mesh Size, and Year for Sink Gillnets (2006 Across Top Row to 2010 Across Bottom Row).

small mesh sink gillnet
dead sturgeon expanded by VTR

Year	Division	1	2	3	4	Total
2006	51					
	52	0				
	53			0		
	61		0	0	0	
	62		0	0	0	
	63	0	0	0	0	0
2007	51	0		0		
	52	0	0	0	1	
	53	0	0		0	
	61		0	0	0	
	62	0	0		0	
	63	0	0		0	1
2008	51	0		0		
	52	0	0	0	0	
	53		0			
	61		0	0		
	62	0	0		0	
	63	0	0	0	0	0
2009	51	0		0	0	
	52	0		0		
	53		0			
	61		0	0	0	
	62		0		0	
	63	0	0		0	0
2010	51			0	0	
	52			0	0	
	53					
	61		0	0	0	
	62		0			
	63	0	0	0	0	0

large mesh sink gillnet
dead sturgeon expanded

Year	Division	1	2	3	4	Total
2006	51	0	0	0	0	
	52	0	0	0	0	
	53		0	0	0	
	61	0	28	0	0	
	62	0	38	0	0	
	63	0	0		0	66
2007	51	15	0	0	0	
	52	0	0	0	0	
	53	0	0	0	0	
	61		0	20	0	
	62	0	0		0	
	63	0	0		0	35
2008	51	16	0	0	0	
	52	0	79	0	0	
	53	0	0	0	0	
	61		0	0		
	62	0	0		0	
	63	6	0	0	0	100
2009	51	0	0	0	0	
	52	0	0	0	0	
	53		0	0	0	
	61		0	0	0	
	62		0		0	
	63	0	0		0	0
2010	51	0	0	0	0	
	52	0	0	0	0	
	53		0	0	0	
	61	0	0	0	0	
	62	0	24			
	63	0	0	0	0	24

x-large mesh sink gillnet
dead sturgeon expanded

Year	Division	1	2	3	4	Total
2006	51	0	0	63	0	
	52	0	0	22	44	
	53	0	0	0	0	
	61	17	31	0	0	
	62	0	0	0	0	
	63	0	3		0	180
2007	51	0	0	0	0	
	52	0	0	0	0	
	53	0	31	0	14	
	61	0	112		0	
	62	0	107		9	
	63	0	0		0	273
2008	51	0	0	0	0	
	52	0	0	0	0	
	53	0	0	0	0	
	61	0	67	0	42	
	62	0	14		0	
	63	4	4		0	131
2009	51	0	0	0	0	
	52	0	0	0	13	
	53	10	69	0	0	
	61	0	33	0	82	
	62	0	8		0	
	63	0	11		0	226
2010	51	0	0	0	0	
	52	0	0	0	0	
	53	0	0			
	61	0	0	0	0	
	62	0	6			
	63		0			6

Table 31H. Dead Atlantic Sturgeon Encounters Expanded By VTR Landings By Division, Mesh Size, and Year for Otter Trawl (2006 Across Top Row to 2010 Across Bottom Row).

small mesh otter trawl
Expanded by ratio to VTR landings
dead sturgeon expanded

Year	Division	1	2	3	4	Total
2006	51	0		0	0	
	52	0	0	0	0	
	53	0	0	0	0	
	56					
	61	0	0	0	61	
	62	29	0	0	0	
	63	0	0	0	0	90
2007	51	0		0	0	
	52	0	0	0	0	
	53	0	0	0	0	
	56					
	61	0	0	0	0	
	62	0	0	0	0	
	63	4			0	4
2008	51	0	0	0	0	
	52	0	0	0	0	
	53	0	0	0	0	
	56					
	61	0	0	0	0	
	62	0	0	0	0	
	63	0		0	0	0
2009	51	0		0	0	
	52	0	0	0	0	
	53	0	0	0	0	
	56					
	61	0	0	0	0	
	62	0	0	0	0	
	63	19	0	0	0	19
2010	51	0		0	0	
	52	0	0	0	0	
	53	0	0	0	0	
	56					
	61	0	0	0	0	
	62	0	0	0	0	
	63	7	0	0	0	7

large mesh otter trawl
dead sturgeon expanded
to VTR all kept

Division					Total
51	0	0	0	0	
52	0	0	0	0	
53	0	0	0	0	
61	0	0	0	0	
62	0	0	0	0	
63	0	0	0	0	0
51	0	0	0	0	
52	0	0	0	0	
53	0	0	0	0	
56	0	0	0	0	
61	0	0	0	0	
62	0	0	59	0	
63	0	0	0	0	59
51	0	0	0	0	
52	0	0	0	0	
53	0	0	0	0	
61	0	36	108	0	
62	0	0	0	0	
63	0	0	0	0	145
51	0	0	0	0	
52	0	0	0	0	
53	0	0	0	0	
56	0	0	0	0	
61	0	0	0	0	
62	0	0	0	0	
63	0	0	0	0	0
51	0	0	0	0	
52	0	0	0	0	
53	0	0	0	0	
56	0	0	0	0	
61	0	0	0	0	
62	0	0	0	0	
63	0			0	0

Table 31I. Summary of Atlantic Sturgeon Encounters of All Fish and Total Dead, By Gear Type and Year.

expanded encounters

	sink gillnet	otter trawl	
2006	1614	1606	3221
2007	1044	807	1851
2008	678	857	1536
2009	1428	1050	2478
2010	347	1644	1991

expanded dead encounters

	sink gillnet	otter trawl	
2006	246	90	336
2007	309	63	373
2008	231	145	376
2009	226	19	245
2010	30	7	37

Total

	encounters	dead
2006	3221	336
2007	1851	373
2008	1536	376
2009	2478	245
2010	1991	37

As illustrated above, for the years 2006 through 2010, an average of approximately 2,215 Atlantic sturgeon were taken by commercial fishing vessels using small and large mesh otter trawls and sink gillnets of varying mesh size (small to extra large). Of this number of encounters, there were approximately 273 mortalities (12%). As noted above, the data were provided by quarter (rather than by month given the relatively low frequency of occurrence). The total number of encounters in sink gillnet and otter trawl gear and associated mortalities for quarters 2 and 3 are most relevant for the timeframe of interest for this determination. For sink gillnets, an average of 483 and 192 Atlantic sturgeon were encountered in the 2006 to 2010 timeframe in quarters 2 and 3, respectively. Of these, there were 133 (28%) mortalities in quarter 2 and 21 (11%) mortalities in quarter 3. For otter trawls, an average of 439 and 360 were encountered in quarters 2 and 3, respectively. It was not appropriate to average the number of mortalities over the five year time frame for quarters 2 and 3 given that all mortalities occurred in just two of the five years (2007 and 2008), and these mortalities occurred just in large mesh otter trawl gear (e.g., there were no mortalities in quarters 2 and 3 in small mesh otter trawl gear). It is important to note that the information provided on mortality rates may be an underestimate as the rate of post-release mortality for those reportedly released alive is unknown.

Most fishing activity in the groundfish fishery occurs in the 500 series of statistical areas (i.e., waters North and east of Long Island, including waters off Rhode Island, Massachusetts, New Hampshire, and Maine) and using large-mesh sink gillnet and otter trawl gear, as required in the NE Multispecies FMP. Small mesh gear is deployed to target small-mesh NE multispecies (whiting, offshore hake, red hake), while extra-large mesh gear is typically utilized to target monkfish. Both of these latter fisheries occur in both northern waters and southern waters. As illustrated in Tables 31A – 31I, there are substantially fewer encounters with Atlantic sturgeon in the 500 series of statistical areas than in the 600 series of statistical areas using these gears from 2006 through 2010. For example, out of a total of 1,179 total estimated encounters by both the large-mesh sink gillnet and otter trawl fisheries combined in 2006, 98 total encounters were estimated in northern waters (500 series of statistical areas) compared to 1,081 total encounters estimated in southern waters (500 series of statistical areas). This pattern is observed through 2010 (see Table 31J). This table also illustrates that estimated encounters with Atlantic sturgeon in northern waters in large mesh sink gillnets and otter trawl gears have declined in recent years to nearly half of that estimated in 2006. It's important to note that, while these data should primarily represent estimated encounters in the groundfish fishery, because other fisheries utilize the same gear types and fish in the same area, it is likely that the actual encounters with Atlantic sturgeon by the groundfish fishery are lower than that presented in Table 31J. However, because the NEFOP data available for this analysis did not identify the species targeted, a more precise evaluation of encounters in only the groundfish fishery cannot be specified at this time.

Table 31J. Yearly Atlantic Sturgeon Encounters Expanded by VTR Landings for Northern (500 Series of Statistical Areas) and Southern Waters (600 Series of Statistical Areas) from 2006 Through 2010 for Both Large-Mesh Sink Gillnet and Otter Trawls.

Year	**Northern Waters Encounters**	**Southern Waters Encounters**	**Total Estimated Encounters**
2006	98	1,081	1,179
2007	75	612	687
2008	208	674	882
2009	34	811	845
2010	51	1,281	1,332
Average	93	892	985

Seasonally, more encounters with Atlantic sturgeon are estimated during Quarters 4 and 1 (i.e., October through March) than during Quarters 2 and 3 (i.e., April through September) (see Table 31K), averaging 64 from 2006-2010. Overall, encounters have dropped slightly in recent years during Quarters 4 and 1, but have remained relatively constant, if not declined slightly, in Quarters 2 and 3. Once again, because other fisheries utilize the same gear types and fish in the same area, it is likely that the actual encounters with Atlantic sturgeon by the groundfish fishery are lower than that presented in Table 31K.

Table 31K. Atlantic Sturgeon Encounters Expanded by VTR Landings for Northern (500 Series of Statistical Areas) for Both Large-Mesh Sink Gillnet and Otter Trawls in Each Quarter of the Year.

Year	**Quarters 4 and 1**	**Quarters 2 and 3**	**Total Estimated**

			Encounters
2006	87	11	98
2007	48	27	75
2008	112	96	208
2009	34	0	34
2010	39	12	51
Average	64	29	93

As noted in Section 7.4.1, there are no total population size estimates for any of the 5 Atlantic sturgeon DPSs at this time. However, there are two estimates of spawning adults per year for two river systems (e.g., 870 spawning adults per year for the Hudson River, and 343 spawning adults per year for the Altamaha River). These estimates represent only a fraction of the total population size as Atlantic sturgeon do not appear to spawn every year and additionally, these estimates do not include subadults or early life stages. Between 2006 and 2010, an average of 154 Atlantic sturgeon mortalities occurred in quarters 2 and 3 in all sink gillnet gear (small mesh, large mesh, and extra large mesh), and some mortalities occurred in two years in large mesh otter trawls in these two quarters (36 in 2008; 167 total in 2007 and 2008). This includes mortalities in all areas. When evaluated only for northern waters predominantly fished by the groundfish fishery, mortalities in Quarters 2 and 3 range from 85 in 2006 to 0 in 2008 and 2010. Based on the available information, it is not possible at this time to attribute these mortalities to the DPS(s) from which these fish originated. However, given the migratory nature of subadult and adult Atlantic sturgeon, it is expected that these mortalities represent takes from multiple DPSs. This conclusion is supported by preliminary genetic mixed stock analyses undertaken by Dr. Isaac Wirgin from New York University and Dr. Tim King from the U.S. Geological Survey. These additional data support the conclusion from the earlier bycatch estimate that this fishery may interact with Atlantic sturgeon from now until the time a final listing determination is made for the species. Thus, while the operations of this fishery over the five months between May 1 and early October 2011 will most likely result in adverse impacts to Atlantic sturgeon, the magnitude of that interaction (e.g., up to 154 fish from multiple DPSs) during this short timeframe of interest is not likely to result in jeopardy to the species, thereby obviating the need for a conference as required under Section 7(a)(4) of the ESA. When evaluated only for northern waters predominantly, but not exclusively, fished by the groundfish fishery and for the entire year, yearly mortalities range from 129 in 2006 to 0 in 2008 and 2010."

6. For Section 8.3.1, add the following text above the subheading for Section 8.3.1.1:
"The measures described in Sections 4.1.1 through 4.1.3 are described as potentially resulting in increases in fishing effort. The targeted fish species affected by these measures are pollock, Georges Bank yellowtail flounder, Georges Bank cod, Georges Bank haddock, and white hake. The informal section 7 consultation for this action concluded that any increase in fishing effort as a result of these measures is likely to be minor in comparison to what was considered for the October 2010 Biological Opinion on the NE multispecies fishery. The October 2010 Biological Opinion did not consider effects to Atlantic sturgeon. However, the Stein et al. (2004a) did review sturgeon bycatch in the NE multispecies fishery for 1989-2000, a time period when effort in the NE multispecies fishery was much greater than what was considered for the October 10, 2010, Biological Opinion, or what would occur if effort on pollock, Georges Bank yellowtail flounder, Georges Bank cod, Georges Bank haddock, and white hake were to increase as a result

of FW 45. Stein et al. (2004a) found the bycatch rate of Atlantic sturgeon (reported as pounds of sturgeon catch per pounds of targeted species landed) to be 0.000105 for pollock; 0.000530 for yellowtail flounder; 0.004762 for cod; and 0.000459 for haddock. There was no observed bycatch for vessels targeting white hake. Compared to the target TACs that were available to the groundfish fishery in FY 2004, the FY 2011 annual catch limits (ACLs) are higher for pollock, Georges Bank (GB) cod, and GB haddock, but lower for white hake and GB yellowtail flounder. This suggests that this action would likely result in an overall increase in the bycatch of Atlantic sturgeon by the groundfish fishery, assuming the entire ACL for each stock is caught in FY 2011."

7. For Section 8.3.1.5, add the following text after the first paragraph of this section:
"The U.S./Canada Resource Sharing TAC measure is unlikely to have an impact on Atlantic sturgeon given the area where the fishery operates under this TAC. The yellowtail flounder allocations simply allow scallop vessels to catch more yellowtail flounder before they are forced out of the area. Scallop dredge gear is not known to pose a bycatch risk for Atlantic sturgeon despite many hours of observer coverage for this gear type."

8. For Section 8.3.2, add the following text above the subheading for Section 8.3.2.1:
"The measures described in Section 4.2 (Fishery Program Administration) are administrative in nature and would not impact any of the Atlantic sturgeon DPSs."

9. For Section 8.3.3.1, add the following text to the end of the second paragraph of this section:
"The General Category Scallop Dredge Exemption measures listed in Section 4.3.1 will have no impact on Atlantic sturgeon. There are no reports of Atlantic sturgeon capture in scallop dredge gear in the NMFS Observer database (based on ASMFC TC 2007 and Stein et al. 2004a)."

10. For Section 8.3.3.2, add the following text after the second paragraph under Option 2:
"The Gulf of Maine Cod Spawning Protection Area measures specified in Section 4.3.2 would have no significant impact on Atlantic sturgeon. The Whaleback area is a relatively small area that occurs off of New Hampshire. Reasonably, groundfish vessels displaced from this area would fish as close as possible to the area. A review of the NEFOP database for the years 2001-2010 did not find any records of observed sturgeon bycatch off of New Hampshire. Therefore, even if commercial fishing effort were displaced out of this area in June, it is unlikely that effort would be displaced to areas where sturgeon bycatch was more likely to occur since there are no records of sturgeon bycatch. With respect to recreational fishing gear, Atlantic sturgeon are known to be caught (including snagged) on recreational fishing gear. There are no studies of post-release mortality, but fish are typically released promptly with limited apparent injuries. The area around the Whaleback area is not known to be an Atlantic sturgeon aggregation area. Therefore, even if recreational fishing gear was displaced from the Whaleback area, it is unlikely that the displaced effort would have a significant impact on Atlantic sturgeon."

11. For Section 8.3.3.3, add the following text above the description of Options 3, 4, and 5:
"The handgear permit management measures specified in Section 4.3.3 are unlikely to have a significant impact on Atlantic sturgeon. The measures would exempt Handgear A vessels (bottom longline/hook-and-line fishery) from portions of the GOM Rolling Closure Areas. The GOM Rolling Closure Areas occur from waters off of Cape Cod and north during the (rolling)

timespans of March 1-June 30, and October 1- November 30. As described above, a review of the NEFOP database for 2001-2010 found no records of observed bycatch in waters off of Maine or New Hampshire. Bycatch did occur in waters off of Massachusetts. However, while handgear used in recreational fisheries is known to capture (snag) Atlantic sturgeon, bycatch and bycatch mortality on hook gear is very low according to the available information."

12. For Section 8.7.5, add the following text after the paragraph under the subheading "Protected Resources" on page 291:
"One of the factors cited in NMFS' proposed listing for the five DPSs of Atlantic sturgeon is bycatch. The ASMFC analysis concluded that to remain stable or grow, populations of Atlantic sturgeon can sustain only very low anthropogenic sources of mortality. It is apparent, therefore, that should the proposed listing be finalized, reductions in bycatch mortality may be required in order to recover Atlantic sturgeon. Final listing determinations for the Atlantic sturgeon DPSs are expected by October 6, 2011. If the final listing rules are published, they will likely become effective 30 days after publication. With the publication of a final listing rule, a Section 7 consultation would be required, as the analysis conducted by the ASMFC and Stein et al (2004a) and an updated evaluation of NEFOP data from 2006 through 2010 (see Section 7.4.4) demonstrate that the multispecies fishery may affect Atlantic sturgeon. Through that consultation process, the effects would be estimated and analyzed.

At this point, because Atlantic sturgeon is a proposed species under the ESA, the question is whether the proposed action is likely to jeopardize the continued existence of the proposed species. Atlantic sturgeon is a proposed species only until a final listing determination is made. When a final listing determination is made, the proposed rule will either be withdrawn or final listing rule will be published. We have considered whether the NE multispecies fishery, including implementation of Framework 45, is likely to jeopardize the proposed Atlantic sturgeon DPSs and conclude that it is not. While it is possible that there may be interactions between Atlantic sturgeon and gear used in the NE multispecies fishery, the number of interactions that will occur between now and the time a final listing determination will be made (e.g., up to 154 mortalities from multiple DPSs) is not likely to cause an appreciable reduction in survival and recovery of any of the five DPSs as described in section 7.4.4.

As discussed in Section 7.4.4, estimated encounters with Atlantic sturgeon by the gear predominantly used in the groundfish fishery (i.e., large-mesh sink gillnet and otter trawl gear) and in waters in which most of the groundfish fishing effort is based (the 500 series of statistical areas) are relatively low on a yearly basis, and have been declining in recent years, with only 51 encounters estimated in 2010. Recent declines in estimated encounters with Atlantic sturgeon in the groundfish fishery is likely attributable to continued reductions in fishing effort in the fishery based on a need to prevent overfishing and rebuild overfished groundfish stocks consistent with the Magnuson-Stevens Act. As groundfish stocks rebuild, it is possible that fishing effort will increase slightly as yearly annual catch limits (ACLs, or quotas) for groundfish stocks also increase. However, due to continued consolidation and cancelation of limited access NE multispecies permits over the past 10 years, it is unlikely that fishing effort will return to levels observed in 2001 or 2002, but will likely stabilize somewhere lower than peak levels, assuming groundfish stock abundances are maintained at or around the maximum sustainable yield for each stock.

As noted in Section 7.4.4, DPS-specific population levels for Atlantic sturgeon are difficult to quantify at this time, and further work needs to be done to accurately quantify the population of this species, thereby triggering the need for a conference on whether NMFS should seek to implement, under its discretionary authority, measures to reduce any adverse impacts on the Atlantic sturgeon. Current estimates indicate that the Hudson River DPS likely consists of approximately 870 spawning individuals in any one year. However, adult Atlantic sturgeon are not believed to spawn annually, but rather every other year for males and every two to five years for females. Although NMFS does not have information necessary to determine the sex or spawning condition of Atlantic sturgeon encountered by the groundfish fishery, these encounters may include both males and females and fish that may or may not spawn during that year. Therefore, encounters of Atlantic sturgeon by the groundfish fishery may be a subset of the entire population, as opposed to being comprised exclusively of the smaller annual spawning population.

Despite limited information that can be used to accurately estimate the number of Atlantic sturgeon in each DPS and because estimated encounters and expected mortalities are lower in recent years than has been estimated in the past, it is unlikely that the implementation of FW 45 would result in significant impacts to any DPS of Atlantic sturgeon during FY 2011. Further, the yearly encounters and mortalities with Atlantic sturgeon that were estimated in Section 7.4.4 include encounters and mortalities by all fisheries utilizing large-mesh sink gillnet and otter trawl gear, including the spiny dogfish, and monkfish fisheries. Thus, it is likely that yearly encounters and mortalities by the groundfish fishery would be lower than those estimates. Moreover, compared to the No Action alternative, it is likely that proposed measures would result in fewer impacts to Atlantic sturgeon. Because the No Action alternative would not approve new sectors, allow handgear vessels to access existing seasonal closure areas, or approve a cod spawning protection area in the Gulf of Maine, fishing effort, particularly in the common pool, may increase in areas in which increased sturgeon encounters are more likely (i.e., further south and in statistical area 521. This could result in increased encounters and, therefore, mortalities of Atlantic sturgeon compared to the preferred alternative. Therefore, the preferred alternative in FW 45 is not likely to result in a significant impact on Atlantic sturgeon at this time.

Serious injuries and mortalities of Atlantic sturgeon in commercial fishing gear are a likely concern for the long term persistence and recovery of the DPSs, and was a primary reason cited for the proposals to list the DPSs under the ESA. If final listing determinations are issued, the existing Section 7 consultation for the multispecies fishery would need to be reinitiated consistent with the requirement to reinitiate formal consultation where discretionary Federal agency involvement or control of the action has been retained and a new species is listed that may be affected by the action. During the reinitiation, the effects of the multispecies fishery on the five DPSs would be fully examined. Along with the impacts analysis, the formal consultation process will result in conservation recommendations and, if pertinent, reasonable and prudent measures, which would be actions deemed necessary or appropriate to minimize the impacts.”

13. For Section 9.3.1.2, add the following text at the end of the last paragraph under Option 2:

"The informal section 7 consultation for this action concluded that any increase in fishing effort as a result of these measures is likely to be minor in comparison to what was considered for the October 2010 Biological Opinion on the NE multispecies fishery. The October 2010 Biological Opinion did not consider effects to Atlantic sturgeon. However, the Stein et al. (2004a) did review sturgeon bycatch in the NE multispecies fishery for 1989-2000, a time period when effort in the NE multispecies fishery was much greater than what was considered for the October 10, 2010, Biological Opinion, or what would occur if effort on Georges Bank yellowtail flounder was to increase as a result of other alternatives considered in FW 45. Stein et al. (2004a) found the bycatch rate of Atlantic sturgeon (reported as pounds of sturgeon catch per pounds of targeted species landed) to be 0.000530 for yellowtail flounder."

14. For Section 9.3.1.5, add the following text at the end of the paragraph under Option 2: "However, scallop dredge gear is not known to pose a bycatch risk for Atlantic sturgeon despite many hours of observer coverage for this gear type."

15. For Section 9.3.2, add the following text above the subheading for Section 9.3.2.1: "Alternatives to the measures described in Section 4.2 (Fishery Program Administration) are administrative in nature and would not impact any of the Atlantic sturgeon DPSs."

16. For Section 9.3.3.1, revise the last sentence of the paragraph under Option 1 to read: "This option would have no impact on protected species, including Atlantic sturgeon, a species that is currently proposed to be listed under the ESA, as it maintains the status quo. Specifically, there are no reports of Atlantic sturgeon capture in scallop dredge gear in the NMFS Observer database (based on ASMFC TC 2007 and Stein et al. 2004a). "

17. For Section 9.3.3.2, add the following text at the end of the paragraph under Option 1: "Atlantic sturgeon are known to be caught (including snagged) on recreational fishing gear. The review of the NEFOP database for the years 2001-2010 did not find any records of observed sturgeon bycatch off of New Hampshire. There are no studies of post-release mortality, but fish are typically released promptly with limited apparent injuries. Therefore, it is unlikely that the No Action option would have any significant impact on Atlantic sturgeon."

18. For Section 9.3.3.3, revise the last sentence in the paragraph under Option 1 to read: "The review of the NEFOP database for 2001-2010 found no records of observed bycatch in waters off of Maine or New Hampshire. Bycatch did occur in waters off of Massachusetts. Although Atlantic sturgeon are known to be caught (including snagged) on recreational fishing gear, which is similar to the handgear used by vessels issued either a Handgear A or B permit, bycatch and bycatch mortality on hook gear is very low according to the available information. Because this measure would maintain status quo management measures, protected species, including Atlantic sturgeon, a species that is currently proposed to be listed under the ESA, are not expected to result in a significant impact on Atlantic sturgeon."

19. For Section 9.3.3.3, add the following text to the end of the second paragraph under Option 2:
"Although Atlantic sturgeon are known to be caught (including snagged) on recreational fishing gear, which is similar to the handgear used by vessels issued either a Handgear A or B permit,

bycatch and bycatch mortality on hook gear is very low according to the available information. There are no studies of post-release mortality, but fish are typically released promptly with limited apparent injuries. However, as noted above, the review of the NEFOP database for 2001-2010 found no records of observed bycatch of Atlantic sturgeon in waters off of Maine or New Hampshire, although bycatch was observed in waters off of Massachusetts. Therefore, even if Handgear A vessel fishing effort was displaced in the waters of the Gulf of Maine, it is unlikely that the displaced effort would have a significant impact on Atlantic sturgeon."

20. For section 10.3, insert the following text after the second paragraph in that section: "While ESA Section 7 consultations are required when the proposed action may affect listed species, a conference is required only when the proposed action is likely to jeopardize the continued existence of a proposed species or destroy or adversely modify proposed critical habitat. Therefore, a conference would be required if it was determined that the NE multispecies fishery, including implementation of Framework 45, was likely to jeopardize one or more of the proposed five DPSs of Atlantic sturgeon or one or more of the nine DPSs of loggerhead sea turtles.

A biological assessment evaluates the potential effects of an action on listed and proposed species and designated and proposed critical habitat to determine whether any such species or habitat are likely to be adversely affected by the action. A biological assessment is used in determining whether formal consultation or a conference is necessary. A formal Section 7 consultation was completed in October 2010 which analyzed the effects of the NE multispecies fishery on listed species and designated critical habitat, including loggerhead sea turtles. For listed species, therefore, the actions under Framework 45 have been analyzed in the informal consultation dated February 1, 2011, and it has been determined that they are not likely to cause an effect to listed species or critical habitat not considered in the October 2010 Biological Opinion.

As noted previously, one of the factors cited in NMFS' proposed listing for the five DPSs of Atlantic sturgeon is bycatch. The ASMFC analysis concluded that to remain stable or grow, populations of Atlantic sturgeon can sustain only very low anthropogenic sources of mortality. It is apparent, therefore, that should the proposed listing be finalized, reductions in bycatch mortality may be required in order to recover Atlantic sturgeon. Final listing determinations for the Atlantic sturgeon DPSs are expected by October 6, 2011. If final listing rules are published, they will likely become effective 30 days after publication. With the publication of a final listing rule, a Section 7 consultation would be required as the analysis conducted by the ASMFC and Stein et al (2004a) demonstrate that the multispecies fishery may affect Atlantic sturgeon. Through that consultation process, the effects would be estimated and analyzed. At this point, because Atlantic sturgeon is a proposed species under the ESA, the question is whether the proposed action is likely to jeopardize the continued existence of the proposed species to determine the need for a conference. Atlantic sturgeon is a proposed species only until a final listing determination is made. When a final listing determination is made, the proposed rules will either be withdrawn or final listing rules will be published. We have considered whether the NE multispecies fishery, including implementation of Framework 45, is likely to jeopardize the proposed Atlantic sturgeon DPSs through October 6, 2011, when a final listing determination is scheduled to be made, and conclude that it is not. While it is possible that there may be interactions between Atlantic sturgeon and gear used in the NE multispecies fishery, the number of interactions that will occur between now and the time a final listing determination will be made is not likely to cause an appreciable reduction in survival and recovery based on current assessments of each DPS, as described in Section 7.4.4. In addition, as discussed further in Section 8.7.5, it is unlikely that the implementation of FW 45 would result in significant impacts to any DPS of Atlantic sturgeon during FY 2011 (i.e., through April 30, 2011).

Serious injuries and mortalities of Atlantic sturgeon in commercial fishing gear are a likely concern for the long term persistence and recovery of the DPSs, and was a primary reason cited for the proposals to list the DPSs under the ESA. If final listing determinations are issued, the existing Section 7 consultation for the multispecies fishery would need to be reinitiated consistent with the requirement to reinitiate formal consultation where discretionary Federal agency involvement or control of the action has been retained and a new species is listed that may be affected by the action. During the reinitiation, the effects of the multispecies fishery on the five DPSs would be fully examined.

That October 2010 Biological Opinion for the NE multispecies fishery concluded that the NE multispecies fishery may affect, but was not likely to jeopardize, loggerhead sea turtles. An incidental take statement and associated reasonable and prudent measures and terms and conditions were included with that Biological Opinion. In reaching that conclusion, the Biological Opinion considered the effect of the estimated take on nesting beach aggregations and ultimately to the global species as listed. The difference between the analysis contained in the October 2010 Biological Opinion and that conducted for the proposed species would be that it was conducted at the level of the global species and it was conducted for a species listed as threatened whereas the proposal is for nine DPSs, two of which are proposed to be listed as threatened and seven to be listed as endangered. The Northwest Atlantic DPS is the one affected the most by the multispecies fishery and it is proposed to be listed as endangered. It is important to note that the effects analysis was conducted by examining the estimated number of takes against what is known about the biological status of loggerhead sea turtles and did not explicitly include any specific variable that would be affected by the listing status (e.g. threatened or endangered). Since the October 2010 Biological Opinion considered effects at the nesting beach aggregation level first and then aggregated up to consider effects at the species level, an analysis considering effects at the DPS rather than species level and on an endangered rather than threatened species would not change the jeopardy conclusion of that Biological Opinion. Therefore, we conclude that a conference for the proposed loggerhead DPSs is not required."

21. For Section 11.2, add the following citations in alphabetical order:
ASMFC TC (Atlantic States Marine Fisheries Commission Technical Committee). 2007. Special Report to the Atlantic Sturgeon Management Board: Estimation of Atlantic sturgeon bycatch in coastal Atlantic commercial fisheries of New England and the Mid-Atlantic. August 2007. 95 pp.

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

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

Holland, B.F., Jr., and G.F. Yelverton. 1973. Distribution and biological studies of anadromous fishes offshore North Carolina. Division of Commercial and Sports Fisheries, North Carolina Dept. of Natural and Economic Resources, Special Scientific Report No. 24. 130pp.

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

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

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Stein, A.B., K. D. Friedland, and M. Sutherland. 2004b. Atlantic sturgeon marine distribution and habitat use along the northeastern coast of the United States. Transaction of the American Fisheries Society 133:527-537.

Waldman, J. R., J. T. Hart, and I. I. Wirgin. 1996. Stock composition of the New York Bight Atlantic sturgeon fishery based on analysis of mitochondrial DNA. Transactions of the American Fisheries Society 125: 364-371.

Framework Adjustment 45
to the
Northeast Multispecies
Fishery Management Plan

Including an

Environmental Assessment
Regulatory Impact Review
Initial Regulatory Flexibility Analysis

Prepared by the
New England Fishery Management Council
in consultation with the
Mid-Atlantic Fishery Management Council
National Marine Fisheries Service

Initial framework meeting:	June 24, 2010
Final framework meeting:	November 18, 2010
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1.0 Executive Summary

In New England, the New England Fishery Management Council (NEFMC) is charged with developing management plans that meet the requirements of the Magnuson-Stevens Act (M-S Act). The Northeast Multispecies Fishery Management Plan (FMP) specifies the management measures for thirteen groundfish species (cod, haddock, yellowtail flounder, pollock, plaice, witch flounder, white hake, windowpane flounder, Atlantic halibut, winter flounder, redfish, Atlantic wolffish, and ocean pout) off the New England and Mid-Atlantic coasts. The FMPs have been updated through a series of amendments and framework adjustments. The most recent multispecies amendment, published as Amendment 16, was submitted for review by the National Marine Fisheries Service in October 2009 and became effective on May 1, 2010. This amendment adopted a broad suite of management measures in order to achieve fishing mortality targets and meet other requirements of the M-S Act. Included in Amendment 16 was a process for setting specifications for the fishery and updating measures through framework actions. Framework 44 to the FMP set specifications for fishing years 2010-2012. It was submitted for review by the National Marine Fisheries Service in January 2010 and became effective concurrently with Amendment 16 on May 1, 2010. This framework would provide modifications to update those two documents.

Amendment 16 included several major changes to the FMP. For several groundfish stocks, the mortality targets adopted by Amendment 16, and the resulting specifications in Framework 44, represented substantial reductions from existing levels. For other stocks, the mortality targets were at or higher than existing levels and mortality could remain the same or even increase. Because most fishing trips in this fishery catch a wide range of species, it is impossible to design measures that will change mortality in a completely selective manner for individual species. The management measures adopted by Amendment 16 to reduce mortality where necessary were also expected to reduce fishing mortality unnecessarily on other, healthy stocks. As a result of these lower fishing mortality rates, yield from healthy stocks is sacrificed and the management plan may not provide optimum yield - the amount of fish that will provide the greatest overall benefit to the nation. Amendment 16 created opportunities to target these healthy stocks. The FMP allows vessels with groundfish permits to either fish under the days-at-sea (DAS) effort control system or to join sectors, which are small groups of self-selected fishermen that receive an allocation of annual catch entitlement (ACE) based upon the catch history of each member.

Because of the newness of the sector program and the effects of a large amount of uncertainty over exactly how sectors would operate once Amendment 16 and Framework 44 were implemented, the Council determined that some changes were needed to the program in order to increase its effectiveness. Additionally, updated scientific information is available on some of the managed stocks and new U.S./Canada area allocations have been negotiated. This framework to the FMP is therefore proposed to adopt modifications that will incorporate this new information. It is intended to be implemented on May 1, 2011.

Proposed Action
This action would implement a range of measures designed to update specifications for the fishery and modify measures to achieve mortality targets and enhance fishery administration. Details of the measures summarized below can be found in Section 4.0. The measures being considered associated with changes to management of the fishery include:

- *Updates to Status Determination Criteria, Formal Rebuilding Programs, and Annual Catch Limits:* Revised status determination criteria would be adopted for pollock and ACLs would be adopted for each affected stock for Fishing Years 2011 through 2012. The ACL, ABC, and overfishing level for each stock that would be modified are presented in Table 3.

    - *Georges Bank yellowtail flounder rebuilding strategy:* The strategy would be modified to rebuild the stock by 2016 with a fifty percent probability of success.

    - *Yellowtail flounder allocation to the scallop fishery:* The scallop fishery would receive the same allocation, by weight, of yellowtail flounder that was received in FW 44.

    - *U.S./Canada Resource Sharing Understanding TACs:* Hard TACs for the U.S./Canada Management Area would be specified for FY 2011.

- *Fishery Program Administration*: Several administrative measures are proposed that relate to sector administration and monitoring.

    - *Implementation of additional sectors:* Five new sectors would be adopted, including four that will operate as state-sponsored permit banks.

    - *Monitoring requirements for Handgear and Small Vessel Exemption permit vessels:* These vessels would no longer be subject to dockside monitoring requirements.

    - *Monitoring requirements for commercial groundfish vessels:* There would be no requirement for the groundfish industry to pay costs associated with at-sea monitoring in FY 2012. Dockside monitoring (DSM) requirements would also be lifted in FY 2011 and FY 2012 except to the extent that NMFS will fund the program. The trip-end hail requirement would remain for all commercial groundfish vessels. DSM requirements would no longer be considered an element of the reporting system, which would allow sectors to request an exemption from elements of the program.

    - *Distribution of PSC from canceled permits:* When a permit is canceled, its associated PSC would be distributed evenly amongst all remaining permits, whether in the common pool or a sector.

    - *Submission of sector rosters:* The deadline for submission of sector rosters would be moved to December 1st of the year prior to the applicable fishing year.

- *Commercial and Recreational Fishery Management Measures:* Three management changes are proposed.

    - *General category scallop dredge exemption:* Scallop dredge vessels fishing under a general category permit would no longer be subject to the yellowtail flounder spawning closures in the Great South Channel.

    - *Gulf of Maine Cod Spawning Protection Area:* An area off New Hampshire (referred to as the Whaleback area) is proposed for a spawning closure in the months of April, May, and June. The closure would affect all vessels, both commercial and recreational, fishing with gear capable of catch groundfish.

- *Handgear permit management measures:* Handgear A vessels would be allowed access to the same rolling closures from which sectors are universally exempted and the GB closure area. The handgear trip limits for GOM cod and GB cod would adjust based on the status of each respective stock. Handgear A vessels would have a cod trip limit of 300 lbs./trip until the trip limit for limited access DAS vessels in the area falls below that number, at which point the trip limits would be equal.

Summary of Environmental Consequences
The environmental impacts of the proposed action are discussed in detail in Section 8.0. Biological impacts are described in Section 8.1, impacts on endangered and other protected species are described in Section 8.3, impacts on essential fish habitat are described in Section 8.2, the economic impacts are described in Section 8.4, and social impacts are described in Section 8.5. Cumulative effects are described in Section 8.7. Summaries of the impacts are provided in the following paragraphs.

Biological Impacts
The measures that constitute the Proposed Action are designed to achieve the rebuilding objectives for the Northeast Multispecies fishery. The most important biological impact of the proposed measures is that they would control fishing mortality on Northeast Multispecies stocks in order to prevent (or end) overfishing and rebuild overfished stocks. The critical measure for these impacts is the specification of ACLs.

Essential Fish Habitat (EFH) Impacts
No significant adverse impacts on EFH are expected to result from the Proposed Action. Impacts are expected to be neutral, and the overall low fishing effort expected as a result of this action, along with Framework 44 and Amendment 16, is expected to benefit habitat by reducing the interaction of groundfish fishing vessels with EFH.

Impacts on Endangered and Other Protected Species
None of the measures proposed in Framework 45 are likely to produce impacts to protected species beyond those described in previous regulations. As with EFH, the impacts are not quantifiable but are expected to be beneficial as a result of an overall low level of groundfish fishing effort resulting from the modifications in this framework in conjunction with the Framework 44 and Amendment 16 measures.

Economic Impacts
Overall, the economic impacts of the Proposed Action would not be severe but the negative impacts may be slightly higher under the Proposed Action than under No Action. Revenues during FY 2011 may be expected to be slightly lower ($4 million) than in FY 2010, and in FY 2012 those revenues could be an additional $7 million lower than in FY 2010. However, at least part of this increase may be offset by cost savings associated with removing the requirement for both dockside and at-sea monitoring. Some efficiency gains may also be forthcoming if the approval of five lease-only sectors results in improved price discovery and access to larger quantities of ACE. The effects of the remaining set of proposed changes to fishery program administration are likely to be small since many of them affect a component of the groundfish fishery that accounts for a tiny fraction of the fishery. Finally, while not evaluated as a gain or a

loss, the Proposed Action for yellowtail lfounder allocations to the scallop fishery would place less fishing revenue at risk than the alternative.

Social Impacts
The Proposed Action is not expected to have major social impacts. The specifications are most likely to change attitudes about management than any other social impact factor, but these changes are likely to be minimal since the proposed modifications are minor and consistent with what may have been anticipated by Amendment 16. The removal of requirements for industry to fund monitoring programs would be likely to have positive social impacts as it would provide a much-desired economic relief.

Cumulative Effects
The Proposed Action is expected to have beneficial effects for managed resources. Updating fishery specifications, improving program administration, and modifying effort controls should increase the likelihood of achieving mortality targets and lead to increased stock sizes. The proposed measures are not expected to have substantial cumulative effects on non-target species, protected resources, or habitat (including essential fish habitat). While fishery specifications are not expected to have impacts on human communities when compared to the No Action alternative, updates in program administration generally have positive impacts, and modifying effort controls have mixed impacts on communities.

Alternatives to the Proposed Action
For each measure that is proposed, the Council considered the No Action alternative. For some elements, other alternatives or options were also considered. These are briefly described below.

- *Revised rebuilding strategy for GB yellowtail flounder:* Under these sub-options, various rebuilding strategies were considered. The alternatives would have required rebuilding by 2016 with a sixty percent or a seventy-five percent probability of success, or by 2019 with a sixty percent probability of success.

- *Yellowtail flounder allocation of 90% of the scallop fishery "projected need" in FY 2011*: Under this alternative, the scallop fishery would have received an allocation of 90% of the yellowtail flounder that is projected to be necessary to fully harvest the scallop ACL in FY 2011 – 2012.

- *Gulf of Maine cod spawning protection area:* Under a sub-option that was considered, this would have been an absolute fishing closure during the proposed months.

- *Handgear permit access to all rolling closures*: Under this alternative, Handgear A vessels would not have been subject to any of the rolling closures that affect the rest of the groundfish fleet.

Impacts of Alternatives to the Proposed Action
In many cases, the No Action alternatives would not have met current requirements of the M-S Act. Specific impacts are described in Section 9.0. Only the most significant biological and economic impacts are highlighted below.

Biological Impacts
The biological impacts of the No Action alternatives would likely be that mortality targets were set at unjustifiably low levels for several stocks. Impacts of the 90% yellowtail flounder

allocation in 2011 would be similar to the Proposed Action. The program administration measures would be unlikely to have significant biological impacts, with the exception of the removal of the requirement for industry to pay at-sea monitoring costs. If that measure led to reduced coverage levels, scientific uncertainty would increase. The commercial and recreational fishery management measures would be expected to have positive or neutral biological impacts.

Essential Fish Habitat Impacts
Overall, the indirect impacts of the No Action alternative would be expected to be minor, and may be slightly positive compared to the Proposed Action. The No Action ACLs would be lower for several stocks and may equate to slightly decreased fishing effort compared to the Proposed Action and decreased interactions of groundfish gear with EFH. The program administration measures would not be expected to affect EFH, and the No Action on the cod spawning closure would have negative effects compared to the Proposed Action.

Impacts on Endangered and Other Protected Species
The No Action alternative would not be expected to have any direct effects on protected species. Although the No Action ACLs would be expected to lead to slightly increased fishing effort, interactions with protected species would be minor. The administrative measures would not affect protected species, and the proposed Whaleback closure is not in an area which is known to be important to protected species.

Economic Impacts
The economic impacts of the No Action alternative would be expected to be slightly lower in the near term than those of the Proposed Action ($4 million higher in revenues in FY 2010, and an additional $7 million higher in FY 2011). The alternatives to the GB yellowtail flounder rebuilding strategy would have generally lower present value of the revenue streams than would the Proposed Action. Under the No Action scenario, however, the industry would also be required to pay for at-sea and dockside monitoring at a cost of $5 million and $281,000 in FY 2011, respectively. Some efficiency gains could be lost if the new sectors were not approved and price discovery was constricted. The effects of the remaining set of fishery program administration changes would likely be small since many of them affect a component of the groundfish fishery that accounts for a tiny fraction of the fishery. While not evaluated as a gain or loss, the allocations of yellowtail flounder to the scallop fishery would increase the fishing revenues (groundfish and scallop industry combined) at risk by about $50 million when compared to No Action.

Social Impacts
The No Action alternative for specifications, if adopted, would entail the failure by the Council to use the best available scientific information and would lead to distrust of the management process. The social impacts of the No Action alternative for program administration measures would be that sector management is more cumbersome and that monitoring costs will burden the industry. A complete closure in the Whaleback area, as considered, would have prevented recreational fishing targeting non-groundfish species and negatively impacted participants in those fisheries. In general, the effects of the No Action alternatives would be minor and the social impacts caused by the implementation of Amendment 16 would not be changed overall.

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2.0 Table of Contents

2.1 List of Tables

2.2 List of Figures

2.3 Acronyms

ACE	Annual Catch Entitlement
ALWTRP	Atlantic Large Whale Take Reduction Plan
APA	Administrative Procedures Act
ASMFC	Atlantic States Marine Fisheries Commission
CAI	Closed Area I
CAII	Closed Area II
CASA	Catch at Size Analysis (scallop assessment model)
CC	Cape Cod
CPUE	Catch per unit of effort
DAM	Dynamic Area Management
DAS	Days-at-sea
DFO	Department of Fisheries and Oceans (Canada)
DMF	Division of Marine Fisheries (Massachusetts)
DMR	Department of Marine Resources (Maine)
DSEIS	Draft Supplemental Environmental Impact Statement
DSM	Dockside monitoring
EA	Environmental Assessment
EEZ	Exclusive economic zone
EFH	Essential fish habitat
EIS	Environmental Impact Statement
ESA	Endangered Species Act
ETA	Elephant Trunk Area
F	Fishing mortality rate
FAAS	Flexible Area Action System
FEIS	Final Environmental Impact Statement
FMP	Fishery Management Plan
FSCS	Fisheries Scientific Computer System
FW	Framework
FY	Fishing year
GAMS	General Algebraic Modeling System
GB	Georges Bank
GIS	Geographic Information System
GOM	Gulf of Maine
GRT	Gross registered tons/tonnage
HAPC	Habitat area of particular concern
HPTRP	Harbor Porpoise Take Reduction Plan
I/O	Input/output
IFQ	Individual fishing quota
ITQ	Individual transferable quota

IVR	Interactive voice response reporting system
IWC	International Whaling Commission
LOA	Letter of authorization
LPUE	Landings per unit of effort
MA	Mid-Atlantic
MAFAC	Marine Fisheries Advisory Committee
MAFMC	Mid-Atlantic Fishery Management Council
MARFIN	Marine Fisheries Initiative
MEY	Maximum economic yield
MMC	Multispecies Monitoring Committee
MMPA	Marine Mammal Protection Act
MPA	Marine protected area
MRFSS	Marine Recreational Fishery Statistics Survey
MSFCMA	Magnuson-Stevens Fishery Conservation and Management Act
MSMC	Multispecies Monitoring Committee
MSY	Maximum sustainable yield
NAA	No Action Alternative
NAPA	National Academy of Public Administration
NAS	National Academy of Sciences
NEFMC	New England Fishery Management Council
NEFSC	Northeast Fisheries Science Center
NEPA	National Environmental Policy Act
NERO	Northeast Regional Office
NFMA	Northern Fishery Management Area (monkfish)
NLCA	Nantucket Lightship closed area
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NSTC	Northern Shrimp Technical Committee
NT	Net tonnage
NWA	Northwest Atlantic
OBDBS	Observer database system
OLE	Office for Law Enforcement (NMFS)
OY	Optimum yield
PBR	Potential Biological Removal
PSC	Potential Sector Contribution
PDT	Plan Development Team
PRA	Paperwork Reduction Act
PREE	Preliminary Regulatory Economic Evaluation
RFA	Regulatory Flexibility Act
RMA	Regulated Mesh Area
RPA	Reasonable and Prudent Alternatives
SA	Statistical Area
SAFE	Stock Assessment and Fishery Evaluation

SAP	Special Access Program
SARC	Stock Assessment Review Committee
SAW	Stock Assessment Workshop
SBNMS	Stellwagen Bank National Marine Sanctuary
SEIS	Supplemental Environmental Impact Statement
SFA	Sustainable Fisheries Act
SFMA	Southern Fishery Management Area (monkfish)
SIA	Social Impact Assessment
SNE	Southern New England
SNE/MA	Southern New England-Mid-Atlantic
SSB	Spawning stock biomass
SSC	Scientific and Statistical Committee
TAC	Total allowable catch
TED	Turtle excluder device
TEWG	Turtle Expert Working Group
TMGC	Trans-boundary Management Guidance Committee
TMS	Ten minute square
TRAC	Trans-boundary Resources Assessment Committee
TSB	Total stock biomass
USCG	United States Coast Guard
USFWS	United States Fish and Wildlife Service
VMS	Vessel monitoring system
VPA	Virtual population analysis
VTR	Vessel trip report
WGOM	Western Gulf of Maine
WO	Weighout
YPR	Yield per recruit

3.0 Introduction and Background

3.1 Background

The primary statute governing the management of fishery resources in the Exclusive Economic Zone (EEZ) of the United States is the Magnuson-Stevens Fishery Conservation and Management Act (M-S Act). In brief, the purposes of the M-S Act are:

> (1) to take immediate action to conserve and manage the fishery resources found off the coasts of the United States;
>
> (2) to support and encourage the implementation and enforcement of international fishery agreements for the conservation and management of highly migratory species;
>
> (3) to promote domestic and recreational fishing under sound conservation and management principles;
>
> (4) to provide for the preparation and implementation, in accordance with national standards, of fishery management plans which will achieve and maintain, on a continuing basis, the optimum yield from each fishery;
>
> (5) to establish Regional Fishery Management Councils to exercise sound judgment in the stewardship of fishery resources through the preparation, monitoring, and revisions of such plans under circumstances which enable public participation and which take into account the social and economic needs of the States.

In New England, the New England Fishery Management Council (NEFMC) is charged with developing management plans that meet the requirements of the M-S Act.

The Northeast Multispecies Fishery Management Plan (FMP) specifies the management measures for thirteen groundfish species (cod, haddock, yellowtail flounder, pollock, plaice, witch flounder, white hake, windowpane flounder, Atlantic halibut, winter flounder, yellowtail flounder, ocean pout, and Atlantic wolffish) off the New England and Mid-Atlantic coasts. Some of these species are sub-divided into individual stocks that are attributed to different geographic areas. Commercial and recreational fishermen harvest these species. The FMP has been updated through a series of amendments and framework adjustments.

The most recent amendment, published as Amendment 16, became effective on May 1, 2010. This amendment adopted a broad suite of management measures in order to achieve fishing mortality targets necessary to rebuild overfished stocks and meet other requirements of the M-S Act. Amendment 16 adopted a process for setting Annual Catch Limits that requires catch levels to be set in biennial specifications packages. Several lawsuits are challenging various provisions of Amendment 16, including the amendment's provisions related to sectors and some of the accountability measures.

The most recent framework, published as Framework 44, became effective on May 1, 2010 concurrently with Amendment 16. It adopted the required specifications for regulated northeast multispecies stocks, as well as stocks managed by the U.S./Canada Resource Sharing Agreement.

It was also used to incorporate the best available information in adjusting effort control measures adopted in Amendment 16.

This framework is intended to build upon revisions made to the sector program in Amendment 16 and Framework 44, and also to set specifications required under the U.S./Canada Resource Sharing Agreement and incorporating an updated stock assessment for pollock.

3.2 Purpose and Need for the Action

The Northeast Multispecies FMP requires that the NMFS Regional Administrator, after consultation with the Council, determine the specifications for the groundfish fishery. The FMP requires the Council and the Regional Administrator to review the best available information regarding the status of the resource and fishery and develop appropriate fishery specifications.

Previous amendments to the FMP established processes to evaluate fishing mortality and rebuilding progress. If necessary as a result of these evaluations, periodic framework adjustments were planned to facilitate any changes to the management program that may prove necessary in order to comply with the rebuilding programs and to provide an opportunity to adjust other management measures as necessary.

These specifications and adjustments to Amendment 16 are intended to meet the goal and many of the objectives of the Northeast Multispecies FMP, as modified in Amendment 16, specifically (see following page):

Need	***Purpose***
Set specifications for ACLs in Fishing Years 2011-2012 consistent with best available science and the ABC control rules adopted in Amendment 16 to the Northeast Multispecies FMP	• Revisions to status determination criteria, including updated pollock assessment • Revision of rebuilding strategy for GB yellowtail flounder • Measures to adopt ACLs, including incidental catch TACs • Measures to adopt TACs for U.S./Canada area • Yellowtail flounder allocations for the scallop fishery
Update fishery program administration in order to enhance viability of the fishery since the implementation of Amendment 16	• Allow for implementation of additional sectors • Adjust monitoring requirements • Determine distribution of PSC from canceled permits into fishery • Modify date for submission of sector rosters
Modify management measures in order to ensure that overfishing does not occur consistent with the status of stocks, the National Standard guidelines, and the requirements of the MSA of 2006	• Spawning closure for cod in the Gulf of Maine • Adjust trip limits and access to closed areas for Handgear A vessels • Exemption for General Category scallop vessels from yellowtail flounder spawning closure
Minimize, to the extent practicable, the adverse effects of fishing on essential fish habitat to comply with section 303(a)(7) of the Magnuson-Stevens Act	• Identify other actions to encourage the conservation and enhancement of EFH

3.3 Brief History of the Northeast Multispecies Management Plan

Groundfish stocks were managed under the M-S Act beginning with the adoption of a groundfish plan for cod, haddock, and yellowtail flounder in 1977. This plan relied on hard quotas (total allowable catches, or TACs), and proved unworkable. The quota system was rejected in 1982 with the adoption of the Interim Groundfish Plan, which relied on minimum fish sizes and codend mesh regulations for the Gulf of Maine and Georges Bank to control fishing mortality. The interim plan was replaced by the Northeast Multispecies FMP in 1986, which established biological targets in terms of maximum spawning potential and continued to rely on gear restrictions and minimum mesh size to control fishing mortality. Amendment 5 was a major revision to the FMP. Adopted in 1994, it implemented reductions in time fished (days-at-sea, or DAS) for some fleet sectors and adopted year-round closures to control mortality. A more detailed discussion of the history of the management plan up to 1994 can be found in Amendment 5 (NEFMC 1994). Amendment 7 (NEFMC 1996), adopted in 1996, expanded the DAS program and accelerated the reduction in DAS first adopted in Amendment 5. After the implementation of

Amendment 7, there were a series of amendments and smaller changes (framework adjustments) that are detailed in Amendment 13 (NEFMC 2003). Amendment 13 was developed over a four-year period to meet the M-S Act requirement to adopt rebuilding programs for stocks that are overfished and to end overfishing. Amendment 13 also brought the FMP into compliance with other provisions of the M-S Act. Subsequent to the implementation of Amendment 13, FW 40A provided opportunities to target healthy stocks, FW 40B improved the effectiveness of the effort control program, and FW 41 expanded the vessels eligible to participate in a Special Access Program (SAP) that targets GB haddock. FW 42 included measures to implement the biennial adjustment to the FMP as well as a Georges Bank yellowtail rebuilding strategy, several changes to the Category B (regular) DAS Program and two Special Access Programs, an extension of the DAS leasing program, and introduced the differential DAS system. FW 43 adopted haddock catch caps for the herring fishery and was implemented August 15, 2006. Amendment 16 was adopted in 2009 and provided major changes in the realm of groundfish management. Notably, it greatly expanded the sector program and implemented Annual Catch Limits in compliance with 2006 revisions to the M-S Act. The amendment also included a host of mortality reduction measures for "common pool" (i.e. non-sector) vessels and the recreational component of the fishery. Framework 44 was also adopted in 2009, and it set specifications for FY 2010 – 2012 and incorporated the best available information in adjusting effort control measures adopted in Amendment 16. A more detailed description of the history of the FMP is included in Amendment 16.

3.4 National Environmental Policy Act (NEPA)

NEPA provides a structure for identifying and evaluating the full spectrum of environmental issues associated with Federal actions, and for considering a reasonable range of alternatives to avoid or minimize adverse environmental impacts. This document is a combined framework adjustment to a fishery management plan and an environmental assessment (EA). An EA provides an analysis of a Proposed Action, the alternatives to that action that were considered, and the impacts of the action and the alternatives. An EA is prepared rather than an Environmental Impact Statement (EIS) when the environmental impacts are not expected to be significant. The required NEPA elements for an EA are discussed in Section 10.2. The evaluation that this action will not have significant impacts is in Section 10.2.2, and the required Finding of No Significant Impact (FONSI) statement is included at the end of that section.

4.0 Proposed Action

This section describes the management measures that the Council is proposing for the Northeast Multispecies Fishery in this action. In order to facilitate tracking measures in this final document with those considered by the Council as the action was developed, the measures are identified by the same option numbers used during the Council discussions. In the NEPA context, all of these proposed measures are preferred alternatives. In the descriptions of the measures and the analyses of their impacts in later sections, the use of the verb “will” rather than “would” does not mean mean that NOAA/NMFS already determined these measures are consistent with the M-S Act and has appoved their implementation.

4.1 Updates to Status Determination Criteria, Formal Rebuilding Programs, and Annual Catch Limits

4.1.1 Revised Status Determination Criteria

Option 2: Revised Status Determination Criteria for Pollock

The M-S Act requires that every fishery management plan specify “objective and measureable criteria for identifying when the fishery to which the plan applies is overfished.” Guidance on this requirement identifies two elements that must be specified: a maximum fishing mortality threshold (or reasonable proxy) and a minimum stock size threshold. The M-S Act also requires that FMPs specify the maximum sustainable yield and optimum yield for the fishery. Amendment 16 adopted status determination criteria for regulated groundfish stocks as determined by the GARM III (NEFSC 2008) and, in the case of Atlantic wolffish, the DPWG (2009).

Due to concerns about the GARM III assessment for pollock, the NEFSC conducted a new assessment in 2010. The assessment adopted a new model and recommended revised status determination criteria (NEFSC 2010). This action adopts the revised status determination criteria for this stock. The review panel recommended using fishing mortality on ages 5-7 of 0.25 as a measure to determine stock status. The value is equivalent to a fully recruited mortality (at age 7) of 0.41.

The updated assessment concluded the pollock stock is not subject to overfishing and is not overfished. As a result, the stock is no longer subject to the formal rebuilding program adopted by Amendment 16.

Table 1 - Proposed Action status determination criteria

Species	Biomass Target (SSB_{MSY} or proxy)	Minimum Biomass Threshold	Maximum Fishing Mortality Threshold (F_{MSY} or proxy)
Pollock	SSB_{MSY}: SSB/R (40%MSP)	½ B_{target}	F40%MSP

Table 2 – Proposed numerical estimates of revised status determination criteria

Species	Model	Bmsy or proxy (mt)	Fmsy or proxy	MSY (mt)
Pollock	ASAP	91,000	$F_{5\text{-}7}$= 0.25 (F_{FR7}= 0.41)	16,200

4.1.2 Revised GB Yellowtail Flounder Rebuilding Mortality Targets

<u>Option 2: Revised Rebuilding Target for Georges Bank Yellowtail Flounder</u>

The Council considered a revision to the rebuilding strategy for GB yellowtail flounder. The following sub-option was selected as the Proposed Action:

> Sub-option A: Use a fishing mortality target that is calculated to rebuild the stock by 2016 with a 50 percent probability of success

Rationale: This proposed measure would extend the formal rebuilding period for this stock two additional years, to 2016. In addition, the rebuilding mortality target would be based on a probability of success that is reduced from 75 percent to 50 percent. Catches will be higher which will provide economic benefits to U.S. fishermen and communities. The extended rebuilding period also facilitates cooperation with Canada on the management of this trans-boundary stock. Since Canadian law does not have a requirement for a defined rebuilding period there were growing disagreements over the appropriate catch levels. By extending the period the U.S. will have more flexibility to coordinate management with the Canadians. The rebuilding strategy will still meet U.S. legal requirements.

4.1.3 Annual Catch Limit Specifications

<u>Option 2: Revised Annual Catch Limit Specifications for Modified Stocks</u>

Consistent with the process established by Amendment 16, and the ABC control rules adopted by that action, this action proposes the Acceptable Biological Catch (ABC) and Annual Catch Limits (ACLs) for pollock for FY 2011 – FY 2014. It also proposes a revised ACL for GB yellowtail flounder for FY 2011 – FY 2012 due to the change in the rebuilding strategy as discussed in Section 4.1.2. It also corrects an error in the white hake ACL published in the *Federal Register* for FY 2011, and lists the ACLs for GB cod, GB haddock, and GB yellowtail flounder that reflect the Council's action on the recommendations from the TMGC. These ACLs will be the basis for determining whether Accountability Measures (AMs) are triggered as described in Amendment 16. As a result of the adoption of these ACLs, the incidental catch TACs that are applicable to the Category B (regular) DAS Program and certain Special Access Programs are also defined. Note that with the revised status of pollock, pollock is no longer a stock of concern and so incidental catch TACs are not specified and the incidental catch trip limits are no longer applicable to this stock.

The ABCs and ACLs proposed are shown in Table 3. This table includes the Overfishing Limits (OFLs) for each stock. The ABCs are those recommended by the Scientific and Statistical Committee (SSC). The incidental catch TACs for the same period are shown in Table 4. The general approach for calculating these values begins with the ABCs set by the SSC. The ABC is distributed among the various components of the fishery as described in Amendment 16 and in Appendix III. Each ABC is then adjusted for management uncertainty, where appropriate, using the adjustments approved by the Council.

The Council considered four alternative rebuilding strategies for GB yellowtail flounder, and Table 3 shows the OFLs and ABCs for the selected strategy. The ABC decision for GB yellowtail flounder is linked to the rebuilding strategy (Section 4.1.2). The ACLs for the given strategy are also linked to the decision for the U.S./Canada TACs (Section 4.1.4). These calculations show that the Council adopts the TMGC recommendations for GB yellowtail flounder and then reduces U.S. catches to remain below the ABC.

The FY 2012 ACLs for GB yellowtail flounder may be modified as a result of future decisions of the Transboundary Management Guidance Committee (TMGC). Allocation of these stocks under the terms of the U.S./Canada Resource Sharing Understanding will affect the amount available for U.S. fishermen.

As noted in Amendment 16, it is expected that the ABCs and ACLs for FY 2012 – FY 2014 will be calculated and adopted before the FY 2012 ACL for white hake in this action is used. The FY 2012 values here are specified in case there is a future delay in updating the ACLs.

Pollock ACLs are not expected to be revisited until 2013.

Table 3 – Proposed OFLs, ABCs, ACLs, and other ACL sub-components for FY 2011 – FY 2012 (metric tons, live weight)

Stock	Year	OFL	U.S. ABC	State Waters Sub-component	Other Sub-Components	Scallop Sub-ACL	Ground fish Sub-ACL	Comm Groundfish Sub-ACL	Rec Groundfish Sub-ACL	Preliminary Sectors Sub-ACL	Preliminary Non_Sector Groundfish Sub-ACL	MWT Sub_ ACL	Total ACL
GB Cod	2011	7,311	4,766	48	191	0	4,301		0	4,129	172	0	4,540
	2012	8,090	5,364	54	215	0	4,841		0	4,647	194	0	5,109
GB Haddock	2011	59,948	34,244	342	1,370	0	30,840		0	30,223	617	64	32,616
	2012	51,150	29,016	290	1,161	0	26,132		0	25,609	523	54	27,637
GB Yellowtail Flounder (A)	2011	3,495	1,099	0	53.5	200.8	790.7		0.0	767.0	23.7	0.0	1045.0
	2012	4,335	1,222	0	51.2	307.5	686.3		0.0	665.7	20.6	0.0	1045.0
White Hake	2011	4,805	3,295	33	132	0	2,974			2,833	141	0	3,138
	2012	5,306	3,638	36	146	0	3,283			3,128	156	0	3,465
Pollock	2011	21,853	16,900	769	1,445	0	13,952		0	13,394	558	0	16,166
	2012	19,887	15,400	754	1,370	0	12,612		0	12,108	504	0	14,736
	2013	20,060	15,600	756	1,380	0	12,791		0	12,279	512	0	14,927
	2014	20,554	16,000	760	1,400	0	13,148		0	12,622	526	0	15,308

(1) Values are rounded to the nearest metric ton (with the exception of GB yellowtail flounder).
(2) Sector and common pool shares are based on FY 2010 shares and will be updated when final FY 2011 sector rosters are known.
(3) Greyed-out values may be adjusted as a result of future recommendations of the TMGC. Values shown for GB haddock and cod in 2012 make an assumption for Canadian catches that may be revised by the TMGC in 2011.

Table 4 – Preliminary incidental catch TACs for Special Management Programs (metric tons, live weight)

	Cat B (regular) DAS Program		CAI Hook Gear Haddock SAP		EUS/CA Haddock SAP	
Stock	**2011**	**2012**	**2011**	**2012**	**2011**	**2012**
GB Yellowtail	0.2	0.2			0.2	0.2

* These values may change as a result of changes in sector membership

4.1.4 U.S./Canada Resource Sharing Understanding TACs

<u>Option 2: U.S./Canada TACs</u>

This alternative specifies hard TACs for the U.S./Canada Management Area for FY 2011 (May 1, 2011 – April 30, 2012) as indicated in Table 5 below. These TACs would be in effect for the the fishing year unless NMFS determines that the catch of GB cod, haddock, or yellowtail flounder from the U.S./Canada Management Area in FY 2010 exceeded the pertinent 2010 TAC. The Understanding and the regulations require that if a TAC is exceeded in a particular fishing year, then the TAC for the subsequent fishing year is reduced by the amount of the overage (TAC adjustment). In order to minimize any disruption of the fishing industry, NMFS would attempt to make any necessary TAC adjustments in the first quarter of the fishing year.

Table 5 - Proposed FY 2011 U.S./Canada TACs (mt) and percentage shares

	Eastern GB Cod	Eastern GB Haddock	GB Yellowtail Flounder
Total Shared TAC	1,050	22,000	1,900
U.S. TAC	200	9,640	1,045
Canada TAC	850	12,540	855

The size of the proposed 2011 TACs relative to the 2010 TACs is shown in Table 6.

Table 6 - Comparison of proposed FY 2011 U.S./Canada TACs with FY 2010 TACs

Stock	FY 2010 (mt)	FY 2011 (mt)	Percent Change
Eastern GB cod	338	200	-41%
Eastern GB haddock	11,988	9,640	-20%
GB yellowtail	1,200	1,045	-13%

More information on the calculation of the percentage shares may be accessed through the TMGC web site at the following address:
http://www.mar.dfo-mpo.gc.ca/science/tmgc/background/share.pdf.

4.1.5 Yellowtail Flounder Allocations for the Scallop Fishery

Amendment 16 adopts ACLs for groundfish stocks. Some of these ACLs are divided into either sub-ACLs that are subject to accountability measures (AMs), or other sub-components that are not subject to AMs. The amendment proposes that a portion of yellowtail flounder will be allocated to the scallop fishery. In FY 2010, the allocation is considered a sub-component, while in FY 2011 and beyond it will be considered a sub-ACL subject to AMs that will be adopted in Scallop Amendment 15. FW 44 adopted values for FY 2010 – 2012, but noted that the values for FY 2011 and FY 2012 might be revised based on updated scallop and yellowtail flounder stock information, TMGC recommendations, and on future scallop fishery access area measures. This measure considers such adjustments as a result of the 2010 TRAC and Scallop Framework 22.

<u>Option 1: No Action</u>

Under this option, the scallop fishery yellowtail flounder allocations implemented in FW 44 are not changed. Allocations were only specified for FY 2010 – 2012. The allocations are shown in Table 7. Note that in this instance "No Action" refers to keeping the FY 2011 and FY 2012 yellowtail founder allocations (in terms of weight) specified in FW 44 and not a specific suite of scallop management measures.

Table 7 - Proposed allocation of yellowtail flounder to the scallop fishery

Groundfish No Action	*Total Expected to be Caught, YTF Stock Area*			*Scallop Fishery ABC*			*Sub-ACL*		
Year	*GB*	*SNE/MA*	*CC/GOM*	*GB*	*SNEMA*	*CC/GOM*	*GB*	*SNEMA*	*CC/GOM*
2011	175.3	57.6	23.6	203	89		200.8	82	
2012	341.8	83.7	20.1	317	136		307.5	127	

* Values are metric tons, live weight, rounded to the nearest 0.1 metric ton.

Rationale: Amendment 16 created a sub-ACL for yellowtail flounder that is caught by the scallop fishery in order to control the catches of yellowtail flounder so that mortality targets are achieved. These sub-ACLs were first specified in FW 44 for GB and SNE/MA yellowtail flounder. The amounts allocated by that action were based on an estimate of the yellowtail flounder catches that would be taken by the scallop fishery; the fishery was allocated 90 percent of the estimated catch in FY 2011 and 2012. This measure would continue to allocate the same amounts (metric tons) even though the catches are now estimated to be less. As areuslt the scallop fishery is allocated a higher percentage. When compared to Option 2, allocating these amounts increases the certainty of achieving scallop and yellowtail flounder biological targets, reduces the chances of a derby fishery in the scallop fishery, and places less revenue at risk for the combined fisheries.

4.2 Fishery Program Administration

4.2.1 Implementation of Additional Sectors

Option 2: Implement New Sectors for FY 2011

The following list summarizes the new sector applications, and request for modifications to existing sectors that were received for inclusion in Framework 45. Sectors that wish to begin operating in a given fishing year are required to submit proposals and operations plans one year prior to the beginning of that fishing year. The following sectors are approved, and will therefore commence operations on May 1, 2011.

State of Maine Permit Banking Sector (MPBS)
Summary: The MPBS will operate as a lease-only sector with no active fishing vessels in FY 2011.

State of Rhode Island Permit Bank Sector
Summary: This sector intends to operate as a lease-only sector, whose sole function would be to hold permits for the purpose of leasing out ACE. Rhode Island may join with other states in the formation and operation of this sector, depending on further evaluation of the benefits of a common sector for multiple permit banks.

State of New Hampshire Permit Bank Sector
Summary: This will operate as a lease-only sector with no active fishing vessels in FY 2011.

State of Massachusetts Permit Bank Sector
Summary: This will operate as a lease-only sector with no active fishing vessels in FY 2011.

Sustainable Harvest Sector III
Summary: This sector would likely be comprised of members who choose to lease their groundfish allocation to other sectors. However, the ability to switch this sector to an active sector as well is requested.

*Note: In the draft Framework 45 document, this option originally included two additional sectors, but during the final action on this framework the Council voted to only approve sectors whose operations plans were submitted by the September 1st, 2010 deadline with the exception of state-operated permit banks. The two sectors that were not approved are described in Section 5.2.1.

4.2.2 Monitoring Requirements for Handgear A and Handgear B Permitted Vessels and Small Vessel Exemption Vessels

Option 2: Dockside Monitoring exemption for Handgear A and Handgear B Permits and Small Vessel Exemption permits

Vessels fishing under a Handgear A or Handgear B permit, or a Small Vessel Exemption permit, are exempted from the dockside monitoring requirements adopted by Amendment 16 when fishing in the common pool.

Rationale: These permit categories land small quantities of groundfish and the expense of the monitoring requirements would make them uneconomical.

4.2.3 Monitoring Requirements for Commercial Groundfish Fishing Vessels

Option 2: Removal of Dockside Monitoring Requirements

In FY 2011 and FY 2012 there is no requirement that dockside monitoring of sector catches be funded by sectors. NMFS will provide as much funding as possible for dockside monitoring of up to 100 percent of sector trips, with a target of 100 percent of trips monitored if funds are available. If funds are not available for monitoring 100 percent of trips, priority will be given to monitor trips that do not have an at-sea observer, at-sea monitor, or an approved electronic monitor. Also, dockside monitoring is removed from the list of reporting requirements for sectors.

Rationale: Dockside monitoring was adopted by Amendment 16 to verify the accuracy of landings by commercial fishing vessels. The requirement was imposed immediately for vessels fishing in sectors and in FY 2012 for common pool vessels. Because this measure did not replace dealer reporting or VTRs, it did not produce a new data stream that assists the assessment and management of the fishery. Eliminating the requirement will reduce monitoring costs to industry, avoid duplication of effort, and will not reduce the availability of landings information. If the cost is to be covered by NMFS, the industry sees some benefit in continuation of the program. Dockside monitoring will not be considered a reporting requirement so that sectors may request an exemption from monitoring rules in the future, for example to request an exemption for the monitoring of landings in southern areas where groundfish is not caught.

*Note: In the draft Framework 45 document, this option originally only included language that would remove the requirement for dockside monitoring for the commercial fleet. The Council voted during the final action to replace that language with the option above.

Option 3: Removal of Requirement for Industry Funding of At-Sea Monitoring for FY 2012

There is no requirement for the industry to fund the costs of adequate at-sea monitoring of catches in FY 2012. This action delays by one year industry responsibility for those costs. Absent further action, industry will be responsible for the portion of these costs not funded by NMFS in FY 2013.

Rationale: Amendment 16 mandates that the industry will fund at-sea and dockside monitoring costs beginning in FY 2012. The Council is concerned that imposing these costs on the industry at that date will reduce profitability and result in making the sector system an economic failure. This action delays by one year industry responsibility for those costs. The Council may further modify this requirement in the future as more information becomes available on the appropriate monitoring levels, costs of those programs, and implementation of electronic monitoring systems.

Option 4: Trip-end Hail Requirement

Should dockside monitoring requirements be eliminated, commercial groundfish vessels subject to the VMS requirement (i.e., all sector vessels, and common pool vessels that fish under a groundfish DAS or in multiple broad stock areas on the same trip) will still be required to provide a trip-end hail report to NMFS via VMS prior to landing any groundfish trip. This report will be based upon the trip-end hail report requirements implemented under Amendment 16, and will include, but is not limited to, the following information: Vessel permit number; vessel trip report serial number, or other applicable trip ID specified by NMFS; landing state; landing port city; dealer name/offload location; estimated arrival date and time; estimated offload date and time; second offload port city and state (if applicable); and total amount of groundfish and non-groundfish species kept. NMFS will specify the content of these reports, including the fields that must be reported, and provide directions for reporting this information. To the extent possible, NMFS will reduce unnecessary duplication of the trip-end hail reports with any other applicable reporting requirements.

Rationale: The recent implementation of ACLs and the requirement for sector vessels to cease fishing operations once sector allocations are caught under Amendment 16 increases incentives to misreport or underreport landings of groundfish stocks. This option provides the data necessary to enable enforcement personnel to intercept vessels when offloading is expected to occur to help ensure that all groundfish landings are offloaded and recorded by a Federally-permitted dealer. Increasing the chances that a vessel will be subject to dockside inspection by enforcement personnel should increase compliance with applicable measures and will help ensure that groundfish landings are accurately monitored.

4.2.4 Distribution of PSC from Canceled Permits

Option 2: Even Redistribution Among All Remaining Permits

When permits are permanently canceled or surrendered, the PSC associated with such permits will be redistributed across all permits that remain in the fishery (whether fishing in the common pool or sectors). The following formula will apply to all remaining permits, where year 0 is the year in which calculations are performed and PSC_{exited} is the total PSC that was attached to all permits leaving the fishery:

$$PSC_{year\ 1} = PSC_{year\ 0} * 1 / (1 - PSC_{exited})$$

This calculation will be performed on an annual basis for each stock at a date to be determined by NMFS

Rationale: PSC is calculated as a percentage history of all landings of a stock. If permits exit the fishery, their history becomes irrelevant and the remaining permits should reflect a relatively larger percentage of the landings history of existing permits. In the interest of fairness, this increase in percentage should apply to all surviving permits and not only those in one segment of the fishery, i.e. the common pool. If this is not done , then the total PSC for the surviving permits will not add up to 100 percent.

4.2.5 Submission of Sector Rosters

Option 2: Revised Submission Date

Sectors are required to submit final sector rosters to NMFS by December 1 in order to operate on May 1 of the following fishing year.

Rationale: Since adoption of Amendment 16, almost all permit holders with allocations have chosen to participate in sectors. NMFS has found this simplifies administration of the sector program and has adjusted sector roster submission dates several times to give the industry more flexibility in making sector decisions. This measure implements these changes on a permanent basis. Note that this measure does not change submission dates for other sector documents.

4.3 Commercial and Recreational Fishery Measures

4.3.1 General Category Scallop Dredge Exemption – Modification of Restrictions

Option 2: Exemption from Yellowtail Flounder Spawning Closure

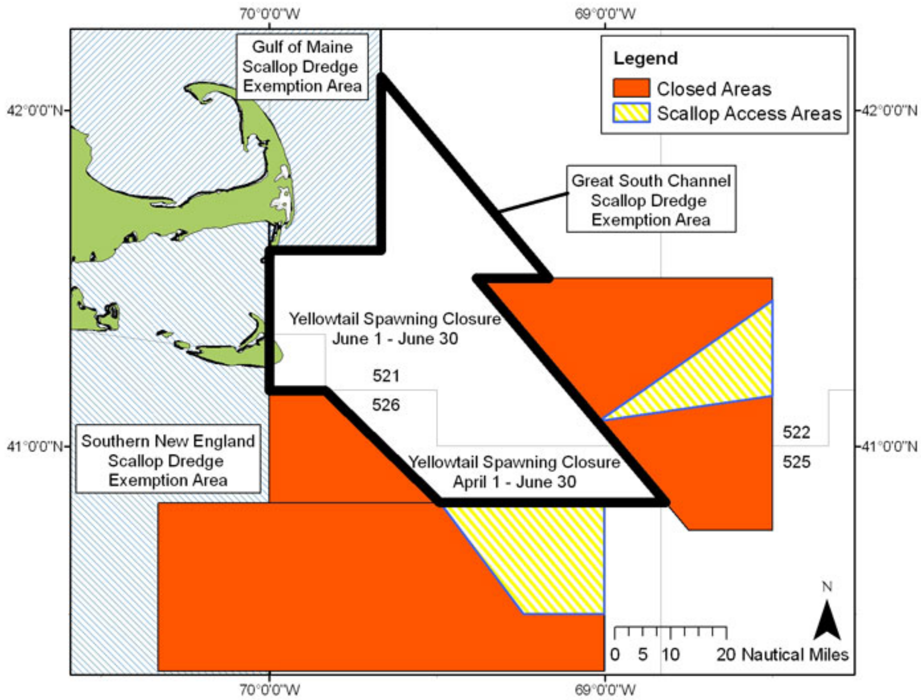
The Proposed Action removes the spawning area closures that apply to the Great South Channel scallop dredge fishery exemption. Under this alternative, vessels issued a General Category scallop permit will no longer be constrained by the Great South Channel SNE/GB yellowtail flounder peak spawning closure, which occurs between April 1 and June 30 and is defined by the straight lines connecting the following points in the order stated below:

Point	*N. Lat.*	*W. Long.*
YTA 1	41° 20’	70° 00
YTA 2	41° 20’	69° 50’
YTA 3	41° 10’	69° 50’
YTA 4	41° 10’	69° 30’
YTA 5	41° 00’	69° 30’
YTA 6	41° 00’	68° 57.58’
YTA 7	40° 50’	68° 49.20’
YTA 8	40° 50’	69° 29.46’
YTA 9	41° 10’	69° 50’
YTA 10	41° 10’	70° 00’
YTA 11	Intersection of south-facing coastline of Nantucket, MA	70° 00’

The other closure that is removed is the Great South Channel CC/GOM yellowtail flounder peak spawning closure, which occurs between June 1 and June 30 and was defined by the straight lines connecting the following points in the order stated below:

Point	*N. Lat.*	*W. Long.*
YTB 1	41° 33.05’	70° 00
YTB 2	41° 20’	70° 00’
YTB 3	41° 20’	69° 50’
YTB 4	41° 10’	69° 50’
YTB 5	41° 10’	69° 30’
YTB 6	41° 00’	69° 30’
YTB 7	41° 00’	68° 57.58’
YTB 8	41° 30’	69° 23’
YTB 9	41° 30’	69° 10’
YTB 10	42° 06’	69° 40’
YTB 11	41° 35’	69° 40’
YTB 12	41° 35’	70° 00’

Figure 1 – General Category scallop fishery yellowtail flounder spawning closure areas (NERO graphic)



Rationale: When the spawning closures were adopted, there were no hard limits to the amount of scallops that could be harvested in the area. Now that the General Category scallop fishery is operating under Individual Transferable Quotas, the main justification for the closure is moot. Furthermore, there is little solid evidence that scallop dredging interferes with yellowtail spawning.

4.3.2 Gulf of Maine Cod Spawning Protection Area

Option 2: GOM Cod Spawning Protection Measures

An area is proposed for the GOM in order to protect spawning aggregations of GOM cod.

The proposed closure area is defined by the following coordinates and illustrated in Figure 2:

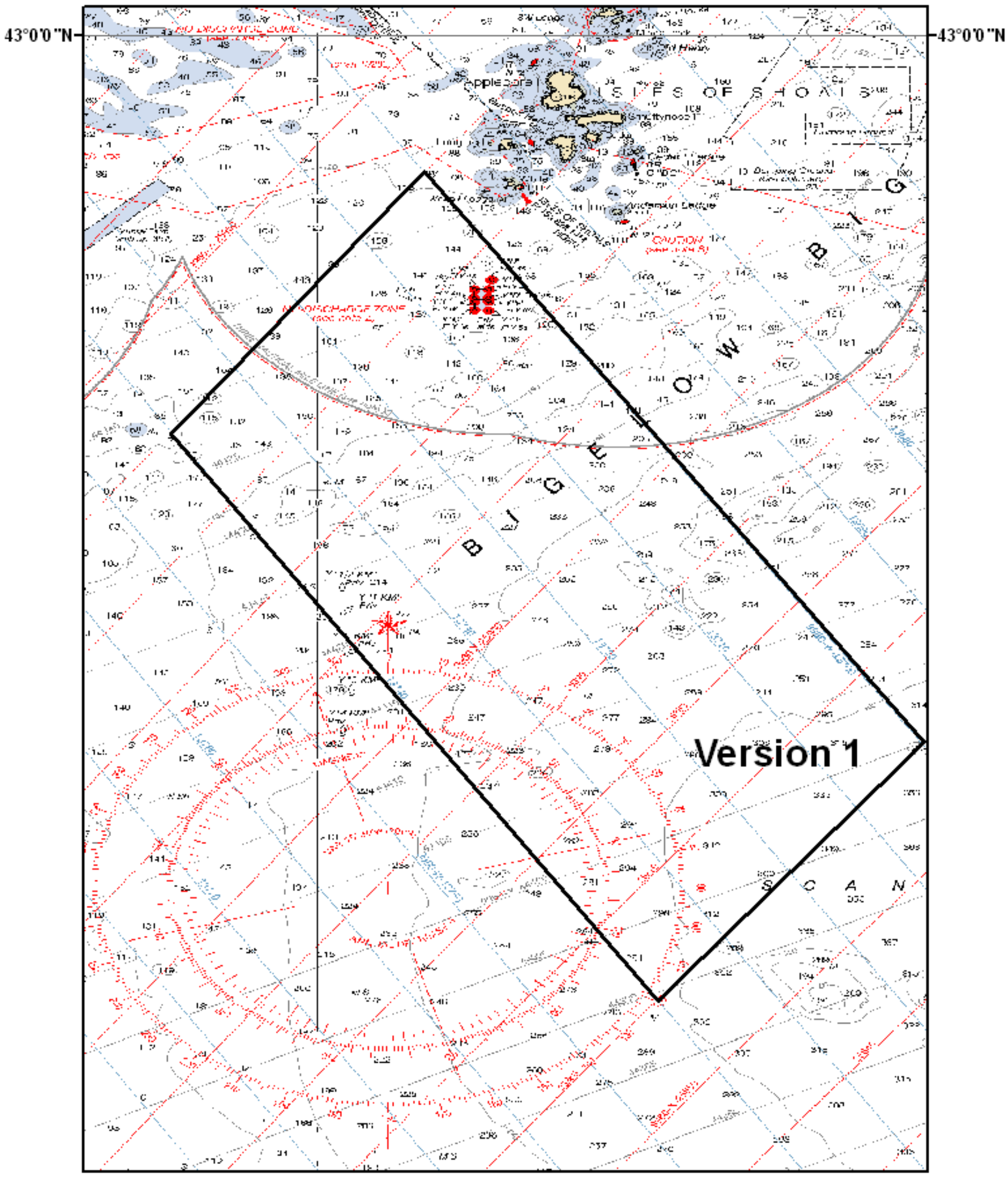
42-50.95 N	70-32.22 W
42-47.65 N	70-35.64 W
42-54.91 N	70-41.88 W
42-58.27 N	70-38.64 W

Provisions that apply to the area are:

- All commercial fishing vessels using gear capable of catching groundfish are prohibited from fishing in the area from June 1 through June 30. Only fishing with exempted gear (that is, gear deemed not capable of catching groundfish as defined by 50 CFR 648.2) is allowed in the area.
- Recreational fishing vessels (including party-charter vessels) are subject to the following restrictions:
    - All recreational fishing vessels using gear capable of catching groundfish are prohibited from fishing in the area from April through June. Only pelagic hook and line gear, as defined in the commercial fishing exempted gear regulations, is allowed for use in the area.
- A fishing vessel (commercial or recreational) may transit the area as long as gear is properly stowed in accordance with regulations promulgated by the Regional Administrator.
- The take or possession of any groundfish species by vessels using exempted gear in this area from April through June is prohibited.

Rationale: This measure restricts commercial and recreational fishing in an inshore area in the GOM that has been identified as being important for cod spawning. This closure is designed to reduce fishing impacts on spawning cod and thus contribute to e further rebuilding of the GOM cod stock. The area is intended to provide protection to spawning cod by limiting fishing at times and areas when catch rates are high, by reducing targeting of large repeat spawners, and by preventing fishing from interfering with spawning activity.

Figure 2 – Proposed GOM cod spawning protection area



4.3.3 Handgear Permit Management Measures

Option 3: Partial Rolling Closure Exemption for Handgear Vessels

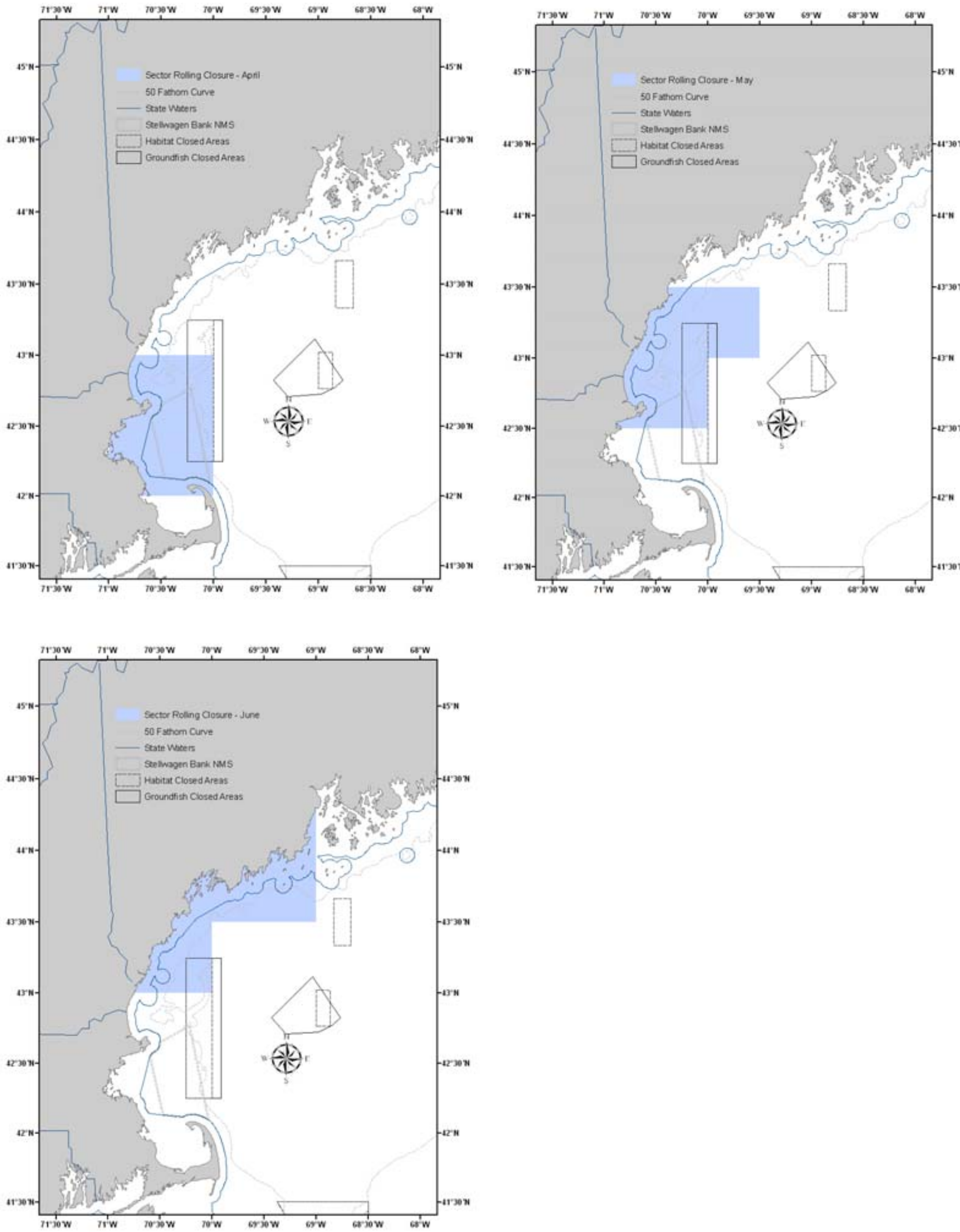
Handgear A vessels are exempt from the same GOM rolling closures as the universal exemption for sector vessels. The areas and months that remain closed to Handgear A vessels are shown in Figure 3. Access to future closed areas (such as the GOM cod spawning protection area in Section 4.3.2) will be determined when the measure is adopted. Handgear A vessel access to these areas will be the same as for other commercial vessels unless Handgear A access is explicitly authorized.

The areas that remain closed to Handgear A vessels are listed below and are shown in Figure 3.

- April: Blocks 124, 125, 132, 133
- May: Blocks 132, 133, 138, 139, 140
- June: 139, 140, 145, 146, 147, 152

Handgear A and B vessels are also exempt from the seasonal closure on Georges Bank.

Figure 3 – GOM rolling closures for which sectors do not receive an automatic exemption (as implemented)



Rationale: Handgear A vessels are constrained by a trip limit that adjusts proportionally to changes made to the trip limit for limited access, common pool vessels. Given the ability of the Regional Administrator to adjust trip limits in season if necessary to prevent the ACL from being exceeded, the Handgear A vessels are competing in a derby with the limited access vessels. As a result, the experience in FY 2010 was that the trip limit was adjusted downward rapidly and at the low levels the Handgear A fishery was not economically viable. This measure provides Handgear

A vessels an opportunity to fish at their trip limit early in the year in the same areas as sector vessels.

Option 4: Handgear A Trip Limit Modification

The Handgear A vessel trip limit for cod will remain at 300 lbs. per trip (one trip per day) until such time that the Regional Administrator has lowered the trip limit that applies to the limited access DAS vessels fishing in the common pool for cod below 300 lbs for the relevant stock area. Once this has occurred, the cod trip limit for vessels fishing under a Handgear A permit would become equal to the trip limit for cod that applies to the limited access DAS vessels fishing in the common pool in the relevant stock area for the remainder of the fishing year.

NMFS may adopt administrative measures necessary to implement this measure, such as requiring Handgear A vessels to obtain a letter of authorization to fish in defined stock areas.

Rationale: Current regulations adjust the Handgear A cod trip limit based on changes to the GOM cod trip limit. As a result, fishing opportunities for Handgear A permit holders on GB are affected by what takes place in the GOM. This measure corrects this inequity. In addition, this measure keeps the trip limit at 300 lbs. for Handgear A vessels until the limited access trip limit is reduced below this level, allowing Handgear A vessels an opportunity to land cod that is similar to that given to limited access vessels.

*Note: In the draft Framework 45 document, this option originally stipulated only that the cod trip limit for vessels fishing under a Handgear A permit would adjust proportionally to the trip limit for cod in the relevant stock area that applied to limited access DAS vessels fishing in the common pool. At the final action, the Council voted to add the language to this option that keeps the Handgear A trip limit at 300 lbs. until the common pool DAS trip limit is lowered beyond that level.

Option 5: Handgear B Trip Limit Modification

The cod trip limit for vessels fishing under a Handgear B permit will adjust proportionally to the trip limit for cod in the relevant stock area that applies to limited access DAS vessels fishing in the common pool. The baseline Handgear B trip limit is 75 lbs./trip, limited to one trip per day. The baseline cod trip limit for limited access vessels fishing in the GOM is that adopted by FW 44 (800 lbs./DAS). For limited access vessels fishing in the GB stock area, the baseline cod trip limit is as adopted in Amendment 16 (2,000 lbs/DAS). As an example, under this measure if the GOM cod trip limit is reduced by 50 percent for limited access vessels, the Handgear B trip limit is reduced by 50 percent for vessels fishing in the GOM, but no change is made to the trip limit for Handgear B vessels fishing on GB.

NMFS may adopt administrative measures necessary to implement this measure, such as requiring Handgear B vessels to obtain a letter of authorization to fish in defined stock areas.

Rationale: Current regulations adjust the Handgear B cod trip limit based on changes to the GOM cod trip limit. As a result, fishing opportunities for Handgear B permit holders on GB are affected by what takes place in the GOM. This measure corrects this inequity.

5.0 Alternatives to the Proposed Action

This section describes alternatives to the Proposed Action that the Council consdiered for the Northeast Multispecies Fishery. In order to facilitate tracking measures in this final document with those considered by the Council as the action was developed, the measures are identified by the same option numbers used during the Council discussions. In the NEPA context, all of these proposed measures are non-preferred alternatives. In the descriptions of the measures and the analyses of their impacts in later sections, the use of the verb “will” rather than “would” does not mean mean that NOAA/NMFS already determined these measures are consistent with the M-S Act and has appoved their implementation.

5.1 Updates to Status Determination Criteria, Formal Rebuilding Programs, and Annual Catch Limits

5.1.1 Revised Status Determination Criteria

<u>Option 1: No Action</u>

If no action is adopted, there will be no revisions to status determination criteria for pollock. The following criteria, as implemented in Amendment 16, would apply:

Table 8 – No Action status determination criteria

Species	Model	B_{msy} or proxy (mt)	F_{msy} or proxy
Pollock	External	½ B_{target}	Rel F at replacement

Numerical estimates of SDCs are in Table 9.

Table 9 – No Action numerical estimates of status determination criteria from GARM III assessment meetings and the Data Poor Working Group

Species	Stock	Model	B_{msy} or proxy (mt)	F_{msy} or proxy	MSY (mt)
Pollock	GB/GOM	AIM	2.00 kg/tow	5.66 c/i	11,320

5.1.2 Revised GB Yellowtail Flounder Rebuilding Mortality Targets

<u>Option 1: No Action</u>

If the No Action alternative is adopted, the rebuilding strategy for GB yellowtail flounder would use a fishing mortality target that is calculated to rebuild the stock by 2014 with a 75 percent probability of success. This rebuilding plan was started in 2006, and is therefore 8 years in duration. The M-S Act requires that overfished stocks be rebuilt as rapidly as possible, usually within a 10-year period.

Option 2B, 2C, and 2D: Revised Rebuilding Target for Georges Bank Yellowtail Flounder

The Council considered a revision to the rebuilding strategy for GB yellowtail flounder. Three of the four sub-options that were under consideration were not selected:

> Sub-Option B: Use a fishing mortality target that is calculated to rebuild the stock by 2016 with a 60 percent probability of success
> Sub-Option C: Use a fishing mortality target that is calculated to rebuild the stock by 2016 with a 75 percent probability of success
> Sub-Option D: Use a fishing mortality target that is calculated to rebuild the stock by 2019 with a 60 percent probability of success

5.1.3 Annual Catch Limit Specifications

Option 1: No Action

If this option was selected, the OFLs/ABCs/ACLs for FY 2011 and FY 2012 would not be modified and would remain as specified in FW 44. Table 10 lists these values for the stocks of interest in this action.

With respect to GB yellowtail flounder, this No Action option is different than if the rebuilding strategy for the stock is not changed. This alternative assumes that the ACLs for GB yellowtail flounder are not changed from those specified in FW 44, regardless of the decision on the proposed rebuilding strategy.

Table 10 – No Action alternative OFLs, ABCs, ACLs, and other ACL sub-components for FY 2011 – FY 2012 (metric tons, live weight)

Stock	Year	OFL	U.S. ABC	State Waters Sub-component	Other Sub-Components	Scallops (1)	Groundfish Sub-ACL	Comm Groundfish Sub-ACL	Rec Groundfish Sub-ACL	Prelim-inary Sectors Sub-ACL	Preliminary Non_Sector Groundfish Sub-ACL	MWT Sub_ ACL	Total ACL
GB Cod(2)	2010	6,272	3,800	38	152	0	3,430			3,256	174	0	3,620
	2011	7,311	5,616	56	225	0	5,068			4,812	257	0	5,349
	2012	8,090	6,214	62	249	0	5,608			5,324	284	0	5,919
GB Haddock(2)	2010	80,007	44,903	449	1,796	0	40,440			39,313	1,127	84	42,768
	2011	59,948	46,784	468	1,871	0	42,134			40,959	1,174	87	44,560
	2012	51,150	39,846	398	1,594	0	35,885			34,885	1,000	74	37,952
GB Yellowtail Flounder(2)	2010	5,148	1,200	0	60	146	964		0	902	63	0	1,170
	2011	6,083	1,081	0	54	**201**	**795**		0	**744**	**52**	0	**1,050**
	2012	7,094	1,226	0	61	**307**	**823**		0	**769**	**53**	0	**1,191**
White Hake	2010	4,130	2,832	28	113	0	2,556			2,435	121	0	2,697
	2011	4,805	3,295	33	132	0	2,974			2,833	141	0	3,138
	2012	5,306	3,638	36	146	0	3,283			3,128	156	0	3,465
Pollock	2010	5,085	3,293	200	200	0	2,748			2,630	118	0	3,148
	2011	5,085	3,293	200	200	0	2,748			2,630	118	0	3,148
	2012	5,085	3,293	200	200	0	2,748			2,630	118	0	3,148

(1) Values are rounded to the nearest metric ton.
(2) Sector and common pool shares are based on FY 2010 shares will be updated when final FY 2011 sector rosters are known.
(3) Greyed-out values may be adjusted as a result of future recommendations of the TMGC. Values shown for GB haddock and cod in 2011 and 2012 are the maximum possible and do not include any Canadian catch.

Option 2: Revised Annual Catch Limit Specifications for Modified Stocks

Since the Council considered four alternative rebuilding strategies for GB yellowtail flounder, the OFLs, ABCs, and ACLs for the strategies that were not selected were considered, but not selected for implementation, in this action. The OFLs, ABCs, and ACLs affiliated with the alternative rebuilding strategies are shown in Table 11.

Note that the GB yellowtail flounder ACLs assume the Council would adopt the TMGC recommendation in section 4.1.4. It is possible that if a different rebuilding strategy was selected that the Council would renegotiate the GB yellowtail flounder TAC with the TMGC.

Table 11 - OFLs, ABCs, ACLs, and other ACL sub-components for FY 2011 – FY 2012 (metric tons, live weight) for non-selected GB yellowtail flounder rebuilding strategies

GB Yellowtail Flounder (No Action)	2011	3,495	0	0	0	0	0	0	0	0	0	0
	2012	4,335	0	0	0	0	0	0	0	0	0	0
GB Yellowtail Flounder (B)	2011	3,495	631	0	32	201	381	0	369	11	0	613
	2012	4,011	844	0	42	307	470	0	456	14	0	820
GB Yellowtail Flounder (C)	2011	3,495	0	0	0	0	0	0	0	0	0	0
	2012	4,208	0	0	0	0	0	0	0	0	0	0
GB Yellowtail Flounder (D)	2011	3,495	1,421	0	51	201	793	0	770	24	0	1,045

(1) Values are rounded to the nearest metric ton.
(2) Sector and common pool shares are based on FY 2010 shares and will be updated when final FY 2011 sector rosters are known.
(3) Greyed-out values may be adjusted as a result of future recommendations of the TMGC.

5.1.4 U.S./Canada Resource Sharing Understanding TACs

Option 1: No Action

If no action is taken on specifications, the recommendations of the TMGC would also not be implemented and there would be no TAC for GB cod, haddock, or yellowtail flounder in the U.S./Canada area for FY 2011. Vessels would still be constrained by the other regulations of the FMP, including days-at-sea (DAS), sector regulations, and closed areas.

5.1.5 Yellowtail Flounder Allocations for the Scallop Fishery

Amendment 16 adopts ACLs for groundfish stocks. Some of these ACLs are divided into either sub-ACLs that are subject to accountability measures (AMs), or other sub-components that are not subject to AMs. The amendment proposes that a portion of yellowtail flounder will be allocated to the scallop fishery. In FY 2010, the allocation is considered a sub-component, while in FY 2011 and beyond it will be considered a sub-ACL subject to AMs that will be adopted in Scallop Amendment 15. FW 44 adopted values for FY 2010 – 2012, but noted that the values for FY 2011 and FY 2012 may be revised in the future based on updated scallop and yellowtail flounder stock information, TMGC recommendations, and on future scallop fishery access area measures. This measure considers such adjustments as a result of the 2010 TRAC and Scallop Framework 22.

Option 2: Revised allocations

An estimate of the yellowtail flounder that will be caught by the scallop fishery in FY 2011 – FY 2013 if it harvests its projected yield was developed for four scallop management scenarios. In FW 44, the Council based the FY 2011 and 2012 yellowtail flounder allocation to the scallop fishery on 90 percent of this expected catch. For CC/GOM yellowtail flounder, scallop fishery incidental catches are low enough that they will be considered part of the “other sub-component”. These catches will be monitored but a specific allocation will not be made in this action. An allocation may be made in the future.

Allocations are adjusted for management uncertainty when the allocation becomes a sub-ACL (in FY 2011 and beyond). As explained in Appendix III, for GB yellowtail flounder the sub-ACL will be set at 97 percent of the allocation, for CC/GOM yellowtail flounder (if/when specified) the sub-ACL will be set at 95 percent of the allocation, while for SNE/MA yellowtail flounder it will be set at 93 percent of the allocation. As noted in Amendment 16 the management uncertainty adjustments may be changed in the future.

The resulting values are shown in Table 12 for the scallop management scenarios proposed in Scallop Framework Adjustment 22. Prior to the Council decision for the yellowtail flounder allocation the Council selected Scallop Scenario 1 as the proposed action/preferred alternative for the scallop fishery. As a result, technically the Council only considered the values for Scenario 1 in this action and only the impacts of this scenario are analyzed.

Rationale: This alternative recognizes the importance of yellowtail flounder to the prosecution of the scallop fishery and allocates most of the yellowtail flounder that the fishery is expected to catch if it harvests the available scallop yield. It also creates an incentive for scallop fishermen to reduce bycatch of yellowtail flounder in order to maximize scallop yield. With respect to Cape Cod/Gulf of Maine yellowtail flounder, no allocation is made since the incidental catch is a low percentage of the available catch (less than 5 percent) and can be accommodated by the "other sub-components" category. An allocation of this stock may be made in the future.

Table 12 – Proposed allocation of yellowtail flounder to the scallop fishery for four alternative scallop management scenarios. Prior to a decision on this action, the Council selected Scallop Scenario 1 for the scallop fishery and only this option was considered as an alternative to the Proposed Action for FW 45. Other scenarios are in italics to highlight this decision.

Scallop No Action	*Total Expected to be Caught, YTF Stock Area*			*Scallop Fishery ABC*			*Sub-ACL*		
Year	*GB*	*SNEMA*	*CC/GOM*	*GB*	*SNEMA*	*CC/GOM*	*GB*	*SNEMA*	*CC/GOM*
2011	*38.0*	*95.1*	*23.4*	*34.2*	*85.6*	*21.1*	*33.2*	*79.6*	
2012	*36.9*	*66.1*	*21.6*	*33.2*	*59.5*	*19.4*	*32.2*	*55.3*	
2013	*404.0*	*134.0*	*18.0*	*363.6*	*120.6*	*16.2*	*352.7*	*112.2*	
Scallop Scenario 1	*Total Expected to be Caught, YTF Stock Area*			*Scallop Fishery ABC*			*Sub-ACL*		
Year	*GB*	*SNEMA*	*CC/GOM*	*GB*	*SNEMA*	*CC/GOM*	*GB*	*SNEMA*	*CC/GOM*
2011	175.3	57.6	23.6	157.8	51.8	21.2	153.0	48.2	
2012	341.8	83.7	20.1	307.6	75.3	18.1	298.4	70.1	
2013	404.0	134.0	18.0	363.6	120.6	16.2	352.7	112.2	
Scallop Scenario 2	*Total Expected to be Caught, YTF Stock Area*			*Scallop Fishery ABC*			*Sub-ACL*		
Year	*GB*	*SNEMA*	*CC/GOM*	*GB*	*SNEMA*	*CC/GOM*	*GB*	*SNEMA*	*CC/GOM*
2011	*50.3*	*57.6*	*25.0*	*45.3*	*51.8*	*22.5*	*43.9*	*48.2*	
2012	*291.6*	*103.4*	*19.8*	*262.4*	*93.1*	*17.8*	*254.6*	*86.5*	
2013	*404.0*	*134.0*	*18.0*	*363.6*	*120.6*	*16.2*	*352.7*	*112.2*	
South Channel Closure	*Total Expected to be Caught, YTF Stock Area*			*Scallop Fishery ABC*			*Sub-ACL*		
Year	*GB*	*SNEMA*	*CC/GOM*	*GB*	*SNEMA*	*CC/GOM*	*GB*	*SNEMA*	*CC/GOM*
2011	*298.7*	*54.9*	*6.9*	*268.8*	*49.4*	*6.2*	*260.8*	*46.0*	
2012	*351.8*	*83.1*	*17.1*	*316.6*	*74.8*	*15.4*	*307.1*	*69.6*	
2013	*404.0*	*134.0*	*18.0*	*363.6*	*120.6*	*16.2*	*352.7*	*112.2*	

* Values are metric tons, live weight, rounded to the nearest 0.1 metric ton.

5.2 Fishery Program Administration

5.2.1 Implementation of Additional Sectors

Option 1: No Action

If No Action is adopted, the list of operating sectors would be limited to the nineteen that were authorized by Amendment 16. These include the Georges Bank Cod Hook Sector, Fixed Gear Sector, Sustainable Harvest Sector, Port Clyde Community Groundfish Sector, Tri-State Sector, and Northeast Fishery Sectors I-XIII.

Option 2: Implement New Sectors for FY 2011

Under Option 2, the following new sector applications were received for inclusion in Framework 45. These applicants were not selected for the Proposed Action. Sectors that wish to begin operating in a given fishing year are required to submit proposals and operations plans one year prior to the beginning of that fishing year. The following sectors, if approved, would therefore commence operations on May 1, 2011.

Northeast Fisheries Sector XIV
Summary: This sector is designed to be comprised of inactive members. Its primary intent is to transfer ACE to and from other sectors. The sector will be comprised of active membership in the future if such action is deemed necessary.

Sustainable Harvest Sector II
Summary: This would be a sector comprised of active groundfish vessels, similar to the existing Sustainable Harvest Sector.

Rationale: At its November 2010 meeting, the Council approved the following motion, "To only implement new sectors for which an operations plan was submitted by the deadline with the exception of the state operation plans." Because the operations plans for the Northeast Fisheries Sector XIV and the Sustainable Harvest Sector II were not submitted by the September 1st deadline, these sectors were not approved in this action.

5.2.2 Monitoring Requirements for Handgear A and Handgear B Permitted Vessels and Small Vessel Exemption Vessels

Option 1: No Action

Under this option there is no change to the requirements for dockside monitoring that were adopted in Amendment 16. Vessels using a Handgear A or Handgear B permit, or a Small Vessel Exemption permit, that join sectors are already required to comply with dockside monitoring requirements; vessels using such permits in the common pool would be required to comply with the dockside monitoring requirements beginning in 2012.

5.2.3 Monitoring Requirements for Commercial Groundfish Fishing Vessels

Option 1: No Action

Under this option there are no changes to the monitoring requirements for commercial groundfish fishing vessels that were adopted in Amendment 16. The regulations require the use of dockside/roving monitoring to observe offloads by groundfish vessels (on twenty percent of trips beginning in FY 2011) to certify the accuracy of dealer reports. As detailed further by Amendment 16, this requirement applies to sector trips beginning in FY 2010, and common pool trips beginning in FY 2012. Furthermore, there is a requirement that the fishing industry would pay the costs of such monitoring, although NMFS has provided funding to date.

5.2.4 Distribution of PSC from Canceled Permits

Option 1: No Action

If No Action is selected, distribution of PSC from canceled permits will continue in the same manner it is currently performed. At this time, if a permit permanently exits the fishery, its associated PSC is assigned to the common pool. This is because the original calculations of PSC that were performed during the implementation of Amendment 16 have not been revisited, and no way to re-assign the PSC to other individual permits has been adopted.

PSC is calculated as a percentage history of all landings of a stock; in other words, the historic catch associated with a single permit, divided by all the historic catch of a stock. As determined by Amendment 16, the value of the historic catch (denominator) does not change, but is static. The implication of this fact is that when there are decreases in the number of current permits due to permanent permit cancellations, the relative percentage of fish allocated to sectors declines but the relative percentage of the allocation to the common pool increases.

5.2.5 Submission of Sector Rosters

Option 1: No Action

There are no changes to current requirements that sectors must submit final sector rosters to NMFS by September 1 for the next fishing year. This requirement was adopted in Amendment 16.

Rationale: September 1 is the submission date for all sector documents. Specified in Amendment 16 at NMFS' request, this date was selected to provide sufficient time for review of all sector documents so that authorization could be granted for a May 1 starting date for sector operations.

5.3 Commercial and Recreational Fishery Measures

5.3.1 General Category Scallop Dredge Exemption – Modification of Restrictions

Option 1: No Action

If No Action is selected, the restrictions associated with the Great South Channel Scallop Dredge Exemption program will remain the same, including the seasonal closures within this exemption area. The yellowtail flounder spawning closures described in Option 2 will remain in effect.

5.3.2 Gulf of Maine Cod Spawning Protection Area

Option 1: No Action

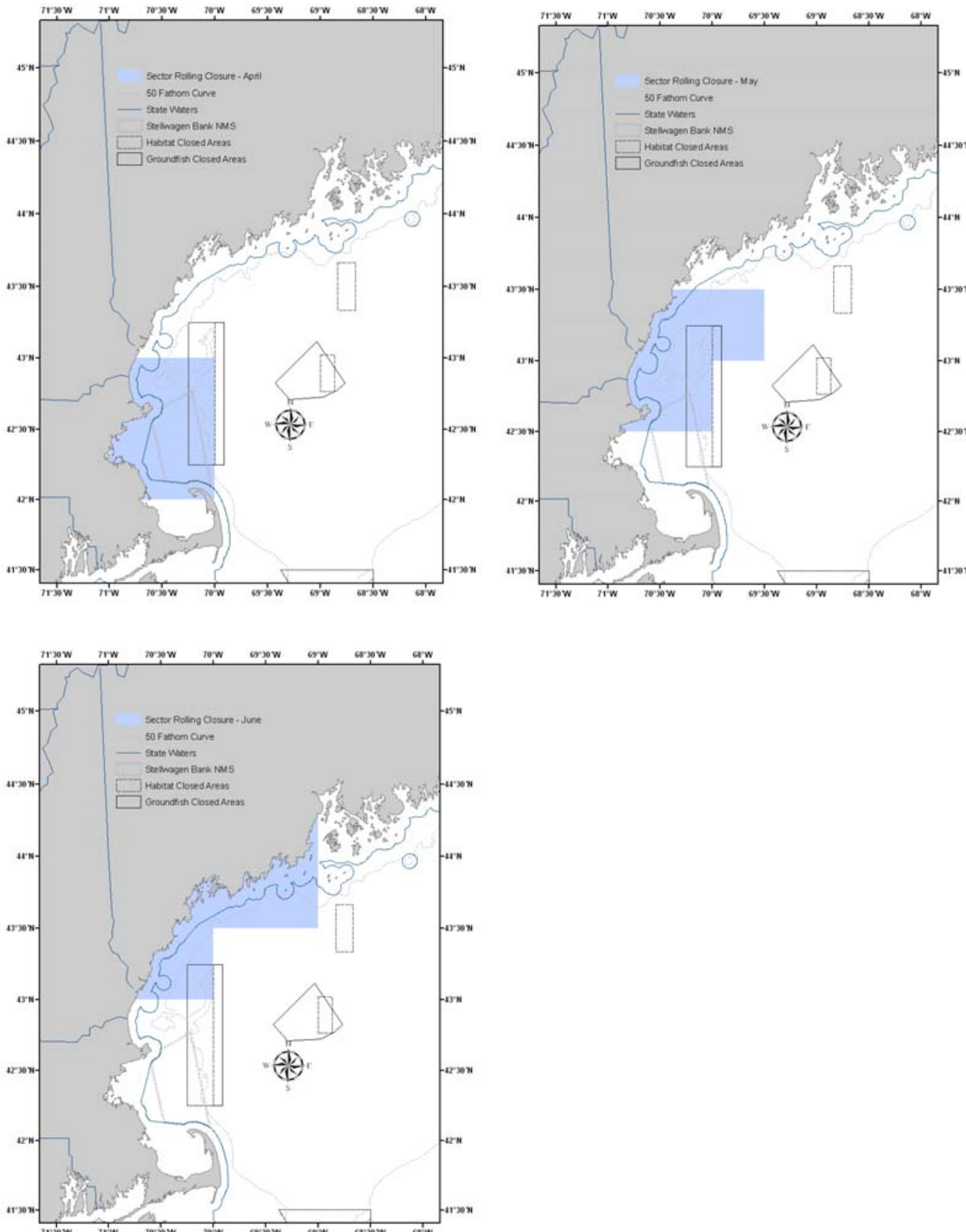
There are no changes to management measures as implemented under Amendment 16. Recreational vessels are allowed to fish in GOM rolling closure areas and sector vessels are allowed to fish in the modified rolling closures.

With respect to the recreational fishery, the measures adopted by Amendment 16 include a minimum fish size for GOM cod, a bag limit, and a seasonal prohibition on possession of GOM cod (November 1 – April 15).

For the commercial fishery, there are separate measures for sector vessels and vessels not in sectors. Sector fishing activity is constrained by quotas for a group of allocated stocks. Sectors are responsible for monitoring their catches and staying within their quotas but are granted latitude to be exempted from numerous other regulations. One of the universal exemptions for all sectors allows fishing during some of the rolling closures in the Gulf of Maine. The areas that remain closed to sector vessels listed below and are shown in Figure 4.

- April: Blocks 124, 125, 132, 133
- May: Blocks 132, 133, 138, 139, 140
- June: 139, 140, 145, 146, 147, 152

Figure 4 – GOM rolling closures for which sectors do not receive an automatic exemption (as implemented)



There is an extensive suite of effort controls for vessels not in sectors. These measures include a trip limit, DAS restrictions, gear requirements, and rolling closures. The principle components of the program are summarized below. FW 44 also granted the Regional Administrator the authority to modify DAS counting and trip limits in order to control catches. These measures remain in effect and are not changed by this action.

Trip Limits:

The trip limits in Table 13 were implemented for fishing on a Category A DAS, while all other trip limits while fishing on a Category A DAS were eliminated. For GB and GOM cod, Handgear A permits are allowed a 300 lb. per trip landing limit, while Handgear B permits are allowed 75 lbs. per trip.

Table 13 – No Action trip limits for common pool vessels (table does not reflect in-season adjustments or changes resulting from imposition of AMs)

Stock	Amendment 16/FW 44
GOM Cod GB Cod	GOM: 800 lbs/DAS, 4,000 lbs/trip; GB: 2,000 lbs./DAS; maximum 20,000 lbs/trip; with the exception of the Eastern U.S./Canada area, where the Regional Administrator will specify the appropriate trip limit at the beginning of the fishing year (the default trip limit for this area remains 500 lbs./DAS, up to a maximum of 5,000 lbs./trip).
CCGOM Yellowtail Flounder	250 lbs./ DAS up to a maximum of 1,500 lbs./trip
SNE/MA Yellowtail Flounder	250 lbs./ DAS up to a maximum of 1,500 lbs./trip
SNE/MA Winter Flounder	0
Windowpane Flounder	0
Atlantic Halibut	One fish/trip
Ocean Pout	0
Atlantic Wolffish	0
Pollock	1,000 lbs./DAS, 10,000 lbs./trip

Restricted Gear Areas:

Two restricted gear areas were established in Amendment 16 (Figure 5). Vessels fishing under a groundfish DAS are required to comply with the gear requirements for these areas.

Administration: Vessel operators must comply with the following administrative requirements to fish in these areas:

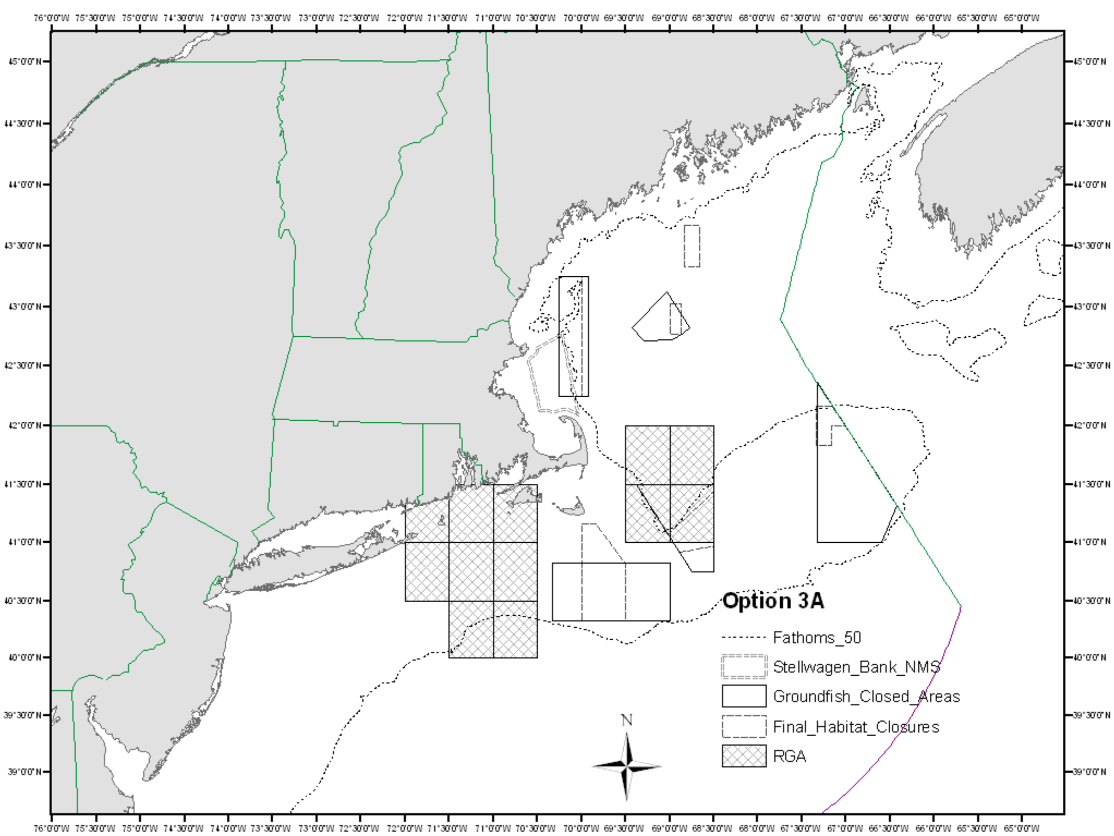
- As specified by the Regional Administrator, vessel operators must either request a Letter of Authorization (LOA) from NMFS or must make a specific VMS declaration to fish in the areas. The minimum participation period if an LOA is required is seven days.
- A vessel can fish inside and outside the area on the same trip, but is subject to the most restrictive measures (gear, trip limits, etc.) for the entire trip.
- Existing gear performance standards apply to gear used in these areas. Gillnets with large mesh that are allowed in the area are allowed to retain monkfish subject to monkfish possession limits and not the gear performance standards.
- Other gear is not allowed on board when operating in these areas.
- Additional gear (such as the five-point trawl, raised footrope trawl, or tie-down sink gillnets with mesh less than ten inches) may be considered for use in this area if approved by the Regional Administrator consistent with the regulations for approving additional gear in special management programs.

Areas: The areas are defined as:

Western GB Multispecies RGA:
42-00N 69-30W
42-00N 68-30W
41-00N 68-30W
41-00N 69-30W

Southern New England Multispecies RGA:
41-30N 70-30W
40-00N 70-30W
40-00N 71-30W
40-30N 71-30W
40-30N 72-00W
North to the Connecticut shoreline at 72-00W
East along the shoreline to 41-30N

Figure 5 – Restricted gear areas adopted in Amendment 16



Gear restrictions include the following authorized gears:

Trawl Gear: Trawl vessels fishing under a groundfish DAS must use a haddock separator trawl, eliminator trawl, or the rope trawl. The haddock separator trawl and Ruhle trawl are described in existing regulations.

Rope trawl: The design includes a four-panel structure to increase headline height and large mesh in the front part of the trawl. The separator panel is made from a series of parallel ropes of different lengths. The panel is one-third from the fishing line in the vertical plane. There is a large escape opening in the bottom of the trawl. Additional details will be clarified by NMFS in the proposed rule and final regulations.

Sink gillnets: No tiedown nets allowed using mesh less than ten inches. Stand-up gillnets are allowed with legal size mesh.

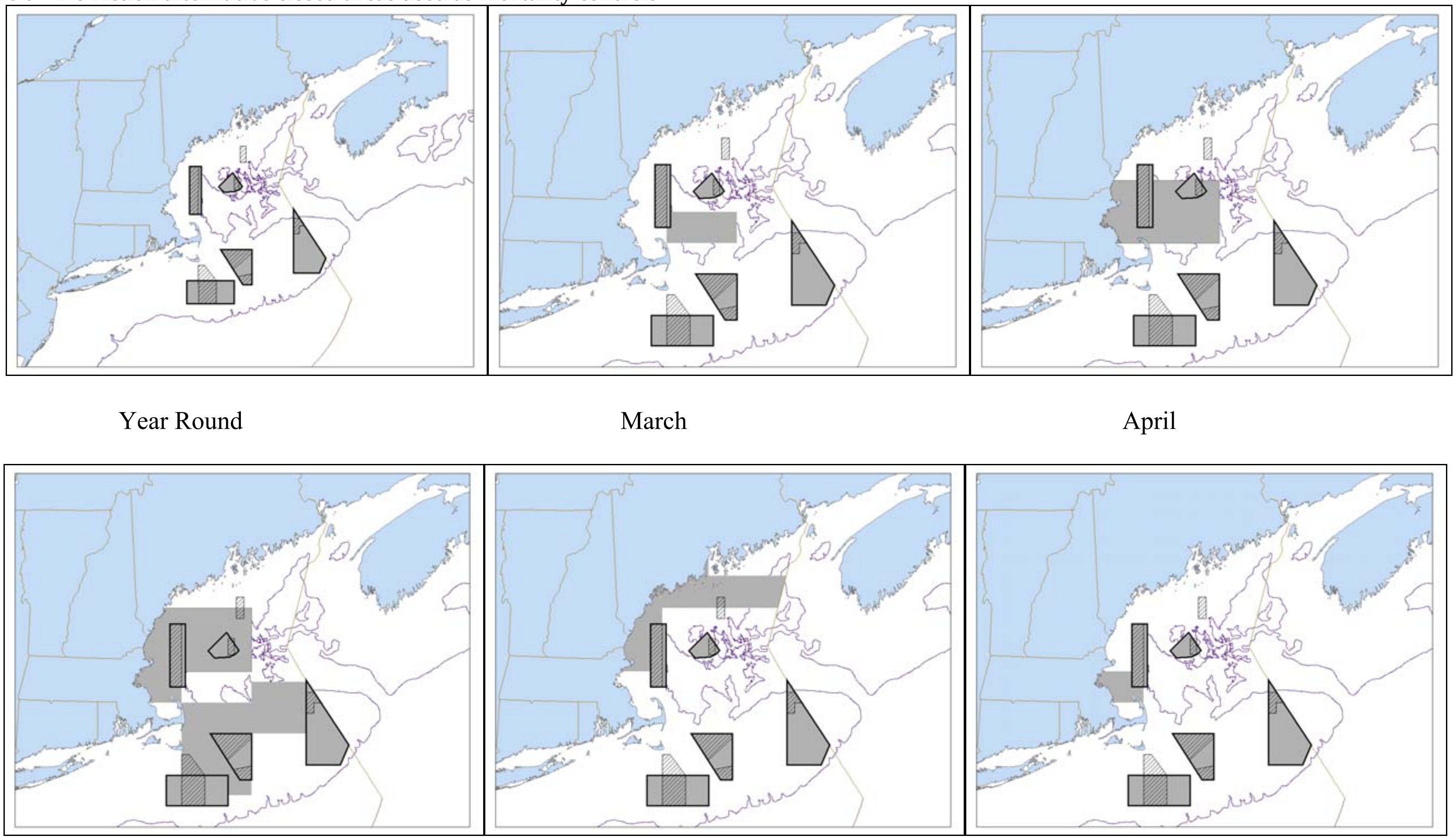
Longline/tub trawls

Handgear

Table 14 – Gear restrictions under No Action alternative

<table>
<tr><th></th><th>GOM</th><th>GB</th><th>SNE</th><th>Mid-Atl</th></tr>
<tr><td colspan="5">MINIMUM MESH SIZE RESTRICTIONS FOR GILLNET GEAR</td></tr>
<tr><td rowspan="2">NE Multispecies
Day Gillnet Category*</td><td>Roundfish nets
6.5" (16.5 cm) mesh;
50-net allowance</td><td rowspan="2">All nets
6.5" (16.5 cm) mesh;
50-net allowance</td><td rowspan="2">All nets
6.5" (16.5 cm) mesh;
75-net allowance</td><td>Roundfish nets
6.5" (16.5 cm) mesh;
75-net allowance</td></tr>
<tr><td>Flatfish nets
6.5" (16.5 cm) mesh;
100-net allowance</td><td>Flatfish nets
6.5" (16.5 cm) mesh;
75-net allowance</td></tr>
<tr><td>NE Multispecies
Trip Gillnet Category*</td><td>All nets
6.5" (16.5 cm) mesh;
150-net allowance</td><td>All nets
6.5" (16.5 cm) mesh;
150-net allowance</td><td>All nets
6.5" (16.5 cm) mesh;
75-net allowance</td><td>All gillnet gear
6.5" (16.5 cm) mesh;
75-net allowance</td></tr>
<tr><td rowspan="2">Monkfish Vessels**</td><td colspan="4">10" (25.4 cm) mesh/150-net allowance</td></tr>
<tr><td colspan="4"></td></tr>
<tr><td colspan="5">MINIMUM MESH SIZE RESTRICTIONS FOR TRAWL GEAR</td></tr>
<tr><td>Codend only
mesh size*</td><td colspan="2">6.5" (16.5 cm) diamond or square</td><td>7.0" (17.8 cm) diamond or
6.5" (16.5 cm) square</td><td>6.5" (16.5 cm) diamond or square</td></tr>
<tr><td>Large Mesh Category -
entire net</td><td colspan="3">8.5" (21.59 cm) diamond or square</td><td>7.5" (19.0 cm) diamond or 8.0" (20.3 cm) square</td></tr>
<tr><td colspan="5">MAXIUM NUMBER OF HOOKS AND SIZE RESTRICTIONS FOR HOOK-GEAR***</td></tr>
<tr><td rowspan="3">Limited access multispecies vessels</td><td>2,000 hooks</td><td>3,600 hooks</td><td>2,000 hooks</td><td>4,500 hooks (Hook-gear vessels only)</td></tr>
<tr><td colspan="4">No less than 6" (15.2 cm) spacing allowed between the fairlead rollers</td></tr>
<tr><td colspan="3">12/0 circle hooks required for longline gear</td><td>N/A</td></tr>
</table>

Figure 6 – No Action alternative closed areas used as mortality controls



Year Round | March | April

May | June | October/November

Closed Areas:

Amendment 16 did not authorize additional closed areas. However, closures in place prior to its adoption remain in effect (Figure 6).

In-Season Adjustments to Mortality Control Measures:

The Regional Administrator has the authority to impose trip limits as necessary under the provisions implementing the U.S./Canada Resource Sharing Understanding. Under those regulations, the Regional Administrator specifies the trip limit for GB yellowtail flounder. In all cases, only one landing limit can be landed in any twenty-four hour period. If a vessel fishes in more than one area, the most restrictive trip limit for a species applies for the entire trip.

Framework 44 to the FMP granted the RA authority to modify effort control measures including trip limits and differential DAS for common pool vessels in order to facilitate the achievement of catch limits, or to prevent exceeding them. The RA may also adjust effort control provisions through the administration of accountability measures including post-season differential DAS adjustments for FY 2010 and 2011 and the hard TAC AM in FY 2012.

Option 2: GOM Cod Spawning Protection Measures

Under Option 2, the following language was considered for restrictions to recreational fishing vessels.

- Recreational fishing vessels (including party-charter vessels) are subject to the following restrictions:
    - Sub-Option A: Recreational vessels are prohibited from fishing in the area from April through June.
    - Sub-Option B: Recreational vessels are prohibited from possessing cod in the area from April through June.

Rationale: After extensive public feedback, the Council decided to allow the prosecution of other fisheries in the area and therefore selected language that allowed fishing with pelagic gear.

5.3.3 Handgear Permit Management Measures

Option 1: No Action

No changes will be made to the regulations for vessels fishing with Handgear A or Handgear B permit vessels. Handgear A vessels would continue to be limited to a trip limit of 300 lbs./trip for cod. This amount adjusts proportionally to any changes to the GOM cod trip limit for limited access vessels as described in 50 CFR 648.82(b)(6). Handgear B vessels would continue to be limited to a trip limit of 75 lbs./trip. This amount adjusts proportionally to any changes to the GOM cod trip limit for limited access vessels as described in 50 CFR 648.88(a)(1).

Vessels fishing with Handgear A permits and not in a sector would continue to be subject to all rolling closures that apply to common pool vessels.

Option 2: Rolling/Seasonal Closure Exemption for Handgear A Vessels

Handgear A vessels are exempt from all GOM rolling closures implemented by Amendment 13.

Handgear A vessels are exempt from the GB seasonal closure.

Access to future closed areas (such as the GOM cod spawning protection area in Section 4.3.2) will be determined when the particular measure is adopted. Handgear A vessel access to new closures will be the same as for other commercial vessels unless Handgear A access is explicitly authorized. Handgear A vessels that are in the common pool will be subject to the same rules as other common pool vessels unless a specific exception is made. Handgear A vessels in sectors will be subject to the same rules as other sector vessels unless a specific exception is made.

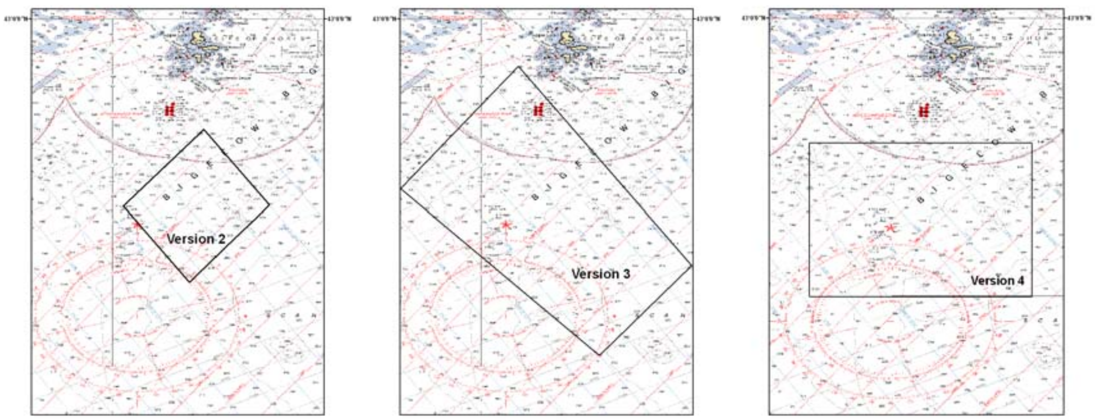
Rationale: Handgear A vessels are constrained by a trip limit that adjusts proportionally to changes made to the trip limit for limited access, common pool vessels. Given the ability of the Regional Administrator to adjust trip limits in season if necessary to prevent the ACL from being exceeded, the Handgear A vessels are competing in a derby with the limited access vessels. As a result, the experience in FY 2010 was that the trip limit was adjusted downward rapidly and at the low levels the Handgear A fishery was not economically viable. This measure provides Handgear A vessels an opportunity to fish at their trip limit early in the year in the rolling closure areas, giving them more of an opportunity to be profitable.

6.0 Alternatives Considered and Rejected

6.1 GOM Cod Spawning Protection Area

The Council considered three alternatives to the proposed area but did not select them for further analysis.

Figure 7 – Rejected candidate areas for the GOM cod spawning protection area



6.2 State-Operated Permit Banks

<u>Option 1: No Action</u>

No changes are made to the FMP to facilitate the operation of state-operated permit banks. If states own groundfish permits, they must enroll them in a sector in order to use them to acquire ACE for the sector. If not enrolled in a sector, the DAS may be leased to vessels fishing in the common pool.

<u>Option 2: Authorization for State Operated Permit Banks</u>

A state-operated permit bank sponsored by NOAA shall be considered a Sector for the exclusive purpose of transferring ACE to qualifying Sectors. Such permit banks will be allocated ACE for a fishing year based on the PSCs of permits owned by the permit bank that are declared as ACE permits for that fishing year. All or a portion of a permit bank's ACE for any NE multispecies stock may be transferred to a qualifying Sector at any time during the fishing year. Permit banks may only act as the transferor in an ACE transfer.

Rationale: Funding has been provided to several states to acquire groundfish permits in order to use the Potential Sector Contribution (PSC) attached to those permits to mitigate adverse effects of sector management. This measure was intended to facilitate state-operated permit banks transferring that PSC to existing sectors without requiring the states to either form a sector or enroll the permits in an existing sector. This would have exempted these permit banks from sector requirements on owners, reporting and record-keeping requirements, etc. While considering this measure, the NEFMC received advice from NOAA General Counsel staff that this type of action could not be instituted in a framework document. The NEFMC expressed its intent to pursue this option in a forthcoming amendment to the FMP.

6.3 Revised Handgear A Trip Limits

The trip limit for vessels fishing for cod using a Handgear A permit will be 300 lbs./trip at the start of the fishing year. Handgear A vessels fishing for GOM cod will not have the trip limit changed proportional to the GOM cod trip limit for common pool limited access vessels. For vessels fishing for GOM cod, the trip limit will change to 0 pounds per trip for the remainder if the fishing year when Handgear A permits have caught (kept and discarded) an amount of GOM cod that is equal to the groundfish GOM cod commercial ACL multiplied by the total GOM cod PSC for Handgear A permits in the common pool. Note that under this measure, Handgear A trip limits in the GOM do not increase if the limited access trip limit for GOM cod increases.

For Handgear A vessels fishing for GB cod, there is no change to the trip limit adjustment (increase or decrease) that is proportional to the GOM cod trip limit adjustment made for common pool limited access vessels.

Rationale: This measure was considered but rejected after NOAA General Counsel stated this measure allocated GOM cod to the Handgear A permit category and thus could not be adopted via a framework action.

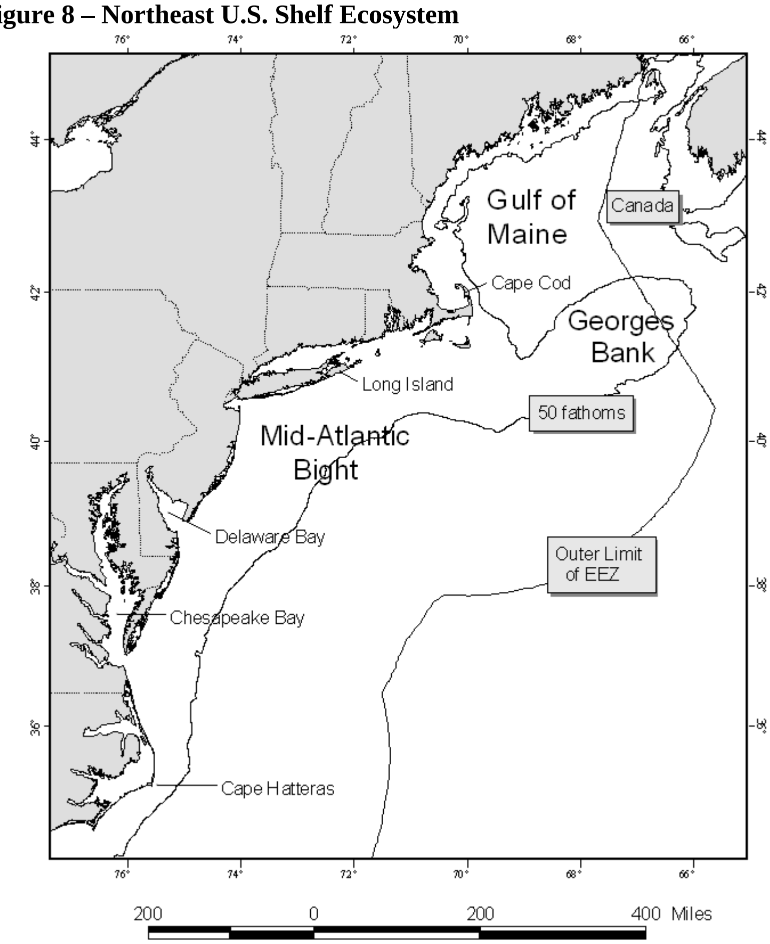
7.0 Affected Environment

The Valued Ecosystem Components (VECs) affected by the Proposed Action include the physical environment, Essential Fish Habitat (EFH), target species, non-target species/bycatch, protected resources, and human communities, which are described below.

7.1 Physical Environment/Habitat/EFH

The Northeast U.S. Shelf Ecosystem (Figure 8) has been described as including the area from the Gulf of Maine south to Cape Hatteras, North Carolina, extending from the coast seaward to the edge of the continental shelf, including offshore to the Gulf Stream (Sherman et al. 1996). The continental slope includes the area east of the shelf, out to a depth of 2,000 meters (m). Four distinct sub-regions comprise the NOAA Fisheries Northeast Region: the Gulf of Maine, Georges Bank, the southern New England/Mid-Atlantic region, and the continental slope. Since the groundfish fleet will primarily be fishing in the inshore and offshore waters of the Gulf of Maine, Georges Bank, and the southern New England/Mid-Atlantic areas, the description of the physical and biological environment is focused on these sub-regions. Information on the affected environment was extracted from Stevenson et al. (2004).

Figure 8 – Northeast U.S. Shelf Ecosystem

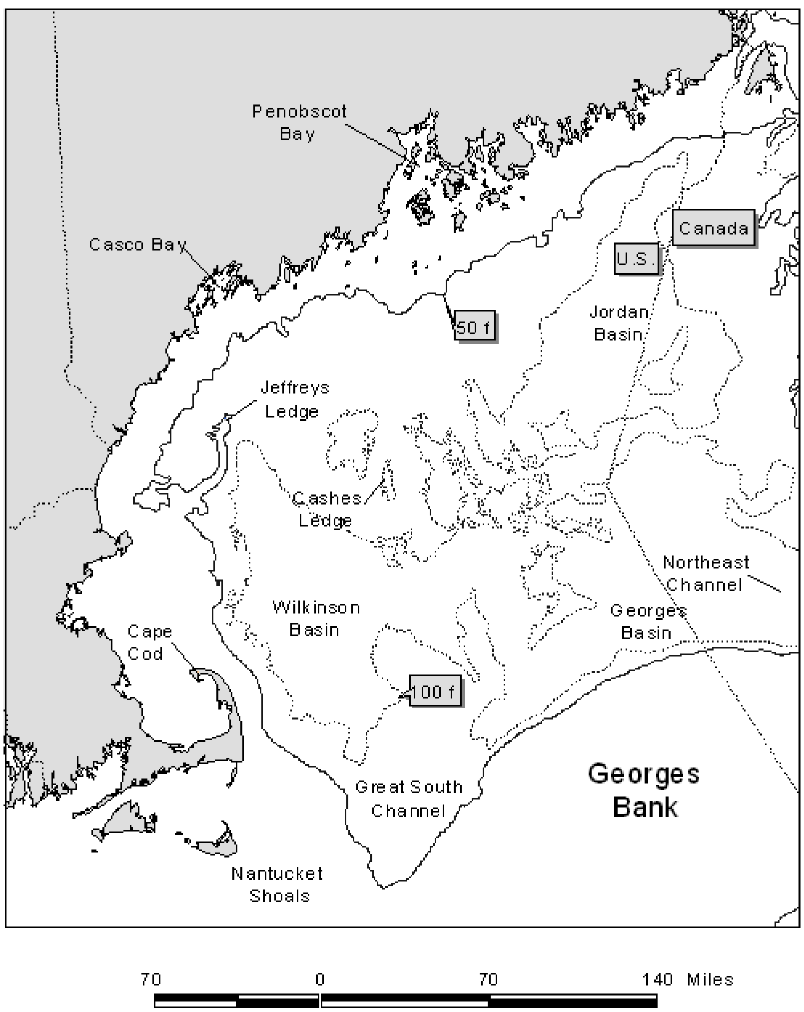


7.1.1 Affected Physical Environment

7.1.1.1 Gulf of Maine

The Gulf of Maine is an enclosed coastal sea, bounded on the east by Browns Bank, on the north by the Nova Scotian (Scotian) Shelf, on the west by the New England states, and on the south by Cape Cod and Georges Bank (Figure 8). The Gulf of Maine is a boreal environment and is characterized by relatively cold waters and deep basins, with a patchwork of various sediment types. There are 21 distinct basins separated by ridges, banks, and swells. Depths in the basins exceed 250 m, with a maximum depth of 350 m in Georges Basin, just north of Georges Bank. High points within the Gulf of Maine include irregular ridges, such as Cashes Ledge, which peaks at 9 m below the surface.

Figure 9 – Gulf of Maine



The Gulf of Maine is an enclosed coastal sea that was glacially derived and is characterized by a system of deep basins, moraines, and rocky protrusions (Stevenson et al. 2004). The Gulf of Maine is topographically diverse from the rest of the continental border of the U.S. Atlantic coast (Stevenson et al. 2004). Very fine sediment particles created and eroded by the glaciers have collected in thick deposits over much of the seafloor of the Gulf of Maine, particularly in its deep basins. These mud deposits blanket and obscure the irregularities of the underlying bedrock, forming topographically smooth terrains. In the rises between the basins, other materials are usually at the surface. Unsorted glacial till covers some morainal areas, sand predominates on some high areas, and gravel,[1] sometimes with boulders, predominates others. Bedrock is the predominant substrate along the western edge of the Gulf of Maine, north of Cape Cod in a narrow band out to a depth of about 60 m. Mud predominates in coastal valleys and basins that often abruptly border rocky substrates. Gravel, often mixed with shell, is common adjacent to bedrock outcrops and in fractures in the rock. Gravel is most abundant at depths of 20 to 40 m, except off eastern Maine where a gravel-covered plain exists to depths of at least 100 m. Sandy areas are relatively rare along the inner shelf of the western Gulf of Maine, but are more common south of Casco Bay, especially offshore of sandy beaches.

The geologic features of the Gulf of Maine coupled with the vertical variation in water properties (e.g. salinity, depth, temperature) combine to provide a great diversity of habitat types that support a rich biological community. To illustrate this, a brief description of benthic invertebrates and demersal (i.e., bottom-dwelling) fish that occupy the Gulf of Maine is provided below. Additional information is provided in Stevenson et al. (2004), which is incorporated by reference.

The most common groups of benthic invertebrates in the Gulf of Maine reported by Theroux and Wigley (1998) in terms of numbers collected were annelid worms, bivalve mollusks, and amphipod crustaceans. Biomass was dominated by bivalves, sea cucumbers, sand dollars, annelids, and sea anemones. Watling (1998) identified seven different bottom assemblages that occur on the following habitat types:

Sandy offshore banks: fauna are characteristically sand dwellers with an abundant interstitial component;

Rocky offshore ledges: fauna are predominantly sponges, tunicates, bryozoans, hydroids, and other hard bottom dwellers;

Shallow (< 60 m) temperate bottoms with mixed substrate: fauna population is rich and diverse, primarily comprised of polychaetes and crustaceans;

Primarily fine muds at depths of 60 to 140 m within cold Gulf of Maine Intermediate Water[2]: fauna are dominated by polychaetes, shrimp, and cerianthid anemones;

Cold deep water, muddy bottom: fauna include species with wide temperature tolerances which are sparsely distributed, diversity low, dominated by a few polychaetes, with brittle stars, sea pens, shrimp, and cerianthids also present;

Deep basin, muddy bottom, overlaying water usually 7 to 8°C: fauna densities are not high, dominated by brittle stars and sea pens, and sporadically by a tube-making amphipods; and

---

[1] The term “gravel,” as used in this analysis, is a collective term that includes granules, pebbles, cobbles, and boulders in order of increasing size. Therefore, the term “gravel” refers to particles larger than sand and generally denotes a variety of “hard bottom” substrates.

[2] Maine Intermediate Water is described as a mid-depth layer of water that preserves winter salinity and temperatures, and is located between more saline Maine bottom water and the warmer, stratified Maine surface water. The stratified surface layer is most pronounced in the deep portions of the western Gulf of Maine.

Upper slope, mixed sediment of either fine muds or mixture of mud and gravel, water temperatures always greater than 8°C: upper slope fauna extending into the Northeast Channel.

Two studies (Gabriel 1992, Overholtz and Tyler 1985) reported common[3] demersal fish species by assemblages in the Gulf of Maine and Georges Bank:

Deepwater/Slope and Canyon: offshore hake, blackbelly rosefish, Gulf stream flounder;

Intermediate/Combination of Deepwater Gulf of Maine-Georges Bank and Gulf of Maine-Georges Bank Transition: silver hake, red hake, goosefish (monkfish);

Shallow/Gulf of Maine-Georges Bank Transition Zone: Atlantic Cod, haddock, pollock;

Shallow water Georges Bank-southern New England: yellowtail flounder, windowpane flounder, winter flounder, winter skate, little skate, longhorn sculpin;

Deepwater Gulf of Maine-Georges Bank: white hake, American plaice, witch flounder, thorny skate; and

Northeast Peak/Gulf of Maine-Georges Bank Transition: Atlantic cod, haddock, pollock.

7.1.1.2 Georges Bank

Georges Bank is a shallow (3 to 150 m depth), elongate (161 kilometer [km] wide by 322 km long) extension of the continental shelf that was formed during the Wisconsinian glacial episode (Figure 8). It is characterized by a steep slope on its northern edge and a broad, flat, gently sloping southern flank and has steep submarine canyons on its eastern and southeastern edges. It is characterized by highly productive, well-mixed waters and strong currents. The Great South Channel lies to the west. Natural processes continue to erode and rework the sediments on Georges Bank. It is anticipated that erosion and reworking of sediments by the action of rising sea level as well as tidal and storm currents reduces the amount of sand and cause an overall coarsening of the bottom sediments (Valentine and Lough 1991).

Bottom topography on eastern Georges Bank is characterized by linear ridges in the western shoal areas; a relatively smooth, gently dipping seafloor on the deeper, easternmost part; a highly energetic peak in the north with sand ridges up to 30 m high and extensive gravel pavement; and steeper and smoother topography incised by submarine canyons on the southeastern margin. The central region of Georges Bank is shallow, and the bottom is characterized by shoals and troughs, with sand dunes superimposed within. The area west of the Great South Channel, known as Nantucket Shoals, is similar in nature to the central region of Georges Bank. Currents in these areas are strongest where water depth is shallower than 50 m. Sediments in this region include gravel pavement and mounds, some scattered boulders, sand with storm-generated ripples, and scattered shell and mussel beds. Tidal and storm currents range from moderate to strong, depending upon location and storm activity.

Oceanographic frontal systems separate water masses of the Gulf of Maine and Georges Bank from oceanic waters south of Georges Bank. These water masses differ in temperature, salinity,

[3] Other species were listed as found in these assemblages, but only the species common to both studies are listed.

nutrient concentration, and planktonic communities, which influence productivity and may influence fish abundance and distribution.

Georges Bank has been historically characterized by high levels of both primary productivity and fish production. The most common groups of benthic invertebrates on Georges Bank in terms of numbers collected were amphipod crustaceans and annelid worms, and overall biomass was dominated by sand dollars and bivalves (Theroux and Wigley 1998). Using the same database, four macrobenthic invertebrate assemblages that occur on similar habitat type were identified (Theroux and Grosslein 1987):

The Western Basin assemblage is found in comparatively deepwater (150 to 200 m) with relatively slow currents and fine bottom sediments of silt, clay, and muddy sand. Fauna are comprised mainly of small burrowing detritivores and deposit feeders, and carnivorous scavengers.

The Northeast Peak assemblage is found in variable depth and current strength and includes coarse sediments, consisting mainly of gravel and coarse sand with interspersed boulders, cobbles, and pebbles. Fauna tend to be sessile (coelenterates, brachiopods, barnacles, and tubiferous annelids) or free-living (brittle stars, crustaceans, and polychaetes), with a characteristic absence of burrowing forms.

The Central Georges Bank assemblage occupies the greatest area, including the central and northern portions of Georges Bank in depths less than 100 m. Medium-grained shifting sands predominate this dynamic area of strong currents. Organisms tend to be small to moderately large with burrowing or motile habits. Sand dollars are most characteristic of this assemblage.

The Southern Georges Bank assemblage is found on the southern and southwestern flanks at depths from 80 to 200 m, where fine-grained sands and moderate currents predominate. Many southern species exist here at the northern limits of their range. Dominant fauna include amphipods, copepods, euphausiids, and starfish.

As stated in Section 7.1.5, common demersal fish species in Georges Bank are offshore hake, blackbelly rosefish, Gulf stream flounder, silver hake, red hake, goosefish (monkfish), Atlantic cod, haddock, pollock, yellowtail flounder, windowpane flounder, winter flounder, winter skate, little skate, longhorn sculpin, white hake, American plaice, witch flounder, and thorny skate.

7.1.1.3 Southern New England/Mid-Atlantic Bight

The Mid-Atlantic Bight includes the shelf and slope waters from Georges Bank south to Cape Hatteras, and east to the Gulf Stream (Figure 8). The northern portion of the Mid-Atlantic Bight is sometimes referred to as southern New England and generally includes the area of the continental shelf south of Cape Cod from the Great South Channel to Hudson Canyon. The Mid-Atlantic Bight is comprised of the sandy, relatively flat, gently sloping continental shelf from southern New England to Cape Hatteras, North Carolina. The shelf slopes gently from shore out to between 100 and 200 km offshore where it transforms to the slope (100 to 200 m water depth) at the shelf break. In both the Mid-Atlantic Bight and on Georges Bank, numerous canyons incise the slope, and some cut up onto the shelf itself (Stevenson et al. 2004). Like the rest of the continental shelf, the topography of the Mid-Atlantic Bight was shaped largely by sea level fluctuations during past ice ages. Since that time, currents and waves have modified this basic structure.

The sediment type covering most of the shelf in the Mid-Atlantic Bight is sand, with some relatively small, localized areas of sand-shell and sand-gravel. On the slope, silty sand, silt, and clay predominate. Permanent sand ridges occur in groups with heights of about 10 m, lengths of 10 to 50 km and spacing of 2 km. The sand ridges are usually oriented at a slight angle towards shore, running in length from northeast to southwest. Sand ridges are often covered with smaller similar forms such as sand waves, megaripples, and ripples. Sand waves are usually found in patches of 5 to 10 with heights of about 2 m, lengths of 50 to 100 m, and 1 to 2 km between patches. The sand waves are usually found on the inner shelf and are temporary features that form and re-form in different locations, especially in areas like Nantucket Shoals where there are strong bottom currents. Because tidal currents southwest of Nantucket Shoals and southeast of Long Island and Rhode Island slow significantly, there is a large mud patch on the seafloor where silts and clays settle out.

Artificial reefs are another significant Mid-Atlantic Bight habitat, formed much more recently on the geologic time scale than other regional habitat types. These localized areas of hard structure have been formed by shipwrecks, lost cargoes, disposed solid materials, shoreline jetties and groins, submerged pipelines, cables, and other materials (Steimle and Zetlin 2000). In general, reefs are important for attachment sites, shelter, and food for many species. In addition, fish predators, such as tunas, may be attracted by prey aggregations or may be behaviorally attracted to the reef structure. Estuarine reefs, such as blue mussel beds or oyster reefs, are dominated by epibenthic organisms, as well as crabs, lobsters, and sea stars. These reefs are hosts to a multitude of fish, including gobies, spot, bass (black sea and striped), perch, toadfish, and croaker. Coastal reefs are comprised of either exposed rock, wrecks, kelp, or other hard material, and these are generally dominated by boring mollusks, algae, sponges, anemones, hydroids, and coral. These reef types also host lobsters, crabs, sea stars, and urchins, as well as a multitude of fish, including; black sea bass, pinfish, scup, cunner, red hake, gray triggerfish, black grouper, smooth dogfish, and summer flounder. These epibenthic organisms and fish assemblages are similar to the reefs farther offshore, which are generally comprised of rocks and boulders, wrecks, and other types of artificial reefs. There is less information available for reefs on the outer shelf, but the fish species associated with these reefs include tilefish, white hake, and conger eel.

The benthic inhabitants of this primarily sandy environment are dominated in terms of numbers by amphipod crustaceans and bivalve mollusks. Biomass is dominated by mollusks (70 percent) (Theroux and Wigley 1998). Pratt (1973) identified three broad faunal zones related to water depth and sediment type:

> The "sand fauna" zone is dominated by polycheates and was defined for sandy sediments (1 percent or less silt) that are at least occasionally disturbed by waves, from shore out to a depth of about 50 m.
>
> The "silty sand fauna" zone is dominated by amphipods and polychaetes and occurs immediately offshore from the sand fauna zone, in stable sands containing a small amount of silt and organic material.
>
> Silts and clays become predominant at the shelf break and line the Hudson Shelf Valley supporting the "silt-clay fauna."

Rather than substrate as in the Gulf of Maine and Georges Bank, latitude and water depth are considered to be the primary factors influencing demersal fish species distribution in the Mid-

Atlantic Bight area. The following assemblages were identified by Colvocoresses and Musick (1984) in the Mid-Atlantic subregion during spring and fall.[4]

Northern (boreal) portions: hake (white, silver, red), goosefish (monkfish), longhorn sculpin, winter flounder, little skate, and spiny dogfish;

Warm temperate portions: black sea bass, summer flounder, butterfish, scup, spotted hake, and northern searobin;

Water of the inner shelf: windowpane flounder;

Water of the outer shelf: fourspot flounder; and

Water of the continental slope: shortnose greeneye, offshore hake, blackbelly rosefish, and white hake.

7.1.2 Habitat

Habitats provide living things with the basic life requirements of nourishment and shelter, ultimately providing for both individual and population growth. The fishery resources of a region are influenced by the quantity and quality of available habitat. Depth, temperature, substrate, circulation, salinity, light, dissolved oxygen, and nutrient supply are important parameters of a given habitat which, in turn, determine the type and level of resource population that the habitat supports. Table 15 briefly summarizes the habitat requirements for each of the 12 groundfish species managed by the Northeast Multispecies (large-mesh) FMP, some of which consist of multiple stocks within the Northeast Multispecies FMP. Information for this table was extracted from the original FMP and profiles available from NMFS (Clark 1998). Essential fish habitat information for egg, juvenile and adult life stages for these species was compiled from Stevenson et al. 2004 (Table 15). Note that EFH for the egg stage was included for species that have a demersal egg stage (winter flounder and ocean pout); all other species' eggs are found either in the surface waters, throughout the water column, or are retained inside the parent until larvae hatch. The egg habitats of these species are therefore not generally subject to interaction with gear and are not listed in Table 15.

[4] Other species were listed as found in these assemblages, but only the species common to both spring and fall seasons are listed.

Table 15 - Summary of geographic distribution, food sources, essential fish habitat features, and commercial gear used to catch each species in the Northeast Multispecies Fishery Management Unit

Species	Geographic Region of the Northwest Atlantic	Food Source	Essential Fish Habitat		Commercial Fishing Gear Used
			Water Depth	Substrate	
Atlantic cod	Gulf of Maine, Georges Bank and southward	Omnivorous (invertebrates and fish)	(J): 25-75 m (82-245 ft) (A): 10-150 m (33-492 ft)	(J): Cobble or gravel bottom substrates (A): Rocks, pebbles, or gravel bottom substrate	Otter trawl, longlines, gillnets
Haddock	southwestern Gulf of Maine and shallow waters of Georges Bank	Benthic feeders (amphipods, polychaetes, echinoderms), bivalves, and some fish	(J): 35-100 m (115– 28 ft) (A): 40-150 m (131-492 ft)	(J): Pebble and gravel bottom substrates (A): Broken ground, pebbles, smooth hard sand, smooth areas between rocky patches	Otter trawl, longlines, gillnets
Acadian redfish	Gulf of Maine, deep portions of Georges Bank and Great South Channel	Crustaceans	(J): 25-400 m (82-1,312 ft) (A): 50-350 m (164–1,148 ft)	(J): Bottom habitats with a substrate of silt, mud, or hard bottom (A): Same as for (J)	Otter trawl
Pollock	Gulf of Maine, extends to Georges Bank, and the northern part of Mid-Atlantic Bight	Juvenile feed on crustaceans, adults also feed on fish and mollusks	(J): 0-250 m (0-820 ft) (A): 15-365 m (49-1,198 ft)	(J): Bottom habitats with aquatic vegetation or substrate of sand, mud, or rocks (A): Hard bottom habitats including artificial reefs	Otter trawl, gillnets

Species	Geographic Region of the Northwest Atlantic	Food Source	Essential Fish Habitat: Water Depth	Essential Fish Habitat: Substrate	Commercial Fishing Gear Used
Ocean Pout	Gulf of Maine, Cape Cod Bay, Georges Bank, southern New England, middle Atlantic south to Delaware Bay	Juveniles feed on amphipods and polychaetes. Adults feed mostly on echinoderms as well as on mollusks and crustaceans	(E): <50 m (<164 ft)	(E): Bottom habitats, generally hard bottom sheltered nests, holes, or crevices where juveniles are guarded.	Otter trawl
			(L): <50 m (<164 ft)	(L): Hard bottom nesting areas	
			(J): <80 m (262 ft)	(J): Bottom habitat, often smooth areas near rocks or algae	
			(A): <110 m (361 ft)	(A): Bottom habitats; dig depressions in soft sediments	
Atlantic Halibut	Gulf of Maine, Georges Bank	Juveniles feed on annelid worms and crustaceans, adults mostly feed on fish	(J): 20-60 m (66-197 ft)	(J): Bottom habitat with a substrate of sand, gravel, or clay	Otter trawl, longlines
			(A):100-700 m (328-2,297 ft)	(A): Same as for (J)	
White hake	Gulf of Maine, Georges Bank, southern New England	Juveniles feed mostly on polychaetes and crustaceans; adults feed mostly on crustaceans, squids, and fish	(J): 5-225 m (16-738 ft)	(J): Bottom habitat with seagrass beds or substrate of mud or fine-grained sand	Otter trawl, gillnets
			(A): 5-325 m (16-1,066 ft)	(A): Bottom habitats with substrate of mud or fine grained sand	
Yellowtail flounder	Gulf of Maine, southern New England, Georges Bank	Amphipods and polychaetes	(J): 20-50 m (66-164 ft)	(J): Bottom habitats with substrate of sand or sand and mud	Otter trawl
			(A): 20-50 m (66-164 ft)	(A): Same as for (J)	

Species	Geographic Region of the Northwest Atlantic	Food Source	Essential Fish Habitat: Water Depth	Essential Fish Habitat: Substrate	Commercial Fishing Gear Used
American plaice	Gulf of Maine, Georges Bank	Polychaetes, crustaceans, mollusks, echinoderms	(J): 45-150 m (148-492 ft)	(J): Bottom habitats with fine grained sediments or a substrate of sand or gravel	Otter trawl
			(A): 45–175 m (148-574 ft)	(A): Same as for (J)	
Witch flounder	Gulf of Maine, Georges Bank, Mid-Atlantic Bight/southern New England	Mostly polychaetes (worms), echinoderms	(J): 50-450 m (164-1,476 ft)	(J): Bottom habitats with fine grained substrate	Otter trawl
			(A): 25-300 m (82-984 ft)	(A): Same as for (J)	
Winter flounder	Gulf of Maine, Georges Bank, Mid-Atlantic Bight/southern New England	Polychaetes, crustaceans	(E): <5 m (16 ft)	(E): Bottom habitats with a substrate of sand, muddy sand, mud, and gravel	Otter trawl, gillnets
			(J): 0.1-10 m (0.3-32 ft) (1-50 m age 1+) (3.2-164 ft)	(J): Bottom habitats with a substrate of mud or fine grained sand	
			(A): 1-100 m (3.2-328 ft)	(A): Bottom habitats including estuaries with substrates of mud, sand, gravel	
Atlantic wolffish Proposed in Amendment 16	Gulf of Maine & Georges Bank	Mollusks, brittle stars, crabs, and sea urchins	(J): 40-240 m (131.2-787.4 ft)	J): Rocky bottom and coarse sediments	Otter trawl, longlines, and gillnets
			(A): 40-240 m (131.2-787.4 ft)	(A): Same as for (J)	
Windowpane flounder	Gulf of Maine, Georges Bank, Mid-Atlantic Bight/southern New England	Juveniles mostly crustaceans; adults feed on crustaceans and fish	(J): 1-100 m (3.2-328 ft)	(J): Bottom habitats with substrate of mud or fine grained sand	Otter trawl
			(A): 1-75 m (3.2-574 ft)	(A): Same as for (J)	

Note: Species life stages are summarized by letter in parentheses following species name. A = adult; E = egg; J = juvenile; m = meter.

7.1.3 Essential Fish Habitat (EFH)

EFH is defined by the Sustainable Fisheries Act of 1996 as "[t]hose waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." The environment that could potentially be affected by the Proposed Action has been identified as EFH for benthic life stages of species that are managed under the Northeast Multispecies FMP; Atlantic sea scallop; monkfish; deep-sea red crab; northeast skate complex; Atlantic herring; summer flounder, scup, and black sea bass; tilefish; squid, Atlantic mackerel, and butterfish; Atlantic surfclam and ocean quahog FMPs. EFH for the species managed under these FMPs includes a wide variety of benthic habitats in state and Federal waters throughout the Northeast U.S. Shelf Ecosystem. EFH descriptions of the general substrate or bottom types for all the benthic life stages of the species managed under these FMPs are summarized in Table 15. Full descriptions and maps of EFH for each species and life stage (except Atlantic wolffish) are available on the NMFS Northeast Region website at http://www.nero.noaa.gov/hcd/index2a.htm. In general, EFH for species and life stages that rely on the seafloor for shelter (e.g., from predators), reproduction, or food is vulnerable to disturbance by bottom tending gear. The most vulnerable habitat is more likely to be hard or rough bottom with attached epifauna.

7.1.4 Gear Types and Interaction with Habitat

The groundfish fleet fishes for target species with a number of gear types: trawl, gillnet, and hook and line gear (including jigs, handline, and non-automated demersal longlines). This section discusses the characteristics of each of the gear types as well as the typical impacts to the physical habitat associated with each of these gear types.

7.1.4.1 Gear Types

The characteristics of typical gear types used by the multispecies fishery are summarized in Table 16.

Table 16 - Descriptions of the fixed gear types used by the multispecies fishery

Gear Type	Trawl	Sink/ Anchor Gillnets	Bottom Longlines	Hook and Line
Total Length	Varies	90 m long per net.	~450 m.	Varies
Lines	N/A	Leadline and floatline with webbing (mesh) connecting	Mainline is parachute cord. Gangions (lines from mainline to hooks) are 15 inches long, 3 to 6 inches apart, and made of shrimp twine	One to several with mechanical line fishing
Nets	Rope or large-mesh size, depends upon target Species	Monofilament, mesh size depends on the target species (groundfish nets minimum mesh size of 6.5 inches	No nets, but 12/0 circle hooks are required.	No nets, but single to multiple hooks, “umbrella rigs”
Anchoring	N/A	22 lb (9–11 kg) Danforth-style anchors are required at each end of the net string	20-24lb (9-11kg) anchors, anchored at each end, using pieces of railroad track, sash weights, or Danforth anchors, depending on currents	No anchoring, but sinkers used (stones, lead)
Frequency/ Duration of Use	Tows last for several hours	Frequency of trending changes from daily (when targeting groundfish) to semi-weekly (when targeting monkfish and skate)	Usually set for a few hours at a time	Depends upon cast/target species

7.1.4.2 Trawl Gear

Trawls are classified by their function, bag construction, or method of maintaining the mouth opening. Function may be defined by the part of the water column where the trawl operates (e.g., bottom) or by the species that it targets (Hayes 1983). Mid-water trawls are designed to catch pelagic species in the water column and do not normally contact the bottom. Bottom trawls are designed to be towed along the seafloor and to catch a variety of demersal fish and invertebrate species.

The mid-water trawl is used to capture pelagic species throughout the water column. The mouth of the net typically ranges from 110 m to 170 m and requires the use of large vessels (Sainsbury 1996). Successful mid-water trawling requires the effective use of various electronic aids to find the fish and maneuver the vessel while fishing (Sainsbury 1996). Tows typically last for several hours and catches are large. The fish are usually removed from the net while it remains in the water alongside the vessel by means of a suction pump. In some cases, the fish are removed from the net by repeatedly lifting the cod end aboard the vessel until the entire catch is in the hold.

Three general types of bottom trawl are used in the Northeast Region, but bottom otter trawls account for nearly all commercial bottom trawling activity. There is a wide range of otter trawl types used in the Northeast as a result of the diversity of fisheries and bottom types encountered in the region (NREFHSC 2002). The specific gear design used is often a result of the target species (whether found on or off the bottom) as well as the composition of the bottom (smooth versus rough and soft versus hard). A number of different types of bottom otter trawl used in the Northeast are specifically designed to catch certain species of fish, on specific bottom types, and at particular times of year. Bottom trawls are towed at a variety of speeds, but average about 5.6 km/hour (3 knots). Use of this gear in the Northeast is managed under several federal FMPs. Bottom trawling is also subject to a variety of state regulations throughout the region.

A flatfish trawl is a type of bottom otter trawl designed with a low net opening between the headrope and the footrope and more ground rigging on the sweep. This type of trawl is designed so that the sweep follows the contours of the bottom, and to get fish like flounders - that lie in contact with the seafloor - up off the bottom and into the net. It is used on smooth mud and sand bottoms. A high-rise or fly net with larger mesh has a wide net opening and is used to catch demersal fish that rise higher off the bottom than flatfish (NREFHSC 2002).

Bottom otter trawls that are used on "hard" bottom (i.e., gravel or rocky bottom), or mud or sand bottom with occasional boulders, are rigged with rockhopper gear. The purpose of the "ground gear" in this case is to get the sweep over irregularities in the bottom without damaging the net. The purpose of the sweep in trawls rigged for fishing on smooth bottoms is to herd fish into the path of the net (Mirarchi 1998).

The raised-footrope trawl was designed to provide vessels with a means of continuing to fish for small-mesh species without catching groundfish. Raised-footrope trawls fish about 0.5 to 0.6 m above the bottom (Carr and Milliken 1998). Although the doors of the trawl still ride on the bottom, underwater video and observations in flume tanks have confirmed that the sweep in the raised-footrope trawl has much less contact with the seafloor than the traditional cookie sweep that it replaces (Carr and Milliken 1998).

7.1.4.3 Gillnet Gear

The fishery also uses individual sink/anchor gillnets which are about 90 m long and are usually fished as a series of 5 to 15 nets attached end-to-end. A vast majority of “strings” consist of 10 gillnets. Gillnets typically have three components: the leadline, webbing and floatline. In New England, leadlines are approximately 30 kilogram (kg)/net. Webs are monofilament, with the mesh size depending on the species of interest. Nets are anchored at each end using materials such as pieces of railroad track, sash weights, or Danforth anchors, depending on currents. Anchors and leadlines have the most contact with the bottom. For New England groundfish, frequency of tending ranges from daily to semiweekly [Northeast Region Essential Fish Habitat Steering Committee (NREFHSC 2002)].

A bottom gillnet is a large wall of netting equipped with floats at the top and lead weights along the bottom. Bottom gillnets are anchored or staked in position. Fish are caught while trying to pass through the net mesh. Gillnets are highly selective because the species and sizes of fish caught are dependent on the mesh size of the net. Bottom gillnets are used to catch a wide range of species. Bottom gillnets are fished in two different ways, as "standup" and "tiedown" nets (Williamson 1998). Standup nets are typically used to catch Atlantic cod, haddock, pollock, and hake and are soaked (duration of time the gear is set) for 12 to 24-hours. Tiedown nets are used to catch flounders and monkfish and are left in the water for 3 to 4 days. Other species caught in bottom gillnets in are dogfish and skates.

7.1.4.4 Hook and Line Gear

7.1.4.4.1 Hand Lines/Rod and Reel

The simplest form of hook-and-line fishing is the hand line, which may be fished using a rod and reel or simply "by hand". The gear consists of a line, sinker (weight), gangion, and at least one hook. The line is typically stored on a small spool and rack and varies in length and the sinkers vary from stones to cast lead. The hooks can vary from single to multiple arrangements in "umbrella" rigs. An attraction device must be used with the hook, usually consisting of a natural bait or an artificial lure. Hand lines can be carried by currents until retrieved or fished in such as manner as to hit bottom and bounce (Stevenson et al. 2004). Hand lines and rods and reels are used in the Northeast Region to catch a variety of demersal species.

7.1.4.4.2 Mechanized Line Fishing

Mechanized line-hauling systems have been developed to allow smaller fishing crews to work more lines, and to use electrical or hydraulic power to work the lines on the spools. The reels, also called "bandits", are mounted on the vessel bulwarks with the mainline wound around a spool. The line is taken from the spool over a block at the end of a flexible arm and each line may have a number of branches and baited hooks.

Jigging machines are used to jerk a line with several unbaited hooks up in the water to snag a fish in its body and is commonly used to catch squid. Jigging machine lines are generally fished in waters up to 600 m (1970 ft) deep. Hooks and sinkers can contact the bottom, depending upon the way the gear is used and may catch a variety of demersal species.

7.1.4.5 Longlines

The remaining gear type that is used by the fishery are bottom longlines which are a long length of line, often several miles long, to which short lengths of line ("gangions") carrying baited hooks are attached. Longlining is undertaken for a wide range of bottom species. Bottom longlines typically have up to six individual longlines strung together for a total length of more than 450 m and are deployed with 9 to 11 kg anchors. The mainline is a parachute cord. Gangions are typically 40 centimeters (cm) long and 1 to 1.8 m apart and are made of shrimp twine. These longlines are usually set for a few hours at a time (NREFHSC 2002).

When fishing with hooks, all hooks must be 12/0 circle hooks. A "circle hook" is, defined as a hook with the point turned back towards the shank and the barbed end of the hook is displaced (offset) relative to the parallel plane of the eyed-end or shank of the hook when laid on its side. The design of circle hooks enables them to be employed to reduce the damage to habitat features that would occur with use of other hook shapes (NREFHSC 2002).

7.1.4.6 Gear Interaction with Habitat

Historically, commercial fishing in the region has been conducted using hook and line, longline, gillnets and trawls. For decades, trawls have been intensively used throughout the region and have accounted for the majority of commercial fishing activity in the multispecies fishery off New England.

Amendment 13 (NEFMC 2003) describes the general effects of bottom trawls on benthic marine habitats. The primary source document used for this analysis was an advisory report prepared for the International Council for the Exploration of the Seas (ICES) that identified a number of possible effects of beam trawls and bottom otter trawls on benthic habitats (ICES 2000). This report is based on scientific findings summarized in Lindeboom and de Groot (1998), which were peer-reviewed by an ICES working group. The focus of the report is the Irish Sea and North Sea, but it also includes assessments of effects in other areas. Two general conclusions were: 1) low-energy environments are more affected by bottom trawling; and 2) bottom trawling affects the potential for habitat recovery (i.e., after trawling ceases, benthic communities and habitats may not always return to their original pre-impacted state). Regarding direct habitat effects, the report also concluded that:

> Loss or dispersal of physical features such as peat banks or boulder reefs (<u>changes are always permanent</u> and lead to an overall change in habitat diversity, which in turn leads to the local loss of species and species assemblages dependent on such features);
>
> Loss of structure-forming organisms such as bryozoans, tube-dwelling polychaetes, hydroids, seapens, sponges, mussel beds, and oyster beds (<u>changes may be permanent</u> leading to an overall change in habitat diversity, which could in turn lead to the local loss of species and species assemblages dependent on such biogenic features);
>
> Reduction in complexity caused by redistributing and mixing of surface sediments and the degradation of habitat and biogenic features, leading to a decrease in the physical patchiness of the seafloor (<u>changes are not likely to be permanent</u>); and
>
> Alteration of the detailed physical features of the seafloor by reshaping seabed features such as sand ripples and damaging burrows and associated structures that provide important habitats for smaller animals and can be used by fish to reduce their energy requirements (<u>changes are not likely to be permanent</u>).

A more recent evaluation of the habitat effects of trawling and dredging was prepared by the Committee on Ecosystem Effects of Fishing for the National Research Council's Ocean Studies Board (NRC 2002). Trawl gear evaluated included bottom otter trawls and beam trawls. This report identified four general conclusions regarding the types of habitat modifications caused by trawls:

> Trawling reduces habitat complexity;
>
> Repeated trawling results in discernable changes in benthic communities;
>
> Bottom trawling reduces the productivity of benthic habitats; and
>
> Fauna that live in low natural disturbance regimes are generally more vulnerable to fishing gear disturbance.

An additional source of information for various gear types that relates specifically to the Northeast region is the report of a "Workshop on the Effects of Fishing Gear on Marine Habitats off the Northeastern U.S." sponsored by the NEFMC and Mid-Atlantic Fishery Management Council (MAFMC) in October 2001 (NEFSC 2002). A panel of invited fishing industry members and experts in the fields of benthic ecology, fishery ecology, geology, and fishing gear technology convened for the purpose of assisting the NEFMC, MAFMC, and NMFS with: 1) evaluating the existing scientific research on the effects of fishing gear on benthic habitats; 2) determining the degree of impact from various gear types on benthic habitats in the Northeast; 3) specifying the type of evidence that is available to support the conclusions made about the degree of impact; 4) ranking the relative importance of gear impacts on various habitat types; and 5) providing recommendations on measures to minimize those adverse impacts. The panel was provided with a summary of available research studies that summarized information relating to the effects of bottom otter trawls, bottom gillnets, and longlines. Relying on this information plus professional judgment, the panel identified the effects and the degree of impact of these gears on mud, sand, and gravel/rock habitats.

Additional information is provided in this report on the recovery times for each type of impact for each gear type in mud, sand, and gravel habitats ("gravel" includes other hard-bottom habitats). This information made it possible to rank these three substrates in terms of their vulnerability to the effects of bottom trawling, although other factors such as frequency of disturbance from fishing and from natural events are also important. In general, impacts from trawling were determined to be greater in gravel/rock habitats with attached epifauna. Impacts on biological structure were ranked higher than impacts on physical structure. Effects of trawls on major physical features in mud (deep water clay-bottom habitats) and gravel bottom were described as permanent, and impacts to biological and physical structure were given recovery times of months to years in mud and gravel. Impacts of trawling on physical structure in sand were of shorter duration (days to months) given the exposure of most continental shelf sand habitats to strong bottom currents and/or frequent storms.

According to the panel, impacts of sink gillnets and longlines on sand and gravel habitats would result in low degree impacts (NEFSC 2002). Duration of impacts to physical structures from these gear types would be expected to last days to months on soft mud but could be permanent on hard bottom clay structures along the continental slope. Impacts to mud would be caused by gillnet lead lines and anchors. Physical habitat impacts from sink gillnets and longlines on sand would not be expected.

The contents of a second expert panel report, produced by the Pew Charitable Trusts and entitled "Shifting Gears: Addressing the Collateral Impacts of Fishing Methods in U.S. Waters" (Morgan and Chuenpagdee 2003), was also summarized in Amendment 13. This group evaluated the habitat effects of 10 different commercial fishing gears used in U.S. waters. The report concluded that bottom trawls have relatively high habitat impacts, bottom gillnets and pots and traps have low to medium impacts, and bottom longlines have low impacts. As in the International Council for Exploration of the Sea (ICES) and National Research Council (NRC) reports, individual types of trawls and dredges were not evaluated. The impacts of bottom gillnets, traps, and longlines were limited to warm or shallow water environments with rooted aquatic vegetation or "live bottom" environments (e.g., coral reefs).

7.1.5 Assemblages of Fish Species

Georges Bank and the Gulf of Maine have been historically characterized by high levels of fish production. Several studies have attempted to identify demersal fish assemblages over large spatial scales. Overholtz and Tyler (1985) found five depth-related groundfish assemblages for Georges Bank and the Gulf of Maine that were persistent temporally and spatially. Depth and salinity were identified as major physical influences explaining assemblage structure. Gabriel (1992) identified six assemblages, which are compared with the results of Overholtz and Tyler (1985) in Table 17 (adapted from Amendment 16). For the Affected Area, including southern New England, these assemblages and relationships are considered to be relatively consistent for purposes of general description. The assemblages include allocated target, non-allocated target, and bycatch species. As presented in Table 17, the terminology and definitions of habitat types varies slightly between the two studies. For further information on fish habitat relationships, see Table 15.

Table 17 – Comparison of demersal fish assemblages of Georges Bank and the Gulf of Maine

Overholtz and Tyler (1985)		Gabriel (1992)	
Assemblage	**Species**	**Species**	**Assemblage**
Slope and Canyon	offshore hake blackbelly rosefish Gulf stream flounder fourspot flounder, goosefish, silver hake, white hake, red hake	offshore hake blackbelly rosefish Gulf stream flounder fawn cusk-eel, longfin hake, armored sea robin	Deepwater
Intermediate	silver hake red hake goosefish Atlantic cod, haddock, ocean pout, yellowtail flounder, winter skate, little skate, sea raven, longhorn sculpin	silver hake red hake goosefish northern shortfin squid, spiny dogfish, cusk	Combination of Deepwater Gulf of Maine/Georges Bank and Gulf of Maine-Georges Bank Transition
Shallow	Atlantic cod haddock pollock silver hake white hake red hake goosefish ocean pout	Atlantic cod haddock pollock	Gulf of Maine-Georges Bank Transition Zone
	yellowtail flounder windowpane winter flounder winter skate little skate longhorn sculpin summer flounder sea raven, sand lance	yellowtail flounder windowpane winter flounder winter skate little skate longhorn sculpin	Shallow Water Georges Bank-southern New England
Gulf of Maine-Deep	white hake American plaice witch flounder thorny skate silver hake, Atlantic cod, haddock, cusk, Atlantic wolffish	white hake American plaice witch flounder thorny skate redfish	Deepwater Gulf of Maine-Georges Bank
Northeast Peak	Atlantic cod haddock pollock ocean pout, winter flounder, white hake, thorny skate, longhorn sculpin	Atlantic cod haddock Pollock	Gulf of Maine-Georges Bank Transition Zone

7.2 Target Species

This section describes the species life history and stock population status for each of the 20 fish stocks that are managed under the Northeast Multispecies FMP that would be harvested by the groundfish fishery under provisions of the FMP. The description of species habitat associations described in Section 7.1.2 provides context for considering the interactions between gear and species. A comparison of depth-related demersal fish assemblages of Georges Bank and the Gulf of Maine is also provided for additional context. The discussion of allocated target species is concluded with an analysis of the interaction between the gear types the fishery will use (as described in Section 7.1.4) and allocated species. Most of the following discussions have been adapted largely from the GARM III report (NEFSC 2008) and can be accessed via the NEFMC website at http://www.nefmc.org.

7.2.1 Description of the Managed Species

The management unit is described in Amendment 16 to the FMP. Life history and habitat characteristics of the stocks managed in this FMP can be found in the Essential Fish Habitat Source documents (series) published as NOAA Technical Memorandums and available at http://www.nefsc.noaa.gov/nefsc/habitat/efh/.

Recent revisions to the National Standard guidelines (50 CFR 600.310, published in 74 *FR* 3178) expanded on the classification of stocks in an FMP. For the Northeast Multispecies FMP, the stocks identified as the management unit are considered "stocks in the fishery" as defined by the NSGs. There are no stocks currently identified as "ecosystem component species," though this classification may be used in the future.

The managed stocks/stocks in the fishery are:

- GOM cod
- GB cod
- GOM haddock
- GB haddock
- CC/GOM yellowtail flounder
- GB yellowtail flounder
- SNE/MA yellowtail flounder
- GOM winter flounder
- GB winter flounder
- SNE/MA winter flounder
- GOM/GB (Northern) windowpane flounder
- SNE/MA (Southern) windowpane flounder
- Atlantic halibut
- Atlantic wolffish
- Plaice
- Ocean pout
- Pollock
- Redfish
- White hake
- Witch flounder

A full description of the life history of these stocks can be found in Framework 44 (NEFMC 2010); no information in that section has been updated.

7.2.2 Summary of Groundfish Stock Status

The Groundfish Assessment Review Meeting (GARM III) conducted during October 2007 – August 2008 provided benchmark assessments for the 19 groundfish stocks managed under the Northeast Multispecies Fishery Management Plan. The GARM III process involved in-depth reviews of the data, models, biological reference points, and assessments of each of the 19 groundfish stocks at the time. This section summarizes the stock status in terms of biomass (B) or spawning stock biomass (SSB) and fishing mortality (F) through 2007 as reported in NEFSC

(2008). Projected SSB and F were estimated in 2008 and 2009 for most of the age-based GARM assessments. The Georges Bank yellowtail assessment is update each year through the TRAC and pollock was assessed in 2010 during SARC 50.

Atlantic wolffish was added to the multispecies groundfish stock complex in A16. Wolffish was assessed in 2008 in the Data Poor Working Group (DPWG 2008). A range of knife edge maturity and selectivity assumptions were used to characterize stock status due to a general lack of biological data on this stock.

The GARM III results show which groundfish stocks were overfished or experiencing overfishing in 2007 (Table 18). A total of 13 stocks were overfished (B less than ½ B_{MSY}) while 6 stocks were not overfished. Similarly, a total of 13 stocks were experiencing overfishing (F greater than F_{MSY}) while 6 stocks were not experiencing overfishing. Eleven of the stocks are both overfished and experiencing overfishing. Pollock, witch flounder, Georges Bank (GB) winter flounder, Gulf of Maine (GOM) winter flounder and northern windowpane had deteriorated in status, while GOM cod improved. GOM cod was still experiencing overfishing but was no longer overfished. Four stocks (redfish, American plaice, GB haddock, and GOM haddock) were classified as not overfished and not experiencing overfishing. Note the GOM winter flounder status determination was uncertain and judged as likely overfished and probably experiencing overfishing.

Subsequent to GARM III, pollock was assessed in SAW 50 (2010). The stock was determined to be not overfished and not subject to overfishing. GB yellowtail flounder was also assessed by the TRAC in 2009 and 2010 and was determined to not be subject to overfishing in both years.

Of the 14 groundfish stocks assessed in GARM III using an analytical assessment model, 7 stocks exhibited retrospective patterns that were considered severe enough that an adjustment to the population numbers and fishing mortality in 2007 was deemed necessary before determining current stock status and subsequently conducting projections. Retrospective pattern adjustments were done one of two ways: either a split in the survey time series during the mid-1990s or an adjustment to the population numbers at age in the terminal year based upon a measure of the age-specific retrospective pattern during the past seven years. Only for American plaice and redfish were the population numbers adjusted. For the other five stocks (GB cod, GB yellowtail, witch flounder, GOM winter flounder, SNE winter flounder) the split survey was used. The remaining seven stocks were judged to have a mild retrospective pattern that did not require an adjustment.

Since GARM II, many stocks have exhibited long term declines in weights-at-age. Age-specific fishery selectivity has also shifted in many stocks to older age groups due to a combination of reduced growth, fishery management measures, and changing fishing practices. These trends were incorporated into the updated biological reference points for the 19 groundfish stocks, and as a consequence many of the newly-estimated biomass reference points are now lower and the fishing mortality reference points higher than those estimated in GARM II. However, a direct one-to-one comparison between the old and new BRPs is inappropriate because of these changes in weights and partial recruitment at age.

Analyses from an ecosystem basis suggest current biomass management targets (B_{MSY}s) for GARM stocks are reasonable. The current targets compare favorably with the results of recent and historical studies in the region and are also in general agreement with results of many studies for other worldwide ecosystems. New summed BRPs for the GARM stocks are similar to BRPs from an aggregate surplus production model for these stocks. Aggregate model results suggest that the overall fishing mortality rate should be relatively low (F=0.15) to obtain MSY for this complex of GARM stocks.

Table 18 summarizes groundfish stocks based on GARM III results. There have been changes for GB yellowtail flounder and pollock; these changes are reported in the stock-specific discussions that follow. For other stocks, an estimate of current stock status is shown that is based on projecting for ward from recent catch estimates.

Table 18 – Summary of groundfish stock status in 2007

Stock	Estimated F in 2007	Fmsy	Percent F Reduction to Fmsy	Biomass in 2007	Bmsy	Percent change in Biomass to achieve Bmsy	MSY	2007 Overfished Status	2007 Overfishing Status
Georges Bank cod	0.303	0.247	18%	17,672	148,084	738%	31,159	Overfished	Overfishing
Gulf of Maine cod	0.456	0.237	48%	33,878	58,248	72%	10,014	Not Overfished	Overfishing
Georges Bank haddock	0.229	0.350	none	315,975	158,873	above Bmsy	32,746	Not Overfished	No Overfishing
Gulf of Maine haddock	0.346	0.430	none	5,850	5,900	1%	1,360	Not Overfished	No Overfishing
Georges bank Yellowtail	0.289	0.254	12%	9,527	43,200	353%	9,400	Overfished	Overfishing
Southern New England-Mid Atlantic Yellowtail	0.413	0.254	38%	3,508	27,400	681%	6,100	Overfished	Overfishing
Cape Cod-Gulf of Maine yellowtail	0.414	0.239	42%	1,922	7,790	305%	1,720	Overfished	Overfishing
American plaice	0.094	0.190	none	11,106	21,940	98%	4,011	Not Overfished	No Overfishing
Witch flounder	0.292	0.200	32%	3,434	11,447	233%	2,352	Overfished	Overfishing
Georges Bank winter flounder	0.282	0.260	8%	4,964	16,000	222%	3,500	Overfished	Overfishing
Gulf of Maine winter flounder	0.417	0.283	32%	1,100	3,792	245%	917	Overfished	Overfishing
Southern New England-Mid-Atlantic winter flounder	0.649	0.248	62%	3,368	38,761	1051%	9,742	Overfished	Overfishing
Acadian redfish	0.007	0.038	none	172,342	271,000	57%	10,139	Not Overfished	No Overfishing
white hake	0.150	0.125	17%	19,800	56,254	184%	5,800	Overfished	Overfishing
pollock [1,4]	10.975 [2]	5.66	48%	0.754 [3]	2	165%	11,320	Not Overfished	Overfishing
northern windowpane [1]	1.96	0.50	74%	0.24 [3]	1.4	483%	700	Overfished	Overfishing
southern windowpane [1]	1.85	1.47	21%	0.19 [3]	0.34	79%	500	Not Overfished	Overfishing
ocean pout [1]	0.38	0.76	none	0.48	4.94	929%	3,754	Overfished	No Overfishing
Atlantic halibut	0.065	0.073	none	1,300	49,000	3669%	3,500	Overfished	No Overfishing

[1] Fmsy and Bmsy index proxies are listed for pollock, ocean pout, southern and northern windowpane.

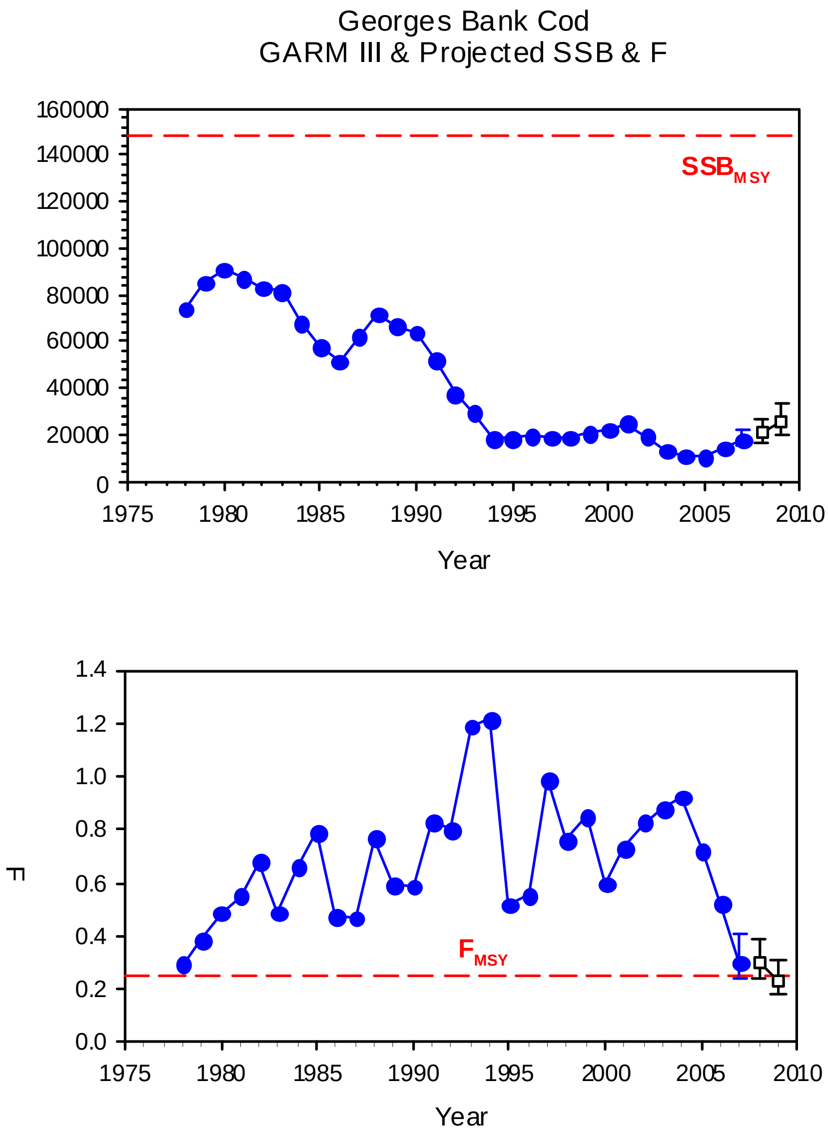
[2] GARM III values are equal to the catch in 2007 / average 2006 & 2007 indices (Updated relative F using the average of 2006, 2007 & 2008 is 10.46).

[3] Index point estimates are in the table. Status determination is made using the 3 year average (pollock = 0.90, N windowpane = 0.53, S windowpane = 0.21 kg / tow).

[4] Note that after GARM III pollock was assessed at SAW 50 and was determined to be not overfished and not subject to overfishing.

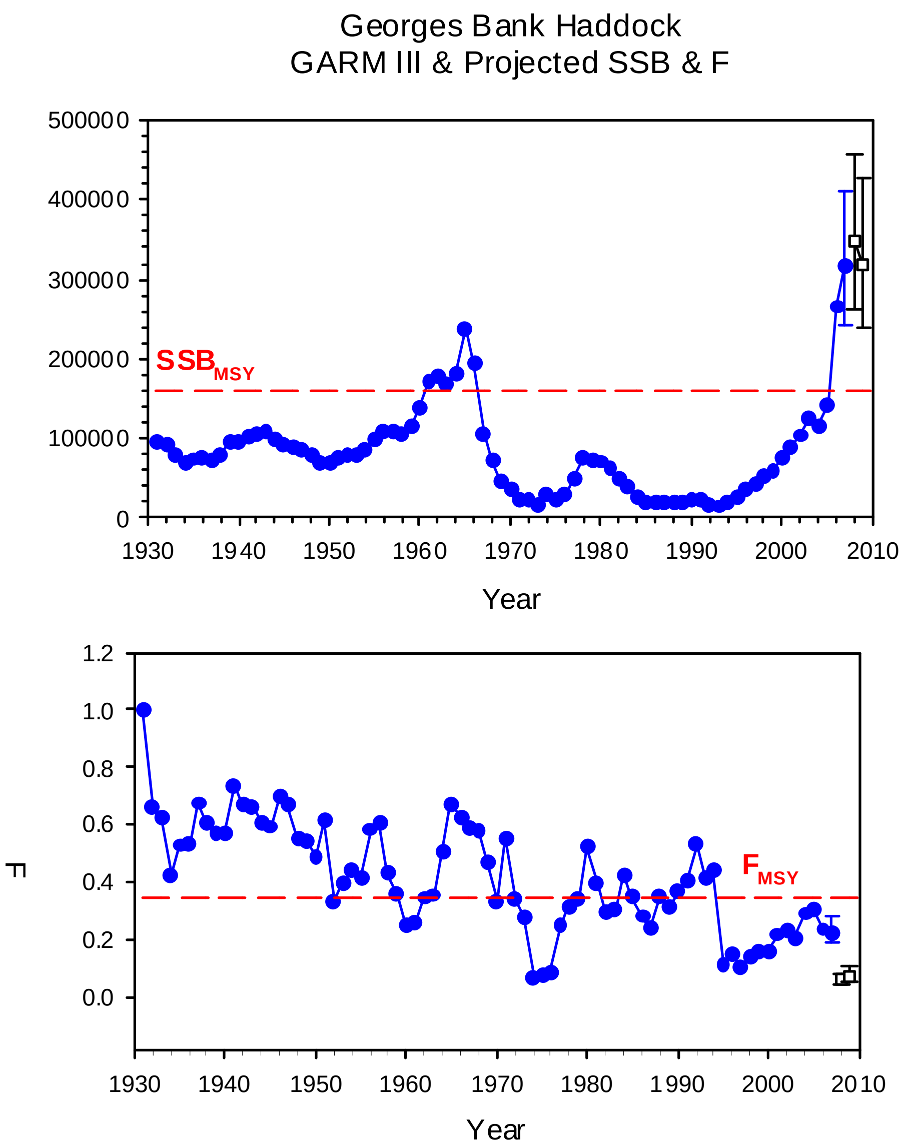
A. Georges Bank cod was overfished and was experiencing overfishing in 2007.
Spawning biomass has remained low since 1994. Fishing mortality has been decreasing since 2004. A split in the survey time series was used to adjust for the retrospective pattern.

Figure 10– Georges Bank cod spawning stock biomass (SSB) and fishing mortality (F) estimates during 1978-2007 reported in GARM III (blue circles) along with 80% confidence intervals for 2007 estimates. Projected SSB and F with 80% confidence intervals are shown with open squares.



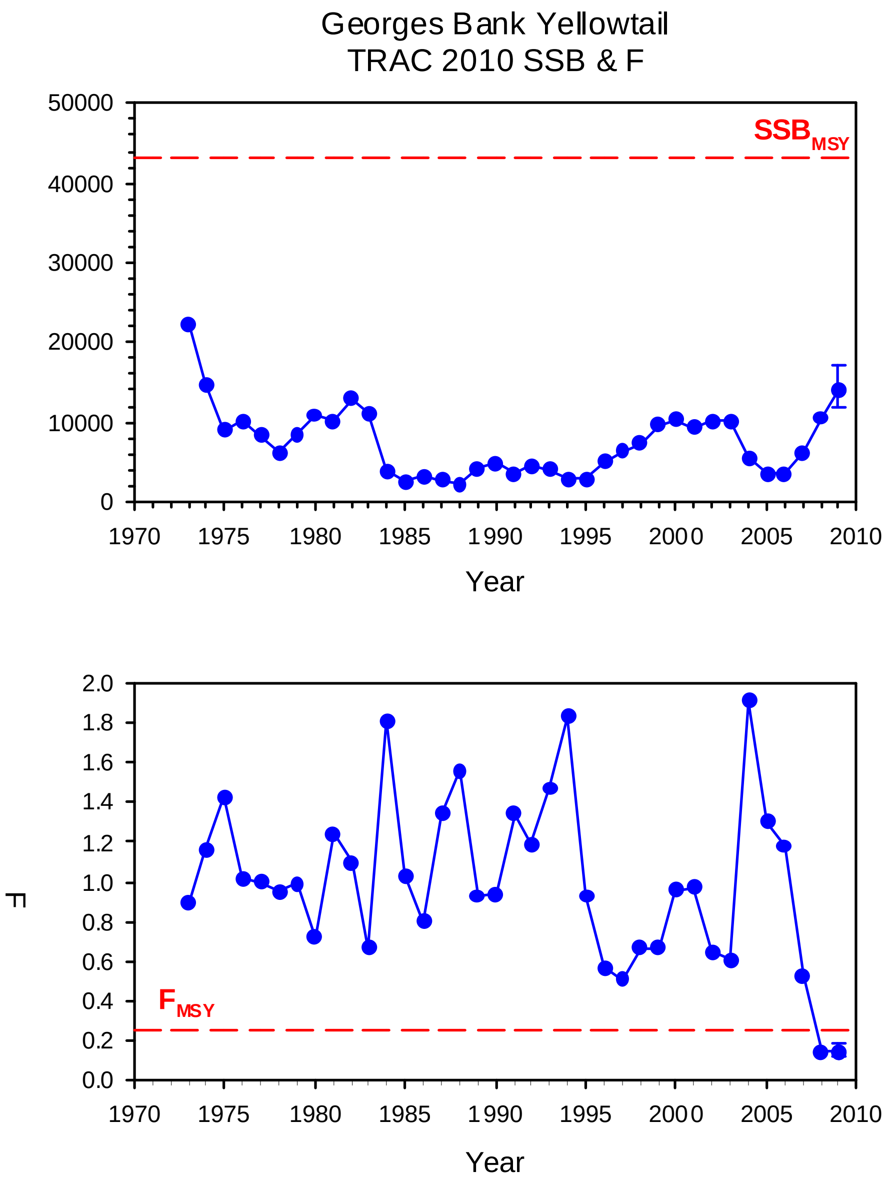
B. Georges Bank haddock was not overfished and was not experiencing overfishing in 2007.
Georges Bank haddock has been rebuilt to about twice B_{msy}. Spawning biomass has increased since 1993. Fishing mortality has remained below F_{msy} since 1995. The partial recruited strong 2003 year class made up most of the catch in 2007. No retrospective adjustment was made for Georges Bank haddock.

Figure 11 – Georges Bank haddock spawning stock biomass (SSB) and fishing mortality (F) estimates during 1931-2007 reported in GARM III (blue circles) along with 80% confidence intervals for 2007 estimates. Projected SSB and F with 80% confidence intervals are shown with open squares.



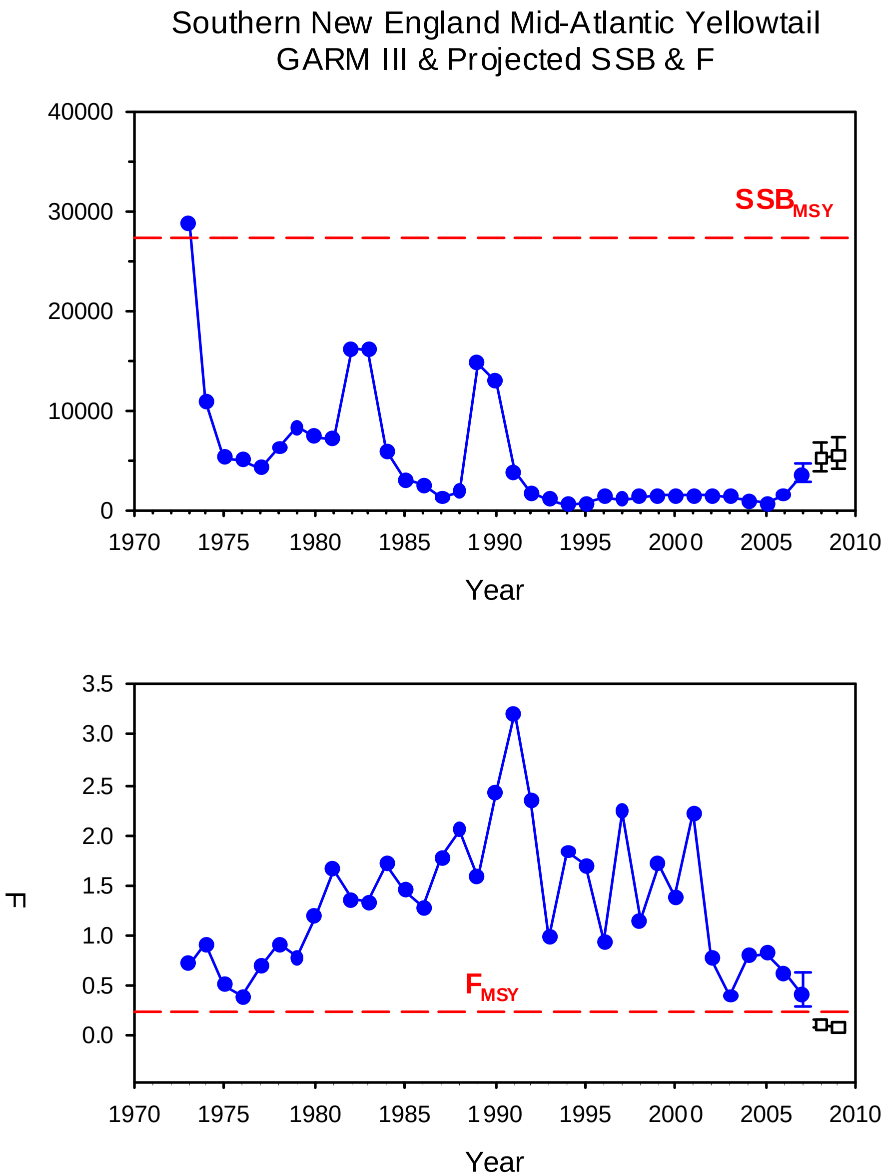
<u>C. Georges Bank yellowtail flounder was overfished and was not experiencing overfishing in 2009.</u> Georges Bank yellowtail flounder was assessed at the TRAC 2010. Spawning biomass has been relatively low since 1984. There has been a slight increase in spawning biomass since the late 1980s. Fishing mortality has had a decreasing trend since 2004. A split in the survey time series was used to adjust for the retrospective pattern.

Figure 12 – Georges Bank yellowtail flounder spawning stock biomass (SSB) and fishing mortality (F) estimates during 1973-2009 reported in TRAC 2010 along with 80% confidence intervals for 2009 estimates.



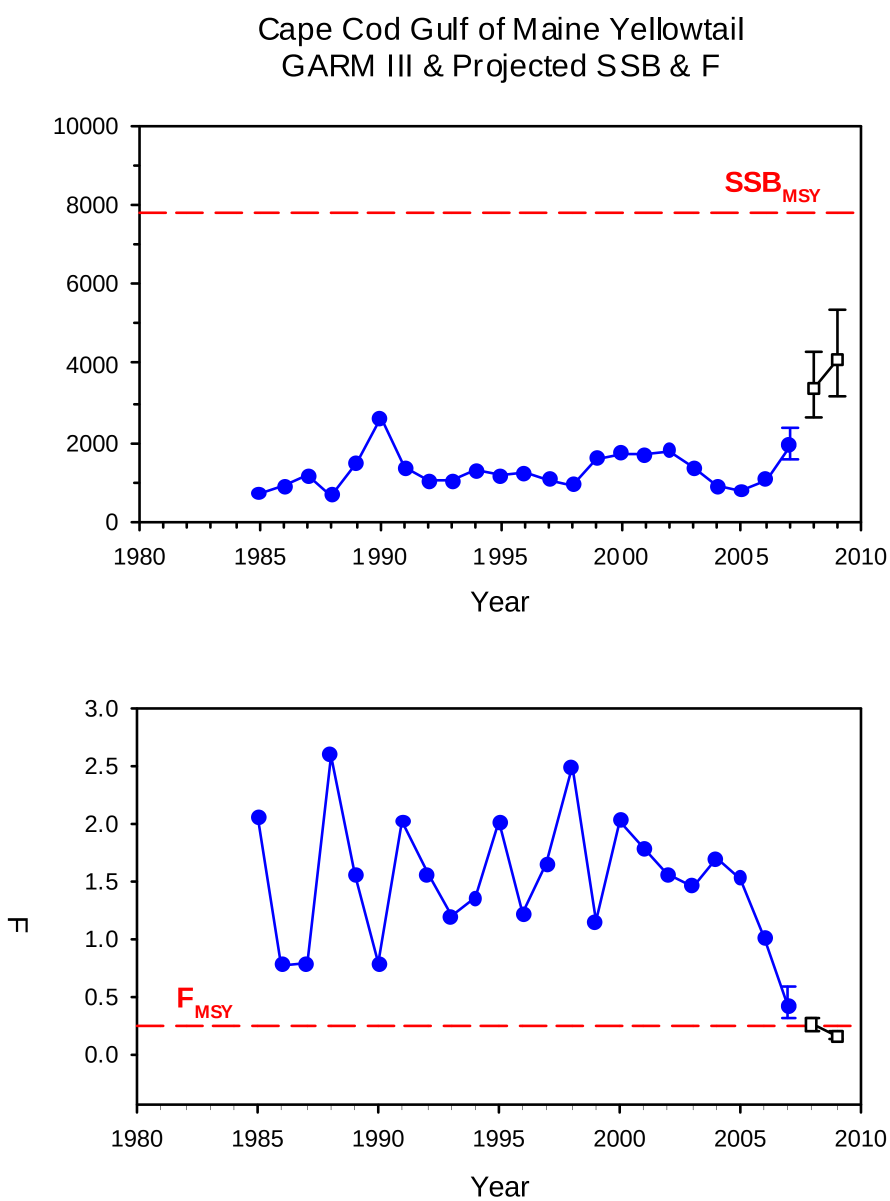
<u>D. Southern New England/Mid-Atlantic yellowtail flounder was overfished and was experiencing overfishing in 2007.</u> Spawning biomass has been low since 1991. There are some signs of rebuilding from a strong 2005 year class. Fishing mortality has had a decreasing trend since 2001 but remains slightly above F_{MSY}. No retrospective adjustment was made for SNE/Mid-Atlantic yellowtail flounder.

Figure 13 – Southern New England/Mid-Atlantic yellowtail flounder spawning stock biomass (SSB) and fishing mortality (F) estimates during 1973-2007 reported in GARM III (blue circles) along with 80% confidence intervals for 2007 estimates. Projected SSB and F with 80% confidence intervals are shown with open squares.



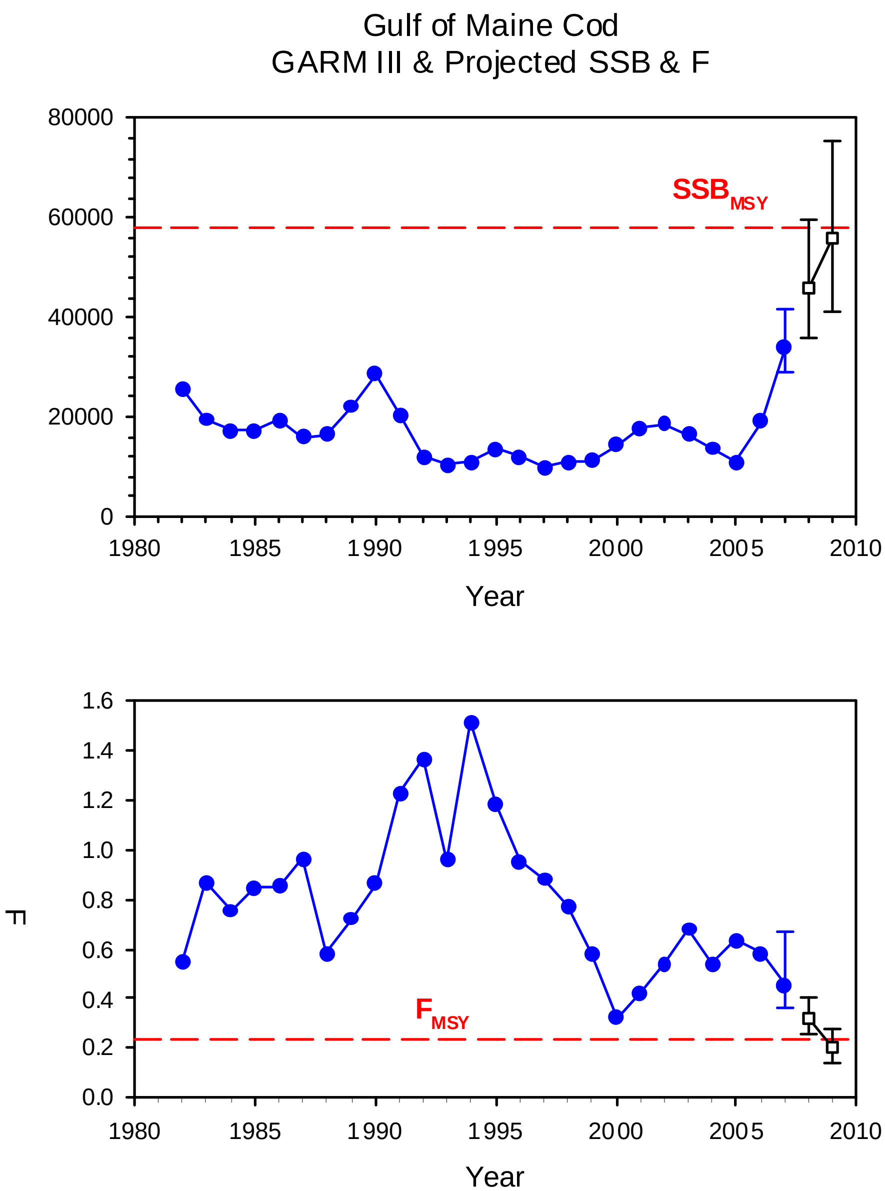
E. Cape Cod/Gulf of Maine yellowtail flounder was overfished and was experiencing overfishing in 2007. Spawning biomass been relatively low over the time series. There appears to be a moderately strong 2005 year class. Fishing mortality has decreased since 2004. No retrospective adjustment was made for Cape Cod/Gulf of Maine yellowtail flounder.

Figure 14 – Cape Cod/Gulf of Maine yellowtail flounder spawning stock biomass (SSB) and fishing mortality (F) estimates during 1985-2007 reported in GARM III (blue circles) along with 80% confidence intervals for 2007 estimates. Projected SSB and F with 80% confidence intervals are shown with open squares.



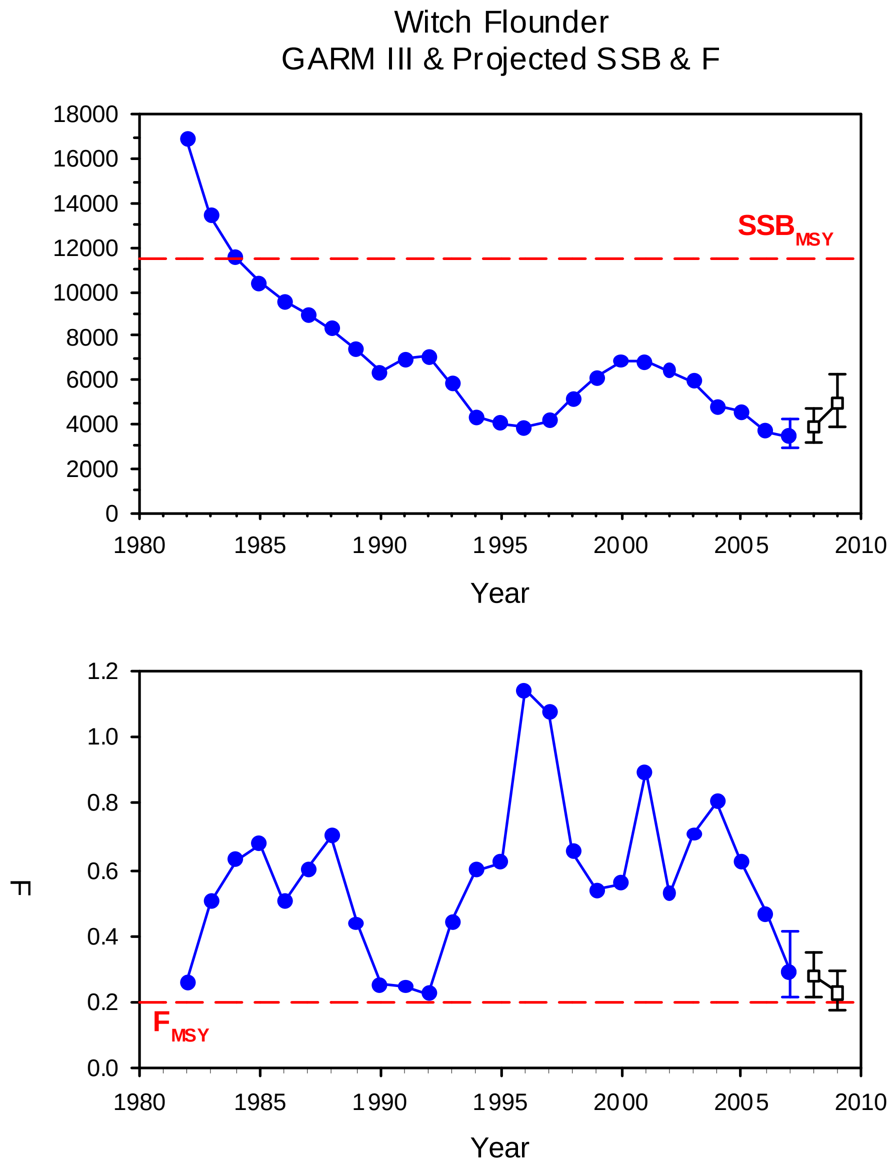
F. Gulf of Maine cod was not overfished but was experiencing overfishing in 2007. Spawning biomass increased in 2006 and 2007. An above average 2005 year class was estimated. Fishing mortality decreased from 1994 to 2000 but has remained above F_{msy} since then. No retrospective adjustment was made for Gulf of Maine Cod.

Figure 15 – Gulf of Maine cod spawning stock biomass (SSB) and fishing mortality (F) estimates during 1982-2007 using GARM III (blue circles) data along with 80% confidence intervals for 2007 estimates. Projected SSB and F with 80% confidence intervals are shown with open squares.



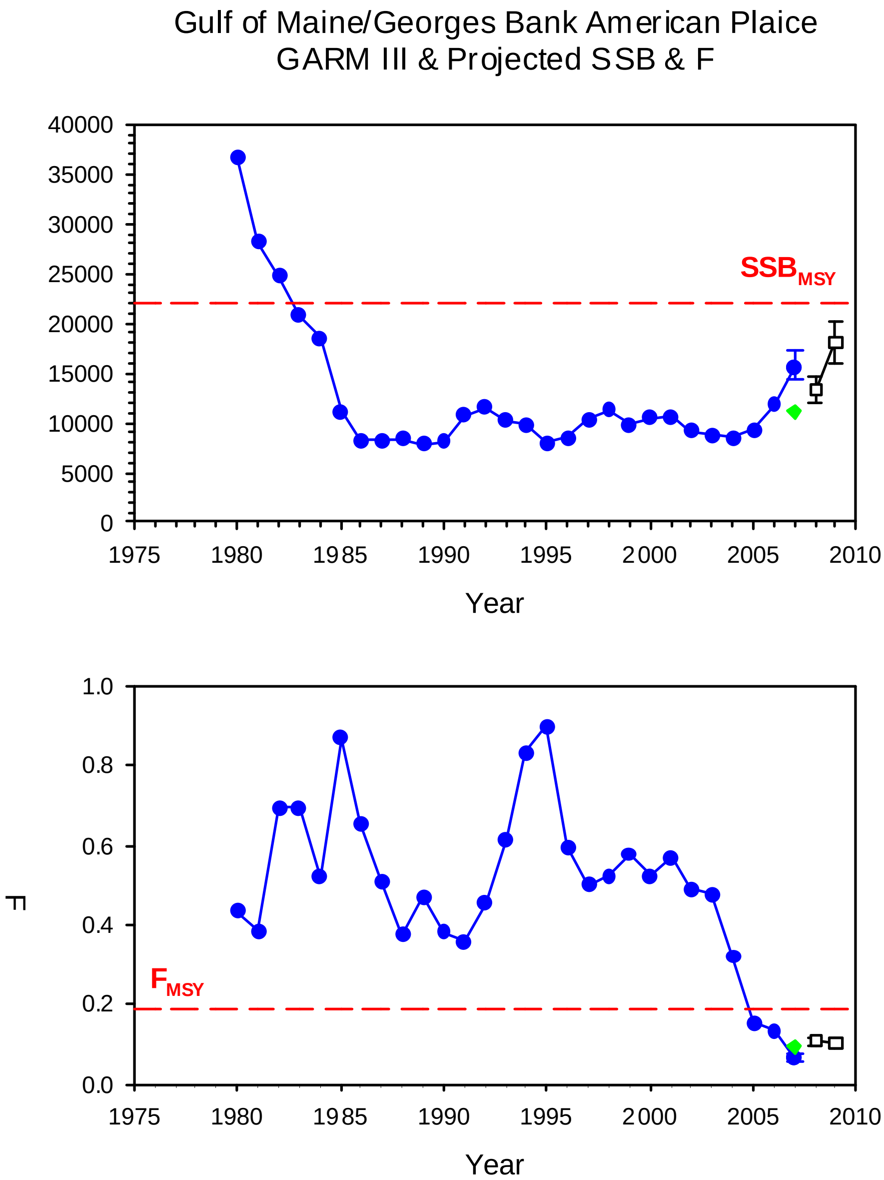
G. Witch flounder was overfished and was experiencing overfishing in 2007. Spawning biomass has declined since 2001 to a record low in 2007. Fishing mortality has decreased since 2004. A split in the survey time series was used to adjust for the retrospective pattern.

Figure 16 – Witch flounder spawning stock biomass (SSB) and fishing mortality (F) estimates during 1982-2007 reported in GARM III (blue circles) along with 80% confidence intervals for 2007 estimates. Projected SSB and F with 80% confidence intervals are shown with open squares.



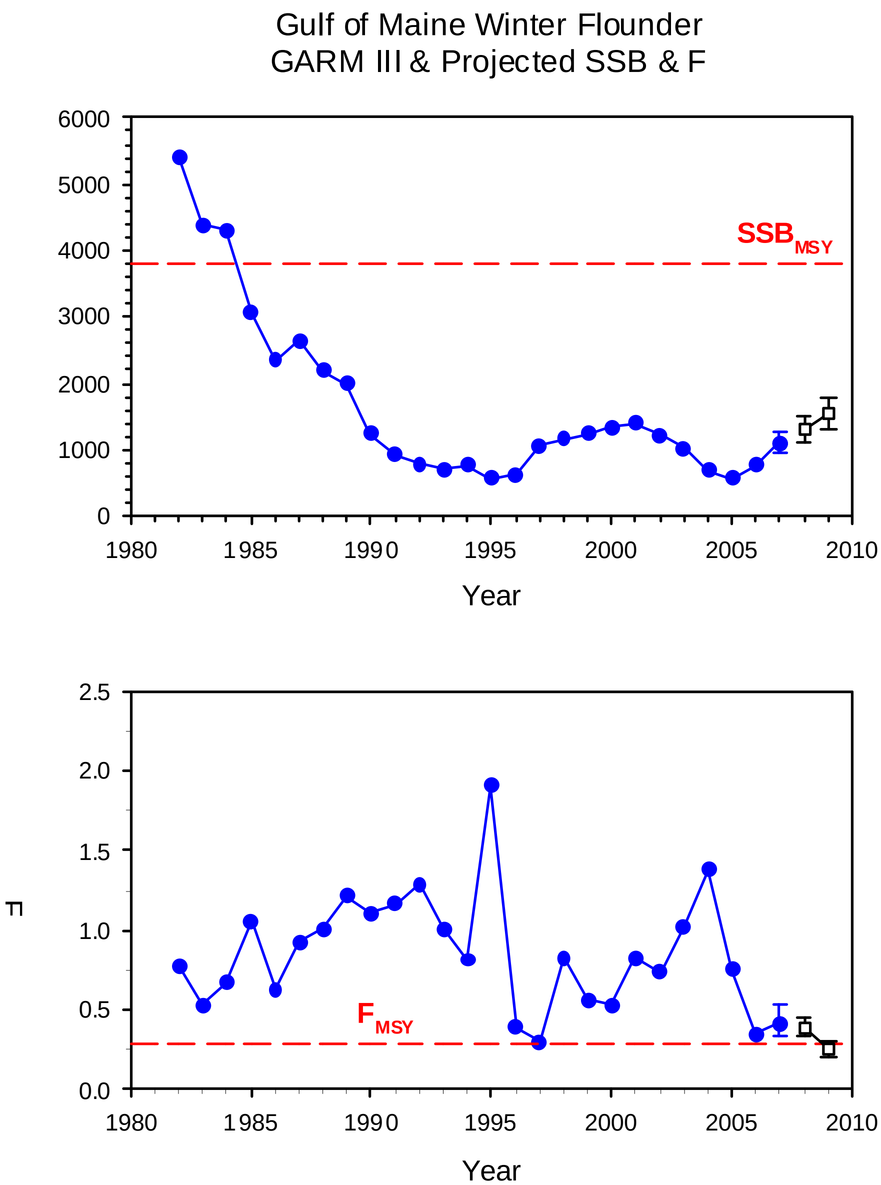
<u>H. American plaice was not overfished and was not experiencing overfishing in 2007.</u> Spawning biomass has been low with a slight increasing trend since 1986. Fishing mortality has had a decreasing trend since 1995. Terminal year population numbers and fishing mortality were adjusted with Mohn's rho estimates.

Figure 17 – American plaice spawning stock biomass (SSB) and fishing mortality (F) estimates during 1980-2007 reported in GARM III (blue circles) along with 80% confidence intervals for 2007 estimates. Mohn's rho adjusted SSB and F are shown in the terminal year with a green diamond. Projected SSB and F with 80% confidence intervals are shown with open squares.



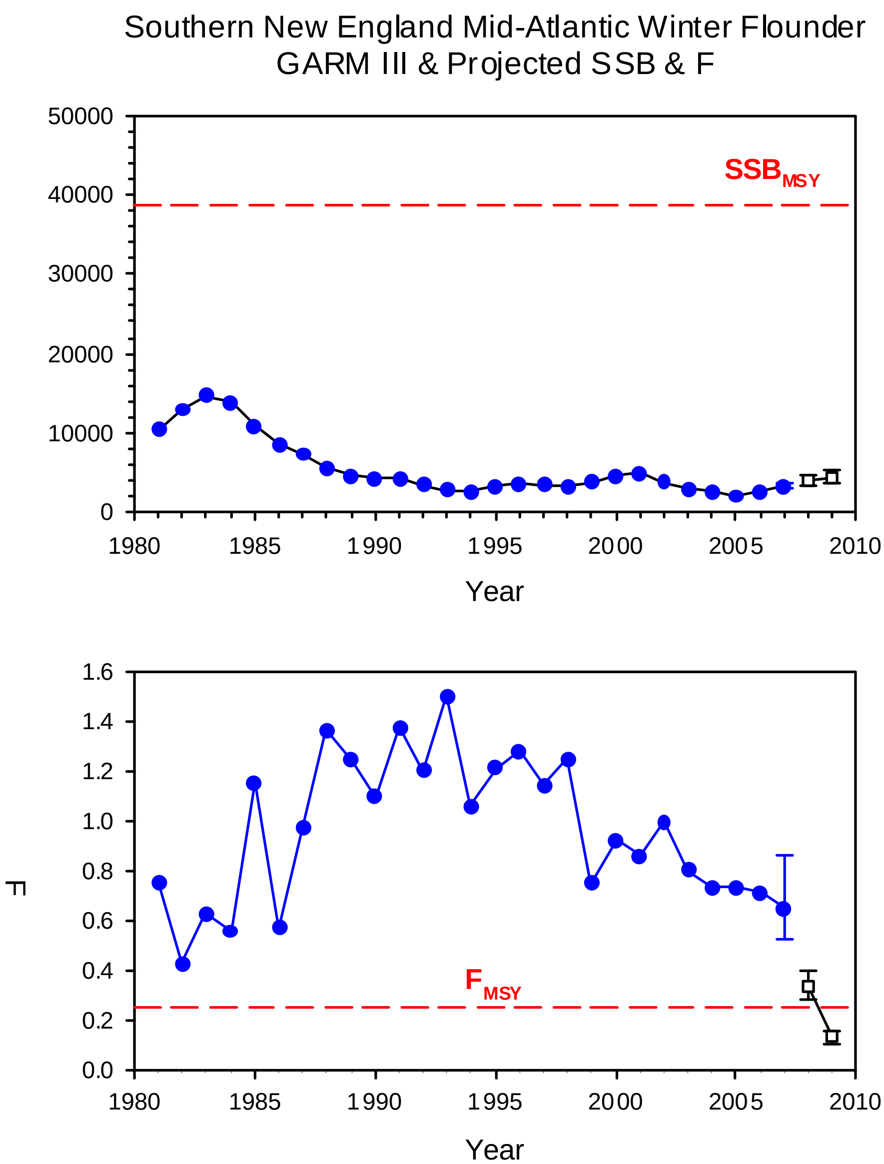
<u>I. Gulf of Maine winter flounder status determination is unknown.</u> Status determination from the split survey run suggests the stock is overfished and overfishing is occurring in 2007. Exact status determination was unknown due to the severity of the retrospective pattern and the magnitude of the change with a retrospective adjustment. However SSB appears to be well below B_{msy} and fishing mortality is likely above F_{msy}.

Figure 18 – Gulf of Maine winter flounder spawning stock biomass (SSB) and fishing mortality (F) estimates during 1982-2007 reported in GARM III (blue circles) along with 80% confidence intervals for 2007 estimates from the split survey run. Projected SSB and F with 80% confidence intervals are shown with open squares. THIS ASSESSMENT WAS NOT ACCEPTED AND STOCK STATUS IS CONSIDERED UNKNOWN.



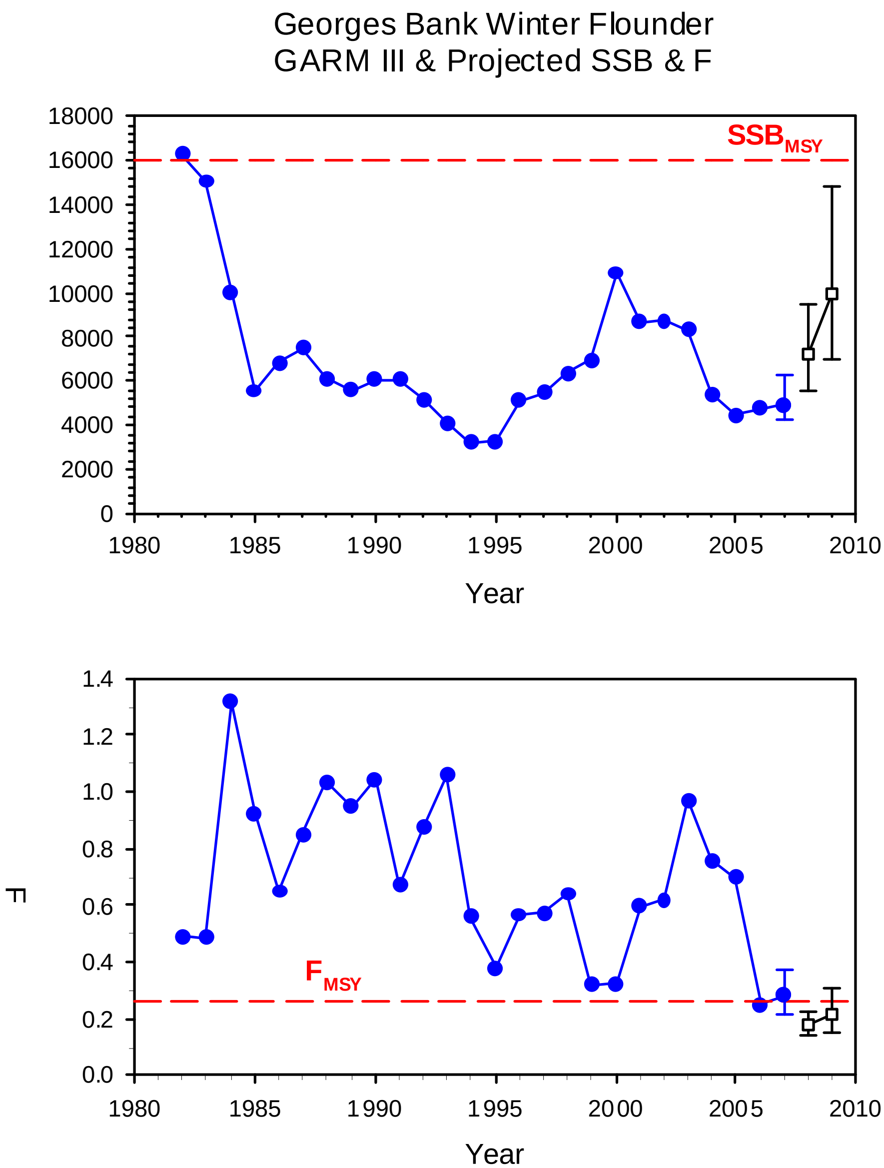
<u>J. Southern New England/Mid-Atlantic winter flounder was overfished and was experiencing overfishing in 2007.</u> Spawning biomass has been very low since the late-1980s. Fishing mortality has been declining since 1993 but remain well above F_{msy}. A split in the survey time series was used to adjust for the retrospective pattern.

Figure 19 – Southern New England/Mid-Atlantic winter flounder spawning stock biomass (SSB) and fishing mortality (F) estimates during 1981-2007 reported in GARM III (blue circles) along with 80% confidence intervals for 2007 estimates. Projected SSB and F with 80% confidence intervals are shown with open squares.



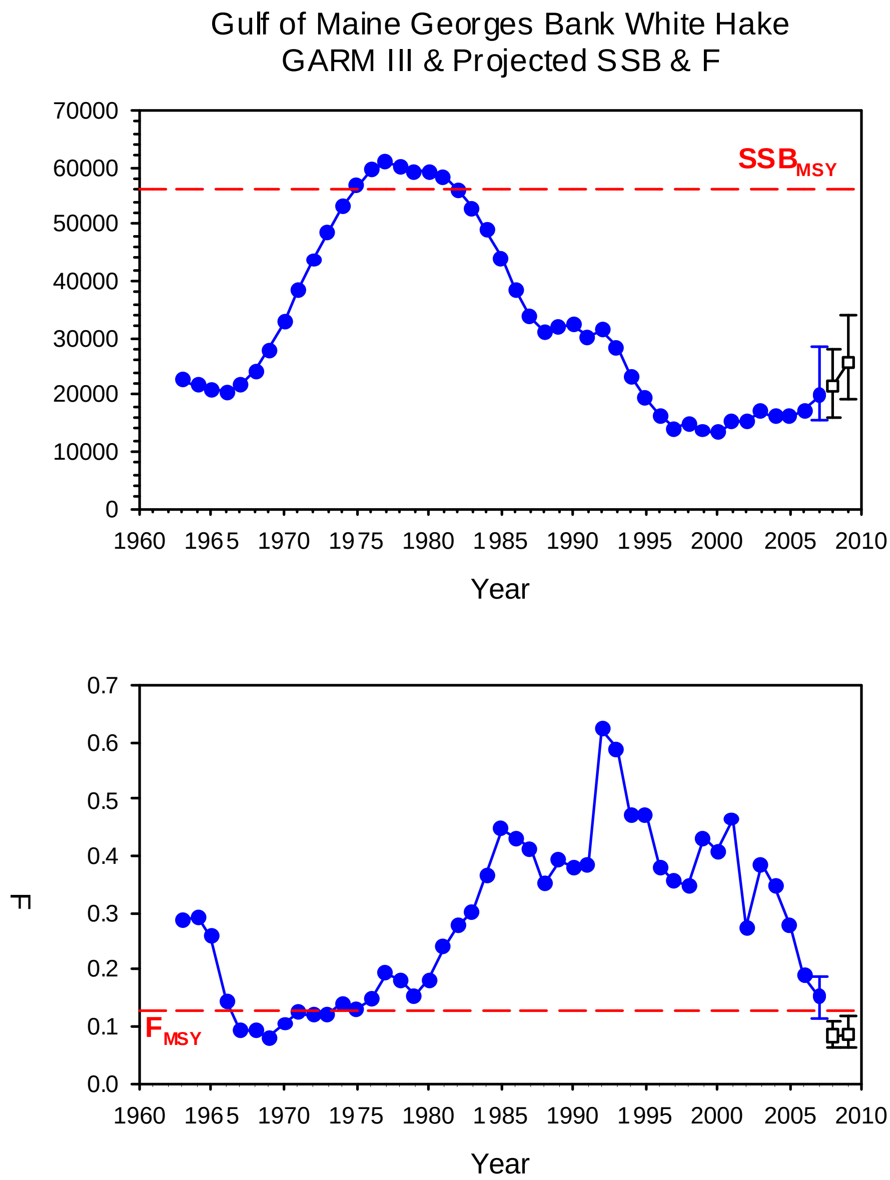
K. Georges Bank winter flounder was overfished and was experiencing overfishing in 2007. Spawning Biomass has declined since 2000. Fishing mortality declined from 2003 but was just above F_{msy} in 2007. No retrospective adjustment was made for Georges Bank winter flounder.

Figure 20 – Georges Bank winter flounder spawning stock biomass (B) and fishing mortality (F) estimates during 1982-2007 reported in GARM III (blue circles) along with 80% confidence intervals for 2007 estimates. Projected SSB and F with 80% confidence intervals are shown with open squares.



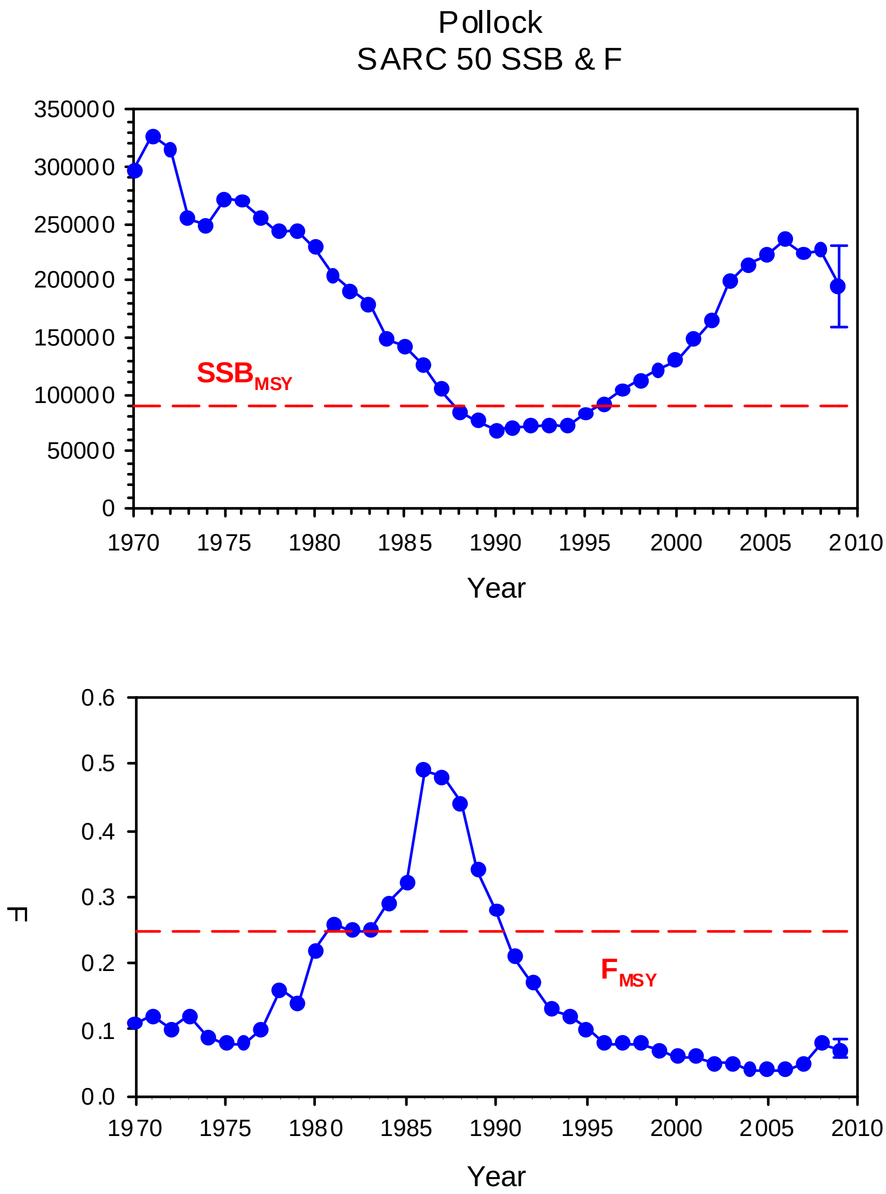
L. White hake was overfished and was experiencing overfishing in 2007. Biomass increased slightly during 2000-2007. Fishing mortality has declined since 2003. No retrospective adjustment was made for white hake.

Figure 21 – Georges Bank/Gulf of Maine white hake spawning stock biomass (SSB) and fishing mortality rate (F) during 1963-2007 reported in GARM III (blue circles) along with 80% confidence intervals for 2007 estimates. Projected SSB and F with 80% confidence intervals are shown with open squares.



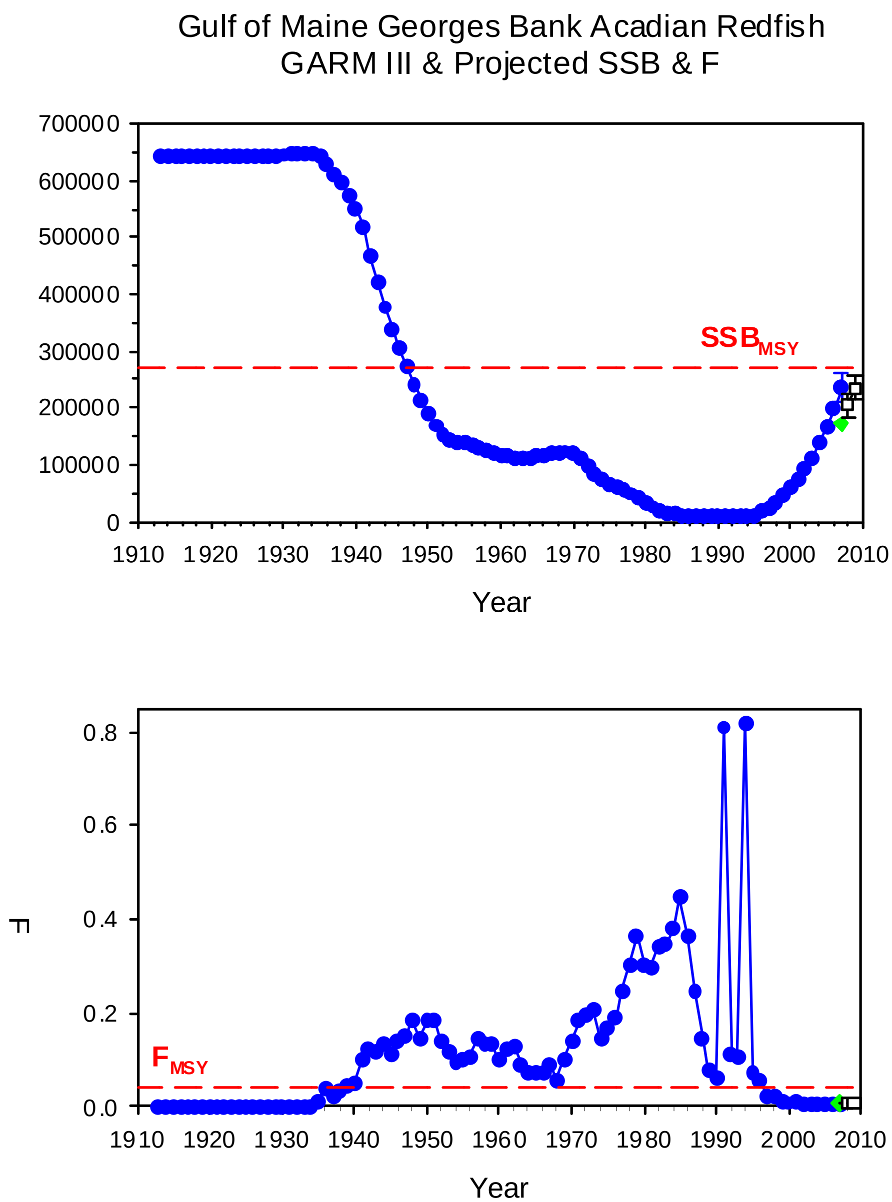
M. Pollock was not overfished and was not experiencing overfishing in 2009. Pollock was assessed at SARC 50 2010. SSB has increased from 1990 to 2006. There has been a slight decline in SSB since 2006.

Figure 22 – Georges Bank/Gulf of Maine pollock spawning stock biomass (SSB) and fishing mortality rate (F) during 1970-2009 reported in SARC 50 along with 80% confidence intervals for 2009 estimates.



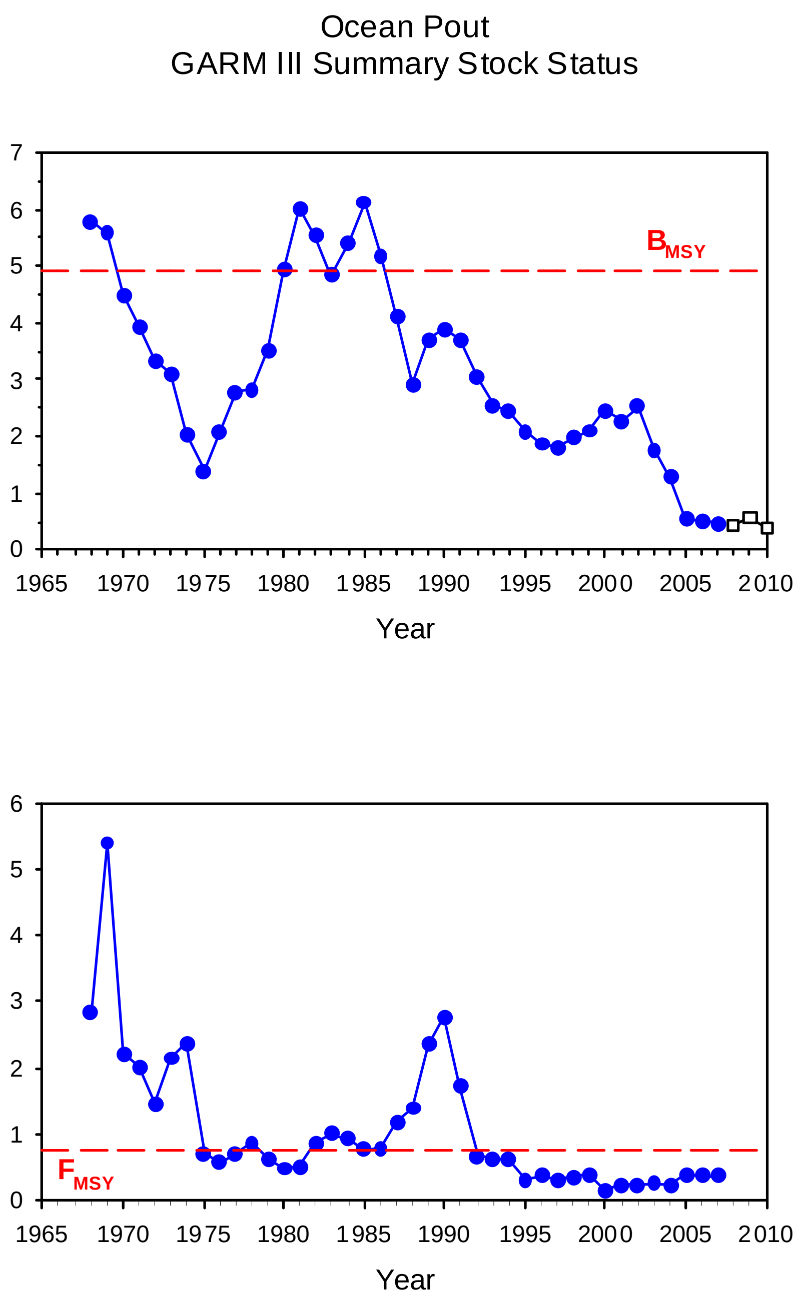
N. Acadian redfish was not overfished and was not experiencing overfishing in 2007. Spawning biomass has increased substantially since the mid-1990s. Fishing mortality has been below F_{msy} since 1997. Terminal year population numbers and fishing mortality were adjusted with Mohn's rho estimates.

Figure 23 – Gulf of Maine/Georges Bank Acadian redfish spawning stock biomass (SSB) and fishing mortality (F) estimates during 1913-2007 reported in GARM III (blue circles) along with 80% confidence intervals for 2007 estimates. Mohn's rho adjusted SSB and F are shown in the terminal year with a green diamond. Projected SSB and F with 80% confidence intervals are shown with open squares.



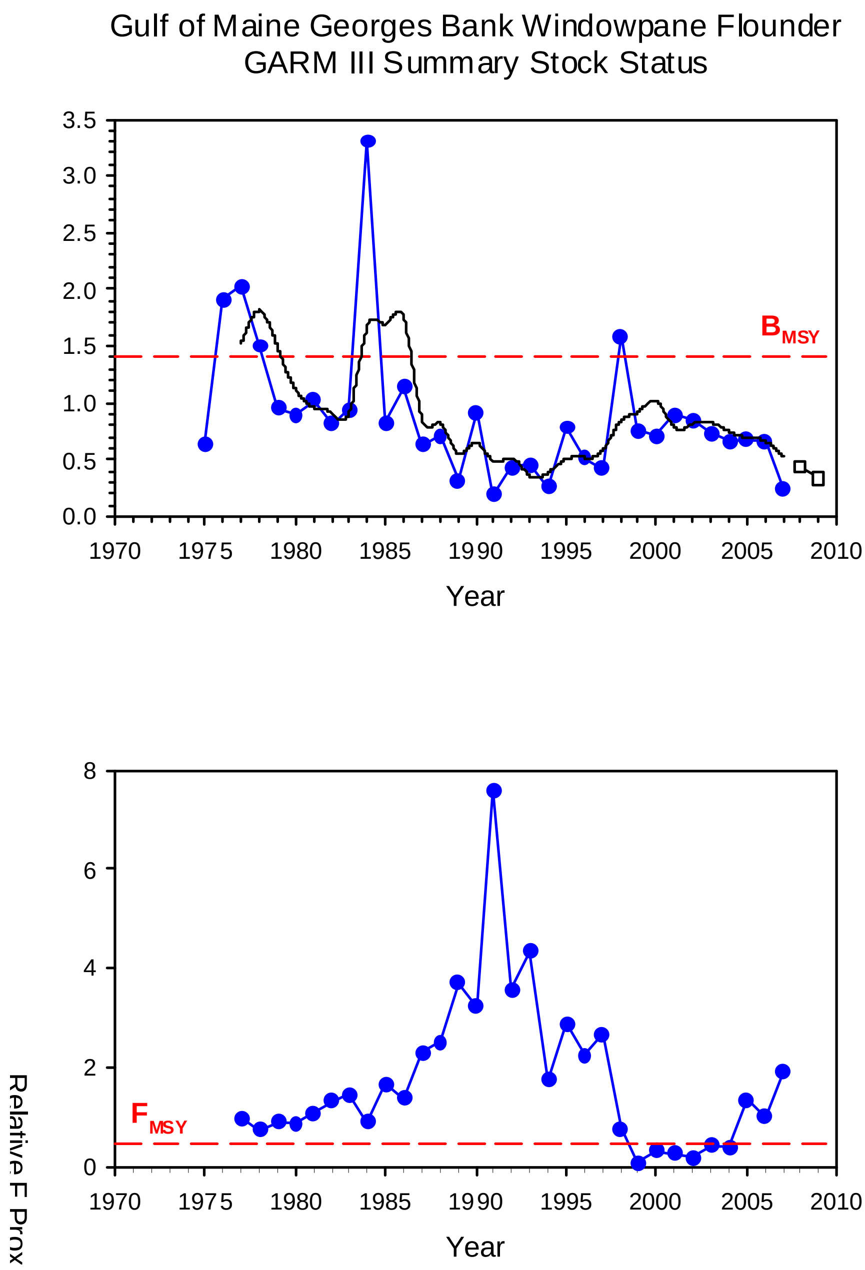
O. Ocean pout was overfished and was not experiencing overfishing in 2007. Biomass has had a decreasing trend since 2002. Fishing mortality has been well below F_{msy} since 1992. There are no signs of stock rebuilding despite that fishing mortality is relatively low.

Figure 24 – Ocean pout spring biomass index (B) and relative exploitation rate (F) during 1968-2007 reported in GARM III. Updated biomass indices for 2008 to 2010 are also shown with open squares. Surveys done with the Bigelow are converted to Albatross units.



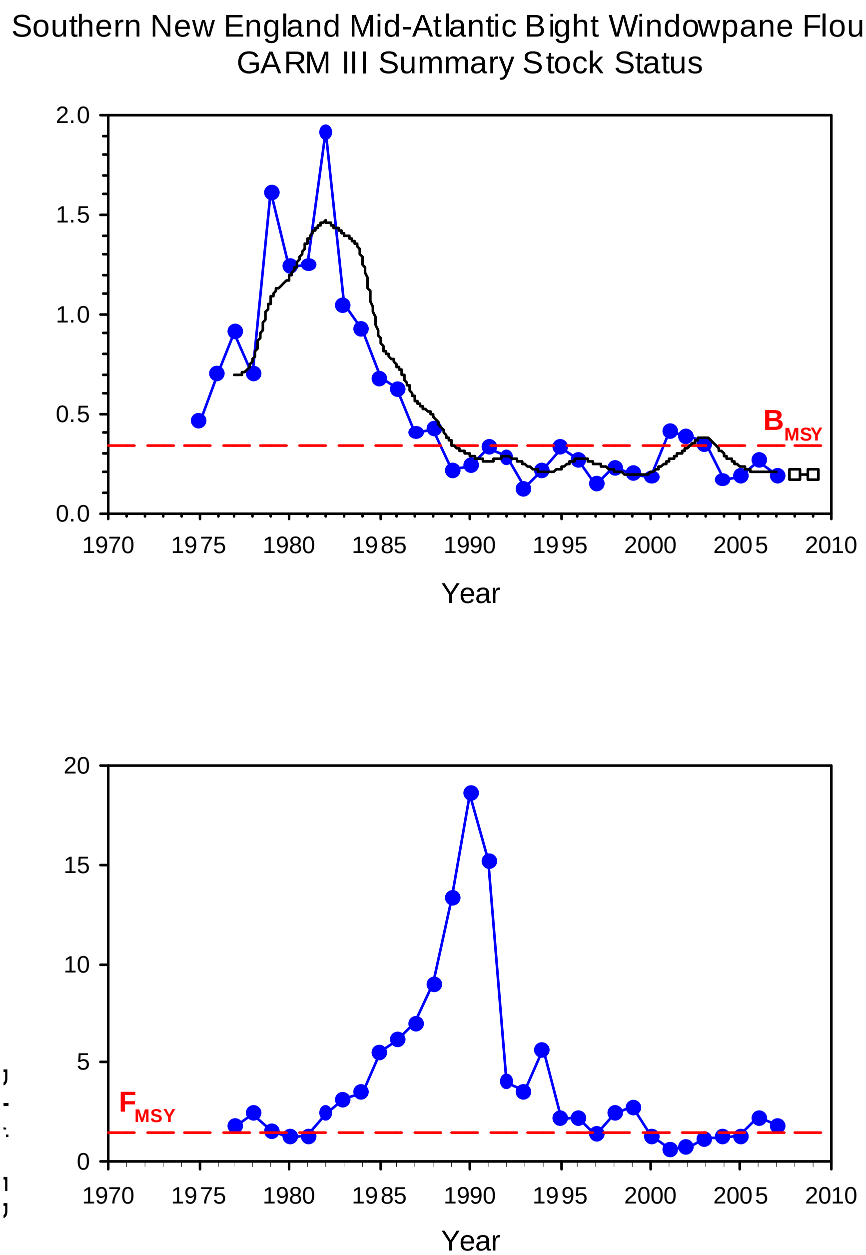
P. Northern windowpane flounder was overfished and was experiencing overfishing in 2007. Biomass has decreased since 2001. Fishing mortality has been increasing since 2002.

Figure 25 – Gulf of Maine/Georges Bank windowpane flounder fall biomass index (B) and relative exploitation rate (F) during 1975-2007 reported in GARM III. Biomass status determination is based on the lagged three year average plotted with a solid black line. Updated biomass indices for 2008 and 2009 are also shown with open squares. Surveys done with the Bigelow are converted to Albatross units.



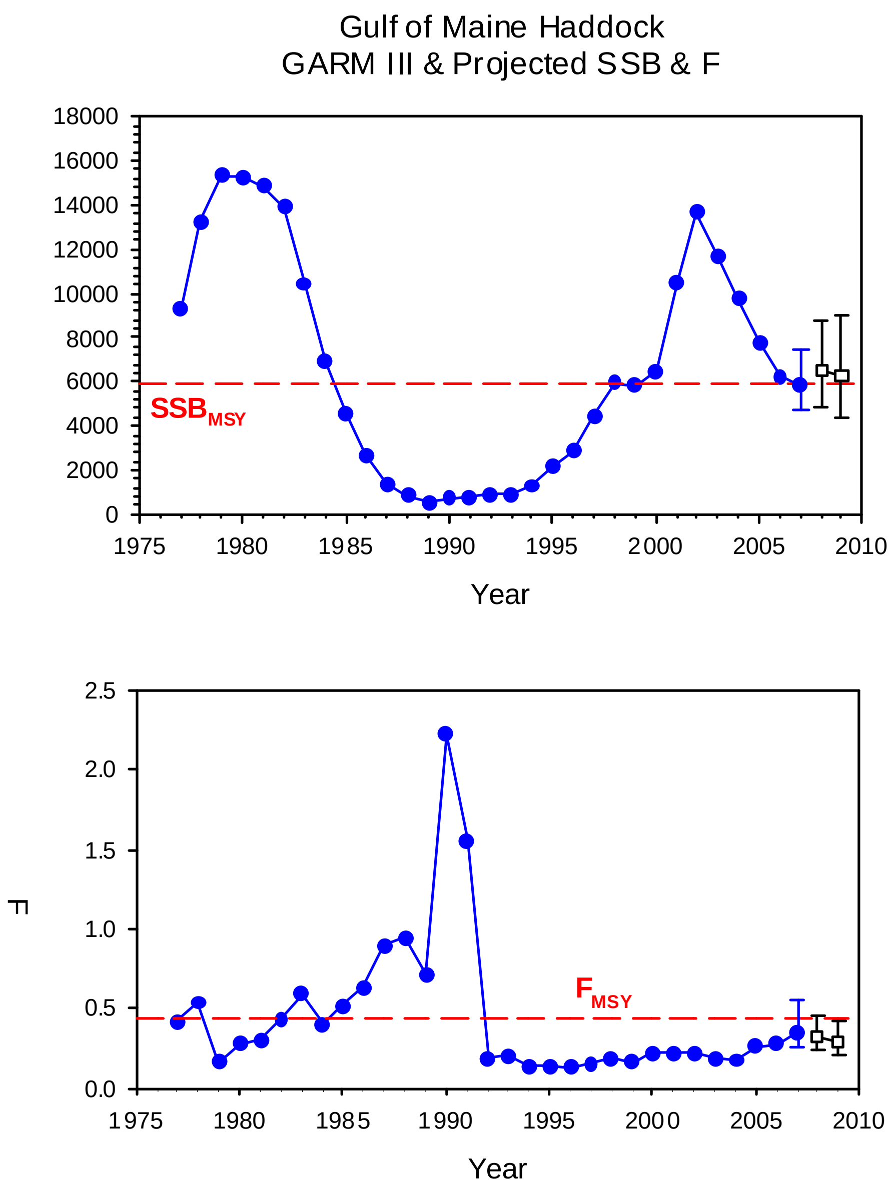
Q. Southern windowpane flounder was not overfished and was experiencing overfishing in 2007. Biomass has been low and fluctuated without trend since the late-1980s. The relative F has increased above F_{msy} in 2006 and 2007.

Figure 26 – Southern New England/Mid-Atlantic windowpane flounder fall biomass index (B) and relative exploitation rate (F) during 1975-2007 reported in GARM III. Biomass status determination is based on the lagged three year average plotted with a solid black line. Updated biomass indices for 2008 and 2009 are also shown with open squares. Surveys done with the Bigelow are converted to Albatross units.



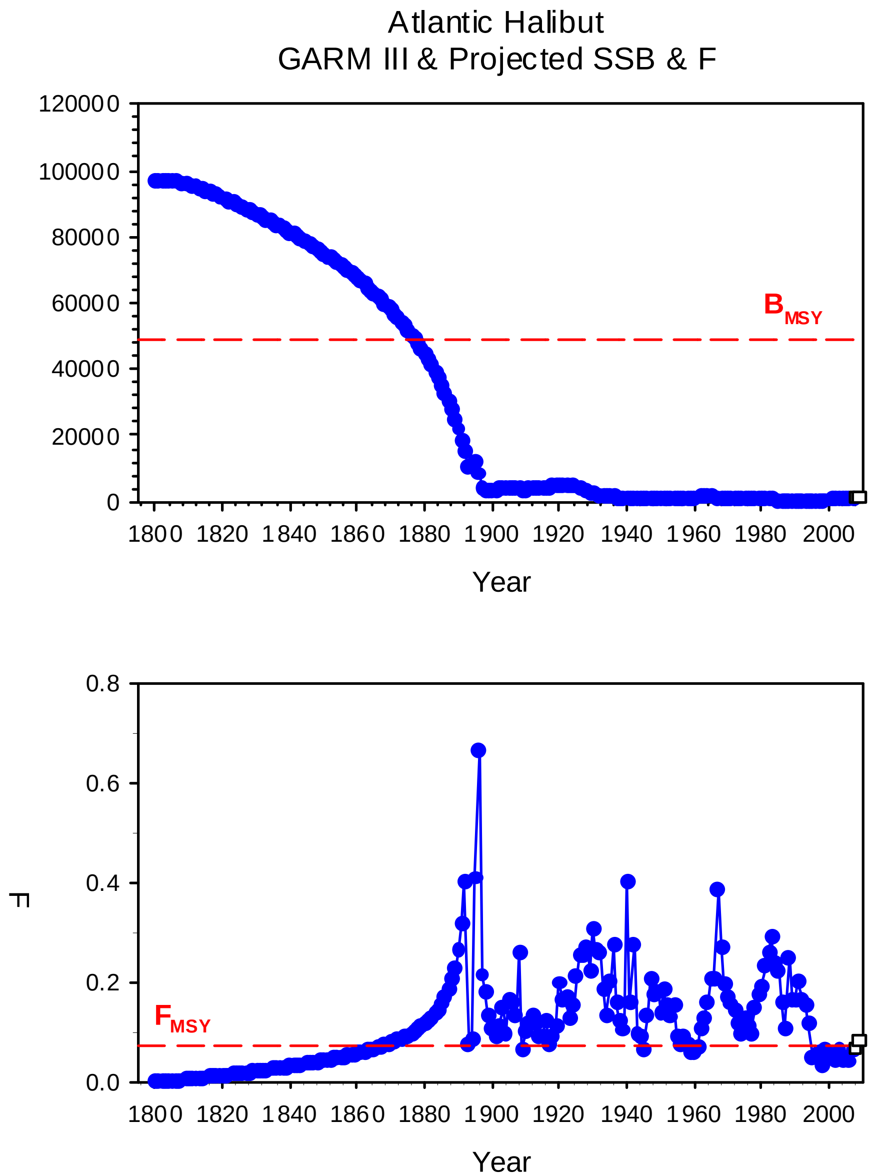
R. Gulf of Maine haddock was not overfished and was not experiencing overfishing in 2007.
Spawning biomass increased from 1989 to 2002 and has decreased since then. Fishing mortality has been below F_{msy} since 1992. No retrospective adjustment was made for Gulf of Maine haddock.

Figure 27 – Gulf of Maine haddock spawning stock biomass (SSB) and fishing mortality (F) during 1977-2007 reported in GARM III (blue circles) along with 80% confidence intervals for 2007 estimates. Projected SSB and F with 80% confidence intervals are shown with open squares.



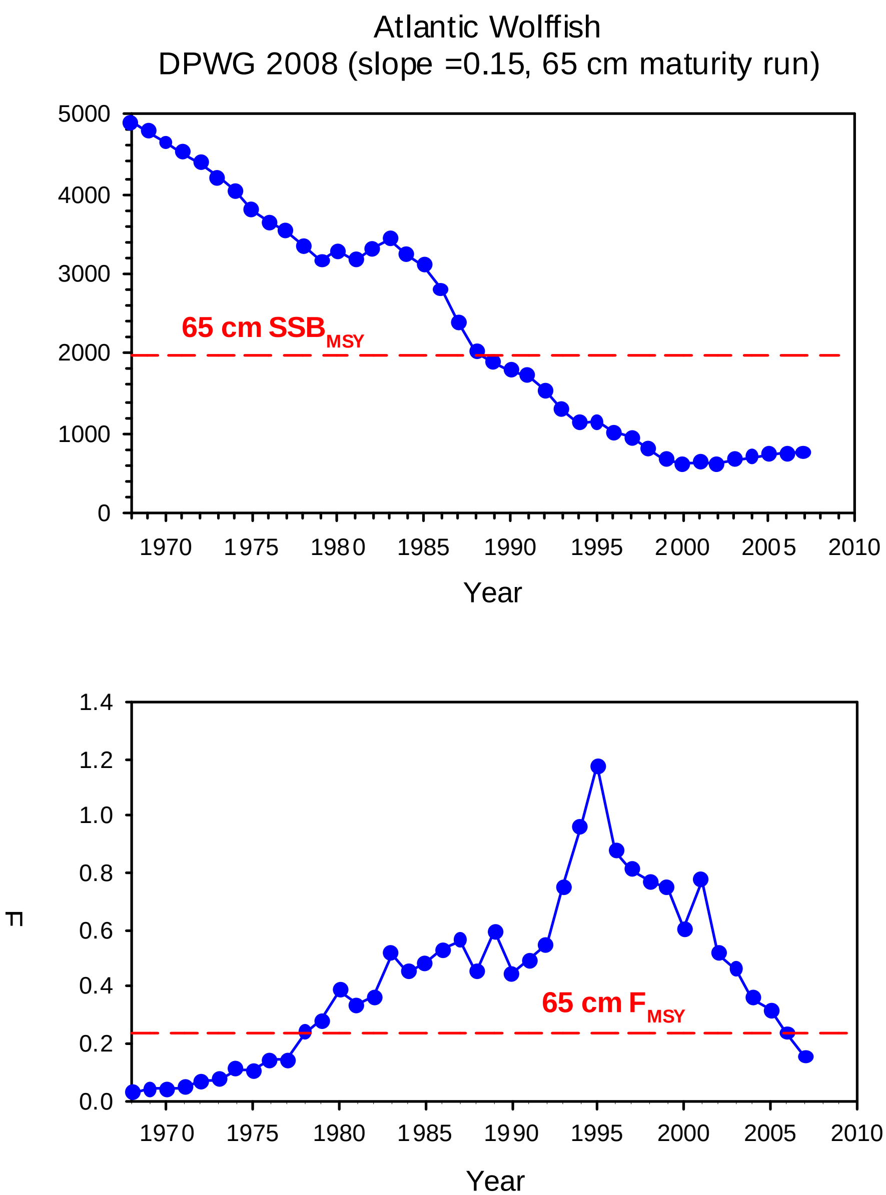
<u>S. Atlantic halibut was overfished and was not experiencing overfishing in 2007.</u> Biomass has been stable and well below B_{msy} since the late 1800s. Fishing mortality has been below F_{msy} since 1995.

Figure 28 – Atlantic halibut biomass (B) and fishing mortality rate (F) during 1800-2007 reported in GARM III (blue circles). Projected SSB and F with 80% confidence intervals are shown with open squares.



<u>T. Atlantic wolffish was overfished and was not experiencing overfishing in 2007.</u> Spawning stock biomass has been stable but low since the late 1990s. Fishing mortality has been declining since the mid 1990s.

Figure 29 – Atlantic wolffish spawning stock biomass (SSB) and fishing mortality rate (F) during 1968-2007 reported in DPWG 2008 (blue circles) assuming 65cm knife edge maturity and an assumed selectivity slope equal to 0.15. Stock status did not change using different assumptions on maturity and selectivity.



7.2.3 Areas Closed to Fishing within the Groundfish Fishery Area

Select areas are closed to some level of fishing to protect the sustainability of fishery resources. The designation of long-term closures has resulted in the removal or reduction of fishing effort from important fishing grounds, with an expected result that fishery-related mortalities to stocks utilizing the closed areas may have been reduced. Figure 30 shows the Closed Areas for:

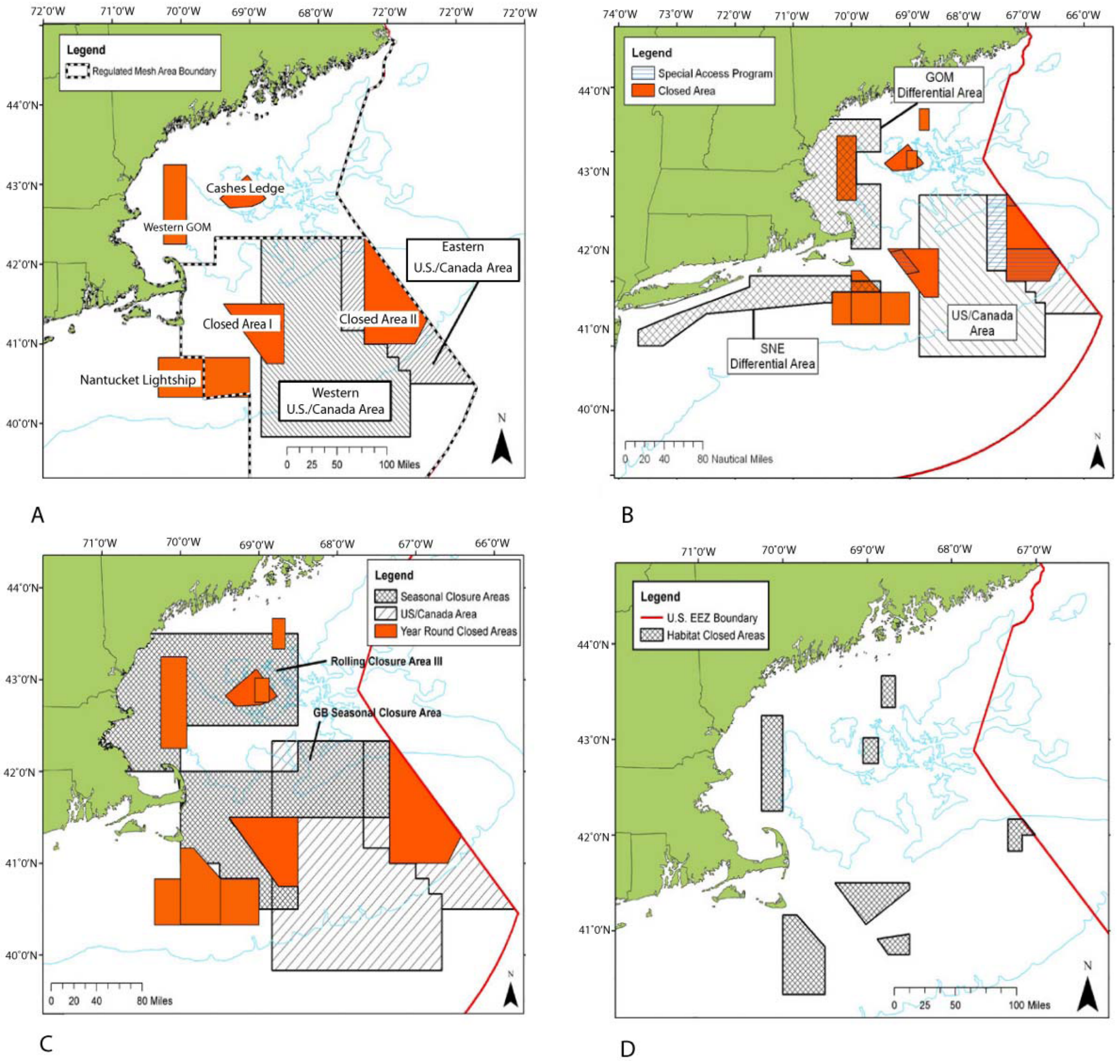
A. Northeast Multispecies Closed Areas and U.S./Canada Management Area;

B. Northeast Multispecies Differential Days-at-Sea Areas, Closed Areas, Special Access Programs, and the U.S./Canada Management Area;

C. Northeast Multispecies May Seasonal Closures Overlaid on Northeast Multispecies Closed Areas and the U.S./Canada area; and

D. Essential Fish Habitat Closure Areas.

Figure 30 - Northeast Multispecies Closed Areas and U.S./Canada area



7.2.4 U.S./Canada Fishery Information

U.S./Canada TACs

The U.S. TACs have varied over time due to primarily the change in the percentage shares allocated to the U.S. under the Sharing Understanding and the stock conditions (fishing mortality and biomass status). The stock conditions exert the dominant influence on the size of the TACs, and it should be noted that in some years, there is relatively high scientific uncertainty regarding stock size (see Transboundary Resource Assessment Committee documents). Despite the change in the weighting formula involving current distribution and historic catch from 60/40 to 85/15 (from 2004 through 2009, respectively), the percentage shares have not varied substantially. The U.S. shares of cod and haddock increased, while the share of yellowtail decreased, then increased, then decreased again.

Table 19 – U.S./Canada TACs (mt) and percentage share by year

Year	TAC Type	Cod	Haddock	Yellowtail Flounder
2011 90/10	Total Shared TAC U.S. TAC Canada TAC	 (**19%**) (81%)	 (**43%**) (57%)	 (**55%**) (45%)
2010 *90/10	Total Shared TAC U.S. TAC Canada TAC	1,350 338 (25%) 1,012 (75%)	29,600 11,988 (40.5%) 17,612 (59.5%)	Δ 1,500 Ω 1,200 *(64%)* □ 756 *(36%)*
2009 85/15	Total Shared TAC U.S. TAC Canada TAC	1,700 527 (31 %) 1,173 (69 %)	30,000 11,100 (37 %) 18,900 (63 %)	2,100 1,617 (77 %) 483 (23 %)
2008 80/20	Total Shared TAC U.S. TAC Canada TAC	2,300 667 (29 %) 1,633 (71 %)	23,000 8,050 (35 %) 14,950 (65 %)	2,500 ** 1,950 (78 %) 550 (22 %)
2007 75/25	Total Shared TAC U.S. TAC Canada TAC	1,900 494 (26 %) 1,406 (74 %)	19,000 6,270 (33 %) 12,730 (67 %)	1,250 900 (72 %) 350 (28 %)
2006 70/30	Total Shared TAC U.S. TAC Canada TAC	1,700 374 (22 %) 1,326 (78 %)	22,000 7,480 (34 %) 14,520 (66 %)	3,000 2,070 (69 %) 930 (31 %)
2005 65/35	Total Shared TAC U.S. TAC Canada TAC	1,000 260 (26 %) 740 (74 %)	23,000 7,590 (33 %) 15,410 (67 %)	6,000 4,260 (71 %) 1,740 (29 %)
2004 60/40	Total Shared TAC U.S. TAC Canada TAC	1,300 300 (23 %) 1,000 (77 %)	15,000 5,100 (34 %) 9,900 (66 %)	7,900 6,000 (76 %) 1,900 (24 %)

* Weighting formula: x/y resource distribution/utilization
* * Adjusted downward to 1,868.7 mt due to overharvest of 2007 TAC
Δ Developed unilaterally by the Council
□ (36% of Canada's desired shared TAC of 2,100 mt)
Ω Adjusted downward to 1,047 mt due to overharvest of 2009 TAC

U.S. Catch from Shared Stocks

The catch of Eastern GB cod, and haddock, and GB yellowtail flounder have varied due the availability of TAC, pertinent regulations, fish availability, market conditions and other factors. For example, particularly notable is the large FY 2004 catch of GB yellowtail flounder that resulted from the large TAC and the opening of the Closed Area II Yellowtail Flounder Special Access Program. Since 2004, the haddock TAC has not been a limiting factor, whereas access to the eastern U.S./Canada Area was limited multiple times by closures as a result of the projected attainment of the yellowtail and cod TACs. In only two instances have one of the TACs been exceeded. In FY 2007, the GB yellowtail TAC was overharvested by 9 percent as a result of late reporting, and relatively slow accounting of yellowtail catch by the scallop fleet (from outside scallop access areas). Since that time, NMFS modified its monitoring to improve the timelines of such data. The GB yellowtail TAC was again exceeded in 2009. The methodology of estimating discards can be found at the following internet address:
http://www.nero.noaa.gov/nero/regs/infodocs/DiscardCalculations.pdf.

Note, for cod and haddock, for trips that fished both inside and outside of the Eastern U.S./Canada Area, in-season monitoring attributed all fish caught on such trips towards the TAC. Because such trips include fish caught both inside and outside of the Eastern U.S./Canada Area, for 2006, the final catch numbers were adjusted downward to reflect only fish caught inside the Eastern Area. All final catch numbers include adjustments made to reflect live weight, as well as adjustments made to account for the discrepancy between vessel monitoring system data and dealer data.

Pursuant to Regional Administrator authority to modify certain measures to optimize catch (neither under-harvest, nor over-harvest the TACs), NMFS has relied upon three management tools: modifications to the cod and yellowtail trip limits, closures to the eastern U.S./Canada Area, and prohibition on the use of flatfish nets. For the 2008, 2009, and 2010 fishing years, the Council recommended, and NMFS implemented a delay in the opening of the Eastern U.S./Canada Area for vessels fishing with trawls, in order to avoid trawl fishing during the season when the cod catch rate is usually high.

During FYs 2004-2010 there were several Special Access Programs (SAPs), which provided vessels opportunities to fish in the U.S. Canada Management Area under rules which differed from the generic regulations that apply to the U.S. Canada Management Area. The catch under each of the SAPs (kept and discarded) counted toward the pertinent U.S. TAC specified for each FY (cod, haddock, and yellowtail flounder), and were consistent with the Understanding.

Table 20 – U.S. catch from shared stocks

Cod				
Fishing Year	TAC (mt)	Catch (% of TAC)	Catch (mt)	Discards (% of catch)
2004	300	59 %	177	23 %
2005	260	94 %	244	64 %
2006	374	90 %	335	50 %
2007	494	64 %	315	67 %
2008	667	75 %	501	15 %
2009	527	89 %	467	35 %

Haddock				
Fishing Year	TAC (mt)	Catch (% of TAC)	Catch (mt)	Discards (% of catch)
2004	5,100	21 %	1,060	18 %
2005	7,590	8 %	589	12 %
2006	7,480	9 %	671	37 %
2007	6,270	5 %	307	46 %
2008	8,050	20 %	1,649	4 %
2009	11,100	14 %	1,563	1 %

Yellowtail Flounder				
Fishing Year	TAC (mt)	Catch (% of TAC)	Catch (mt)	Discards* (% of catch)
2004	6,000	98 %	5,852	8 %
2005	4,260	88 %	3,760	9 %
2006	2,070	89 %	1,851	29 %
2007	900	109 %	981	39 %
2008	1,869	82 %	1,531	28 %
2009	1,617	109 %	1,770	31 %

* Note; yellowtail discard % includes groundfish and scallop fishery discards

Table 21 – Summary of numbers of trips and DAS* in U.S./Canada management area

Fishing Year	Trips			Days-at-Sea		
	Total	West	East	Total	West	East
2004	1,910	1,424	468	9,805	7,808	1,997
2005	2,176	1,963	213	14,368	13,287	1,081
2006	1,579	1,295	284	9,282	7,907	1,375
2007	1,272	1,134	138	10,950	10,264	686
2008	1,273	559	714	8,990	4,804	4,186
2009	1,621	1,175	446	9,426	6,911	2,515

* A, B regular, and B reserve groundfish DAS

Table 22 – Number of distinct vessels that fished in the U.S./Canada management area

Fishing Year	Western Area	Eastern Area	East and West
2004	159	110	162
2005	184	78	184
2006	155	92	161
2007	148	59	151
2008	126	92	147
2009	127	81	136

Table 23 – Estimates of observer coverage in U.S./Canada area (percent of trips)

Fishing Year	Approximate Percentage
2006	19 %
2007	26 %
2008	29 %
2009	23 %

Table 24 – Canadian catch from shared Georges Bank stocks

Cod				
	TAC (mt)	Catch (% of TAC)	Catch (mt)	**Discards**
2004	1,000	111 %	1,112	unknown
2005	* 640 (740)	98 %	627	unknown
2006	1,326	109 %	1,448	24 %
2007	* 1,275 (1,406)	94 %	1,195	125 mt from scallopers
2008	1,633	94 %	1,529	36 mt from scallopers
2009	1,173	103 %	1,209	69 mt from scallopers
2010 *	**976		291	32

* *Adjusted downward to account for previous year's overharvest

Haddock				
	TAC (mt)	Catch (% of TAC)	Catch (mt)	Discards
2004	9,900	98 %	9,745	unknown
2005	15,410	94 %	14,483	unknown
2006	14,520	83 %	12,054	
2007	12,728	94 %	11,951	61 mt from scallopers
2008	14,950	99 %	14,815	33 mt from scallopers
2009	18,900	93 %	17,649	54 mt from scallopers
2010 *	17,612		10,195	8

Yellowtail Flounder				
	TAC (mt)	Catch (% of TAC)	Catch (mt)	Discards
2004	1,900	< 1 %	95	unknown
2005	1,740	< 1 %	29	unknown
2006	930	62 %	580	
2007	350	38 %	132	105 mt from scallopers
2008	550	29 %	158	117 mt from scallopers
2009	483	18%	87	84 mt from scallopers
2010 *	756		197	182 mt from scallopers

*As of August 20, 2010

Table 25 – Summary of GB yellowtail flounder catch by scallop fishery

Year	2005	2006	2007	2008	2009
Landings	2,000 lb	16,000 lb	1,100 lb	10,000 lb	5,000 (open area)
Discards	470,000 lb	949,000 lb	417,000 lb	475,000 lb (6,575,000 meat lb of scallop X 0.072 discard rate for USCA open access scallop trips)	509,000 (open area: 172,000; (access area: 338,000)
Total	472,000 lb	966,000 lb	419,000 lb	485,000 lb	514,000
Groundfish GB Yellowtail TAC	9,392,000	4,564,000	1,984,000	4,119,779	3,564,875
% of TAC	5%	21%	21%	12 %	14%

* Based on NMFS/FSO end of fishing year summary reports for U.S./Canada area; includes both scallop access area and open areas on GB)

Table 26 – GB yellowtail catch from scallop access fishery (from FSO website)

	Kept	Discarded	Total
2009 CA II Scallop Access Area	7,240 lb	305,790 lb	313,030 lb
2007 CA I Scallop Access Area	501 lb	53,387 lb	53,888 lb
2006 CA II Scallop Access Area	7,470 lb	454, 842 lb	462,312

7.2.5 Interaction between Gear and Target Species

The analysis of interactions between gear and allocated species is based on catch information for the Northeast Multispecies FMP Common Pool fishery from FY 1996 through FY 2006 as presented in GARM III. Historic landings for select target species by gear type from FY 1996 through FY 2006 (Table 27) show that the majority of fish of all species are caught with trawls. Only cod and white hake are caught in significant numbers by gillnets. Only haddock are caught in significant numbers by hook and line.

Table 27 - Historic landings for groundfish species by gear type from FY 1996 - 2006 in metric tons (mt) as presented in GARM III.

Stock/species	Trawl	Large-mesh trawl discards	Small-mesh trawl discards	Gillnet	Gillnet discards	Hook/ line	Hook/ line discards	Scallop dredge	Scallop dredge discards	Other	Other discards	Total discards	Total landings
Georges Bank Cod		2,742	551						170			2,862	73,806
Georges Bank Haddock	38,989	3,950		883	61	2,461	380		31	297		4,423	42,626
Georges Bank Yellowtail Flounder		1,280	134						2,562			3,976	27,960
So. New England/Mid-Atlantic Yellowtail Flounder		725	129						1,119			1,972	7,968
Gulf of Maine/Cape Cod Yellowtail Flounder		1,123	33		510				944			2,611	15,796
Gulf of Maine Cod	22,435	5,301		17,532	4,036					3,639		9,337	43,606
Witch Flounder		1,911	469								71	2,481	27,031
American Plaice		3,059	1,237								350	4,533	31,031
Gulf of Maine Winter Flounder	4,479	259	54	1,346	163					168		476	5,993
So. New England/Mid-Atlantic Winter Flounder[a]												1,481	31,146
Georges Bank Winter Flounder	18,202	169	47					210	418	135		634	18,546
White Hake	22,532			9,355	239					2,191		2,173	32,547
Pollock												N/A	51,568

Stock/species	Trawl	Large-mesh trawl discards	Small-mesh trawl discards	Gillnet	Gillnet discards	Hook/ line	Hook/ line discards	Scallop dredge	Scallop dredge discards	Other	Other discards	Total discards	Total landings
Acadian Redfish												6,200	4,115
Ocean Pout[a]												5,165	207
Gulf of Maine Haddock	6,396	5	0.49	1,091	1					969	2		8,456
Atlantic Halibut [a]												157	138
Gulf of Maine/Georges Bank Windowpane [a]	1,966	3,584	403	4				3	615	7		4,850	1,978
Southern New England/Mid-Atlantic Windowpane [a]	1,071	1,762	433	3				1	1,004	18		3,197	1,093
Atlantic Wolffish[b]													

Notes:

[a] as adopted by the NEFMC June, 2009

[b] provisionally added to list of stocks not allocated

7.3 Other Species

Species likely to be affected by the multispecies fishery include monkfish, skates, and spiny dogfish. These species have no allocation under the Northeast Multispecies FMP and are managed under separate FMPs. The discussion in this section is limited to these three groups of fish. Monkfish and skates are commonly landed when caught. Monkfish may be discarded when regulations or market conditions constrain the amount of the catch that could be landed. Spiny dogfish, which tend to be relatively abundant in catches, may be landed but are often the predominant component of the discarded bycatch.

7.3.1 Monkfish

Life History: Monkfish, *Lophius americanus*, also called goosefish, are distributed in the western North Atlantic from the Grand Banks and northern Gulf of St. Lawrence south to Cape Hatteras, North Carolina. Monkfish may be found from inshore areas to depths of at least 900 m. Seasonal onshore-offshore migrations occur and appear to be related to spawning and possibly to food availability.

Female monkfish begin to mature at age 4, and 50 percent of females are mature by age 5 (about 43 cm). Males mature at slightly younger ages and smaller sizes (50 percent maturity at age 4.2 or 36 cm). Spawning takes place from spring through early autumn, progressing from south to north, with most spawning occurring during the spring and early summer. Females lay a buoyant egg raft or veil which can be as large as 12 m long and 1.5 m wide, and only a few mm thick. The eggs are arranged in a single layer in the veil, and the larvae hatch after about 1 to 3 weeks, depending on water temperature. The larvae and juveniles spend several months in a pelagic phase before settling to a benthic existence at a size of about 8 cm.

Population Management and Status: Monkfish are currently regulated by the Monkfish FMP, which was implemented in 1999 (NEFMC and MAFMC 1998). The FMP was designed to stop overfishing and rebuild the stocks through a number of measures, including: limiting the number of vessels with access to the fishery and allocating DAS to those vessels; setting trip limits for vessels fishing for monkfish; minimum fish size limits; gear restrictions; incidental catch possession limits for vessels not on a monkfish DAS; and a framework adjustment process.

The FMP defines two management areas for monkfish (northern and southern), divided roughly by an east-west line bisecting Georges Bank. Monkfish in both management regions are not overfished and overfishing is not occurring.

7.3.2 Skates

Life History: The seven species in the Northeast Region (Maine to Virginia) skate complex are: little skate (*Leucoraja erinacea*), winter skate (*L. ocellata*), barndoor skate (*Dipturus laevis)*, thorny skate (*Amblyraja radiata*), smooth skate (*Malacoraja senta*), clearnose skate (*Raja eglanteria*), and rosette skate (*L. garmani*). The barndoor skate is most common skate in the Gulf of Maine, on Georges Bank, and in southern New England. In the Northeast Region, the center of distribution for the little and winter skates is Georges Bank and southern New England. The thorny and smooth skates are commonly found in the Gulf of Maine. The clearnose and rosette skates have a more southern distribution, and are found primarily in southern New England and the Chesapeake Bight.

Skates are not known to undertake large-scale migrations. Skates tend to move seasonally in response to changes in water temperature, moving offshore in summer and early autumn and returning inshore during winter and spring. Members of the skate family lay eggs that are enclosed in a hard, leathery case commonly called a mermaid's purse. Incubation time is 6 to 12 months, with the young having the adult form at the time of hatching.

Population Management and Status: The Skate FMP was implemented in September 2003 with a primary requirement for mandatory reporting of skate landings by species by both dealers and vessels. Possession prohibitions of barndoor, thorny, and smooth skates in the Gulf of Maine were also provisions of the FMP. Amendment 3 and the Environmental Impact Statement (EIS) to the Skate FMP updates and supplements the original EIS for the skate fishery and serves as a Stock Assessment and Fishery Evaluation (SAFE) Report (http://www.nefmc.org/skates/fmp/fmp.htm). Amendment 3 was developed by the Council to rebuild overfished skate stocks and implement ACLs and AMs consistent with the requirements of the reauthorized Magnuson-Stevens Act. Amendment 3 implements a rebuilding plan for smooth skate and establishes an ACL and annual catch target (ACT) for the skate complex, total allowable landings (TAL) for the skate wing and bait fisheries, seasonal quotas for the bait fishery, new possession limits, in season possession limit triggers, and other measures to improve management of the skate fisheries. Possession limit is 5,000 lb wing weight unless the vessel is in possession of a Skate Bait Letter of Authorization. To ensure that the skate wing TAL is not exceeded, when 80 percent of the annual skate wing TAL is landed, the 5,000–lb skate wing possession limit will be reduced to 500 lb wing weight for the remainder of the FY. A possession limit of 20,000 lb whole weight is implemented for vessels participating in the skate bait fishery that also possess a Skate Bait LOA.

Skate landings have been reported to be generally increasing since 2000. Due to insufficient information about the population dynamics of skates, there remains considerable uncertainty about the status of skate stocks. The landings and catch limits proposed by Amendment 3 have been reported to have an acceptable probability of promoting biomass growth and achieving the rebuilding (biomass) targets for thorny skates. Modest reductions in landings and a stabilization of total catch below the median relative exploitation ratio is expected to cause skate biomass and future yield to increase.

7.3.3 Spiny Dogfish

Life History: Spiny dogfish, *Squalus acanthias*, are distributed in the western North Atlantic from Labrador to Florida and are considered to be a unit stock off the coast of New England. In summer, dogfish migrate northward to the Gulf of Maine-Georges Bank region and into Canadian waters and return southward in autumn and winter. Spiny dogfish tend to school by size and, when mature, by sex. The species bears live young, with a gestation period of about 18 to 22 months, and produce between 2 to 15 pups with an average of 6. Size at maturity for females is around 80 cm, but can vary from 78 cm to 85 cm depending on the abundance of females.

Population Management and Status: The fishery is managed under a FMP developed jointly by the NEFMC and Mid Atlantic Fishery Management Council (MAFMC) for federal waters and a plan developed concurrently by the Atlantic States Marine Fisheries Commission for state waters. Spawning stock biomass of spiny dogfish declined rapidly in response to a directed fishery during the 1990s. Management measures, initially implemented in 2001, have been effective in reducing landings and reducing fishing mortality (MAFMC 2009). Overfishing is not presently considered to be occurring. A peer-review of the spiny dogfish stock in April 2010 concluded that the spawning stock biomass had been above the biomass target for two years and in June, the

Councils received a letter from the National Marine Fisheries Service (NMFS) indicating that the spiny dogfish stock was rebuilt. Amendment 3 to the Spiny Dogfish FMP is currently under development. The MAFMC has recommended a 20 million pound quota and a 3,000 pound trip limit for the 2011 fishing year for spiny dogfish, based on the allowable biological catch determination of the Council's Scientific and Statistical Committee. This quota represents a 33% increase from the 2010 level.

7.3.4 Interaction between Gear and Incidental Catch Species

The analysis of interactions between gear and non-allocated species and by catch is based on catch information for the Northeast Multispecies FMP Common Pool fishery from FY 1996 to FY 2006.

The Final Supplemental Environmental Impact Statement (FSEIS) to Amendment 2 (NEFMC and MAFMC 2003) evaluated the potential adverse effects of gears used in the directed monkfish fishery for monkfish and other federally-managed species and the effects of fishing activities regulated under other federal FMPs on monkfish. The two gears used in the directed monkfish fishery are bottom trawls and bottom gill nets which are described in detail in Section 1.2.1 of Appendix 2 to Amendment 2 to the Monkfish FMP (NEFMC and MAFMC 2003).

Regionally, skates are harvested in two very different fisheries, one for lobster bait and one for wings for food. Vessels tend to catch skates when targeting other species like groundfish, monkfish, and scallops and land them if the price is high enough. Therefore, gear interactions with skate can be expected in the conduct of fishing for groundfish. Detailed information about skate fisheries, gear and conduct can be found in Section 7.6 of the recent NEFMC Amendment to the Skate FMP and accompanying FSEIS (NEFMC 2009b).

Of the non-allocated target species considered in the EA, dogfish have the potential for an interaction with all gear types expected to be used by the groundfish fleet. Historic landings for non-allocated target species from FY 1996 to FY 2007 (Table 28) show that the majority of fish of all species are caught with otter trawls. Only cod and white hake are caught in significant numbers by gillnets. Only haddock are caught in significant numbers by hook and line.

Table 28 - Historic landings (mt) for other species by gear type from FY 1996 - 2006[a]

	Gear Type								
	Trawl		Gillnet		Dredge		Other Gear[b]	Total	
Species	land	discard	land	discard	land	discard	land	land	discard
Monkfish	122,700	16,520	7,440	6,526	31,555	16,136	8,811	228,000	35,100
Skates	117,381	189,741	29,711	19,448	38,638	--	4,413	151,505	247,827
Dogfish	24,368	61,914	72,712	39,852	--	--	946	98,026	101,766

Notes:

[a] monkfish 1997-2006, skates 1996-2006, dogfish 1996-2005

[b] discards not available for other gear

Source: Northeast Data Poor Stocks Working Group 2007; Sosebee et al. 2008; NEFSC 2006b.

7.4 Protected Resources

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

7.4.1 Species Present in the Area

Table 29 lists the species, protected either by the ESA, the MMPA, or both, may be found in the environment that would be utilized by the groundfish fishery.

Table 29 – Species protected under the Endangered Species Act and Marine Mammal Protection Act that may occur in the operations area for the groundfish fishery

Species	Status
Cetaceans	
North Atlantic right whale (*Eubalaena glacialis*)	Endangered
Humpback whale (*Megaptera novaeangliae*)	Endangered
Fin whale (*Balaenoptera physalus*)	Endangered
Sei whale (*Balaenoptera borealis*)	Endangered
Blue whale (*Balaenoptera musculus*)	Endangered
Sperm whale (*Physeter macrocephalus*	Endangered
Minke whale (*Balaenoptera acutorostrata*)	Protected
Northern bottlenose whale (*Hyperoodon ampullatus*)	Protected
Beaked whale (*Ziphius and Mesoplodon spp*.)	Protected
Pygmy or dwarf sperm whale (*Kogia spp.)*	Protected
Pilot whale (*Globicephala spp*.)	Protected
False killer whale (*Pseudorca crassidens*)	Protected
Melonheaded whale (*Peponocephala electra*)	Protected
Rough-toothed dolphin (*Steno bredanensis*)	Protected
Risso's dolphin (*Grampus griseus*)	Protected
White-sided dolphin (*Lagenorhynchus acutus*)	Protected
Common dolphin (*Delphinus delphis*)	Protected
Spotted and striped dolphins (*Stenella spp*.)	Protected
Bottlenose dolphin – Offshore stock (*Tursiops truncatus*)[a]	Protected
White-beaked dolphin (*Lagenorhynchus albirostris*)	Protected
Harbor Porpoise (*Phocoena phocoena*)	Protected

Table 29 **(continued)**
Species protected under the Endangered Species Act and Marine Mammal Protection Act that may occur in the operations area for the groundfish fishery.

Species	Status
Sea Turtles	
Leatherback sea turtle (*Dermochelys coriacea*)	Endangered
Kemp's ridley sea turtle (*Lepidochelys kempii*)	Endangered
Green sea turtle (*Chelonia mydas*)	Endangered[b]
Loggerhead sea turtle (*Caretta caretta*)	Threatened
Fish	
Shortnose sturgeon (*Acipenser brevirostrum*)	Endangered
Atlantic salmon (*Salmo salar*)	Endangered
Pinnipeds	
Harbor seal (*Phoca vitulina*)	Protected
Gray seal (*Halichoerus grypus*)	Protected
Harp seal (*Pagophilus groenlandicus*)	Protected
Hooded seal (*Cystophora cristata*)	Protected

Note:

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

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

Two additional species of pinnipeds: Ringed seal (*Phoca hispida*) and the Bearded seal (*Erignathus barbatus*) are listed as candidate species under the ESA. The Northeastern U.S. is at the southern tip of the habitat range for both of these species. These species are rarely sighted off the northeastern U.S., although a few stranding records have been recorded in the Northeast Region, but sightings are rare in the Northeast Atlantic.

7.4.2 Species Potentially Affected

It is expected that the sea turtle, cetacean, and pinniped species discussed below have the potential to be affected by the operation of the multispecies fishery. Background information on the range-wide status of sea turtle and marine mammal species that occur in the area and are known or suspected of interacting with fishing gear (demersal gear including trawls, gillnets, and longline types) can be found in a number of published documents. These include sea turtle status reviews and biological reports (NMFS and USFWS 1995; Marine Turtle Expert Working Group (TEWG) 1998, 2000; NMFS and USFWS 2007a, 2007b; Leatherback TEWG 2007), recovery plans for ESA-listed cetaceans and sea turtles (NMFS 1991, 2005; NMFS and USFWS 1991a, 1991b; NMFS and USFWS 1992), the marine mammal stock assessment reports (e.g., Waring et al. 2006; 2007; 2009), and other publications (e.g., Clapham et al. 1999, Perry et al. 1999, Best et al. 2001, Perrin et al. 2002).

Additional ESA background information on the range-wide status of these species and a description of critical habitat can be found in a number of published documents including recent sea turtle (NMFS and USFWS 1995, TEWG 2000, NMFS SEFSC 2001, NMFS and USFWS 2007a), loggerhead recovery team report (NMFS and USFWS 2008), status reviews and stock assessments, Recovery Plans for the humpback whale (NMFS 1991), right whale (NMFS 1991a, NMFS 2005), right whale EIS (August 2007), fin and sei whale (NMFS 1998b), and the marine mammal stock assessment report (Waring et al. 2008) and other publications (*e.g.*, Perry *et al.* 1999; Clapham *et al.* 1999; IWC 2001 *a*). A recovery plan for fin and sei whales is also available and may be found at the following web site http://www.NOAAFisheries.noaa.gov/prot_res/PR3/recovery.html (NOAA Fisheries unpublished).

7.4.2.1 Sea Turtles

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

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

7.4.2.2 Large Cetaceans

The most recent Marine Mammal Stock Assessment Report (SAR) (Waring et al. 2009) reviewed the current population trend for each of these cetacean species within U.S. EEZ waters, as well as providing information on the estimated annual human-caused mortality and serious injury, and a description of the commercial fisheries that interact with each stock in the U.S. Atlantic. Information from the SAR is summarized below.

The western North Atlantic baleen whale species (North Atlantic right, humpback, fin, sei, and minke) follow a general annual pattern of migration from high latitude summer foraging grounds, including the Gulf and Maine and Georges Bank, to low latitude winter calving grounds (Perry et al. 1999, Kenney 2002). However, this is an oversimplification of species movements, and the complete winter distribution of most species is unclear (Perry et al. 1999, Waring et al. 2009). Studies of some of the large baleen whales (right, humpback, and fin) have demonstrated the presence of each species in higher latitude waters even in the winter (Swingle et al. 1993, Wiley et al. 1995, Perry et al. 1999, Brown et al. 2002, Patrician et al. 2009). Blue whales are most often sighted on the east coast of Canada, particularly in the Gulf of St. Lawrence, and occurs only infrequently within the U.S. EEZ (Waring et al. 2002).

In comparison to the baleen whales, sperm whale distribution occurs more on the continental shelf edge, over the continental slope, and into mid-ocean regions (Waring et al. 2006). However, sperm whales distribution in U.S. EEZ waters also occurs in a distinct seasonal cycle (Waring et al. 2006). Typically, sperm whale distribution is concentrated east-northeast of Cape Hatteras in winter and shifts northward in spring when whales are found throughout the Mid-Atlantic Bight (Waring et al. 2006). Distribution extends further northward to areas north of Georges Bank and the Northeast Channel region in summer and then south of New England in fall, back to the Mid-Atlantic Bight (Waring et al. 1999).

For North Atlantic right whales, the available information suggests that the population is increasing at a rate of 1.8 percent per year during 1990-2003, and the total number of North Atlantic right whales is estimated to be at least 323 animals in 2003 (Waring et al. 2009). The minimum rate of annual human-caused mortality and serious injury to right whales averaged 3.8 per year during 2002 to 2006 (Waring et al. 2009). Of these, 1.4 per year resulted from fishery interactions. Recent mortalities included six female right whales, including three that were pregnant at the time of death (Waring et al. 2009).

The North Atlantic population of humpback whales is estimated to be 11,570, although the estimate is considered to be negatively biased (Waring et al. 2009). The best estimate for the Gulf of Maine stock of humpback whales is 847 whales (Waring et al. 2009). The population trend was considered positive for the Gulf of Maine population, but there are insufficient data to estimate the trend for the larger North Atlantic population. Based on data available for selected areas and time periods, the minimum population estimates for other western north Atlantic whale stocks are 2,269 fin whales, 207 sei whales, 4,804 sperm whales, and 3,312 minke whales (Waring et al. 2009). No recent estimates are available for blue whale abundance. Insufficient data exist to determine trends for any other large whale species.

The ALWTRP was recently revised with publication of a new final rule (72 FR 57104, October 5, 2007) that is intended to continue to address entanglement of large whales (right, humpback, fin, and minke) in commercial fishing gear and to reduce the risk of death and serious injury from entanglements that do occur.

It should also be noted that NMFS expects to propose changes to critical habitat designations of the North Atlantic right whale in 2011. At the time of writing, an announcement by the agency acknowledged that it is proceeding with the petition by working on a rule to propose revisions to the critical habitat designation for this species. "Critical habitat" is an area that contains physical or biological features that may require special management and that are essential to the conservation of the species. Three critical habitat areas currently exist, established in 1994, two of which are within the jurisdiction of the NEFMC; the feeding grounds in Cape Cod Bay and the Great South Channel.

7.4.2.3 Small Cetaceans

Numerous small cetacean species (dolphins; pygmy and dwarf sperm whales; pilot and beaked, whales; and the harbor porpoise) occur within [the area from Cape Hatteras through the Gulf of Maine]. Seasonal abundance and distribution of each species in [Mid-Atlantic, Georges Bank, and/or Gulf of Maine] waters varies with respect to life history characteristics. Some species primarily occupy continental shelf waters (e.g., white sided dolphins, harbor porpoise), while others are found primarily in continental shelf edge and slope waters (e.g., Risso's dolphin), and still others occupy all three habitats (e.g., common dolphin, spotted dolphins, striped dolphins). Information on the western North Atlantic stocks of each species is summarized in Waring et al. (2009).

7.4.2.4 Pinnipeds

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

7.4.3 Species Not Likely to be Affected

The Gulf of Maine (GOM) Distinct Population Segment (DPS) of anadromous Atlantic salmon was initially listed by the USFWS and NMFS (collectively, the Services) as an endangered species on November 17, 2000 (65 FR 69459). A subsequent listing as an endangered species by the Services on June 19, 2009 (74 FR 29344) included an expanded range for the GOM DPS of Atlantic salmon.

Presently, the GOM DPS includes all anadromous Atlantic salmon whose freshwater range occurs in the watersheds from the Androscoggin River northward along the Maine coast to the Dennys River. Included are all associated conservation hatchery populations used to supplement these natural populations; currently, such conservation hatchery populations are maintained at Green Lake National Fish Hatchery (GLNFH) and Craig Brook National Fish Hatchery (CBNFH). Coincident with the June 19, 2009 endangered listing, NMFS designated critical habitat for the GOM DPS of Atlantic salmon (74 FR 29300; June 19, 2009). The critical habitat designation for the GOM DPS includes 45 specific areas occupied by Atlantic salmon at the time of listing that include approximately 19,571 km of perennial river, stream, and estuary habitat and 799 square km of lake habitat within the range of the GOM DPS and in which are found those physical and biological features essential to the conservation of the species. The entire occupied range of the GOM DPS in which critical habitat is designated is within the State of Maine.

At the time of this writing, a set of four public hearings on the proposed listing of Atlantic sturgeon under the endangered species act have been scheduled along the eastern seaboard.

NMFS has proposed that five populations along the east coast receive protection, after the 2007 formal status review. Two of the proposed five populations (Gulf of Maine and New York Bight) are in the areas managed by the NEFMC in which the groundfish fishery operates.

The action being considered in the EA is not likely to adversely affect shortnose sturgeon, the Gulf of Maine distinct population segment (DPS) of Atlantic salmon, hawksbill sea turtles, blue whales, or sperm whales, all of which are listed as endangered species under the ESA. Shortnose sturgeon and salmon belonging to the Gulf of Maine DPS of Atlantic salmon occur within the general geographical areas fished by the multispecies fishery, but they are unlikely to occur in the area where the fishery operates given their numbers and distribution. Therefore, none of these species are likely to be affected by the groundfish fishery. The following discussion provides the rationale for these determinations. Although there are additional species that may occur in the operations area that are not known to interact with the specific gear types that would be used by the groundfish fleet, impacts to these species are still considered due to their range and similarity of behaviors to species that have been adversely affected.

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

The wild populations of Atlantic salmon found in rivers and streams from the lower Kennebec River north to the U.S. - Canada border are listed as endangered under the ESA. These populations include those in the Dennys, East Machias, Machias, Pleasant, Narraguagus, Ducktrap, and Sheepscot Rivers and Cove Brook. Juvenile salmon in New England rivers typically migrate to sea in May after a 2- to 3-year period of development in freshwater streams, and remain at sea for two winters before returning to their U.S. natal rivers to spawn. Results from a 2001 post-smolt trawl survey in Penobscot Bay and the nearshore waters of the Gulf of Maine indicate that Atlantic salmon post-smolts are prevalent in the upper water column throughout this area in mid- to late May. Therefore, commercial fisheries deploying small-mesh active gear (pelagic trawls and purse seines within 10 m of the surface) in nearshore waters of the Gulf of Maine may have the potential to incidentally take smolts. However, it is highly unlikely that the approval of this EA would affect the Gulf of Maine DPS of Atlantic salmon given that operation of the groundfish fishery would not occur in or near the rivers where concentrations of Atlantic salmon are likely to be found and groundfishing gear used by the fleet operates in the ocean at or near the bottom rather than near the water surface. Thus, this species is not considered further in this EA.

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

Blue whales do not regularly occur in waters of the U.S. EEZ (Waring et al. 2009). In the North Atlantic, blue whales are most frequently sighted in the St. Lawrence from April to January (Sears 2002). No blue whales were observed during the Cetacean and Turtle Assessment Program (CeTAP) surveys of the mid- and north Atlantic areas of the outer continental shelf (CeTAP 1982). Calving for the species occurs in low latitude waters outside of the area where the groundfish fishery operates. Blue whales feed on euphausiids (krill) that are too small to be captured in fishing gear. Given that the species is unlikely to occur in areas where the groundfish fishery operates, and given that the operation of the fishery would not affect the availability of blue whale prey or areas where calving and nursing of young occurs, the Proposed Action would not be likely to adversely affect blue whales.

Unlike blue whales, sperm whales do regularly occur in waters of the EEZ. However, the distribution of the sperm whales in the EEZ occurs on the continental shelf edge, over the continental slope, and into mid-ocean regions (Waring et al. 2006). In contrast, the multispecies fishery would operate in continental shelf waters. The average depth of sperm whale sightings observed during the CeTAP surveys was 1792 m (CeTAP 1982). Female sperm whales and young males almost always inhabit open ocean, deep water habitat with bottom depths greater than 1000 m and at latitudes less than 40° N (Whitehead 2002). Sperm whales feed on large squid and fish that inhabit the deeper ocean regions (Perrin et al. 2002). Given that sperm whales are unlikely to occur in areas (based on water depth) where the groundfish fishery would operate, and given that the operation of the fishery would not affect the availability of sperm whale prey or areas where calving and nursing of young occurs, the Proposed Action would not be likely to adversely affect sperm whales.

Although large whales and marine turtles may be potentially affected through interactions with fishing gear, it is likely that the continued authorization of the multispecies fishery should not have any adverse effects on the availability of prey for these species. Right whales and sei whales feed on copepods (Horwood 2002, Kenney 2002). The multispecies fishery would not affect the availability of copepods for foraging right and sei whales because copepods are very small organisms that would pass through multispecies fishing gear rather than being captured in it. Humpback whales and fin whales also feed on krill as well as small schooling fish (e.g., sand lance, herring, mackerel) (Aguilar 2002, Clapham 2002). Multispecies fishing gear operates on or very near the bottom. Fish species caught in multispecies gear are species that live in benthic habitat (on or very near the bottom) such as flounders versus schooling fish such as herring and mackerel that occur within the water column. Therefore, the continued authorization of the multispecies fishery should likely not affect the availability of prey for foraging humpback or fin whales. Moreover, none of the turtle species are known to feed upon groundfish.

7.4.4 Interactions between Gear and Protected Resources

Commercial fisheries are categorized by NMFS based on a two-tiered, stock-specific fishery classification system that addresses both the total impact of all fisheries on each marine mammal stock as well as the impact of individual fisheries on each stock. The system is based on the numbers of animals per year that incur incidental mortality or serious injury due to commercial fishing operations relative to a stock's Potential Biological Removal (PBR) level (the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population). Tier 1 takes into account the cumulative mortality and serious injury to marine mammals caused by commercial fisheries while Tier 2 considers marine mammal mortality caused by the individual fisheries; Tier 2 classifications are used in this EA to indicate how each type of gear proposed for use in the Proposed Action may affect marine mammals. Table 30 identifies the classifications used in the List of Fisheries (LOF) for FY 2011 (50 CFR 229), which are broken down into Tier 2 Categories I, II, and III).

Table 30 – Descriptions of the Tier 2 Fishery Classification Categories

Category	Category Description
Tier 2, Category I	A commercial fishery that has frequent incidental mortality and serious injury of marine mammals. This classification indicates that a commercial fishery is, by itself, responsible for the annual removal of 50 percent or more of any stock's potential biological removal (PBR) level.
Tier 2, Category II	A commercial fishery that has occasional incidental mortality and serious injury of marine mammals. This classification indicates that a commercial fishery is one that, collectively with other fisheries, is responsible for the annual removal of more than 10 percent of any marine mammal stock's PBR level and that is by itself responsible for the annual removal of between 1 percent and 50 percent, exclusive of any stock's PBR.
Tier 2, Category III	A commercial fishery that has a remote likelihood of, or no known incidental mortality and serious injury of marine mammals. This classification indicates that a commercial fishery is one that collectively with other fisheries is responsible for the annual removal of: a. Less than 50 percent of any marine mammal stock's PBR level, or b. More than 1 percent of any marine mammal stock's PBR level, yet that fishery by itself is responsible for the annual removal of 1 percent or less of that stock's PBR level. In the absence of reliable information indicating the frequency of incidental mortality and serous injury of marine mammals by a commercial fishery, the Assistant Administrator would determine whether the incidental serious injury or mortality is "remote" by evaluating other factors such as fishing techniques, gear used, methods used to deter marine mammals, target species, seasons and areas fished, qualitative data from logbooks or fisher reports, stranding data, and the species and distribution of marine mammals in the area or at the discretion of the Assistant Administrator.

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

Although interactions between deployed gear and protected species would vary, interactions generally include becoming caught on hooks (longlines), entanglement in mesh (gillnets and trawls), entanglement in the float line (gillnets and trawls), entanglement in the groundline (gillnets, trawls, and longlines), entanglement in anchor lines (gillnets and longlines), or entanglement in the vertical lines that connect gear to the surface and surface systems (gillnets, trawls, and longlines). Entanglements are assumed to occur with increased frequency in areas where more gear is set and in areas with higher concentrations of protected species.

Table 31 lists the marine mammals known to have had interactions with sink gillnets, bottom trawls, and bottom longlines within the Gulf of Maine and Georges Bank, as excerpted from the proposed LOF for FY 2011 (also see Waring et al. 2009). Northeast sink gillnets have the greatest potential for interaction with protected resources, followed by bottom trawls. Impacts to protected resources through interaction with bottom longline gear are not known within the operations area; however, interactions between the pelagic longline fishery and both pilot whales and Risso's dolphins led to the development of the Pelagic Longline Take Reduction Plan.

Table 31 – Marine mammals impacts based on groundfishing gear and Northeast Multispecies fishing areas (based on 2011 List of Fisheries)

Fishery		Estimated Number of Vessels/Persons	Marine Mammal Species and Stocks Incidentally Killed or Injured
Category	Type		
Tier 2, Category I	Mid-Atlantic gillnet	5,495	Bottlenose dolphin, Northern Migratory costal Bottlenose dolphin, Southern Migratory costal Bottlenose dolphin, Northern NC estuarine system Bottlenose dolphin, Southern NC estuarine system Bottlenose dolphin, WNA, offshore Common dolphin, WNA Gray seal, WNA Harbor porpoise, GME/BF Harbor seal, WNA Harp seal, WNA Humpback whale, Gulf of Maine Long-finned pilot whale, WNA Minke whale, Canadian east coast Short-finned pilot whale, WNA White-sided dolphin, WNA
Tier 2, Category I	Northeast sink gillnet	7,712	Bottlenose dolphin, WNA, offshore Common dolphin, WNA Fin whale, WNA Gray seal, WNA Harbor porpoise, GME/BF Harbor seal, WNA Harp seal, WNA Hooded seal, WNA Humpback whale, Gulf of Maine Minke whale, Canadian east coast North Atlantic right whale, WNA Risso's dolphin, WNA White-sided dolphin, WNA

Fishery		Estimated Number of Vessels/Persons	Marine Mammal Species and Stocks Incidentally Killed or Injured
Category	**Type**		
Tier 2, Category II	Mid-Atlantic bottom trawl	1,182	Bottlenose dolphin, WNA offshore Common dolphin, WNA Long-finned pilot whale, WNA Risso's dolphin, WNA Short-finned pilot whale, WNA White-sided dolphin, WNA
	Northeast bottom trawl	1,635	Common dolphin, WNA Harbor porpoise, GME/BF Harbor seal, WNA Harp seal, WNA Long-finned pilot whale, WNA Short-finned pilot whale, WNA White-sided dolphin, WNA
	Atlantic mixed species trap/pot	1,912	Fin whale, WNA Humpback whale, Gulf of Maine
Tier 2, Category III	Northeast/Mid-Atlantic bottom longline/hook-and-line	1,183	None documented in the most recent 5 years of data

To minimize potential impacts to certain cetaceans, multispecies fishing vessels would be required to adhere to measures in the ALWTRP, which was developed to reduce the incidental take of large whales, specifically the right, humpback, fin, and minke whales in specific Category I or II commercial fishing efforts that utilize traps/pots and gillnets. The ALWTRP calls for the use of gear markings, area restrictions, and use of weak links, and neutrally buoyant groundline. Fishing vessels would be required to implement the ALWTRP in all areas where gillnets were used. In addition, the HPTRP would be implemented in the Gulf of Maine to reduce interactions between the harbor porpoise and gillnets; the HPTRP implements gear specifications, seasonal area closures, and in some cases, the use of pingers (acoustic devices that emit a loud sound) to deter harbor porpoises, and other marine mammals, from approaching the nets.

Although sea turtles have been caught and injured or killed in multiple types of fishing gear, including gillnets and hook and line fishing, mortalities from these gear types account for only about 50 percent of the mortalities associated with trawling gear (NMFS 2009c). A study conducted in the mid-Atlantic region showed that bottom trawling accounts for an average annual take of 616 loggerhead sea turtles, although Kemp's ridleys and leatherbacks were also caught during the study period (Murray 2006). Sea turtles generally occur in more temperate waters than those in the Northeast multispecies area. Gillnets are considered more detrimental to marine mammals such as pilot whales, dolphins, porpoises, and seals, as well as large marine whales; however, protection for marine mammals would be provided through various Take Reduction Plans outlined above.

7.5 Human Communities and the Fishery

This EA considers changes to the multispecies FMP and evaluates the effect such changes may have on people's way of life, traditions, and community. These "social impacts" may be driven by changes in fishery flexibility, opportunity, stability, certainty, safety, and/or other factors. Although it is possible that social impacts would be solely experienced by individual fishery participants, it is more likely that impacts would be experienced across communities, gear cohorts, and/or vessel size classes.

The remainder of this section reviews the Northeast multispecies fishery and describes the human communities potentially impacted by the Proposed Action. This includes a description of the fishery participants as well as their homeports.

7.5.1 Overview of New England Groundfish Fishery

New England's fishery has been identified with groundfishing both economically and culturally for over 400 years. Broadly described, the Northeast multispecies fishery includes the landing, processing, and distribution of commercially important fish that live on the sea bottom. In the early years, the Northeast multispecies fishery related primarily to cod and haddock. The Northeast Multispecies FMP (large-mesh and small-mesh) includes a total of 13 large-mesh species of groundfish (Atlantic cod, haddock, pollock, yellowtail flounder, witch flounder, winter flounder, windowpane flounder, American plaice, Atlantic halibut, redfish, ocean pout, white hake, and Atlantic wolffish) harvested from three geographic areas (Gulf of Maine, Georges Bank, and Mid-Atlantic Bight/southern New England) representing twenty distinct stocks.

Prior to the industrial revolution, the groundfish fishery focused primarily on cod. The salt cod industry, which preserved fish by salting while still at sea, supported a hook and line fishery that included hundreds of sailing vessels and shore-side industries including salt mining, ice harvesting, and boat building. Late in the 19th century, the fleet also began to focus on Atlantic halibut with landings peaking in 1896 at around 4,900 tons.

From 1900 to 1930, the fleet transitioned to steam powered trawlers and increasingly targeted haddock for delivery to the fresh and frozen fillet markets. With the transition to steam powered trawling, it became possible to exploit the groundfish stocks with increasing efficiency. This increased exploitation resulted in a series of boom and bust fisheries from 1930 to 1960 as the North American fleet targeted previously unexploited stocks, depleted the resource, and then transitioned to new stocks.

In the early 1960's, fishing pressure increased with the discovery of haddock, hake, and herring off of Georges Bank and the introduction of foreign factory trawlers. Foreign effort levels remained elevated until the passage of the Magnuson Fishery Conservation and Management Act in 1976. Early in this time period, landings of the principal groundfish (cod, haddock, pollock, hake, and redfish) peaked at about 650,000 tons. However, by the 1970's, landing decreased sharply to between 200,000 and 300,000 tons as the previously virgin GB stocks were exploited (NOAA 2007).

The exclusion of the foreign fishermen in 1976, coupled with technological advances and some strong classes of cod and haddock, caused a rapid increase in the number and efficiency of U.S. vessels participating in the Northeast groundfish fishery in the late 1970's. This shift resulted in a temporary increase in domestic groundfish landings; however overall landings continued to trend downward from about 200,000 tons to about 100,000 tons through the mid 1980s (NOAA 2007). In 1986, NEFMC implemented the Northeast Multispecies FMP with the goal of rebuilding stocks. From that time, the multispecies fishery has been administered as a limited access fishery managed through a variety of effort control measures including DAS, area closures, trip limits, minimum size limits, and gear restrictions. Partially in response to those regulations, landing decreased throughout the latter part of the 1980s until reaching a more or less constant level of around 40,000 tons annually since the mid 1990's.

In 2004, the final rule implementing Amendment 13 to the FMP allowed for self-selected groups of limited access groundfish permit holders to form sectors. These sectors develop a legally binding operations plan and operate under an Annual Catch Entitlement (ACE) – a quota that limits catch. The 2004 rule also authorized implementation of the first sector, the Georges Bank Cod Hook Sector and in 2006 a second sector, the Georges Bank Cod Fixed Gear Sector, was authorized. While approved sectors are subject to general requirements specified in Amendment 16 in exchange for operating under an ACE, sector members are exempt from DAS and some of the other effort control measures that tended to limit the flexibility of fishermen.

Through Amendment 16, NEFMC sought to rewrite groundfish sector policies with a scheduled implementation date of May 1, 2009. When that implementation date was delayed until FY 2010, the NMFS Regional Administrator announced that, in addition to a previously announced 18 percent reduction in DAS, interim rules would be implemented to reduce fishing mortality during FY 2009. These interim measures generally reduced opportunity among groundfish vessels through differential DAS counting, elimination of the SNE/MA winter flounder SAP, elimination of the state waters winter flounder exemption, revisions to incidental catch allocations and a reduction in some groundfish allocations (NOAA 2009a). Amendment 16 was then implemented on May 1, 2010 and a much higher percentage of participants in the fishery fished in one of 19 approved sectors.

In 2007, the Northeast multispecies fishery included 2,515 permits, about 1,500 of which are limited access, and about 690 active fishing vessels. Those vessels include a range of gear types including hook, bottom longline, gillnet, and trawlers (NEFMC 2009a). In FY 2009, between 40 and 50 of these vessels were members of the Georges Bank Cod Sectors. The remaining vessels were Common Pool groundfishing vessels. In 2010, roughly half of all groundfish vessels were members of sectors; these permits, however, constituted the majority of effort and landings.

There are over 100 communities that are homeport to one or more Northeast groundfishing vessels. These ports are distributed throughout the coastal northeast and in New Jersey. Vessels from these ports pursue stocks in three geographic regions: Gulf of Maine, Georges Bank, and southern New England. In 2009, the estimated dockside value of these groundfish landings was slightly less than $60 million.

Many groundfish captains and crew are second- or third-generation fishermen who hope to pass the tradition on to their children. This occupational transfer is an important component of community continuity as an important alternative occupation in these port areas, tourism, is largely seasonal.

There is little hard socio-economic data upon which to evaluate the regional- or community-specific importance of the multispecies fishery. In addition to the direct employment of captains and crew, the industry is known to support ancillary businesses such as gear, tackle, and bait suppliers; fish processing and transportation; marine construction and repair; and restaurants. The perceived importance of these economic interrelationships is reflected by the creation of the

Cape and Islands Regional Competitiveness Council, government recommendations that NEFMC begin compiling the data necessary to evaluate the importance of the fishery to the regional economy, and the inclusion of social and economic impact analysis in the NEFMC research priorities and data needs 2009-2013.

7.5.2 Multispecies Fleet Home Ports

Each of these ports is described below (in alphabetic order). The primary source of information for these descriptions is the Community Profiles for Northeast US Fisheries, by NEFSC (2009). Please refer to the source documents for a list of references as all of the in-text citations in this section are implied to be 'as cited in' NEFSC (2009).

7.5.2.1 Boston, Massachusetts

The City of Boston (42.35º N, 71.06º W) is the capital of Massachusetts, and is located in Suffolk County. Boston Harbor opens out onto Massachusetts Bay (USGS 2008). The city covers a total of 89.6 square miles, of which only 48.4 square miles (54 percent) is land.

7.5.2.1.1 History

The City of Boston has been an important port since its founding in 1630. Early on, it was the leading commercial center in the colonies (Banner 2005) and its economy was based on fishing, shipbuilding, and trade in and out of Boston Harbor. After the Revolutionary War, Boston became one of the wealthiest international ports in the world, exporting products such as rum, tobacco, fish, and salt (Lovestead 1997). Once an important manufacturing center, with many factories and mills based along Boston's numerous rivers and in the surrounding communities, many of the manufacturing jobs began to disappear around the early 1900s, as factories moved to the South. These industries were quickly replaced, however, by banking, financing, retail, and healthcare, and Boston later became a leader in high-tech industries (Banner 2005). The city remains the largest in New England and an important hub for shipping and commerce, as well as being an intellectual and educational hub. The Boston Fish Pier, located on the South Boston waterfront, has been housing fishermen for almost a century, and is the oldest continuously operating fish pier in the United States (BHA No Date) and home to the nation's oldest daily fish auction.

7.5.2.1.2 Commercial Fishing

More than 11,500 tons of fish are processed at the Fish Pier each year, of which 4,000 tons come from the 12 to 15 fishing vessels that dock there (BHA 2004). The landings show that large-mesh groundfish were the most valuable fishery in Boston, followed by monkfish and lobster (Table 32). While the value of landings in the multispecies fishery was less in 2006 than the 1997-2006 average, the value of both lobster and monkfish to Boston fishermen increased.

There are far more vessels with their homeport in Boston than there are vessel owners in Boston, indicating that most fishermen docked in Boston Harbor live elsewhere (Table 33). The landings values for both homeport and landed port varied over the period from 1997 to 2006, with no significant pattern. The landed port value exceeded the homeport value in every year, meaning some fishermen come from elsewhere to land their catch here.

Table 32 – Dollar value of federally managed groups landed in Boston

Federal Group	Rank Value of Average Landings from 1997-2006[d]
Large-mesh Groundfish[a]	1
Monkfish	2
Lobster	3
Other[b]	4
Squid, Mackerel, Butterfish	5
Skate	6
Scallop	7
Herring	8
Summer Flounder, Scup, Black Sea Bass	9
Small-mesh Groundfish[c]	10
Bluefish	11
Dogfish	12
Tilefish	13

Notes:

[a]. Large-mesh Groundfish: cod, winter flounder, yellowtail flounder, American plaice, sand-dab flounder, haddock, white hake, redfish, and Pollock.

[b] "Other" species includes any species not accounted for in a federally managed group.

[c] Small-mesh Multispecies: red hake, ocean pout, mixed hake, black whiting, silver hake (whiting).

[d] Only rank value is provided because value information is confidential in ports with fewer than three vessels or fewer than three dealers, or where one dealer predominates in a particular species and would therefore be identifiable.

Table 33 – Commercial fishing trends in Boston

Year	Number of vessels with Boston homeport	Number of vessels whose owner receives mail in Boston
1997	66	16
1998	49	10
1999	45	8
2000	37	10
2001	42	9
2002	45	9
2003	42	9
2004	43	9
2005	46	8
2006	46	7

7.5.2.2 Cundy's Harbor, Maine

The Village of Cundy's Harbor (44.40º N, 69.89º W) is located on Casco Bay within the town of Harpswell, in Cumberland County, Maine. The town of Harpswell is made up of a 10-mile peninsula extending into Casco Bay. It also includes three large islands, Bailey Island, Orr Island, and Great (Sebascodegan) Island, and over 200 small islands, creating over 216 miles of coastline for the town (TPL 2007). Cundy's Harbor is located on the tip of Great Island (USGS 2008).

7.5.2.2.1 History

The town of Harpswell is geographically spread out, and is divided into five main villages: Cundy's Harbor, Harpswell, South Harpswell, Bailey Island, and Orr's Island. Cundy's Harbor is the oldest lobstering community in Maine (TPL 2007). Harpswell was incorporated as a town in 1758, under what was then the Massachusetts Bay Colony. Many tall ships, sloops, and schooners were built here during the 1800s, and fishing has been an important economic activity for the town for centuries. Today the town is often considered to have three populations: commuters, who reside here but work in Portland, Bath, or Brunswick; retirees who have moved to Harpswell; and "working townsfolk," many of whom earn their income from fishing (Hall-Arber et al. 2001).

7.5.2.2.2 Commercial Fishing

There are multiple commercial wharves here including Cundy's Harbor, Holbrook's, Hawkes, Mill's Ledge Seafood, Watson's, and Oakhurst Island. Overall, lobster dominates the landings in Cundy's Harbor, worth more than $2.5 million in 2006 (Table 34). Landings in the "Other" species grouping were also significant, with the 10-year average greater than the 2006 value. The level of landings in Cundy's Harbor overall varied during this time period between about $1.5 million and over $3.4 million, with no discernible pattern (Table 35). The level of homeport fishing for Cundy's Harbor was consistently lower than the level of landings here overall, indicating that fishermen from other harbors land their catch there. The level of fishing for homeported values was also variable. The number of homeported vessels in Cundy's Harbor showed somewhat of a declining trend from 1997 to 2006, while the number of vessels with owners living in Cundy's Harbor declined sharply, from 11 in 1997 to three in 2006.

Table 34 – Commercial fishing trends in Cundy's Harbor

Year	Number of vessels with Cundy's Harbor homeport	Number of vessels whose owner receives mail in Cundy's Harbor	Value of landings among vessels homeported in Cundy's Harbor[a]	Value of fisheries landed in Cundy's Harbor[a]
1997	28	11	$2,053,625	$2,595,709
1998	21	7	$1,611,016	$1,577,290
1999	21	6	$1,343,196	$3,248,354
2000	17	3	$1,361,446	$3,329,120
2001	20	2	$1,371,412	$2,636,583
2002	25	2	$2,029,047	$1,797,178
2003	21	1	$1,849,415	$2,191,411
2004	19	2	$1,676,130	$3,230,312
2005	19	2	$2,573,070	$3,479,115
2006	20	3	$2,708,258	$3,206,997

Note:
[a] All values are reported in nominal U.S. dollars.

Table 35 – Dollar value of federally managed groups landed in Cundy's Harbor

Federal Group	Average from 1997-2006[d]	2006 only[d]
Lobster	$2,088,171	$2,512,267
Other[a]	$500,190	$385,155
Large-mesh Groundfish[b]	$109,930	$285,239
Monkfish	$26,098	$17,655
Herring	$3,671	$0
Dogfish	$667	$6,667
Scallop	$380	$0
Skate	$106	$0
Small-mesh Groundfish[c]	$12	$0
Squid, Mackerel, Butterfish	$1	CONFIDENTIAL

Notes:
[a]. "Other" species includes any species not accounted for in a federally managed group.
[b] Large-mesh Groundfish: cod, winter flounder, yellowtail flounder, American plaice, sand-dab flounder, haddock, white hake, redfish, and Pollock.
[c] Small-mesh Multispecies: red hake, ocean pout, mixed hake, black whiting, silver hake (whiting).
[d] All values are reported in nominal U.S. dollars.

7.5.2.3 Gloucester, Massachusetts

The City of Gloucester (42.62°N, 70.66°W) is located on Cape Ann, along the northern coast of Massachusetts in Essex County. It is 30 miles northeast of Boston and 16 miles northeast of Salem. The area encompasses 41.5 square miles of territory, of which 26 square miles is land (USGS 2008).

7.5.2.3.1 History

The history of Gloucester has revolved around the fishing and seafood industries since its settlement in 1623. By the mid 1800s, Gloucester was regarded by many to be the largest fishing port in the world. The construction of memorial statues and an annual memorial to fishermen demonstrates that the historic death tolls in commercial fisheries are still in the memory of the town's residents. The town is well-known as the home of Gorton's frozen fish packaging company, the nation's largest frozen seafood company. As in many communities, after the U.S. passed the Magnuson Fishery Conservation and Management Act of 1976 and foreign vessels were prevented from fishing within the EEZ, Gloucester's fishing fleet soon increased -- only to decline with the onset of major declines in fish stocks and subsequent strict catch regulations. For more detailed information regarding Gloucester's history, see Hall-Arber et al. (2001).

7.5.2.3.2 Commercial Fishing

Although there are threats to the future of Gloucester's fishery, the fishing industry remains strong in terms of recently reported landings. Gloucester's commercial fishing industry had the 13th highest landings in the U.S. (over 39,000 tons) and the nation's ninth highest landing value in 2002 ($41.2 million). Gloucester's federally managed group with the highest landed value was large-mesh groundfish worth nearly $20 million in 2006 (Table 36). Lobster landings were second in value, bringing in more than $10 million in 2006, a significant increase from the 1997-2006 average value of just over $7 million. Monkfish and herring were also valuable species; both had more valuable landings in 2006 than the 10-year average value. The number of vessels homeported (federal) decreased slightly from 1997 to 2006 (Table 37).

Table 36 – Dollar value of federally managed groups landed in Gloucester

Federal Group	Average from 1997-2006[d]	2006 only[d]
Large-mesh Groundfish[a]	$17,068,934	$19,577,975
Lobster	$7,036,231	$10,179,221
Monkfish	$3,556,840	$4,343,644
Other[b]	$3,246,920	$1,906,551
Herring	$3,127,523	$5,623,383
Squid, Mackerel, Butterfish	$1,065,567	$3,692,506
Scallop	$735,708	$1,113,749
Small-mesh Groundfish[c]	$732,353	$254,287
Dogfish	$375,972	$316,913
Skate	$63,488	$27,334
Tilefish	$52,502	$245,398
Surf Clams, Ocean Quahog	$29,033	$77,805
Bluefish	$21,672	$18,116
Summer Flounder, Scup, Black Sea Bass	$1,286	$603

Notes:

[a] Large-mesh Groundfish: cod, winter flounder, yellowtail flounder, American plaice, sand-dab flounder, haddock, white hake, redfish, and Pollock.

[b] "Other" species includes any species not accounted for in a federally managed group.

[c] Small-mesh Multispecies: red hake, ocean pout, mixed hake, black whiting, silver hake (whiting).

[d] All values are reported in nominal U.S. dollars.

Table 37 – Commercial fishing trends in Gloucester

Year	Number of vessels with Gloucester homeport	Number of vessels whose owner receives mail in Gloucester	Value of landings among vessels homeported in Gloucester[a]	Value of fisheries landed in Gloucester[a]
1997	123	49	$14,260,267	$43,219,804
1998	104	43	$11,898,155	$35,203,041
1999	116	47	$14,781,969	$42,393,247
2000	115	43	$16,486,230	$45,434,740
2001	109	39	$15,488,517	$34,356,660
2002	107	40	$15,208,020	$40,396,946
2003	114	40	$15,478,904	$28,892,963
2004	111	38	$17,763,527	$34,690,050
2005	111	43	$18,051,059	$34,613,266
2006	104	44	$13,255,702	$27,825,058

Note:

[a] All values are reported in nominal U.S. dollars.

7.5.2.4 New Bedford, Massachusetts

New Bedford is the fourth largest city in Massachusetts. It is situated on Buzzards Bay, located in the southeastern section of the state in Bristol County. The city is 54 miles south of Boston (State of Massachusetts 2006), and has a total area of 24 square miles, of which about 4 square miles (16.2 percent) is water (USGS 2008).

7.5.2.4.1 History

Settled in 1652, a New Bedford fishing community was established in 1760. The port focused largely on whaling until the discovery of petroleum decreased the demand for sperm oil in the mid- to late 1800's. At that time, New Bedford began to diversify its economy, by expanding the focus of the fishing fleet, and focusing on the manufacture of textiles until the southeast cotton boom in the 1920s.

Since then, New Bedford has continued to diversify, but the city is still a major commercial fishing port (USGenNet 2006) consistently ranked among the top two ports in the U.S. for landed value. One factor complicating further development of the New Bedford harbor area is its listing by U.S. EPA as a superfund site due to the presence of metals, organic compounds, and PCBs.

7.5.2.4.2 Commercial Fishing

The number of commercial fishing vessels homeported in New Bedford increased from 244 in 1997 to 273 in 2006 as fishermen moved to New Bedford to take advantage of commercial fishing infrastructure. Concurrent with this increase in homeported vessels, the value of fishing for homeport vessels more than doubled from $80 million to $184 million from 1997 to 2006 and the value of New Bedford landings increased to $281 million (Table 38). However, over that same time the value of groundfish landings decreased approximately 20 percent (Table 39).

Table 38 – Commercial fishing trends in New Bedford

Year	Number of vessels with New Bedford homeport	Number of vessels whose owner receives mail in New Bedford	Value of landings among vessels homeported in New Bedford[a]	Value of fisheries landed in New Bedford[a]
1997	244	162	$80,472,279	$103,723,261
1998	213	137	$74,686,581	$94,880,103
1999	204	140	$89,092,544	$129,880,525
2000	211	148	$101,633,975	$148,806,074
2001	226	153	$111,508,249	$151,382,187
2002	237	164	$120,426,514	$168,612,006
2003	245	181	$129,670,762	$176,200,566
2004	257	185	$159,815,443	$206,273,974
2005	271	195	$200,399,633	$282,510,202
2006	273	199	$184,415,796	$281,326,486

Note:
[a] All values are reported in nominal U.S. dollars.

Table 39 – Dollar value of federally managed groups landed in New Bedford

Federal Group	Average from 1997-2006[d]	2006 only[d]
Scallop	$108,387,505	$216,937,686
Large-mesh Groundfish[a]	$30,921,996	$23,978,055
Monkfish	$10,202,039	$8,180,015
Surf Clams, Ocean Quahog	$7,990,366	$9,855,093
Lobster	$4,682,873	$5,872,100
Other[b]	$4,200,323	$2,270,579
Skate	$2,054,062	$3,554,808
Squid, Mackerel, Butterfish	$1,916,647	$5,084,463
Summer Flounder, Scup, Black Sea Bass	$1,481,161	$2,227,973
Small-mesh Groundfish[c]	$897,392	$1,302,488
Herring	$767,283	$2,037,784
Dogfish	$89,071	$13,607
Bluefish	$25,828	$10,751
Tilefish	$2,675	$1,084

Notes:

[a] Large-mesh Groundfish: cod, winter flounder, yellowtail flounder, American plaice, sand-dab flounder, haddock, white hake, redfish, and Pollock.

[b] "Other" species includes any species not accounted for in a federally managed group.

[c] Small-mesh Multispecies: red hake, ocean pout, mixed hake, black whiting, silver hake (whiting).

[d] All values are reported in nominal U.S. dollars.

In addition to the commercial fleet, New Bedford has approximately 44 fish wholesale companies, 75 seafood processors, and about 200 shore-side industries (Hall-Arber 2001). This core seafood industry supports 2,600 local jobs, which represents 45 percent of employment in the seafood harvesting sector in Massachusetts (State of Massachusetts 2002).

7.5.2.5 Newport, Rhode Island

Newport, Rhode Island (41.50°N, 71.30°W) is located at the southern end of Aquidneck Island in Newport County (USGS 2008). The city is located 60 miles from Boston, Massachusetts, and about 187 miles from New York City.

7.5.2.5.1 History

English settlers founded Newport in 1639 (City of Newport No Date). Although Newport's port is now mostly dedicated to tourism and recreational boating, it has had a long commercial fishing presence. In the mid 1700s, Newport was one of the five largest ports in colonial North America. Until Point Judith's docking facilities were developed, Newport was the center for fishing and shipping in Rhode Island (Hall-Arber et al. 2001; RIEDC 2008).

Between 1800 and 1930, the bay and inshore fleet dominated the fishing industry of Newport. Menhaden was the most important fishery in Newport and all of Rhode Island until the 1930s when the fishery collapsed. At this time, the fishing industry shifted to groundfish trawling. The use of the diesel engine, beginning in the 1920s, facilitated fishing farther from shore than was done in prior years (Hall-Arber et al. 2001).

7.5.2.5.2 Commercial Fishing

Of the federal landed species, scallop had the highest value in 2006, at over $13 million. The average value of scallop landings for 1997-2006 was just over $2.5 million; 2006 landings represent a more than five-fold increase over this average value. Lobster was the most valuable species, worth more than $2.7 million on average, and close to $3 million in 2006. The squid, mackerel, and butterfish grouping, large-mesh groundfish, and monkfish were all valuable fisheries in Newport (Table 40). The value of landings for homeported vessels in Newport was relatively consistent from 1997-2006, with a high of just under $8 million in 2003 (Table 41). The level of landings in Newport was steady from 1997-2004, and then saw enormous increases in 2005 and 2006, to almost $21 million in 2006. Homeported vessels in Newport declined from a high of 59 in 2000 to 48 in 2006. The number of vessels with owners living in Newport increased from 13 in 1997 to 18 in 2006 indicating that most vessels homeported in Newport have owners residing in other communities.

Table 40 - Dollar value of federally managed groups landed in Newport

Federal Group	Average from 1997-2006[d]	2006 only[d]
Lobster	$2,578,908	$2,971,680
Scallop	$2,528,448	$13,267,494
Squid, Mackerel, Butterfish	$1,425,947	$1,315,229
Large-mesh Groundfish[a]	$1,039,962	$445,273
Monkfish	$878,265	$1,068,547
Summer Flounder, Scup, Black Sea Bass	$739,880	$815,918
Other[b]	$334,103	$401,779
Small-mesh Groundfish[c]	$179,296	$43,165
Skate	$58,481	$224,184
Herring	$42,538	$267,164
Dogfish	$26,441	$6,037
Red Crab	$15,560	$0
Bluefish	$11,759	$9,878
Tilefish	$9,230	$1,213

Notes:

[a] Large-mesh Groundfish: cod, winter flounder, yellowtail flounder, American plaice, sand-dab flounder, haddock, white hake, redfish, and Pollock.

[b] “Other” species includes any species not accounted for in a federally managed group.

[c] Small-mesh Multispecies: red hake, ocean pout, mixed hake, black whiting, silver hake (whiting).

[d] All values are reported in nominal U.S. dollars.

Table 41 - Commercial fishing trends in Newport

Year	Number of vessels with Newport homeport	Number of vessels whose owner receives mail in Newport	Value of landings among vessels homeported in Newport [a]	Value of fisheries landed in Newport [a]
1997	52	13	$5,130,647	$7,598,103
1998	52	16	$6,123,619	$8,196,648
1999	52	14	$6,313,350	$8,740,253
2000	59	14	$6,351,986	$8,296,017
2001	52	15	$5,813,509	$7,485,584
2002	55	17	$6,683,412	$7,567,366
2003	52	16	$7,859,848	$9,082,560
2004	52	15	$5,951,228	$8,402,556
2005	54	17	$6,012,472	$14,281,505
2006	48	18	$6,811,060	$20,837,561

Note:
[a] All values are reported in nominal U.S. dollars.

7.5.2.6 Portland Harbor, Maine

The city of Portland, Maine (43.66 N, 70.2 W) has 56.9 miles of coastline (Sheehan and Copperthwaite 2002), a terrestrial area of 54.9 square miles, and 31.4 square miles of water. It is located in Cumberland County on Casco Bay, and is adjacent to South Portland, Westbrook, and Falmouth. Portsmouth and Manchester, New Hampshire are the closest large cities (MapQuest 2006). Portland is the largest city in Maine and has the highest population in New England north of Boston.

7.5.2.6.1 History

The city's port industries have driven its economy since its settlement. From the mid-1800s until World War I, Portland provided the only port for Montreal, Canada. Railroads from the south to the north fed through the city, facilitating trade and travel. Although Canada developed its own ports, and other cities in southern New England states built larger ports, the city remained tied to its maritime roots by depending on the fishing industry. More recently, it has become a popular cruise ship destination. Although tourism plays a major role in the city's economy, Portland functions as the second largest oil port on the east coast of the U.S., and as valuable fishing port (Monroe No Date). For a more detailed history of Portland and the surrounding fishing communities, refer to Hall Arber et al. (2001).

7.5.2.6.2 Commercial Fishing

Portland's landings come primarily from the large-mesh groundfish species and from lobster, with over $14 million and $12 million respectively over the 10-year average (Table 42). Monkfish and herring are also important species. There was also a variety of other species landed in Portland between the years 1997-2006. Both the number of vessels homeported and number of vessels registered with owner's living in Portland slightly decreased between 1997 and 2006. The level of fishing homeport value increased until 2006, where there was a drop from over $18 million in the previous year to about $13 million. The level of fishing landed experienced a similar trend, with a dip from 2005 to 2006 of over $6 million (Table 43).

Table 42 - Dollar value of federally managed groups landed in Portland Harbor

Federal Group	Average from 1997-2006[d]	2006 only[d]
Large-mesh Groundfish[a]	$14,433,950	$10,756,311
Lobster	$12,616,286	$8,737,373
Monkfish	$4,908,022	$3,094,679
Herring	$2,524,047	$4,423,437
Other[b]	$2,007,356	$684,362
Scallop	$65,950	$72,250
Small-mesh Groundfish[c]	$44,811	$168
Skate	$44,582	$933
Squid, Mackerel, Butterfish	$17,444	CONFIDENTIAL
Tilefish	$15,623	CONFIDENTIAL
Summer Flounder, Scup, Black Sea Bass	$12,334	CONFIDENTIAL
Dogfish	$12,023	$12,211
Bluefish	$151	$73

Notes:

[a]. "Other" species includes any species not accounted for in a federally managed group.

[b] Large-mesh Groundfish: cod, winter flounder, yellowtail flounder, American plaice, sand-dab flounder, haddock, white hake, redfish, and Pollock.

[c] Small-mesh Multispecies: red hake, ocean pout, mixed hake, black whiting, silver hake (whiting).

[d] All values are reported in nominal U.S. dollars.

Table 43- Commercial fishing trends in Portland

Year	Number of vessels with Portland homeport	Number of vessels whose owner receives mail in Portland	Value of landings among vessels homeported in Portland [a]	Value of fisheries landed in Portland [a]
1997	123	49	$14,260,267	$43,219,804
1998	104	43	$11,898,155	$35,203,041
1999	116	47	$14,781,969	$42,393,247
2000	115	43	$16,486,230	$45,434,740
2001	109	39	$15,488,517	$34,356,660
2002	107	40	$15,208,020	$40,396,946
2003	114	40	$15,478,904	$28,892,963
2004	111	38	$17,763,527	$34,690,050
2005	111	43	$18,051,059	$34,613,266
2006	104	44	$13,255,702	$27,825,058

Note:
[a] All values are reported in nominal U.S. dollars.

7.5.2.7 Portsmouth, New Hampshire

Portsmouth (43.03° N, 70.47°W) (USGS 2008) is located in Rockingham County, New Hampshire. Portsmouth Harbor is located by the mouth of the Piscataqua River, which allows deep water access (State of New Hampshire DHR 2006). Portsmouth is located along the state's seaboard that only totals about 18 miles.

7.5.2.7.1 History

The City of Portsmouth is the second oldest city in New Hampshire. It was originally settled in 1623 as Strawberry Banke and was incorporated as Portsmouth in 1631. Fishing, farming, shipbuilding, and coastal trade were the major industries throughout New Hampshire in the 1600s. By 1725, Portsmouth was a thriving commercial port, exporting timber products and importing a wide range of goods (Wallace 2006). However, the 1800s brought change to Portsmouth as the seacoast declined as a commercial center. Many nearby towns, like Dover, Newmarket, and Somersworth, turned to textile manufacturing (Wallace 2006). The Portsmouth Naval Shipyard, established in June 1800, is the oldest naval shipyard continuously operated by the United States Government (PNS No Date). In recent times, high-tech industries and an increase in tourism has transformed Portsmouth and all of southern New Hampshire, making New Hampshire into the fastest growing state in the Northeast (State of New Hampshire DHR 2006).

7.5.2.7.2 Commercial Fishing

Large-mesh groundfish and monkfish were the most valuable landings in Portsmouth between the years 1997 and 2006 (Table 44). Additionally, lobster, "other" species, and sea scallops accounted for a large portion of the value of species landed in Portsmouth. The value of landings of most of these species groupings had declined in 2006 from the 1997-2006 average; lobster landings had increased considerably, however, and were the most valuable landings for Portsmouth in 2006.

The number of homeported vessels has varied between the years 1997 and 2006, but overall showed an increasing trend. In 1997, there were 54 vessels which increased to a high of 67 vessels in 2004. The number of vessels where the owner's city is Portsmouth varies slightly over the years with no consistent trend (Table 45).

Table 44 - Dollar value of federally managed groups landed in Portsmouth

Federal Group	Rank Value of Average Landings from 1997-2006[d]
Large-mesh Groundfish[a]	1
Monkfish	2
Lobster	3
Other[b]	4
Scallop	5
Dogfish	6
Herring	7
Small-mesh Groundfish[c]	8
Skate	9
Bluefish	10
Squid, Mackerel, Butterfish	11
Summer Flounder, Scup, Black Sea Bass	12
Tilefish	13

Notes:

[a] Large-mesh Groundfish: cod, winter flounder, yellowtail flounder, American plaice, sand-dab flounder, haddock, white hake, redfish, and Pollock.

[b] "Other" species includes any species not accounted for in a federally managed group

[c] Small-mesh Multispecies: red hake, ocean pout, mixed hake, black whiting, silver hake (whiting).

[d] Only rank value is provided because value information is confidential in ports with fewer than three vessels or fewer than three dealers, or where one dealer predominates in a particular species and would therefore be identifiable.

Table 45 – Commercial fishing trends in Portsmouth

Year	Number of vessels with Portsmouth homeport	Number of vessels whose owner receives mail in Portsmouth
1997	54	26
1998	44	20
1999	45	18
2000	62	21
2001	63	22
2002	59	25
2003	54	21
2004	67	29
2005	64	20
2006	66	19

7.5.3 Commercial Harvesting Sector

7.5.3.1 Commercial Harvesting Sector Data Caveats

Data Sources
NMFS Dealer Database
NMFS Permit Database
NMFS Enforcement Database
NMFS Observer Database

Reported Numbers of Vessels
When evaluating the number of vessels reported in any given table in the following sections it is necessary to understand exactly which vessels those numbers represent. Depending on the way in which the data were queried, a different number of vessels will emerge. In each of the following sections, there are two tables describing the landings and revenues of vessels permitted in the multispecies fishery. The first is associated with total landings by permitted multispecies vessels. In this table, the number given for each fishing year is the quantity of vessels which possess multispecies permits and were active in *any* fishery, which may or may not include the regulated multispecies fishery, in that given fishing year. The second table is associated with groundfish landings only. In this table, the number given for each fishing year is the landings of vessels which possess multispecies permits and were active in the *groundfish* fishery, having landed at least one pound of regulated groundfish, in that given fishing year. In all sections, the fishing activity discussed is associated only with vessels that hold a multispecies permit--one large-mesh limited access multispecies permit *OR* one or more open access multispecies permits.

7.5.3.2 DAS Allocations and Use

One of the principal management measures used to control groundfish fishing mortality from FY 1994 through FY 2009 was limits on the amount of time (days-at-sea, or DAS) that permit holders can fish for regulated groundfish. Most permits are allocated a fixed number of DAS. As mentioned previously, Amendment 13 reduced overall DAS allocations and categorizes DAS into four categories. Category A DAS can be used to fish for any regulated groundfish stock and are similar to the DAS that were allocated before Amendment 13. Category B (regular) and (reserve) DAS can only be used to target healthy groundfish stocks within specific management programs that include controls on the incidental catch of unhealthy stocks. Category C DAS cannot be used until some point in the future. FW 42 reduced the number of Category A DAS to permit holders, and increased the number of Category B DAS by the same amount. This change reduced the number of Category A DAS available to each permit by 8.3 percent. Amendment 16, in turn, changed the way DAS are used in the fishery. That action split the fishery into two segments starting in FY 2010: sector vessels, which are still allocated DAS but are only required to use them to fish non-groundfish species (such as monkfish or skates), and common pool vessels, which use Category A DAS as described above but saw a fifty percent reduction in their allocation of days.

Interpreting the relationship of DAS data to actual time spent fishing is complicated by changes in how DAS were tracked and charged. After FY 1996, most limited access permits were required to use DAS, and they were tracked through calls made by the vessel operator prior to sailing and upon return. When trip limits were imposed that were based on DAS charged, some vessel operators would either start their clock before leaving the dock or would let the clock run after returning. Day gillnet vessels were charged a minimum of fifteen hours for any trip longer than three hours, regardless of time spent fishing. By FY 2004, the number of vessels using a Vessel Monitoring System (VMS) increased, and by FY 2006 all DAS vessels were required to use this equipment. VMS does not start tracking DAS until a vessel crosses a demarcation line that is outside the port, as opposed to when the vessel left the dock as under the call-in system. FY 2004 also marked the start of a program that does not charge DAS for vessels transiting to fish only in the Eastern U.S./Canada area. Starting in FY 2006, in some areas DAS were charged at a differential rate to reduce effort in those areas. Finally, since FY 2010 common pool vessels have their DAS charged in 24-hour increments (i.e. a 3-hour trip counts as 24 hours). The information in the following tables represents DAS charged and takes into account differential DAS, transit time to the Eastern U.S./Canada area that is not charged DAS, etc.

Total DAS Use
While the total number of days allocated to all vessels remained relatively constant from 2005-2007 and then decreased in 2008 and 2009, the number of DAS used was actually similar in all years, ranging from 30,847 in 2008 to 32,804 in 2007. This means that the percentage of allocated DAS that was used increased greatly in 2008 and 2009. The number of vessels using DAS decreased slightly every year, from 685 in 2005 to 469 in 2009.

DAS Use by Multispecies Permit Category
From FY 2005 through FY 2009, the Individual Category vessels were allocated and used the greatest number of DAS of all the permit categories by a large margin (Table 46). In FY 2009, 95.5% of all DAS were used by Individual DAS vessels. The days used by Individual vessels also mirrored the total DAS used in that it was roughly constant from 2005-2007 and then decreased in 2008 and 2009. The percentage of allocated days that were actually used by Individual DAS vessels increased in 2008 and 2009.

Other vessels categories, however, saw different use patterns. Hook gear saw a decrease in total DAS used throughout the time series. Large Mesh and Combination permits fluctuated greatly in use, while Large Mesh decreased in allocation throughout. The Small Vessel Exemption Category first increased, then decreased slightly in both allocation and use.

DAS Use by Length Class

The DAS use by length classes generally varied throughout the time series (Table 47). Vessels with a length of 30-49 feet had the most DAS allocated (the allocation declined from 22,350 in 2005 to 17,088 in 2009), but used a similar number as vessels 50-74 feet in length in the years 2005 through 2007. In 2008 and 2009, the 30-49 ft. vessels used substantially more DAS than those 50-74 ft. The largest (75+ ft.) and smallest (1-29 ft.) vessels fluctuated in both allocation and use.

Generally, larger vessels used a higher percentage of their allocated DAS in all years. The smallest vessels used a tiny percentage of their allocated DAS (2.1% in 2009), while the largest vessels used 90.2% in 2009.

DAS Use by Home Port State

Table 48 describes DAS use by homeport state, as reported on the vessel's permit application. These data illustrate the relative changes in the distribution of fishing activity on a regional basis.

From 2005 through 2009, it is difficult to characterize DAS use by home port state because of wide variations in allocations and use among states. DAS allocations were generally less in most states in 2008 and 2009 than in previous years. Allocation in New York saw a particularly large decrease. The large states of Massachusetts and Maine experienced a large decrease in the number of vessels that called in to use DAS throughout the period, while New Hampshire remained more constant and Rhode Island decreased only in the final years. Total DAS used actually increased in Massachusetts and New Hampshire, and Maine and Rhode Island experienced slight decreases and increases followed by a larger decrease in 2008 and 2009.

DAS Use by Gear Type

For this discussion, refer to Table 49. This table summarizes DAS use by primary gear. Primary gear is listed on the permit application and may not match the gear actually used on a given trip.

Bottom Trawl:

In FY 2005 there were 456 active vessels in the bottom trawl component, 60% of the total number of permitted bottom trawl vessels. The number and percentage of active vessels decreased over the next four years, reaching 298 vessels and 41% of permitted vessels that were active in FY 2009. DAS use by bottom trawl vessels generally remained constant from 2005-2007 and decreased in 2008-2009. 67% of the DAS allocated to active permitted bottom trawl vessels were used by these vessels in FY 2005 (including through leasing) and 81% of allocated DAS were used by active bottom trawl vessels in FY 2009.

Bottom Longline:

In FY 2005 there were 42 active vessels in the bottom longline component, 31% of the total number of permitted bottom longline vessels. The percentage of active vessels decreased over the next four years, reaching 24% in FY 2009. DAS use by bottom longline vessels generally decreased from 918 days in FY 2005 to 641 days in FY 2009. 31% of the DAS allocated to active permitted bottom longline vessels were used by these vessels in FY 2005 (including through leasing) and 47% of allocated DAS were used by active bottom longline vessels in FY 2009.

Handline:
In FY 2005 there were 18 active vessels in the handline component, 30% of the total number of permitted handline vessels. The percentage of active vessels decreased over the next six years, reaching 11%, or only 7 vessels, in FY 2009. DAS use by handline vessels generally decreased from FY 2005 to FY 2009. 32% of the DAS allocated to active permitted handline vessels were used by these vessels in FY 2005 (including through leasing) and 21% of allocated and net leased DAS were used by active handline vessels in FY 2009.

Sink Gillnet:
In FY 2005 there were 139 active vessels in the sink gillnet component, 54% of the total number of permitted sink gillnet vessels. The percentage of active vessels remained relatively constant over the next four years, reaching 58% in FY 2009. DAS use by sink gillnet vessels increased steadily throughout the FY 2005-FY 2009 time period. 66% of the DAS allocated to active permitted sink gillnet vessels were used by these vessels in FY 2005 and 95% of allocated and net leased DAS were used by active sink gillnet vessels in FY 2007.

Table 46 - Multispecies limited access A days-at-sea used by multispecies permit category, FY 2005 - 2009

Categories		Total Number of Permitted Vessels	Total Days-at-Sea Allocated	Number of Permitted Vessels that Called In	DAS Allocated to Vessels that Called In	DAS Allocated and Net Leased to Vessels that Called In	Total DAS Used
2005	Individual	1,128	45,969	619	34,529	41,022	29,898
	Combination	46	649	11	472	485	423
	Hook Gear	94	1,682	31	1,119	1,105	387
	Large Mesh	44	1,680	24	1,127	1,540	1,064
	Small Vessel Exemption	8	38	0	0	0	0
	Total	**1,320**	**50,018**	**685**	**37,247**	**44,152**	**31,773**
2006	Individual	1,107	46,240	568	31,184	40,137	30,072
	Combination	47	439	3	189	169	157
	Hook Gear	82	2,413	22	1,472	1,479	337
	Large Mesh	41	1,692	32	1,261	1,631	1,229
	Small Vessel Exemption	7	37	0	0	0	0
	Total	**1,284**	**50,820**	**625**	**34,106**	**43,416**	**31,794**
2007	Individual	1,099	45,835	524	28,721	40,637	31,595
	Combination	47	415	5	204	296	234
	Hook Gear	79	2,287	19	1,277	1,265	270
	Large Mesh	33	1,034	25	956	990	693
	Small Vessel Exemption	13	138	1	12	12	12
	Total	**1,271**	**49,710**	**574**	**31,170**	**43,200**	**32,804**
2008	Individual	1,037	41,258	474	24,369	36,102	29,354
	Combination	46	517	5	219	393	369
	Hook Gear	74	1,216	9	435	393	115
	Large Mesh	31	883	23	769	842	963
	Small Vessel Exemption	12	97	1	12	12	46
	Total	**1,200**	**43,971**	**512**	**25,805**	**37,743**	**30,847**
2009	Individual	1,017	35,300	433	19,251	32,568	29,469
	Combination	47	548	5	207	432	343
	Hook Gear	74	943	11	435	435	122
	Large Mesh	30	780	19	570	736	906
	Small Vessel Exemption	11	86	1	10	10	26
	Total	**1,179**	**37,656**	**469**	**20,472**	**34,181**	**30,867**

*These data include multispecies/monkfish DAS trips (in which the multispecies and monkfish clocks run concurrently).
Permits are limited access multispecies permits that were active on the last day of the fishing year.
DAS Allocated is multispecies A DAS net allocation after including base and carry over, NOT leased.
Source: Permits Database and AMS Database

Table 47 - Multispecies limited access A days-at-sea used by vessel size, FY 2005 - 2009

Categories		Total Number of Permitted Vessels	Total Days-at-Sea Allocated	Number of Permitted Vessels that Called In	DAS Allocated to Vessels that Called In	DAS Allocated and Net Leased to Vessels that Called In	Total DAS Used
2005	1 - 29 feet	178	2,018	18	518	536	117
	30 - 49 feet	670	22,350	350	17,166	19,139	11,924
	50 - 74 feet	320	16,727	221	12,888	15,778	12,088
	75+ feet	152	8,923	96	6,675	8,700	7,645
	Total	**1,320**	**50,018**	**685**	**37,247**	**44,152**	**31,773**
2006	1 - 29 feet	216	3,500	8	420	420	75
	30 - 49 feet	621	22,827	336	16,470	19,702	12,536
	50 - 74 feet	300	16,416	202	11,858	15,523	12,012
	75+ feet	147	8,077	79	5,358	7,771	7,171
	Total	**1,284**	**50,820**	**625**	**34,106**	**43,416**	**31,794**
2007	1 - 29 feet	261	3,560	6	357	347	56
	30 - 49 feet	577	22,163	308	15,423	19,721	13,042
	50 - 74 feet	287	15,570	178	10,181	14,831	12,010
	75+ feet	146	8,416	82	5,208	8,301	7,696
	Total	**1,271**	**49,710**	**574**	**31,170**	**43,200**	**32,804**
2008	1 - 29 feet	274	3,096	4	213	198	17
	30 - 49 feet	530	19,747	277	12,298	17,426	13,462
	50 - 74 feet	257	13,017	158	8,615	12,267	10,150
	75+ feet	139	8,111	73	4,679	7,852	7,219
	Total	**1,200**	**43,971**	**512**	**25,805**	**37,743**	**30,847**
2009	1 - 29 feet	300	1,956	3	128	179	41
	30 - 49 feet	496	17,088	258	10,117	15,938	14,323
	50 - 74 feet	247	10,985	140	6,400	10,597	9,627
	75+ feet	136	7,626	68	3,827	7,468	6,876
	Total	**1,179**	**37,656**	**469**	**20,472**	**34,181**	**30,867**

*These data include multispecies/monkfish DAS trips (in which the multispecies and monkfish clocks run concurrently).
Permits are limited access multispecies permits that were active on the last day of the fishing year.
DAS Allocated is multispecies A DAS net allocation after including base and carry over, NOT leased.
Source: Permits Database and AMS Database

Table 48 – Multispecies limited access A days-at-sea used by homeport state, FY 2005 - 2009

State (Homeport)		Total Number of Permitted Vessels	Total Days-at-Sea Allocated	Number of Permitted Vessels that Called In	DAS Allocated to Vessels that Called In	DAS Allocated and Net Leased to Vessels that Called In	Total DAS Used
2005	Maine	200	8,206	91	5,479	7,412	5,731
	New Hampshire	73	3,302	45	2,608	3,029	2,217
	Massachusetts	675	29,306	385	21,669	25,878	18,734
	Rhode Island	114	3,859	68	3,505	3,675	2,661
	Connecticut	19	635	12	535	535	258
	New York	111	2,363	47	1,741	1,905	1,094
	New Jersey	80	1,387	24	1,020	969	450
	Other	48	961	13	689	750	629
	Total	**1,320**	**50,018**	**685**	**37,247**	**44,152**	**31,773**
2006	Maine	202	8,928	85	5,389	7,223	5,173
	New Hampshire	73	3,176	37	2,117	2,764	2,210
	Massachusetts	639	30,349	332	19,619	26,425	19,542
	Rhode Island	111	3,419	66	3,048	3,142	2,445
	Connecticut	18	580	10	447	457	347
	New York	114	2,235	47	1,702	1,685	948
	New Jersey	81	1,272	36	1,174	998	535
	Other	46	861	12	610	724	595
	Total	**1,284**	**50,820**	**625**	**34,106**	**43,416**	**31,794**
2007	Maine	191	7,708	71	4,456	6,692	5,377
	New Hampshire	70	3,464	36	2,078	2,997	2,398
	Massachusetts	646	30,529	300	18,130	26,546	19,714
	Rhode Island	113	3,645	67	2,982	3,447	3,110
	Connecticut	16	482	8	382	426	279
	New York	107	1,934	40	1,459	1,418	858
	New Jersey	82	1,271	39	1,182	1,053	620
	Other	46	676	13	501	621	448
	Total	**1,271**	**49,710**	**574**	**31,170**	**43,200**	**32,804**
2008	Maine	168	6,013	55	3,176	4,916	4,291
	New Hampshire	70	3,406	36	1,951	3,123	2,672
	Massachusetts	624	28,105	281	15,598	24,364	19,732
	Rhode Island	103	2,801	58	2,390	2,660	2,262
	Connecticut	15	410	7	309	344	301
	New York	102	1,614	36	1,085	1,186	689
	New Jersey	77	1,079	29	904	776	584
	Other	41	543	10	392	374	317
	Total	**1,200**	**43,971**	**512**	**25,805**	**37,743**	**30,847**
2009	Maine	166	5,042	50	2,505	4,474	3,919
	New Hampshire	72	3,171	35	1,605	2,561	2,851
	Massachusetts	623	25,368	266	12,521	23,634	20,671
	Rhode Island	90	1,865	49	1,850	1,773	1,860
	Connecticut	16	257	8	261	214	249
	New York	101	846	31	797	650	551
	New Jersey	73	650	20	574	496	435
	Other	38	456	10	357	379	331
	Total	**1,179**	**37,656**	**469**	**20,472**	**34,181**	**30,867**

*These data include multispecies/monkfish DAS trips (in which the multispecies and monkfish clocks run concurrently).
Permits are limited access multispecies permits that were active on the last day of the fishing year.
DAS Allocated is multispecies A DAS net allocation after including base and carry over, NOT leased.
Source: Permits Database and AMS Database

Table 49 – Multispecies limited access A days-at-sea used by primary gear type, FY 2005 - 2009

Categories		Total Number of Permitted Vessels	Total Days-at-Sea Allocated	Number of Permitted Vessels that Called In	DAS Allocated to Vessels that Called In	DAS Allocated and Net Leased to Vessels that Called In	Total DAS Used
2005	Bottom Trawl	765	34,982	456	26,305	31,634	23,595
	Midwater Trawl	5	223	3	175	191	55
	Other Trawl	9	382	5	278	370	297
	Longline	135	2,916	42	1,970	2,050	918
	Hand Line	60	952	18	595	634	302
	Rod and Reel	64	615	12	400	400	174
	Gillnet	259	9,420	139	7,102	8,449	6,199
	Pots and Traps	10	49	2	49	49	5
	Other	13	479	8	373	375	229
	Total	**1,320**	**50,018**	**685**	**37,247**	**44,152**	**31,773**
2006	Bottom Trawl	764	34,077	410	23,117	29,741	23,017
	Midwater Trawl	4	167	2	122	137	93
	Other Trawl	11	560	6	315	472	415
	Longline	118	3,043	33	1,996	2,107	865
	Hand Line	56	1,004	9	401	457	197
	Rod and Reel	62	797	8	496	511	162
	Gillnet	240	10,503	148	7,163	9,494	6,765
	Pots and Traps	10	46	1	46	46	14
	Other	19	623	8	451	451	265
	Total	**1,284**	**50,820**	**625**	**34,106**	**43,416**	**31,794**
2007	Bottom Trawl	767	33,642	376	21,163	30,108	23,986
	Midwater Trawl	4	133	2	122	122	81
	Other Trawl	14	648	6	302	522	504
	Longline	110	2,668	30	1,833	1,922	717
	Hand Line	57	1,075	8	374	407	207
	Rod and Reel	58	754	8	431	431	160
	Gillnet	233	10,212	138	6,700	9,415	6,993
	Pots and Traps	8	46	1	46	46	11
	Other	20	531	5	198	227	146
	Total	**1,271**	**49,710**	**574**	**31,170**	**43,200**	**32,804**
2008	Bottom Trawl	731	30,025	335	17,622	25,924	21,249
	Midwater Trawl	4	152	2	122	122	59
	Other Trawl	13	541	6	314	485	380
	Longline	100	1,795	25	1,192	1,257	544
	Hand Line	60	846	6	266	276	121
	Rod and Reel	52	503	6	281	281	128
	Gillnet	219	9,893	129	5,880	9,252	8,267
	Pots and Traps	7	0		0	0	
	Other	14	216	3	126	144	100
	Total	**1,200**	**43,971**	**512**	**25,805**	**37,743**	**30,847**
2009	Bottom Trawl	723	25,192	298	13,615	23,111	20,475
	Midwater Trawl	3	94	2	104	94	41
	Other Trawl	13	375	6	267	373	459
	Longline	91	1,355	22	851	1,033	641
	Hand Line	62	909	7	263	321	190
	Rod and Reel	52	328	6	239	231	123
	Gillnet	214	9,235	125	5,027	8,881	8,773
	Pots and Traps	6	0		0	0	
	Other	15	168	3	106	137	165
	Total	**1,179**	**37,656**	**469**	**20,472**	**34,181**	**30,867**

*These data include multispecies/monkfish DAS trips (in which the multispecies and monkfish clocks run concurrently).
Permits are limited access multispecies permits that were active on the last day of the fishing year.
DAS Allocated is multispecies A DAS net allocation after including base and carry over, NOT leased.
Source: Permits Database and AMS Database

7.5.3.3 Landings and Revenues

The commercial harvesting sector may be described as a function of its multiple components, including gear types, vessels, and communities. In this section, activity in the commercial sector is characterized in terms of **permit category**, **vessel length class**, **homeport state, and port group**. Because of the way in which the data is queried for each of these descriptive approaches, total numbers of vessels, landings and revenues may differ slightly among the four sections. In some cases information cannot be reported due to data confidentiality provisions. Where such anomalies occur, we have attempted to provide a clear explanation. Revenue is reported as gross revenue and does not take into account the changes in fixed and operating costs over time (net revenue).

Landings and revenues by fishing year were summarized in Amendment 13, FW 40A, FW 40B, FW 41, FW 42, Amendment 16, and FW 44. This section updates this information for FY 2004 through 2009. Minor differences exist between the information previously reported and this section due to updates to the databases and revisions to data queries (including the addition of Atlantic wolffish to the management unit). Most notably, nominal and constant groundfish revenues were incorrectly reported in Amendment 16 in Table 57 (NEFMC 2009a) due to a data error; other tables were correct. The data are also reported in different categories than in previous reports in order to capture changes in permit categories and changes in landings and revenues in communities.

Regulated groundfish (cod, haddock, yellowtail flounder, winter flounder, witch flounder, windowpane flounder, plaice (dabs), pollock, redfish, Atlantic halibut, white hake, red/white hake mixed, and Atlantic wolffish) and ocean pout landings and revenues are summarized in Table 50. This table includes all landings reported to the NMFS dealer database system, regardless of whether the landings can be attributed to a multispecies permit. It includes aggregate landings reported by states and landings that cannot be attributed to a permit as well as landings by vessels that did not possess a federal multispecies permit (i.e. landings from state registered vessels fishing in state waters). Regulated groundfish landings declined from 80 million pounds in FY 2004 to 50 million pounds (landed weight) in FY 2006, or 37 percent, before increasing to 68 million pounds in FY 2008 and decreasing again to 66 million pounds in FY 2009. Nominal revenues decreased 9 percent from FY 2004 ($84.6 million) to FY 2006 ($76.9 million) and then rebounded to $85 million in FY 2008 before decreasing again to $79.7 million in FY 2009. Revenues in constant 1999 dollars declined 13 percent, from $74.0 million in FY 2004 to $60.4 million in FY 2009. The average price, in both nominal and constant dollar terms, peaked in FY 2006, the year with the lowest landed weight. By FY 2008, in terms of constant dollars the price declined to less than a dollar per pound. The sections following this table summarize landings and revenues for groundfish permit holders only.

Table 50 – Total groundfish landings and revenues, FY 2004 - 2009

	FY					
Data	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**
Groundfish, landed weight	79,833,841	65,707,988	50,095,191	60,781,989	68,161,349	66,159,986
Groundfish, live weight	87,280,257	72,063,086	54,979,680	67,437,099	75,843,340	73,999,137
Nominal Dollars	$84,633,488	$85,210,805	$76,893,026	$84,596,827	$85,061,015	$79,744,807
1999 Dollars	$73,980,543	$74,026,292	$64,951,294	$67,027,790	$64,358,387	$60,423,467
Average Price (nominal)	$1.06	$1.30	$1.53	$1.39	$1.25	$1.21
Average Price (constant)	$0.93	$1.13	$1.30	$1.10	$0.94	$0.91

7.5.3.3.1 Landings and Revenues by Groundfish Permit Category

As mentioned earlier, the information in the following sections is reported for vessels with groundfish permits only. Total landings by groundfish permits declined from 606.3 million pounds in FY 2001 to 436.4 million pounds in FY 2006 before rebounding to 467.9 million pounds in FY 2009, a decline of 22.8 percent from FY 2001. For individual DAS permits, total landings declined from 244.9 million pounds in FY 2004 to 194.6 million pounds in FY 2007 before increasing to 208.9 million pounds in FY 2009, a decline of 14.7 percent from FY 2004. Before FY 2004, total landings from individual DAS permits were significantly lower, due to a large number of vessels fishing under fleet DAS permits. Revenue changes were similar; from FY 2004 to FY 2009 revenues (constant 1999 dollars) declined 7.3 percent for all permits and 18.0 percent for individual DAS permits (Table 51 and Table 52).

Groundfish landings by permitted vessels declined from 103.4 million pounds in FY 2001 to 48.4 million pounds in FY 2006 (-53.2%), then increased to 63.5 million pounds in FY 2009 (-38.6% from FY 2001). Groundfish revenues showed a similarly large initial reduction, declining from $98.6 million in FY 2001 to $62.5 million in FY 2006, a decline of 63.4 percent. In spite of the increase in landed weight from FY 2006 to FY 2009, revenues actually continued to decline slightly to $57.7 million, or 7.7 percent less than FY 2006. Individual DAS permits did slightly better, with FY 2004 revenues of $66.9 million declining 9 percent to $60.5 million in FY 2006, and declining again to $56.1 million in FY 2009, 16.1 percent less than in FY 2004 (Table 53 and Table 54).

The percentage of revenues generated by groundfish permits that came from groundfish tended to decline from FY 2001 to FY 2009, from 75% to just over 12%. These revenues can be earned on groundfish trips or on trips in other fisheries. When comparing total revenues and groundfish revenues for individual DAS permit holders it is clear that groundfish is only a portion of the revenue generated by these fishing businesses. For individual DAS permits, groundfish revenues were 49 percent of total revenues in FY 2001 and declined to 42 percent in FY 2009.

During this period, the number of active groundfish permits with a landings record of any groundfish species in the dealer database also declined, from 1,314 in FY 2001 to 633 in FY 2009 (a change of 52 percent) (Table 55). The number of active Individual DAS permits declined from 691 in 2004 to 450 in 2009. Active Small Vessel Exemption category permits remained fairly constant in numbers, while Combination and Handgear permits declined through about 2004 and remained steady thereafter. Vessels using active Hook Gear permits declined greatly, from 81 in FY 2001 to 9 in FY 2009 (88.9 percent).

Average groundfish revenues for active groundfish permits varied widely across the time series (Table 56). Individual DAS category permits increased from an average of $96,771 in FY 2004 to $124,811 in FY 2009 (22.5 percent). Hook Gear permits fluctuated from a high of $26,535 in FY 2005 to a low of $7,149 in 2009. Handgear A permits had generally increasing average revenues, from a low of $1,392 in FY 2005 to a high of $5,093 in FY 2009. Average revenue from Combination vessel permits declined from FY 2004 until FY 2007, before rebounding in FY 2008 and 2009 (51.3 percent total decline from 2003 to 2009).

Table 51 – Total landings by groundfish permit category, FY 2001 - 2009

Category	2001	2002	2003	2004	2005	2006	2007	2008	2009
Individual DAS	67,082,886	60,555,258	55,545,268	244,869,377	203,659,914	195,144,787	194,633,706	212,790,439	208,885,463
Fleet DAS	231,268,872	188,132,355	186,143,621	605,481					
Small Vessel Exemption	6,588	Conf.	Conf.	10,159	31,635	20,551	119,178	157,423	118,134
Hook Gear	2,770,964	1,675,134	1,818,524	2,134,466	1,694,986	1,218,495	1,009,899	1,108,746	939,276
Combination Vessel	12,926,924	13,218,161	17,743,414	14,452,283	10,888,403	10,970,697	9,360,710	11,375,497	9,578,028
Large Mesh DAS	8,311,976	7,415,139	7,791,124	7,255,971	4,910,866	4,338,460	4,307,712	4,359,829	3,894,537
Handgear	126,761,476	72,361,485	143,865,251						
Handgear A				1,637,728	30,178,130	18,763,373	7,554,424	6,418,633	5,461,766
Handgear B				129,282,110	153,016,712	113,799,842	126,772,588	130,474,054	133,638,177
Other Open Access	157,128,632	96,729,305	100,873,093	109,709,282	98,185,684	92,146,876	97,217,711	104,828,248	105,424,529
Total	606,258,318	440,086,837	513,780,295	509,956,857	502,566,330	436,403,081	440,975,928	471,512,869	467,939,910

Table 52 – Total revenues (1999 dollars) by groundfish permit category, FY 2001 - 2009

Category	2001	2002	2003	2004	2005	2006	2007	2008	2009
Individual DAS	$63,005,926	$61,734,890	$52,738,496	$161,467,018	$180,707,691	$161,258,141	$147,249,497	$142,749,706	$132,375,083
Fleet DAS	$120,721,087	$117,177,937	$112,644,270	$598,602					
Small Vessel Exemption	$7,290	Conf.	Conf.	$11,443	$100,195	$39,263	$146,880	$261,457	$208,113
Hook Gear	$2,854,182	$2,676,627	$2,445,595	$3,335,824	$3,743,698	$3,648,543	$2,835,928	$2,398,836	$2,189,518
Combination Vessel	$27,857,876	$31,513,079	$33,708,899	$40,517,445	$48,260,800	$44,677,387	$38,921,702	$35,848,712	$37,344,169
Large Mesh DAS	$9,352,720	$8,212,359	$6,963,302	$6,567,583	$6,710,455	$4,860,237	$3,789,944	$4,389,421	$2,883,164
Handgear	$28,884,772	$24,452,876	$28,581,585						
Handgear A				$1,401,010	$5,078,144	$4,069,096	$3,008,347	$2,583,039	$2,830,077
Handgear B				$38,259,487	$57,326,175	$55,521,251	$55,642,744	$53,286,823	$49,116,934
Other Open Access	$140,342,092	$158,078,405	$185,176,530	$241,955,823	$281,705,097	$254,821,291	$255,819,899	$221,923,988	$230,847,061
Total	393,025,947	403,846,172	422,258,677	494,114,235	583,632,255	528,895,209	507,414,941	463,441,982	457,794,119

Table 53 – Groundfish landings by groundfish permit category, FY 2001 – FY 2009

Category	2001	2002	2003	2004	2005	2006	2007	2008	2009
Individual DAS	50,301,967	40,864,820	38,216,342	72,715,253	62,067,822	46,802,829	57,662,703	64,671,329	61,835,378
Fleet DAS	45,007,575	38,017,046	37,911,377	95,484					
Small Vessel Exemption	5,496	Conf.	Conf.	Conf.	Conf.	Conf.	1,848	2,592	3,579
Hook Gear	1,098,050	528,342	478,978	631,805	544,607	205,806	192,718	209,022	51,216
Combination Vessel	3,820,879	2,465,981	2,839,056	1,894,704	846,338	397,448	558,376	1,180,765	1,003,665
Large Mesh DAS	2,679,578	1,352,573	1,303,702	1,524,913	671,286	590,093	163,378	317,851	342,503
Handgear	454,907	178,787	136,244						
Handgear A				248,024	30,955	122,378	79,083	100,167	152,261
Handgear B				68,475	47,647	54,995	150,517	84,528	44,852
Other Open Access	49,841	69,615	137,776	101,875	58,480	212,711	115,814	78,370	43,547
Total	103,418,293	83,477,164	81,023,475	77,280,533	64,267,135	48,386,260	58,924,437	66,644,624	63,477,001

Table 54 – Groundfish revenues (1999 dollars) by groundfish permits category, FY 2001 - 2009

Category	2001	2002	2003	2004	2005	2006	2007	2008	2009
Individual DAS	$47,329,837	$45,305,967	$36,299,927	$66,868,777	$69,188,498	$60,526,167	$62,728,288	$59,656,481	$56,164,817
Fleet DAS	$43,106,389	$44,351,025	$39,424,405	$61,184					
Small Vessel Exemption	$5,630	Conf.	Conf.	Conf.	Conf.	Conf.	$2,976	$3,389	$4,059
Hook Gear	$1,258,845	$762,310	$645,903	$828,724	$875,657	$383,944	$336,908	$271,353	$64,345
Combination Vessel	$3,802,377	$2,903,858	$2,958,558	$1,763,554	$1,195,786	$535,598	$727,519	$1,075,572	$880,322
Large Mesh DAS	$2,626,588	$1,612,110	$1,187,912	$1,393,033	$759,700	$554,015	$202,134	$1,145,087	$281,632
Handgear	$463,326	$243,824	$170,583						
Handgear A				$183,214	$47,329	$117,613	$108,815	$124,544	$173,161
Handgear B				$90,048	$75,338	$78,602	$207,849	$124,239	$61,963
Other Open Access	$44,302	$82,275	$127,506	$111,505	$83,056	$321,082	$169,123	$88,292	$45,923
Total	$98,637,293	$95,261,368	$80,814,794	$71,300,039	$72,225,364	$62,517,020	$64,483,613	$62,488,957	$57,676,221

Table 55 – Active groundfish permits, FY 2001 - 2009

Category	2001	2002	2003	2004	2005	2006	2007	2008	2009
Individual DAS	132	131	131	691	634	593	531	507	450
Fleet DAS	734	676	649						
Small Vessel Exemption	4	1	1	2	1	2	4	4	5
Hook Gear	81	53	48	35	33	22	18	15	9
Combination Vessel	32	22	18	16	15	10	16	11	11
Large Mesh DAS	43	28	4	27	22	17	11	7	7
Handgear	226	179	156						
Handgear A				46	34	26	23	32	34
Handgear B				72	58	52	62	61	73
Other Open Access	62	47	63	65	53	63	62	49	44
Total	1,314	1,137	1,070	954	850	785	727	686	633

Table 56 – Average groundfish revenues (1999 dollars) per active groundfish permit, FY 2001 - 2009

Category	2001	2002	2003	2004	2005	2006	2007	2008	2009
Individual DAS	$358,559	$345,847	$277,099	$96,771	$109,130	$102,068	$118,132	$117,666	$124,811
Fleet DAS	$58,728	$65,608	$60,746						
Individual + Fleet Combined	$104,430	$111,099	$97,082						
Small Vessel Exemption	$1,407	Conf.	Conf.	Conf.	Conf.	Conf.	$744	$847	$812
Hook Gear	$15,541	$14,383	$13,456	$23,678	$26,535	$17,452	$18,717	$18,090	$7,149
Combination Vessel	$118,824	$131,994	$164,364	$110,222	$79,719	$53,560	$45,470	$97,779	$80,029
Large Mesh DAS	$61,083	$57,575	$296,978	$51,594	$34,532	$32,589	$18,376	$163,584	$40,233
Handgear	$2,050	$1,362	$1,093						
Handgear A				$3,983	$1,392	$4,524	$4,731	$3,892	$5,093
Handgear B				$1,251	$1,299	$1,512	$3,352	$2,037	$849
Other Open Access	$715	$1,751	$2,024	$1,715	$1,567	$5,097	$2,728	$1,802	$1,044

7.5.3.3.2 Landings and Revenues by Vessel Length Group

When total landings and revenues (constant 1999 dollars) of groundfish permits are examined by vessel length, it is clear that vessels less than 30 feet in length have become an inconsequential component of the fishery since FY 2004, accounting for less than 0.13 percent of landings in FY 2009. The revenues from these few landings decreased by 53.6 percent from FY 2004 through FY 2009. Vessels between 30 and 50 feet in length actually increased groundfish landings (+38 percent) and revenues (+23 percent) from FY 2004 to FY 2009 after a decrease from FY 2001 to FY 2004, the only vessel size class to do so. In FY 2009, Vessels between 50 and 75 feet saw landings decline by 13.7 percent since FY 2004 and by 24.6 percent since FY 2001, and saw revenues decline by 14.5 percent from FY 2004 to FY 2009 after a 10.0% increase from FY 2001 to FY 2004. Vessels 75 feet and over fluctuated in landings but increased in revenue (30.7 percent) from FY 2001 through FY 2004. However, these largest vessels then saw landings decline by 14.2 percent from FY 2004 to FY 2009, and revenues decline by 9.9 percent in the same period (Table 57).

Groundfish landings and revenues (constant 1999 dollars), as examined by vessel length, mirror those of the total landings by vessel length. Vessels less than 30 feet in length accounted for 0.16 percent of landings in FY 2009. The revenues from these few landings decreased by 79.0 percent from FY 2004 through FY 2009. Vessels between 30 and 50 feet in length actually increased groundfish landings (+21 percent) and revenues (+8.9 percent) from FY 2004 to FY 2009 after a decrease from FY 2001 to FY 2004, the only vessel size class to do so. In FY 2009, Vessels between 50 and 75 feet saw landings decline by 38.1 percent since FY 2004 and by 69.4 percent since FY 2001, and saw revenues decline by 31.9 percent from FY 2004 to FY 2009 after a 33.9% decrease from FY 2001 to FY 2004. Vessels 75 feet and over decreased in both groundfish landings (15.7 percent) and revenue (20.9 percent) from FY 2001 through FY 2004. However, these largest vessels then saw landings fluctuate from FY 2004 to FY 2009, ending at 19.3 percent lower than FY 2004, and saw revenues decline by 24.4 percent in the same period. These changes are somewhat surprising, as many believed that the smaller vessels size class (30-50 feet) would suffer the most from the differential DAS counting measures adopted in FW 42 (Table 58).

Table 57 – Total landed weight (lbs.) and revenues (1999 dollars) by length group, FY 2001 – 2009

Length Group	Data	2001	2002	2003	2004	2005	2006	2007	2008	2009
Less than 30	Weight	1,495,389	1,014,569	803,224	1,807,914	1,651,703	1,211,166	818,954	706,801	624,400
	Dollars	$1,426,091	$1,120,241	$1,173,094	$2,047,056	$1,620,449	$1,672,873	$1,546,528	$1,350,337	$949,556
30 to less than 50	Weight	52,543,920	45,049,181	48,202,346	41,176,348	46,103,586	47,588,975	51,369,775	56,808,183	66,066,544
	Dollars	$57,010,963	$52,429,810	$50,153,461	$49,919,445	$76,975,863	$70,891,944	$70,136,102	$69,147,699	$64,560,213
50 to less than 75	Weight	151,531,804	136,713,383	129,204,193	132,542,972	114,714,912	103,909,761	108,288,944	109,601,020	114,317,182
	Dollars	$122,110,693	$126,424,416	$127,033,443	$135,594,052	$156,721,390	$142,378,995	$129,174,633	$120,273,972	$115,940,249
75 and over	Weight	400,687,205	257,309,891	335,571,309	334,429,623	340,096,129	283,693,179	280,498,255	304,396,865	286,931,784
	Dollars	$212,478,201	$223,871,947	$243,899,903	$306,553,683	$348,314,553	$313,951,398	$306,557,678	$272,669,974	$276,344,101
Total Weight		606,258,318	440,087,024	513,781,072	509,956,857	502,566,330	436,403,081	440,975,928	471,512,869	467,939,910
Total Dollars		$393,025,947	$403,846,414	$422,259,902	$494,114,235	$583,632,255	$528,895,209	$507,414,941	$463,441,982	$457,794,119

Table 58 – Groundfish landed weight (lbs.) and revenues (1999 dollars) by length group, FY 2001 – 2009

Length Group	Data	2001	2002	2003	2004	2005	2006	2007	2008	2009
Less than 30	Weight	839,251	396,167	354,991	480,973	146,590	111,993	70,667	57,272	101,519
	Dollars	$942,778	$570,899	$461,981	$518,424	$201,463	$134,229	$105,350	$65,151	$108,764
30 to less than 50	Weight	23,905,156	17,927,058	18,436,523	15,975,112	15,514,340	13,767,506	17,269,922	20,520,014	20,184,371
	Dollars	$23,409,792	$21,922,821	$19,423,441	$17,325,040	$18,620,985	$16,776,424	$18,529,843	$19,800,753	$19,044,650
50 to less than 75	Weight	43,518,214	34,342,719	32,791,598	31,223,980	24,542,026	18,365,249	19,791,111	21,868,584	19,322,235
	Dollars	$40,340,343	$37,897,022	$32,001,358	$26,661,714	$26,827,521	$23,738,294	$22,144,339	$21,040,897	$18,250,097
75 and over	Weight	35,155,672	30,811,275	29,440,367	29,601,487	24,066,362	16,142,254	21,792,737	24,198,754	23,868,876
	Dollars	$33,944,381	$34,870,693	$28,928,019	$26,796,080	$26,577,010	$21,868,655	$23,704,081	$21,582,156	$20,272,711
Total Groundfish Weight		103,418,293	83,477,219	81,023,479	77,281,552	64,269,318	48,387,002	58,924,437	66,644,624	63,477,001
Total Groundfish Dollars		$98,637,293	$95,261,434	$80,814,800	$71,301,257	$72,226,979	$62,517,603	$64,483,613	$62,488,957	$57,676,221

7.5.3.3.3 Landings and Revenue by Homeport State

Each permit holder declares a homeport state on all permit applications. When evaluating impacts of regulations on individual states, summarizing landings and revenues by these homeport states may indicate differential impacts under the assumption that the economic benefits of fishing activity return primarily to these homeport states. Total landings and revenues by homeport state are shown in Table 59 and Table 60. Groundfish landings by homeport state are shown in Table 61 and Table 62.

Vessels claiming Maine, New Hampshire, Massachusetts, or Rhode Island as homeport state landed 97.4 percent of the groundfish in FY 2009, an increase from the 93 percent landed in FY 2004. Of these four states, only New Hampshire vessels increased groundfish landings from FY 2004 to FY 2009 by 1.6 million pounds, or 68 percent. New Hampshire also increased 4 percent from FY 2001 to FY 2009. In FY 2009 Maine vessels landed 94 percent of the groundfish they landed in FY 2004 and 76 of what they landed in FY 2001, while Massachusetts vessels landed 85 percent of what was landed in FY 2004 and 64 percent of what was landed in FY 2001. Groundfish landings by Rhode Island in FY 2009 vessels declined to 34 percent of the FY 2004 value and 28 percent of the FY 2001 value. Again, these changes are somewhat surprising in that the inshore differential DAS area in the GOM was expected to reduce groundfish landings for New Hampshire vessels. Revenue changes differed only slightly from the changes in groundfish landed weight with the exception of Rhode Island, where the 66 percent decline in landings led to only a 42 percent decline in groundfish revenues between FY 2004 and FY 2009.

But as previously noted revenues (constant 1999 dollars) from other fisheries are key components of the income for permit holders. When total revenues by homeport state are examined for the permitted groundfish vessels, a different picture emerges. From FY 2004 to FY 2009, total revenue declines were seen for permits claiming homeport states of Massachusetts (-6 percent), Rhode Island (-13 percent), and New Hampshire (-17 percent). Total revenues for vessels with a Maine homeport increased by 24 percent.

Table 59 – Total landings by homeport state, FY 2001 – 2009

HPST	2001	2002	2003	2004	2005	2006	2007	2008	2009
CT	363,090	439,728	1,436,588	448,781	484,347	676,813	2,492,876	4,499,534	5,057,629
ME	78,724,996	59,323,936	57,293,476	54,890,246	56,618,663	50,232,331	55,559,478	61,229,147	66,214,886
MA	283,227,205	198,514,601	255,231,528	231,381,193	245,837,887	209,348,873	210,919,028	203,706,598	199,354,075
NH	13,367,647	5,642,063	12,581,323	35,369,073	26,996,393	14,342,036	21,918,173	22,039,395	27,138,010
RI	75,348,434	38,070,333	43,504,270	47,543,755	45,940,811	47,476,698	43,997,569	44,954,778	44,130,965
NJ	88,004,781	70,218,101	77,464,613	75,001,365	73,611,052	68,001,667	69,641,289	87,529,876	80,130,006
NY	30,724,670	27,716,785	26,217,127	22,654,206	17,984,632	18,026,110	16,984,292	22,646,698	24,770,025
NC	19,079,500	23,031,633	22,944,851	24,678,303	21,339,788	15,127,768	8,660,404	14,729,383	11,888,749
Other	17,417,995	17,129,844	17,107,296	17,989,935	13,752,757	13,170,785	10,802,819	10,177,460	9,255,565
Total	606,258,318	440,087,024	513,781,072	509,956,857	502,566,330	436,403,081	440,975,928	471,512,869	467,939,910

Table 60 – Total revenues (1999 dollars) by homeport state, FY 2001 – 2009

HPST	2001	2002	2003	2004	2005	2006	2007	2008	2009
CT	$611,048	$730,789	$2,994,566	$1,087,123	$1,840,043	$2,207,758	$5,849,372	$10,526,580	$10,217,904
ME	$26,626,551	$24,710,117	$23,252,319	$23,848,402	$29,474,842	$26,762,024	$29,606,405	$29,528,857	$31,259,947
MA	$195,349,374	$204,157,832	$203,395,819	$230,557,035	$278,960,149	$254,783,145	$242,587,222	$214,714,594	$215,665,776
NH	$8,428,811	$7,087,426	$6,097,642	$16,263,303	$18,411,066	$13,491,492	$14,937,574	$14,461,475	$13,464,488
RI	$30,777,543	$28,525,346	$31,448,563	$30,233,620	$33,951,187	$35,071,866	$29,551,818	$28,163,240	$23,023,845
NJ	$44,292,729	$47,745,282	$57,987,717	$76,836,382	$98,227,659	$93,073,649	$97,696,476	$86,744,930	$83,520,120
NY	$26,398,229	$25,128,722	$23,437,366	$21,108,304	$22,880,870	$21,281,065	$17,807,011	$19,184,325	$20,056,525
NC	$20,069,579	$24,660,941	$28,587,578	$36,166,710	$43,398,662	$33,992,317	$30,152,327	$26,308,882	$26,778,922
Other	$40,472,082	$41,099,959	$45,058,332	$58,013,357	$56,487,775	$48,231,892	$39,226,736	$33,809,098	$33,806,591
Total	$393,025,947	$403,846,414	$422,259,902	$494,114,235	$583,632,255	$528,895,209	$507,414,941	$463,441,982	$457,794,119

Table 61 – Groundfish landings by homeport state, FY 2001 – 2009

HPST	2001	2002	2003	2004	2005	2006	2007	2008	2009
CT	115,152	206,295	205,084	44,916	20,744	91,739	189,999	218,419	101,390
ME	15,319,317	11,649,857	12,854,761	12,348,854	11,565,820	8,611,001	11,240,196	12,075,418	11,641,998
MA	67,392,307	54,942,388	50,527,509	50,702,142	40,489,242	30,784,454	37,684,924	44,257,818	43,238,152
NH	4,712,053	3,313,107	3,445,717	3,346,377	3,170,158	2,795,023	3,944,409	5,245,665	4,899,354
RI	7,239,855	7,225,382	7,596,776	6,114,406	5,319,875	3,661,606	3,611,712	2,616,902	2,048,790
NJ	854,198	502,831	658,452	657,135	599,466	557,385	517,943	386,225	414,864
NY	4,199,723	3,589,125	3,373,185	1,722,950	1,315,094	1,016,606	961,635	854,845	481,209
NC	1,254,276	866,766	1,010,968	1,356,537	1,113,425	410,869	359,894	492,204	621,199
Other	2,331,412	1,181,468	1,351,027	988,235	675,494	458,319	413,725	497,128	30,045
Total	103,418,293	83,477,219	81,023,479	77,281,552	64,269,318	48,387,002	58,924,437	66,644,624	63,477,001

Table 62 – Groundfish revenues (1999 dollars) by homeport state, FY 2001 – 2009

HPST	2001	2002	2003	2004	2005	2006	2007	2008	2009
CT	$99,883	$214,561	$229,002	$54,177	$12,362	$155,887	$280,790	$245,458	$95,732
ME	$14,080,005	$12,309,933	$11,464,247	$10,822,914	$12,050,536	$9,366,964	$10,186,039	$10,395,459	$9,464,422
MA	$65,020,184	$64,152,683	$52,129,610	$48,164,703	$47,268,256	$41,237,285	$42,624,942	$41,421,318	$40,454,349
NH	$4,343,507	$3,715,925	$3,318,173	$3,276,638	$3,184,183	$2,665,476	$3,534,547	$5,205,610	$4,306,638
RI	$6,971,015	$8,150,757	$7,457,243	$4,838,032	$5,613,998	$5,527,044	$4,924,134	$3,018,019	$2,038,594
NJ	$708,091	$511,135	$719,633	$662,121	$636,116	$873,485	$805,938	$474,001	$304,439
NY	$4,066,979	$4,120,634	$3,352,344	$1,605,484	$1,633,937	$1,509,486	$1,282,188	$939,712	$477,467
Other	$2,239,204	$1,234,655	$1,256,223	$962,629	$805,639	$565,236	$378,248	$381,566	$25,876
Total	$98,637,293	$95,261,434	$80,814,800	$71,301,257	$72,226,979	$62,517,603	$64,483,613	$62,488,957	$57,676,221

7.5.3.3.4 Landings and Revenues by Port Group

In this section, landings and revenues are summarized by the place of landing, with individual ports grouped into a series of port groups first used to characterize fishing activity in Amendment 13 (Table 63 through Table 67). This is a different way of looking at the economic activity generated by groundfish fishing activity. Maine ports experienced a large drop in groundfish landings over the period FY 2001 through FY 2009, with the state as a whole seeing groundfish landings decline by 74 percent. In contrast, Coastal New Hampshire experienced only a 16 percent decrease, while Gloucester and the North Shore had a 25 percent increase (almost all since FY 2006), and Boston and the South Shore a 51 percent increase – with the increase occurring since FY 2006. With respect to revenues, only Gloucester/North Shore (+14 percent) and Boston/South Shore (+35 percent) increased groundfish revenues from FY 2001 to FY 2009. In spite of a smaller decrease in landed weight, New Hampshire port groundfish revenues declined by 26 percent from FY 2001 to FY 2009. New Bedford MA was the top groundfish port group through FY 2007, but by FY 2008 ceded the top ranking to Gloucester/North Shore MA.

When groundfish revenues and landings by homeport state are compared to the same data by port group, it is clear that some vessels in Maine and New Hampshire no longer land in those states. Given the changes in Gloucester and Boston, it is likely (though not yet confirmed) that vessels that used to land in Maine now land in other ports.

As with revenues by homeport state, the total revenues for individual DAS permits differs from the changes noted for groundfish revenues. Gloucester/North Shore and Boston/South Shore show a 13 percent and 41 percent increase in total revenues for groundfish permits. Coastal NH showed a 40 percent increase (although the high in FY 2005 was 32 percent higher than FY 2009), while Lower Mid-Coast Maine experienced a 60 percent decline in total revenues. New Bedford experienced a 37 percent increase (although there was a 23 percent decline from FY 2005 to FY 2009). Most other port groups experienced declines as well.

The number of multispecies permit holders landing groundfish generally declined in all the larger ports. In coastal New Hampshire, active permits in FY 2009 were only 48 percent of those in FY 2001. In Boston and the South Shore that number was 60 percent, it was also 60 percent in Gloucester and the North Shore, 48 percent in New Bedford, and the Cape and Islands was at only 23 percent of the number of active permits. Coastal Rhode Island had 61 percent as many active permits in FY 2009 as in FY 2001. The only port group that saw an increase in permit holders landing there was Downeast Maine, which had a 350 percent increase throughout the time period (but a small sample size – only 9 permits landed there in FY 2009).

Table 63 – Total landings by port group of landing, FY 2001 – 2009

	Port Group	2001	2002	2003	2004	2005	2006	2007	2008	2009
ME	DOWNEAST ME	607,957	512,139	1,370,037	1,400,914	999,460	974,648	2,340,763	1,332,093	1,868,214
	LOWER MID-COAST ME	86,291,510	48,763,435	57,138,362	47,631,628	42,162,367	39,424,712	29,357,297	28,051,707	40,551,569
	ME					12,000	44,426		48	
	SOUTHERN ME	409,035	424,372	374,822	931,542	696,509	1,231,166	1,239,286	646,877	1,342,709
	UPPER MID-COAST ME	45,475,509	20,846,839	21,739,636	36,316,483	23,392,409	36,338,042	35,659,839	35,714,458	25,656,765
ME Total		132,784,011	70,546,785	80,622,857	86,280,567	67,262,745	78,017,695	70,635,643	65,891,133	70,207,800
MA	BOSTON AND SOUTH SHORE	10,456,302	9,540,137	8,317,949	7,207,106	8,022,364	7,744,359	10,291,142	11,559,444	11,369,324
	CAPE AND ISLANDS	18,744,749	14,965,246	12,666,623	11,254,569	12,763,994	11,140,464	11,445,082	11,686,676	12,224,652
	GLOUCESTER AND NORTH SHORE	114,314,736	55,069,635	98,413,636	75,359,192	118,224,606	91,352,927	84,555,984	95,020,073	98,731,239
	NEW BEDFORD COAST	81,867,937	82,353,878	101,154,939	106,768,138	109,888,378	91,566,346	107,540,003	100,971,529	101,699,852
MA Total		225,495,383	161,946,593	220,635,534	200,590,536	248,899,342	201,812,947	213,832,211	219,237,722	224,076,503
NH	COASTAL NH	13,944,028	18,220,967	23,343,645	21,883,121	18,425,372	9,181,470	7,955,796	7,045,528	11,937,713
NH Total		13,944,028	18,220,967	23,343,645	21,883,121	18,908,003	9,181,470	8,029,992	7,366,561	12,308,506
RI	COASTAL RI	79,009,995	49,433,268	50,983,080	52,019,190	51,340,504	52,198,590	42,822,765	44,613,344	40,390,012
	RI		114,000	650,822	285,212	346,228	51,194	96,093	111,210	2,122,455
RI Total		79,009,995	49,547,268	51,633,902	52,304,402	51,686,732	52,249,784	42,918,858	44,724,554	42,512,467
NY	LONG ISLAND NY	22,558,582	20,447,040	18,375,148	17,311,641	14,000,770	15,201,028	12,610,637	13,164,231	15,127,572
	NY	16,654	4,422	5,647	691,185	232,669	101,936	514,548	96,270	296,012
NY Total		22,575,236	20,451,462	18,380,795	18,002,826	14,233,439	15,302,964	13,125,185	13,266,567	15,443,413
NJ	NJ	1,296,046	226,238	12,589	7,082		2,661	25,195		
	NORTHERN COASTAL NJ	24,017,723	22,609,450	19,766,855	19,126,611	19,264,673	22,759,772	22,789,732	20,955,663	23,619,137
	SOUTHERN COASTAL NJ	49,755,926	55,551,760	61,286,494	76,976,729	56,520,214	37,206,644	53,072,364	75,364,292	58,961,500
NJ Total		75,069,695	78,387,448	81,065,938	96,110,422	75,784,887	59,969,077	75,887,291	96,319,955	82,580,637
CT	COASTAL CT		147,133	1,327,493				1,498,766	3,961,481	4,377,667
CT Total			147,133	1,327,493				1,498,766	4,007,557	4,576,897
Other		57,379,970	40,839,368	36,770,908	34,778,868	25,790,478	19,869,144	15,047,982	20,698,506	16,233,687
Total		606,258,318	440,087,024	513,781,072	509,956,857	502,566,330	436,403,081	440,975,928	471,512,869	467,939,910

* Note state totals include landings that are not attributed to a specific group.

Table 64 – Total revenues (1999 dollars) by port group, FY 2001 – 2009

	Port Group	2001	2002	2003	2004	2005	2006	2007	2008	2009
ME	DOWNEAST ME	$1,841,756	$1,861,686	$1,565,858	$1,493,214	$1,790,079	$2,004,990	$3,160,673	$2,088,450	$2,357,371
	LOWER MID-COAST ME	$26,960,777	$24,214,776	$21,468,003	$20,738,395	$18,849,006	$14,125,504	$11,727,081	$12,052,921	$10,887,865
	ME					$1,033	$283		$323	
	SOUTHERN ME	$363,648	$463,259	$356,085	$883,034	$804,490	$1,514,532	$1,220,372	$880,403	$1,162,712
	UPPER MID-COAST ME	$5,531,333	$3,988,340	$3,648,877	$3,769,537	$4,270,165	$5,143,643	$6,270,437	$8,537,322	$8,790,977
ME Total		$34,697,513	$30,528,060	$27,038,823	$26,884,179	$25,714,772	$22,804,063	$22,870,774	$23,963,277	$23,694,937
MA	BOSTON AND SOUTH SHORE	$8,784,135	$10,806,196	$9,205,128	$8,580,074	$11,752,031	$12,482,215	$13,788,998	$12,743,678	$12,393,509
	CAPE AND ISLANDS	$19,566,974	$16,027,211	$15,035,559	$13,624,301	$22,050,918	$17,568,145	$15,185,292	$13,599,958	$13,110,641
	GLOUCESTER AND NORTH SHORE	$31,318,638	$27,533,121	$30,353,512	$25,991,808	$40,115,317	$35,244,102	$35,098,496	$34,111,982	$35,354,488
	NEW BEDFORD COAST	$137,369,392	$153,726,636	$155,861,625	$188,540,437	$244,956,563	$238,374,839	$220,807,559	$178,138,396	$188,318,753
MA Total		$197,174,488	$208,147,476	$210,513,640	$236,746,245	$318,874,829	$303,706,791	$284,880,345	$238,594,013	$249,200,519
NH	COASTAL NH	$7,947,105	$7,030,472	$5,722,055	$15,833,672	$16,254,167	$12,662,885	$12,108,900	$10,752,686	$11,113,339
NH Total		$7,947,105	$7,030,472	$5,722,055	$15,833,672	$16,316,653	$12,662,885	$12,383,050	$10,856,665	$11,467,798
RI	COASTAL RI	$33,069,263	$29,055,085	$30,485,588	$32,174,669	$44,421,188	$49,126,857	$33,356,541	$27,726,903	$23,018,561
	RI		$10,024	$37,726	$32,021	$45,045	$91,324	$211,795	$137,390	$68,837
RI Total		$33,069,263	$29,065,109	$30,523,314	$32,206,690	$44,466,233	$49,218,182	$33,568,336	$27,864,293	$23,087,398
NY	LONG ISLAND NY	$18,951,602	$17,191,381	$15,872,243	$15,854,244	$17,663,580	$17,878,960	$15,526,791	$14,872,368	$15,005,072
	NY	$11,803	$5,568	$5,139	$438,670	$175,014	$58,702	$339,563	$49,994	$142,216
NY Total		$18,963,405	$17,196,949	$15,877,382	$16,292,914	$17,838,593	$17,937,661	$15,866,354	$14,936,078	$15,168,877
NJ	NJ	$892,437	$216,298	$18,074	$4,644		$14,078	$133,137		
	NORTHERN COASTAL NJ	$23,185,875	$24,435,522	$26,241,720	$29,008,811	$39,462,676	$34,961,114	$35,351,408	$31,143,948	$28,143,708
	SOUTHERN COASTAL NJ	$26,453,501	$28,914,474	$37,040,064	$57,706,780	$52,752,401	$37,382,588	$52,777,491	$59,457,230	$55,169,917
NJ Total		$50,531,813	$53,566,294	$63,299,858	$86,720,235	$92,215,077	$72,357,779	$88,262,036	$90,601,178	$83,313,626
CT	COASTAL CT		$14,839	$1,817,751				$3,380,732	$8,424,792	$8,604,231
CT Total			$14,839	$1,817,751				$3,380,732	$8,468,218	$8,725,525
Other		$50,642,359	$58,297,215	$67,467,079	$79,410,102	$68,202,903	$50,207,848	$46,203,314	$48,158,141	$43,135,438
Total		$393,025,947	$403,846,414	$422,259,902	$494,114,235	$583,632,255	$528,895,209	$507,414,941	$463,441,982	$457,794,119

Table 65 – Groundfish landings by port group, FY 2001 – 2009

	Port Group	2001	2002	2003	2004	2005	2006	2007	2008	2009
ME	DOWNEAST ME	Conf.	Conf.			2,815	1,780	3,191	3,884	6,690
	LOWER MID-COAST ME	18,548,510	14,065,240	13,844,756	13,822,854	11,390,361	6,913,858	7,220,350	6,792,606	4,609,448
	ME								48	
	SOUTHERN ME	360,248	261,089	299,639	559,631	458,892	272,039	228,630	71,651	360,124
	UPPER MID-COAST ME	1,776,235	1,495,340	1,453,711	651,447	581,538	50,783	150,556	162,746	358,630
ME Total		20,684,993	15,821,669	15,598,106	15,033,932	12,433,606	7,240,219	7,602,727	7,031,705	5,336,335
MA	BOSTON AND SOUTH SHORE	5,974,231	5,907,806	5,650,258	5,216,066	5,091,528	4,351,885	7,947,857	9,134,345	9,021,914
	CAPE AND ISLANDS	8,140,487	4,992,069	4,346,465	3,941,488	3,466,607	1,975,394	2,624,889	3,143,801	3,294,815
	GLOUCESTER AND NORTH SHORE	18,390,780	15,808,691	16,777,975	14,708,843	15,429,355	14,235,393	19,044,659	22,750,685	22,975,212
	NEW BEDFORD COAST	40,733,040	34,236,222	31,697,104	31,436,468	22,076,741	13,975,919	15,240,663	18,565,310	17,838,425
MA Total		73,333,041	60,953,767	58,471,802	55,302,865	46,064,231	34,538,591	44,858,068	53,594,141	53,130,366
NH	COASTAL NH	3,881,879	2,625,237	2,926,183	3,520,796	3,270,963	3,248,560	2,915,213	3,648,770	3,265,447
NH Total		3,881,879	2,625,237	2,926,183	3,520,796	3,270,963	3,248,560	2,933,814	3,657,890	3,606,699
RI	COASTAL RI	3,582,482	3,224,566	2,859,158	2,645,309	1,876,245	2,334,131	2,568,854	1,704,956	1,186,785
	RI	3,582,482	3,224,566	2,859,158	2,645,309	1,876,245	2,334,417	2,568,854	1,705,003	1,186,999
RI Total		3,582,482	3,224,566	2,859,158	2,645,309	1,876,245	2,334,417	2,568,854	1,705,003	1,186,999
NY	LONG ISLAND NY	1,319,273	584,058	658,362	357,407	323,905	568,942	498,920	336,225	152,169
	NY	Conf.	1,746		Conf.	Conf.	Conf.			674
NY Total		1,319,373	585,804	658,362	358,877	324,175	569,002	498,920	336,707	153,067
NJ	NJ	Conf.								
	NORTHERN COASTAL NJ	578,599	262,028	498,746	407,040	296,113	450,506	423,277	216,855	10,740
	SOUTHERN COASTAL NJ	5,217	2,238	1,278	2,704	1,437	4,406	3,669	707	24,338
NJ Total		583,816	264,266	500,024	409,744	297,550	454,912	426,946	217,562	35,078
CT	COASTAL CT			6,003				34,238	100,171	27,155
CT Total				6,003				34,238	100,171	27,155
Other		3,601	1,620	3,841	10,029	2,548	1,301	870	1,445	1,302
Total		103,418,293	83,477,219	81,023,479	77,281,552	64,269,318	48,387,002	58,924,437	66,644,624	63,477,001

Table 66 – Groundfish revenues (1999 dollars) by port group, FY 2001 - 2009

	Port Group	2001	2002	2003	2004	2005	2006	2007	2008	2009
ME	DOWNEAST ME	Conf.	Conf.			$11,443	$7,640	$13,113	$15,655	$24,637
	LOWER MID-COAST ME	$17,072,559	$14,930,932	$12,514,645	$12,306,848	$11,752,197	$7,741,772	$6,703,526	$7,182,142	$3,686,562
	ME								$323	
	SOUTHERN ME	$316,120	$291,448	$259,009	$583,903	$455,095	$303,841	$214,573	$59,038	$274,279
	UPPER MID-COAST ME	$1,534,707	$1,544,064	$1,315,051	$547,824	$645,058	$66,849	$182,348	$152,130	$272,346
ME Total		$18,947,094	$16,766,731	$14,088,704	$13,438,575	$12,863,794	$8,123,764	$7,113,559	$7,410,238	$4,260,664
MA	BOSTON AND SOUTH SHORE	$5,892,094	$7,126,012	$6,326,092	$5,455,998	$6,085,710	$5,956,670	$7,946,000	$7,944,989	$7,964,457
	CAPE AND ISLANDS	$8,333,913	$6,434,570	$4,919,719	$4,792,674	$4,748,862	$2,990,911	$3,624,090	$3,239,667	$3,296,215
	GLOUCESTER AND NORTH SHORE	$18,324,684	$18,678,838	$18,002,399	$15,340,838	$18,017,107	$16,837,096	$18,366,900	$19,165,107	$20,979,663
	NEW BEDFORD COAST	$38,358,940	$38,389,226	$30,448,335	$25,796,892	$24,186,247	$20,543,177	$19,899,518	$19,009,186	$16,718,578
MA Total		$71,013,353	$70,644,631	$59,696,545	$51,386,401	$53,037,927	$46,327,853	$49,836,509	$49,358,948	$48,958,913
NH	COASTAL NH	$3,673,222	$3,131,381	$2,826,691	$3,438,552	$3,126,812	$2,730,512	$2,385,931	$2,845,531	$2,730,393
NH Total		$3,673,222	$3,131,381	$2,826,691	$3,438,552	$3,126,812	$2,730,512	$2,397,925	$2,853,063	$3,030,093
RI	COASTAL RI	$3,299,551	$3,703,841	$2,871,007	$2,152,964	$2,340,605	$3,770,813	$3,654,369	$2,026,543	$1,189,509
	RI	$3,299,551	$3,703,841	$2,871,007	$2,152,964	$2,340,605	$3,771,153	$3,654,369	$2,026,625	$1,189,774
NY	LONG ISLAND	$1,214,417	$696,270	$739,255	$389,164	$441,206	$831,152	$729,412	$404,081	$171,157
	NY	Conf.	$1,609		Conf.	Conf.	Conf.			$449
NY Total		$1,214,417	$697,880	$739,255	$389,164	$441,206	$831,152	$729,412	$404,711	$171,880
NJ	NJ	Conf.								
	NORTHERN COASTAL NJ	$485,725	$313,869	$584,559	$481,599	$413,679	$725,030	$690,092	$308,693	$7,974
	SOUTHERN COASTAL NJ	$2,172	$1,971	$1,270	$3,261	$1,314	$6,804	$3,215	$703	$23,554
NJ Total		$487,896	$315,840	$585,828	$484,859	$414,993	$731,834	$693,307	$309,395	$31,528
CT	COASTAL CT			$5,029				$58,136	$124,944	$32,211
CT Total				$5,029				$58,136	$124,944	$32,211
Other		$1,474	$1,131	$1,740	$10,236	$1,299	$1,283	$395	$1,033	$1,158
Total		$98,637,293	$95,261,434	$80,814,800	$71,301,257	$72,226,979	$62,517,603	$64,483,613	$62,488,957	$57,676,221

Table 67 – Number of multispecies permit holders landing groundfish, by landing port group (FY 2001 – 2009) for major groundfish states

State		2001	2002	2003	2004	2005	2006	2007	2008	2009
ME	Downeast	2	1	0	0	4	4	6	6	9
	Lower MidCoast	148	139	130	115	111	96	77	77	54
	Southern ME	17	17	10	17	16	11	10	8	10
	Upper Midcoast	31	36	30	22	25	13	12	32	21
	Other ME	0	0	0	0	0	1	0	3	1
NH	Coastal NH	106	112	82	78	65	58	48	48	51
	Other NH	0	0	0	0	0	0	4	4	19
MA	Boston and South Shore	96	85	93	74	65	60	64	58	58
	Cape and Islands	252	210	186	152	125	93	83	75	58
	Gloucester and North Shore	294	277	257	218	220	177	175	181	176
	New Bedford/Fairhaven	232	220	232	183	160	158	166	126	111
	Other MA	8	3	0	0	0	0	0	0	0
RI	Coastal RI	144	120	117	108	112	109	99	98	88
	Other RI	0	0	0	0	0	1	0	1	1
CT				5				8	22	19
NY	Long Island	114	98	96	80	71	89	81	71	64
	Other NY	1	3	0	2	2	1	0	4	5
NJ	Northern NJ	51	38	43	39	43	48	42	41	14
	Southern NJ	16	8	13	8	6	12	9	7	13
	Other NJ	1	0	0	0	0	0	0	0	0

7.5.3.3.5 Distribution of Groundfish Landings

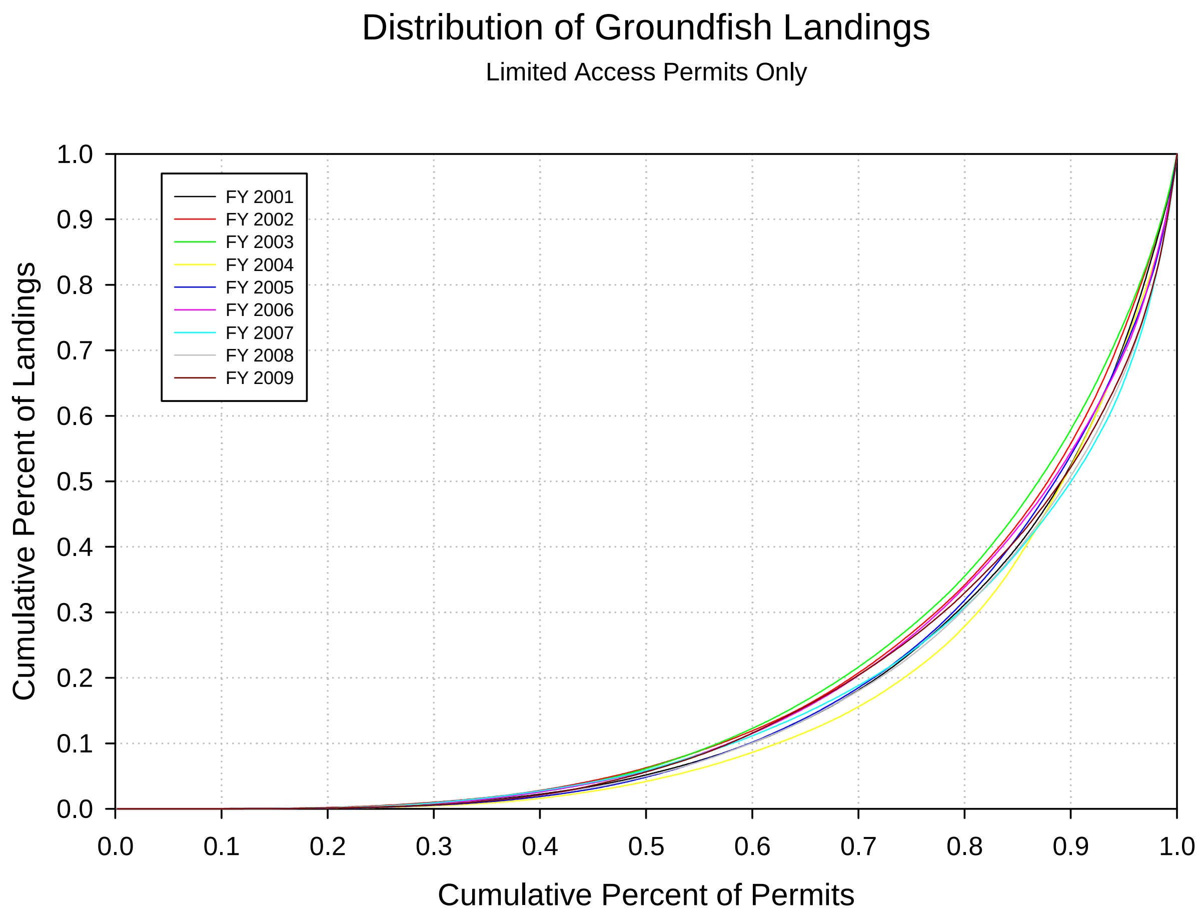
Table 68 shows the distribution of regulated groundfish landings of active limited access permits – that is, permits that landed groundfish in a given year, as opposed to all groundfish permits. Overall, the number of limited access permits landing groundfish has declined by 53 percent since FY 2001. At the same time, groundfish landings have also declined (see Table 51). The groundfish landings at each percentile of the number of permits has increased, as has the average groundfish landings per active permit. Median groundfish landings increased by 64 percent since FY 2001; at the 25th percentile the increase was even higher, at 85 percent. The top 10th percentile of landings increased by only 8 percent.

Figure 31 summarizes the cumulative distribution of groundfish landings by active limited access permit holders. While there is some year to year variability, in all years roughly half the landings were attributed to between 10 and 15 percent of the active permits. Between 70 to 75 percent of the active limited access permits accounted for only 20 percent of the landings in all years.

Table 68 – Distribution of groundfish landings by active limited access permit holders, FY 2001 - 2009

Percent of Active Permits	2001	2002	2003	2004	2005	2006	2007	2008	2009
10%	479	538	395	421	364	451	715	682	692
25%	5,628	7,064	6,218	5,214	5,731	6,043	10,041	8,594	10,419
Median	39,467	41,655	44,817	36,337	40,745	35,093	46,654	51,527	64,615
75%	133,503	121,030	125,203	121,871	122,167	99,614	122,129	155,673	164,746
90%	298,212	259,684	260,213	299,812	246,847	192,652	246,567	305,669	322,842
Average	200,796	182,120	184,993	199,642	182,447	149,288	203,040	245,394	264,572
# Permits	1024	913	872	769	702	642	576	540	477

Figure 31 – Cumulative distribution of groundfish landings by active limited access permit, FY 2001 - 2009



7.5.3.4 Effort in the Commercial Fishery

Amendment 16 management measures were expected to reduce fishing effort, either by reducing the number of DAS allocated to common pool vessels or through the increased efficiency of fishing in sectors. The amendment was targeting mortality reductions for several stocks that ranged from about 40 percent to 66 percent. For common pool vessels, DAS allocations were reduced by 50 percent from FW 42 allocations and all DAS were to be counted using a 24-hour DAS clock. Analyses in the amendment suggested sector trawl vessels would reduce effort 40 percent solely due to the increased efficiency that resulted from trip limit exemptions.

In order to get a preliminary indication whether fishing effort declined as expected, DAS/VMS trip declaration data were queried to determine the number of permits that declared the start of a multispecies trip, the number of trips, and the total time at sea (note that this is different than the DAS charged). The data was summarized by vessel size for the period May 1 – October 15 for fishing years 2008 through 2010. The data was analyzed for the fishery as a whole and was not subdivided by sector and non-sector fishing activity. Results are summarized in Table 69 for the three largest length groups. Data for vessels less than 30 feet is not reported due to data confidentiality restrictions, but these vessels account for only a fraction of fishing activity.

With respect to the number of permits that declared the start of a trip, the overall total is 41 percent lower than in FY 2008. Overall, time at sea during this period declined by 36 percent and the number of trips declined by 45 percent. For all three length groups, the number of trips declared declined in 2010 compared to 2008. The relative change by size group shows vessels 75 feet and over showing the least change since FY 2008 and vessels 50 to 75 feet showing the largest decline. Time at sea was reduced significantly for vessels between 30 and 75 feet, but increased by 6 percent for the vessels over 75 feet. The largest decline for both of these factors was for the 50 to 75 foot vessels, while least change was for the vessels 75 feet and over. Vessels in the 50 to 75 foot size group appear to be using 44 percent of the fishing effort they used in FY 2008. Average trip length remained constant for vessels in the smallest group but increased overall by 17 percent.

These results suggest that in the first six and a half months of FY 2010 overall fishing effort declined as expected by Amendment 16 analyses. Since vessel trip costs should be lower with less time at sea, when these data are combined with the revenue data (see Table 69 which shows revenues increased from 2009 to 2010) the revenues per trip available to service fixed costs may have increased. These increases only directly benefit the vessels that are still fishing. The data also suggest that the smaller length groups have had larger reductions in the number of trips than the vessels over 75 feet in length. In 2008 and 2009, the two smaller length groups accounted for 96 percent of trips and 75 to 78 percent of the time at sea during this period. In 2010 these vessels accounted for 94 percent of trips but only 64 percent of the time at sea. Vessel costs have likely increased for some sector vessels in order to pay for the leasing of ACE by sector vessels and sector administrative costs, or the leasing of DAS for common pool vessels; what is unknown is whether these increases absorb the increase in the trip margin.

Table 69 – Number of permits, trips declared, and time at sea, 2008 – 2010

May 1 – October 15					
Permits	2008	2009	2010	Change, 08-09	Change, 08-10
30 TO LESS THAN 50	295	274	170	-7%	-42%
50 TO LESS THAN 75	158	120	81	-24%	-49%
75 AND OVER	63	64	51	2%	-19%
Total	516	458	302	-11%	-41%
Trips Declared					
30 TO LESS THAN 50	9,590	10,139	5,393	6%	-44%
50 TO LESS THAN 75	2,656	1,951	1,156	-27%	-56%
75 AND OVER	462	431	441	-7%	-5%
Total	12,708	12,521	6,990	-1%	-45%
Time at Sea (not DAS charged)					
30 TO LESS THAN 50	4,813	4,536	2,704	-6%	-44%
50 TO LESS THAN 75	4,423	3,325	2,176	-25%	-51%
75 AND OVER	2,595	2,562	2,740	-1%	6%
Total	11,832	10,424	7,620	-12%	-36%
Average Trip Length					
30 TO LESS THAN 50	0.502	0.447	0.5	-11%	0%
50 TO LESS THAN 75	1.665	1.704	1.88	2%	13%
75 AND OVER	5.617	5.944	6.21	6%	11%
Total	0.931	0.832	1.09	-11%	17%

7.5.3.5 Handgear A Fishing Activity

The Handgear A fishery is a very small component of the groundfish fleet. Permits participating in the Handgear A fishery landed 0.24 percent of all groundfish in the fishery in FY 2009 (Table 53). The average length of Handgear A vessels is 28 feet. Landings and revenues for Handgear A permits were by far the greatest in Massachusetts in all years from FY 2006 through FY 2009 (Table 70). New Hampshire was the only other state with significant landings and revenues from the permit category. Pounds landed increased substantially in both states in every year from FY 2006 through FY 2009, while revenue increased in Massachusetts and decreased in New Hampshire. In Massachusetts, the fishery landed three times as many pounds of groundfish in FY 2009 as in FY 2006, and earned slightly more than twice as much revenue. In New Hampshire, FY 2009 landings were also roughly three times FY 2006 levels, but nominal revenues in FY 2009 were just slightly lower than in FY 2006.

Table 70 – Landings and revenues for Handgear A permits by landing state, FY 2006 - 2009

	FY							
	2006	2007	2008	2009	2006	2007	2008	2009
Landing State	**Live Pounds Landed**				**Nominal Revenues**			
Maine		Conf.	174			Conf.	$251	
Massachusetts	36,946	49,295	77,199	113,483	$65,191	$77,519	$101,921	$137,433
New Hampshire	3,366	3,588	9,325	4,075	$4,842	$5,846	$12,997	$4,537
Grand Total	40,312	52,883	86,698	117,558	$70,033	$83,365	$115,169	$141,970

*Other states cannot be shown due to data confidentiality restrictions. This also restricts showing data by stock.

The number of permits landing cod in the Handgear A category stayed relatively constant from FY 2006 to FY 2009. Maine had between zero and three permits, Massachusetts varied between twelve and nineteen, and New Hampshire had four to five (Table 71).

Table 71 – Handgear A permits landing cod with handline or longline (tub trawl), by landing state, FY 2006 - 2009

FY	2006	2007	2008	2009
Maine	0	1	3	0
Massachusetts	16	12	19	19
New Hampshire	4	4	4	5

Total landings and revenues, as well as groundfish landings and revenues, for Handgear A vessels in all states increased from FY 2006 to FY 2009 (Table 72). Groundfish landings in FY 2009 were 220 percent higher than in FY 2006, and groundfish revenues were 130 percent higher. The percentage of total revenues for these vessels that came from groundfish also generally increased throughout the time series, from 24 to 37 percent.

Table 72 – Total and groundfish-only landings and revenues for Handgear A vessels, FY 2006 - 2009

	FY			
	2006	**2007**	**2008**	**2009**
Total Landings (live weight)	170,588	139,761	246,034	278,595
Total Revenues	$305,507	$279,701	$456,112	$448,676
Groundfish Landings (live weight)	41,939	59,287	96,334	134,289
Groundfish Revenues	$71,801	$92,295	$133,273	$165,090
Groundfish as Percent of Total Revenues	24%	33%	29%	37%

Handgear A permits hold a relatively small percentage of ACE for all groundfish stocks, shown in Table 73. When the PSC of individual permit holders are totaled, the stock with the greatest PSC from handgear vessels is GOM cod, equaling eight-tenths of one percent of all ACE. Only GOM cod, GB cod, CC/GOM yellowtail flounder, pollock, and white hake have greater than one hundredth of one percent allocated to the handgear fishery.

Table 73 – Total PSC held by Handgear A permits for allocated groundfish stocks and 2010 ACE (in lbs.)

Stock	Handgear A PSC	2010 ACE
GOM Cod	0.00809525	79,972
GB Cod	0.00330745	20,315
GOM Haddock	0.00098190	1,866
GB Haddock	0.00025988	23,169
CC/GOM Yellowtail Flounder	0.00218393	3,751
GB Yellowtail Flounder	0.00030281	738
SNE/MA Yellowtail Flounder	0.00015930	148
Pollock	0.00248868	15,077
Redfish	0.00085822	12,953
White Hake	0.00173518	9,778
American Plaice	0.00057133	3,587
GOM Winter Flounder	0.00079898	278
GB Winter Flounder	0.00011705	478
Witch Flounder	0.00089422	1,680

*PSCs in this table are current as of September 18, 2010

7.5.3.6 Sector Fishing Activity

The widespread adoption of sectors with the implementation of Amendment 16 on May 1, 2010 was generally expected to produce changes in the fishery. While it early to know what, if any, aspects of the fishery have changed, the following tables show comparisons between the first three months of FY 2009 and FY 2010. These data were developed by NOAA's National Marine Fisheries Service (NMFS) and are the best available. Data sources for this report include: (1) Vessels via VMS; (2) Vessels via vessel logbook reports; (3) Dealers via Dealer Electronic reporting. Differences with previous reports are due to corrections made to the database.

Table 74 shows landings and revenue data for groundfish trips in the first six months of FY 2010. Note that the table only presents two years of data and thus has limited ability to demonstrate long-term changes in the fishery. The revenue data also lacks an adjustment for inflation.

Table 74 – Sector groundfish landings and revenue, 2009 – 2010 by stock (first six months, groundfish trips only)

STOCK	May 1 - October 31					
	Landings			Revenue		
	2009 (Metric Tons)	2010 (Metric Tons)	2010 as Percent of 2009 (%)	2009 ($000)	2010 ($000)	2010 as Percent of 2009 (%)
GB Cod	1,749	1,011	57.8	4,701	3,923	83.5
GOM Cod	3,185	1,984	62.3	8,048	7,881	97.9
Plaice	678	612	90.2	1,501	1,759	117.2
GB Winter Flounder	1,161	1,012	87.2	4,028	4,431	110.0
GOM Winter Flounder	81	25	30.8	271	112	41.4
SNE/MA Winter Flounder	94	37	39.8	309	172	55.6
Witch Flounder	463	264	57.1	1,915	1,513	79.0
CC/GOM Yellowtail Flounder	143	101	70.6	353	328	92.9
GB Yellowtail Flounder	557	337	60.5	1,340	1,039	77.5
SNE/MA Yellowtail Flounder	40	13	33	101	40	39.7
GB Haddock	2,499	3,892	155.8	5,504	8,960	162.8
GOM Haddock	118	103	87	253	234	92.6
White Hake	924	745	80.7	1,652	1,742	105.4
Pollock	3,455	2,069	59.9	4,624	3,978	86.0
Redfish	689	898	130.4	654	972	148.7
Northern Windowpane	17	6	34.9	23	7	30.7
Southern Windowpane	1	0	20.5	1	0	19.2
Ocean Pout	0	0	0	0	1	0.0
Halibut	6	4	64.1	58	50	85.1
Wolffish	25	0	1.1	36	1	1.5
Total	15,884	13,114	82.6	35,371	37,142	105.0

Landings in live weight
Landings include estimate of missing dealer reports
Revenue based on dealer-reported average prices for species
Source: NMFS Northeast Regional Office
Run Date: December 1, 2010

In comparing the first six months of FY 2009 and FY 2010, landings of most groundfish stocks appeared to be lower in 2010. Exceptions were GB haddock, and redfish. Revenue appeared to increase on most stocks, with the exceptions of several stocks that had significantly reduced catch limits in FY 2010 (most flounders and Atlantic wolffish, for example).

The changes in landings from FY 2009 to FY 2010 need to be interpreted in the context of the targeted catch levels (groundfish sub-ACLs) adopted by FW 44. These catch levels were set to achieve the rebuilding mortality targets of Amendment 16. The FY 2010 ACLs for six stocks are lower than the CY 2009 catches: GOM cod (ACL is 65 percent of 2009 catches), GOM winter flounder (62 percent), witch flounder (80 percent), GB yellowtail flounder (49 percent), SNE/MA yellowtail flounder (68 percent), and GB cod (97 percent). The fact that landings for these stocks are lower than the previous year is an indication that mortality targets are more likely to be met and could be interpreted as a management success. The FY 2010 ACLs for eight stocks are higher than CY 2009 catches: (GB haddock (742 percent), redfish (409 percent), pollock (211 percent), GOM haddock (157 percent), CC/GOM yellowtail flounder (128 percent), and white hake (108 percent). For two of these stocks (GB haddock and redfish) landings to date are higher than the previous year; for the others, landings to date are lower.

Table 75 - Sector groundfish landings and revenue, 2009 - 2010 by principal port (first six months, groundfish trips only)

State	May 1 - October 31					
	Groundfish Landings			Revenue		
	2009 (mt)	2010 (mt)	2010 as percent of 2009 (%)	2009 ($000)	2010 ($000)	2010 as percent of 2009 (%)
Portland, ME	1,067	1,810	169.7	1,994	3,752	188.1
Other ME	1,433	707	49.3	2,680	2,027	75.6
ME Total	2,500	2,517	100.7	4,674	5,779	123.6
Gloucester, MA	2,866	2,363	82.4	6,114	7,029	115.0
New Bedford, MA	3,350	3,293	98.3	8,882	10,427	117.4
Other MA	4,251	2,988	70.3	9,046	8,279	91.5
MA Total	10,467	8,644	82.6	24,043	25,736	107.0
New Hampshire	1,652	815	49.4	3,359	2,549	75.9
Rhode Island	786	694	88.3	2,046	1,881	92.0
Connecticut	40	4	9	108	11	10.1
New York	63	183	289.7	185	501	271.8
New Jersey	71	-	0	144	0	0.0
Other Northeast	306	257	84.1	812	685	84.3
Total	15,884	13,114	82.6	35,371	37,142	105.0

**Includes unspecified ports
Vessels indicating 2010 principal port on permit application
Landings in live weight
Landings include estimate of missing dealer reports
Revenue based on dealer-reported average prices for species
Source: NMFS Northeast Regional Office
Run Date: December 1, 2010

Vessel owners are required to designate a principal port on permit applications. This is defined as the city and state where the majority of landings occur. Landings and revenues of groundfish by sector vessels with principal ports in each New England state is shown in Table 75. Vessels with a principal port of Portland ME and New York saw the largest relative increase in landings and revenues between the beginning of FY 2009 and the beginning of FY 2010. Rhode Island stayed roughly the same between the two years, while New Hampshire saw a large decrease in landings and a smaller but substantial decrease in revenue. The Massachusetts principal ports had approximately similar or slightly fewer landings in FY 2010 than FY 2009, but revenues in those ports increased by 14 to 20 percent. Vessels with home ports in Maine outside of Portland saw approximately a 50 percent decrease in landings and a 25 percent decrease in revenues in FY 2010 over FY 2009.

Table 76 - Sector groundfish landings and revenue, 2009 – 2010 by landing port (first six months, groundfish trips only)

Landing Port of Vessel	May 1 - October 31					
	Groundfish Landings			Revenue		
	2009 (mt)	2010 (mt)	2010 as percent of 2009 (%)	2009 ($000)	2010 ($000)	2010 as percent of 2009 (%)
Portland, ME	1,493	1,033	69.2	2,781	2,582	92.9
Other ME	655	392	59.8	1,253	1,139	90.9
ME Total	2,148	1,425	66.3	4,033	3,721	92.3
Gloucester, MA	3,813	3,688	96.7	8,065	10,020	124.2
New Bedford, MA	4,180	4,366	104.4	11,005	13,259	120.5
Other MA	3,845	2,692	70	8,061	7,226	89.6
MA Total	11,839	10,746	90.8	27,130	30,504	112.4
New Hampshire	1,338	615	46	2,786	2,028	72.8
Rhode Island	504	260	51.6	1,277	709	55.6
Connecticut	9	4	41.9	27	11	40.4
New York	5	64	1,363.60	18	168	931.6
New Jersey	15	-	0	37	0	0.0
Other Northeast	26	-	0	62	0	0.0
Total	15,884	13,114	82.6	35,371	37,142	105.0

**Includes unspecified ports
Landing port if available, else principal port indicated on vessel permit application
Landings in live weight
Landings include estimate of missing dealer reports
Revenue based on dealer-reported average prices for species
Source: NMFS Northeast Regional Office
Run Date: October 1, 2010

Table 76 shows groundfish landings and revenue by sector vessels in each port of landing. New Bedford was the port with highest landings and revenues in both years. Landings and revenues in the first six months in Maine, New Hampshire, Rhode Island, and Connecticut all decreased in 2010 compared to 2009 levels. The Massachusetts landing ports fared much better, with landings increasing in New Bedford but slightly decreasing elsewhere in the state and revenues increasing in Gloucester, New Bedford, other MA ports, and in MA as a whole. Across the fishery, the landings decreased by 2.7 million pounds in FY 2010 but revenue increased five percent.

7.5.3.7 Sector ACE Transfers

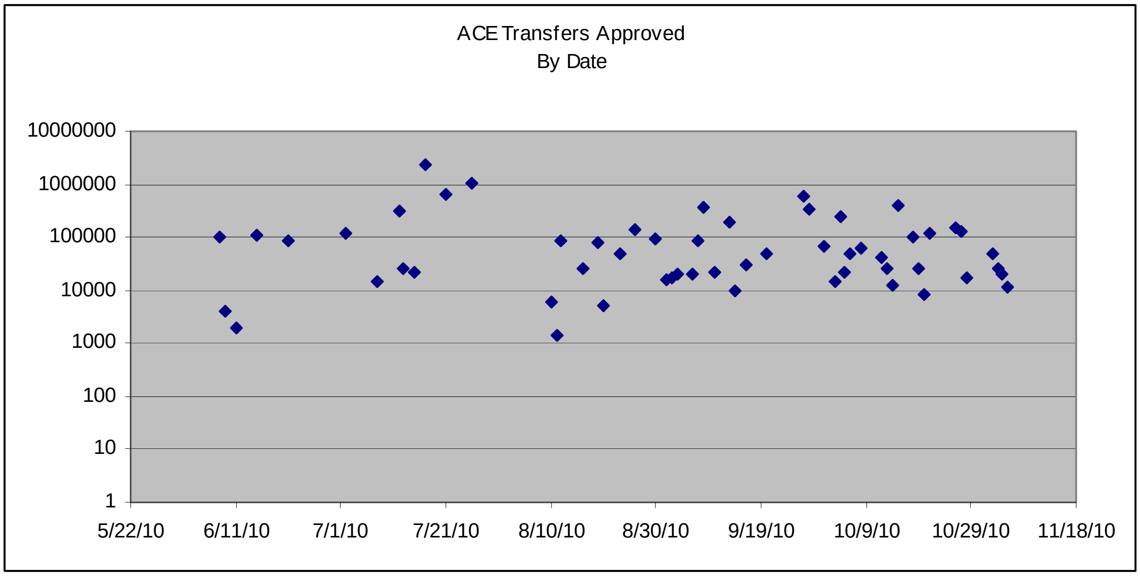
One of the features of the sector program is that sectors are allowed to transfer ACE between each other. Transfers are viewed as a business decision between sectors and there are few regulations governing their use beyond those required for reporting and approving transfers. Data confidentiality limitations prevent reporting individual transfers but this section provides a general overview of transfer activity in the first half of FY 2010.

The first transfer was approved in the first week of June, 2010, five weeks into the fishing year. Through November 5, 2010, 136 ACE transfers were completed with a total of 8.6 million pounds (3,932 mt) exchanged. After a slow start, transfers have been approved at a steady rate since early August (Figure 32) and so far there is no obvious trend in the volume of transfer activity. The average weight in a transfer was 63,745 lbs. This value is skewed by a few large transfers and the median amount in an individual transfer was 18,130 lbs. Eighty-six of the transfers involved a single stock while the remainder included from 2 to 16 stocks (note it is not clear if single stock transfers were part of an agreement that was completed on a different date). Pollock accounts for the largest weight transferred between sectors. GB cod (west), GOM haddock and GOM winter flounder are the three stocks with the largest percentage of the sector sub-ACL transferred, at between 12.7 and 18.6 percent. All of the stocks have been acquired by at least 8 different sectors.

Table 77 – ACE transfers by stock, May 1, 2010 – November 5, 2010

Stock	Pounds (live weight)	Metric Tons	Percent of Sector ACE	Number of Sectors Acquiring ACE	Average Weight Acquired (lbs.)
CC/GOM Yellowtail Flounder	161,645	73	9.1%	9	17,961
GB Cod East	41,650	19	5.8%	9	4,628
GB Cod West	1,221,430	554	18.6%	12	101,786
GB Haddock East	762,107	346	2.9%	10	76,211
GB Haddock West	1,324,150	601	2.1%	11	120,377
GB Winter Flounder	178,548	81	4.4%	9	19,839
GB Yellowtail Flounder	163,709	74	9.2%	8	20,464
GOM Cod	1,113,694	505	11.7%	10	111,369
GOM Haddock	225,845	102	12.8%	9	25,094
GOM Winter Flounder	37,416	17	12.7%	9	4,157
Plaice	324,859	147	5.4%	9	36,095
Pollock	2,228,726	1,011	6.2%	11	202,611
Redfish	235,275	107	1.6%	10	23,528
SNE/MA Yellowtail Flounder	16,391	7	3.2%	10	1,639
White Hake	485,129	220	8.8%	11	44,103
Witch Flounder	148,802	67	8.2%	9	16,534
Total	8,669,376	3,932	9.1%	9	17,961

Figure 32 – Weight of ACE transfers approved by date, FY 2010 through November 5, 2010. Note logarithmic scale for the weight transferred.



Fifteen sectors transferred ACE to another sector, but only fourteen sectors received ACE. The sectors that transferred ACE to another sector differ from the sectors that received ACE – three sectors received ACE but have not transferred any to other sectors. With one exception, all the sectors that transferred ACE completed more than one transfer. With that same exception, all of the sectors transferring ACE have transferred ACE to more than one other sector.

The average weight of ACE a sector has transferred to other sectors is 577,958 lbs. while the median is just over 96,000 lbs. The range extends from 0 (no transfers) to nearly 3 million pounds. The average weight of ACE received by a sector is 619,241 lbs. while the median is 216,434 lbs.

While it took some time for the transfer market to develop, activity has been steady since mid-August. Data on the compensation exchanged between sectors is limited and is insufficient to estimate the costs of the transfer program. It is clear from an examination of the exchanges that many transfers involve the trade of one stock for another – for example, a trade of GOM cod in exchange for GB cod. Close to half the exchanges can be easily identified as a direct exchange between two sectors because of their timing and the species and quantities exchanged. Further evidence that this is taking place is given by the fact that seven of the sectors that have transferred ACE to other sectors have kept their total ACE allocation within five percent of their original total allocation. Such exchanges indicate that the transfer market does not necessarily impose costs on all transfers. These exchanges allow a sector to trade something that may be of limited value (for example because it cannot be harvested by small vessels, or is in an area the sector does not want to fish, etc.) to another sector for something that is of greater value to the sector. Four sectors that have transferred ACE have reduced their total ACE weight by between 15 and 20 percent to date. Three sectors have increased their allocation by between 9 and 16 percent to date.

7.5.3.8 Commercial Discards

Amendment 13 (NEFMC 2003) and Amendment 16 (NEFMC 2009) summarized discards in the multispecies fishery by compiling discard estimates from assessment documents. One of the possible impacts of increased sector participation noted in Amendment 16 was a reduction in discards by vessels fishing in sectors. Conversely, FW 44 (NEFMC 2010) noted that GOM cod and pollock trip limits adopted in that action might increase discards by common pool vessels.

While the exact changes in discards will not be known until assessments are updated, NMFS does develop in-season estimates of discards for both common pool and sector fishing vessels. These in–season estimates may differ from the final values determined in future assessments since the in-season estimates are developed using only those data that are currently available. They also do not take into account the possible presence of an observer effect, where behavior on observed trips may differ from that on unobserved trips and bias the estimates. Nevertheless, they do provide an early indication of the nature of changes in discards.

Table 78 summarizes discard estimates for common-pool vessels. As a result lf various in-season actions, most stocks have trip limits that apply to common pool fishing vessels. There is a wide range in the rate of discarded to kept fish for the various stocks. For GOM cod, GB cod, GOM haddock, GB haddock, GOM winter flounder, witch flounder, white hake, and pollock have ratios of less than 20 percent. While somewhat higher than the ratios in earlier years, they are in the same range. The ratios for GB winter flounder, CC/GOM yellowtail flounder, and GB yellowtail flounder are much higher than in the past. Discards account for 15 percent of the common pool catch. Even so, the total discards from common pool vessels are about 92 mt, or less than 0.7 percent of the total commercial catch.

Table 79 summarizes discard estimates for sector vessels. Ten of the stocks have ratios less than 10 percent and with two exceptions (CC/GOM yellowtail flounder and SNE/MA yellowtail flounder) the others are 20 percent or less. In all but three instances the sector discards to kept ratios are lower than for common pool vessels. When compared to recent observed ratios based on GARM III estimates, the current sector ratio is much lower for GOM cod, GB haddock, GB cod, GB winter flounder, and GOM winter flounder. The ratios, however, are similar to previous ratios for plaice and CC/GOM yellowtail flounder. Overall, sector discards account for about 4 percent of removals by sector vessels and just fewer than 4 percent of total removals by the commercial fishery.

Table 80 summarizes in-season discard estimates for the commercial fishery. Overall, the current in-season estimates suggest discards in the commercial fishery have declined with the expansion of the sector program under Amendment 16. As noted earlier, this preliminary conclusion may be modified in the future when final estimates are developed. In-season estimates do not consider any possible observer effects. With respect to the common pool vessels, the discard rates support conclusions in past actions that trip-limit reductions tend to increase discard rates.

Table 78 – In-season discard estimates for common-pool vessels using data compiled through October 9, 2010 (Source: NMFS NERO)

	Common Pool			
STOCK	Discard (mt)	Kept (mt)	Catch (mt)	D/K %
GB Cod East	0	0	0	NA
GB Cod	1.1	10.99	12.09	10.01
GOM Cod	30.15	183.71	213.86	16.41
Plaice	9.16	20.84	30	43.95
GB Winter Flounder	2.86	5.89	8.75	48.56
GOM Winter Flounder	2.65	18.72	21.37	14.16
Witch Flounder	3.62	25.37	28.99	14.27
CC/GOM Yellowtail Flounder	18.37	13.42	31.78	136.89
GB Yellowtail Flounder	10.59	7.77	18.36	136.29
SNE/MA Yellowtail Flounder	0	1.94	1.94	0.00
GB Haddock East	0	0	0	NA
GB Haddock	0.38	91.5	91.88	0.42
GOM Haddock	0.17	5.19	5.36	3.28
White Hake	4.36	35.66	40.02	12.23
Pollock	7.58	79.04	86.62	9.59
Redfish	1.3	4.55	5.85	28.57

Table 79 - In-season discard estimates for sector vessels using data compiled through October 9, 2010

	Sectors			
STOCK	Discard (mt)	Kept (mt)	Catch (mt)	D/K %
GB Cod East	7.24	83.55	90.79	8.67
GB Cod	92.74	903.23	995.97	10.27
GOM Cod	32.1	1690.33	1722.45	1.90
Plaice	96.12	539.28	635.38	17.82
GB Winter Flounder	13.22	883.55	896.78	1.50
GOM Winter Flounder	0.6	21.58	22.19	2.78
Witch Flounder	24.94	232.03	256.98	10.75
CC/GOM Yellowtail Flounder	16.19	79.27	95.44	20.42
GB Yellowtail Flounder	37.06	326.72	363.78	11.34
SNE/MA Yellowtail Flounder	2.35	10.97	13.32	21.42
GB Haddock East	5.93	351.83	357.75	1.69
GB Haddock	28.55	3580.49	3609.06	0.80
GOM Haddock	1.36	103.5	104.86	1.31
White Hake	22.57	623.53	646.1	3.62
Pollock	38.67	1730.53	1769.19	2.23
Redfish	69.48	857.02	926.52	8.11

Table 80 – In-season discard estimates for all commercial vessels using data compiled through October 9, 2010

	Commercial			
STOCK	Discard (mt)	Kept (mt)	Catch (mt)	D/K %
GB Cod East	7.24	83.55	90.79	8.67
GB Cod	93.84	914.22	1008.06	10.26
GOM Cod	62.25	1874.04	1936.31	3.32
Plaice	105.28	560.12	665.38	18.80
GB Winter Flounder	16.08	889.44	905.53	1.81
GOM Winter Flounder	3.25	40.3	43.56	8.06
Witch Flounder	28.56	257.4	285.97	11.10
CC/GOM Yellowtail Flounder	34.56	92.69	127.22	37.29
GB Yellowtail Flounder	47.65	334.49	382.14	14.25
SNE/MA Yellowtail Flounder	2.35	12.91	15.26	18.20
GB Haddock East	5.93	351.83	357.75	1.69
GB Haddock	28.93	3671.99	3700.94	0.79
GOM Haddock	1.53	108.69	110.22	1.41
White Hake	26.93	659.19	686.12	4.09
Pollock	46.25	1809.57	1855.81	2.56
Redfish	70.78	861.57	932.37	8.22

7.5.4 Recreational Fishing Activity in the Gulf of Maine

This framework considers a GOM cod spawning protection area that proposes to change the management measures for recreational fishing in the GOM. Amendment 16 (NEFMC 2009) summarized party/charter fishing activity throughout the Northeast Region. Information from that document that is specific to the GOM and cod is repeated here.

7.5.4.1 Cod

During 2001 to 2007 the total number of cod caught in the Northeast region has ranged from a high of 2.5 million fish during 2001 to just over one million fish during 2006 (Table 81). Although cod are caught by recreational anglers in both the EEZ and in state waters, the majority are caught in the EEZ averaging 80% of all cod caught. In the EEZ total recreational catch peaked during 2005 at 1.9 million fish, but declined to less than one million fish during 2006 before rebounding to 1.2 million cod during 2007. In state waters the split between inland and other state waters varied significantly ranging from 2% of cod from inland waters during 2003 to almost 90% during 2007.

Table 81 - Number of cod caught by distance from shore (1,000's)

Year	<= 3 Mi	> 3 mi	Inland	Total	EEZ Proportion
2001	507.1	1612.5	361.9	2481.5	65.0%
2002	418.9	1316.4	51.6	1786.9	73.7%
2003	202.0	1674.5	4.0	1880.6	89.0%
2004	172.7	1284.4	95.8	1552.9	82.7%
2005	269.7	1853.4	54.9	2178.0	85.1%
2006	151.4	879.6	34.4	1065.4	82.6%
2007	32.7	1184.8	279.1	1496.6	79.2%

Although cod are caught in Gulf of Maine and Georges Bank stock areas, the proportion caught in the Gulf of Maine exceeded 90% in all years except 2004 and 2005 (Table 82). Over two million cod were caught in the Gulf of Maine by recreational anglers during 2001. The number of Gulf of Maine cod caught has been below this level since 2001, but averaged 1.7 million fish during 2002 to 2005. During 2006 the number of Gulf of Maine cod caught was a recent time series low of 932 thousand before increasing to 1.3 million fish during 2007; an increase of 43%. The percentage of harvested Golf of Maine cod averaged about 38% of total catch (recreational harvest, commercial landings and discards) from 2001 to 2004. However, the percentage of harvested Gulf of Maine cod has been declining in consecutive years since 2004 to 23% of the catch during 2007.

Table 82 - Number of cod by catch disposition and stock area

	Gulf of Maine			Georges Bank		
Year	Catch (A+B1+B2	Harvested (A+B1)	Released Alive (B2)	Catch (A+B1+B2	Harvested (A+B1)	Released Alive (B2)
2001	2,330.3	1,018.3	1,312.0	168.6	99.3	69.3
2002	1,640.6	551.4	1,089.2	146.5	93.1	53.4
2003	1,721.0	613.0	1,108.0	162.4	94.2	68.2
2004	1,427.6	531.9	895.7	245.2	130.1	115.1
2005	1,859.0	584.2	1,274.8	511.2	141.8	369.4
2006	932.4	249.7	682.7	79.4	39.6	39.8
2007	1,337.1	307.0	1,030.1	24.8	3.9	20.9

Compared to the Gulf of Maine, the overwhelming majority of Georges Bank cod were harvested by party/charter anglers (Table 83). Party/charter anglers accounted for more than 90% of harvested Georges Bank, whereas party/charter anglers averaged 25% of harvested Gulf of Maine cod in during 2001 to 2007 except for 2006 where 55% of harvested were caught by party/charter anglers.

Table 83 - Number of harvested cod by stock and mode

	Gulf of Maine		Georges Bank	
Year	Party/Charter	Private Boat	Party/Charter	Private Boat
2001	252.6	741.7	78.9	17.9
2002	92.7	437.2	56.1	34.5
2003	139.4	449.5	92.1	0.9
2004	129.5	404.0	93.7	8.2
2005	162.3	420.8	127.3	14.2
2006	121.3	100.2	38.8	0.0
2007	77.2	173.6	2.1	0.9

On average, 57% of total Gulf of Maine cod kept by party/charter anglers were caught on trips where four or fewer cod were landed (Figure 33). Note that these trips accounted for 87% of total angler trips that kept Gulf of Maine cod (Figure 34). This also means that 13% of party/charter angler trips accounted for 43% of total kept Gulf of Maine cod in the party/charter mode. At least since 2004 the possession limit on Gulf of Maine cod has been 10 cod per person. During 2004 to 2007 about 94% of Gulf of Maine cod were caught on trips that retained 10 or fewer fish. This indicates that about 6% of the cod kept on party/charter angler trips may not have been in compliance with the Federal possession limit. Note that these occasions represent a small percent (about 1%) of total trips that retained Gulf of Maine cod and may be associated with over night trips. If the latter, then possessing up to 20 cod would be legal since the bag limit is a daily limit.

Figure 33 - Cumulative percent of Gulf of Maine cod kept in the party/charter mode

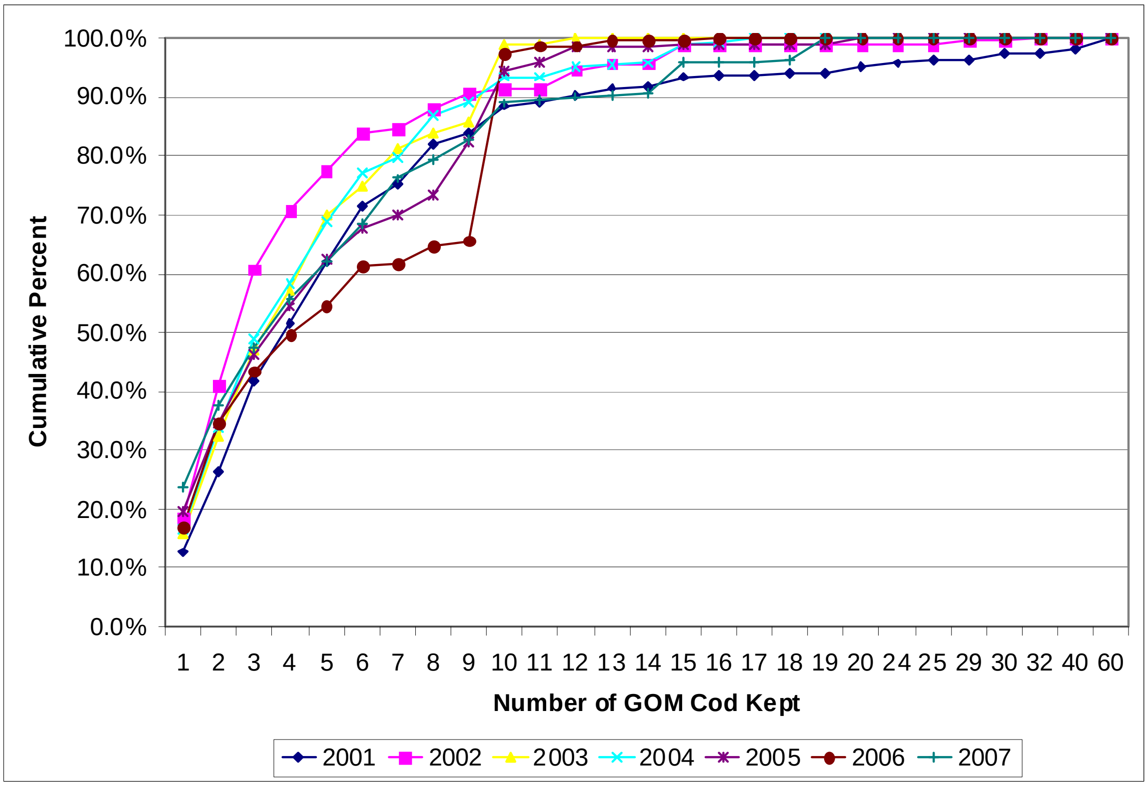
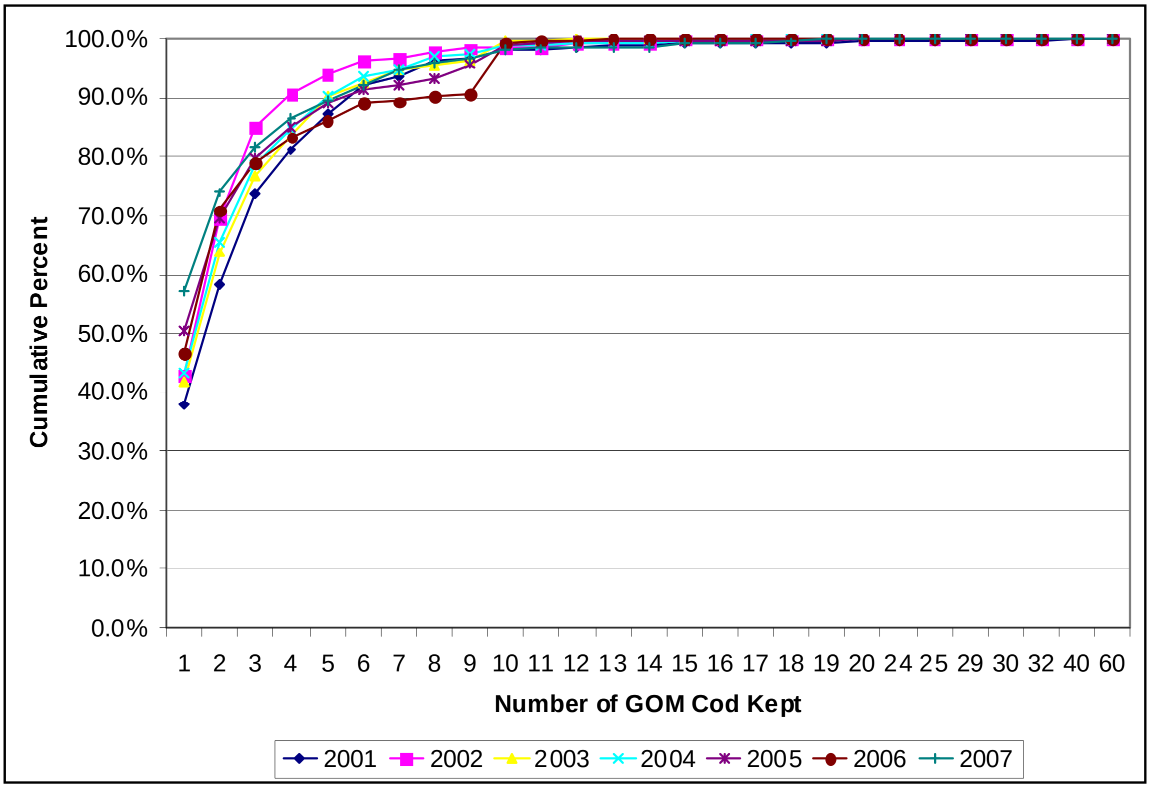
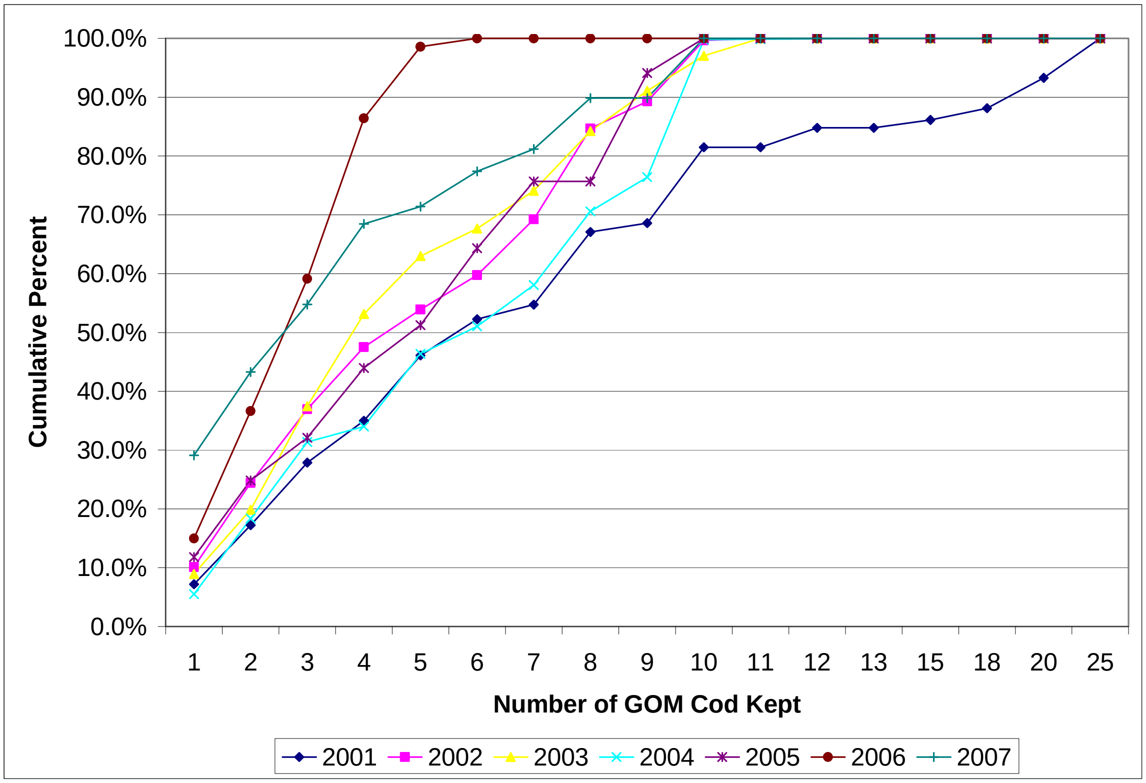


Figure 34 - Cumulative percent of party/charter angler trips that retained Gulf of Maine cod



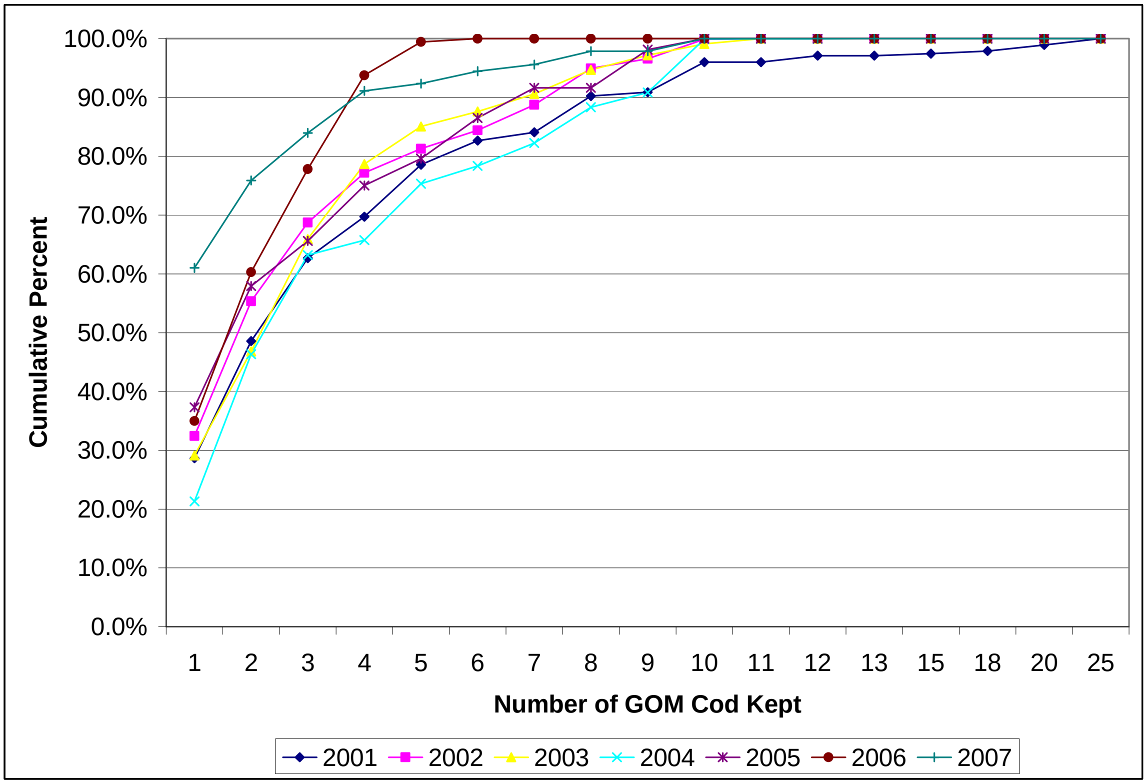
Compared to the party/charter mode, the range of retained cod by number kept per angler trip in the private boat mode was more compact, but there was substantially greater inter-annual variability in the cumulative distribution of retained Gulf of Maine cod (Figure 35). For example, during 2001 to 2007 private boat angler trips that kept five of fewer Gulf of Maine cod ranged from 46% to 98% whereas the percentage kept by party/charter anglers ranged between 55% and 77%. Also, since 2002 the number of Gulf of Maine kept by private boat anglers has been truncated at 11 cod in all but one year, and during 2005 to 2007 has been truncated at the 10 cod possession limit.

Figure 35 - Cumulative percent of kept Gulf of Maine cod private boat mode by number kept per angler trip



On average, more than half of all private boat angler trips that retained Gulf of Maine cod kept either one or two fish per trip during 2001 to 2007 (Figure 36). The cumulative distribution of private boat angler trips during 2006 and 2007 were more truncated than in other years as 92% of trips kept four or fewer cod as compared to 73% in all other years. This difference may be due to the November to March closed season implemented in 2006.

Figure 36 – Cumulative percent of private boat angler trips that retained Gulf of Maine cod



During 2001 to 2007 the number of measured cod increased from 141 during 2001 to more than 600 cod during 2003 to 2007 (Table 84). Additionally, more than 1,000 released cod were measured during 2005 to 2007 in the party mode. By contrast, the number of measured cod was just over 100 in the private boat mode during 2001 to 2003 but has dwindled to only 20 cod during 2007. For this reason the size distribution of harvested cod in the private boat mode could not be estimated. Note also that the majority of measured cod were from the Gulf of Maine a size distribution for Georges Bank cod could not be estimated.

Table 84 - Numbers of measured Atlantic cod by year and mode

YEAR	Party/Charter Kept	Private Boat Kept	Party Released
2001	141	104	
2002	343	119	
2003	647	104	
2004	901	81	
2005	774	28	1364
2006	817	20	1608
2007	681	19	1606

During 2001 to 2007 the Gulf of Maine cod size limit changed from 21-inches during 2001 to 23-inches during 2002 to 2005, and was raised again to 24-inches as part of Framework 42 during 2006. During 2001, when the size limit for Gulf of Maine cod was 21-inches, 17% of harvested cod was 20-inches or less (Figure 37). During the full calendar years over which the size limit was 23-inches (2003 to 2005) the percentage of Gulf of Maine cod below the legal size averaged

30% of total harvest. During 2006 and 2007 the percentage of cod harvested by Gulf of Maine party/charter anglers that was less than 24-inches averaged 22%.

Nearly all Gulf of Maine legal-sized cod caught by party-boat anglers are kept, as less than 1% of the released catch was above the minimum size (Figure 38). The size distribution for 2007 is suggestive of a shift toward proportionally more released cod at higher sizes. For example, about 35% of the released Gulf of Maine cod were less than 15-inches during 2005 and 2006. This also means that 65% of the released catch was greater than 15-inches. During 2007, more than 80% of the released Gulf of Maine cod were more than 15-inches. Similarly, about 10% of the released Gulf of Maine cod harvest was above 20-inches during 2005 and 2006 but was 22% of the released catch during 2007.

Figure 37- Cumulative distribution of Gulf of Maine cod party/charter mode harvest by length

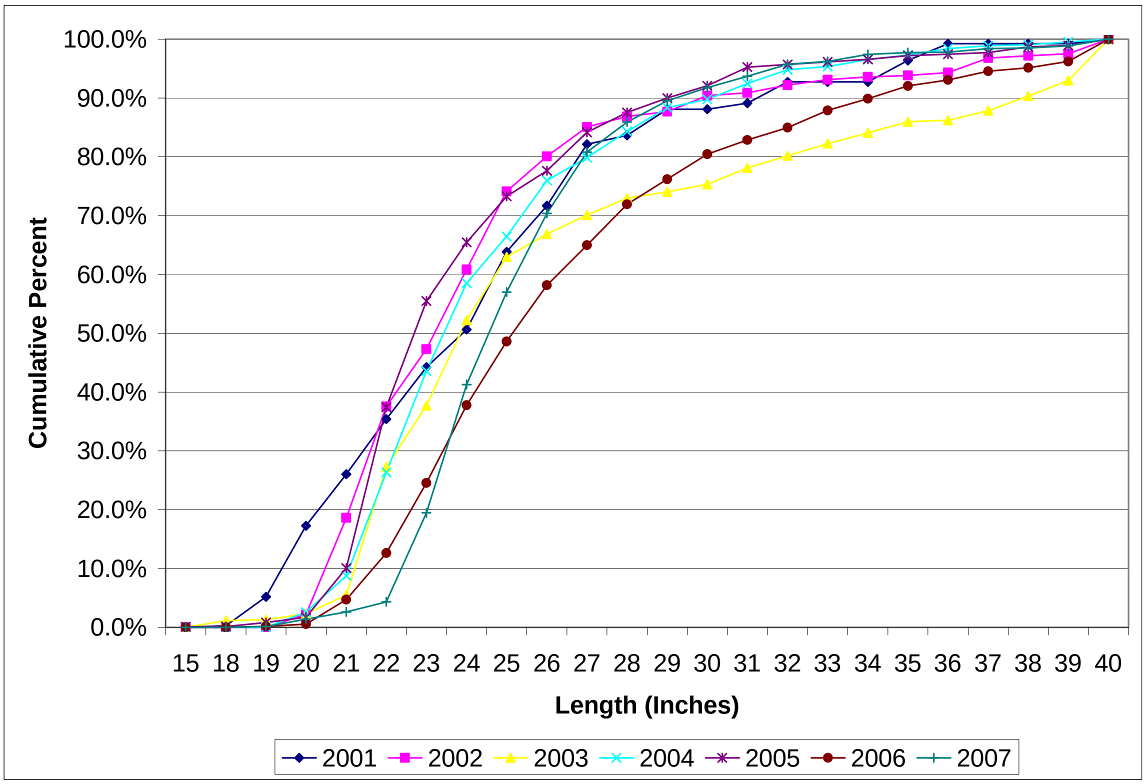
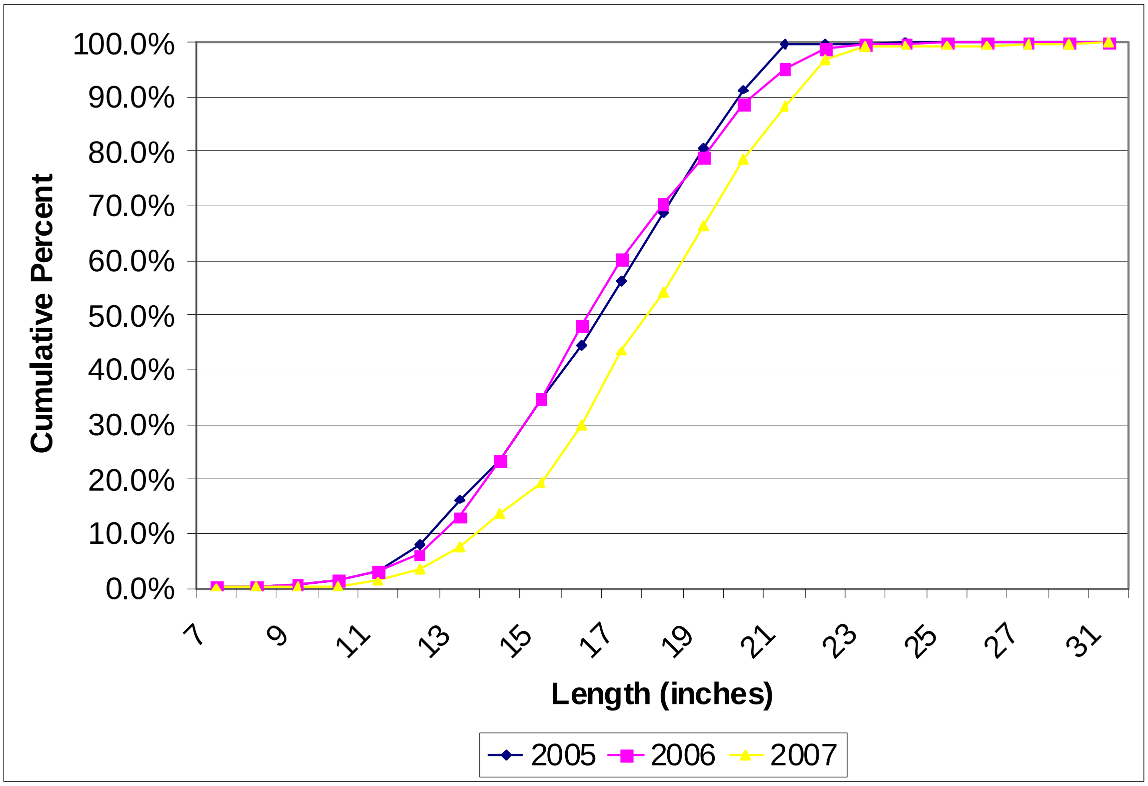


Figure 38 - Cumulative distribution of Gulf of Maine cod party mode released catch by length



The seasonal distribution of the party/charter harvest of Gulf of Maine cod differs somewhat between party/charter anglers and private boat anglers. The party/charter season begins in April peaks in May or June, but remains reasonably steady through the summer months before tapering off in October and November. Party/charter harvest averaged less than 2% of total harvest in November and less than 1% of harvest during December. Note that during November of 2006 and March 2007, party/charter harvest of Gulf of Maine cod was zero as these months have been closed to possession of cod since implementation of Framework 42.

The seasonal distribution of private boat mode harvest varied more than that of the party/charter mode (Table 85). In some years harvest peaked during spring and early summer while in others, harvest peaked during the fall. This results in somewhat of a bimodal season with highs during the spring and fall with lulls occurring during summer and winter.

Table 85 - Monthly distribution of Gulf of Maine cod harvest by mode

	2001	2002	2003	2004	2005	2006	2007
				Private Boat Mode			
Mar	0.5%	2.1%	0.0%	0.0%	0.0%	2.9%	0.0%
Apr	11.4%	21.3%	19.0%	0.3%	40.7%	5.6%	23.4%
May	21.7%	14.4%	34.4%	18.7%	21.0%	29.3%	12.0%
Jun	12.2%	4.1%	6.2%	11.8%	8.0%	4.9%	3.4%
Jul	21.1%	11.4%	15.7%	2.2%	5.7%	16.1%	6.2%
Aug	4.5%	10.1%	5.6%	2.4%	12.9%	14.6%	10.8%
Sep	5.8%	4.8%	14.8%	37.0%	3.5%	0.8%	28.7%
Oct	9.7%	8.6%	0.4%	4.7%	0.5%	25.8%	2.1%
Nov	11.4%	19.9%	2.7%	17.4%	7.9%	0.0%	13.5%
Dec	1.8%	3.4%	1.1%	5.6%	0.0%	0.0%	0.0%
				Party/Charter Mode			
Mar	0.0%	6.1%	0.0%	0.8%	1.9%	12.4%	0.0%
Apr	0.8%	7.5%	4.6%	8.4%	28.4%	26.1%	15.4%
May	19.6%	16.5%	37.1%	25.5%	17.6%	9.2%	29.0%
Jun	4.7%	17.7%	11.6%	14.1%	16.3%	27.7%	14.1%
Jul	34.8%	7.7%	8.4%	7.7%	11.2%	9.0%	17.5%
Aug	6.1%	11.3%	6.8%	17.3%	11.6%	7.9%	6.4%
Sep	16.3%	18.7%	17.8%	14.9%	5.2%	6.0%	15.3%
Oct	16.4%	11.5%	9.5%	5.8%	5.8%	1.7%	2.4%
Nov	1.4%	1.4%	4.4%	4.5%	1.7%	0.0%	0.0%
Dec	0.0%	1.7%	0.0%	0.9%	0.3%	0.0%	0.0%

7.5.4.2 Party/Charter Activity

The number of vessels reporting retaining any groundfish through the VTR ranged from 251 to 299 during FY 2001-2007 (Table 86). These vessels include individuals that hold an open access multispecies party/charter permit as well as limited access vessels that carry passengers for hire. The number of participating vessels declined in consecutive years from 283 operators during FY 2003 to 259 operators during FY2006 before increasing to 269 vessels during FY 2007. The number of trips retaining groundfish and number of passengers carried on those trips were highest during FY 2001. However, even as the number of trips and passengers fluctuated over time the number of trips taken per vessel was nearly constant at about 20 trips. Likewise the number of passengers per trip did not vary very much.

Table 86 - Summary of party/charter operations

Fishing Year	Number of Reporting Vessels	Number of Groundfish Trips	Number of Anglers	Anglers per Trip	Trips per Vessel
2001	299	5,898	136,748	23.2	19.7
2002	251	5,106	108,034	21.2	20.3
2003	283	5,475	119,520	21.8	19.3
2004	277	5,710	119,612	20.9	20.6
2005	265	5,768	115,737	20.1	21.8
2006	259	5,133	102,759	20.0	19.8
2007	269	5,622	109,734	19.5	20.9

The number of party/charter operators taking passengers for hire on groundfish trips dropped by 48 permits from FY 2001 to FY 2002, but increased by 38 permit holders from FY 2002 to FY 2003. During FY 2004 – FY 2007 the annual change in number of operating units ranged between +10 to -6. Embedded in these changes is a mixture of vessels that have operated continuously for multiple years and others that have operated on an intermittent basis.

Party/charter vessels may offer a mix of recreational trips that target groundfish and trips that do not. Since party/charter revenues are directly linked to passengers, dependence on groundfish was based on the proportion of passengers carried when groundfish were retained to total passengers carried. Of the party/charter operators that took at least one groundfish trip, the distribution of dependence exhibits a bimodal pattern where approximately three quarters of all vessels either relied on groundfish for more than 90% of passengers or relied on groundfish for 20% or less (Table 87). That is, about 35% of party/charter vessels taking at least one groundfish trip relied on groundfish for over 90% of total passengers. Approximately 40% of party/charter operators relied on groundfish for 20% of less of total passenger load.

The bimodal distribution of groundfish dependence is at least in part explained by area fished. On average, 82% of party/charter vessels took passengers for hire exclusively in the Gulf of Maine (48%) or in the Southern New England/Mid-Atlantic (34%) (Table 88). Of the vessels fishing exclusively in the Gulf of Maine more than 60% relied on groundfish for more than 90% of passengers (Table 89). By contrast, 87% of party/charter vessels fishing exclusively in the SNEMA area relied on groundfish for 20% or less of total passengers carried during the fishing year.

Table 87 - Dependence on groundfish trips

	2001	2002	2003	2004	2005	2006	2007
<= 10%	102	81	95	90	70	75	76
> 10% <= 20%	22	25	22	24	24	22	31
> 20% <= 30%	11	8	14	10	9	5	13
> 30% <= 40%	13	6	9	12	13	11	14
> 40% <= 50%	10	8	6	9	11	11	9
> 50% <= 60%	10	6	6	8	13	14	11
> 60% <= 70%	10	9	8	13	11	11	6
> 70% <= 80%	10	6	6	8	11	2	6
> 80% <= 90%	7	11	8	11	7	9	8
> 90%	104	91	109	92	96	99	95
<= 10%	34.1%	32.3%	33.6%	32.5%	26.4%	29.0%	28.3%
> 10% <= 20%	7.4%	10.0%	7.8%	8.7%	9.1%	8.5%	11.5%
> 20% <= 30%	3.7%	3.2%	4.9%	3.6%	3.4%	1.9%	4.8%
> 30% <= 40%	4.3%	2.4%	3.2%	4.3%	4.9%	4.2%	5.2%
> 40% <= 50%	3.3%	3.2%	2.1%	3.2%	4.2%	4.2%	3.3%
> 50% <= 60%	3.3%	2.4%	2.1%	2.9%	4.9%	5.4%	4.1%
> 60% <= 70%	3.3%	3.6%	2.8%	4.7%	4.2%	4.2%	2.2%
> 70% <= 80%	3.3%	2.4%	2.1%	2.9%	4.2%	0.8%	2.2%
> 80% <= 90%	2.3%	4.4%	2.8%	4.0%	2.6%	3.5%	3.0%
> 90%	34.8%	36.3%	38.5%	33.2%	36.2%	38.2%	35.3%

Table 88 - Stock area combinations fished by party/charter vessels by fishing year

Fishing Year	GOM Only	GB Only	SNEMA Only	GOM & GB	GB & SNEMA	GOM & SNEMA	All Areas
2001	131	10	121	10	8	11	8
2002	123	4	85	12	11	12	4
2003	132	1	104	13	12	16	5
2004	126	4	87	15	11	27	7
2005	137	2	81	13	7	16	9
2006	134	2	76	11	8	20	8
2007	133	0	103	4	6	16	7

Table 89 - Dependence on groundfish for vessels fishing exclusively in GOM or SNEMA

	GOM Only			SNEMA Only		
Fishing Year	GF Depend <= 20%	GF Depend > 20% < 90%	GF Depend >= 90%	GF Depend <= 20%	GF Depend > 20% < 90%	GF Depend >= 90%
2001	4.6%	29.8%	65.6%	85%	14.0%	0.8%
2002	8.1%	29.3%	62.6%	91%	9.4%	0.0%
2003	5.3%	25.8%	68.9%	88%	6.7%	4.8%
2004	9.5%	30.2%	60.3%	92%	6.9%	1.1%
2005	6.6%	33.6%	59.9%	84%	13.6%	2.5%
2006	9.0%	30.6%	60.4%	86%	10.5%	3.9%
2007	8.3%	28.6%	63.2%	83%	12.6%	4.9%
Average	7%	30%	63%	87%	11%	3%

The majority (approximately 85%) of party/charter groundfish trips took place in the Gulf of Maine (Table 90). These trips also accounted for about 86% of passengers on board party/charter trips that landed groundfish. The number of trips and passengers on groundfish trips in the Gulf of Maine fell during FY 2006 compared to FY 2003 - FY 2005. This reduction may have been associated with Framework 42 measures that implemented a closed season and raised the cod size limit. During FY 2006 the number of Gulf of Maine groundfish trips was down 5.4% compared to the FY 2003 - FY 2005 average and the number of passengers was down 10.2%. Both trips and number of passengers rose in FY 2007 compared to FY 2006 and while the number of Gulf of Maine groundfish trips was 1.1% higher compared to the FY 2003 - FY 2005 average, the number of passengers was still down by 7.8%.

Table 90 - Summary of party/charter vessels groundfish trips and passengers by fishing year and stock area

Fishing Year	Number of Reporting Vessels	Number of Groundfish Trips	Number of Anglers	Anglers per Trip	Trips per Vessel
			Gulf of Maine		
2001	153	4,786	11,4081	23.8	31.3
2002	146	4,456	9,6261	21.6	30.5
2003	164	4,534	10,1104	22.3	27.6
2004	165	4,823	10,3361	21.4	29.2
2005	171	4,861	9,673	19.9	28.4
2006	168	4,484	9,020	20.1	26.7
2007	157	4,792	9,256	19.3	30.5
			Georges Bank		
2001	32	103	1,273	12.4	3.2
2002	30	82	1,022	12.5	2.7
2003	23	104	1,811	17.4	4.5
2004	26	108	1,955	18.1	4.2
2005	25	110	1,805	16.4	4.4
2006	21	113	2,415	21.4	5.4
2007	14	37	808	21.8	2.6
			Southern New England/Mid-Atlantic		
2001	134	1,009	21,394	21.2	7.5
2002	97	568	10,751	18.9	5.9
2003	112	837	16,605	19.8	7.5
2004	117	779	14,296	18.4	6.7
2005	98	807	17,202	21.3	8.2
2006	98	536	10,142	18.9	5.5
2007	120	793	16,267	20.5	6.6

7.5.5 General Category Scallop Fishery

Table 92 through Table 94 describes general category landings by gear type. These tables are generated by VTR data and since not all VTR records include gear information, the number of vessels in these tables will differ from other tables that summarize general category vessels and landings from dealer data. Primary gear is defined as the gear used to land more than 50% of scallop pounds. Most general category effort is and has been from vessels using scallop dredge and other trawl gear (Table 93). The number of vessels using scallop trawl gear increased through 2006 but has declined in recent years. In terms of landings, most scallop landings under general category are with dredge gear (Table 93), with significant amounts also landed by scallop trawls and other trawls. Table 94 shows the percent of general category landings by primary gear and year. The percentages of scallop landings with other trawl gear in 2008 and 2009 were the highest they have been since 2001, but still significantly less than dredge.

Table 91 - Active scallop vessels by permit category by fish year (Dealer data, nominal values)

Permit Plan	Data	2004	2005	2006	2007	2008
General Category	Number of vessels	432	619	661	495	459
	Scallop pounds per vessel	6,553	11,493	10,439	10,026	10,621
	Average scallop revenue per vessel	34,043	88,071	69,181	65,190	72,077
	Average total revenue per vessel (?)	249,167	260,942	250,752		135,378
	Total scallop landings	2,831,030	7,113,906	6,900,329	4,963,101	4,545,828
	Total scallop revenue	14,706,711	54,515,676	45,728,570	32,268,982	30,849,009
	Ex-vessel price ($)	5.6	7.7	6.7	6.5	6.8

Table 92 - Number of general category vessels by primary gear and fishing year

FISHING YEAR	DREDGE, OTHER	DREDGE, SCALLOP	MISC	TRAWL, OTHER	TRAWL, SCALLOP
1994	*	33	4	42	*
1995	4	91	5	48	4
1996	7	101	13	49	*
1997	6	118	9	55	UNK
1998	10	100	8	52	*
1999	10	87	3	61	5
2000	7	78	9	91	3
2001	4	122	7	118	6
2002	3	147	3	104	9
2003	6	155	2	116	17
2004	8	217	10	183	35
2005	26	280	3	183	60
2006	29	366	9	159	65
2007	26	280	4	125	30
2008	9	129	5	66	21
2009	8	117	*	53	22

** indicates 3 or less vessels*
UNK - value unknown

Table 93 - General category scallop landings by primary gear (in lbs.)

FISHING YEAR	DREDGE, OTHER	DREDGE, SCALLOP	MISC	TRAWL, OTHER	TRAWL, SCALLOP
1994	111	144,139	260	9,564	2,601
1995	4,812	501,910	1,146	43,585	11,797
1996	1,352	578,884	3,314	19,460	1,644
1997	3,253	682,270	3,465	30,227	*
1998	6,049	334,930	2,443	19,677	3,750
1999	18,322	236,482	599	17,537	3,970
2000	6,446	303,168	1,411	173,827	8,179
2001	91,939	1,254,153	6,518	404,709	28,276
2002	21,888	1,266,144	919	74,686	41,977
2003	22,614	1,590,575	484	171,511	196,376
2004	36,260	2,624,753	2,259	487,620	373,980
2005	198,736	4,934,735	1,441	744,027	892,154
2006	198,400	5,607,142	8,386	418,708	599,508
2007	142,044	4,517,800	724	226,131	395,683
2008	87,186	2,593,870	1,502	528,252	287,362
2009	63,368	1,940,047	400	574,555	211,598

** value unknown*

Table 94 - Percentage of general category scallop landings by primary gear

FISHING YEAR	DREDGE, OTHER	DREDGE, SCALLOP	MISC	TRAWL, OTHER	TRAWL, SCALLOP
1994	0.07%	92.00%	0.17%	6.10%	1.66%
1995	0.85%	89.11%	0.20%	7.74%	2.09%
1996	0.22%	95.74%	0.55%	3.22%	0.27%
1997	0.45%	94.86%	0.48%	4.20%	*
1998	1.65%	91.30%	0.67%	5.36%	1.02%
1999	6.62%	85.40%	0.22%	6.33%	1.43%
2000	1.31%	61.49%	0.29%	35.26%	1.66%
2001	5.15%	70.24%	0.37%	22.67%	1.58%
2002	1.56%	90.08%	0.07%	5.31%	2.99%
2003	1.14%	80.27%	0.02%	8.66%	9.91%
2004	1.03%	74.46%	0.06%	13.83%	10.61%
2005	2.94%	72.88%	0.02%	10.99%	13.18%
2006	2.90%	82.07%	0.12%	6.13%	8.77%
2007	2.69%	85.53%	0.01%	4.28%	7.49%
2008	2.49%	74.15%	0.04%	15.10%	8.21%
2009	2.27%	69.54%	0.01%	20.59%	7.58%

** value unknown*

Since 2001, there has been considerable growth in fishing effort and landings by vessels with general category permits, primarily as a result of resource recovery and higher scallop prices (Table 95). This additional effort was likely a contributing factor to why the scallop FMP has been exceeding the fishing mortality targets.

Table 95 - General category permits before and after Amendment 11 implementation

FY	Number of active general category vessels	General category scallop landings (million lb.)	% share of general category landings in total scallop landings
1994	202	0.17	1.0%
1995	199	0.13	0.8%
1996	244	0.24	1.4%
1997	261	0.38	2.7%
1998	227	0.18	1.5%
1999	202	0.16	0.7%
2000	212	0.37	1.1%
2001	290	1.58	3.3%
2002	315	1.11	2.2%
2003	348	1.95	3.4%
2004	433	3.16	4.9%
2005	611	7.40	13.5%
2006	661	6.90	12.0%
2007	495	4.96	8.8%

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8.0 ENVIRONMENTAL CONSEQUENCES – ANALYSIS OF IMPACTS OF THE PROPOSED ACTION

The following sections provide analysis to describe the estimated impacts of the Proposed Action. In order to facilitate tracking measures in this final document with those considered by the Council as the action was developed, the measures are identified by the same option numbers used during the Council discussions. In the NEPA context, all of these proposed measures are preferred alternatives. In the descriptions of the measures and the analyses of their impacts, the use of the verb "will" rather than "would" does not mean mean that NOAA/NMFS already determined these measures are consistent with the M-S Act and has appoved their implementation.

In addition to the impact categories detailed below (biological, EFH, protected resources, economic, and social), there is on historic wreck in the affected area (the *Portland*). Vessels fishing under this FMP would typically avoid this area of the ocean bottom and, therefore, the Proposed Action would not have any adverse affect on the wreck of the *Portland*.

8.1 Biological Impacts

Biological impacts discussed below focus on expected changes in fishing mortality. Impacts on habitat and endangered or threatened species are discussed in separate sections. Impacts of the Proposed Action are discussed in relation to impacts on regulated groundfish, other species, and bycatch (as defined by the M-S Act).

8.1.1 Updates to Status Determination Criteria, Formal Rebuilding Programs, and Annual Catch Limits

8.1.1.1 Revised Status Determination Criteria

Option 2: Revised Status Determination Criteria for Pollock

This option adopts the SDC recommended by SAW 50 (NEFSC 2010). Using these criteria, the stock is not overfished and overfishing is not occurring. The stock is estimated to be above SSB_{MSY} and as a result a formal rebuilding program is no longer required. Catches can increase above recent levels and well above the catches proposed in FW 44 using the No Action SDC and a formal rebuilding program. The impacts of increased catches will be described in a subsequent section. When compared to No Action, this option results in a different stock status as a result of using the best available scientific information.

By adopting the revised criteria management of this stock will be based on a more complete assessment than the index-based assessment used previously. While the most noticeable change is that catches will increase in the short-term, over the long-term the use of an analytic assessment should lead to a better understanding of the resource and a more accurate determination of sustainable catch levels.

This option uses the best available science and as a result is consistent with the M-S Act and National Standard 2.

Impacts on Other Species
Adopting revise SDC for pollock is primarily an administrative measure and is unlikely to have direct impacts on other groundfish species or non-groundfish species. Any impacts are unlikely to differ from No Action. There may be indirect impacts that result from increasing pollock catches; these will be discussed in the analysis of new ACLs (section 8.1.1.3).

8.1.1.2 Revised GB Yellowtail Flounder Rebuilding Mortality Targets

For stocks such as GB yellowtail flounder with an age-based analytic assessment, the impacts on stock size of different rebuilding strategies can be estimated using short-term projections. These projections estimate median stock size expected if the target fishing mortality rate is achieved, and also indicate the uncertainty of the estimate by providing a distribution of the results by allowing some inputs to vary. The primary inputs varied in the projection to characterize the uncertainty are initial stock numbers at age and recruitment. The projection results do not incorporate other sources of uncertainty. While these projections are based on the scientific advice of the GARM III and TRAC panels, the SSC, and the Groundfish Plan Development Team, projections are subject to uncertainty and future stock size may differ from the trajectories illustrated here.

One nuance of the projections is worth noting. Groundfish stocks are assessed on a calendar year basis, yet the FMP's specifications are set for the fishing year (May 1 – April 30). This difference is not considered in the following analyses because a method has not been developed to reconcile this difference.

Option 2A: Revised Rebuilding Target for GB Yellowtail Flounder

Since recent assessments indicate the stock will not rebuild by 2014 in the absence of all fishing mortality, an alternative rebuilding strategy was selected for this measure. This option targets a rebuilding at a slower pace than under the No Action alternative. Stock size will be smaller when compared to No Action until the ending date of rebuilding, and fishing mortality will be higher. The sub-option selected is:

> Sub-option A: Use a fishing mortality target that is calculated to rebuild the stock by 2016 with a 50 percent probability of success

This sub-option extends the rebuilding period to 2016. Since the rebuilding program was initiated in 2006, this is the final year of a ten-year rebuilding program that meets M-S Act requirements. While this sub-option rebuilds more slowly than the No Action alternative, rebuilding will still occur by 2016 in accordance with M-S Act requirements.

The success of the rebuilding strategy is contingent not only on the control of fishing mortality but on other factors beyond the control of management. The projections use an assumption on future recruitment - that is, the number of Age 1 fish that enter the population in each year. The projections sample from the observed distribution of recruitment from 1963 – 2009 with a two-stage approach: when stock size is below 5,000 mt, samples are only taken from the recruitment at lower stock sizes. This recruitment stream averages about 24.6 million fish. This is the same recruitment stream used to develop the biomass target. Since 1983, the observed recruitment averaged only 14.1 million fish. If future recruitment is at this lower average, the stock will not rebuild as indicated in these projections and has only a 5 percent probability of rebuilding by 2020 (TRAC 2010). But if this recruitment stream continues, the recruitment assumption used to estimate the biomass target can be questioned and the biomass target might be re-estimated using a different recruitment assumption (Cadrin, pers. comm., 2010).

The impacts of different recruitment assumptions on rebuilding success and catch advice are not obvious. These types of analyses (e.g. specification of status determination criteria, examination of recruitment assumptions, etc.) are typically performed at benchmark assessments and are subject to peer review before incorporation into management. For this reason only a cursory examination of these issues was attempted for this document. A simple exploration was conducted using two alternative recruitment scenarios. The two scenarios used the time periods 1973-2009 and 1983-2009 in a projection using the TRAC results. No other conditions were changed, and a two-stage re-sampling of the recruitment stream was used. The results showed that as expected the estimate of SSB_{MSY} declined in both scenarios with the result that rebuilding probability increased in the short term. But with the reduced recruitment streams SSB does not increase as rapidly, MSY is lower, and future catches are not as high as those produced by the current assessment and projections.

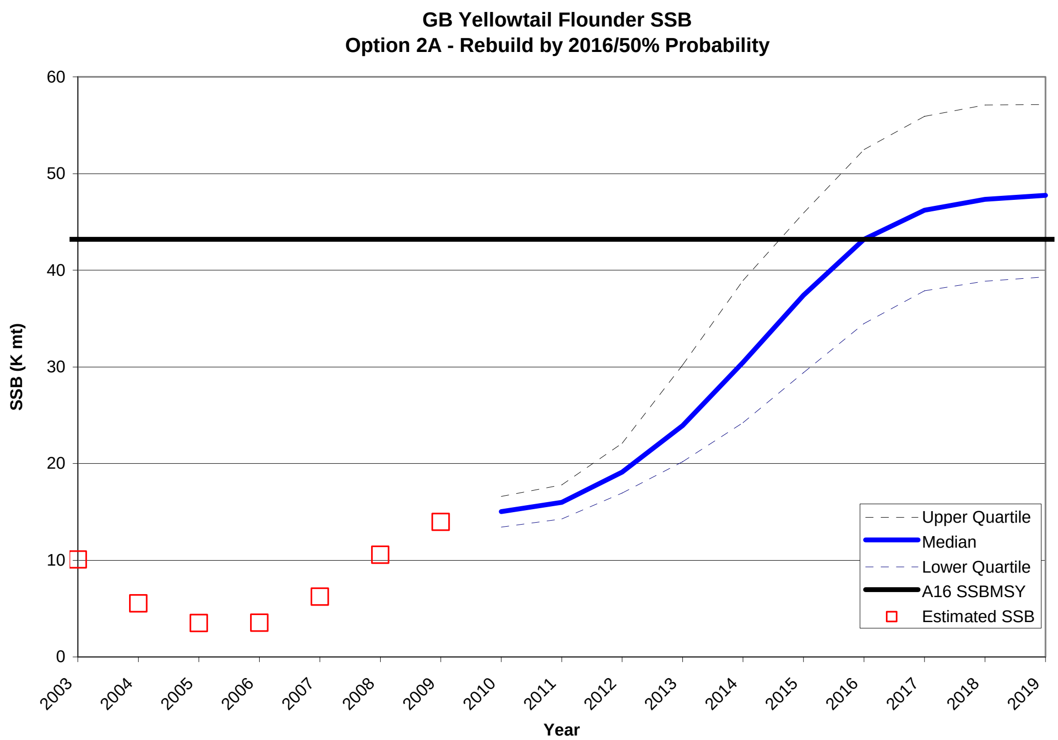
The 2010 assessment (TRAC, 2010) also addressed the impacts on rebuilding success of the retrospective pattern observed in the assessment. The retrospective pattern introduces additional uncertainty over rebuilding success. These projections do not account for this pattern. The Council's SSC reviewed the assessment and stated that "The inconsistency in estimates of recent stock size primarily results from over-estimating the abundance of the 2005 year-class." They did not adjust catch advice based on rebuilding scenarios for this pattern.

Estimates for the rebuilding fishing mortality needed to meet the strategy based on current projections are provided in Table 96. These values may change in future years if stock conditions differ from the projection results. Spawning stock biomass trajectories for this rebuilding strategy is shown in the following figures.

Table 96 – Target fishing mortality rates (current estimates) for proposed GB yellowtail flounder rebuilding strategy

Option Name	Ending Year/Probability	Rebuilding Mortality Estimate
Option 2A	2016/50%	0.138

Figure 39 – Option 2A – GB yellowtail flounder rebuilding strategy (2016/50%)



Impacts on Other Species
Changing the GB yellowtail flounder rebuilding strategy is unlikely to have direct impacts on groundfish or other species. Any impacts are unlikely to differ from No Action. There may be indirect impacts that result from increasing GB yellowtail flounder catches by extending the rebuilding period; these will be discussed in the analysis of new ACLs (section 8.1.1.3).

8.1.1.3 Annual Catch Limit Specifications

Option 2: Revised Annual Catch Limits for Modified Stocks

GB Cod
The total ABC for Option 2 does not differ from that for the No Action alternative. As a result, stock size and fishing mortality under this option are not expected to differ from that described under the No Action alternative. The rebuilding trajectory would be as shown in Figure 48.

The distribution of the ABC does differ from the No Action alternative. This is because the TACs proposed for the U.S./Canada area for 2011 are known and have been incorporated into the table. The reduced cod TAC for the U.S./Canada area (see section 4.1.4) results in a shift of available catch from the eastern area to the western area. It is unknown whether this will have biological impacts on the cod stock. It is possible that catching more fish on the western component of the stock may have unexpected effects on rebuilding.

GB Haddock
The total ABC for Option 2 does not differ from that for the No Action alternative. As a result, stock size and fishing mortality under this option are not expected to differ from that described under the No Action alternative. The rebuilding trajectory would be as shown in Figure 49.

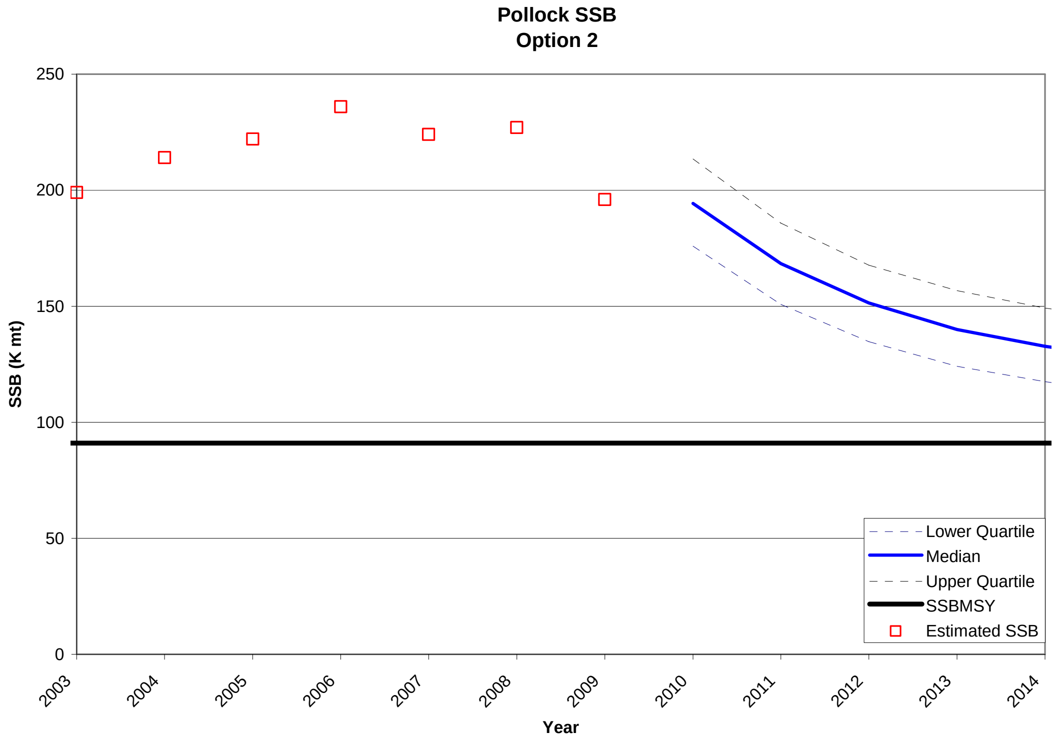
The distribution of the ABC does differ from the No Action alternative. This is because the TACs proposed for the U.S./Canada area for 2011 are known and have been incorporated into the table. This is not as much a concern for this stock since it is estimated to be above SSB_{MSY}.

GB Yellowtail Flounder
The options for revised OFLs/ABCs/ACLs included five sub-options for GB yellowtail flounder (the No Action rebuilding strategy and four sub-Options A-D). Each option results from a specific rebuilding strategy that was being considered. All of the options incorporated the TMGC recommendation for the allocation of GB yellowtail flounder to U.S. and Canadian fishermen.

The ABCs for all of the options are the result of a specific rebuilding strategy. Expected stock size trajectories and fishing mortality for the Proposed Action are described in Section 8.1.1.2. The Proposed Action allows higher catches than the No Action ACL alternative and would result in lower stock size and higher fishing mortality. The other three alternatives would result in lower catches, lower fishing mortality, and higher stock size than the No Action ACL alternative.

Pollock
This option adjusts the pollock specifications based on the updated pollock assessment that resulted from SAW-50. All specifications are based on new estimates of stock size and status determination criteria. The ABC is calculated at a fishing mortality that is 75 percent of F_{MSY}. The expected fishing mortality resulting from the catch is 0.31, and there is less than a 10 percent probability of overfishing in any single year between 2011 and 2014. The stock size trajectory is shown in Figure 40. Because the stock is estimated to be well above SSB_{MSY}, stock size will decline. Since the catch under this option is higher than under the No Action alternative, stock size will decline more than under No Action and fishing mortality will be higher. Even so, under this option the stock is not expected to be overfished (stock size is unlikely to be below SSB_{MSY}) and overfishing is not likely to occur.

Figure 40 – Option 2 pollock SSB trajectory



As stated earlier, the projections do not capture all the uncertainty in the assessment. In the case of pollock this is an issue because this is the first analytic assessment that was completed in over twelve years. One source of uncertainty in the assessment highlighted by assessment reviewers is the selectivity in the survey and the fishery: "The ASAP model with dome-shaped survey and fishery selectivity implies the existence of a large biomass (35 – 70% of total) (i.e. cryptic biomass) that neither current surveys nor the fishery can confirm" (NEFSC 2010). Further the review panel advised "The projections of stock biomass are appropriate if the survey and fishery selectivity assumptions are true. However, density dependent influences on recruitment could become an issue if flat-topped survey selectivity is true but a domed selectivity was used to undertake the projections…The Panel recommends that it would be useful when making stock projections to more explicitly formulate the consequences to the pollock stock of different model assumptions in a decision table similar to that employed in risk assessment." (O'Boyle, pers. comm.)

At the assessment meeting a sensitivity run was performed that assumed flat-topped selectivity in the survey, but continues to use dome-shaped selectivity in the fishery. This reduces current stock size estimates by about 30 percent. This model formulation can be used to explore the impact of the selectivity assumption on the probability of overfishing and the probability of being overfished. *It is important to note this is not the model formulation accepted by the review panel.* Nor does this model account for all elements of model uncertainty; for example, it does not incorporate flat-topped selectivity in the fishery. But it does provide some indication of the effects of the dome-shaped selectivity pattern on catches and future stock size.

When evaluating the consequences of different model assumptions, an important issue is how long an incorrect assumption would guide catch advice before an error was detected and could be corrected. Presumably this would not occur until the next benchmark assessment for the stock. While the next pollock assessment has not been scheduled, it is reasonable to assume that it will not be conducted until at least 2015. The following sensitivity analyses assume that an incorrect assumption on model structure guides catch advice through 2015 and then is corrected. This is longer than the period for the proposed OFLs/ABCs/ACLs, which will be revisited in 2013.

Another issue is what metric to use for determining if the stock is overfished and if overfishing is occurring under a particular model formulation. The two different formulations produce different estimates of F_{MSY} and SSB_{MSY}. The value of F_{MSY} for the flat-topped formulation, at F=0.39, is lower than the F_{MSY} =0.41 of the accepted model, and SSB_{MSY} is reduced to 58K mt. The following tables indicate the metric used. "Dome SSB_{MSY}" refers to the value estimated by the approved assessment model, or 91K mt. "Flat SSB_{MSY}" refers to the value estimated by the flat-topped survey selectivity formulation, or 58K mt.

The sensitivity runs used the proposed ABCs in a projection based on the flat-topped survey selectivity assessment. Results are summarized in Table 97. The results indicate that overfishing is likely to occur, but the stock is not likely to be overfished during the period 2011 – 2015 when compared to the SSB_{MSY} estimate from the flat-topped survey selectivity assessment.

The results can be summarized in a table that compares the risk of overfishing and being overfished between 2011 -2015 under the different catch scenarios. While O'Boyle (2010, pers. comm.) suggests there are four possible scenarios to consider, when applied to the risks associated with a catch stream the results collapse into two possibilities for the model formulations examined. This is because the model formulations are mutually exclusive. Either the dome shaped selectivity is correct (true), or it is incorrect (false) and the flat-topped selectivity model more accurately represents stock status. Table 98 summarizes the risks for the two model formulations. The table is somewhat misleading because this evaluation of risk does not consider the likelihood a particular model is correct. The table implies the two models are equally probable. Clearly this is not the case since only one model was accepted by reviewers.

If the dome shaped selectivity is true, there is little risk of overfishing or being overfished through 2015 under the proposed ABCs. If the dome is false, the option 2 ABCs are likely to result in overfishing. The proposed ABC has a medium risk of the stock being less than 45K mt by 2015, but a low risk of the stock being less than 29K mt by 2015.

Table 97 – Results of sensitivity projection assuming flat-topped survey selectivity and Option 2 ABCs

Year	Catch	Median F	Median SSB_{MSY}	Prob. $F>/F_{MSY}(0.39)$	Prob. SSB > ½ Dome SSB_{MSY}	Prob. SSB > ½ Flat SSB_{MSY}
			75% of F_{MSY} (Dome)			
2011	16.914	0.595	70.052	0.978	0.974	0.995
2012	15.393	0.641	61.090	0.981	0.880	0.993
2013	15.554	0.668	55.796	0.985	0.781	0.981
2014	15.970	0.701	51.703	0.978	0.678	0.949
2015	16.266	0.780	47.460	0.981	0.553	0.895

Table 98 – Summary of risk associated with proposed catch

Catch Scenario	Dome True/Flat False	Dome False/Flat True
Risk of Being Overfished By 2015		
75% F_{MSY}	Low	Low/Med
Risk of Overfishing By 2015		
75% F_{MSY}	Low	High

* Note that as presented this table implies the two model formulations are equally likely. This is not the case since the review accepted only the dome selectivity model.

Low: < 25 percent
Med: 25 – 50 percent
High: Over 50 percent

Impacts on Other Species
The major difference between the proposed ACLs and the No Action alternative is that the ACLs for GB yellowtail flounder and pollock increase. These increases could lead to changes in the distribution of fishing activity by groundfish fishing vessels. In the case of groundfish stocks, catches are controlled through the management plan and so these changes are not likely to result in increased fishing mortality. For other stocks, however, this may not be the case. The change in GB yellowtail flounder catches is relatively small when compared to No Action and as a result it is unlikely that there will be noticeable impacts on other stocks. The pollock ACL, however, is over three times larger than the No Action ACL. The increased opportunities to fish for pollock – particularly for sector vessels – could lead to increased fishing activity in the Gulf of Maine, the areas that contribute most of the pollock catch. Bycatch of species in this area could increase.

8.1.1.4 U.S./Canada Resource Sharing Understanding TACs

Option 2: U.S./Canada TACs

The proposed TACs are at levels that correspond to the fishing mortality rates consistent with the management strategy agreed to under the Understanding, and the recommendations of the Science and Statistical Committee (SSC) for GB yellowtail flounder. Under the Understanding, the strategy is to maintain a low to neutral risk of exceeding the fishing mortality limit reference (F_{ref} = 0.18, 0.26, 0.25, for cod, haddock, and yellowtail flounder, respectively). When stock conditions are poor, fishing mortality rates should be further reduced to promote rebuilding. The recommended 2011 TACs for cod, haddock, and yellowtail flounder were based upon the most recent stock assessments (TRAC 2010). The 2011 TACs for Eastern GB cod and haddock, and GB yellowtail flounder, were recommended by the Transboundary Management Guidance Committee (TMGC), based upon the fishing mortality strategy shared by both the United States and Canada. The full justification for the proposed TACs is described in Section 4.1.4 of this EA.

Based upon fishing years 2004 through 2009, information on catch (landings and discards) from the U.S. Canada Management Area, the management measures implemented by Amendment 13 and subsequent framework adjustments have restrained the catches of GB cod, haddock, and yellowtail flounder to below their respective TACs with two minor exceptions. In FY 2007, the catch of GB yellowtail flounder exceeded the TAC by nine percent due to some late reporting and because a portion of the yellowtail catch by the scallop fleet was not considered until after the end of the fishing year. A downward adjustment was made in the size of the 2008 TAC. In order to prevent such an overharvest from recurring, the monitoring methodology was modified to evaluate the amount of yellowtail catch from the scallop fishery more frequently. In 2009, the GB yellowtail catch exceeded the TAC by 9 percent (153 mt), as a result of increases in the catch rate late in the fishing year. A downward adjustment was made to the FY 2010 TAC, which resulted in an adjusted overall TAC of 1,047 mt for FY 2010.

Based upon preliminary information, NMFS does not anticipate that there will be an overage (i.e., the catch will not exceed the TAC) for FY 2010 for Eastern GB cod, Eastern GB haddock, or GB yellowtail flounder.

Although it is not possible to separate out the precise impact of the hard TACs on the overall pattern of fishing behavior and landings, the TACs and associated regulations have played an important role in determining fishing patterns on GB, as further explained in the Economic Impacts of the proposed TACs. Because the proposed TACs are based upon fishing mortality rates that are in accordance with the Understanding and the FMP, and the management measures that are associated with the U.S. Canada Management Area have been demonstrated to effectively control fishing effort, the proposed TACs are appropriate and will contribute toward the growth of the GB cod and yellowtail flounder stocks, and the maintenance of the GB haddock stock. The shared harvest strategy of the Understanding is maintaining a low to neutral risk of exceeding the fishing mortality reference point (F reference) and when stock conditions are poor, fishing mortality levels should be further reduced in order to promote stock rebuilding. Because the TACs will contribute toward the growth and maintenance of the stocks, the biological impacts will be positive. As a result of the implementation of Amendment 16 in FY 2010, and the fact that the large majority of vessels are fishing in sectors, there have been substantive changes in fishing behavior in the groundfish fishery in FY 2010, which arguably could result in a different risk than the historical risk that the FY 2011 U.S./Canada TACs will be exceeded. At this time it is not clear whether the risk of exceeding the U.S./Canada TACs is more or less than in the past. The increased observer coverage in the fishery, as well as other augmented monitoring methods implemented in FY 2010, however, support the contention that the risk of overharvest in FY 2011 will be reduced. Furthermore, it should be noted that the ACLs specified in this action for FY 2011 account for management uncertainty.

A delay in the opening of the Eastern U.S./Canada Area to trawl vessels (for both Sector and non-sector vessels) until August 1, 2011, will likely result in a reduced chance that the cod TAC will be caught or exceeded because trawl vessels will not have access to the area during the period when cod is typically caught at a relatively high rate.

FY 2011 will be the second year the FMP has operated under the revised sector regulations, with the likelihood of a very high percentage of active vessels participating in sectors. Trip limits (that only apply to vessels fishing in the common pool) will play a reduced role in in-season management of catch rates for most vessels, and sectors will continue to have more choices regarding fishing strategy.

8.1.1.5 Yellowtail Flounder Allocations for the Scallop Fishery

Option 1: No Action

This measure allocates a portion of the yellowtail flounder ACL to the scallop fishery to account for incidental catches in that fishery. In FY 2010, the allocations to the scallop fishery were considered an "other sub-component" and were not subject to specific scallop fishery AMs. In subsequent years the allocation will be considered a sub-ACL and the scallop FMP, through Amendment 15 (to be implemented in 2011) will adopt AMs to control these catches. The AM proposed in Amendment 15, if approved, will close defined areas in the SNE/MA and GB yellowtail flounder stocks areas the year after an ACL is exceeded. The areas will be closed for a length of time necessary to reduce future yellowtail flounder catches by the same percentage as the overage. The result may be reduced catches of yellowtail flounder by the scallop fishery and when combined with the management measures for the groundfish fishery result in a greater likelihood that catches will be kept below the ABC and mortality targets will be met.

Since the No Action alternative is proposed, there are no difference between the Proposed Action and the No Action alternative. The biological impacts are expected to be similar to those described in FW 44 when the sub-ACLs were adopted: that is, the allocation will make it more likely that mortality targets for yellowtail flounder will be met. Additional information is available that modifies the expected impacts slightly. First, updated estimates of the yellowtail flounder the scallop fishery is expected to catch in FY 2011 and FY 2012 indicated that the expected catch is lower than the amount allocated in FY 2011 for both stocks, and in FY 2012 for SNE/MA yellowtail flounder. This makes it even less likely that the sub-ACLs will be exceeded than was estimated in FW 44 or in Option 2, where the allocation was estimated to be only 90 percent of what would be caught. This makes it less likely that the scallop fishery AMs will be triggered as a result of exceeding the sub-ACL. Second, the proposed scallop fishery AMs have been determined. These AMs rely on seasonal closures in the year following an overage of areas with high bycatch rates. This approach will help to reduce the likelihood that if there is an overage it will continue in the following year.

Impacts on Other Species

The allocation of yellowtail flounder to the scallop fishery will have the most direct impact on scallop stocks. If scallop fishermen cannot control their catches of yellowtail flounder to the amount that is allocated, then in the following year the AM will close an area specified in Scallop Amendment 15 at the beginning of the scallop fishing year (March). Generally, scallop meat weights are higher in the spring, leading to higher CPUEs. If scallop fishing effort shifts into times and areas with lower CPUEs and lower catch rates there could be an increase in the number of scallops for a given catch weight leading to increased scallop fishing mortality. Since in the Proposed Action the amount of yellowtail being allocated is more than the estimate of what the scallop fishery is likely to catch, the expectation is that these impacts are less likely to occur than if Option 2 was selected. Thus, not only does the Proposed Action decrease the risk of exceeding yellowtail flounder ABCs, it helps to assure that fishing mortality targets will be met for scallops.

The estimates of the amount of yellowtail flounder that will be caught by the scallop fishery are based on past observed bycatch rates. These rates are adjusted based on predicted changes in scallop exploitable biomass and yellowtail flounder SSB. The differences between the expected catches of GB yellowtail flounder estimated in FW 44 and the expected catches estimated for this action are partly due to changes in the estimates of future stock size for GB yellowtail flounder. These are the result of a revised assessment of the stock that was completed in 2010 (TRAC 2010) which reduced the estimate of recent stock size. Table 99 below compares the projected future stock size in 2011 – 2014 as predicted by the two assessments. Note that TRAC 2009 used two assessment models and concluded that actual stock size was likely between the two; both results are shown here. The table shows that the estimate of 2008 SSB ranges from 10,560 mt in the most recent estimate to a maximum of 22,900 mt reported by TRAC 2009. More importantly, the SSB change from 2008 to 2011 differs between 18 and 33 percent when projections are made from the different assessment results.

Table 99 – Comparison of past and future estimates of SSB for GB yellowtail flounder; as determined by TRAC 2009 and TRAC 2010

	TRAC 2009						TRAC 2010		
	Large DFO Survey Incl.			Large DFO Survey Excl.					
Pctile	**25**	**50**	**75**	**25**	**50**	**75**	**25**	**50**	**75**
Year					SSB				
2008	22.9	22.9	22.9	17.8	17.8	17.8	10.56	10.56	10.56
2009							13.966	13.966	13.966
2010									
2011	36.496	41.171	46.832	25.207	29.343	34.042	14.485	16.203	18.027
2012	40.448	46.597	54.137	29.308	34.6	41.453	17.62	19.865	22.897
2013	43.594	51.207	60.391	33.296	40.252	49.455	21.289	25.169	31.529
2014	47.55	56.779	67.346	38.435	47.316	57.346	25.823	32.25	40.974
					Change from 2008				
2011	59.4%	79.8%	104.5%	41.6%	64.8%	91.2%	37.2%	53.4%	70.7%
2012	76.6%	103.5%	136.4%	64.7%	94.4%	132.9%	66.9%	88.1%	116.8%
2013	190.4%	223.6%	263.7%	187.1%	226.1%	277.8%	69.3%	106.1%	166.3%
2014	207.6%	247.9%	294.1%	215.9%	265.8%	322.2%	244.5%	305.4%	388.0%

The estimates of the yellowtail flounder that will be caught by the scallop fishery are subject to a number of sources of uncertainty. These include the observed bycatch ratios and the relative changes in estimated or projected stock size over time for both the scallop and yellowtail flounder stocks. The effect of uncertainty can illustrated by focusing on just the uncertainty in future GB yellowtail flounder stock size that results from the TRAC 2010 assessment. The difference in projected SSB between the 25th and 75th percentile is 3,542 mt in 2011 and 5,277 mt in 2012. When the change in stock size from 2008 to 2011 at these same percentiles is compared to the change at the median the difference is about +/- 30 percent in 2011 and between -24 and +32 percent in 2012. Ignoring other elements of uncertainty, these differences would change the estimate of the expected catch of yellowtail flounder by a similar percentage from the point estimate based on the median.

As shown in Table 7, the estimated catch of GB yellowtail flounder by the scallop fishery is 175.3 mt in 2011 and 341.8 mt in 2012. The uncertainty over GB yellowtail flounder stock size suggests that the range in 2011 may be 120 mt – 230 mt and in 2012 it may be 260 mt - 444 mt. Since the proposed ACL is above the median value of this range, when compared to Option 2 it is less likely that the scallop fishery will exceed its ACL and thus less likely that the negative impacts on the scallop resource will occur. This conclusion also applies to SNE/MA yellowtail flounder for the same reasons. While this analysis ignored other sources of uncertainty, it does indicate that selecting a higher allocation than the median estimated catch will be less likely to lead to higher fishing mortality rates on scallop stocks than if the rejected alternative had been selected.

There may also be impacts on other stocks caught in the sea scallop and groundfish fisheries. For example, if sea scallop fishing activity is changed because of yellowtail flounder incidental catches, catches of skates, monkfish, and other species caught byscallop fishermen may be changed in a proportional manner. Similar effects on a wider range of species may occur if the groundfish fishery loses effort as a result of allocating yellowtail flounder to the scallop fishery. Catches of monkfish, skates, lobster, fluke, and other species caught by trawl fishermen could be reduced.

8.1.2 Fishery Program Administration

8.1.2.1 Implementation of Additional Sectors

Option 2: Implement New Sectors for FY 2011

Under this option seven additional sectors would be authorized.

The biological impacts of this action are likely to be minor when compared to the No Action alternative. Much of the fishery is already operating under sector rules (over 95 percent of the catch is allocated to sectors) and it is not likely that the addition of these sectors will substantially change sector membership. There may be subtle shifts in the catch that have impacts on specific stocks but the overall impacts of the FMP are not likely to change.

Four of the sectors would be formed as NMFS-sponsored state-operated permit banks and would not consist of any active fishing vessels. NMFS has provided $1 million to each of four states to form permit banks. These funds will be used to acquire limited access permits with groundfish PSC. The ACE associated with that PSC will be leased to vessels in other sectors (there is a chance that some permits will be held by the state outside of the sector and the DAS leased for cooperative research). States have signed an MOA with NMFS on the use of the funds that restrict leasing activity to smaller vessels from small coastal communities. As a result, it is possible that when compared to No Action this will lead to increased fishing activity in inshore areas and on inshore stocks. Whether this shift actually occurs depends on how the permits purchased by the states have been used in the past. The total amount of catch obtained by the states is not likely to exceed 2 million pounds, or about 907 mt. This is a small portion of the total groundfish catch.

A fifth sector is being proposed to operate as a lease only sector, and a sixth sector may operate as either a lease only sector or a sector with active vessels. The addition of two lease-only sectors and the state-operated permit banks may facilitate the transfer of ACE between sectors, which might lead to a greater portion of the available ACE being caught when compared to the No Action alternative. But with only part of the fishing year completed it is too early to tell if catches will fall significantly short of the available ACE and thus adding permit banks would lead to a substantial change.

One new sector is proposed to operate with active fishing vessels. Given the fact most of the catch his already allocated to existing sectors, the addition of one sector is not likely to have large impacts. It is possible that if active vessels are fishing in more sectors, the uncertainty around discard estimates will be higher than under No Action since there will be more discard strata that are estimated. It is not clear if one sector will make a noticeable difference since the overall CVs under sectors have not yet been calculated.

Impacts on Other Species
Without details on membership of the new sectors, or how the permit bank sectors will operate, it is not possible to do anything other than a cursory analysis of the impacts of new sectors on other species. The impacts are not likely to be substantially different than the No Action alternative. Sectors provide an opportunity for members to fish without limits on the days fished. Amendment 16 noted that sectors provided an opportunity to fish more efficiently, reducing discards, but could also lead to more opportunities to fish for skates and/or spiny dogfish. But there is not enough experience with sectors to determine if these impacts on other species change with the number of approved sectors.

The state operated permit banks may provide a marginal benefit to non-groundfish stocks by reducing fishing mortality on those stocks. The states will only be allowed to access the groundfish PSC or DAS assigned to the permit. Since permits cannot be split and fished in different fisheries, this means that some effort may be removed from other limited access fisheries when states acquire permits.

8.1.2.2 Monitoring Requirements for Handgear A and Handgear B Permitted Vessels and Small Vessel Exemption Vessels

Option 2: Dockside Monitoring Exemption for Handgear A and Handgear B Permits and Small Vessel Exemption Permits

This option removes the requirement that Handgear A, Handgear B, and Small Vessel Exemption vessels fishing in the common pool have 20 percent of their trips monitored by dockside monitors beginning in FY 2012. The requirement would remain for Handgear A and Small Vessel Exemption Vessels that fish in sectors (Handgear B vessels are not eligible to join sectors).

When compared to the No Action alternative there is a possibility that if this measure is adopted the catch information from these permit holders might be slightly less accurate than if the requirement remains in place. This assumes that on some of the trips that might be monitored (1 in 5) the absence of the monitor leads to inaccurate reporting. There is no empirical evidence to determine if this will actually occur. Because these vessels land less than one-half of one percent of the groundfish landed by permitted vessels, it is unlikely that this will make a noticeable difference in the ability to assess stocks as a whole. For cod, pollock, and haddock – the three species most often landed by these permits (see section 7.5.3.5), the percentages of landings are higher but still a small part of total landings and marginal changes in catch data are not likely to be detectable. As a result, it is very unlikely that there will be detectable biological impacts of this measure when compared to No Action.

Impacts on Other Species

Because of the small size of this component of the fishery, the use of hand gear, and the fact this is primarily an administrative measure, the Proposed Action is not likely to have either direct or indirect biological effects on other species. It is also unlikely there is any difference from the No Action alternative.

8.1.2.3 Monitoring Requirements for Commercial Groundfish Fishing Vessels

Option 2: Removal of Dockside Monitoring Requirements

This option removes the requirement for dockside monitoring of 20 percent of commercial groundfish trips (for sector vessels beginning in FY 2011 and for all other vessels beginning in FY 2012). As a result, landings from these trips will not be independently verified, though dealer reports and vessel reports will still be required. There is a possibility that as a result landings information will be less accurate than under the No Action alternative. The extent to which this will occur is unknown since there is no experience with which to characterize the effectiveness of dockside monitoring in this fishery. Nevertheless, the lack of dockside monitoring of 20 percent of trips creates an opportunity for additional inaccurate landings reports to be submitted. This could lead to less certainty in controlling catches to the specified TACs, leading to a failure to achieve mortality targets. Under this option such a result is more likely than under the No Action alternative even though the difference cannot be quantified.

Option 3: Removal of Requirement for Industry Funding of Monitoring for FY 2012

Multispecies Stocks

This option removes the requirement for industry funding of at-sea monitoring in FY 2012. While this does not have direct biological impacts, at-sea monitoring is essential to provide accurate information on discards. Discard information is needed so that assessments are based on total catch. Without this information there is more uncertainty on fishing mortality estimates and as a result a greater likelihood that rebuilding targets and mortality goals may not be met.

When evaluating the biological impacts of this measure it is not clear what funding will be available in the absence of industry finding. At one extreme, the federal government may provide the funding necessary for an adequate at-sea monitoring program that achieves the standards required by NMFS, including the SBRM CV standard specified as a minimum for sector-developed at-sea monitoring programs by Amendment 16. If this occurs, then from a biological perspective there would not be any difference between this option and the No Action alternative. The same information would be available in either case. The current targeted coverage rate is 38 percent of trips; as of mid-October 2010, coverage was falling short of this goal and was at 33 percent, with the rate for individual sectors ranging from 25 percent to 105 percent. Amendment 16 established that at a minimum the at-sea monitoring coverage developed and implemented by sectors should be sufficient to achieve the CV established by the SBRM (NEFMC 2007). These values have not yet been calculated so it is uncertain if the standard is being met.

While it is possible that the federal government would provide a lower level of funding than that required to meet monitoring standards it seems unlikely that all funding will be removed. For argument's sake, the funding level might be similar to the funding that provided coverage of 8 percent of groundfish trips prior to the provision of increased funding for the implementation of sectors. This level was sufficient to meet the SBRM CV standard for most stocks for the fishery as a whole. It is unlikely to be a sufficient level of coverage to meet the CV standard for each sector, as required by Amendment 16. Indeed, Palmer (2010) reports the results of simulation studies that suggest that even if 40 percent of trips are observed it is unlikely that the CV standard will be met for all sectors.

An additional concern is that these CV evaluations do not consider the possibility that vessels may be operated in ways that bias the estimation of discards based on observer coverage. Vessel operators may not fish in the same manner when an observer is present. This observer effect, as it is commonly called, is difficult to detect and one of the few ways to minimize its influence is to increase observer coverage. With a reduced coverage level, there are more trips when fishing behavior may not be the same as on observed trips. As a result the accuracy of discard estimates may decrease.

Whether the proposed change affects the ability of assessment scientists to accurately measure fishing mortality depends in part on the overall magnitude of actual discards. If the actual discards are only a small portion of removals, then whether the estimates are biased or are not precise may have little influence on stock status. As the actual discards increase, the inaccuracy of estimates becomes more troublesome. In-season discard estimates in 7.5.3.8 indicate that discards are estimated to be less than 20 percent of the catch by sector vessels for all stocks. The three stocks where discards are approaching 20 percent of the sector catch are plaice, CC/GOM yellowtail flounder, and SNE/MA yellowtail flounder. These three stocks are the ones most likely to have assessment accuracy influenced by less precise discard estimates.

Other stocks

While these analyses focused on multispecies stocks, the reality is that other stocks are caught on sector groundfish trips and if fewer trips are observed the discard estimates for those stocks will also be affected. Monkfish, skates, and dogfish are three stocks that are often caught on these trips. Skates and dogfish are of relatively low value, are managed by trip limits, and as a result are frequently discarded. Estimates of the discards of these stocks are the ones most likely to be affected by reduced observer coverage if funding is not available for at-sea monitoring.

Summary

In summary, when compared to No Action the removal of the requirement that the industry fund at-sea monitoring in FY 2012 increases the risk that an adequate monitoring system may not be in place for that year. This could lead to increased uncertainty about actual catches, making it less likely that mortality objectives will be achieved. On the whole this increased uncertainty can only be viewed as having negative biological impacts on groundfish and non-groundfish stocks.

Option 4: Trip-end Hail Requirement

This option requires all groundfish vessels subject to VMS requirements (i.e., all sector vessels, and common pool vessels that fish under a groundfish DAS or in multiple broad stock areas on the same trip) to submit a trip-end hail report to NMFS detailing the expected landing and offloading time and location for each groundfish trip even though the formal dockside monitoring program originally implemented under Amendment 16 is eliminated. This report provides the information necessary to facilitate the inspection of vessel offloads by enforcement personnel, increasing the likelihood that such offloads will be monitored despite the removal of a separate formal dockside monitoring program. Compared to the No Action alternative, this option will provide less assurance that landings will be reported accurately, or that all fish will be offloaded. However, compared to Option 2, this option could continue to reduce incentives to misreport or underreport landings, leading to slightly more certainty in controlling catches and achieving mortality targets, although the degree to which this option will affect compliance with reporting and landing regulations cannot be quantified. This option could also provide similar benefits to the accuracy of landings information for non-groundfish species landed from groundfish trips.

8.1.2.4 Distribution of PSC from Canceled Permits

Option 2: Even Redistribution Among All Remaining Permits

Unlike the No Action alternative, in this option if a permit is cancelled the associated PSC is redistributed proportionally to all other permit holders. The end result is that with a small number of cancelled permits there is a marginal increase in the PSC associated with all permits. As a result, the source of the cancelled permit (common pool or sector) is less important in the future since not all of the PSC is assigned to the common pool; it is redistributed to all permits, some that are in sectors nad some that are in the common pool. Part of the redistributed PSC either remains subject to the sector quotas (in the case of a cancelled permit that was in as sector) or becomes subject to sector quotas (in the case of a cancelled permits that was in the common pool). In the case of a small number of permits, this option may be marginally more likely to achieve mortality targets in FY 2011 than the No Action alternative since at least part of the redistributed PSC will be in sectors and as a result subject to a hard TAC, but any differences are likely to be slight. In FY 2012 and beyond there is not likely to be any difference since both groups will be managed by hard TACs. Indications are that initially this measure will reallocate about 72,000 pounds of groundfish, an inconsequential number. In the case of a large number of permits exiting the fishery - such as if there is a future vessel buyout – the difference from No Action would be greater in FY 2011 when the common pool remains under effort controls (i.e. this option will have a greater likelihood of achieving mortality targets).

The proposed formula simplifies the calculation of the PSC for each permit. It can be shown to be equivalent to recalculating all individual PSCs as follows:

Let P_n be the landings for a permit during the qualification period.

Then the PSC for the permit is:

$$P_n / \sum_1^n P_n$$

Where *n* is the total number of permits eligible to join as sector.

The sum over all permits adds to 1:

$$1= \sum_1^n (P_n \Big/ \sum_1^n P_n)$$

If permits are removed from the fishery, then the total remaining share is the original 1 minus the sum of the shares that exit the fishery:

$$(1- \sum_1^b (P_b / \sum_1^n P_n)$$

Where *b* represents the permits that exit.

Compute factor:

$$1/(1- \sum_1^b (P_b / \sum_1^n P_n)$$

Multiplying the shares remaining by this factor gets the total shares back to 1:

$$(1- \sum_1^b (P_b / \sum_1^n P_n) \ * \ 1/(1- \sum_1^b (P_b / \sum_1^n P_n) = 1$$

Multiplying each permit share by this factor gets the total back to 1.

Impacts on Other Species
Because this is an administrative measure the Proposed Action is not likely to have either direct or indirect biological effects on other species. It is also unlikely there is any difference from the No Action alternative.

8.1.2.5 Submission of Sector Rosters

Option 2: Revised Submission Date
This is an administrative measure that is not likely to have either direct or indirect biological impacts on any groundfish or non-groundfish stock. The impacts of the Proposed Action are no different than the No Action alternative.

8.1.3 Commercial and Recreational Fishery Measures

8.1.3.1 General Category Scallop Dredge Exemption – Modification of Restrictions

Option 2: Exemption from Yellowtail Flounder Spawning Closure

This option eliminates the two spawning area closures that are designed to reduce the interference of General Category scallop fishing with spawning yellowtail flounder. As noted in the description of the No Action alternative, the spawning closures may provide some un-quantified benefit to protecting yellowtail flounder. Removing the closures under this option will provide less protection to spawning fish than the No Action alternative. These benefits are marginal, however, since the closures do not apply to groundfish fishing vessels (some that may be targeting yellowtail flounder) or limited access scallop dredge trips.

When the closures were implemented as part of the authorization of the Great South Channel Scallop Exemption area, the General Category (GC) fishery was an open access fishery managed through the use of a trip limit. There was no limit on the number of trips and no limit on the number of participants. The GSC exemption area thus had the potential of creating the opportunity for an unlimited number of trips targeting scallops during the period of yellowtail flounder spawning. The groundfish fishery and the limited access scallop fishery are allowed to fish during the closures but are limited by DAS limits, and part of the area is subject to the May GB closure for groundfish fishing vessels. The GC fishery is now an IFQ fishery with a limited number of participants and a fixed quota for every vessel; there is no longer the potential for unlimited effort in this area. Any catches of scallops that occur in April – June are catches that will not take place at other times if the year. In some cases, a shifting of scallop effort into these months might reduce overall bycatch since bycatch rates are higher during later months of the year. Some sense of the amount of GC effort that can be expected can be assumed by behavior in 2005 and 2006, before the closures were adopted. In these years, about 30 percent of the total GC catch was taken from SA 521 and 526 between April and June.

A cooperative research experiment (Salerno et al 2008) was conducted in SA 521 and 526 to determine bycatch rates of yellowtail flounder in the scallop dredge fishery, document maturity stages of yellowtail flounder in the area, and document the distribution of yellowtail flounder in relation to commercially exploitable scallop beds. The experiment used commercial vessels and commercial gear. The Council’s Research Steering Committee reviewed the experiment and raised concerns about the use of three different vessels, three different dredges and twin top sizes, and the lack of any attempt to extrapolate the impacts to fleet-wide impacts. The Committee concurred with this statement: “It is premature to reconsider the yellowtail flounder spawning closures or revisions to the timing of these closures for the GSCDEA based on this study.” Nevertheless, the data in this study does supplement the available information on General Category scallop dredge vessels interactions with bycatch species in this area during April through June. The experimental results are consistent with observer information.

Salerno et al (2008) used three commercial vessels to dredge for scallops in SA 521 and 526 during the spring and fall of 2007. Catch rates of yellowtail flounder were low in all months, but were lowest in the spring (Table 100). Yellowtail flounder accounted for only 0.16 percent of the total catch; the highest value in the spring was in June when it was 0.17 percent of the catch.

Winter and windowpane flounder were also caught in small amounts. Skates (all species combined) were caught in larger amounts, particularly in June and September. After converting scallop shell weight to meat weight, the experiment's ratios of yellowtail flounder to scallop meat weights are in the order of 2 percent, which is similar to the observed ratio of scallop meat weights to yellowtail flounder caught (Table 100).

During the experiment researchers sampled 99 yellowtail flounder for maturity stage (Table 102). The largest amount of ripe and running fish was encountered in May when 36 percent of the fish sampled were in that condition. Unlike April, when spawning fish were only seen in SA 521, in May they were caught in both areas. The low number of fish sampled and one-year period of the experiment make it difficult to draw firm conclusions but these results indicate that there are spawning fish in the area, which is consistent with the time of yellowtail founder spawning identified in the EFH source document.

The distribution of yellowtail flounder observed in the experiment (Figure 52) is similar to that shown by observer data (Figure 54). Yellowtail flounder seem to be concentrated in the southern part of the GSC Scallop Dredge Exemption Area or just west of the northern boundary of CAI.

Table 100 - Catch rates (lbs/hr) of selected species by month (from Salerno et al. 2008)

	sea scallop	monkfish	yellowtail flounder	winter flounder	windowpane flounder	skates, all combined
March	129.5	0.1	0.4	1.1	0.3	10.6
April	315.1	0.0	0.4	0.6	0.6	9.8
May	332.0	0.7	0.6	1.3	1.2	29.7
June	346.0	8.2	0.9	0.8	1.6	83.1
September	232.0	8.6	1.1	0.5	4.7	82.9
Project Total (all months)	**283.2**	**3.2**	**0.6**	**0.9**	**1.6**	**41.4**
Project Total (April – September)	**310.6**	**3.8**	**0.7**	**0.8**	**1.8**	**46.8**

* Scallop weight is whole/live weight (i.e. shell weight not meat weight)

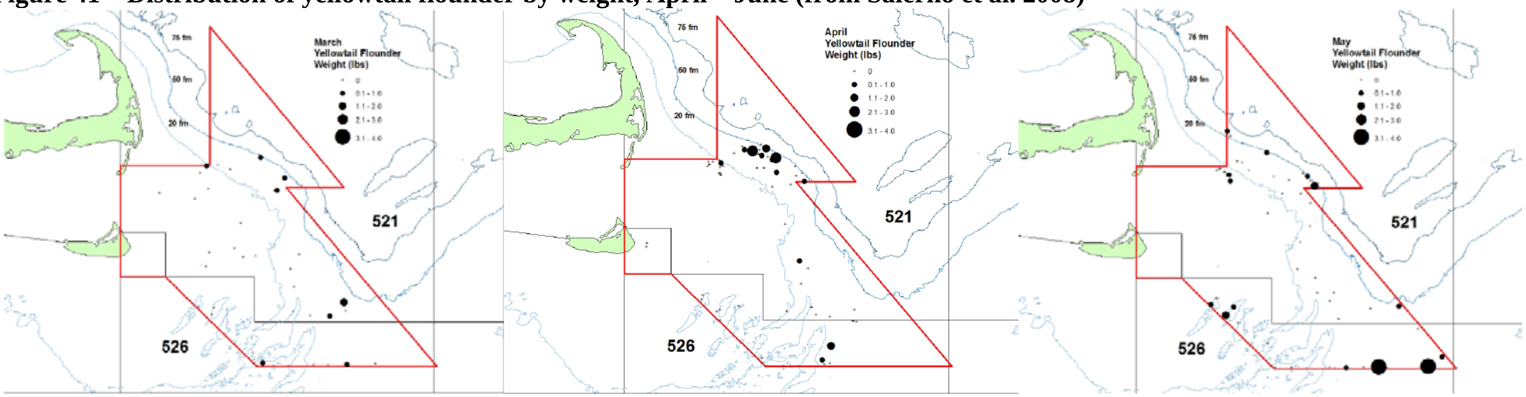
Table 101 – Number of yellowtail flounder by maturity stage in SA 521 and 526 (from Salerno et al. 2008)

	immature	developing	ripe/ ripe-running	spent	resting	**total**
April	7	5	7	13	0	**32**
May	13	11	14	1	0	**39**
June	3	5	4	5	11	**28**
total	**23**	**21**	**25**	**19**	**11**	**99**

Table 102 – Number of spawning yellowtail flounder by statistical areas (from Salerno at al 2008)

	statistical area 521		statistical area 526		**total**	
	# of fish	# per tow	# of fish	# per tow	**# of fish**	**# per tow**
April	7	0.14	0	0	**7**	**0.11**
May	5	0.14	9	0.50	**14**	**0.26**
June	1	0.04	3	0.14	**4**	**0.09**

Figure 41 – Distribution of yellowtail flounder by weight, April – June (from Salerno et al. 2008)



Removing the closures will result in an increase in scallop fishing in this area during the April – June months. Both observer data and a cooperative research project (Salerno at al 2008) indicate that bycatch rates of yellowtail flounder in this area are likely to be low during the spring months, with a peak in June. There is evidence of spawning activity, both based on MARMAP plots of egg distribution and maturity stages of sampled fish in a cooperative research experiment. On the whole removing the closures would be expected to result in negative impacts on yellowtail flounder in this area during spawning season. The relative scale of the impacts, however, is important.

The total General Category scallop catch is likely to be on the order of 3 million pounds in the near future (exact amounts vary from year to year based on stock status). Some sense of the amount of GC effort that can be expected in the area can be illustrated by behavior in 2005 and 2006, before the closures were adopted. In these years, about 30 percent of the total GC catch was taken from SA 521 and 526 between April and June.

Eliminating the spawning area closures may attract GC fishing effort into the area in the months of April through June. If this effort is attracted into the area from areas or months with lower groundfish bycatch it may increase the bycatch of groundfish. An effort shift into this area during these months is expected to increase any adverse effects that may interfere with yellowtail flounder spawning activity, but it is important to consider the scale of these effects.

Estimating the amount of effort that may be attracted to the area is difficult for several reasons. The two spawning closures are in SA 521 and 526. Because these areas also include the CAI scallop access area (open to GC vessels in 2007 and primarily in SA 521) and the NLCA access area (open to GC vessels in 2006, 2007, and 2008 and entirely within SA 526) it is hard to draw conclusions about the distribution of GC fishing effort absent assumptions on the access areas. Changes in GC management (particularly the adoption of an IFQ program) also confound interpretation of the available data. In 2005 and part of 2006 the GC fishery was an open access fishery without effective limits on the catches; beginning in 2008 the fishery was limited by quarterly TACs, and in FY 2011 the fishery will be managed as an IFQ program. Because of these changes caution should be used when using recent landings history to estimate future behavior if the spawning closures are removed.

Table 103 summarizes GC scallop landings from SA 521 and 526 for scallop FY 2005 through scallop FY 2009. This table includes data from vessels with a GC permit as well as limited access vessels making GC trips outside of the DAS program. On average, GC trips accounted for 9.5 percent of the scallop landings from these two statistical areas. In FY 2005, however, GC trips accounted for 21 percent of the landings from these areas. Landings from these areas accounted for an average of 11.8 percent of the total GC landings. From FY 2005 through FY 2007 these areas accounted for 14-15 percent. The GC landings distribution shifted south with the authorization of GC trips in the ETAA and DELMARVA access areas in FY 2008 and 2009. This is reflected in the fact these two areas provided a smaller percentage of GC landings in these years. Relative to total scallop landings form these two areas, GC landings in recent years have been less than ten percent of the total removals. This suggests that when compared to activity that is allowed to occur in the area during spawning (limited access scallop fishing and groundfish fishing) the impacts on spawning activity of removing the closures will be minor.

GC landings in SA 521 and 526 are concentrated in the first six months of the fishing year. Even with the current spawning closures the three months of April through June account for an average of 35 percent of the GC landings from these two areas, and reached 49 percent in FY 2008. The extent to which this is due to access area trips is unknown because the data are not broken down by access and open areas. In four of the five years most of the GC landings from these two areas have been taken in SA 521 (Table 104). The exception is FY 2008 when trips to the NLCA apparently shifted the catch distribution to SA 526.

These data can be used to draw broad conclusions about GC fishing activity in SA 521 and 526 in the absence of the spawning closures. Based on recent GC fishing activity, it seems logical to expect that these two statistical areas will provide between 5 and 15 percent of GC landings. The exact amount will depend on specific access area openings – when southern access areas are open the percentage of catch from these two areas will probably be at the lower end. With GC quotas expected to be about 3 million pounds in the near future, the amount from these two statistical areas would be between 150,000 and 450,000 pounds (meat weight). This is lower than recent catches from these areas because the GC IFQ program will be limited to lower catches than in recent years. If 35 percent of this catch is taken in the time period from April through June (the average of the most recent five years), the catch in these months would range from 52,500 lbs. to 157,500 lbs. It does not seem that removing the spawning closures will lead to a large effort shift into these two areas compared to recent years, and the GC IFQ program will limit the effort shift when compared to No Action.

The ratio of yellowtail flounder discard to scallop meat weights is about 0.02:1 (see Figure 53) during these months, though there are differences between the two statistical areas and between open and access areas. At this ratio, the yellowtail flounder discards in the two areas during April through June would be expected to be 1,050 lbs. to 3,150 lbs. On average, 72.5 percent of the GC landings from these two areas are taken in SA 521. Assuming the discards are proportional to the scallop landings, 72 percent of the discards (~750 lbs. to ~2,300 lbs.) would be CC/GOM yellowtail flounder and the remainder would be primarily SNE/MA yellowtail flounder. These rough estimates can be compared to recent estimates of the discards of yellowtail flounder by GC activity. For CC/GOM yellowtail flounder, they ranged from 1 mt (CY 2006 and 2008) to 22 mt in CY 2007, the year the CAI access area was open (Legault, 2009, pers. comm.). While the relative change in discards could be viewed as a doubling of the lower values, the absolute value (about 1 mt) is a small fraction of the yellowtail flounder ABC. It is also possible that the overall discards may decline since in the past the ratio of yellowtail flounder to scallop meat weights has been higher in some other months. By estimating the impact of the change on yellowtail flounder discards, this analysis addresses one of the concerns expressed by the Council's Research Steering Committee when reviewing the GC fishery experiment.

In summary, these results suggest that when compared to the No Action option, removing the spawning closures may increase yellowtail flounder discards but the absolute magnitude of the change is small. While there is much uncertainty in these estimates since the GC management program will be very different beginning in FY 2011, even if the effort shift is under-estimated by this analysis it is unlikely to rise to the level where a specific sub-ACL is needed to CC/GOM yellowtail flounder in the near future and is only a small fraction of the SNE/MA yellowtail flounder scallop sub-ACL. when compared to activity that is allowed to occur in the area during spawning (limited access scallop fishing and groundfish fishing) the impacts on spawning activity of removing the closures will be negative but minor when compared to the No Action alternative.

Table 103 – Summary statistics on GC fishing activity in SA 521 and 526

	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Average
GC as percent of all SA 521/526 scallop landings	21.0%	6.5%	8.1%	6.0%	5.9%	9.5%
Percent of all GC landings	14.16%	15.36%	14.49%	9.48%	5.59%	11.82%
GC landings April-June	30.16%	32.07%	38.62%	49.18%	30.67%	35.10%

Table 104 – Landings of scallops by GC vessels from SA 521 and 526 (lbs., meat weight)

AREA	MONTH	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009
526	3	571	410	2,459	2,273	4,852
	4	698	154	1,120	8,260	4,474
	5	2,114	330	1,732	610	821
	6	17,662	123,299	111,162	101,993	616
	7	28,425	54,354	69,402	112,085	1,573
	8	39,093	2,762	9,931	26,009	0
	9	24,201	20,742	6,064	4,493	2,596
	10	14,814	10,638	5,530	873	2,032
	11	11,509	15,115	4,411	0	242
	12	1,237	8,353	1,570	2,052	441
	2	26	1,585	410	0	1,745
	1	51	3,248	1,119	0	2,873
526 Total		140,400	240,990	214,909	258,648	22,266
521	3	13,350	60,113	34,674	7,311	2,723
	4	20,720	52,694	37,714	32,967	6,399
	5	128,001	63,129	103,733	45,327	1,683
	6	122,191	70,566	36,246	23,248	57,320
	7	128,716	46,884	91,778	13,057	58,529
	8	147,276	46,819	107,035	21,507	0
	9	101,311	130,152	61,970	11,124	34,626
	10	73,027	70,700	33,968	4,304	0
	11	61,939	82,761	9,742	144	0
	12	7,951	44,238	7,728	10,552	22,166
	2	12,204	22,625	3,432	2,401	0
	1	9,007	35,504	12,437	1,298	26,799
521 Total		825,693	726,185	540,457	173,240	210,245
Total GC		966,093	967,175	755,367	431,888	232,511
Total All Categories		4,596,777	14,830,462	9,280,631	7,173,150	3,956,703

Impacts on Other Species
The Proposed Action will allow General Category vessels to fish the Great South Channel over the entire year; under the No Action alternative scallop dredge fishing is prohibited in two areas during the spring to reduce interference with spawning of yellowtail flounder. As a result, when compared to No Action, this alternative may shift fishing effort of the fleet into a different time and area. While this does not change the total amount of scallops the fishery can harvest, since the fishery is managed as an IFQ fishery with a quota, it could alter when and where the scallops are caught. If scallop meat weights are higher in the spring (as is generally the case) in this area than in other times or areas, there would be fewer scallops caught for a given quota and fishing mortality (based on numbers) might be lower for a given quota when compared to the same size quota under the No Action alternative. Any changes are likely to be marginal since the total General Category quota is five percent of the overall quota, and not all will be caught in this area. There may also be minor differences in the quantity of bycatch species (skates, monkfish) caught by the General Category fishery, but it is not possible to be certain of the direction of any changes.

8.1.3.2 Gulf of Maine Cod Spawning Protection Area

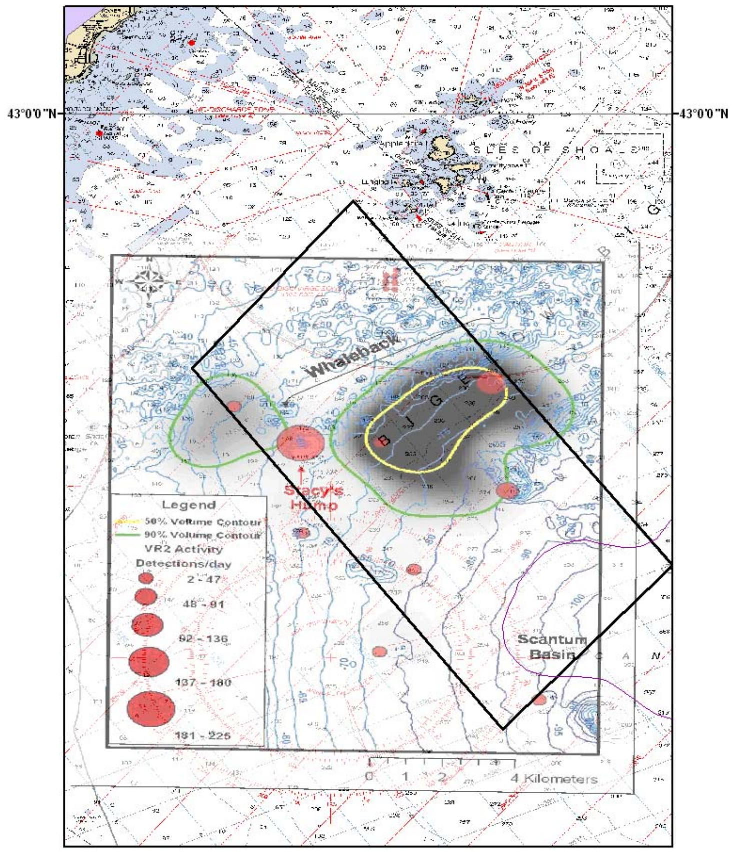
Option 2: GOM Cod Spawning Protection Measures

Under this option, vessels fishing in sectors would be prohibited from fishing in an area with aggregations of spawning cod during the month of June. Commonly referred to as the Whaleback area, the proposed closure covers most of the area identified in Howell (2009) as an area with large concentrations of spawning cod (Figure 56). As a result, when compared to the No Action alternative, this option provides additional protection to spawning cod.

This option considers two sub-options with respect to recreational vessels. In sub-option A, recreational vessels would be prohibited from fishing in the area from April through June. This would reduce a source of mortality on spawning cod and thus provide benefits superior to the No Action alternative.

Sub-option B would prohibit recreational vessels from possessing cod in this area from April through June. As a result it is less clear that there would be any benefits to cod. If recreational vessels fish in the area, and catch cod but discard it, some of those cod will not survive and the effectiveness of the measure would be weakened. This sub-option would return less benefit that sub-option A, but may provide marginally more protection than the No Action alternative.

Figure 42 - Proposed closure area and volume contours of cod detections from Howell et al (2009)



Proposed GOM Cod Spawning Closure Area

whaleback_ver1

* Distortion caused by process of combining graphic with proposed closure area).

Impacts on Other Species

The Proposed Action restricts groundfish fishing in an area that is currently open. Biological impacts on other species caused by the Proposed Action are possible as a result of changes in the effort distribution of recreational and commercial groundfish fishing vessels. Shifts in fishing effort could theoretically lead to incidental catches of different species, or even targeting of different species in other fisheries if the closure severely limits groundfish fishing activity. The proposed Cod Spawning Protection Area is a relatively small area (about 82 square statute miles) and so shifts in effort are not likely to result in a wholesale redistribution of groundfish fishing effort when compared to the No Action alternative. Since commercial groundfish fishing is prohibited in the area in April and May, and only sector vessels are allowed into the area in June, effort shifts by these vessels are likely to be small when compared to overall fishing activity. Changes in recreational fishing activity will be larger since they are currently allowed to fish in the area; but again, the shifts in effort represent only a small part of the fishery and the use of hand gear limits possible impacts on other species. As a result of the proposed action, vessels fishing in exempted fisheries (such as the herring mid-water and purse seine fisheries) will also be excluded form the area; but, the small size of the area makes it unlikely that this will result in noticeable changes in fishing practices. Overall, the Proposed Action is not expected to result in biological impacts on other species that differ from the No Action alternative.

8.1.3.3 Handgear Permit Management Measures

Option 3: Partial Rolling Closure Exemption for Handgear A Vessels

This option authorizes Handgear A vessels to fish in some of the GOM rolling closures and the GB seasonal closed area. Similar to Option 2, it is likely to increase catches by these vessels when compared to the No Action alternative. Increases might be less for GOM stocks because the vessels will still be subject to some of the rolling closures. This option may also result in more impacts on spawning fish than under the No Action alternative, though the impacts will be less than those under Option 2. Because of the small size of this fishery and the large number of recreational vessels that already fish in these areas, it is unlikely that the marginal increase of the impacts will be noticeable.

Impacts on Other Species
Because of the small size of this fishery and the use of handgear, any biological impacts on other species are likely undetectable and are probably not different than those that would result from the No Action alternative.

Option 4: Handgear A Trip Limit Modification

This option makes it clear that the cod trip limit for Handgear A permits is adjusted by stock area, based on changes to the relevant trip limit for limited access DAS vessels fishing in the common pool. In other words, the Handgear A limit for GOM cod changes when the GOM cod trip limit for DAS vessels is changed, and the limit for GB cod changes when the GB cod trip limit for DAS vessels is changed. When compared to No Action, this increases the likelihood that trip limit adjustments are made at the right time to reduce the possibility that ACLs for GOM and GB cod will be exceeded. This should increase the chances of achieving mortality targets. Because the cod catches by Handgear A vessels have been a small part of the total catches for these stocks, it is not likely that this change will make a noticeable difference. This option – a trip limit change - is not directly comparable to rejected Option 2 – an area closure. But it is likely to lead to less of an increase in catch by this gear than would occur if all rolling closures were eliminated.

Impacts on Other Species
Because of the small size of this fishery and the use of handgear, any biological impacts on other species are likely undetectable and are probably not different than those that would result from the No Action alternative.

Option 5: Handgear B Trip Limit Modification

This option makes it clear that the cod trip limit for Handgear B permits is adjusted by stock area, based on changes to the relevant trip limit for limited access DAS vessels fishing in the common pool. In other words, the Handgear B limit for GOM cod changes when the GOM cod trip limit for DAS vessels is changed, and the limit for GB cod changes when the GB cod trip limit for DAS vessels is changed. When compared to No Action, this increases the likelihood that trip limit adjustments are made at the right time to reduce the possibility that ACLs for GOM and GB cod will be exceeded. This should increase the chances of achieving mortality targets. Because the cod catches by Handgear B vessels have been a small part of the total catches for these stocks, it is not likely that this change will make a noticeable difference. This option – a trip limit change - is not directly comparable to rejected Option 2 – an area closure. But it is likely to lead to less of an increase in catch by this gear than would occur if all rolling closures were eliminated.

Impacts on Other Species
Because of the small size of this fishery and the use of handgear, any biological impacts on other species are likely undetectable and are probably not different than those that would result from the No Action alternative.

8.2 Impacts to EFH

8.2.1 Updates to Status Determination Criteria, Formal Rebuilding Programs, and Annual Catch Limits

The alternatives outlined in this section of the Framework would result in changes to the target catches for various managed species. In some cases, targets would increase, while in other cases, they would decrease. In general, increased catch targets could result in increased fishing time and thus increased area swept to achieve those targets, and therefore would result in increased impacts to the seabed and associated EFH. Similarly, decreased catch targets could result in decreased fishing time, area swept, and impacts to the seabed and EFH. However, this is a gross oversimplification because the particular array of catch targets across the various managed species/stocks will influence fishing behavior of the fleet. For example, depending on the catch targets and availability of quota, the choice of fishing location may vary, and this would influence impacts to EFH because not all habitats are equally susceptible to damage from fishing gear. In addition, appropriate catch targets and quotas may alleviate some bycatch concerns, such that fishermen can harvest quotas more efficiently with associated reductions in EFH impacts.

8.2.1.1 Revised Status Determination Criteria for Pollock

Option 2: Revised Status Determination Criteria for Pollock

Option 2 revises the status determination criteria for pollock according to the findings of the most recent assessment. The result would be an increase in MSY. While associated ACLs are set via a separate alternative (see Section 8.2.1.3 below), adjusting the status determination criteria allows for a substantial increase in the ACLs for pollock. Thus option 2 would be expected to result in an increase in bottom contact time and thus an increase in impacts to EFH.

8.2.1.2 Revised GB Yellowtail Flounder Rebuilding Mortality Targets

Option 2: Revised Rebuilding Target for Georges Bank Yellowtail Flounder

The Council considered a revision to the rebuilding strategy for GB yellowtail flounder. The following sub-option was selected as the proposed action:

> Sub-option A: Use a fishing mortality target that is calculated to rebuild the stock by 2016 with a 50 percent probability of success

While associated ACLs and US/Canada TACs are set via separate alternatives (see Sections 8.2.1.3 and 8.2.1.4), the sub-option A results in similar ABCs/ACLs, which would be expected to result in similar impacts to EFH as compared to No Action.

8.2.1.3 Annual Catch Limit Specifications

Option 2: Revised Annual Catch Limit Specifications for Modified Stocks

This action proposes the ABC and ACLs for pollock for FY 2011 – FY 2014, a revised ACL for GB yellowtail flounder for FY 2011 – FY 2012, corrects an error in the white hake ACL published in the *Federal Register* for FY 2011, and lists the ACLs for GB cod, GB haddock, and GB yellowtail flounder that reflect the Council's action on the recommendations from the TMGC.

Depending on the stock, Option 2 results in higher or lower ABCs and ACLs in comparison with no action. Specifically, Option 2 results in lower ABCs and ACLs for the GB cod and GB haddock, higher ABCs and ACLs for pollock, and little to no change in ABCs and ACLs for GB yellowtail and for white hake. Higher ABCs and ACLs would be expected to result in increased fishing time, bottom contact, and associated EFH impacts, while lower ABCs and ACLs would be expected to reduce fishing time, bottom contact, and EFH impacts.

8.2.1.4 U.S./Canada Resource Sharing Understanding TACs

Option 2: U.S./Canada TACs

Option 2 adopts the TMGC recommendations for the three stocks for 2011; in all cases the 2011 TACs are lower than the 2010 TACs, which would presumably reduce effort, bottom contact time, and EFH impacts as compared to limits currently in place. Note that this option likely has higher effort, bottom contact time, and EFH impacts in comparison with the No Action option, because No Action results in no TACs being set.

8.2.1.5 Yellowtail Flounder Allocations for the Scallop Fishery

Option 1: No Action

Under this option, the scallop fishery yellowtail flounder allocations for fishing years 2011 and 2012 would be maintained as they were implemented in FW 44. Projected catches of yellowtail under Scallop Framework 22 Scenario 1 are similar to the sub-ACL allocation in Framework 44, as shown in the following table:

Table 105 – Expected yellowtail catches for scallop fishery under FW 22 scenario selected by the Council as compared with FW 44 sub-ACLs.

	Total yellowtail expected to be caught, by YTF stock area (mt) for scallop FW 22, Scenario 1			Scallop fishery sub-ACL from FW 44 (mt)		
Year	GB	SNEMA	CC/GOM	GB	SNEMA	CC/GOM
2011	175.3	57.6	23.6	201	82	-
2012	341.8	83.7	20.1	307	127	-

Although it is difficult to know whether scallop fishery yellowtail catches are likely to exceed the allocated ACLs, having adequate available ACL to meet the requirements of the scallop fishery allows them to fish primarily in access areas, which generally have higher catches per unit effort/area swept, and thus lower impacts to EFH.

8.2.2 Fishery Program Administration

The alternatives in this section would modify administrative aspects of the fishery but would not be expected to influence the total magnitude of catches, and therefore would not be expected to have impacts on EFH that differ from the status quo. Each alternative is briefly described below.

8.2.2.1 Implementation of Additional Sectors

Option 2: Implement New Sectors for FY 2011

Option 2 for this alternative would implement new sectors beginning in May 2011. The following new sectors were approved: State of Maine Permit Banking Sector (MPBS) (lease-only), State of Rhode Island Permit Bank Sector (lease-only), State of New Hampshire Permit Bank Sector (lease-only), State of Massachusetts Permit Bank Sector (lease-only), Sustainable Harvest Sector III (likely lease-only). It is possible that new sectors would influence the distribution of fishing effort somewhat, which could result in different impacts to EFH as habitats are differentially vulnerable, spatially, but these changes are likely to be minimal, and furthermore, would be very difficult to evaluate.

8.2.2.2 Monitoring Requirements for Handgear A and Handgear B Permitted Vessels and Small Vessel Exemption Vessels

Option 2: Dockside Monitoring exemption for Handgear A and Handgear B Permits and Small Vessel Exemption permits

Option 2 for this alternative would exempt Handgear A and B vessels, as well as those holding a Small Vessel Exemption permit, from dockside monitoring requirements. Option 2 is not expected to have influence the magnitude or location of catches, and thus is not expected to result in additional impacts to EFH as compared to no action.

8.2.2.3 Monitoring Requirements for Commercial Groundfish Fishing Vessels

Option 2: Removal of Dockside Monitoring Requirements

In FY 2011 and FY 2012, there is no requirement that dockside monitoring of sector catches be funded by sectors. NMFS will provide as much funding as possible for dockside monitoring of up to 100 percent of sector trips, with a target of 100 percent of trips monitored if funds are available. If funds are not available for monitoring 100 percent of trips, priority will be given to monitor trips that do not have an at-sea observer, at-sea monitor, or an approved electronic monitor. Because it is unlikely to influence catches, Options 2 is not expected to have additional impacts to EFH as compared to no action.

Option 3: Removal of Requirement for Industry Funding of At-Sea Monitoring for FY 2012

There is no requirement for the industry to fund the costs of adequate at-sea monitoring of catches in FY 2012. Because it is unlikely to influence catches, Options 3 is not expected to have additional impacts to EFH as compared to no action.

Option 4: Trip-end Hail Requirement

Option 4 would implement a trip-end hail requirement, if dockside monitoring is eliminated. Because it is unlikely to influence catches, Options 4 is not expected to have additional impacts to EFH as compared to no action.

8.2.2.4 Distribution of PSC from Canceled Permits

Option 2: Even Redistribution Among All Remaining Permits

Option 2 for this alternative would redistribute PSC from canceled permits across all segments of the fishery, rather than just into the common pool. Option 2 could have a small effect on the magnitude and distribution of catches if permits are canceled during 2011, with a greater effect if more permits are canceled. In 2012, both sectors and the common pool will be managed by hard TACs, so the magnitude of catches will not change even if the distribution of catches changes. Any additional impacts to EFH as compared to no action are expected to be minimal.

8.2.2.5 Submission of Sector Rosters

Option 2: Revised Submission Date

Option 2 for this alternative would change the submission date for sector rosters from September 1 to December 1 to allow more flexibility for sector participants. Option 2 is administrative in nature and is not expected to have additional impacts to EFH as compared to no action.

8.2.3 Commercial and Recreational Fishery Measures

The following alternatives influence fishery operations and thus the location and timing of catches, which could have an additional impact on EFH as compared to the status quo, depending on the alternative. Each measure is discussed separately below.

8.2.3.1 General Category Scallop Dredge Exemption – Modification of Restrictions

Option 2: Exemption from Yellowtail Flounder Spawning Closure

Option 2 for this alternative would eliminate the prohibition on general category scallop fishing in two spawning closures in the Great South Channel during April 1-June 30 (Great South Channel SNE/GB yellowtail flounder peak spawning closure) and June 1-June 30 (Great South Channel CC/GOM yellowtail flounder peak spawning closure). The rationale for implementing this option is two-fold: first, it is not clear that scallop dredging has a significant impact on yellowtail flounder spawning or spawning habitat, and second, the general category scallop fishery is now managed by a quota system, such that the total landings from that segment of the scallop fishery are capped. It follows from this that impacts to EFH are also limited, although changes in EFH impacts from the status quo will depend on the location of fishing as EFH in different locations is not all equally vulnerable.

8.2.3.2 Gulf of Maine Cod Spawning Protection Area

Option 2: GOM Cod Spawning Protection Measures

Option 2 for this alternative would implement an area in the GOM to generate additional protection for spawning cod, with the following provisions:

- All commercial fishing vessels using gear capable of catching groundfish are prohibited from fishing in the area from June 1 through June 30.
- Fishing with exempted gear is allowed in the area, but the take or possession of any groundfish species by vessels using exempted gear in this area from April through June is prohibited.
- All recreational (including party-charter) fishing vessels using gear capable of catching groundfish are prohibited from fishing in the area from April through June. Only pelagic hook and line gear, as defined in the commercial fishing exempted gear regulations, is allowed for use in the area.
- A fishing vessel (commercial or recreational) may transit the area as long as gear is properly stowed in accordance with regulations promulgated by the Regional Administrator.

This option would redistribute fishing effort that would normally occur in this location during this time into other areas, some of which would likely have lower densities of cod and thus lower catch rates of cod. In general, fishing with lower catch rates is expected to increase bottom contact time and area swept, and thus to increase impacts to EFH. However, the proposed area is small relative to the footprint of the fishery, and therefore any increased impacts to EFH as a result of this alternative are expected to be minimal.

8.2.3.3 Handgear A Trip Limits

Option 3: Partial Rolling Closure Exemption for Handgear Vessels

Handgear A vessels are exempt from the same GOM rolling closures as the universal exemption for sector vessels. Access to future closed areas (such as the GOM cod spawning protection area in Section 4.3.2) will be determined when the measure is adopted; Handgear A vessel access to these areas will be the same as for other commercial vessels unless Handgear A access is explicitly authorized. The areas that remain closed to Handgear A vessels are listed below.

- April: Blocks 124, 125, 132, 133
- May: Blocks 132, 133, 138, 139, 140
- June: 139, 140, 145, 146, 147, 152

While this option would likely influence the magnitude and location of catches, handgear (hook and line) operation does not have an adverse effect on EFH (Morgan and Chuenpagdee 2003), such that the implementation of any of the options would not result in different impacts to EFH as compared to the status quo.

Option 4: Handgear A Trip Limit Modification

The Handgear A vessel trip limit for cod will remain at 300 lbs. per trip (one trip per day) until such time that the Regional Administrator has lowered the trip limit for cod for the relevant stock area that applies to the limited access DAS vessels fishing in the common pool below 300 lbs. Once this has occurred, the cod trip limit for vessels fishing under a Handgear A permit would become equal to the trip limit for cod that applies to the limited access DAS vessels fishing in the common pool in the relevant stock area for the remainder of the fishing year.

While this option would likely influence the magnitude and location of catches, handgear (hook and line) operation does not have an adverse effect on EFH (Morgan and Chuenpagdee 2003), such that the implementation of any of the options would not result in different impacts to EFH as compared to the status quo.

Option 5: Handgear B Trip Limit Modification

The cod trip limit for vessels fishing under a Handgear B will adjust proportionally to the cod trip limit for cod in the relevant stock area that applies to limited access DAS vessels fishing in the common pool. The baseline Handgear B trip limit is 75 lbs./trip, limited to one trip per day. The FW 44 baseline cod trip limit for limited access vessels fishing in the GOM or GB stock areas are 800 lbs./DAS or 2,000 lbs./DAS, respectively. As an example, under this measure if the GOM cod trip limit is reduced by 50 percent for limited access vessels, the Handgear B trip limit is reduced by 50 percent for vessels fishing in the GOM, but no change is made to the trip limit for Handgear A vessels fishing on GB.

While this option would likely influence the magnitude and location of catches, handgear (hook and line) operation does not have an adverse effect on EFH (Morgan and Chuenpagdee 2003), such that the implementation of any of the options would not result in different impacts to EFH as compared to the status quo.

8.2.4 Summary of EFH Impacts

EFH impacts of the various alternatives are summarized below (Table 106).

Table 106 - Summary of EFH impacts for Framework 45 alternatives (does not include those considered but rejected)

Measure	Summary	Increase/decrease/little or no change in impacts to EFH
Revised status determination criteria for pollock	Would likely lead to an increase in catch limits	Possible increase
Revised GB YTF rebuilding targets	Catches likely to be similar as compared to current catches	Likely to experience little change
ACL specifications	Could lead to higher or lower catches in the short term, depending on the species	Might increase, decrease, or experience little change, depending on the species
US/Canada TACs	Would lead to a decrease in catches in comparison with 2010	Possible decrease
Additional sectors	Administrative measure	Little or no change expected
Handgear A/B monitoring changes	Administrative measure	Little or no change expected
Commercial vessel monitoring changes	Administrative measure	Little or no change expected
Distribution of PSC from canceled permits	Administrative measure; could influence magnitude and location of catches	Likely minimal impacts to EFH, if any
Submission of sector rosters	Administrative measure	Little or no change expected
Removal of General Category scallop dredge exemption area	Could increase general category effort in GSC	Possible increase in impacts due to increased fishing on vulnerable habitats in GSC
Implementation of GOM cod spawning protection area	Could redistribute fishing effort during closure months	Little to no change expected due to small size of area
Change to Handgear A area restrictions and changes to Handgear B trip limits	Could influence magnitude and location of catches	Little to no change expected, as handgear has little to no impacts on seabed habitats

Changes to EFH impacts as a result of this action are expected to be minimal in most cases. Where increased impacts are likely in comparison with no action, they typically result from shifts towards more biologically appropriate catch targets (e.g. the change in pollock status determination criteria) or measures to protect the target stock (i.e. the proposed whaleback spawning closure). In some areas, there may be declines in fishing effort due to revised specifications as compared to no action/2010 TACs, which would result in reduced habitat impacts. In summary, in the context of the overall declines in fishing effort since the baseline EFH review completed for Amendment 13, adverse effects to EFH will continue to be minimized by the FMP following implementation of this action.

8.3 Impacts on Endangered and Other Protected Species

8.3.1 Updates to Status Determination Criteria, Formal Rebuilding Programs, and Annual Catch Limits

8.3.1.1 Revised Status Determination Criteria for Pollock

Option 2: Revised Status Determination Criteria for Pollock

This option uses the best available science and as a result is consistent with the M-S Act and National Standard 2. It would allow catches to increase above recent levels and well above the catches proposed in FW 44, using the recommendations of the SAW 50 (NEFSC 2010).

Compared to the No Action alternative, the increase in catch is likely to adversely effect, but not jeopardize, the protected species present in the areas in which catch will increase. An increase in fishing effort is likely to increase the catch, and as a result, a potential increase in incidents of bycatch of protected species may also occur, as well as a decrease in the amount of forage available. It is not clear, however, if the circumstances created by the measure will result in these adverse effects on protected species or where the effort is likely to occur. This option also implements the use of an analytic assessment, which should lead to a better understanding of the resource and a more accurate determination of sustainable catch levels. It may also lead to better analysis of where effort will occur in the future and therefore improve the ability to predict impacts to protected species.

8.3.1.2 Revised GB Yellowtail Flounder Rebuilding Mortality Targets

Option 2A: Revised Rebuilding Target for GB Yellowtail Flounder

Four alternative rebuilding strategies were being considered for this measure, all of which target a rebuilding at a slower pace than under the No Action alternative. The selected strategy is:

> Sub-option A: Use a fishing mortality target that is calculated to rebuild the stock by 2016 with a 50 percent probability of success

This sub-option extends the rebuilding period to 2016. All impacts discussed below would be expected to last as long as the rebuilding period, barring other changes to the FMP or specifications.

Compared to the No Action alternative, this sub-option would possibly result in more effort exerted by the fishery; and may therefore result in more possible gear interactions for protected species, such as harbor, hooded and harp seals. Although not directly correlated, the greater the fishing effort, the more interactions with protected species may occur. Sub-option A has less probability of gear interaction with protected species than the considered sub-option D but more probability than sub-options B and C, as it has the second highest target fishing mortality rate. Effort in the fishery may or may not result in area shifts; it is unclear how fishermen may react to the target mortality rates. Overall it is important to note that the differences in impact on protected species between the sub-options are likely to be minor, and the target fishing mortality values may change in future years if stock conditions differ from the projection results. In all cases the impact to protected species is likely to be negative but inconsequential. The uncertainty in the location and amount of effort exerted by the fishery, however, makes it difficult to calculate the amount of impact that the four sub-options may have on protected species, from impacts such as forage availability to encounters with fishing vessels.

8.3.1.3 Annual Catch Limit Specifications

Option 2: Revised Annual Catch Limits for Modified Stocks

This option proposes to adopt new specifications and ACLs for FY 2011 -2012 for GB cod, GB haddock, GB yellowtail flounder, white hake, and pollock. This measure includes the identification of ACLs, OFLs, and ABCs as required by the M-S Act and as implemented by Amendment 16. It also incorporates adoption of the incidental catch TACs for the special management programs that use Category B DAS. Implementation of ACLs is required by the Magnuson-Stevens Act and may have social impacts that are difficult to define. The social impacts of ACL-setting in general are discussed in detail in Amendment 16.

As was mentioned in the analysis of the previous options, the greater the fishing effort, the more possibility that interactions with protected species may occur. The TACs, and therefore the total ABC for GB Cod and GB Haddock for Option 2 do not differ from that for the No Action alternative. As a result, the impacts of the TACs to protected species under this option are not expected to differ from that described under the No Action alternative. The reduced cod TAC for the U.S./Canada area may result in a shift of available catch from the eastern area to the western area. The quantitative consequences of these changes are unknown, but could be positive if effort is reduced in seasonal high use areas and the reduction overlaps with the distribution of protected resources.

The revised figures for GB yellowtail flounder result from the specific rebuilding strategy that was considered in Section 4.1.2; sub-option A. The revised OFLs/ABCs/ACLs including sub-option A would result in higher catches than the No Action alternative. Using the same logic as above, sub-option A would result in greater potential impacts to protected species through fishery interaction, compared to the No Action alternative. Similarly, the revised OFLs/ABCs/ACLs for pollock would result in increased catches, which could result in increases in interaction of protected species with the fishery, such as the hooded and harp seals, which have an increased potential of interaction during the winter.

It is important to note that all of the options which could cause increases or decrease in interactions with the fishery the overall impact to protected species are likely to be negligible, and the impacts are uncertain as quantitative analysis has not been performed. Catches in the fishery will still be constrained by other limitations placed on the fishery, such as those relating to the catch of other co-managed species and bycatch, thereby mitigating the impacts of the potential changes.

8.3.1.4 U.S./Canada Resource Sharing Understanding TACs

Option 2: U.S./Canada TACs

This option would adopt the TMGC recommendations for GB cod, GB haddock, and GB yellowtail in the U.S./Canada area for FY 2011. The recommendations lower the TACs from the FY 2010, but maintain the rebuilding schedule, and so potential forage may increase while the probability of fishery encounters with protected species may decrease. In comparison to the No Action alternative, however, the TACs would increase, as none would be implemented under No Action. The impacts to protected species would therefore be the inverse of the No Action alternative; potential fishery interaction may increase slightly, but the rebuilding schedule would be faster, and forage species may be more readily available. Change in the location of fishing effort as a result of the action is unknown. The impacts are uncertain but they are expected to be negligible as a result of this action.

It is difficult to evaluate the effect of a zero allocation of trips in the Closed Area II SAP because, there would still be fishing effort allowed in CA II under the expanded access allowed for haddock (August 1 through January 31). Compared to fishing years prior to FY 2010, there is likely to be an increase in fishing effort in the Eastern U.S./Canada Area due to the opportunity to fish in CA II, which had not been accessible to the groundfish fishery since 2004. An increase in effort would have limited effect on ESA-listed cetaceans given the measures that are already in place under the ALWTRP for the use of gear in the groundfish fishery, and would have limited effect on ESA-listed sea turtles given their distribution and abundance on Georges Bank.

Delay of the use of trawl gear in the U.S./Canada Management Area until August 1, 2011 would be of benefit to those protected species, such as small cetaceans, that occur in the management area and can be captured in trawl gear. A delay in the use of trawl gear would not change the effects to large cetaceans given that these species are not captured in trawl gear. The delay would also not change the effects to sea turtles given the relatively low abundance and distribution of sea turtles in the U.S./Canada Management Area.

8.3.1.5 Yellowtail Flounder Allocations for the Scallop Fishery

Option 1: No Action

With this option, the allocations of GB and SNE/MA yellowtail flounder are not changed from the amounts specified in FW 44 (as amended). Since these amounts are more than the scallop fishery is expected to catch according to the most recent estimates it is not likely that the sub-ACLs will be exceeded and AMs will be triggered. The scallop fishery AMs, if triggered, will implement area closures in the year following an overage. Since it is less likely that the AMs will be triggered under this option (when compared to Option 2), the impacts on endangered and other protected species are more likely to reflect those identified in scallop management actions.

8.3.2 Fishery Program Administration

8.3.2.1 Implementation of Additional Sectors

Option 2: Implement New Sectors for FY 2011

This option would authorize five new sectors for the FY 2011: the State of Maine Permit Banking Sector, the State of Rhode Island Permit Bank, the State of New Hampshire Permit Bank Sector, the State of Massachusetts Permit Bank Sector, and the Sustainable Harvest Sector III. All of the sectors under consideration in this option would be either permit banks or inactive members with the primary function of transferring ACE. As a result, this action is unlikely to have protected species impact, as it is mainly procedural in nature. The two sectors which would have active members may change fishing behavior, but the changes are very difficult to predict, compared to the No Action option. As such, the provision should not result in impacts beyond those analyzed and discussed in the Amendment 16.

8.3.2.2 Monitoring Requirements for Handgear A and Handgear B Permitted Vessels and Small Vessel Exemption Vessels

Option 2: Dockside Monitoring Exemption for Handgear A and Handgear B Permits and Small Vessel Exemption Permits

This option removes the requirement that Handgear A, Handgear B, and Small Vessel Exemption vessels fishing in the common pool have 20 percent of their trips monitored by dockside monitors beginning in FY 2012. The requirement would remain for Handgear A and Small Vessel Exemption Vessels that fish in sectors (Handgear B vessels are not eligible to join sectors). It is unlikely that this option would have any impact to protected species; as was discussed in the No Action option, protected species will not benefit from dockside monitoring, and so this option will not affect protected species.

8.3.2.3 Monitoring Requirements for Commercial Groundfish Fishing Vessels

Option 2: Removal of Dockside Monitoring Requirements

This option removes the requirement for dockside monitoring of 20 percent of commercial groundfish trips (for sector vessels beginning in FY 2011 and for all other vessels beginning in FY 2012). As was discussed in earlier sections, dockside monitoring does not affect protected species; this option is therefore not expected to have impacts on protected species.

Option 3: Removal of Requirement for Industry Funding of Monitoring for FY 2012

This option removes the requirement for industry funding of at-sea monitoring in FY 2012. At-sea monitoring is essential to provide accurate information on discards, particularly in regards to protected species, which cannot be landed. Without this information there will be more uncertainty on fishing mortality estimates and as a result a greater likelihood that the assessment of the stocks will be wrong.

The impacts of this option are unclear because the funding options for monitoring, absent industry funding, are unclear. The federal government may provide the funding necessary for an adequate at-sea monitoring program that achieves the standards required by NMFS, including the SBRM CV standard specified as a minimum by the Council. If this occurs, then there would be no difference between this option and the No Action alternative for protected species, as the SBRM coverage levels would be maintained. If the federal government were to provide a lower level of funding than that required to meet monitoring standards, then protected species may be adversely affected. The option would not jeopardize any species, however, as nothing will directly affect them. At the time of this writing, however, the level of funding, and therefore the level of coverage, is uncertain, and so the impacts of this option cannot be fully evaluated.

Option 4: Trip-end Hail Requirement

This option would require commercial vessels to still provide a trip-end hail, despite the elimination of dockside monitoring requirements. This is an administrative option and will not impact protected species.

8.3.2.4 Distribution of PSC from Canceled Permits

Option 2: Even Redistribution Among All Remaining Permits

Unlike the No Action alternative, in this option if a permit is cancelled the associated PSC is redistributed proportionally to all other permit holders. The end result is that with a small number of cancelled permits there is a marginal increase in the PSC associated with all permits. The overall amount of PSC, which affects the overall amount of fishing effort that may interact with protected species, does not change as a result of this option. The availability of forage and the location of the fishing effort are also not expected to change. Neither this option nor the No Action option is expected to have an impact on protected species.

8.3.2.5 Submission of Sector Rosters

Option 2: Revised Submission Date

This option would require sectors to submit final sector rosters to NMFS by December 1 in order to operate on May 1 of the following fishing year. Due to the administrative nature of this option, it is not expected to have impacts on protected species.

8.3.3 Commercial and Recreational Fishery Measures

8.3.3.1 General Category Scallop Dredge Exemption – Modification of Restrictions

Option 2: Exemption from Yellowtail Flounder Spawning Closure

This option eliminates the two spawning area closures, which occur during April 1-June 30 (Great South Channel SNE/GB yellowtail flounder peak spawning closure) and June 1-June 30 (Great South Channel CC/GOM yellowtail flounder peak spawning closure). The closures are designed to reduce the interference of General Category scallop fishing with spawning yellowtail flounder. As noted in the description of the No Action alternative, the spawning closures may provide some unquantified benefit to protecting yellowtail flounder. Removing the closures under this option will provide less protection to spawning fish than the No Action alternative. In turn, this may reduce the amount of forage available for protected species. These impacts would be marginal, however, since the closures do not apply to groundfish fishing vessels (some that may be targeting yellowtail flounder) or limited access scallop dredge trips.

Current management measures limit the groundfish fishery and the General Category fishery, and any catches of scallops that occur in April – June are catches that will not take place at other times if the year. In some cases, a shifting of scallop effort into these months might reduce overall bycatch since bycatch rates are higher during later months of the year. This would potentially benefit protected species by providing more forage base. The shift of effort into the area could increase the probability of protected species interacting with the fishery’s gear, however, but the impact would be likely be limited to sea turtles. Sea turtles are more prevalent within the operations area during the spring and summer, and therefore would have a higher potential for interaction with groundfish vessels during these seasons.

Some sense of the amount of GC effort, and therefore potential of impact to sea turtles, that can be expected can be assumed by behavior in 2005 and 2006, before the closures were adopted. In these years, about 30 percent of the total GC catch was taken from SA 521 and 526 between April and June. The EA for the original action which implemented these measures (2006), however, summarized the impacts of the scallop dredge gear in the then-proposed areas as minimal for sea turtles and any other protected species. At the time of the EA, only one single sea turtle had been documented as bycatch anywhere on GB, even with considerable observer coverage. It would therefore be reasonable to expect that the re-opening of these areas would have minimal impact on sea turtles. Overall, protected species, mainly turtles, may be somewhat adversely affected by these measures. The impact is not expected to jeopardize any of the species, however.

8.3.3.2 Gulf of Maine Cod Spawning Protection Area

Option 2: GOM Cod Spawning Protection Measures

Under this option, vessels fishing in sectors would be prohibited from fishing in an area with aggregations of spawning cod during the month of June, commonly referred to as the whaleback area. This option considers two sub-options with respect to recreational vessels: sub-option A, would prohibit recreational vessels from fishing in the area from April through June; sub-option B would prohibit recreational vessels from possessing cod in this area from April through June.

Overall when compared to the No Action option, this option may positively affect protected species by providing additional protection to spawning cod, thereby increasing the amount of forage available. It may also limit potential interaction with gear in the fishery, which could reduce harm and mortality to protected species such as large cetaceans and sea turtles, which are more abundant in the summer or harbor and gray seals, which are year-round residents. More specifically, sub-option A may provide more protection from gear interactions and forage availability. Sub-option B, however, only limits the possession of cod, and so the benefits to protected species may be limited, if at all, when compared to the No Action option.

8.3.3.3 Handgear Permit Management Measures

Option 3: Partial Rolling Closure Exemption for Handgear A Vessels

Under this option, Handgear A vessels would be exempt from the same GOM rolling closures as sector vessels are under the universal exemption. Access to future closed areas (such as the GOM cod spawning protection area in 4.3.2) will be determined when the closed areas are adopted.

This option will likely shift fishing effort and effort magnitude into locals and amounts that could potentially be detrimental to protected species. The Northeast/Mid-Atlantic bottom longline/hook-and-line fishery is listed as a Tier 2 Category III fishery in the LOF (2010), however in recent years, marine mammal species and stocks incidentally killed or injured by those gears have been documented as zero. Similarly, right whale critical habitat does fall in some of the affected areas, however hook gear has not been implicated in entanglements. This option is therefore not expected to affect protected species, as the trend is not expected to change as a result of the option.

Option 4: Handgear A Trip Limit Modification

Under this option the cod trip limit for vessels fishing under a Handgear A permit will adjust proportionally to the cod trip limit for cod in the relevant stock area that applies to limited access DAS vessels fishing in the common pool. The baseline Handgear A trip limit is 300 lbs./trip, limited to one trip per day. The baseline cod trip limit for limited access vessels fishing in the GOM is that adopted by FW 44 (800 lbs./DAS). For limited access vessels fishing in the GB stock area, the baseline cod trip limit is as adopted in Amendment 13 (2,000 lbs/DAS). As an example, under this measure if the GOM cod trip limit is reduced by 50 percent for limited access vessels, the Handgear A trip limit is reduced by 50 percent for vessels fishing in the GOM, but no change is made to the trip limit for Handgear A vessels fishing on GB.

This option is likely to affect trip limits for Handgear A vessels, which as a general rule can affect protected species by changing fishing effort. The Northeast/Mid-Atlantic bottom longline/hook-and-line fishery is listed as a Tier 2 Category III fishery in the LOF (2010), however, in recent years, marine mammal species and stocks incidentally killed or injured by those gears have been documented as 0. Similarly, right whale critical habitat does fall in some of the affected areas, but hook gear has not been implicated in entanglements. This option is therefore not expected to affect protected species even if it leads to a change in trip limits, as the trend is not expected to change as a result of the option.

Option 5: Handgear B Trip Limit Modification

Under this option the cod trip limit for vessels fishing under a Handgear B will adjust proportionally to the cod trip limit for cod in the relevant stock area that applies to limited access DAS vessels fishing in the common pool. The baseline Handgear A trip limit is 75 lbs./trip, limited to one trip per day. The baseline cod trip limit for limited access vessels fishing in the GOM is that adopted by FW 44 (800 lbs./DAS). For limited access vessels fishing in the GB stock area, the baseline cod trip limit is as adopted in Amendment 13 (2,000 lbs/DAS). As an example, under this measure if the GOM cod trip limit is reduced by 50 percent for limited access vessels, the Handgear B trip limit is reduced by 50 percent for vessels fishing in the GOM, but no change is made to the trip limit for Handgear A vessels fishing on GB.

The protected resources impacts of this option are likely to be similar to that of Option 4 (that is, no impact). It is likely to affect trip limits for Handgear B vessels, which generally can affect protected species by changing fishing effort. The Northeast/Mid-Atlantic bottom longline/hook-and-line fishery is listed as a Tier 2 Category III fishery in the LOF (2010), however, in recent years, marine mammal species and stocks incidentally killed or injured by those gears have been documented as 0. Similarly, right whale critical habitat does fall in some of the affected areas, but hook gear has not been implicated in entanglements. This option is therefore not expected to affect protected species even if it leads to a change in trip limits, as the trend is not expected to change as a result of the option.

8.4 Economic Impacts

8.4.1 Updates to Status Determination Criteria, Formal Rebuilding Programs, and Annual Catch Limits

8.4.1.1 Revised Status Determination Criteria for Pollock

Option 2: Revised Status Determination Criteria for Pollock

Economic impacts of revised status determination criteria are transmitted through the effect these changes have on setting OFLs, ABCs, and ultimately on ACLs. For an analysis of the economic impact of ACLs associated with this option, see Section 8.4.1.3.

8.4.1.2 Revised GB Yellowtail Flounder Rebuilding Mortality Targets

Option 2: Revised Rebuilding Target for GB Yellowtail Flounder

The economic impacts of the different rebuilding strategies were estimated by calculating the present value of the stream of potential revenues for each rebuilding strategy. Net benefits were not calculated since attribution of costs to a single stock in a multispecies fishery is not possible. Additionally a number of other simplifying assumptions were made. First, the yellowtail flounder ex-vessel price was held constant. Although prices do respond to changes in market supplies, ex-vessel price functions for groundfish tend to be relatively flat meaning that the average annual price change does not change all that much in response to changes in annual supplies. Second, discards were not deducted from the catch streams. Ignoring discards is recognized as resulting in an overestimate of realized revenue streams. However, since there is no basis for assuming discarding incentives would be different under any of the alternatives accounting for discarding would merely reduce the revenue streams by a scalar without having any affect on the ordinal ranking of alternatives. Last, US/Canada shares are not known more than one year ahead. To account for potential Canadian response to US rebuilding options the proposed TAC of at least 855 mt or 40% of the TAC, whichever was greater, was assumed to be attributed to Canada regardless of rebuilding alternative. This means that the US catch was set to zero for any TAC less than 855 mt and was the difference between the Canadian TAC and the total TAC. For purposes of comparison the potential value of the total TAC and the US portion of the TAC was calculated.

Discount rates of 3%, 5%, and 7% were used. Even though the No Action alternative would have no catch from 2011 to 2014 the increased catches from 2015 to 2020 were large enough that the present value of the No Action option exceeded that of Option C. Options A (the Proposed Action), B, and D yielded higher present value than No Action. Alternative D yielded the highest present value although the difference between rebuilding by 2016 instead of 2019 with the same probability of success was only $6.3 million over a 10 year time period. In terms of ordinal ranking, Option D had highest present value followed by Option A, Option B, No Action, and Option C. These rankings were the same for all discount rates and at the median, upper and lower quartiles as well as all other percentiles of the distribution of projected catch streams.

The ordinal ranking of the present value of revenue streams based on an estimate of the US catch alone was the same as that of the combined TAC. That is Option C produced the lowest present value of revenues regardless of discount rate or percentile of the catch distribution. Notably there was almost no difference in revenue potential between the No Action and Option B. Overall Option D produced highest net present value although the difference in median present value was only about $4 million.

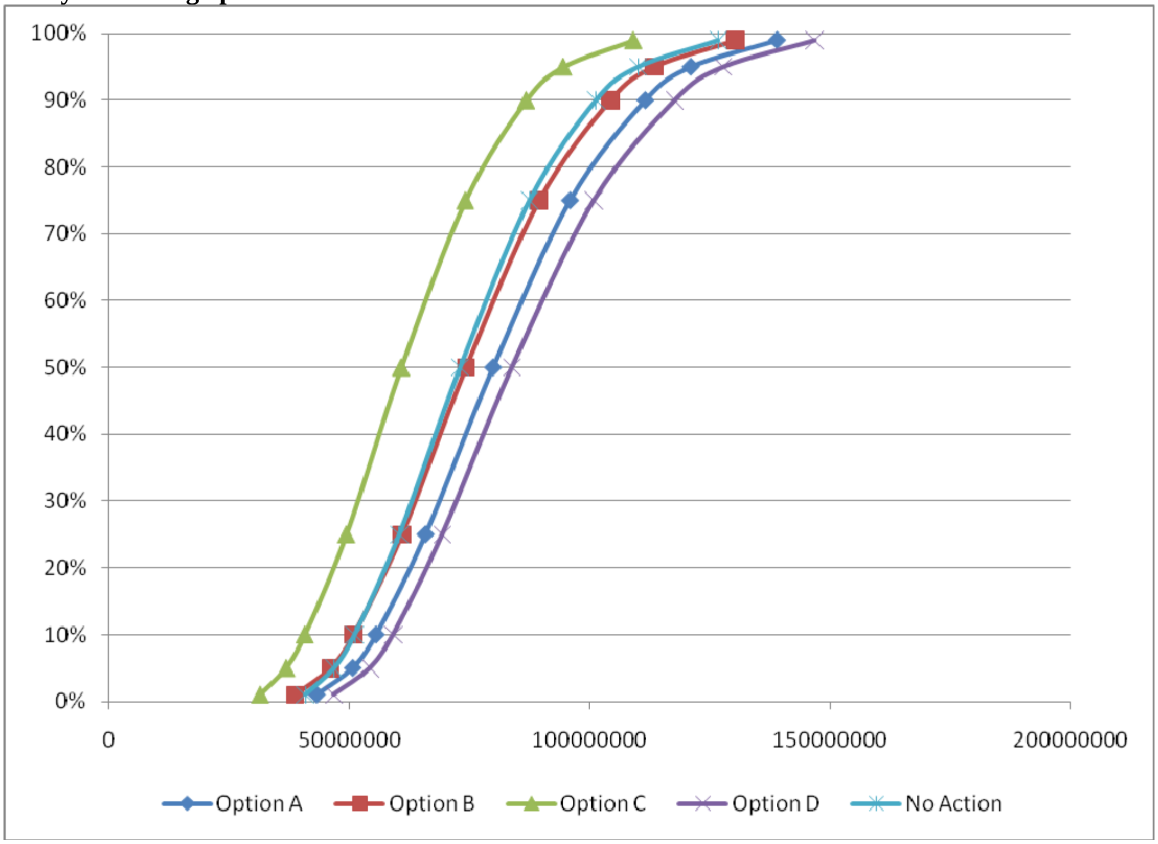
Table 107 – Present value of total TAC revenue streams for GB YT rebuilding options for 3%, 5%, and 7% discount rates

	3% Discount Rate		
Option	Lower Quartile	Median	Upper Quartile
No Action	100.9	122.0	146.1
Option A	111.0	133.7	160.2
Option B	105.1	126.2	150.7
Option C	92.8	110.9	131.6
Option D	115.9	140.0	168.3
	5% Discount Rate		
Option	Lower Quartile	Median	Upper Quartile
No Action	88.3	106.6	127.5
Option A	98.7	118.6	141.9
Option B	92.9	111.3	132.8
Option C	81.0	96.5	114.5
Option D	103.6	124.9	149.9
	7% Discount Rate		
Option	Lower Quartile	Median	Upper Quartile
No Action	77.5	93.5	111.7
Option A	88.2	105.8	126.3
Option B	82.6	98.7	117.6
Option C	71.0	84.5	100.0
Option D	93.1	112.0	134.3

Table 108 - Present value of TAC revenue streams for GB YT rebuilding options for 3%, 5%, and 7% discount rates for U.S. portion of TAC

	Lower Quartile	Median	Upper Quartile
3% Discount Rate			
No Action	60.3	73.0	87.4
Option A	65.8	79.9	95.9
Option B	60.8	74.2	89.4
Option C	49.3	60.7	74.1
Option D	69.3	83.8	100.8
5% Discount Rate	Lower Quartile	Median	Upper Quartile
No Action	52.7	63.7	76.3
Option A	58.4	70.8	84.9
Option B	53.6	65.3	78.6
Option C	42.6	52.4	64.0
Option D	61.9	74.7	89.7
7% Discount Rate	Lower Quartile	Median	Upper Quartile
No Action	46.3	55.9	66.8
Option A	52.1	63.1	75.6
Option B	47.4	57.7	69.5
Option C	36.9	45.5	55.5
Option D	55.6	67.0	80.3

Figure 43 – Cumulative probability distributions for present value of U.S. gross revenues from GB YT by rebuilding option for a discount rate of 3%



8.4.1.3 Annual Catch Limit Specifications

Option 2: Revised Annual Catch Limits for Modified Stocks

The economic impact of taking no action and revised 2011 and 2012 ACLs was estimated in a manner similar to that done for Framework 44. Specifically, total potential revenue was assumed to be measured by the revenue associated with taking the entire ACL for all stocks. This would only be possible if there were no discarding and all stocks were taken with perfectly selective gear. An estimate of potential realized revenues was obtained by projecting the ACL utilization rate based catch rates as of October 16, 2010 forward for the rest of the fishing year then adjusting for discards.

Compared to the No Action alternative, estimated revenues for FY 2011 and FY 2012 are lower because of the revised U.S. shares for both GB haddock and for GB YT. That is, even though the revised reference point results in a larger pollock ACL, the combined effect of a lower ACL for GB haddock and for GB YT results in a net difference of $2-3 million depending on which GB YT rebuilding option is selected. As was the case above, both the GB YT No Action rebuilding alternative and rebuilding Option C would result in a zero ACL for both FY 2011 and FY 2012 so the estimated revenues under either of those options would be much lower than shown here.

Table 109 – Estimated commercial revenues ($ million) by ACL option for FY 2011 and FY 2012

	Full Commercial ACL Utilization Total Revenue		Estimated Commercial Total Revenue		Estimated Sector Revenue		Estimated Common Pool Revenue	
Option	2011	2012	2011	2012	2011	2012	2011	2012
Option 1 - No Action	$194.1	$187.9	$80.2	$81.9	$71.1	$73.0	$4.4	$4.3
Option 2 - GBYT No Action	$185.4	$180.0	$77.7	$79.3	$68.3	$70.0	$3.9	$3.9
Option 2 - GBYT A	$187.8	$181.0	$79.8	$72.5	$70.4	$62.6	$3.9	$4.5
Option 2 - GBYT B	$186.6	$180.3	$78.7	$71.9	$69.3	$62.0	$3.9	$4.5
Option 2 - GBYT C	$185.4	$178.8	$77.7	$70.7	$68.3	$60.7	$3.9	$4.5
Option 2 - GBYT D	$187.8	$181.0	$79.8	$72.5	$70.4	$62.6	$3.9	$4.5

8.4.1.4 U.S./Canada Resource Sharing Understanding TACs

Option 2: U.S./Canada TACs

The economic impacts that result from the use of hard TACs for the shared stocks of GB stocks can best be described in terms of 5 different effects: 1) Hard TACs for cod, haddock, and yellowtail flounder will limit the total amount of catch of these stocks (landings and discards) allowed by law; 2) Associated rules such as gear restrictions, trip limits, and closures that may be implemented in order to prevent catch from exceeding the TACs will impact when and how such access to these stocks occurs; 3) Access restrictions implemented to control catch of one particular stock may indirectly impact access to other stocks; 4) Discarded fish count against the TAC; and 5) The timing and rate of landing of these stocks may impact the market for these species. These effects are described in more detail in the following section. This discussion builds upon the information contained in the affected environment, the description of the GB groundfish fishery.

The economic impacts of the proposed hard TACs are difficult to predict because of the 5 effects noted above, the fact that the Amendment 16 regulations that implemented substantial changes in the fishery will still be relatively new in FY 2011, and the fact that these effects interact in a complex manner. The amount of fish landed and sold will not be equal to the sum of the TACs, but will be reduced as a result of discards, and may be further reduced by limitations on access to stocks that may result from the associated rules. Reductions to the value of the fish may result from fishing derby behavior and potential impact on markets.

The cod, yellowtail, and haddock TACs specified under the Understanding all represent reductions in the size of the TACs compared to those specified for FY 2010 as shown in Table 110 below.

Table 110 – TACs for U.S./Canada stocks, FY 2010 and FY 2011

Stock	2010 TAC (mt)	2011 TAC (mt)	Difference
GB yellowtail	*1,200	1,045	-13 %
Eastern GB cod	338	200	-41 %
Eastern GB haddock	11,988	9,640	-20 %

*Adjusted downward from 1,200 mt to 1,407 due to 2009 overharvest.

A further reduction to the TAC will result from the allocation of GB yellowtail flounder to the scallop fishery. There are multiple alternative management scenarios under consideration for the scallop fishery for FY 2011, and therefore multiple allocations of yellowtail flounder based upon anticipated yellowtail catch by the scallop fishery. One alternative represents an increase, and the rest represent decreases when compared to FY 2010.

As noted above, it is difficult to predict the fishing patterns that are likely to occur in FY 2011 due to the fact that this fishery is evolving. Although there may be increased efficiencies as a result of sectors, as well as decreased discarding, which may increase revenue and/or profitability, the substantially reduced TACs will nevertheless result in reduced overall revenue. The reduced revenue will be due to both the decreased potential landings of cod and yellowtail, as well as a loss of revenue from other stocks caught on trips to the Eastern Area, when vessels lose access to this area when the TAC is projected to be caught. Although the level of haddock catch in the Eastern U.S./Canada Area is not likely to be limited by the TAC, access to haddock may be impacted by the cod and yellowtail TACs. Winter flounder is the second most valuable stock caught in the Eastern U.S./Canada area (after haddock). If vessels are able to harvest more haddock than in previous years, some of the decreased revenue described above may be recouped through increases in haddock landings.

Providing an estimate of possible catch levels and the associated revenue, based upon multiple assumptions, may be the most useful way of estimating economic impacts. Table 111 contains estimates of 2008, 2009, and 2010 revenue from the U.S./Canada Area, based upon 'matched' dealer data, and extrapolations based on total trip length to trip length on matched trips.

Table 111 – Revenue from U.S./Canada area for FY 2008, 2009, and 2010

Stock or Species	Revenue 2008	Revenue 2009	Revenue 2010 Ω
Eastern Georges Bank Cod	$ 1,610,820	$ 1,268,734	$ 827,580
Eastern Georges Bank Haddock	$ 3,797,560	$ 4,795,397	$ 1,866,460
Georges Bank Yellowtail Flounder	$ 3,205,300	$ 2,613,800	$ 955,451
Sum	$ 8,613,680	$ 8,677,931	$ 3,649,492
All Species (including other groundfish and non-groundfish species)	$ 41,819,778	$ 39,322,036 *	$ 19,168,254

*Does not include lobster revenue, which, in 2008 was worth $ 1.5 M (448 trips)
Information through October 23, 2010 (only partial fishing year)

Although FY 2008 and 2009 had similar levels of revenue, and similar numbers of distinct vessels fishing, there were 27% more trips in FY 2009 than 2008 (see also Section 7.2.4). Such a trend generates questions about the trip length, and the overall profitability of trips to the U.S./Canada Area that have not been explored. Table 112 below provides an estimate of revenue associated with the proposed 2011 TACs based on assumed price, assumed percentage of TAC caught, and an assumed discard-to-catch ratio. Past fishing years and FY 2010 catches were utilized to estimate two scenarios for the percentage of TAC caught. Discard to catch ratios and price per pound were from 2009 data. Average price estimates are based on 2009 dealer reports submitted to the NMFS Fisheries Statistics Office. Catch and landings data are based upon VMS and dealer report data, and adjusted according to the methods described at the following internet address: http://www.nero.noaa.gov/nero/regs/infodocs/DiscardCalculations.pdf. It is likely that cod will be the most limiting stock.

Table 112 – Revenue estimates from landings of shared stocks from U.S./Canada management area for 2011, under two scenarios

Stock	TAC	Assumed Price per lb	Scenario 1 % of TAC caught	Scenario 1 FY 2001 Revenue Estimate	Scenario 2 % of TAC caught	Scenario 2 FY 2011 Revenue Estimate
Eastern GB Cod	200	$ 1.54	75%	$ 331,024	100%	$ 441,365
Eastern GB Haddock	9,640	$ 1.03	5 %	$ 1,083,562	10%	$ 2,167,124
GB Yellowtail	1,045	$ 1.20	75%	$ 1,430,679	100%	$ 1,907,572
Total				$ 2,845,265		$ 4,516,061

* Discard rates: 35 %, 1 %, and 31 % (cod, haddock, and yellowtail, respectively)

According to Table 111 and Table 112 above, for 2009 the total revenue from Eastern GB cod, Eastern GB haddock, and GB yellowtail was approximately $ 8,677,931 – slightly more than the FY 2008 value of $ 8,613,680. For 2011, the estimate of the total revenue from Eastern GB cod, Eastern GB haddock, and GB yellowtail is between $ 2,845,265 and $ 4,516,061, a substantial reduction from FY 2009 revenue. The prices paid for these stocks in FY 2010 (to date) have been higher than in FY 2009, so the above FY 2011 revenue values, which are based upon FY 2009 prices, may be underestimated. The reduced size of the FY 2011 TACs is the principal reason for the reduced level of revenue expected.

When considering the revenue associated with the landings of cod, haddock, and yellowtail flounder from the U.S./Canada Area, and the impact of interannual fluctuations in the size of the TACs, it is important to note that many other species are landed from trips to the U.S./Canada Area. If the time period during which vessels have access to the area is prolonged, there would also be increased landings of other groundfish and non-groundfish species, resulting in additional revenue. Due to the implications of catching a TAC for either the common pool or sector vessels on access to resources in addition to cod, haddock and yellowtail flounder, the reduced size of the 2011 cod and yellowtail TACs will affect total revenue in 2011. However, it is very difficult to estimate the potential revenue for *other stocks* caught on trips to the U.S./Canada Area for FY 2011 due to the fact that the number of vessels that will be fishing in the common pool and in sectors in FY 2011 is not finalized. Furthermore, it is too soon to draw conclusions regarding the impact of the Amendment 16 management regime on the U.S./Canada Area fishery. The current (2010) fishing year, which is the first in which the majority of the groundfish fishery is fishing in sectors, is only half completed at the time of this analysis. The U.S./Canada TACs will be divided between the common pool and sectors. When the common pool cod, haddock, or yellowtail flounder TAC is projected to be caught, common pool vessels may no longer fish in the Eastern U.S. Canada Area, and lose all fishing opportunity in the Eastern Area. If the yellowtail flounder TAC is caught, a common pool vessel may still fish in the Western U.S./Canada Area, but may not retain yellowtail flounder. When a particular sector catches its TAC of Eastern U.S. cod or haddock the implications are the same (as for a common pool vessel), however when a sector catches its TAC (ACE) for GB yellowtail flounder they lose fishing opportunity throughout the yellowtail stock area. It should be noted that the amount of haddock that has been harvested from the U.S./Canada Area has been increasing since 2004, but it is unknown whether this trend will continue.

In contrast with the No Action Alternative, the Proposed Action would have short term negative economic impacts, due to the fact that the harvest of the shared stocks would be constrained by the TACs.

8.4.1.5 Yellowtail Flounder Allocations for the Scallop Fishery

Option 1: No Action

The Proposed Action maintains the same yellowtail flounder allocations to the scallop fishery that were adopted in FW 44 – that is, the GB and SNE/MA yellowtail flounder sub-ACLs for the scallop fishery are not changed. This is the No Action alternative. The allocation of yellowtail flounder between the scallop and groundfish fisheries may affect the fishing opportunities of the respective fleets. Determining the exact impact of the allocations is difficult because of the different management measures between the two fisheries. In particular, the AMs that apply to the fisheries shape the extent of the impacts.

Elements of the groundfish fishery actively target yellowtail flounder, particularly in the GB stock area. The species is also caught while fishing for other stocks, particularly other flatfish. Under multispecies sector provisions, sector vessels can only fish in a stock area with gear that catches yellowtail flounder if they have Annual Catch Entitlement (ACE) remaining. Since sectors are subject to hard TACs, reducing the amount of yellowtail flounder available to the sectors may limit their opportunities to fish for other species. For vessels in the common pool the issue is more complex. Because common pool vessels are governed by effort controls and a differential DAS AM in FY 2011, a reduction in yellowtail flounder available to this component does not necessarily result in an immediate loss of opportunities; but exceeding an ACL in the first year triggers the AM in the second year, so ultimately fishing opportunities are affected. In the U.S./Canada area the impacts are more immediate since the catch of GB yellowtail flounder is controlled by a hard TAC and by in-season AMs such as changes in trip limits, gear requirements, and the loss of access to the Eastern U.S./Canada area. Beginning in FY 2012 with the adoption of the hard TAC AM for common pool vessels, any change in yellowtail flounder allocations has immediate impacts on the common pool fleet since an area closes if the entire ACL is caught. There are two components to the value of yellowtail flounder to the groundfish fishery: the direct value of each pound of yellowtail flounder, and the value of other species caught while fishing for yellowtail flounder. Placing a value on the other species is difficult because fishermen may be able to adjust fishing practices to reduce the impacts of a lower yellowtail flounder allocation.

For the scallop fishery, yellowtail flounder is an important incidental catch species. Since 2004, scallop fishery catches of yellowtail flounder have not showed clear trends even while yellowtail stocks rebuild (Table 113). As a portion of the total catch, the percentage of catch by the scallop fishery increased as the restrictions on the groundfish fleet reduced overall harvest. Until Amendment 16 the only limit on yellowtail flounder catch applicable to this fishery was on the amount that could be harvested from within the CAI, CAII, and NLCA closed area access programs. Regulatory requirements establish this limit as 10 percent of the target TAC/ACL for the GB or SNE/MA stocks. The scallop management measures, however, compensate scallop vessel with trips in open areas if an access area is closed due to yellowtail flounder catches. With the adoption of an allocation and AMs applicable to the scallop fishery the possibility exists that the amount of yellowtail flounder available to this fishery could limit access to scallops in the GB and SNE/MA yellowtail flounder stock areas in FY 2011 and beyond.

Table 113 – Scallop fishery yellowtail flounder catches, CY 2004-2008

	Fishing Year	2004	2005	2006	2007	2008
CC/GOM	Total TAC	881	1233	650	1078	1406
	Total TAC for scallop fishery*	86.3	120.8	63.7	105.6	137.8
	Scallop AA open or closed	N/A	N/A	N/A	N/A	N/A
	Total YT catch by dredge gear (landings and discards)	18	6	12	35	5
	Total YT Catch (all gear)	1186	997	620	627	727
	Scallop catch as percent of total catch	1.5%	0.6%	1.9%	5.6%	0.7%
SNE	Total TAC	707	1982	146	213	312
	Total TAC for scallop fishery*	69	194	14	21	31
	Scallop AA open or closed	open	closed	open	open	open
	Total YT catch by dredge gear (landings and discards)	125	130	168	188	151
	Total YT Catch (all gear)	614	367	369	396	504
	Scallop catch as percent of total catch	20.3%	35.4%	45.5%	47.5%	29.9%
GB	Total TAC	6000	4260	2070	900	1869
	Total TAC for scallop fishery*	588	417	203	88	183
	Scallop AA open or closed	open	open	open	open	closed
	Total YT catch by dredge gear (landings and discards)	84	194	254	122	134
	Total YT Catch (all gear, U.S. only)	6386	3637	1573	1564	1118
	Scallop catch as percent of total catch	1.3%	5.3%	16.1%	7.8%	12.0%

The relative value of yellowtail flounder to the two fisheries can be calculated, but the characterization of this value as a loss or gain to either fishery is complicated by the different management measures just described. It is clearly not appropriate to consider all of the yellowtail flounder allocated to the scallop fishery as a loss to the groundfish fishery because the groundfish fishery does not “own” the yellowtail flounder. The scallop fishery has a history of catching yellowtail flounder that is well documented and any allocation method needs to take this into account. It is more accurate to consider the allocations as a transfer between the two fisheries, particularly since FW 44 adopted regulations that require scallop vessels to land all legal-size yellowtail flounder. While the vessels that receive revenue for the yellowtail flounder change based on how much is allocated to each fishery, changes in net benefits to the nation are due only to the different costs and prices between the fisheries and the extent to which scallop fishermen do not land the yellowtail flounder they are allocated (either because of illegal discards or because catches are reduced below the estimate).

Table 114 – Revenue shift associated with allocation of GB yellowtail flounder to scallop fishery under Proposed/No Action alternative, FY 2011 - 2012

Alternative	Year	Sub-ACL (mt)	lb	Revenue
Proposed/No Action	2011	201	443,125	$ 593,787
Proposed/No Action	2012	307	676,812	$ 906,928

Price per pound for yellowtail = $ 1.34 (GB; FY 2010)

Table 115 – Revenue shift associated with allocation of SNE/MA yellowtail flounder to scallop fishery under Proposed/No Action alternative, FY 2011 - 2012

Alternative	Year	Sub-ACL (mt)	lb	Revenue
Proposed/No Action	2011	82	180,777	$ 242,241
Proposed/No Action	2012	127	279,984	$ 375,179

Price per pound for yellowtail = $ 1.34 (GB; FY 2010)

As mentioned, a possible impact from allocating yellowtail flounder to the scallop fishery is that it may limit opportunities for groundfish fishermen to target other stocks. In the extreme, the groundfish fishery might lose all the revenue that would be caught with the yellowtail flounder. This likely overstates the actual secondary impacts as not all of the species are caught on the same tows and fishermen may be able to adjust their behavior in the same stock area to mitigate the loss of yellowtail flounder. They may also be able to fish in other areas, increasing their catches of other stocks. Rather than refer to these possible changes in revenue as a loss, it is better to consider them revenue that is put at risk by the allocation. As discussed in section 8.4.1.4, the ratio of yellowtail flounder revenues to total groundfish revenues on GB is about 19:1; in the SNE/MA area it is only 7.5:1. Using these factors, the revenue at risk on GB is $11.2 million in 2011 and $17.2 million in 2012. For the SNE/MA stock area, it is $1.8 million in 2011 and $2.8 million in 2012 (Table 116 and Table 117). The combined total, discounted to 2011, is $32,560,387 ($31,832,850) at a discount rate of 3% (7%).

Table 116 – Secondary revenue at risk for the groundfish fishery associated with allocation of GB yellowtail flounder to scallop fishery under Proposed/No Action alternative, FY 2011 - 2013

Alternative	Year	Sub-ACL (mt)	lb	Revenue
Proposed/No Action	2011	201	443,125	$11,281,953
Proposed/No Action	2012	307	676,812	$17,231,632

Price per pound for yellowtail = $ 1.34 (GB; FY 2010)

Table 117 – Secondary revenue at risk for the groundfish fishery associated with allocation of SNE/MA yellowtail flounder to scallop fishery under Proposed/No Action alternative, FY 2011 - 2013

Alternative	Year	Sub-ACL (mt)	lb	Revenue
Proposed/No Action	2011	82	180,777	$1,816,808
Proposed/No Action	2012	127	279,984	$2,813,843

Price per pound for yellowtail = $ 1.34 (GB; FY 2010); used as proxy due to insufficient data for a stock specific value

Table 118 – Summary of groundfish revenues at risk under the Proposed Action; discounted to 2011

Proposed Action	Total Revenues at Risk - Undiscounted	Discounted at 3%	Discounted at 7%
2011	$13,098,761	$13,098,761	$13,098,761
2012	$20,045,475	$19,461,626	$18,734,089
Total	$33,144,236	$32,560,387	$31,832,850

The economic effects of this allocation are also felt by the scallop fishery because scallop fishing activity can be constrained if the yellowtail flounder ACL is exceeded and an AM is triggered. Evaluating the economic effects of the scallop fishery AM are complex. Because the AM does not reduce scallop DAS, but only closes an area, the AMs are unlikely to reduce scallop revenues by the same percentage as the yellowtail flounder overage. If fishermen can modify their behavior they may mitigate the effects the AM, but if not then they may lose a percentage of their revenues that is the same as the percentage overage in yellowtail flounder. As was done for the goundfish fishery, one way to evaluate the effects is to consider the same percentage of scallop revenues “at risk” rather than as a loss. The effects will be felt one year after the overage.

Under the Proposed Action the scallop fishery is allocated more GB yellowtail flounder than the median estimated catch in 2011, and more SNE/MA yellowtail flounder in both 2011 and 2012. Only in 2012 is the GB yellowtail flounder allocated to the scallop fishery at 93 percent of the median expected catch. As a result, when compared to the allocation of 90 percent of the median catch Option 2, there is a lesser possibility that the scallop fishery AM will be triggered. The AM is designed to reduce future yellowtail flounder catches by the same percentage as the overage. Since the GB yellowtail flounder sub-ACL is 93 percent of the amount of yellowtail flounder the scallop fishery is expected to catch in 2012, seven percent of the revenues from this stock are at risk in 2013 with this option (because the AM is implemented the year after an overage). This totals $4,485,721. The present value of this revenue is $4,228,222 ($3,918,002) in 2011 at a discount rate of 3% (7%). In addition to the scallop revenue risk, there are additional potentially negative impacts associated with derby fishing. Lower yellowtail flounder allocations to the scallop fishery could increase the potential for approaching ACLs, which could encourage derby fishing. Finally, there is an indirect benefit for the yellowtail flounder resource and groundfish fishery from allocating more yellowtail flounder to the scallop fishery than it is estimated to catch. Both stocks are under a rebuilding program, so allocations not caught by either fishery will help accelerate the rebuilding. So the difference between the proposed action and Option 2 puts more scallop catch and revenue at risk, and if the difference is not caught by either fishery rebuilding could occur more quickly whil lprovide future economic benefits.

Table 119 - Scallop fishery revenues at risk, Proposed Action; discounted to 2011

Proposed Action	Landings at risk (GB area)	Est. Price (in 2010 prices)	Revenues at risk	Discounted Revenues at Risk (3%)	Discounted Revenues at Risk (3%)
2012	0	7.48	0	$0	
2013	608,646	7.37	4,485,721	$4,228,222	$3,918,002
Total	608,646		4,485,721	4,228,222	$3,918,002

The total revenue at risk for the two fisheries under the Proposed Action is $37.6 million in nominal dollars, or $36.8 million ($35.8 million) at a discount rate of 3% (7%). This is $56.9 million less than the revenues at risk with Option 2 (see section 9.1.1.5); $54.3 million ($51.1 million) at a discount rate of 3% (7%). Overall far less revenue is at risk with the Proposed Action compared to Option 2, and the Council did not want to change these allocations before the AM process was implemented under Scallop Amendment 15. The Council will review these allocations again, and could adjust them up or down based on new information.

Table 120 – Total revenues at risk, discounted to 2011; comparison of Proposed Action and Option 2

Combined	Total Revenues at Risk	Discounted at 3%	Discounted at 7%
Proposed Action	$37,629,957	$36,788,609	$35,750,852
Option 2	$94,499,927	$91,063,372	$86,862,119
Difference	($56,869,971)	($54,274,763)	($51,111,267)

8.4.2 Fishery Program Administration

8.4.2.1 Implementation of Additional Sectors

Option 2: Implement New Sectors for FY 2011

Depending on how sector costs for monitoring and the sector manager are levied among sector members, having lease-only sectors may result in costs savings to lease-only members since there would be no monitoring or reporting requirements other than what is required to register trades. The concept behind the state permit banks is to lease ACE to vessels that may not otherwise have sufficient ACE to remain viable as a fishing business. The terms and conditions that state permit banks may impose on participating lessees and what eligibility requirements will be adopted are not known. Furthermore, the actual leasing rates that will be offered are not known. There have been reports that leasing rates are higher than what may be affordable and/or that leases are unavailable. Presumably the state permit banks would alleviate some of these concerns for some vessels. The realized benefits will depend on how much PSC will be able to be acquired by the state permit banks. At present, the four state permit banks have about $7 million available for purchasing permits. This funding was provided by NMFS and is not evenly distributed, with Maine receiving about $3 million and Massachusetts, New Hampshire, and Rhode Island receiving about $1 million. A substantial number of permitted vessels have already been acquired by both private entities and quasi-public entities. It is likely that vessels with comparatively higher allocations of PSC have already been acquired. If this is the case, then the vessels and associated permits that may be acquired by the state permit banks may not be sufficient to meet the demand or needs for leasable ACE. A very rough approximation is that the $7 million might be able to acquire permits with about 1,300 mt of ACE (2.8 million pounds) if permits are available. Nevertheless, the state permit banks may be anticipated to provide access to leasable ACE at a price that may not otherwise be available. These potential benefits would not be available under No Action. Because of restrictions negotiated between the states and NMFS, initially the states will only be able to lease ACE to vessels that are 45 feet or shorter and are associated with communities of less than 30,000 residents.

Some concern has been expressed regarding the effect that state permit banks may have on both the market for vessels/permits and the influence of leasing policies that may be implemented on the private market lease price. With respect to the former, the concern is the prospect that with a large institutional buyer would have less emphasis on assuring a return on investment, or that there would be a demand for permit/acquisition all at the same time, that acquisition prices would be bid up. If this is the case, then private entities would end up having to pay more to acquire a given vessel/permit than in the absence of states being involved in the permit market. Conversely, concerns have been raised that the ACE leasing price may be affected particularly if states offer leasing rates at below the prevailing market rate. Whether either of these effects may occur and the magnitude of impact is speculative.

Part of the difficulty of getting beyond speculation is that the Proposed Action merely authorizes these sectors to form. Other than their names and the fact that there will be one lease-only sector comprised of privately owned vessel/permit owners and four state permit banks no other information is provided upon which to base a reasonable economic impact assessment. No information is provided to even know how many permits may be acquired by state permit banks nor is any information provided to evaluate any economic implications for how any of these proposed sectors may operate.

8.4.2.2 Monitoring Requirements for Handgear A and Handgear B Permitted Vessels and Small Vessel Exemption Vessels

Option 2: Dockside Monitoring Exemption for Handgear A and Handgear B Permits and Small Vessel Exemption Permits

The potential cost that would be imposed on these vessels beginning in FY 2012 will depend on the number of trips taken by these vessels and the amount of groundfish landed. Predicting trips that may be taken two fishing years from now is speculative at best. Nevertheless, an approximation of the relative cost that may be associated with dockside monitoring was obtained by estimating the potential costs based on fishing year 2009 activity (see Table 121 below).

According to VTR data, small vessel exemption (Category C) permit holders took 36 trips during FY 2009 where one or more pounds of groundfish were landed. Groundfish were landed on 661 and 632 trips for Handgear HA and HB permit holders respectively. Assuming dockside monitoring costs will be the same during FY 2012 as they are during FY 2010, the estimated cost was calculated as a fixed rate of $33 per trip and a rate of $0.015 per pound of groundfish landed for 20% of trips. Based on these assumptions the dockside monitoring costs would represent 5.2%

of total groundfish trip revenue for Category C permit holders and 2.3% and 3.7% respectively for HA and HB permit holders. Note that compared to both either Category C or HB permit holders Handgear A permit holders land only small amounts of species other than groundfish when groundfish are landed. This means that relative to total groundfish trip revenue the monitoring costs still represent more than 2% of groundfish trip fishing revenue as compared to 1.8% for Category C and 0.2% for HB permit holders.

Table 121 – Groundfish landings and associated predicted monitoring costs for permit categories C, HA, and HB

Category	Trips	Groundfish Pounds	Groundfish Value	Other Value	Monitor Cost	Monitoring Cost as Percent of Groundfish	Monitoring Cost as % of Total Revenue on GF Trips
C	36	3473	4804	9450	251	5.2%	1.8%
HA	661	153645	217173	28909	4977	2.3%	2.0%
HB	632	110431	125767	2515068	4613	3.7%	0.2%

Option 2 would eliminate the cost of dockside monitoring resulting in an aggregate reduction in fishing costs of $9,841. However, in conjunction with the following measure that removes the industry requirement to fund dockside monitoring, it is unclear what the cost would be to NMFS in FY 2011 and FY 2012 since it has not yet been determined what the coverage levels will be.

8.4.2.3 Monitoring Requirements for Commercial Groundfish Fishing Vessels

Option 2: Removal of Dockside Monitoring Requirements

The cost of dockside monitoring for FY 2010 has been subsidized by the NMFS. Based on preliminary data the overall average cost associated with dockside monitoring averaged about $0.02 per landed pound. This estimate is based on an agreed formula between the NMFS and sector managers to calculate reimbursement for dockside monitoring services which includes a per pound rate of $0.015, $33 per trip monitored, and $27 per trip requiring a roving monitor. Note that the estimated cost per pound landed for monitored trips was based on invoices received by sectors May-August. However, not all sectors had sent in invoices as of the date the average cost reported herein were estimated so the actual costs may differ by sector and may be substantially different once the fishing year has been completed.

Using methods similar to that used to estimate expected revenues for the FY 2011 and FY 2012 ACLs (i.e. based on a linear projection of average ACL use rates and average discard rates) the estimated cost for dockside monitoring for FY 2010 would be $616,000 or 0.8% of estimated FY 2010 revenues. Since dockside monitoring would be reduced to 20% during 2011, the estimated monitoring cost would be $281 thousand or 0.4% of the estimated FY 2011 groundfish revenues. Note that the actual overall average dockside monitoring cost per pound landed will be zero for any lease-only sectors and may be higher for sectors with below average landings per trip since the trip cost gets spread out over fewer pounds. Similarly, the average cost per pound may be lower for sectors with higher than average landings per trip. These costs would be eliminated if Option 2 is selected.

Option 3: Removal of Requirement for Industry Funding of Monitoring for FY 2012

The potential cost of at-sea monitoring depends on the number of trips and trip duration. Amendment 16 requires sectors to devise a monitoring system capable of achieving the same or better CV as that for the SBRM. At least for FY 2010, a target rate of 38% coverage of the combined common pool and sector trips was deemed necessary to adequately monitor total catches. This target rate is intended to be reached using a combination of at-sea monitors and the NEFOP. Under No Action, industry would be required to fully fund the at-sea monitoring portion of the catch monitoring program beginning in FY 2012. Although the 38% target rate has not yet been achieved and the estimated cost for the at-sea portion is based on assuming that the 8% NEFOP coverage determined to be needed or bycatch reporting prior to sectors would continue leaving 30% of trips that would be need to be paid for by industry. Available data indicate that the number of trips taken during FY 2010 (as of October 15) is approximately 44% lower as compared to the same date of FY 2009. Assuming this trend continues the expected number of trips taken during FY 2010 would be 13,100 trips as compared to 23,466 trips during FY 2009. Notably the average trip duration during FY 2010 has increased from less than 24 hours to just over 24 hours. This means that, on average, each trip spans at least two calendar days which increases the at-sea monitoring cost since the cost is based on a calendar day. Assuming 30% at-sea monitoring coverage would still be required in FY 2012, an average of 2 calendar days, and an average at-sea monitoring cost of $630 per day results in an estimate of about $5 million. This estimate represents about 6% of total expected groundfish revenue during FY 2010. The at-sea monitoring costs during FY 2010 may represent an even larger percentage of FY 2012 revenues since ACLs for some stocks will be lower during FY 2012 than they were during FY 2010.

Option 3 would remove the requirement for industry funding of at-sea monitoring costs in FY 2012. The economic impact of this action is uncertain since the likelihood of continued NMFS subsidies to the groundfish fishery after FY 2011 is not known. At least some coverage would be provided through the NEFOP to meet SBRM requirements, but whether higher levels of coverage are needed to monitor discarding under output based management controls as compared to the level of precision achieved under DAS is not certain.

Assuming that at-sea monitoring does provide greater precision in discard estimates and NMFS does not provide any funding for at-sea monitoring during FY 2012, then one way to deal with the increased uncertainty resulting from this contingency under Option 3 would be to increase the management uncertainty buffer in setting ACLs. If as noted in Section 7.1.2.3 discards are a small fraction of total removals then any adjustment to the management buffer may not be needed or would at least be smaller than otherwise. Nevertheless, if an adjustment is needed and the buffer results in a more than 6% reduction in expected revenues then the industry may be better off paying for at-sea monitoring.

Option 4: Trip-end Hail Requirement

The economic impacts associated with this option are limited to the costs associated with the submission of the trip-end hail report via VMS. The evaluation of the costs of this option assume that the current trip-end hail report originally implemented under Amendment 16, including all of the fields specified in the trip-end hail report mandated by that action, are maintained. The most expensive VMS provider currently charges $0.004 per character, plus $0.5 per email transmission. Using the fields required by the Amendment 16 trip-end hail report, the hail email consists of a total of 100 characters per submission, including the vessel permit number (6 characters), VTR serial number or other applicable trip ID number (14 characters), the first dock or dealer the vessel will be landing at (10 characters), the first port or harbor of landing (10 characters), the first state of landing (2 characters), the second port or harbor of landing (10 characters), the second state of landing (2 characters), arrival time (12 characters), offload time(12 characters), and the total weight of groundfish on board (6 characters), the total weight of non-groundfish on board (6 characters), and the commas used to separate fields (10 characters). Thus, the total cost to submit each trip-end hail report via VMS is estimated at $0.90. Assuming 25,000 trips are taken each year and that 2,500 trip-end hail reports are also submitted to correct inaccuracies in the originally-submitted trip-end hail reports, the total annual cost to the public for complying with this requirement is estimated to be $24,750 ($0.9/hail x 27,500 hails). However, based on fishing patterns during the beginning of FY 2010, it is likely that the number of tirps will be lower in future years, with 13,000 trips expected in FY 2010. If this trend continues, trip end hail costs would be about $12,870 per year. Therefore, this option maintains some of the costs already imposed upon the fishing industry and would not increase costs compared to the No Action alternative.

8.4.2.4 Distribution of PSC from Canceled Permits

Option 2: Even Redistribution Among All Remaining Permits

Assuming equivalent PSC utilization rates and cost of fishing, the economic value derived from available ACL would be unchanged whether the PSC from cancelled permits is allocated to the common pool (No Action) or equally distributed to all permits under this option. However, PSC utilization rates in terms of landings and the cost of fishing varies. An economically optimal allocation would allocate PSC from cancelled permits to the most profitable vessels whether they are in the common pool or in a sector. Neither the No Action nor this option contemplates making allocations of cancelled PSC in this manner. However, if, on average, vessels that fish in the common pool are less profitable than sector vessels, then this option would result in an improvement in economic efficiency as compared to taking no action.

Initially this measure is expected to redistribute about 72,00 lbs. of groundfish, an inconsequential number, and is not likely to have substantial economic impacts.

8.4.2.5 Submission of Sector Rosters

Option 2: Revised Submission Date

Allowing sector rosters to be submitted in December would be unlikely to have any meaningful economic impact but may offer individuals more flexibility in time to weigh their options. This may prove advantageous for two reasons. First, since the proposed action would not change the requirement to submit other sector documents by September 1, individual vessels owners would have the opportunity to understand and evaluate each sector's operations plan and make a reasoned choice on whether or not to join a sector and which sector's operations plan best aligns with the individual's interests. The second advantage depends on the timing of when revised ABCs and ACLs will be made available. If the timing for setting these targets is similar to that of when they were set for FY 2010 (i.e. during August) then submitting sector rosters in December allows vessel owners more time to consider their options in light of any potential adjustments to ABCs and ACLs.

8.4.3 Commercial and Recreational Fishery Measures

8.4.3.1 General Category Scallop Dredge Exemption – Modification of Restrictions

Option 2: Exemption from Yellowtail Flounder Spawning Closure

This option would provide the opportunity to improve the economic value of landed scallops and may result in improved IFQ scallop share values in comparison to the No Action alternative. That is, provided the exemption would make it possible to harvest the same quantities of scallop at lower cost, the economic value in terms of profitability would be improved. This improved profitability would be reflected in higher IFQ share values.

However, if fishing with a scallop dredge is found to interfere with yellowtail flounder spawning then the full cost of lower spawning success and the lower landings that may result would not be reflected in the general category scallop profitability or IFQ share prices. Note that this externality does not necessarily mean that the No Action alternative should be adopted since the efficiency gains from the general category scallop dredge exemption may outweigh the losses associated with lower yellowtail spawning.

8.4.3.2 Gulf of Maine Cod Spawning Protection Area

Option 2: GOM Cod Spawning Protection Measures

Option 2 would prohibit recreational fishing during the months of April – June within the so-called Whaleback area in the Gulf of Maine while using gear capable of catching groundfish. This would affect any recreational fishing trip that may have taken place inside the closure area whether or not cod was the target groundfish species. This action would affect both party/charter operators as well as have an impact on the value recreational anglers derive from taking a fishing trip. Note that the latter includes both party/charter anglers and private boat anglers since the closure would apply to all recreational fishing modes. Recreational fishing values are measured by the economic surplus over and above what anglers actually have to pay to take a trip. Estimating these values requires specialized surveys from which economic surplus measures may be inferred. These studies are not available for the recreational groundfish fishery at this time.

Nevertheless, the proposed closure is likely to result in some unknown loss in economic surplus since recreational anglers would not be able to fish in their preferred location. Note that a loss in economic surplus would still prevail even if trips are taken to alternative non-preferred fishing sites and anglers spend the same amount of money to take a trip.

The potential impact on party/charter operators may be measured by the potential loss in passenger revenues should passengers either not to take a trip or the party/charter operator is unable to fish elsewhere. During FY 2007 - 2009 the number of party/charter trips taken during April-June inside the proposed GOM spawning closure was 81 in FY 2007, increased to 116 during FY 2008 then declined to 103 trips during FY 2009. These trips represented 1-2% of total GOM party/charter trips. On average the number of passengers carried (26-22) was higher than the GOM-wide average of 18. Fishing year 2008 and 2009 data suggest that during these two years the proposed spawning area has become more important to the party/charter sector as the shares of GOM cod, passengers, and trips all were higher compared to FY 2007 (Table 122).

Table 122 - Summary of Gulf of Maine party/charter trips, FY 2007 - 2009

	FY 2007	FY 2008	FY 2009
	Gulf of Maine Totals		
Total Trips	6537	5580	4704
Total Cod	103532	117244	114559
Total Kept	407171	492516	517876
Total Anglers	117465	100537	85212
	Trips Affected by GOM Spawning Closure		
Trips	81	116	103
Kept Cod	1578	4094	5388
Total kept	6982	12536	8448
Anglers	2174	3064	2234
	Share of Affected GOM Trips		
Trip Share	1.2%	2.1%	2.2%
Cod Share	1.5%	3.5%	4.7%
Kept Share	1.7%	2.5%	1.6%
Angler Share	1.9%	3.0%	2.6%

The potential loss in gross sales to the GOM party/charter sector as a whole, assuming no alternative fishing locations are sought, would be proportional to the share of anglers on affected GOM trips. However, since not all party/charter operators take trips within the proposed spawning closure the potential revenue reductions would be taken only by party/charter vessels operating in the area. The number of party/charter operators taking one or more affected trips ranged from 13 during FY 2007 to 18 operators during FY 2008. Some of these operators took trips in each fishing year from 2007 to 2009 while others may have taken passengers for hire during only one of the three fishing years. Only 6 party/charter vessels took at least one trip within the proposed spawning closure in all three fishing years while 10 operators took at least one trip during both FY 2008 and FY 2009. For purposed of analysis these 10 vessels are considered the most likely to be affected since they reflect more recent participation as well as including the 6 vessels that also took passengers for hire in the spawning closure area during FY

2007. Gross sales by the 10 participating party/charter operators were $1.8 million and $1.5 million during FY 2008 and FY 2009 respectively. Gross sales associated with trips taken within the proposed spawning closure were $112 thousand and $103 thousand respectively; a loss of approximately 6-7% or about $10 thousand per vessel. Note the potential loss ranged from less than $1,000 to a high of just over $42,000 depending on fishing year. These values represent an upper bound estimate since it is likely that party/charter operators may be able to seek out alternative fishing locations.

In summary, when compared to No Action, the adoption of the proposed Whaleback closure area will result in economic losses for the recreational fishery. These cannot be quantified for the private boat sector. For party/charter vessel operators that make trips in the GOM the loss in gross sales would be in the range of 1.9% to 3.0%. A subset of operators that make multiple trips in the area would suffer larger losses estimated to be in the range of 6-7% or $10,000 per vessel. These estimates are upper bound estimates because trips may be made to alternate fishing locations.

8.4.3.3 Handgear Permit Management Measures

Option 3: Partial Rolling Closure Exemption for Handgear A Vessels

Providing handgear permits with the same rolling closure universal exemptions granted to sectors will improve their economic opportunity. Since the rolling closures were originally selected because of comparatively high catch rates, handgear permit holders may be expected to be able fish at their trip limit in, perhaps, less time compared to alternative fishing locations. Whether this option would result in a realized economic gain to handgear permit holders is uncertain.

This option provides handgear permit vessels with a potential competitive advantage relative to other common pool vessels. In so doing, it may be regarded as permitting handgear vessels to get a jump on the derby relative to other common pool vessels. Depending on catch rates and level of participation, the exemption for handgear permits may result in an earlier adjustment to the GOM cod trip limit affecting all common pool vessels, handgear permit holders included. That is, in a competitive derby fishery, it is unlikely that creating an economic opportunity for one permit category will have no impact on other fishery participants.

Option 4: Handgear A Trip Limit Modification

Linking the cod trip limit with the trip limit to its stock area would provide an economic opportunity and incentive to fish in multiple stock areas in order to access the largest cod tirp limit. The number of handgear permit holders that may be able to take advantage of this option is uncertain. Accessing the GB stock area for a substantial number of fishery participants may require at least a temporary relocation of their fishing business because of the limited ranged of their vessels; many of these vessels are small and are unlikely to fish in multiple stock areas on the same trip. For those handgear vessels that do routinely fish on GB the Proposed Action would assure that the cod trip limit was linked to the cod stock that they are actually fishing on rather than fishing effort occurring in the GOM.

In addition to linking any required cod trip limit adjustments to the stock area, Option 4 would adjust the manner in which the Handgear A trip limit is made. Specifically, the GOM cod trip limit would keep the cod trip limit at 300 lbs. per trip until the DAS common pool trip limit dropped below 300 pounds. Once this trigger is reached the Handgear A trip limit will be the same as that of the DAS common pool. Taking no action would mean that the Handgear A trip limit would be adjusted in the same proportion as that of the common pool trip limit. As such, taking no action would not change the economic opportunities available to Handgear A permit holders whereas the proposed action would enable Handgear A permit holders to retain up to 300 pounds of cod for a longer period of time. Furthermore, even if the trip limit is lowered below 300 pounds Handgear A permit holders would still be able to retain more cod than they would under No Action. The realized economic impacts of this option are uncertain but may be expected to be positive. In a manner similar to that of providing Handgear A permit holders access to the rolling closure areas, this alternative improves the relative competitive position of Handgear A permit holders and may allow participating vessels to increase their share of the GOM and/or GB cod ACL that may be taken before a trip limit adjustment would be imposed on all other DAS common pool participants. Whether this potential effect would be realized and the magnitude of the economic externality that may be imposed on other common pool participants cannot be reliably estimated.

Option 5: Handgear B Trip Limit Modification

Linking the cod trip limit with the trip limit to its stock area would provide an economic opportunity and incentive to fish in multiple stock areas. The number of handgear permit holders that may be able to take advantage of this option is uncertain. Accessing the GB stock area for a substantial number of fishery participants may require at least a temporary relocation of their fishing business because of the limited ranged of their vessels. For those handgear vessels that do routinely fish on GB the Proposed Action would assure that the cod trip limit was linked to the cod stock that they are actually fishing on rather than fishing effort occurring in the GOM.

8.5 Social Impacts

The need to assess social impacts emanating from federally mandated fishing regulations stems from National Environmental Policy Act (NEPA) and M-S Act mandates that the social impacts of management measures be evaluated. NEPA requires the evaluation of social and economic impacts in addition to the consideration of environmental impacts. National Standard 8 of the M-S Act demands that "Conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of over fishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities in order to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities" (16 U.S.C.§1851(2)(8)). The analysis that follows provides a context for understanding possible social impacts resulting from the proposed measures in Framework 45.

Amendment 13 identified five social impact factors: *regulatory discarding, safety, disruption in daily living, changes in occupational opportunities and community infrastructure, and formation of attitudes*. All of these factors can be affected by changes in management measures. Fishermen find regulatory discarding both distasteful and wasteful of valuable fishery resources. Modifications to daily routines can make long-term planning difficult. New gear requirements such as netting and some equipment must be ordered months in advance resulting in changes to daily routines when these modifications cannot be met in a time- and cost-efficient manner. Additionally, the cost of making such changes may prove to be a burden for some vessel owners. Changes in management measures that limit access to fishing may increase the likelihood of safety risks. Increased risk can result when fishermen spend longer periods at sea in order to minimize steam time to and from fishing grounds, operate with fewer crew, and fish in poor weather conditions. Formation of attitudes refers to the positive or negative feelings or beliefs expressed by members of the communities that will be affected by the Proposed Action. The effect of the Proposed Action on these factors will be discussed below.

Amendment 13 also identified primary and secondary port groups that are most affected by changes in groundfish management. The criteria port groups identified for this action are discussed in Section 7.5.2. It not likely that this action would affect all of these port groups to the same extent. Those port groups that are more dependent on groundfish would likely have more social impacts than those that participate in a range of fisheries. Even among communities with similar dependence on groundfish, there are likely to be different impacts since some measures have localized impacts. The following discussion will also highlight the differences between port groups, where appropriate.

8.5.1 Updates to Status Determination Criteria, Formal Rebuilding Programs, and Annual Catch Limits

8.5.1.1 Revised Status Determination Criteria

Option 2: Revised Status Determination Criteria for Pollock

This option adopts the SDC recommended by SAW 50 (NEFSC 2010). Using these criteria, the stock is not overfished and overfishing is not occurring. The stock is estimated to be above SSB_{MSY} and as a result a formal rebuilding program is no longer required. Catches can increase above recent levels and well above the catches proposed in FW 44 using the No Action SDC and a formal rebuilding program.

Compared to the No Action alternative, the most substantial effect of this alternative will be the increase in allowable catch levels. This increase is not expected to have major social impacts. The inclusion of the best available, and most recent, science into management measures may have a slight positive effect on the *formation of attitudes* about the management process. The assessment was conducted in part due to public concern about the accuracy of previous assessments on this stock. The positive response of incorporating these results in a timely manner should lead to some degree of satisfaction among interested parties.

8.5.1.2 Revised GB Yellowtail Flounder Rebuilding Mortality Targets

Option 2: Revised Rebuilding Target for GB Yellowtail Flounder

Four alternative rebuilding strategies were being considered for this measure, all of which target a rebuilding at a slower pace than under the No Action alternative. The selected strategy is:

> Sub-option A: Use a fishing mortality target that is calculated to rebuild the stock by 2016 with a 50 percent probability of success

This sub-option extends the rebuilding period to 2016. All impacts discussed below would be expected to last as long as the rebuilding period, barring other changes to the FMP or specifications.

This option would have positive social impacts compared to the No Action alternative. It would result in increased effort and landing of this stock when compared to the No Action alternative, which would provide for some increased occupational opportunities, although the exact amount of the effort increase is difficult to predict in a mixed-stock fishery. An increase in available GB yellowtail flounder could enable sectors and the common pool to operate longer before reaching their ACE and ACL, which would help create a more stable market and facilitate long-range planning for industry participants. Adoption of these options will also instill a sense of fairness that the rebuilding plans were re-considered in a way that promoted economic growth and incorporated best available science to not be unreasonable restrictive. The magnitude of that effect will be determined by how much the chosen strategy increases available catch over the applicable time frame.

8.5.1.3 Annual Catch Limit Specifications

Option 2: Revised Annual Catch Limits for Modified Stocks

This option proposes to adopt new specifications and ACLs for FY 2011 - 2012 for GB cod, GB haddock, GB yellowtail flounder, and pollock. In addition, white hake specifications in FW 44 are reiterated so that NMFS can correct an error in their publication. This measure includes the identification of ACLs, OFLs, and ABCs as required by the M-S Act and as implemented by Amendment 16. It also incorporates adoption of the incidental catch TACs for the special management programs that use Category B DAS. Implementation of ACLs is required by the Magnuson-Stevens Act and may have social impacts that are difficult to define. The social impacts of ACL-setting in general are discussed in detail in Amendment 16.

Compared to the No Action alternative, some of the ACLs being adopted are more permissive than those in Framework 44, while others are more restrictive. The adoption of the more restrictive ACLs may lead to concerns that the fishery is being managed in an overly conservative manner. This could affect attitudes towards the management program since it will be viewed as limiting occupational opportunities unnecessarily. However, the more permissive ACLs proposed in this option are likely to have the opposite effect: they can increase *occupational opportunities* and reduce *regulatory discarding* that may occur if trip limits are imposed on stocks with low ACLs. These effects are expected to be minor. Because this is a mixed-stock fishery, an increase in ACLs for certain stocks, such as pollock, is tempered by the fact that catches may still be limited by bycatch or concurrent catch of other species managed in the FMP.

Because the ACLs are simply caps on the amount of catch that can occur for each stock in the fishery, the adoption of ACLs numbers itself does not have major social impacts. There is likely to be little difference between the social impacts of the Proposed Action and No Action. Under both circumstances, catches are limited, they may be viewed as conservative limits, and the complexity of setting the limits may deter participation in the management process. The relatively minor differences in catch levels are not likely to substantially alter the perception of the management program.

8.5.1.4 U.S./Canada Resource Sharing Understanding TACs

Option 2: U.S./Canada TACs

This option adopts the TACs for Eastern GB cod, Eastern GB haddock, and GB yellowtail flounder that are applicable to the U.S./Canada Resource Sharing Understanding. The proposed hard TACs for the U.S./Canada area are not expected to have significant social impacts in comparison to the No Action alternative. The TACs for EGB cod and haddock and GB yellowtail flounder were determined in the same way as has been done in recent years. TACs of the three co-managed species vary from year to year, and the FW 45 numbers are lower than in recent years but not hugely so. Although discarding may occur in the area as it does in the rest of the fishery, it is unlikely to be a special issue.

Although the Proposed Action would be expected to have short-term negative economic impacts in contrast to the No Action Alternative, the impacts should not be significantly different from those in the rest of the fishery in a way that would cause them to have unique social impacts. The long term impacts of the No Action Alternative are more likely to be negative than the Proposed Action. Stock rebuilding is likely to have positive social effects, as it will allow effort to increase in the area, and such rebuilding could be jeopardized by the No Action alternative.

8.5.1.5 Yellowtail Flounder Allocations for the Scallop Fishery

Option 1: No Action

Under this option, the scallop fishery yellowtail flounder allocations implemented in FW 44 would not be changed. Allocations were only specified for FY 2010 – 2012. The allocations are shown in Table 12. Note that in this instance "No Action" refers to keeping the FY 2011 and FY 2012 yellowtail founder allocations (in terms of weight) specified in FW 44 and not a specific suite of scallop management measures.

Framework 22, the framework to the Scallop FMP that adopts ACLs for that fishery, was adopted by the Council in November 2010. Updated analysis of yellowtail bycatch needs of the scallop fishery suggest the No Action alternative will not be constraining on the scallop fishery. This may exacerbate some equity concerns that would have arisen had the yellowtail allocation constrained the scallop catch. Then, the social impacts to the scallop fleet would have been negative due to lost occupational opportunities and disruptions in planning and daily living, and unreported discarding could have increased, although the scallop fleet is currently required to land all yellowtail flounder caught. Similarly, because the No Action alternative maintains the same allocations as in Framework 44, there should be no additional constraints on the groundfish fishery from this Proposed Action. The other social impacts of this allocation, such as a possible perception of inequity between the scallop and groundfish fleets, were described in Framework 44 when it was originally adopted.

8.5.2 Fishery Program Administration

8.5.2.1 Implementation of Additional Sectors

Option 2: Implement New Sectors for FY 2011

This measure is largely administrative in nature and is not, in itself, likely to have major impacts on any of the social factors when compared to the No Action alternative. The new sectors, as proposed in this option, may create *changes in occupational opportunities and community infrastructure*, because each sector may have jobs associated with it and provide more geographical options for participants in the fishery. Also, an increase in options for sector membership may mitigate *disruptions in daily living* if participants can find sectors that are more geographically or socially suitable to their interests. The Amendment 16 analysis of social impacts concluded that increased sector membership would reduce regulatory discarding, so the creation of new sectors in this option will also have that effect if it encourages a larger percent of fishermen to join sectors or shifts effort into those sectors.

The fact that several of the proposed new sectors are state-operated permit banks could have distinct social impacts, but those impacts are impossible to predict at this time. Since the Memoranda of Understanding for these permit banks require that ACE accrue to specific ports and vessels of a specific size, localized impacts to particular participating communities could occur. While the social impacts to communities that qualified for the programs would be expected to be positive due to increased fishing opportunities, impacts to non-qualifying communities would be negative. In addition to decreased fishing opportunities, there could be concerns over equity and changes in community infrastructure.

8.5.2.2 Monitoring Requirements for Handgear A and Handgear B Permitted Vessels and Small Vessel Exemption Vessels

Option 2: Dockside Monitoring Exemption for Handgear A and Handgear B Permits and Small Vessel Exemption Permits

This option removes the requirement that Handgear A, Handgear B, and Small Vessel Exemption vessels fishing in the common pool have 20 percent of their trips monitored by dockside monitors beginning in FY 2012. The requirement would remain for Handgear A and Small Vessel Exemption Vessels that fish in sectors (Handgear B vessels are not eligible to join sectors).

This option would have positive social impacts for the portion of the fleet to which it is directed. If these small vessel operators are not required to pay for dockside monitoring, they can run more profitable trips and have more occupational opportunities. For the fleet as a whole, however, this option could create the perception of inequity across the fleet. The removal of dockside monitoring requirements for only these types of vessels may seem unfair to other operators that land similar or slightly higher amounts of groundfish with different permit types.

8.5.2.3 Monitoring Requirements for Commercial Groundfish Fishing Vessels

Option 2: Removal of Dockside Monitoring Requirements

This option removes the requirement for dockside monitoring of 20 percent of commercial groundfish trips (for sector vessels beginning in FY 2011 and for all other vessels beginning in FY 2012). As a result, landings from these trips will not be independently verified, though dealer reports and vessel reports will still be required.

Similarly to the removal of the requirement for dockside monitoring for handgear and small vessel exemption permits, this option would have positive social impacts for the portion of the fleet to which it is directed in comparison to the No Action alternative. If the entire fleet is not required to pay for dockside monitoring, they can run more profitable trips and have more occupational opportunities. Unlike that option, however, this one is directed toward the entire fleet and therefore does not raise concerns of equitability.

Option 3: Removal of Requirement for Industry Funding of At –Sea Monitoring in FY 2012

This option removes the requirement for industry funding of at-sea monitoring in FY 2012. While this does not have direct biological impacts, at-sea monitoring is essential to provide accurate information on discards. Discard information is needed so that assessments are based on total catch. Without this information there is more uncertainty on fishing mortality estimates and as a result a greater likelihood that rebuilding targets and mortality goals may not be met.

It is not possible to accurately estimate the impacts of this measure since it is not known what coverage levels would be in the absence of industry funding. Assuming that coverage would decrease as a result of this, there are several negative social impacts associated with that decreased coverage. As noted, it will lead to increased uncertainty in mortality estimates; including that uncertainty adjustments may change ACLs more greatly from year to year, rendering long-term occupational planning difficult. Also, the degree of trust among participants in the fishery, and between fishermen and managers, may be diminished if catches are not verified and some industry members are seen as able to "cheat" the system. This can lead to loss of community cohesion and a decreased feeling of stewardship for the fishery.

However, the simple fact of removal of the requirement for industry to pay for at-sea monitoring, divorced from the impacts on coverage levels is expected to have largely positive social impacts. The monitoring is expected to be a large percentage of revenues for at least some boats in the fleet, and these vessels are currently struggling to adapt to sector management and a flagging economy. The industry is very supportive of this measure, and the extra profits they can earn if they are exempt from this payment would be able to go toward long-range planning, decreased disruptions in living and vessel operations, and would create positive attitudes about the willingness of the managers to make sector management effective.

Option 4: Trip-end Hail Requirement

Should dockside monitoring requirements be eliminated, commercial vessels will still be required to provide a trip-end hail via VMS. This measure should not have considerable impacts in comparison to the No Action alternative. While it does take time to submit a hail report, the expense is the same as that associated with the No Action alternative, as discussed above, and the extra effort in minimal. Vessels are already making this hail as part of dockside monitoring requirements in FY 2010, so the system and methods for doing so are already in place. It is generally regarded as a useful tool for enforcement and its purpose is well understood and accepted by some members of the fishing industry. This option should not affect attitudes or cause significant disruptions to fishing practices.

8.5.2.4 Distribution of PSC from Canceled Permits

Option 2: Even Redistribution Among All Remaining Permits

Unlike the No Action alternative, in this option if a permit is cancelled the associated PSC is redistributed proportionally to all other permit holders. This option will impact *formation of attitudes* by leading to a more positive perception of fairness in the fishery in comparison to the No Action alternative. Since the PSC of all participants is calculated as a percentage of the total available sub-ACL for the commercial fishery, redistributing the PSC of cancelled permits back into that overall pool will appear to be the most equitable option to participants.

8.5.2.5 Submission of Sector Rosters

Option 2: Revised Submission Date

This option would require sectors to submit final sector rosters to NMFS by December 1 in order to operate on May 1 of the following fishing year.

Compared to the No Action option, this option allows potential sector members to have more time to develop a profitable business plan and decide whether joining a sector will suit them. There are several reasons why fishermen would want to wait until 5 months prior to the fishing year to make this decision, including changing regulations and economies, and personal matters of the participants. Also, having a date certain on roster submission will decrease uncertainty in the fishery and allow for less disruptive planning.

8.5.3 Commercial and Recreational Fishery Measures

8.5.3.1 General Category Scallop Dredge Exemption – Modification of Restrictions

Option 2: Removal of Yellowtail Flounder Spawning Closure

This option eliminates the two spawning area closures that are designed to reduce the interference of General Category scallop fishing with spawning yellowtail flounder. As noted in the description of the No Action alternative, the spawning closures may provide some unquantifiable benefit to protecting yellowtail flounder. Removing the closures under this option will provide less protection to spawning fish than the No Action alternative. These benefits are marginal, however, since the closures do not apply to groundfish fishing vessels (some that may be targeting yellowtail flounder) or limited access scallop dredge trips.

As described in the biological impacts section, removal of the spawning closures may have the effect of shifting scallop effort into these months, which could reduce overall bycatch since bycatch rates are higher during later months of the year. Reducing bycatch is desirable; however, since this fleet is required to land all caught yellowtail flounder this will neither increase nor reduce *regulatory discarding*.

The amount of yellowtail flounder that is sub-allocated to the scallop fishery is set in Section 4.1.5 to match the numbers allocated in FW 44. That means that if the removal of the closures changes the amount of yellowtail caught by the scallop fleet, the cap will apply, so there should be no shifting of effort between the groundfish and scallop fisheries. If in a later action, the yellowtail allocation to the scallop fishery is calculated as a percentage of the scallop fishery's need (as was done in FW 44), this measure could create such an effort shift. When compared to No Action any measure that shifts allocation from one fishery to another may have impacts on some of the other social impact categories. *Changes in occupational opportunities* could occur if the allocation provides more opportunities in either fleet: if the scallop fishery is seen as advantaged from the allocation, then effort could shift into that fishery. *Formation of attitudes* could clearly be affected if constituents of either fishery feel disadvantaged by the measure with respect to the other fishery.

8.5.3.2 Gulf of Maine Cod Spawning Protection Area

Option 2: GOM Cod Spawning Protection Measures

Under this option, commercial vessels fishing in sectors or the common pool would be prohibited from fishing in an area with aggregations of spawning cod during the month of June commonly referred to as the whaleback area. When compared to the No Action alternative, this option provides additional protection to spawning cod.

This option adopts the following rule with respect to recreational vessels: all recreational fishing vessels using gear capable of catching groundfish are prohibited from fishing in the area from April through June. This would reduce a source of mortality on spawning cod and thus provide benefits superior to the No Action alternative. It also provides greater benefits than Sub-option B, which was not selected but would have prohibited recreational vessels from possessing cod in this area from April through June, and which had less clear benefits.

Social impacts of closed areas may tend to be more far-reaching in nature than social impacts from other management measures in this framework that are more administrative in nature, although the impacts are not as great as those that would result from very low catch limits or reductions in days at sea (see NEFMC 2009a for a more thorough description). This measure can also be expected to have wider impacts than others because it affects both the commercial and recreational fleets.

Area closures tend to have the most significant impacts on *disruption in daily living* and *changes in occupational opportunities and community infrastructure*. A closure in the Whaleback area, compared to the No Action alternative, is likely to cause effort (especially recreational effort) to be shifted to other areas, which could change opportunities and infrastructure in the ports that are currently operating trips in the whaleback area. Reductions in groundfish fishing opportunities in this area compromise vessels' flexibility and can have direct impacts on fishing activity within a port, consequently impacting the shoreside facilities that are dependent on the affected vessels. If vessels in the area lose business as party/charter clients sign up for trips in other areas, social impacts associated with economic loss could occur including increased uncertainty and instability in the fishery and/or community, problems finding and keeping crew members on a year-round basis, social impacts related to family and business financial problems, overall increased stress at the individual, family, and community level, and reductions in perceptions about job satisfaction. Given the small area of the closure, however, the loss of business is expected to be minor and therefore these effects will not be substantial.

There are also positive social impacts associated with this option. Because the closure affects commercial and recreational fishermen equally, it could help to promote perceptions of equity among the two fleets. However, some recreational vessel operators have indicated that they feel as thought this option targets them unfairly, as commercial vessels are subject to rolling closures anyway for the first two months of the closure. Another potentially positive impact is that there has been wide support for protecting spawning cod, as all participants in the fishery value large and robust fish. The creation of a closure or a cod possession limit could lead to more positive attitudes about the future of the fishery by satisfying a sense of stewardship than the No Action alternative.

Note that the most significantly impacted communities will be those that are geographically proximate to the area or that serve as the homeport for vessels that fish there. The most affected areas are expected to be the New Hampshire Seacoast as well as northern Massachusetts ports including Newburyport as far south as Gloucester.

8.5.3.3 Handgear A Cod Trip Limits

Option 3: Partial Rolling Closure Exemption for Handgear A Vessels

Handgear A vessels are exempt from all the same GOM rolling closures as the universal exemptions for sector vessels. The areas and months that remain closed to Handgear A vessels are shown in Figure 3. Access to future closed areas (such as the GOM cod spawning protection area in 4.3.2) will be determined when the measure is adopted.

This option is expected to have similar impacts to Option 2 under this measure, except that the positive occupational opportunity impacts will be somewhat less (since there are still some closures in effect). The perceptions of unfairness would also be expected to be smaller with this option, since sector vessels are already exempt from the same closures and therefore there is a precedent with a different part of the fleet.

Option 4: Handgear A Trip Limit Modification

The cod trip limit for vessels fishing under a Handgear A permit will adjust proportionally to the cod trip limit for cod in the relevant stock area that applies to limited access DAS vessels fishing in the common pool. The baseline Handgear A trip limit is 300 lbs./trip, limited to one trip per day. The baseline cod trip limit for limited access vessels fishing in the GOM is that adopted by FW 44 (800 lbs./DAS). For limited access vessels fishing in the GB stock area, the baseline cod trip limit is as adopted in Amendment 13 (2,000 lbs/DAS). As an example, under this measure if the GOM cod trip limit is reduced by 50 percent for limited access vessels, the Handgear A trip limit is reduced by 50 percent for vessels fishing in the GOM, but no change is made to the trip limit for Handgear A vessels fishing on GB. NMFS may adopt administrative measures necessary to implement this measure, such as requiring Handgear A vessels to obtain a letter of authorization to fish in defined stock areas.

This option makes changes in the Handgear A GOM cod trip limit independent of changes in the GB cod trip limits. It is expected to have minor impacts since this is a small portion of the fleet. However, among those participants in the handgear fishery, and especially those that fish for GB cod, it should have positive impacts. The de-coupling of the trip limits for the two stocks is a common-sense measure that bases catch limits on the status of the applicable stock and will remove the link that bases GB cod handgear catches on biological attributes of the GOM stock. To that end, it should promote a sense of fairness. It should also, to a small extent, reduce unnecessary discards of GB cod that would occur if catch limits on that stock were set unnaturally low to be tied to the GOM stock. As mentioned above, this fishery is not expected to produce large amounts of cod discards. Under the No Action alternative, the trip limit on GB cod could be smaller, so these regulatory discards resulting from the trip limit would likely be larger; this measure would probably decrease discards when compared to No Action. This measure would also prevent a situation in which handgear fishing on GB cod could be effectively shut down if the GOM cod common pool ACL is approached and the trip limit on that stock goes very low or to zero. A very low trip limit of zero would be likely to prevent these vessels from going fishing at all and hence would produce no discards, but would reduce occupational opportunities and lead to lost income.

The exemption from seasonal closures in GB is expected to have the same impacts as Options 1 and 2, and is discussed in those sections.

Keeping the trip limit for handgear A vessels at 300 lbs. until the DAS trip limit is reduced below that number is also expected to have minor overall impacts due to the small size of the fleet. However, it may lead to perceptions of inequity since the Handgear A trip limit will no longer be proportional to the common pool trip limit. The result of this action would be that the common pool may have its trip limit reduced by a much larger percentage than the Handgear A component of the fleet does during the course of a fishing season. Although this could be perceived as unfair and favoring one type of permit category over others, its impacts may be somewhat offset by the fact that the Handgear A catches are a small percentage of the commercial catch. If handgear landings increase disproportionally and constrain catch for vessels fishing on other common pool permit types, the Council may choose to revisit this issue.

Option 5: Handgear B Trip Limit Modification

The cod trip limit for vessels fishing under a Handgear B will adjust proportionally to the cod trip limit for cod in the relevant stock area that applies to limited access DAS vessels fishing in the common pool. The baseline Handgear A trip limit is 75 lbs./trip, limited to one trip per day. The baseline cod trip limit for limited access vessels fishing in the GOM is that adopted by FW 44 (800 lbs./DAS). For limited access vessels fishing in the GB stock area, the baseline cod trip limit is as adopted in Amendment 13 (2,000 lbs/DAS). As an example, under this measure if the GOM cod trip limit is reduced by 50 percent for limited access vessels, the Handgear B trip limit is reduced by 50 percent for vessels fishing in the GOM, but no change is made to the trip limit for Handgear A vessels fishing on GB. NMFS may adopt administrative measures necessary to implement this measure, such as requiring Handgear A vessels to obtain a letter of authorization to fish in defined stock areas.

The impacts of this measure are similar to those of the adjustment by area measures in Option 4, except that they apply to Handgear B permits.

8.6 Impacts on Other Fisheries

The M-S Act requires that fishery management plans or amendments assess, specify, and describe the likely effects, if any, of the conservation and management measures on participants in the fisheries conducted in adjacent areas under the authority of another Council, after consultation with such Council and representatives of the participants. Amendment 16 described the impacts of the proposed management program on several fisheries. Since this action adopts measures designed to make Amendment 16 more effective, and to achieve the mortality targets in the amendment, it is not expected to result in substantially different impacts on other fisheries.

8.6.1 Mid-Atlantic Fisheries

The Proposed Action implements specifications (OFLs/ABCs/ACLs) for groundfish stocks as required by Amendment 16. These values are consistent with the fishing mortality targets adopted by that action. As such, the impacts on other fisheries – including those managed by the MAFMC – are expected to be consistent with those described in Amendment 16. In general, the overall concern is that the ACLs, and management measures designed to restrict catches to those ACLs, may limit fishing opportunities to such an extent that effort is redirected into other fisheries. Since many of these fisheries are managed through quotas, it is not likely that such effort shifts will lead to overfishing. It is more likely that any substantial effort shifts would have an adverse impact on the economic performance of the fishery as the quota is distributed among more vessels and/or trips. It could also lead to more rapid closures as quarterly or seasonal quotas may be reached more quickly, interrupting the supply of these products to markets.

8.6.2 Scallop Fishery

The scallop fishery will be directly affected by the decision on the amount of GB and SNE/MA yellowtail flounder to allocate to the groundfish and scallop fisheries. The Proposed Action adopts the No Action alternative; that is, the amount of these stocks allocated to the scallop fishery is the same amount specified in FW 44. The impacts, however, are likely to differ from those estimated in FW 44 because updated information indicates the scallop fishery is expected to catch less yellowtail flounder than estimated last year. These impacts are described in Section 8.4.1.5.

8.6.3 Herring Fishery

The Proposed Action includes a Cod Spawning Protection Area in the inshore GOM. Fishing in this area is only allowed with exempted gear during the period of the closure. FW 43 changed the herring mid-water trawl and purse seine fisheries to an exempted fishery from its earlier status as exempted gear because of evidence that these gears do catch regulated groundfish. As an exempted fishery these two gears will not be allowed to fish in the Cod Spawning Protection Area.

This area is located entirely within Herring Management Area 1A; most of the Cod Spawning Protection Area is in SA 513. Current ASMFC herring regulations prohibit landing herring from Herring Management Area 1A from January through May. Mid-water trawl vessels are excluded from the area during the months of June through September. As a result, the only herring vessels affected by the proposed action are purse seine vessels. The herring PDT summarized the number of directed herring purse seine trips in SA 513 in May and June, 2005 – 2009; the total was 121 trips (Cournane and Correia, per. comm.). While most purse seine trips in May and June were taken in SA 513, this is less than ten percent of the total purse seine trips taken over the course of the year. In addition the spawning closure area isles than ten percent of the total area of SA 513 (82 sq. statute mi. out of 9,141 sq. statute miles). While the proposed action does slightly reduce the area available to the purse seine fishery in May, it is unlikely to reduce herring fishing opportunities to any substantial degree.

8.7 Cumulative Effects Analysis

8.7.1 Introduction

A cumulative effects assessment (CEA) is a required part of an EIS or EA according to the Council on Environmental Quality (CEQ) (40 CFR part 1508.7) and NOAA's agency policy and procedures for NEPA, found in NOAA Administrative Order 216-6. The purpose of the CEA is to integrate into the impact analyses, the combined effects of many actions over time that would be missed if each action were evaluated separately. CEQ guidelines recognize that it is not practical to analyze the cumulative effects of an action from every conceivable perspective but rather, the intent is to focus on those effects that are truly meaningful. This section serves to examine the potential direct and indirect effects of the alternatives in Framework 44 together with past, present, and reasonably foreseeable future actions that affect the groundfish environment. It should also be noted that the predictions of potential synergistic effects from multiple actions, past, present and/or future will generally be qualitative in nature.

Valued Ecosystem Components (VEC)
As noted in Section 7.0 (Description of the Affected Environment), the VECs that exist within the groundfish fishery are identified and the basis for their selection is established. Those VECs were identified as follows:

1. Regulated groundfish stocks (target and non-target);
2. Non-groundfish species (incidental catch and bycatch);
3. Endangered and other protected species;
4. Habitat, including non-fishing effects; and
5. Human Communities (includes economic and social effects on the fishery and fishing communities).

Temporal Scope of the VECs
While the effects of historical fisheries are considered, the temporal scope of past and present actions for regulated groundfish stocks, non-groundfish species, habitat and the human environment is primarily focused on actions that have taken place since implementation of the initial NE Multispecies FMP in 1977. An assessment using this timeframe demonstrates the changes to resources and the human environment that have resulted through management under the Council process and through U.S. prosecution of the fishery, rather than foreign fleets. For endangered and other protected species, the context is largely focused on the 1980s and 1990s, when NMFS began generating stock assessments for marine mammals and turtles that inhabit waters of the U.S. EEZ. In terms of future actions, this analysis examines the period between implementation of this amendment (May 1, 2011) and the anticipated rebuilding of the fishery in 2026. This date was chosen because after the fishery is rebuilt, changes to the management of groundfish that are not possible to predict at this time are likely.

Geographic Scope of the VECs
The geographic scope of the analysis of impacts to regulated groundfish stocks, non-groundfish species and habitat for this action is the total range of these VECs in the Western Atlantic Ocean, as described in the Affected Environment section of the document (Section 7.0). However, the analyses of impacts presented in this amendment focuses primarily on actions related to the harvest of the managed resources. The result is a more limited geographic area used to define the

core geographic scope within which the majority of harvest effort for the managed resources occurs. For endangered and protected species, the geographic range is the total range of each species (Section 7.4).

Because the potential exists for far-reaching sociological or economic impacts on U.S. citizens who may not be directly involved in fishing for the managed resources, the overall geographic scope for human communities is defined as all U.S. human communities. Limitations on the availability of information needed to measure sociological and economic impacts at such a broad level necessitate the delineation of core boundaries for the human communities. Therefore, the geographic range for the human environment is defined as those primary and secondary ports bordering the range of the groundfish fishery (Section 7.5.2) from the U.S.-Canada border to, and including, North Carolina.

Analysis of Total Cumulative Effects

A cumulative effects assessment ideally makes effect determinations based on the culmination of the following: (1) impacts from past, present and reasonably foreseeable future actions; PLUS (2) the baseline condition for resources and human communities (note – the baseline condition consists of the present condition of the VECs plus the combined effects of past, present and reasonably foreseeable future actions); PLUS (3) impacts from the Proposed Action and alternatives.

A description of past, present and reasonably foreseeable future actions is presented immediately below in

Table 123. The baseline conditions of the resources and human community are subsequently summarized although it is important to note that beyond the stocks managed under this FMP and protected species, quantitative metrics for the baseline conditions are not available. Finally, a brief summary of the impacts from the alternatives contained in this framework is included. The culmination of all these factors is considered when making the cumulative effects assessment.

8.7.2 Past, Present and Reasonably Foreseeable Future Actions

Table 123 summarizes the combined effects of other past, present and reasonably foreseeable future actions that affect the VECs, i.e., actions other than those alternatives under development in this document.

Note that most of the actions affecting this framework and considered in

Table 123 come from fishery-related activities (e.g., Federal fishery management actions). As expected, these activities have fairly straightforward effects on environmental conditions, and were, are, or will be taken, in large part, to improve those conditions. The reason for this is the statutory basis for Federal fisheries management - the reauthorized Magnuson-Stevens Act. That legislation was enacted to promote long-term positive impacts on the environment in the context of fisheries activities. More specifically, the act stipulates that management comply with a set of National Standards that collectively serve to optimize the conditions of the human environment. Under this regulatory regime, the cumulative impacts of past, present, and future Federal fishery management actions on the VECs should be expected to result in positive long-term outcomes. Nevertheless, these actions are often associated with offsetting impacts. For example, constraining fishing effort frequently results in negative short-term socio-economic impacts for fishery participants. However, these impacts are usually necessary to bring about long-term sustainability of a given resource and as such should, in the long-term, promote positive effects on human communities, especially those that are economically dependent upon the managed resource.

Non-fishing activities were also considered when determining the combined effects from past, present and reasonably foreseeable future actions. Activities that have meaningful effects on the VECs include the introduction of chemical pollutants, sewage, changes in water temperature, salinity, dissolved oxygen, and suspended sediment into the marine environment. These activities pose a risk to the all of the identified VECs in the long term. Human induced non-fishing activities that affect the VECs under consideration in this document are those that tend to be concentrated in near shore areas. Examples of these activities include, but are not limited to agriculture, port maintenance, beach nourishment, coastal development, marine transportation, marine mining, dredging and the disposal of dredged material. Wherever these activities co-occur, they are likely to work additively or synergistically to decrease habitat quality and, as such, may indirectly constrain the sustainability of the managed resources, non-target species, and protected resources. Decreased habitat suitability would tend to reduce the tolerance of these VECs to the impacts of fishing effort. Mitigation of this outcome through regulations that would reduce fishing effort could then negatively impact human communities.

Table 123 – Summary effects of past, present and reasonably foreseeable future actions on the VECs identified for Framework 45

VEC	Past Actions	Present Actions	Reasonably Foreseeable Future Actions	Combined Effects of Past, Present, Future Actions
Regulated Groundfish Stocks	**Mixed** Combined effects of past actions have decreased effort, improved habitat protection, and implemented rebuilding plans when necessary. However, some stocks remain overfished	**Positive** Current regulations continue to manage for sustainable stocks	**Positive** Future actions are anticipated to continue rebuilding and strive to maintain sustainable stocks	**Short-term Negative** Several stocks are currently overfished, have overfishing occurring, or both **Long-Term Positive** Stocks are being managed to attain rebuilt status
Non-Groundfish Species	**Positive** Combined effects of past actions have decreased effort and improved habitat protection	**Positive** Current regulations continue to manage for sustainable stocks, thus controlling effort on direct and discard/bycatch species	**Positive** Future actions are anticipated to continue rebuilding and target healthy stocks, thus limiting the take of discards/bycatch	**Positive** Continued management of directed stocks will also control incidental catch/bycatch
Endangered and Other Protected Species	**Positive** Combined effects of past fishery actions have reduced effort and thus interactions with protected resources	**Positive** Current regulations continue to control effort, thus reducing opportunities for interactions	**Mixed** Future regulations will likely control effort and thus protected species interactions, but as stocks improve, effort will likely increase, possibly increasing interactions	**Positive** Continued effort controls along with past regulations will likely help stabilize protected species interactions
Habitat	**Mixed** Combined effects of effort reductions and better control of non-fishing activities have been positive but fishing activities and non-fishing activities continue to reduce habitat quality	**Mixed** Effort reductions and better control of non-fishing activities have been positive but fishing activities and non-fishing activities continue to reduce habitat quality	**Mixed** Future regulations will likely control effort and thus habitat impacts but as stocks improve, effort will likely increase along with additional non-fishing activities	**Mixed** Continued fisheries management will likely control effort and thus fishery related habitat impacts but fishery and non-fishery related activities will continue to reduce habitat quality
Human Communities	**Mixed** Fishery resources have supported profitable industries and communities but increasing effort and catch limit controls have curtailed fishing opportunities	**Mixed** Fishery resources continue to support communities but increasing effort and catch limit controls combined with non-fishing impacts such as rising fuel costs have had a negative economic impact	**Short-term Negative** As effort controls are maintained or strengthened, economic impacts will be negative **Long-term Positive** As stocks improve, effort will likely increase which would have a positive impact	**Short-term Negative** Lower revenues would likely continue until stocks are fully rebuilt **Long-term Positive** Sustainable resources should support viable communities and economies

Impact Definitions:
-Regulated Groundfish Stocks, Non-groundfish species, Endangered and Other Protected Species: positive=actions that increase stock size and negative=actions that decrease stock size
-Habitat: positive=actions that improve or reduce disturbance of habitat and negative=actions that degrade or increase disturbance of habitat
-Human Communities: positive=actions that increase revenue and well being of fishermen and/or associated businesses and negative=actions that decrease revenue and well being of fishermen and/or associated businesses

8.7.3 Baseline Conditions for Resources and Human Communities

For the purposes of a cumulative effects assessment, the baseline conditions for resources and human communities is considered the present condition of the VECs plus the combined effects of the past, present, and reasonably foreseeable future actions. The following table (Table 124) summarizes the added effects of the condition of the VECs (i.e., status/trends from section 7.0) and the sum effect of the past, present and reasonably foreseeable future actions (from

Table 123 above). The resulting CEA baseline for each VEC is exhibited in the last column (shaded). In general, straightforward quantitative metrics of the baseline conditions are only available for the managed resources, non-target species, and protected resources. The conditions of the habitat and human communities VECS are complex and varied. As such, the reader should refer to the characterizations given in Sections 7.1 and 7.5, respectively. As mentioned above, this cumulative effects baseline is then used to assess cumulative effects of the proposed management actions below in Table 124.

<u>Impact Definitions for Table 124 below:</u>

Regulated Groundfish Stocks, Non-groundfish species, Endangered and Other Protected Species	Positive = actions that increase stock size Negative = actions that decrease stock size
Habitat	Positive = actions that improve or reduce disturbance of habitat Negative = actions that degrade or increase disturbance of habitat
Human Communities	Positive = actions that increase revenue and well being of fishermen and/or associated businesses Negative = actions that decrease revenue and well being of fishermen and/or associated businesses
All VECs	Mixed=both positive and negative

Table 124 – Cumulative effects assessment baseline conditions of the VECs

VEC		Status/Trends	Combined Effects of Past, Present Reasonably Foreseeable Future Actions (Table 123)	Combined CEA Baseline Conditions
Regulated Groundfish Stocks	**Georges Bank Cod**	Overfished and overfishing is occurring.	**Negative** – short term: Several stocks are currently overfished, have overfishing occurring, or both; **Positive** – long term: Stocks are being managed to attain rebuilt status	**Negative** – short term: Overharvesting in the past contributed to several stocks being overfished or where overfishing is occurring; **Positive –** long term: Regulatory actions taken over time have reduced fishing effort and with the addition of Amendment 16, stocks are expected to rebuild in the future
	Gulf of Maine Cod	Not overfished but overfishing is occurring.		
	Georges Bank Haddock	Not overfished and overfishing is not occurring.		
	Gulf of Maine Haddock	Not overfished and overfishing is not occurring.		
	Georges Bank Yellowtail	Overfished and overfishing is occurring.		
	SNE/Mid-Atlantic Yellowtail	Overfished and overfishing is occurring.		
	Cape Cod-Gulf of Maine Yellowtail	Overfished and overfishing is occurring.		
	American Plaice	Not overfished and overfishing is not occurring.		
	Witch Flounder	Overfished and overfishing is occurring.		
	Georges Bank Winter Flounder	Overfished and overfishing is occurring.		
	Gulf of Maine Winter Flounder	Overfished and overfishing is occurring.		
	SNE/Mid-Atlantic Winter Flounder	Overfished and overfishing is occurring.		
	Acadian Redfish	Not overfished and overfishing is not occurring.		
	White Hake	Overfished and overfishing is occurring.		
	Pollock	Not overfished and overfishing is not occurring.		
	Northern Windowpane	Overfished and overfishing is occurring.		
	Southern Windowpane	Not overfished but overfishing is occurring.		
	Ocean Pout	Overfished but overfishing is not occurring.		
	Atlantic Halibut	Overfished but overfishing is not occurring.		

Table 124 continued

VEC		Status/Trends	Combined Effects of Past, Present Reasonably Foreseeable Future Actions (Table 123)	Combined CEA Baseline Conditions
Non-groundfish Species (principal species listed in section 7.3)	**Monkfish**	Not overfished and overfishing is not occurring.	**Positive** – Continued management of directed stocks will also control incidental catch/bycatch.	**Positive** – Although prior groundfish management measures likely contributed to redirecting effort onto non-groundfish species, as groundfish rebuild this pressure should lessen and all of these species are also managed through their own FMP.
	Dogfish	Not overfished and overfishing is not occurring.		
	Skates	Winter, thorny and smooth skates are overfished and thorny is also subject to overfishing. Barndoor skate is not overfished and is rebuilding toward biomass target. Little skate is not overfished, although it is close to the overfished biomass threshold. Clearnose and rosette skates are not overfished and overfishing is not occurring.		
Habitat		Fishing impacts are complex and variable and typically adverse (see section 7.1.4); Non-fishing activities had historically negative but site-specific effects on habitat quality.	**Mixed** – Future regulations will likely control effort and thus habitat impacts but as stocks improve, effort will likely increase along with additional non-fishing activities.	**Mixed** - reduced habitat disturbance by fishing gear but impacts from non-fishing actions, such as global warming, could increase and have a negative impact.
Protected Resources	**Sea Turtles**	Leatherback, Kemp's ridley and green sea turtles are classified as endangered under the ESA and loggerhead sea turtles are classified as threatened.	**Positive** – reduced gear encounters through effort reductions and management actions taken under the ESA and MMPA have had a positive impact	**Positive** – reduced gear encounters through effort reductions and additional management actions taken under the ESA and MMPA.
	Large Cetaceans	Of the baleen whales (right, humpback, fin, blue, sei and minke whales) and sperm whales, all are protected under the MSA and with the exception of minke whales, all are listed as endangered under the ESA.		
	Small Cetaceans	Pilot whales, dolphins and harbor porpoise are all protected under the MSA. The most recent stock assessment for harbor porpoise shows that takes are increasing and nearing PBR.		
	Pinnipeds	ESA classification: Endangered, number of nesting females below sustainable level; taken by *Loligo* trawl		

Table 124 continued

VEC	Status/Trends	Combined Effects of Past, Present Reasonably Foreseeable Future Actions (Table 123)	Combined CEA Baseline Conditions
Human Communities	Complex and variable (see Section 7.5). Although there are exceptions, generally groundfish landings have decreased for most New England states since 2001. Declines in groundfish revenues since 2001 have also generally occurred.	**Negative** – Although future sustainable resources should support viable communities and economies, continued effort reductions over the past several years have had negative impacts on communities	**Negative –** short term: lower revenues would continue until stocks are sustainable **Positive** – long term: sustainable resources should support viable communities and economies

8.7.4 Summary Effects of Framework 45 Actions

The alternatives contained in Framework 45 can be divided into three broad categories. First, this action adjusts status determination criteria and catch levels for some stocks within the management complex. Second, the action adopts administrative measures related to sector management and monitoring requirements. Third, the action adopts a few effort control measures for the commercial and recreational fleets.

The adjustments in specifications for FY 2011 – FY 2012 complete actions called for by Amendment 16 in order to fulfill M-S Act requirements and update management goals using the best available science. Amendment 16 defined the fishing mortality targets needed to rebuild groundfish stocks and end overfishing, and adopted a complex suite of measures designed to achieve these mortality objectives. This action builds upon the specifications adopted in Framework 44 that used available data to translate those mortality targets into specific amounts of fish. These quantities must be defined in order to implement the ACLs and AMs called for in the amendment. The ACLs identified are thus consistent with the amendment. Other elements of this process include setting the status determination criteria for pollock, revising the GB yellowtail flounder rebuilding strategy, allocating yellowtail flounder to the groundfish and scallop fisheries, and specifying U.S./Canada TACs. In general, the adoption of all of these specifications will benefit groundfish stocks because collectively they make it more likely that mortality targets are reasonable and will not be exceeded. They are not likely to impact non-groundfish stocks, protected species, or habitat to any great extent when compared to the No Action alternative, since these proposed specifications differ only slightly from the No Action alternative. In almost some cases the specifications will have negative impacts on communities in the short-term as they further reduce expected landings and revenues, while for others (namely the revised ACLs for pollock and GB yellowtail flounder) the reverse impacts on communities will occur. In the long-term however, communities should ultimately benefit form rebuilding progress.

The second broad category of measures adopted by this action is administrative measures related to sector management and monitoring requirements. Implementation of additional sectors and changes to the distribution of PSC from canceled permits and sector roster submission dates will help the sector program be sensible and increase its chances of success. Changes to the monitoring program, including modification of the dockside monitoring program, elimination of that program for Handgear and Small Vessel Exemption permits, and the removal of the requirement for industry to fund at-sea monitoring in 2012, are designed to bring economic relief to the industry.

Finally, the third broad category includes commercial and recreational effort control measures. The removal of restrictions for general category scallop dredge vessels in the Great South Channel is designed to ensure equal access to the resource without exceeding ACLs in light of ITQ management in that fishery. The Gulf of Maine spawning protection area will limit fishing in a small region in order to protect spawning aggregations of cod and therefore is expected to lead to increased rebuilding and robustness of that stock while incurring the minimum practicable economic impacts. The handgear permit management measures will allow for more even access to cod for a small portion of the fleet that uses gear with minimal impacts to EFH and low bycatch rates. These measures are expected to have positive or neutral benefits for groundfish stocks, since if catches remain at or below the ACL it is more likely that mortality targets will be met and rebuilding efforts will be successful. None of these measures are expected to appreciably affect non-groundfish stocks, protected species, or EFH.

8.7.5 Cumulative Effects Summary

The regulatory atmosphere within which Federal fishery management operates requires that management actions be taken in a manner that will optimize the conditions of resources, habitat, and human communities. Consistent with NEPA, the M-S Act requires that management actions be taken only after consideration of impacts to the biological, physical, economic, and social dimensions of the human environment. Given this regulatory environment, and because fishery management actions must strive to create and maintain sustainable resources, impacts on all VECs (except short-term impacts to human communities) from past, present and reasonably foreseeable future actions, when combined with baseline conditions, have generally been positive and are expected to continue in that manner for the foreseeable future. This is not to say that some aspects of the various VECs are not experiencing negative impacts, but rather that when taken as a whole and compared to the level of unsustainable effort that existed prior to and just after the fishery came under management control, the overall long-term trend is positive.

Table 125 below is provided as a summary of likely cumulative effects found in the various groups of management alternatives contained in Framework 45. Impacts are listed as no impact/neutral, positive, negative, or mixed. Impacts listed as no impact/neutral include those alternatives that have no impact or have a neutral impact (neither positive nor negative). Impacts listed as mixed contain both positive and negative impacts. The resultant cumulative effect is the CEA baseline that, as described above in Table 124, represents the sum of the past, present, and reasonably foreseeable future (identified hereafter as "other") actions and conditions of each VEC. When an alternative has a positive effect on a VEC, for example, reduced fishing mortality on a managed species, it has a positive cumulative effect on the stock size of the species when combined with the "other" actions that were also designed to increase stock size. In contrast, when an alternative has a negative effect on a VEC, such as increased mortality, the cumulative effect on the VEC would be negative and tend to reduce the positive effects of the "other" actions. The resultant positive and negative cumulative effects are described below for each VEC and are exhibited in Table 124.

Managed Resources

As noted in

Table 123, the combined impacts of past federal fishery management actions have led to short-term impacts that result in overfishing and/or overfished status for several stocks. However, management measures, in particular modifications implemented through Amendment 16 to the FMP, are expected to yield rebuilt sustainable groundfish stocks in the future. The actions proposed by Framework 45 are expected to continue this trend. Updates to status determination criteria, rebuilding programs, and ACLs for FY 2011 – 2012, including the allocation of yellowtail flounder to the scallop fishery and the setting of U.S./Canada TACs, are expected to have positive impacts on the managed groundfish resources. These measures all increase the likelihood that mortality targets will be achieved and should continue groundfish rebuilding. The commercial fishery effort control changes (general category scallop dredge exemption, Gulf of Maine cod spawning protection area, and handgear management measures) are also expected to have positive impacts as they reduce the risk that ACLs will be exceeded. The past and present impacts, combined with the Proposed Action and future actions which are expected to continue rebuilding and strive to maintain sustainable stocks, should yield positive non-significant impacts to managed resources in the long term.

<u>Non-Target Species</u>

As noted in

Table 123, the combined impacts of past federal fishery management actions have decreased fishing effort and improved habitat protection for non-target species. Current management measures, including those implemented through Amendment 16 to the FMP, are expected to continue to control effort, and decrease bycatch and discards. The actions proposed by Framework 45 are expected to continue this trend. The adoption of fishery specifications proposed is not expected to have any impacts on non-target species. The specifications implement mortality objectives adopted in Amendment 16 and thus are not expected to have any impacts beyond those described in that action. The modifications in effort controls in this action are not expected to impact non-target species. These changes only affect fishing in discrete geographic areas and by gear types that do not have a significant impact on non-target species. The past and present impacts, combined with the Proposed Action and future actions which are expected to continue rebuilding and strive to maintain sustainable stocks, should yield positive non-significant impacts to non-target species.

Protected Resources

As noted in

Table 123, the combined impacts of past federal fishery management actions have reduced fishing effort, and therefore reduced interactions with protected resources. Current management measures, including those implemented through Amendment 16 to the FMP, are expected to continue to control effort and catch, and therefore continue to lessen interactions with protected resources. The actions proposed by Framework 45 are expected to continue this trend; however, as stocks rebuild to sustainable levels, future actions may lead to increased effort, which may increase potential interactions with protected species. Proposed changes to fishery specifications could have varying impacts on protected species. While the setting of ACLs is not expected to have any direct impacts, the increase in allowable catches for pollock and Georges Bank yellowtail flounder may have minor negative effects. The modifications in program administration rules and effort control measures are not expected to have major impacts, since they will not change fishing in areas or with gears that affect protected species. Overall, the combination of past, present, and future actions is expected to stabilize protected species interactions and lead to positive impacts to protected species.

<u>Habitat, Including EFH</u>

As noted in

Table 123, the combined impacts of past federal fishery management actions have reduced fishing effort, and therefore have been positive for habitat protection. In addition, better control of non-fishing activities has also been positive for habitat protection. However, both fishing and non-fishing activities continue to decrease habitat quality. None of the fishery specifications measures are expected to substantial impacts to habitat or EFH; only the Gulf of Maine cod spawning closure area may have slight beneficial impacts. Generally, the modifications to program administration measures are expected to have neutral or no impacts, since these actions are administrative in nature and should not greatly alter fishing practices. Overall, the combination of past, present, and future actions is expected to reduce fishing effort and hence reduce damage to habitat; however, it is likely that fishing and non-fishing activities will continue to degrade habitat quality.

Human Communities

As noted in

Table 123, the combined impacts of past federal fishery management actions have reduced effort, and therefore have curtailed fishing opportunities. Past and current management measures, including those implemented through Amendment 16 to the FMP, will maintain effort and catch limit controls, which together with non-fishing impacts such as rising fuel costs have had significant negative short term economic impacts on human communities. The specifications are expected to have long-term positive impacts on human communities as they promote stock rebuilding, but in the short-term revenues are mixed compared to what would be expected under the No Action alternative. Increased ACLs for pollock and GB yellowtail flounder will have positive social impacts, as it will allow greater fishing effort. Specifying U.S./Canada TACs is not expected to have significant social impacts. Program administration measures are expected to have positive impacts on communities, as they reduce the burden of some monitoring costs and simplify sector administration rules. Changes to the commercial and recreational fishery effort control measures are expected to have mixed impacts on communities. While the general category scallop dredge exemption will allow for fishing in a previously restricted area for one portion of the fleet, the Gulf of Maine cod spawning protection area with restrict another to commercial and recreational vessels for part of the year. In the short term, this action is expected to produce slightly decreased revenue that will compound the significant economic impact on the fishing industry from past actions. However, this action alone is not expected to have significant socioeconomic impacts. Overall, the combination of past, present, and future actions is expected to enable a sustainable harvest of groundfish stocks, which should lead to a long term positive impact on fishing communities and economies.

Table 125 – Cumulative effects expected on the VECs

Management Measure		VECs				
		Managed Resources	**Non-target Species**	**Protected Resources**	**Habitat Including EFH**	**Human Communities**
UPDATES TO STATUS DETERMINATION CRITERIA, FORMAL REBUILDING PROGRAMS, AND ANNUAL CATCH LIMITS	**REVISED STATUS DETERMINATION CRITERIA**	**Positive** – Revised specifications will guide management actions (AMs) and rebuilding using the best available science. This, combined with past management efforts, should contribute to stock rebuilding and provide positive cumulative impacts	**No Impact/ Neutral** – Provided rebuilding continues, additional impacts to non-target species are not anticipated	**No Impact/ Neutral** – Provided rebuilding continues, additional impacts to protected species are not anticipated	**No Impact/ Neutral** – Provided rebuilding continues, additional impacts to habitat are not anticipated	**Positive** – Overall revenues will increase as stocks rebuild however, revenues under the revised specs would be less than no action
	REVISED GB YELLOWTAIL FLOUNDER REBUILDING MORTALITY TARGETS	**Positive** – Revised specifications will guide management actions (AMs) and rebuilding using the best available science. This, combined with past management efforts, should contribute to stock rebuilding and provide positive cumulative impacts	**No Impact/ Neutral –** Provided rebuilding continues, additional impacts to non-target species are not anticipated	**No Impact/ Neutral –** Provided rebuilding continues, additional impacts to protected species are not anticipated	**No Impact/ Neutral –** Provided rebuilding continues, additional impacts to habitat are not anticipated	**Positive** – Overall revenues will increase as stocks rebuild however, revenues under the revised specs would be less than no action

Management Measure		VECs				
		Managed Resources	**Non-target Species**	**Protected Resources**	**Habitat Including EFH**	**Human Communities**
UPDATES TO STATUS DETERMINATION CRITERIA, FORMAL REBUILDING PROGRAMS, AND ANNUAL CATCH LIMITS (cont.)	**ANNUAL CATCH LIMIT SPECIFICATIONS**	**Positive** – Revised specifications will guide management actions (AMs) and rebuilding using the best available science. This, combined with past management efforts, should contribute to stock rebuilding and provide positive cumulative impacts	**No Impact/ Neutral** – Provided rebuilding continues, additional impacts to non-target species are not anticipated	**No Impact/ Neutral** – Provided rebuilding continues, additional impacts to protected species are not anticipated	**No Impact/ Neutral** – Provided rebuilding continues, additional impacts to habitat are not anticipated	**Positive** – Overall revenues will increase as stocks rebuild however, revenues under the revised specs would be less than no action
	U.S./CANADA RESOURCE SHARING UNDERSTANDIN G TACs	**Positive** – Specification of TACs ensures combined U.S./Canada catches of EGB cod, haddock, and GB yellowtail flounder are consistent with mortality targets	**No impact/ Neutral** – Limiting catches of these stocks unlikely to affect non-target species compared to No Action	**Mixed/ Unknown** – Specification of TACs does not appreciably change fishing effort in GB area compared to No Action	**No Impact/ Neutral** – Specification of TACs does not appreciably change fishing effort in GB area compared to No Action	**No impact/ Neutral** – Measure promotes stock rebuilding, but little difference from No Action alternative

	YELLOWTAIL FLOUNDER ALLOCATIONS FOR THE SCALLOP FISHERY	**Positive** – Allocation of ACL to groundfish and scallop fisheries reduces likelihood yellowtail flounder mortality targets will be exceeded	**No Impact/ Neutral** – Unlikely to have significant impacts on scallops and other non-target species	**Mixed/ Positive** – May marginally reduce scallop dredge effort if yellowtail flounder allocation restricts fishery	**No Impact/ Neutral** – Provided rebuilding continues, additional impacts to habitat are not anticipated	**Mixed** – Allocation may limit access to scallop and groundfish resources but long-term rebuilding benefits will be positive
FISHERY PROGRAM ADMINISTRATION	**IMPLEMENTATION OF ADDITIONAL SECTORS**	**No impact/ Neutral** – This is an administrative measure that is not expected to change fishing behavior or impacts to managed species	**No impact/ Neutral** – This is an administrative measure that is not expected to change fishing behavior or impacts to non-target species	**No Impact/ Neutral** – This is an administrative measure that is not expected to change fishing behavior or impacts to protected species	**No Impact/ Neutral** – This is an administrative measure that is not expected to change fishing behavior or impacts to habitat	**Positive** – More options for sector membership will allow for greater flexibility in business planning
	MONITORING REQUIREMENTS FOR HANDGEAR A AND HANDGEAR B PERMITTED VESSELS AND SMALL VESSEL EXEMPTION VESSELS	**No impact/ Unknown** – These permit categories comprise a small amount of total groundfish landings and coverage levels would be low under No Action	**No impact** – Removal of dockside monitoring requirements unlikely to affect non-target species compared to No Action	**No impact** – Removal of dockside monitoring requirements unlikely to affect protected species compared to No Action	**No impact** – Removal of dockside monitoring requirements unlikely to affect habitat compared to No Action	**Positive** – Removal of requirement eases financial burden on holders of these permits
	MONITORING REQUIREMENTS FOR COMMERCIAL GROUNDFISH FISHING VESSELS	**Unknown/ Negative** – If measure leads to decreased coverage, uncertainty over groundfish landings and bycatch rates will increase	**Unknown/ Negative** – If measure leads to decreased coverage, uncertainty over non-target species bycatch rates will increase	**Unknown/ Negative** – If measure leads to decreased coverage, uncertainty over protected species bycatch rates will increase	**Unknown/ Negative** – If measure leads to decreased coverage, uncertainty over fishing effort and habitat impacts will increase	**Positive** – Removal of funding requirements eases financial burden on industry

FISHERY PROGRAM ADMINISTRATION (cont.)	**DISTRIBUTION OF PSC FROM CANCELED PERMITS**	**No impact/ Neutral** – This is an administrative measure that is not expected to change fishing behavior or impacts to managed species	**No impact/ Neutral** – This is an administrative measure that is not expected to change fishing behavior or impacts to non-target species	**No Impact/ Neutral** – This is an administrative measure that is not expected to change fishing behavior or impacts to protected species	**No Impact/ Neutral** – This is an administrative measure that is not expected to change fishing behavior or impacts to habitat	**No Impact/ Postive** – Measure should be seen as dividing resources equitably, but little difference from No Action alternative
	SUBMISSION OF SECTOR ROSTERS	**No impact/ Neutral** – This is an administrative measure that is not expected to change fishing behavior or impacts to managed species	**No impact/ Neutral** – This is an administrative measure that is not expected to change fishing behavior or impacts to non-target species	**No Impact/ Neutral** – This is an administrative measure that is not expected to change fishing behavior or impacts to protected species	**No Impact/ Neutral** – This is an administrative measure that is not expected to change fishing behavior or impacts to habitat	**No Impact/ Postive** – Measure should promote ability to plan for future fishing activity
COMMERCIAL AND RECREATIONAL FISHERY MEASURES	**GENERAL CATEGORY SCALLOP DREDGE EXEMPTION – MODIFICATION OF RESTRICTIONS**	**No impact/ Neutral** – Allowing general category scallop dredging in the area not expected to exceed mortality targets or jeaopardize rebuilding	**No Impact/ Neutral** – Not expected to increase overall scallop catch and will not affect other non-target species	**No Impact/ Neutral** – Not expected to increase scallop dredge effort or increase impacts to protected species	**No Impact/ Neutral** – Not expected to increase scallop dredge effort or increase impacts to habitat	**Positive** – Measure will allow more options for fishing areas to increase efficiency

COMMERCIAL AND RECREATIONAL FISHERY MEASURES (cont.)	**GULF OF MAINE COD SPAWNING PROTECTION AREA**	**Positive –** Measure will protect spawning cod aggregations and promote stock health	**No Impact/ Positive** – May decrease catch on non-target species during closure	**No Impact/ Neutral** – Not expected to change impacts to protected species as they are not often caught in the area	**No Impact/ Positive** – Reduced habitat/gear interaction will occur during closure	**Mixed** – Measure will allow for healthier stock in long term, but some operators that fish in the area will see economic impacts
	HANDGEAR PERMIT MANAGEMENT MEASURES	**No Impact/ Neutral** – Provided rebuilding continues, catch will not increase above mortality targets and will not negatively impact stocks	**No Impact/ Neutral** – Gear type has little bycatch and thus unlikely to affect non-target species as compared to No Action	**No Impact/ Neutral** – Gear type has little bycatch and thus unlikely to affect protected species as compared to No Action	**No Impact/ Neutral** – Gear type has little bottom contact and thus unlikely to affect habitat as compared to No Action	**Positive** – Measures will increase access and provide stability for portion of fleet

9.0 Environmental Consequences – Analysis of Impacts of Alternatives to the Proposed Action

9.1 Biological Impacts

Biological impacts discussed below focus on expected changes in fishing mortality. Impacts on habitat and endangered or threatened species are discussed in separate sections. Impacts of the Proposed Action are discussed in relation to impacts on regulated groundfish, other species, and bycatch (as defined by the M-S Act).

9.1.1 Updates to Status Determination Criteria, Formal Rebuilding Programs, and Annual Catch Limits

9.1.1.1 Revised Status Determination Criteria

<u>Option 1: No Action</u>

Under this option the status determination criteria (SDC) would not be changed from those developed by the Reference Point Working Group (NEFSC 2002) and implemented by Amendment 13; they were updated by GARM III (NEFSC 2008) and modified in Amendment 16. These SDCs were developed using an index-based assessment model. The F_{MSY} proxy is a relative fishing mortality estimate that divides the catch by the fall trawl survey index; a centered three-year moving average was used to smooth survey variability.

Information developed by SAW 50 (NEFSC 2010) indicates that if these status determination criteria were used, the stock would be determined to be overfished and overfishing would still be occurring. The formal rebuilding program first adopted in Amendment 16 would need to be continued. Catches would be held at a low level to rebuild the stock. As a result, fishing mortality would be reduced and stock status would improve.

This option would not use the best available science to determine stock status and would be inconsistent with the requirements of the M-S Act, specifically National Standard 2.

9.1.1.2 Revised GB Yellowtail Flounder Rebuilding Mortality Targets

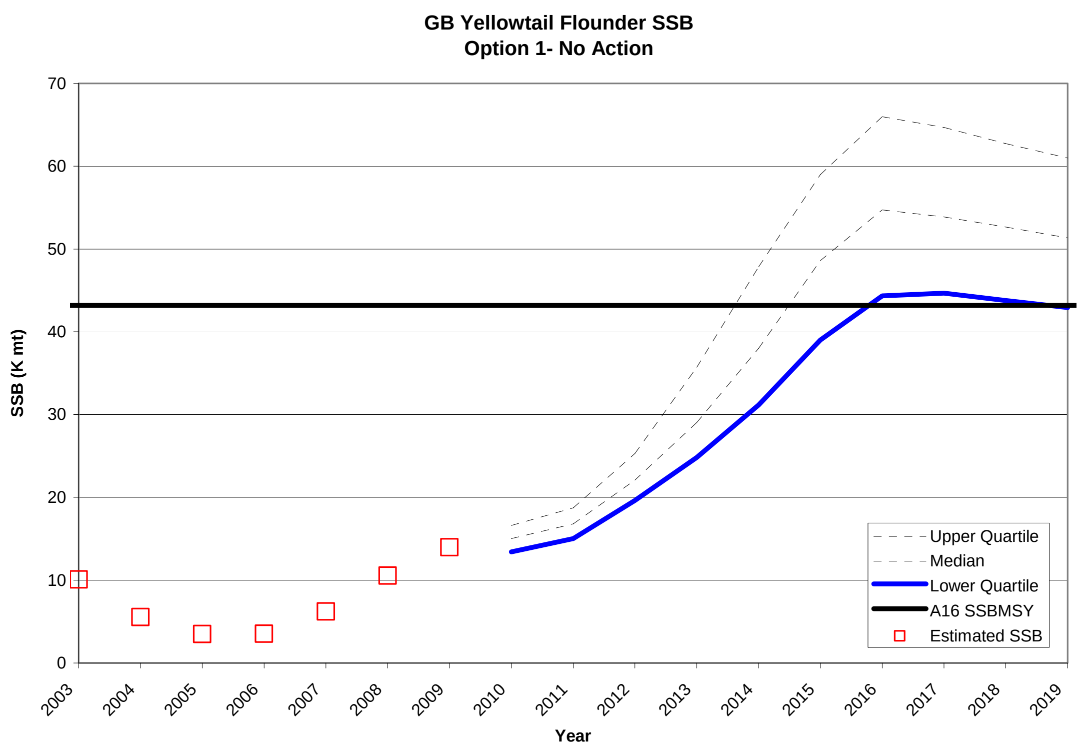
For stocks such as GB yellowtail flounder with an age-based analytic assessment, the impacts on stock size of different rebuilding strategies can be estimated using short-term projections. These projections estimate median stock size expected if the target fishing mortality rate is achieved, and also indicate the uncertainty of the estimate by providing a distribution of the results by allowing some inputs to vary. The primary inputs varied in the projection to characterize the uncertainty are initial stock numbers at age and recruitment. The projection results do not incorporate other sources of uncertainty. While these projections are based on the scientific advice of the GARM III and TRAC panels, the SSC, and the Groundfish Plan Development Team, projections are subject to uncertainty and future stock size may differ from the trajectories illustrated here.

One nuance of the projections is worth noting. Groundfish stocks are assessed on a calendar year basis, yet the FMP's specifications are set for the fishing year (May 1 – April 30). This difference is not considered in the following analyses because a method has not been developed to reconcile this difference.

Option 1: No Action

Under this option the rebuilding strategy for GB yellowtail flounder would continue to target rebuilding by 2014 with a 75 percent probability of success. This option would rebuild this stock more quickly than the other options under consideration. The 2010 assessment of this stock (TRAC 2010) indicated that this goal cannot be achieved even in the absence of all fishing mortality. Nevertheless, if this option is selected and a target fishing mortality of F=0 is adopted for the stock in order to rebuild as rapidly as possible, the stock would be expected to grow more rapidly than the other options. The stock would exceed the biomass target of 43,200 mt in 2015 with a 64 percent probability and in 2016 there would be a 77 percent probability of exceeding the target. Figure 44 indicates the stock size trajectory projected if all fishing mortality is eliminated. After the stock is rebuilt this projection assumes fishing at the ABC control rule (75% of F_{MSY}).

Figure 44 – No Action GB yellowtail flounder rebuilding trajectory



<u>Option 2B, 2C, and 2D: Revised Rebuilding Target for GB Yellowtail Flounder</u>

Since recent assessments indicate the stock will not rebuild by 2014 in the absence of all fishing mortality, four alternative rebuilding strategies were being considered for this measure. All four options target a rebuilding at a slower pace than under the No Action alternative. Stock size would be smaller under all of the options when compared to No Action until the ending date of rebuilding. The three options under consideration that were not selected for the proposed action are:

> Sub-Option B: Use a fishing mortality target that is calculated to rebuild the stock by 2016 with a 60 percent probability of success
> Sub-Option C: Use a fishing mortality target that is calculated to rebuild the stock by 2016 with a 75 percent probability of success
> Sub-Option D: Use a fishing mortality target that is calculated to rebuild the stock by 2019 with a 60 percent probability of success

The first two sub-options extend the rebuilding period to 2016. Since the rebuilding program was initiated in 2006, this is the final year of a ten-year rebuilding program that meets M-S Act requirements. These three sub-options consider different probabilities of success, which can be interpreted as different levels of risk that the rebuilding target will not be achieved. While these sub-options rebuild more slowly than the No Action alternative, rebuilding will still occur by 2016 in accordance with M-S Act requirements.

Sub-option D extends the rebuilding period until 2019, and targets a probability of success of 60 percent. It will result in lower stock sizes than the No Action or other alternatives until the target biomass is reached in 2019. On the surface, this period does not appear to meet M-S Act rebuilding requirements that rebuilding not extend past ten years except in certain circumstances. There are three identified exceptions in the act: "…except in cases where the biology of the stock of fish, other environmental conditions, or management measures under an international agreement in which the United States participates dictate otherwise." This stock is not managed by a recognized international agreement so the only possible exceptions relate to biology of the stock of fish or other environmental conditions. National Standard Guidelines interpret the Act's language on biology of the stock to refer to its ability to rebuild in the absence of fishing mortality. If this minimum period is less than ten years, then ten years is the maximum rebuilding period; if more than ten years, the period is extended by one generation time for that stock or stock complex. Analyses performed for this stock in 2005 indicated that it could rebuild in ten years, setting a maximum period that ends in 2016. With respect to whether environmental conditions justify extending beyond ten years, no guidance is provided for how environmental conditions should be evaluated.

The success of the rebuilding strategies is contingent not only on the control of fishing mortality but on other factors beyond the control of management. The projections use an assumption on future recruitment - that is, the number of Age 1 fish that enter the population in each year. The projections sample from the observed distribution of recruitment from 1963 – 2009, with a two-stage approach: when stock size is below 5,000 mt, samples are only taken from the recruitment at lower stock sizes. This recruitment stream averages about 24.6 million fish. This is the same recruitment stream used to develop the biomass target. Since 1983, the observed recruitment averaged only 14.1 million fish. If future recruitment is at this lower average, the stock will not rebuild as indicated in these projections and has only a 5 percent probability of rebuilding by 2020 (TRAC 2010). But if this recruitment stream continues, the recruitment assumption used to estimate the biomass target can be questioned and the biomass target should be re-estimated using a different recruitment assumption (Cadrin, pers. comm., 2010).

The 2010 assessment (TRAC, 2010) also addressed the impacts on rebuilding success of the retrospective pattern observed in the assessment. The retrospective pattern introduces additional uncertainty over rebuilding success. These projections do not account for this pattern. The Council's SSC reviewed the assessment and stated that "The inconsistency in estimates of recent stock size primarily results from over-estimating the abundance of the 2005 yearclass." They did not adjust catch advice based on rebuilding scenarios for this pattern.

Estimates for the alternative rebuilding fishing mortality needed to meet the strategies based on current projections are provided in Table 96. These values may change in future years if stock conditions differ from the projection results. Spawning stock biomass trajectories for these rebuilding strategies are shown in the following figures.

Table 126 – Target fishing mortality rates (current estimates) for alternative GB yellowtail flounder rebuilding strategies

Option Name	Ending Year/Probability	Rebuilding Mortality Estimate
No Action	2014/75%	0
Option 2B	2016/60%	0.101
Option 2C	2016/75%	0.039
Option 2D	2019/60%	0.182

Figure 45 – Option 2B – GB yellowtail flounder rebuilding strategy (2016/60%)

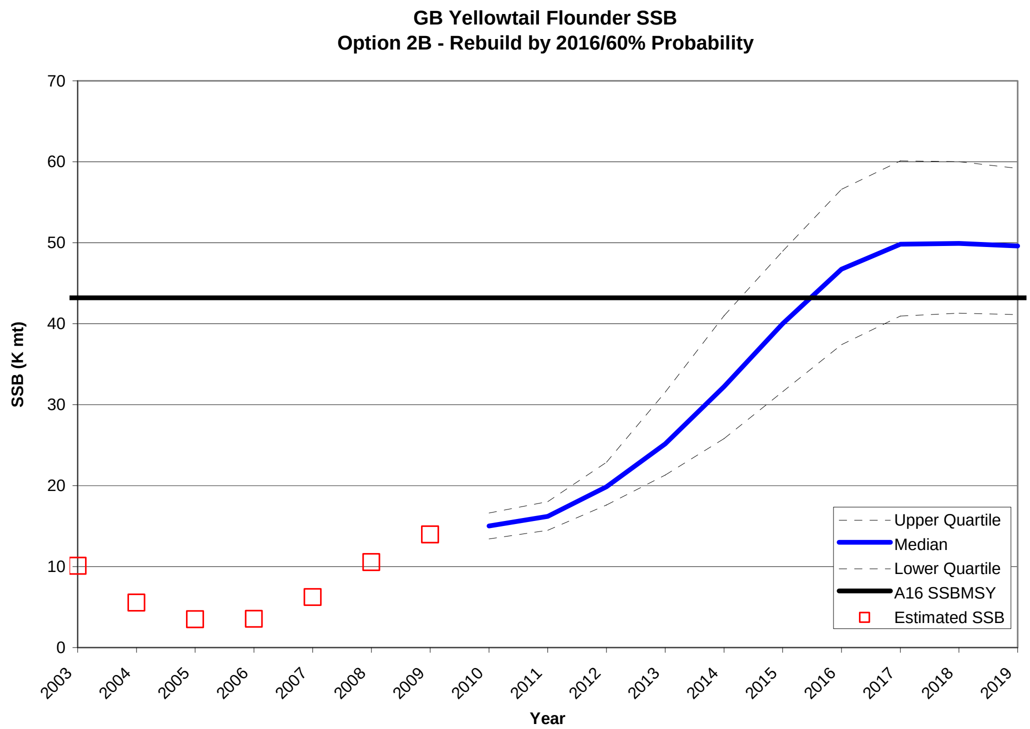


Figure 46 – Option 2C – GB yellowtail flounder rebuilding strategy (2016/75%)

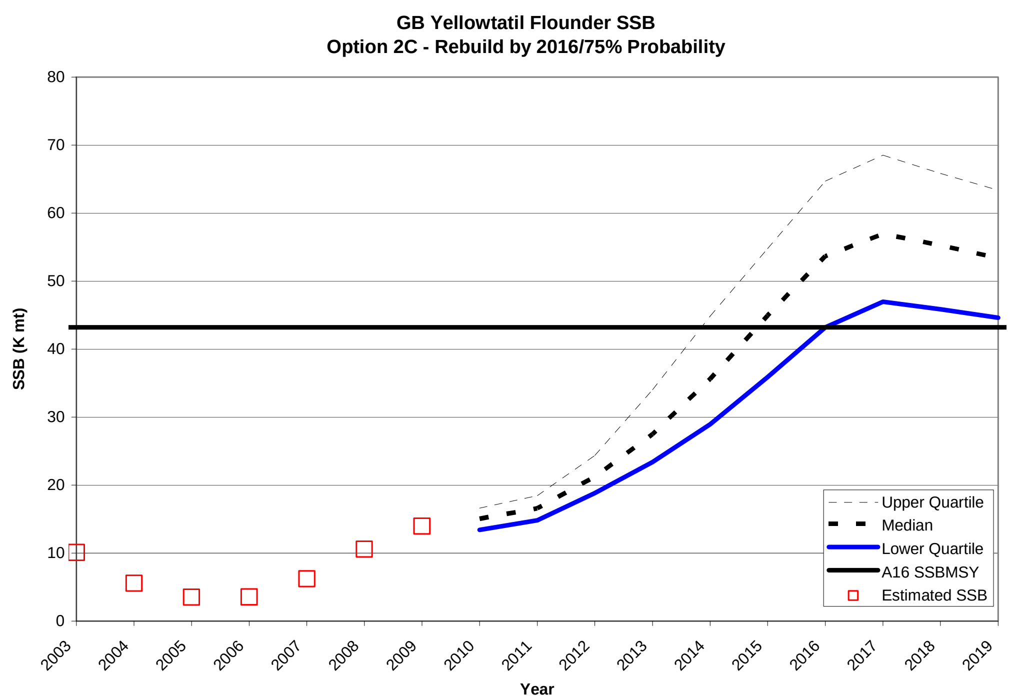
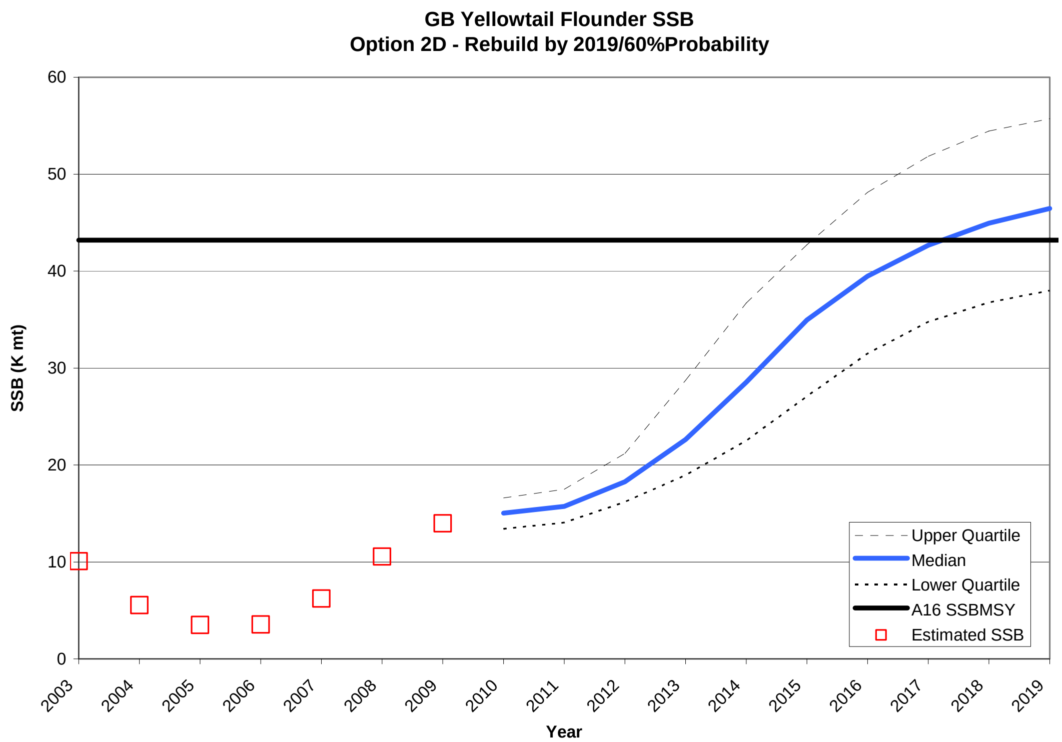


Figure 47 – Option 2D – GB yellowtail flounder rebuilding strategy (2019/60%)



9.1.1.3 Annual Catch Limit Specifications

<u>Option 1: No Action</u>

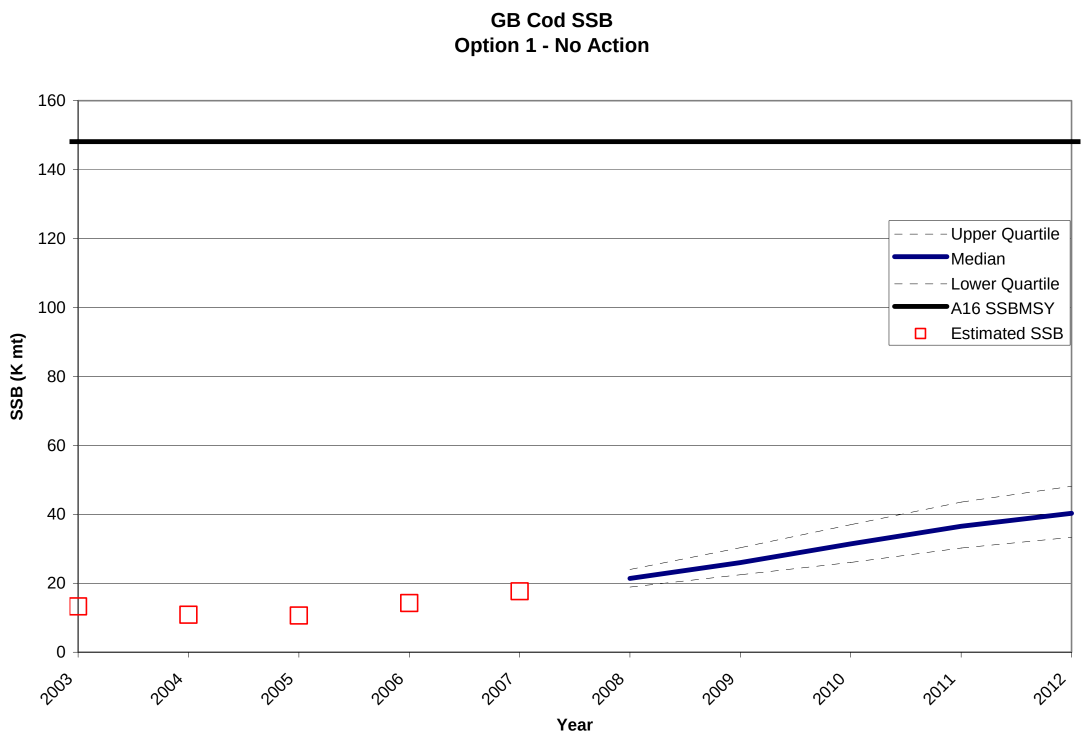
This No Action option does not modify the OFLs/ABCs/ACLs for GB cod, GB haddock, GB yellowtail flounder, white hake, and pollock that were adopted by FW 44 (NEFMC 2010). All of the elements of the ACLs would remain the same, such as the allocations of GB and SNE/MA yellowtail flounder to the scallop fishery that were adopted in that same action.

FW 44 defined the Overfishing Level (OFL), Acceptable Biological Catch (ABC), and Annual Catch Limits (ACLs) for the multispecies fishery. The OFLs were based on estimates of stock size and $F_{MSY.}$ The ABCs were reduced below the OFL and are based on a control rule for each stock. These control rules were identified in Amendment 16. In most cases, the ABC was based on a fishing mortality of either 75 percent of F_{MSY} or an $F_{rebuild}$, whichever is lower. The ABC is thus below the OFL and if catches are kept at or below the ABC, overfishing is unlikely to occur. The ACL is set lower than the ABC to account for management uncertainty. The ABCs – and thus the ACLs - that were specified for FY 2010 through FY 2012 are based on the fishing mortality targets adopted by Amendment 16. These targets were designed to end overfishing and to rebuild groundfish stocks consistent with the requirements of the M-S Act and the Council's rebuilding goals. The ABCs were set by the Science and Statistical Committee (SSC). In all cases the ACL is lower than the ABC.

GB cod

The No Action alternative does not change the OFLS/ABCs/ACLs for GB cod, including the distribution of the catch to various components of the fishery. The expected fishing mortality rates and stock size changes would be as described in FW 44 as modified by information on the 2009 catch. Fishing mortality in 2001 and 2012 would be expected to be about 0.18, well below F_{MSY}, and there is about a 15 percent chance of overfishing occurring. This is essentially unchanged from the FW 44 analyses.

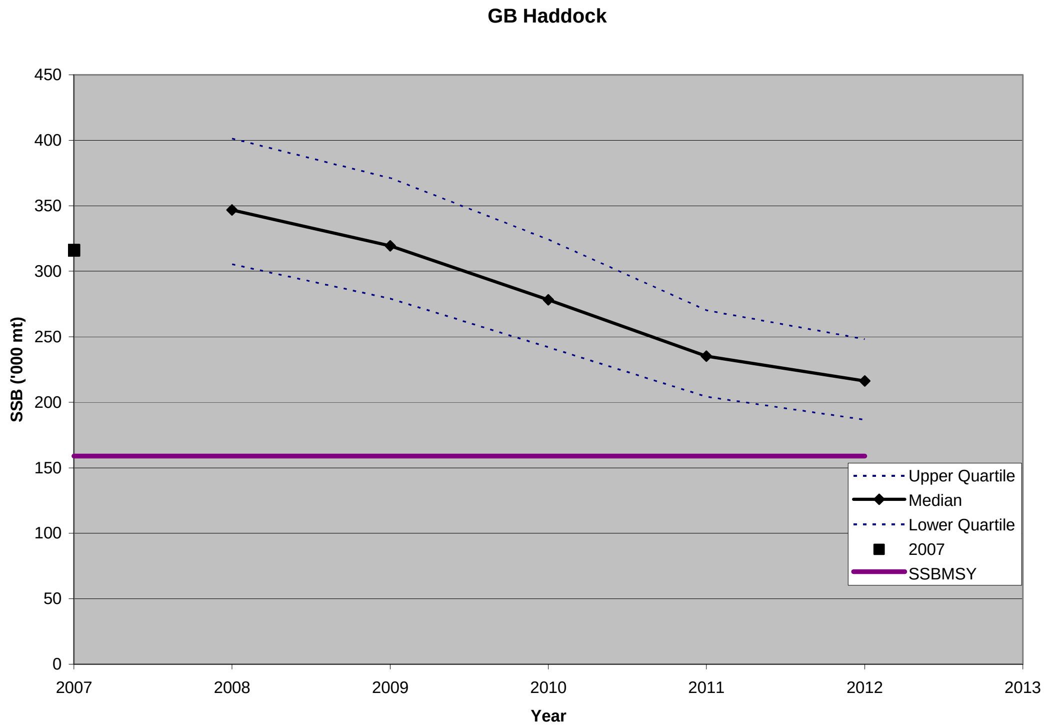
Figure 48 – No Action GB cod SSB trajectory



GB haddock

The No Action alternative does not change the OFLS/ABCs/ACLs for GB haddock, including the distribution of the catch to various components of the fishery. The expected fishing mortality rates and stock size changes would be as described in FW 44 as modified by information on the 2009 catch. Fishing mortality in 2001 and 2012 would be expected to be about 0.26, well below F_{MSY} (0.35), and there is about a 2 percent chance of overfishing occurring.

Figure 49 – No Action GB haddock rebuilding trajectory (assumes catch at ABC)



GB yellowtail flounder
In the case of GB yellowtail flounder, the OFLs/ABCs/ACL were established based on the TRAC assessment completed in 2009 (TRAC 2009). This assessment used two assessment formulations that were believed to bracket actual stock status. Both the SSC and the TMGC considered these two assessments formulations for determining the 2010 specifications, but did not provide advice for 2011 and 2012. As a result, FW 44 adopted the values that came from the formulation that returned the smallest values. The OFL for 2011 was 6,083 mt and for 2012 was 7,094 mt. The total ABC (US and Canada catch) for 2011 was 1,689 mt and for 2012 was 1,916 mt. Retaining the No Action/FW 44 specifications for GB yellowtail flounder does not match well with any of the rebuilding strategies that are being considered but the values are bracketed by the catch from rebuilding sub-options 2A and 2B.

TRAC 2010 used only one model formulation and estimated stock size at lower values than TRAC 2009. As a result, there is a noticeable difference in the new OFL levels of 2011 and 2012 when compared to the No Action/FW 44 values. If the FW 44/No Action OFLs are retained, they exceed the OFLs based on the current assessment. This has little direct impact on the stock as the target catch levels (ABC and ACL) are set well below the OFL. Management actions are not triggered by catches that exceed the OFL; accountability measures (AMs) are based on catches approaching the ACL. Nevertheless, if catches were compared to the No Action OFLs, it would give a misleading impression of management success in preventing overfishing.

Table 127 – Comparison of OFLs for GB yellowtail flounder for 2011 and 2012 (metric tons)

OFL Source	FY 2011	FY 2012
FW 44/ (FW 45 No Action on OFLs)	6,083	7,094
FW 45	3,495	4,208

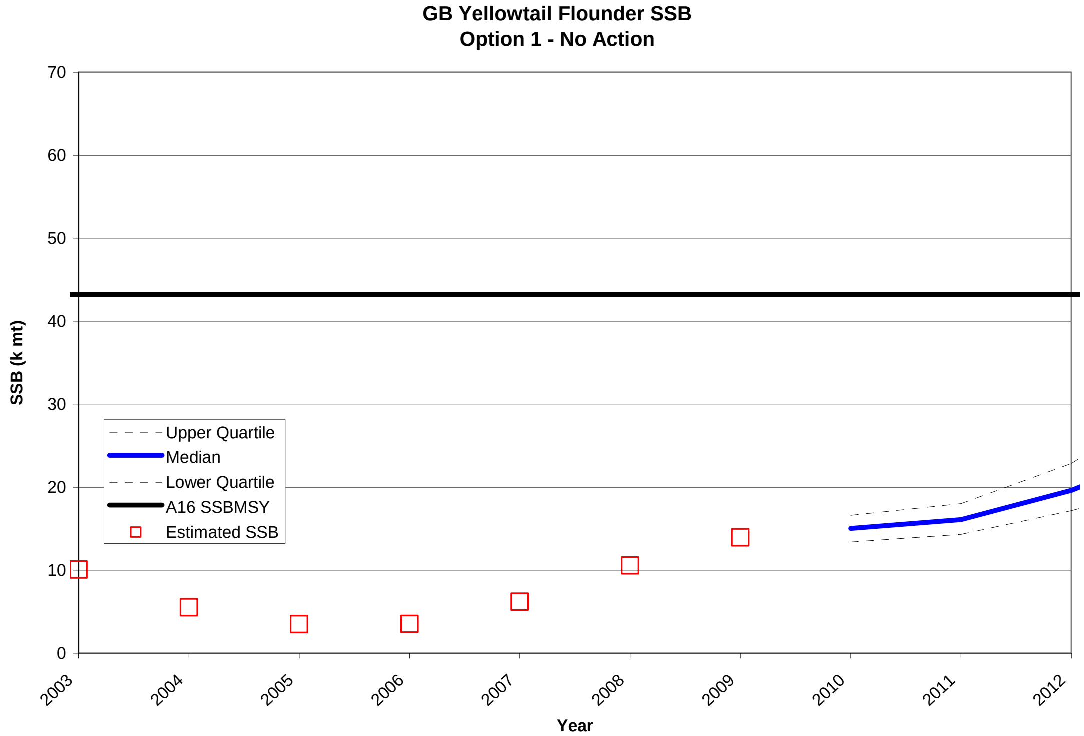
Based on the current assessment and projections, the FW 44 ABCs would be expected to result in a fishing mortality of 0.12, well below the F_{MSY} value of 0.25. There is essentially no chance that overfishing will occur; it is also unlikely the stock will rebuild by 2014 at this catch. This evaluation is based on the projection and it should be remembered that projections do not capture all sources of uncertainty. TRAC 2010 reported the presence of a retrospective pattern in this assessment. The SSC concluded that "Although recent retrospective inconsistency is substantial, it may not continue if it was indeed associated with the 2005 year class" (Cadrin, pers. comm.) and chose not to modify catch advice from the projections. Nevertheless, if the projection is adjusted for that pattern, the fishing mortality resulting from the FW 44 ABCs would be expected to be about 0.20 and there would be about a 12 percent probability of overfishing in 2011 and 2012.

If the ABCs from FW 44 are compared to the candidate ABCs for the different rebuilding strategies considered in this action, they are lower than the Sub-Option 2A and 2D values but higher than all other alternatives (Table 128). As a result, fishing mortality under this option would be less than that expected from Sub-Option 2A and Sub-Option 2D but higher than from other options, and rebuilding would be slower than all options except Sub-Options 2A and 2D. The rebuilding trajectory for the No Action alternative is shown in Figure 44; it differs only slightly from the trajectory that results from the ACLs associated with Sub-Options 2A and 2B (see Figure 39 and Figure 45).

Table 128 – Comparison of ABCs for GB yellowtail flounder for 2011 and 2012 (metric tons)

ABC Source	FY 2011	FY 2012
FW 44/ (FW 45 No Action on ACLs)	1,689	1,916
FW 45: GB YTF rebuilding strategy No Action	0	0
FW 45: GB YTF rebuilding strategy 2A	1,998	2,222
FW 45: GB YTF rebuilding strategy 2B	1,486	1,699
FW 45: GB YTF rebuilding strategy 2C	590	706
FW 45: GB YTF rebuilding strategy 2D	2,584	2,784

Figure 50 – No Action GB yellowtail flounder SSB trajectory

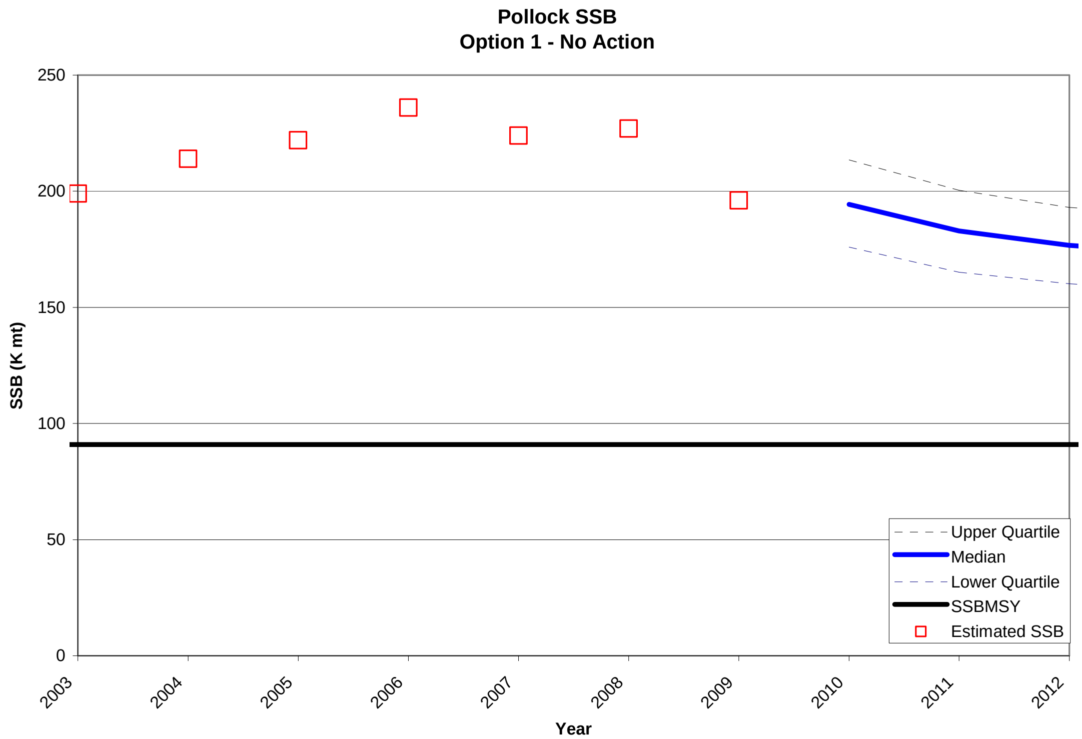


Pollock

The pollock OFLs/ABCs/ACLs specified in FW 44 for FY 2011 and 2012 were developed using an average of the fall trawl survey index and an exploitation rate of 75% of F_{MSY}. At the time this was adopted pollock was determined to be overfished and overfishing was occurring. The default ABC control rule was used to set these specifications because of concerns over the ability to develop a reliable rebuilding projection from the index assessment. The No Action ABCs and ACLs are less than half the alternative values being considered. As a result, fishing mortality would be lower and stock size higher under No Action than the alternative.

SAW 50 (NEFSC 2010) developed an analytic assessment of pollock that concluded the stock was not overfished and overfishing was not occurring (see section 7.2.2 for current stock status). The acceptance of this assessment facilitates the use of projections to estimate fishing mortality and stock size at for identified catch levels. If the No Action/FW 44 ABCs for pollock are input into the projection model as catch in 2011 and 2012, fishing mortality would be expected to be about 0.08 in 2011 and 2012 and median SSB would remain above 176,000 mt. For the uncertainty that is captured by the assessment, there is essentially no chance the stock would be overfished or subject to overfishing during these two years. It should be remembered that the projections do not account for all sources of uncertainty.

Figure 51 – No Action pollock SSB trajectory



9.1.1.4 U.S./Canada Resource Sharing Understanding TACs

Option 1: No Action

The biological impacts of the No Action Alternative would be primarily negative. The No Action Alternative does not represent the appropriate level of TACs from a biological perspective, and would allow fishing mortality to be too high. Allowing an excessive amount of fish to be caught would represent a level of fishing mortality that exceeded the desired level of fishing mortality. If the appropriate levels of fishing mortality were exceeded, it is likely that stock rebuilding would be slowed. Under the No Action Alternative (with no TACs specified), it is possible that excessive harvest could occur for all three shared stocks. Since 2004, the U.S./Canada TACs have proved effective at controlling fishing effort on the shared stocks, in a precise manner.

9.1.1.5 Yellowtail Flounder Allocations for the Scallop Fishery

Option 2: Revised Allocations

This option would change the amount of GB and SNE/MA yellowtail flounder allocated to the scallop fishery. Since it does not change the total catches of these two stocks it would not have direct impacts on groundfish fishing mortality or stock size. It may have indirect impacts by reducing the amount of yellowtail flounder allocated to the scallop fishery. Since most groundfish vessels are fishing in sectors, most of the yellowtail flounder allocated to the groundfish fishery is subject to a hard TAC. Generally hard TACs are considered more effective at controlling fishing mortality than indirect measures if reporting and monitoring requirements are adequate. Scallop fishery AMs for yellowtail flounder are not a hard TAC and so are less likely to constrain catches. By allocating more yellowtail to the groundfish fishery, this option appears marginally more likely to achieve GB and SNE/A yellowtail flounder mortality objectives than the Proposed Action. This is only the case if estimates of scallop fishery catches of yellowtail flounder prove accurate. If the estimates under-estimate actual catches, then the amount allocated to the scallop fishery will be insufficient, will be exceeded, and could lead to exceeding the ABC.

With respect to other species, reduced yellowtail flounder allocations would make it more likely that the scallop fishery AMs for yellowtail flounder would be triggered. The AM that was adopted by Scallop Amendment 15 imposes area closures in the year following an overage. As discussed in section (cross to bio impacts of proposed action), there is uncertainty over the estimate of the yellowtail flounder the scallop fishery will catch in future years. Because this option only allocates the fishery 90 percent of the estimated amount it is more likely that the AM will be triggered. If, as a result, scallop fishing effort shifts into areas and seasons with lower scallop CPUEs then it could lead to increased scallop fishing mortality for a given weight of scallops harvested.

Effort shifts as a result of the triggering of the AM could cause changes in the distribution of scallop fishing effort which might lead to changes in the species that are caught and discarded by scallop vessels. It is not clear which other species would be affected by these changes. When compared to the No Action alternative (which is the Proposed Action) these changes are more likely to occur.

As a result, while there may be a marginal benefit to GB and SNE/MA yellowtail flounder fishing mortality with this option, this option is more likely to lead to adverse biological effects on a wider range of species as a result of possible changes in the distribution of scallop fishing effort. In addition, uncertainty over the estimates of scallop fishery yellowtail flounder catches call into question the conclusion that there may be a marginal benefit to yellowtail flounder fishing mortality with this option.

9.1.2 Fishery Program Administration

9.1.2.1 Implementation of Additional Sectors

Option 1 – No Action

Under the No Action option there would not be any additional sectors authorized; the existing seventeen sectors would remain the only authorized sectors. As analyzed in Amendment 16, The existing sectors were expected to result in a greater likelihood that fishing mortality targets would be achieved since catches by vessels in the fishery would be limited by a hard quota for allocated stocks. Sectors were also expected to result in reduced discards, since sector vessels would not be subject to regulatory trip limits for groundfish species. There was also an expectation that there would be less time spent fishing by sector vessels since they would fish more efficiently. Finally, the realization of some of these benefits depended on accurate catch monitoring.

With only six months of sector operations completed it is too early to draw definitive conclusions on whether these expectations have been met. Information in the AE (section 7.5.3) indicates that sector catches have been kept below allocations so far this year. While discards have been reduced for some stocks – primarily those that were subject to trip limits in FY 2009 – for other stocks there has not been decline. Effort – in terms of both the number of trips and the time spent at sea – has declined as expected by Amendment 16. It is not clear yet whether catch reporting has been accurate. On the whole, however, preliminary indications are that catches under sectors are likely to be at levels expected to achieve the mortality targets of the FMP.

Option 2: Implement New Sectors for FY 2011

Under this option two additional sectors were considered for authorized but not selected.

The biological impacts of this action are likely to be minor when compared to the No Action alternative. Much of the fishery is already operating under sector rules (over 95 percent of the catch is allocated to sectors) and it is not likely that the addition of these sectors will substantially change sector membership. There may be subtle shifts in the catch that have impacts on specific stocks but the overall impacts of the FMP are not likely to change.

One of these two sectors is being proposed to operate as a lease only sector. The addition of the lease-only sector may have facilitated the transfer of ACE between sectors, which might lead to a greater portion of the available ACE being caught when compared to the No Action alternative. But with only part of the fishing year completed it is too early to tell if catches will fall significantly short of the available ACE and thus adding permit banks would lead to a substantial change.

The other of these two new sectors is proposed to operate with active fishing vessels. Given the fact most of the catch his already allocated to existing sectors, the addition of one sector is not likely to have large impacts. It is possible that if active vessels are fishing in more sectors, the uncertainty around discard estimates will be higher than under No Action since there will be more discard strata that are estimated. It is not clear if one sector will make a noticeable difference since the overall CVs under sectors have not yet been calculated.

9.1.2.2 Monitoring Requirements for Handgear A and Handgear B Permitted Vessels and Small Vessel Exemption Vessels

Option 1: No Action

Under the No Action alternative, vessels with Handgear A, Handgear B, and Small Vessel Exemption permits would be subject to the same requirements for dockside monitoring as other common pool vessels. Measures adopted in Amendment 16 require that all common pool vessels would be subject to dockside monitoring beginning in FY 2012, when the hard TAC AM is implemented for common pool vessels. The current required level of coverage is for 20 percent of trips to be monitored.

Under the No Action alternative there may be a minor improvement in the accuracy of landings information from these vessels. Dockside monitoring is proposed in order to verify the accuracy of landings information. Because this program was first adopted in FY 2010 (for limited access vessels participating in sectors) there is no data with which to evaluate the effectiveness of this requirement for handgear and small vessel exemption vessels. Because these vessels land less than one-half of one percent of the groundfish landed by permitted vessels, it is unlikely that this will make a noticeable difference in the ability to assess stocks as a whole. For cod, pollock, and haddock – the three species most often landed by these permits (see section 7.5.3.5), the percentages of landings are higher but still a small part of total landings and marginal improvements in catch data are not likely to be detectable.

9.1.2.3 Monitoring Requirements for Commercial Groundfish Fishing Vessels

Option 1: No Action

Under the No Action option, the monitoring requirements adopted by Amendment 16 for commercial groundfish fishing vessels would continue. This includes both at-sea monitoring at a level sufficient to meet requirements and dockside monitoring of 20 percent of trips. At-sea monitoring must, at a minimum, meet the CV standard of the SBRM and the level of required coverage will be specified by NMFS.

Monitoring requirements do not have direct biological impacts but can indirectly influence the ability of the management program to achieve mortality targets. Accurate landings and discard information are needed in order to conduct stock assessments. By requiring an at-sea monitoring program, information is collected in order to estimate discards with sufficient accuracy to support quota-monitoring needs. Similarly, random dockside monitoring of 20 percent of groundfish trips reduces the likelihood that some catches will be unreported. While this should improve the accuracy of catch statistics, since the requirement was first adopted at the start of FY 2010 there is no data available yet to evaluate the program’s effectiveness.

Under the No Action option, the Amendment 16 requirement that sectors develop and fund an at-sea monitoring program in FY 2012 is not changed. As a result, there is a high expectation that an adequate program will be in place to accurately estimate discards. Similarly, under this option the dockside monitoring program will also continue. As a result, the ability to constrain sector catches to the desired quotas should continue. This should contribute to achieving mortality targets.

9.1.2.4 Distribution of PSC from Canceled Permits

Option 1: No Action

Under the No Action alternative, when a limited access permit that is eligible for a sector is canceled, the PSC associated with that permit is assigned to the common pool. The biological impacts of this practice are difficult to determine. In FY 2011, common pool vessels will be managed by effort controls such as DAS limits and trip limits, but in FY 2012 these vessels will also be subject to a hard TAC. If the number of permits that are cancelled is only a small number, the effects are minor. If the permits that are cancelled were in sectors, then in FY 2011 this option shifts the available catch from a sector controlled by a hard quota to the common pool where effort controls are used. As a result, the amount of catch where there is less certainty that measures will constrain catches increases slightly and thus there is less certainty of meeting mortality objectives. If the permits are already in the common pool, however, there is no expected biological impact of this practice. After FY 2012, it will not matter which component the cancelled permits were in as both groups will be managed by a hard TAC. If a large number of permits are cancelled – such as through a vessel buyout – the impacts are less certain. On the one hand, if the cancelled permits were in sectors and the associated PSC is added to the common pool, the amount of catch controlled by less certain effort controls increases, enhancing the risk that mortality controls will not be achieved. But the number of vessels fishing in the common pool does not automatically change, which may mitigate this effect to some extent as more fish are available for common pool vessels, making it less likely that they will exceed their available catch. In effect, the PSC assigned to the common pool becomes a buffer between the PSC associated with the vessels fishing and the level of catch that exceeds mortality targets.

9.1.2.5 Submission of Sector Rosters

Option 1: No Action

The required date for submission of sector rosters is an administrative measure that is not expected to have any direct or indirect biological impacts on regulated groundfish or other species. There are no differences expected between the No Action and Proposed Action impacts.

9.1.3 Commercial and Recreational Fishery Measures

9.1.3.1 General Category Scallop Dredge Exemption – Modification of Restrictions

Option 1: No Action

The No Action option maintains two seasonal closures in the Great South Channel Scallop Exemption Area that are designed to protect spawning yellowtail flounder. These closures were adopted when the exemption was implemented in August, 2006. The EA supporting the action (NMFS 2006) justifies the closures as necessary to protect rebuilding stocks of yellowtail flounder but provides no analysis or rationale for creating the closures for the General Category Scallop Fishery when groundfish fishing is allowed in the area at the same time, and limited access scallop vessels are not subject to the same restrictions. The EA does not provide evidence describing the specific impacts of scallop dredge fishing on yellowtail flounder spawning activity.

General Category scallop fishing vessels tend to have low bycatch rates of yellowtail flounder and other groundfish (NMFS 2006), but fishing on spawning aggregations may have impacts beyond those on fishing mortality. Thompson (pers. com.) summarized fishing impacts on spawning activity (generally, not specific to scallop dredge fishing) in a letter to the Council as follows:

- Fishing activity may disrupt spawning signals and thereby reduce spawning success (Rountree et al. 2006);
- Fishing activity may disturb spawning habitat or habitat essential for early life history stages;
- Spawning fish are stressed and may be less able to survive handling, or capture may reduce egg production, even if fish are released (Taylor et al. 2001);
- Fishing increases mortality which reduces the number of older fish spawning. This may have adverse impacts as there is evidence (at least for cod) that first time spawners perform poorly compared to repeat spawners (Trippel, 1998).

Yellowtail flounder in the Southern New England area are believed to spawn during April to June (NMFS 1999); more precise information on spawning times and locations is not reported. MARMAP icthyoplankton surveys documented egg concentrations in this area from April to May, with a peak in May (see Figure 52). Observed catches of yellowtail flounder in all dredge gear (general category and limited access trips) from 2006 through 2009 were examined to determine if there was evidence of seasonal changes that corresponded with the spawning periods. The spawning area closures are in SA 521 and 526; see Figure 1. Because of a lack of observations in all months and all years, a ratio was calculated for each month and the average of the months over the time period was determined. These data are inconclusive in SA 521, where catches seem to peak in mid-summer (July-August) rather than in April through June. But in SA 526, there is a pronounced increase in June but an even higher peak in December. Catches in SA 526 also appear higher in mid-summer than in the late spring. The distribution of observed tows (Figure 54) shows that the largest catches of yellowtail flounder in SA 521 and 526 during the April through June period tend to be east of the NLCA, just south of the spawning area closure. There are few observed trips in SA 521 during this period so these data should be viewed with caution.

In summary, the distribution of yellowtail flounder eggs observed in MARMAP surveys suggest spawning activity in the area of the closures in April through June. Observed catches of yellowtail flounder in scallop dredges indicate that catches increase rapidly in June in SA 526, but in SA 521 there is less of an indication that catches increase during the reported period of spawning activity. To the extent that dredge activity interferes with spawning activity, under the No Action alternative the spawning closures will reduce scallop dredge fishing interference with yellowtail flounder spawning.

Figure 52 – Distribution and abundance of yellowtail flounder eggs collected from NEFSC MARMAP surveys, February to September, 1977 - 1987 (copied from NMFS 2009, EFH Source Document for Yellowtail Flounder)

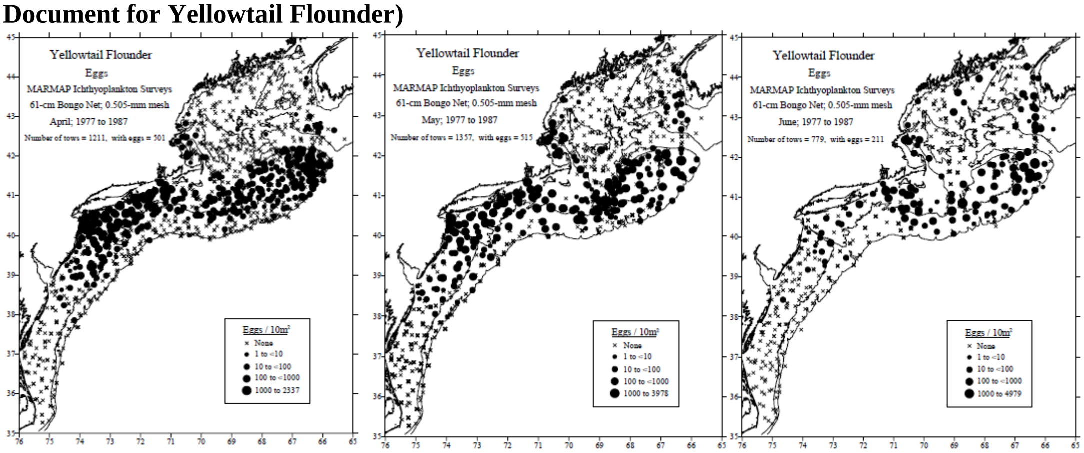


Figure 53 – Ratio of yellowtail flounder discarded to scallop meat weights kept by scallop dredge vessels in statistical areas 521 and 526 (average of 2006 - 2009 monthly ratios)

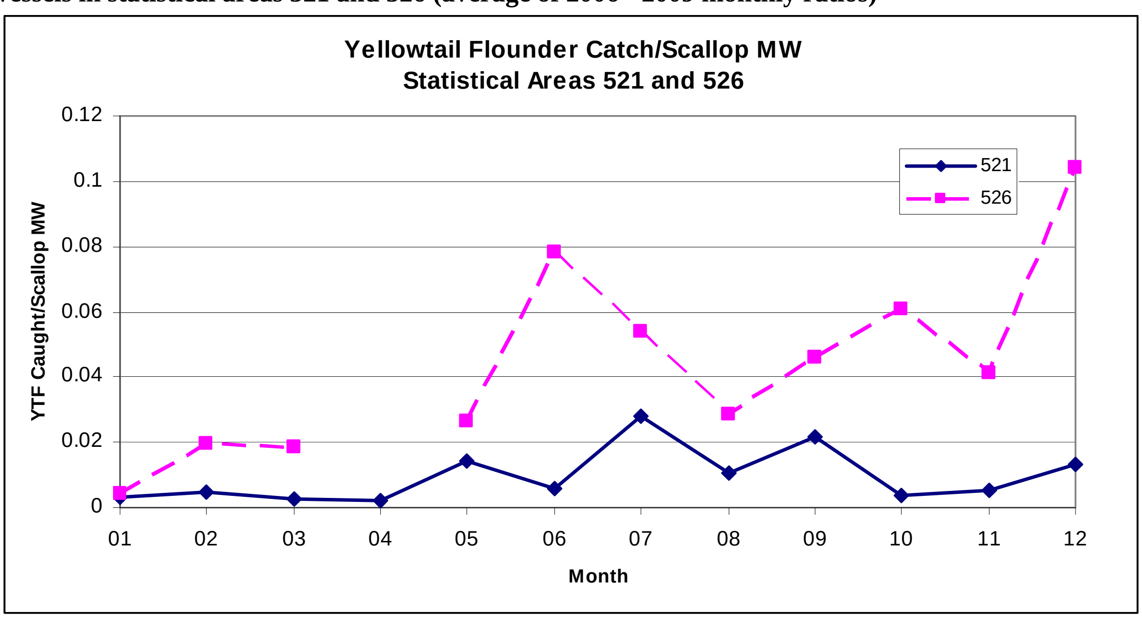
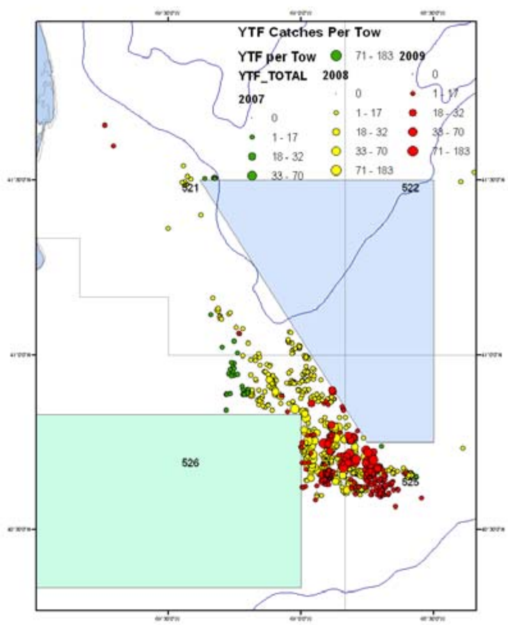


Figure 54 - Observed dredge catches of yellowtail flounder, April – June, 2007 – 2009



9.1.3.2 Gulf of Maine Cod Spawning Protection Area

Option 1: No Action

The No Action alternative maintains current management measures in the inshore GOM for commercial and recreational vessels. The commercial management measures differ for vessels in the common pool and vessels in sectors. Vessels in the common pool are not allowed to fish in the inshore area during April, May, and June because of the existing rolling closures. Vessels in sectors are allowed to fish in the rolling closures during June and can request other exemptions from the rolling closures (none have been granted to date). With respect to the recreational fishery, the measures in place include a minimum fish size, bag limit, and seasonal prohibition on possession of GOM cod (November 1 – April 15).

These measures are designed primarily to control fishing mortality of this stock and while they may provide some protection to spawning fish the measures were not specifically designed for that purpose. Early management actions implementing the closures tend to focus on the closures as a method of reducing catches. FW 20 (NEFMC 1997) first considered seven area closure alternatives and focused the impacts analysis on the effect on cod landings without any mention of spawning closures. FW 25 (NEFMC 1998) adopted rolling closures "…targeting the areas of highest cod landings", with no mention of spawning closures in the document. FW 26 adopted additional protection for "spawning cod" and referred to existing closures as designed to reduce mortality and protect spawning cod but does not include any documentation identifying cod spawning times and areas. Beginning with FW 27 and continuing through Amendment 13, rolling closures were adjusted to control fishing mortality on a wide range of groundfish stocks, not just cod, making the link between the closures and cod spawning protection even more tenuous.

Nevertheless, there is evidence that the commercial closures do coincide with cod spawning activity in the Ipswich Bay area. Within the areas of the sector exemption in June, there is general information on spawning activity for several stocks. Table 129 summarizes the spawning periods for regulated groundfish in the GOM. According to Lough (2004), cod spawning in the GOM occurs from winter through spring but the time of peak spawning varies with location. Spawning in Massachusetts Bay peaks in January and February, north of Cape Ann it peaks between February and April, and off the coast of Maine it peaks between March and May. Generally, sector vessels are not automatically exempted from closures that overlap these cod spawning periods, though this is further explored below. The extended spawning periods for many groundfish stocks mean it is possible that the areas that are open to sector vessels may include spawning fish. Howell's acoustic tagging study in the Ipswich Bay area of the Gulf of Maine reports on specific activity associated with cod spawning and identifies relatively small areas that contained aggregations of spawning cod. Of particular interest are the peak spawning periods for American plaice and GOM haddock. American plaice maximum spawning occurs in the western Gulf of Maine, with peak spawning in April and May. They are batch spawners, releasing eggs every few days over the spawning period; nursery areas are found in coastal waters of the GOM (Johnson, 2004). Peak spawning for GOM haddock occurs between February and April; Jeffreys Ledge and Stellwagen Bank are the primary spawning sites (Brodziak 2005). Sector vessel access to the inshore GOM could have impacts on spawning activity of these two stocks.

Recent cod tagging studies provided additional information on cod spawning activity in the inshore GOM, including the areas and times of the rolling closures. Howell et al. (2008) reported a mark and recapture study of cod in the GOM, particularly related to the closed areas. Seasonal changes in abundance in the inshore areas were noted and these seemed consistent with spawning activity. In block 133, two peaks in abundance were observed: November-January and April – July, suggesting two distinct spawning populations. They concluded that the closure of block 124 in April, May, and November seemed appropriate to protect spawning fish, as did the closure of block 133 in April and May but possibly not June.

A more recent acoustic tagging study focused on a finer-scale investigation into spawning behavior in the Ipswich Bay area (Howell 2009). Howell's acoustic tagging study in the Ipswich Bay area of the Gulf of Maine reports on specific activity associated with cod spawning and identifies relatively small areas that contained aggregations of spawning cod during the spring. The study area (blue line) and area with cod detections (red line) is shown in Figure 55. Acoustic detections indicated that cod aggregated in specific locations within the study area while spawning during April through June (Figure 56).

Under the No Action alternative, recreational fishermen can target these aggregations of cod after April 15. Commercial vessels in sectors are allowed to target these aggregations in June. If they receive an additional exemption they might be allowed to target them in April and May as well. Common pool vessels are not allowed to target these aggregations due to the rolling closures. The No Action alternative thus does not provide complete protection to the spawning fish located by Howell (Howell et al. 2009).

It is possible that fishing on these spawning aggregations may have impacts on spawning activity other than just the removal of fish. As noted previously:

- Fishing activity may disrupt spawning signals and thereby reduce spawning success (Rountree et al. 2006);
- Fishing activity may disturb spawning habitat or habitat essential for early life history stages;
- Spawning fish are stressed and may be less able to survive handling, or capture may reduce egg production, even if fish are released (Taylor et al. 2001);
- Fishing increases mortality which reduces the number of older fish spawning. This may have adverse impacts as there is evidence (at least for cod) that first time spawners perform poorly compared to repeat spawners (Trippel, 1998).

Figure 55 – Cod acoustic tagging study area. Blue line indicates areas monitored for cod detections, red line indicates area of detections. From Howell et al 2009

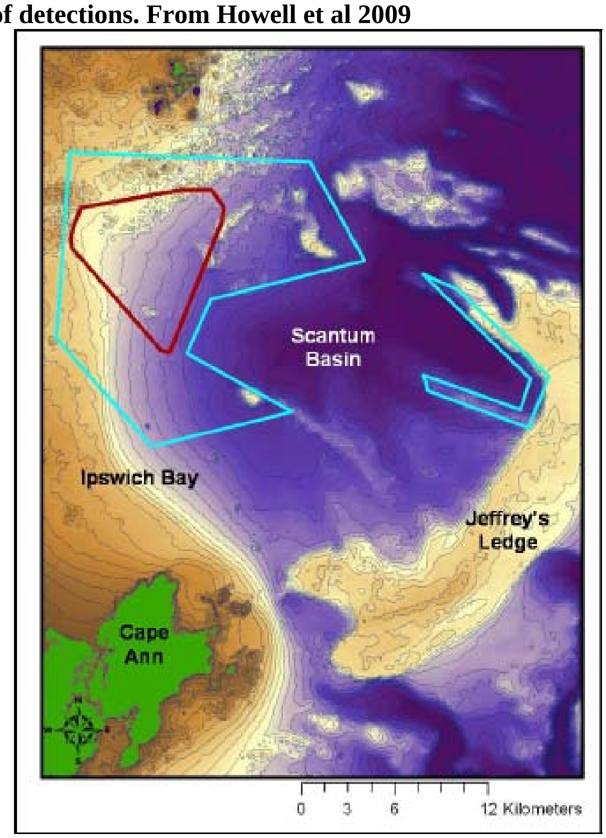


Figure 56– Volume contours of detections from cod acoustic tagging study (from Howell et al 2009)

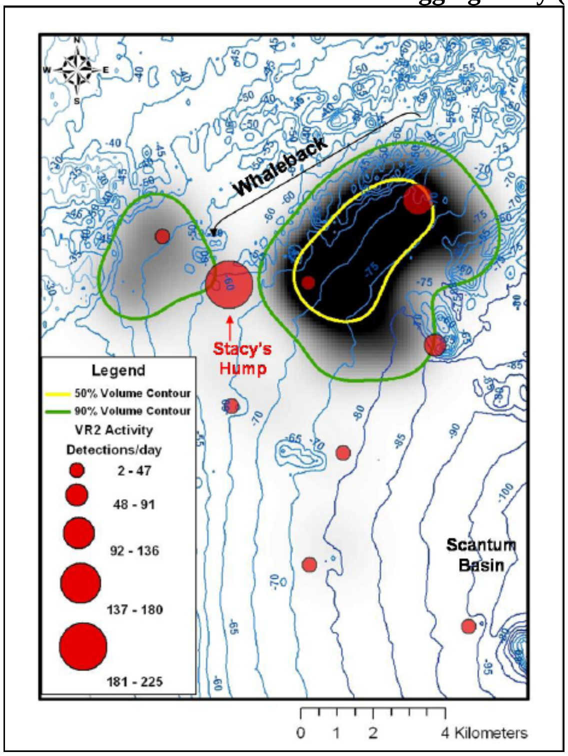


Table 129 - Spawning periods for GOM regulated groundfish. (Source: Essential Fish Habitat source documents)

spawning months

peak spawning months

Species	*January*	*February*	*March*	*April*	*May*	*June*	*July*	*August*	*September*	*October*	*November*	*December*	*Notes*
American Plaice,GM													Berrien and Sibunka 1999
GOM Atlantic Cod													
Atlantic Halibut													Atlantic Canada waters
GOM Haddock													
Northern Ocean Pout													
Pollock													
Redfish													*copulation from Oct-Jan; fertilization from Feb-April; no peak times evident
GB-GOM White Hake													*no peak times evident
GB Windowpane													
GOM Winter Flounder													
GB-GOM Witch Flounder													
CC-GOM Yellowtail Flounder													

9.1.3.3 Handgear Permit Management Measures

Option 1: No Action

The No Action regulations for Handgear A permits mandate a 300 lb. trip limit for these permits. The trip limit adjusts (higher or lower) proportional to the GOM cod trip limit for common pool DAS vessels. This includes any in-season adjustment to the GOM cod trip limits implemented by the Regional Administrator. In-season adjustments are based on whether catches need to be slowed or increased to achieve the common-pool ACL for GOM cod.

By tying the Handgear A trip limit to the total common pool catch, and adjusting trip limits as necessary, the No Action alternative increases the probability that GOM cod catch will be constrained to the ACL. With this measure there is a greater likelihood that mortality targets for this stock will be met. At the same time, however, the adjustments are made without regard to the GB cod stock and the trip limit for Handgear A vessels fishing on that stock will not reflect whether catches are approaching that ACL. Handgear A permits only account for a small portion of the catch for both stocks, however, so it is likely that these effects are undetectable.

Similarly, the trip limit for Handgear B vessels begins at 75 lbs./trip and is adjusted proportional to the GOM cod trip limit for limited access vessels. With this measure there is a greater likelihood that mortality targets for this stock will be met. At the same time, however, the adjustments are made without regard to the GB cod stock and the trip limit for Handgear A vessels fishing on that stock will not reflect whether catches are approaching that ACL. Handgear B permits only account for a minute portion of the catch for both stocks, however, so it is likely that these effects are undetectable.

Under this option, vessels fishing with a handgear permit are not allowed to fish in the GOM rolling closures that are applicable to common pool vessels. This makes it unlikely that handgear vessels will interfere with spawning cod. This likely has little effect as recreational vessels are allowed to fish for cod in many of these closures, and these vessels outnumber the handgear permitted vessels.

Option 2: Rolling Closure Exemption for Handgear A Vessels

Under this option, vessels fishing under a Handgear A permit will be exempt from all rolling closures in the GOM and the seasonal closure on GB. They will not be exempt from the year-round areas closed to commercial groundfish fishing activity. This action is likely to increase catches of groundfish species by Handgear A vessels – in particular, the catches of GOM cod and possibly GB cod as well. When compared to the No Action alternative this option increases the risk that catches of these stocks may exceed the ACL and potentially lead to overfishing. Because of the small amount of catch that can be attributed to these vessels it is unlikely that the increased risk is detectable.

Most Handgear A vessels fished in the common pool in FY 2010. Handgear A vessels have been subject to rolling closures in the GOM, and the seasonal GB closure, since these closures were implemented. The primary tools used to restrict catches by these vessels are the restriction to use handgear (which includes tub trawls of up to 250 hooks) and trip limits for cod catches. GOM and GB cod catches by Handgear A vessels in recent years are shown in Table 130. Catches in FY 2010 are expected to decline because of the adjustment of cod trip limits during the fishing year as the common pool ACL was approached. The low trip limits that resulted made fishing uneconomical for these vessels. This measure is designed to provide additional opportunities for Handgear A vessels before the trip limits are likely to change as a result of fishing by limited access vessels. The expectation is that when compared to No Action cod catches will increase, which may increase fishing mortality for groundfish stocks – particularly GOM and GB cod.

As limited access permits, handgear A vessels have a calculated PSC. This PSC effectively determines the amount of groundfish that this permit category brings to the common pool sub-ACL. If catches by Handgear A vessels exceed this amount then the risk that the overall ACL increases. The amount of GOM cod that these vessels will bring to the common pool in FY 2011 is approximately 14 percent of the total GOM cod common pool ACE, or 52,000 pounds live weight, based on preliminary sector rosters, or approximately 173 trips at 300 lbs./trip. Vessels with Handgear A permits caught more than this amount of GOM cod each year since fishing year 2006 without access to the rolling closure areas (see Table 130). While Handgear A vessel catches are a small part of total removals, as the number of limited access permits fish in sectors increases then the handgear A permits will reflect a larger percentage of the common pool fishery. While the catches by this fleet are currently small, the concept that each component of the fishery is responsible for its own catch argues that overages should be avoided if at all possible to increase the likelihood that mortality targets will be met.

Table 130 – Handgear A permit landings (lbs., landed weight) of GOM and GB cod, FY 2006 – 2009 (Source: VTR database)

		FY 2006	FY 2007	FY 2008	F Y2009
GOM	Handgear	45,507	51,409	76,528	118,090
	Longline	18,055	14,056	5,759	17,262
	Total	63,562	65,465	82,287	135,352
GB	Handgear	9,421	6,769	11,333	8,108
	Longline		100	1,714	
	Total	9,421	6,869	13,047	8,108

There is evidence that Handgear A vessel catches will increase if they are granted access to the rolling closure areas. These areas are actively fished by recreational vessels in April through June. Charter vessels in these areas successfully target cod with handgear during the closures. It is reasonable to expect that Handgear A vessels will also be successful.

There are measures in place that can be used by NMFS to help control catches by Handgear A vessels. For example, in FY 2011 NMFS can adjust trip limits if necessary to slow the catch of cod. Beginning in FY 2012, common pool vessels will be subject to a hard TAC AM and if the ACL is approached then fishing in the relevant stock area will be curtailed. If these tools are successfully applied, then the risk to mortality targets from this change may prove small.

If this option is adopted, handgear A vessels will be fishing in areas that are known to include cod spawning activity. Fishing by these vessels could adversely affect cod spawning by removing large spawning fish. Because of the small size of this fishery and the large number of recreational vessels that already fish in these areas, it is unlikely that the marginal increase of the impacts will be noticeable. Nevertheless, when compared to No Action, there is a possibility that there would be slight negative impacts on spawning activity.

9.2 Impacts to EFH

9.2.1 Updates to Status Determination Criteria, Formal Rebuilding Programs, and Annual Catch Limits

The alternatives outlined in this section of the Framework would result in changes to the target catches for various managed species. In some cases, targets would increase, while in other cases, they would decrease. In general, increased catch targets could result in increased fishing time and thus increased area swept to achieve those targets, and therefore would result in increased impacts to the seabed and associated EFH. Similarly, decreased catch targets could result in decreased fishing time, area swept, and impacts to the seabed and EFH. However, this is a gross oversimplification because the particular array of catch targets across the various managed species/stocks will influence fishing behavior of the fleet. For example, depending on the catch targets and availability of quota, the choice of fishing location may vary, and this would influence impacts to EFH because not all habitats are equally susceptible to damage from fishing gear. In addition, appropriate catch targets and quotas may alleviate some bycatch concerns, such that fishermen can harvest quotas more efficiently with associated reductions in EFH impacts.

9.2.1.1 Revised Status Determination Criteria for Pollock

Option 1: No Action

The no action option for this alternative would retain the current status determination criteria for pollock.

9.2.1.2 Revised GB Yellowtail Flounder Rebuilding Mortality Targets

Option 1: No Action

The no action option for this alternative would retain the current rebuilding target of 2014 with a 75% probability of success.

Option 2B, 2C, and 2D: Revised Rebuilding Target for Georges Bank Yellowtail Flounder

Option 2 and the associated sub-options would extend the rebuilding period to either 2016 (sub-options B-C) or to 2019 (sub-option D) with a probability of success of 60% or 75% for Options B/D, and C, respectively. While associated ACLs and US/Canada TACs are set via separate alternatives (see Sections 8.2.1.3 and 8.2.1.4), the various sub-options would allow for higher/lower catches in the short-term, which would be expected to result in an increase/decrease in bottom contact time and thus an increase/decrease in impacts to EFH. Specifically, options B and C result in lower ABCs/ACLs, and option D results in higher ABCs/ACLs.

9.2.1.3 Annual Catch Limit Specifications

Option 1: No Action

Implementation of this option would mean that specifications would not be changed from FW 44 levels. Note that the no action option for this alternative assumes that ACLs for GB yellowtail flounder are not changed from Framework 44, regardless of the decision on proposed rebuilding strategy.

Option 2: Revised Annual Catch Limit Specifications for Modified Stocks

While revised specifications were adopted for most stocks, multiple GB yellowtail flounder ACL sub-options were prepared, depending on the various updated rebuilding strategy scenarios. Thus, this action refers to the OFLs, ABCs, ACLs, and other ACL sub-components for FY 2011 – FY 2012 that were not selected, based on the rejected GB yellowtail flounder rebuilding strategies (i.e. strategies B, C, and D).

9.2.1.4 U.S./Canada Resource Sharing Understanding TACs

Option 1: No Action

The no action option for this alternative results in no TACs being adopted for Eastern GB cod, Eastern GB haddock, and GB yellowtail. While this would likely reduce fishing and thus EFH impacts, it would also preclude any and all landings of fish from these stocks during 2011.

9.2.1.5 Yellowtail Flounder Allocations for the Scallop Fishery

Option 2: Revised allocations

This option would allocate yellowtail flounder ACL to the scallop fishery in relation to the expected amount required to prosecute the fishery under the scallop management scenario selected in Framework 22 to the Atlantic Sea Scallop FMP. It is difficult to know whether scallop fishery yellowtail catches are likely to exceed the allocated ACLs, even if those ACLs are specifically tied to scallop fishery catch projections. However, having adequate available ACL to meet the requirements of the scallop fishery allows them to fish primarily in access areas, which generally have higher catches per unit effort/area swept, and thus lower impacts to EFH. This option might have slightly reduced impacts to EFH as compared to no action, but since the no action option ACLs are similar to the projected scallop fishery catches, differences between this option and no action are expected to be minimal.

9.2.2 Fishery Program Administration

The alternatives in this section would modify administrative aspects of the fishery but would not be expected to influence the total magnitude of catches, and therefore would not be expected to have impacts on EFH that differ from the status quo. Each alternative is briefly described below.

9.2.2.1 Implementation of Additional Sectors

Option 1: No Action

Option 1 would not implement any additional sectors beyond those implemented via Amendment 16.

Option 2: Implement New Sectors for FY 2011

Option 2 for this alternative would implement new sectors beginning in May 2011. While some new sectors were approved, two were not: Northeast Fisheries Sector XIV and Sustainable Harvest Sector II. It is possible that new sectors would influence the distribution of fishing effort somewhat, which could result in different impacts to EFH as habitats are differentially vulnerable, spatially, but these changes are likely to be minimal, and furthermore, would be very difficult to evaluate.

9.2.2.2 Monitoring Requirements for Handgear A and Handgear B Permitted Vessels and Small Vessel Exemption Vessels

Option 1: No Action

Under No Action, no changes will be made to the regulations for vessels fishing with Handgear A or Handgear B permit vessels, i.e. Handgear A vessels would continue to be limited to a trip limit of 300 lbs./trip for cod, and Handgear B vessels would continue to be limited to a trip limit of 75 lbs./trip.

9.2.2.3 Monitoring Requirements for Commercial Groundfish Fishing Vessels

Option 1: No Action

Under this option there are no changes to the monitoring requirements for commercial groundfish fishing vessels that were adopted in Amendment 16.

9.2.2.4 Distribution of PSC from Canceled Permits

Option 1: No Action

If no action is selected, distribution of PSC from canceled permits will continue in the same manner it is currently performed.

9.2.2.5 Submission of Sector Rosters

Option 1: No Action
The no action option would maintain the current September 1 date for submission of sector rosters.

9.2.3 Commercial and Recreational Fishery Measures

9.2.3.1 General Category Scallop Dredge Exemption – Modification of Restrictions

Option 1: No Action

The no action option would maintain the existing restrictions on General Category scalloping in the two Yellowtail Spawning Closures in the Great South Channel.

9.2.3.2 Gulf of Maine Cod Spawning Protection Area

Option 1: No Action

The No Action option would not implement a new spawning protection area in the GOM.

Option 2: GOM Cod Spawning Protection Measures

Under Option 2, the following language was considered for restrictions to recreational fishing vessels, but was not approved.

- Recreational fishing vessels (including party-charter vessels) are subject to the following restrictions:
    - Sub-Option A: Recreational vessels are prohibited from fishing in the area from April through June.
    - Sub-Option B: Recreational vessels are prohibited from possessing cod in the area from April through June.

9.2.3.3 Handgear A Trip Limits

Option 1: No Action

No changes will be made to the regulations for vessels fishing with Handgear A or Handgear B permit vessels.

Option 2: Rolling/Seasonal Closure Exemption for Handgear A Vessels

Handgear A vessels are exempt from all GOM rolling closures implemented by Amendment 13. Handgear A vessels are exempt from the GB seasonal closure.

Access to future closed areas (such as the GOM cod spawning protection area in Section 4.3.2) will be determined when the particular measure is adopted. Handgear A vessel access to new closures will be the same as for other commercial vessels unless Handgear A access is explicitly authorized. Handgear A vessels that are in the common pool will be subject to the same rules as other common pool vessels unless a specific exception is made. Handgear A vessels in sectors will be subject to the same rules as other sector vessels unless a specific exception is made.

9.3 Impacts on Endangered and Other Protected Species

9.3.1 Updates to Status Determination Criteria, Formal Rebuilding Programs, and Annual Catch Limits

9.3.1.1 Revised Status Determination Criteria for Pollock

Option 1: No Action

Under this option the formal rebuilding program first adopted in Amendment 16 would need to be continued, and catches would be held at a low level to rebuild the stock. The impacts of the fishery to protected species may not change as a result of the continuation of the rebuilding plan, however this option would be inconsistent with the requirements of the M-S Act, specifically National Standard 2.

9.3.1.2 Revised GB Yellowtail Flounder Rebuilding Mortality Targets

Option 1: No Action

This option would rebuild this stock more quickly than the other options under consideration by targeting rebuilding by 2014 with a 75 percent probability of success. The 2010 assessment of this stock (TRAC 2010) indicated that a fishing mortality of F=0 would need to be adopted to achieve this goal (although the assessment noted that goal could not be achieved even under this fishing mortality). A fishing mortality of F=0 would mean all fishing would cease, and would likely result in a benefit for protected species by reducing any potential interaction with groundfish fishing gear in all areas at all times.

Option 2: Revised Rebuilding Target for GB Yellowtail Flounder

Since recent assessments indicate the stock will not rebuild by 2014 in the absence of all fishing mortality, four alternative rebuilding strategies were being considered for this measure. All four options target a rebuilding at a slower pace than under the No Action alternative. Stock size would be smaller under all of the options when compared to No Action until the ending date of rebuilding. The three options under consideration that were not selected for the proposed action are:

> Sub-Option B: Use a fishing mortality target that is calculated to rebuild the stock by 2016 with a 60 percent probability of success
> Sub-Option C: Use a fishing mortality target that is calculated to rebuild the stock by 2016 with a 75 percent probability of success
> Sub-Option D: Use a fishing mortality target that is calculated to rebuild the stock by 2019 with a 60 percent probability of success

The first two sub-options extend the rebuilding period to 2016, each considering a different probabilities of success. Sub-option D extends the rebuilding period until 2019, and targets a probability of success of 60 percent. All impacts discussed below would be expected to last as long as the rebuilding period, barring other changes to the FMP or specifications.

Compared to the No Action alternative, all four sub-options would possibly result in more effort exerted by the fishery; all four sub-options may therefore result in more possible gear interactions for protected species, such as harbor, hooded and harp seals. The highest target fishing mortality rate was estimated for sub-option D, and would likely result in the most fishing effort. Although not directly correlated, the greater the fishing effort, the more interactions with protected species may occur. By that same logic, sub-option A has less probability of gear interaction with protected species than sub-option D but more probability than sub-options B and C, as it has the second highest target fishing mortality rate. Sub-option B has even less probability than A and D, but sub-option C has the lowest target fishing mortality rate, and therefore the least probability of gear interaction with protected species of the four. Effort in the fishy may or may not result in area shifts; it is unclear how fishermen may react to the target mortality rates. Overall it is important to note that the differences in impact on protected species between the sub-options are likely to be minor, and the target fishing mortality values may change in future years if stock conditions differ from the projection results. In all cases the impact to protected species is likely to be negative but inconsequential. The uncertainty in the location and amount of effort exerted by the fishery, however, makes it difficult to calculate the amount of impact that the four sub-options may have on protected species, from impacts such as forage availability to encounters with fishing vessels.

9.3.1.3 Annual Catch Limit Specifications

Option 1: No Action

This No Action option does not modify the OFLs/ABCs/ACLs for GB cod, GB haddock, GB yellowtail flounder, white hake, and pollock that were adopted by FW 44 (NEFMC 2010). All of the elements of the ACLs would remain the same, such as the allocations of GB and SNE/MA yellowtail flounder to the scallop fishery that were adopted in that same action.

No major protected species impacts would be expected to occur as a result of the No Action option. As such, the provision should not result in impacts beyond those analyzed and discussed in FW 44 (NEFMC 2010). As summarized from FW 44 (NEFMC 2010) the specification of ACLs was not expected to have direct impacts on protected species, and was consistent with the fishing mortality targets adopted by Amendment 16.

9.3.1.4 U.S./Canada Resource Sharing Understanding TACs

Option 1: No Action

Under this option no TACs would be implemented for GB cod, GB haddock, and GB yellowtail in the U.S./Canada area for FY 2011 in opposition to the recommendation of the TMGC. The impact to protected species may be positive, as there would be less effort in the area, which would reduce the likelihood of fishery encounter with protected species. The action would also lengthen the rebuilding time of the stock, however, which could decrease the amount of forage available for protected species. Overall, the impacts are expected to be negligible.

9.3.1.5 Yellowtail Flounder Allocations for the Scallop Fishery

Option 2: Revised Allocations

This option would reduce the allocations of GB and SME/MA yellowtail flounder to the scallop fishery. As a result, it is more likely that the scallop fishery sub-ACLs for these two stocks would be exceeded, triggering AMs in the following year. This could lead to effort shifts that may affect the interactions of the scallop fishery with endangered and other protected species. It is difficult to predict whether these shifts will occur or how they will change the fishery's interactions with these species. When compared to the No Action alternative, such changes are more likely under this option.

9.3.2 Fishery Program Administration

9.3.2.1 Implementation of Additional Sectors

Option 1: No Action

Under this action the nineteen operating sectors authorized under Amendment 16 would remain the sole operators. This action is not expected to have an impact on protected species as it maintains the status quo and is administrative in nature.

Option 2: Implement New Sectors for FY 2011

This option could have authorized two additional sectors for the FY 2011: the Northeast Fisheries Sector XIV, and the Sustainable Harvest Sector II. One of the sectors under consideration but not selected in this option would have been comprised of inactive members with the primary function of transferring ACE. As a result, this action is unlikely to have protected species impact, as it is mainly procedural in nature. The other sector which would have active members may change fishing behavior, but the changes are very difficult to predict, compared to the No Action option. As such, the provision should not result in impacts beyond those analyzed and discussed in the Amendment 16.

9.3.2.2 Monitoring Requirements for Handgear A and Handgear B Permitted Vessels and Small Vessel Exemption Vessels

Option 1 – No Action

The requirements for dockside monitoring that were adopted in Amendment 16 would not change under this option. The measures adopted in Amendment 16 required sectors to comply with dockside monitoring beginning in FY 2010, and would require that all common pool vessels also be subject to dockside monitoring beginning in FY 2012, when the hard TAC AM is implemented for the common pool. The required level of coverage beginning in FY 2011 is for 20 percent of trips to be monitored. Although the accuracy of landing information may improve as a result of this option, it would not help protected species, as protected species are illegal to bring to the dock and therefore would not be monitored better. There are therefore expected to be no impacts as a result of this option.

9.3.2.3 Monitoring Requirements for Commercial Groundfish Fishing Vessels

Option 1: No Action

Under the No Action option, the monitoring requirements adopted by Amendment 16 for commercial groundfish fishing vessels would continue. This includes both at-sea monitoring at a level sufficient to meet requirements and dockside monitoring of 20 percent of trips. At-sea monitoring must, at a minimum, meet the CV standard of the SBRM and the level of required coverage will be specified by NMFS. Monitoring requirements stand to positively impact protected species by providing more information about them, however this option would not change coverage levels and so would have no impact.

9.3.2.4 Distribution of PSC from Canceled Permits

Option 1: No Action

Under the No Action alternative, when a limited access permit that is eligible for a sector is canceled, the PSC associated with that permit is assigned to the common pool. Impacts to protected species are expected to be negligible; although some PSC may move from one sector to the common pool, the fishing effort and distribution likely will not change as a result of the option.

9.3.2.5 Submission of Sector Rosters

Option 1: No Action

Under this option, there would be no changes to current requirements, adopted in Amendment 16, that sectors must submit final sector rosters to NMFS by September 1 for the next fishing year. This option would have no impact on protected species, as it maintains the status quo.

9.3.3 Commercial and Recreational Fishery Measures

9.3.3.1 General Category Scallop Dredge Exemption – Modification of Restrictions

Option 1: No Action

The No Action option maintains two seasonal closures in the Great South Channel Scallop Exemption Area that are designed to protect spawning yellowtail flounder. This option would have no impact on protected species, as it maintains the status quo.

9.3.3.2 Gulf of Maine Cod Spawning Protection Area

Option 1: No Action

The No Action alternative maintains current management measures in the inshore GOM for commercial and recreational vessels. The commercial management measures differ for vessels in the common pool and vessels in sectors. Vessels in the common pool are not allowed to fish in the inshore area during April, May, and June because of the existing rolling closures. Vessels in sectors are allowed to fish in the rolling closures during June and can request other exemptions from the rolling closures (none have been granted to date). These measures are not intended to protect spawning fish, but to reduce mortality to the stock; however, some beneficial spawning protection is provided, which may be maintaining forage availability. As this option would maintain the status quo, however, it is not expected to have impacts on any protected species.

9.3.3.3 Handgear Permit Management Measures

Option 1: No Action

Under this option, no changes will be made to the regulations for vessels fishing with a Handgear A or Handgear B permit vessels. Vessels fishing with Handgear A permits and not in a sector would continue to be subject to all rolling closures that apply to common pool vessels.
This measure would maintain status quo, and therefore protected species are not liable to experience adverse or jeopardizing effects.

Option 2: Rolling Closure Exemption for Handgear A Vessels

Under this option, Handgear A vessels would be exempt from all GOM rolling closures implemented by Amendment 13. Access to future closed areas (such as the GOM cod spawning protection area in Section 4.3.2) will be determined when the closed areas are adopted.

This option will likely shift fishing effort and effort magnitude into locals and amounts that could potentially be detrimental to protected species. The Northeast/Mid-Atlantic bottom longline/hook-and-line fishery is listed as a Tier 2 Category III fishery in the LOF (2010), however in recent years, marine mammal species and stocks incidentally killed or injured by those gears have been documented as zero. Similarly, right whale critical habitat does fall in some of the affected areas, however hook gear has not been implicated in entanglements. This option is therefore not expected to affect protected species, as the trend is not expected to change as a result of the option.

9.4 Economic Impacts

9.4.1 Updates to Status Determination Criteria, Formal Rebuilding Programs, and Annual Catch Limits

9.4.1.1 Revised Status Determination Criteria for Pollock

Option 1: No Action

Economic impacts of status determination criteria are transmitted through the affect these changes have on setting OFLs, ABCs, and ultimately on ACLs. For an analysis of the economic impact of ACLs associated with this option, see Section 8.4.1.3.

9.4.1.2 Revised GB Yellowtail Flounder Rebuilding Mortality Targets

Option 1: No Action

The present value of total TAC revenue streams for the No Action rebuilding strategy is shown in Table 107. The present value of TAC revenue streams for the U.S. portion of this stock is shown in Table 108.

Option 2: Revised Rebuilding Target for GB Yellowtail Flounder

The economic impacts of the different rebuilding strategies were estimated by calculating the present value of the stream of potential revenues for each rebuilding strategy. Net benefits were not calculated since attribution of costs to a single stock in a multispecies fishery is not possible. Additionally a number of other simplifying assumptions were made. First, the yellowtail flounder ex-vessel price was held constant. Although prices do respond to changes in market supplies, ex-vessel price functions for groundfish tend to be relatively flat meaning that the average annual price change does not change all that much in response to changes in annual supplies. Second, discards were not deducted from the catch streams. Ignoring discards is recognized as resulting in an overestimate of realized revenue streams. However, since there is no basis for assuming discarding incentives would be different under any of the alternatives accounting for discarding would merely reduce the revenue streams by a scalar without having any affect on the ordinal ranking of alternatives. Last, US/Canada shares are not known more than one year ahead. To account for potential Canadian response to US rebuilding options the proposed TAC of at least 855 mt or 40% of the TAC, whichever was greater, was assumed to be attributed to Canada regardless of rebuilding alternative. This means that the US catch was set to zero for any TAC less than 855 mt and was the difference between the Canadian TAC and the total TAC. For purposes of comparison the potential value of the total TAC and the US portion of the TAC was calculated.

Discount rates of 3%, 5%, and 7% were used. Even though the No Action alternative would have no catch from 2011 to 2014 the increased catches from 2015 to 2020 were large enough that the present value of the No Action option exceeded that of Option C. Options A, B, and D yielded higher present value than No Action. Alternative D yielded the highest present value although the difference between rebuilding by 2016 instead of 2019 with the same probability of success was only $6.3 million over a 10 year time period. In terms of ordinal ranking, Option D had highest present value followed by Option A, Option B, No Action, and Option C. These rankings were the same for all discount rates and at the median, upper and lower quartiles as well as all other percentiles of the distribution of projected catch streams.

The ordinal ranking of the present value of revenue streams based on an estimate of the US catch alone was the same as that of the combined TAC. That is Option C produced the lowest present value of revenues regardless of discount rate or percentile of the catch distribution. Notably there was almost no difference in revenue potential between the No Action and Option B. Overall Option D produced highest net present value although the difference in median present value was only about $4 million.

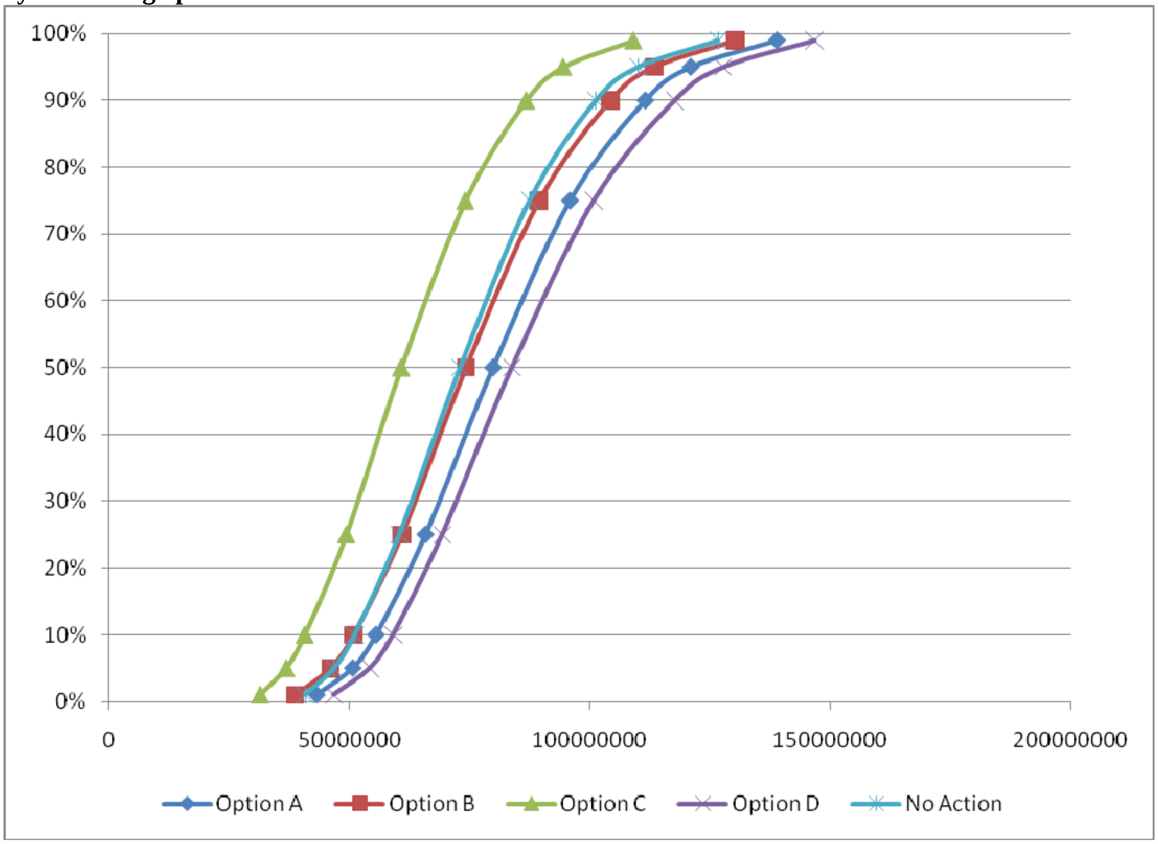
Table 131 – Present value of total TAC revenue streams for GB YT rebuilding options for 3%, 5%, and 7% discount rates

	3% Discount Rate		
Option	Lower Quartile	Median	Upper Quartile
No Action	100.9	122.0	146.1
Option A	111.0	133.7	160.2
Option B	105.1	126.2	150.7
Option C	92.8	110.9	131.6
Option D	115.9	140.0	168.3
	5% Discount Rate		
Option	Lower Quartile	Median	Upper Quartile
No Action	88.3	106.6	127.5
Option A	98.7	118.6	141.9
Option B	92.9	111.3	132.8
Option C	81.0	96.5	114.5
Option D	103.6	124.9	149.9
	7% Discount Rate		
Option	Lower Quartile	Median	Upper Quartile
No Action	77.5	93.5	111.7
Option A	88.2	105.8	126.3
Option B	82.6	98.7	117.6
Option C	71.0	84.5	100.0
Option D	93.1	112.0	134.3

Table 132 - Present value of TAC revenue streams for GB YT rebuilding options for 3%, 5%, and 7% discount rates for U.S. portion of TAC

3% Discount Rate			
	Lower Quartile	Median	Upper Quartile
No Action	60.3	73.0	87.4
Option A	65.8	79.9	95.9
Option B	60.8	74.2	89.4
Option C	49.3	60.7	74.1
Option D	69.3	83.8	100.8
5% Discount Rate			
	Lower Quartile	Median	Upper Quartile
No Action	52.7	63.7	76.3
Option A	58.4	70.8	84.9
Option B	53.6	65.3	78.6
Option C	42.6	52.4	64.0
Option D	61.9	74.7	89.7
7% Discount Rate			
	Lower Quartile	Median	Upper Quartile
No Action	46.3	55.9	66.8
Option A	52.1	63.1	75.6
Option B	47.4	57.7	69.5
Option C	36.9	45.5	55.5
Option D	55.6	67.0	80.3

Figure 57 – Cumulative probability distributions for present value of US gross revenues from GB YT by rebuilding option for a discount rate of 3%



9.4.1.3 Annual Catch Limit Specifications

Option 1: No Action

For stocks that may be improving more rapidly than anticipated or where the scientific understanding of status has changed due to a revised stock assessment, taking no action would result in forgone income provided the No Action ACL was market limited. Conversely, taking no action to change an ACL in a stock that is declining at an unanticipated rate or, if based on new information, a stock is found to be less productive than previously thought, revised stock failure to adjust an ACL may prolong rebuilding or may prevent rebuilding from occurring. In this instance current revenues may be higher, but lower longer term revenue streams may offset any short term gains.

The economic impact of taking no action and revised 2011 and 2012 ACLs was estimated in a manner similar to that done for Framework 44. Specifically, total potential revenue was assumed to be measured by the revenue associated with taking the entire ACL for all stocks. This would only be possible if there were no discarding and all stocks were taken with perfectly selective gear. An estimate of potential realized revenues was obtained by projecting the ACL utilization rate based catch rates as of October 16, 2010 forward for the rest of the fishing year then adjusting for discards.

The projected annual utilization rate was calculated by dividing the ACL use rate as of October 16 (NERO multispecies monitoring reports) by the number of elapsed weeks (25) in the fishing year (see Table 133). The weekly catch rate was then multiplied by 52 to obtain an estimate of ACL use rate for the entire fishing year. These calculations suggest that sectors would catch their cumulative allocation of GB yellowtail and witch flounder with a small overage and at least 75% of the sector sub-ACL for GOM cod, GOM haddock, and witch flounder. The FW44 economic analysis posited sector exemptions and changed economic incentives would enable sectors to obtain higher utilization rates than past experience. The last column in Table 133 shows the PDT estimated average underages and overages for TTACs set for the 2007-2008 fishing years. Comparing these estimates with the FY 2010 sector ACL use suggests that sectors may indeed be able to obtain higher use rates as the estimated FY 2010 use rates for GB cod, GOM cod, GOM haddock, plaice, witch flounder, and GB winter exceeded that of the 2007-2008 average. Note that there was no TTAC set for GOM winter during 2007-2008, and the adjusted FY 2010 for pollock ACL is substantially larger than the Pollock TTAC during FY 2007 and FY 2008. Whether this preliminary assessment finding, based on partial year data, will be borne out is uncertain. Furthermore, individual sector performance may differ substantially from this analysis based on aggregate data.

The projected ACL use rates suggest that the common pool will exceed its FY 2010 sub-ACL for GOM cod, GB YT, CC/GOM YT, witch flounder, and for white hake. Depending on actions taken by the RA to reduce these potential overages the estimated use rates for other stocks may be affected. This management uncertainty compounds the uncertainty already embedded in the procedures used to calculate a projected ACL use rate for the common pool.

Table 133 – Estimated sector and non-sector ACL utilization rates

Stock	Percent Sector Catch As of October 9	Sector Weekly Catch Rate	Projected FY10 Sector ACL Utilization	Percent Non-Sector Catch As of October 9	Non-Sector Weekly Catch Rate	Projected FY10 Non-Sector ACL Utilization	2007-2008 Average Utilization Rate
GB Cod	29%	0.01215	63.2%	8.6%	0.0036	18.6%	44%
GOM Cod	42%	0.01766	91.9%	89.1%	0.0371	193.1%	69%
GB Haddock	8%	0.00323	16.8%	27.9%	0.0116	60.5%	17%
GOM Haddock	13%	0.01766	91.9%	20.6%	0.0086	44.7%	51%
GB YT	46%	0.01934	100.6%	91.8%	0.0383	198.9%	117%
SNE/MA YT	5%	0.00205	10.7%	12%	0.0011	5.6%	174%
CC/GOM YT	16%	0.00680	35.4%	63.6%	0.0265	137.7%	55%
Plaice	23%	0.00973	50.6%	30.0%	0.0125	65.0%	28%
Witch Flounder	34%	0.01398	72.7%	116.0%	0.0483	251.2%	24%
GB Winter Flounder	49%	0.02037	105.9%	30.2%	0.0126	65.4%	48%
GOM Winter Flounder	28%	0.01147	59.7%	85.5%	0.0356	185.2%	NA
Redfish	14%	0.00567	29.5%	6.5%	0.0027	14.1%	46%
White Hake	27%	0.01118	58.2%	78.5%	0.0327	170.0%	114%
Pollock	11%	0.00467	24.3%	23.1%	0.0096	50.0%	82%

Estimated discard rates for sectors and the common pool were calculated based on cumulative catch reports as of October 9 (see Table 134). As was the case for the calculated ACL use rates, the calculated discard rates are also based on partial year data and may not reflect discarding over the entirety of the 2010 fishing year. Note that the estimated discard rates are based on aggregated data so they are unlikely to reflect sector-specific discard rates and should not be used make any inferences about the performance of any given sector.

Table 134 – Estimated sector and non-sector discard rates for FY 2010

Stock	Sector Catch (Oct 9)	Sector Landings (Oct 9)	Sector Discard Rate	Non-Sector Catch (Oct 9)	Non-Sector Landings (Oct 9)	Non-Sector Discard Rate
GB Cod	1147	910	0.26	12	11	0.10
GOM Cod	1844	1335	0.38	214	181	0.18
GB Haddock	4067	3107	0.31	92	91	0.01
GOM Haddock	107	79	0.36	6	5	0.12
GB YT	392	296	0.33	18	8	1.30
SNE/MA YT	14	8	0.75	2	1	0.70
CC/GOM YT	107	56	0.90	32	13	1.47
Plaice	715	356	1.01	30	20	0.50
Witch Flounder	276	172	0.61	29	25	0.17
GB Winter Flounder	970	692	0.40	9	6	0.45
GOM Winter Flounder	22	18	0.22	21	18	0.19
Redfish	1000	617	0.62	6	4	0.48
White Hake	704	473	0.49	40	29	0.38
Pollock	1885	1141	0.65	87	46	0.88

Using average prices by stock as of September 30, and assuming full utilization of the No Action commercial sub-ACL the potential value of the FY 2011 ACLs would be $191.3 million and the potential FY 2012 ACLs would be $184.6 million (see Table 109). These estimates are lower than that estimated for the same ACLs in the FW 44 document ($205 and $196 million respectively) because of changes in prices. In particular, as of September 1, the average haddock price was $1.00 per pound whereas the haddock price used in the FW 44 analysis was $1.25. Since GB haddock accounts for nearly half of the total ACL value under No Action, a change in prices received for this species alone would have a substantial affect on estimated potential revenues.

Estimated revenues from full utilization of the commercial sub-ACL including the sub-ACL allocated to state waters and to the combined sector and common pool during FY 2011 ranged from a low of $185.4 million to a high of $187.8 million. Note that the GB YT U.S. ACL would both be set to zero for the No Action and the Option C rebuilding alternatives. Based on existing sector implementation regulations, sectors would not be able to operate within the GB YT stock area since they would not receive any GB YT ACE. This means that the potential revenues associated with either the No Action or Option C would be significantly lower since revenues from any other groundfish stock that coincides with the GB YT stock area would also be zero. Accounting for both discarding and the estimated ACL utilization rate the potential revenues under the No Action alternative would be $80.2 million during FY 2011 and $81.9 million during FY 2012. Estimated sector revenues would be $71.1 million during FY 2011 and $73.0 million during FY 2012. Common pool revenues would be $4.4 million during FY2011 and $4.3 million during FY 2012. Note that the difference between the combined sector and common pool estimated revenues is attributable to the potential revenues from commercial fishing in state waters.

9.4.1.4 U.S./Canada Resource Sharing Understanding TACs

Option 1: No Action

The No Action Alternative, under which specification of U.S./Canada TACs would not occur, would result in greater revenue in FY 2011 than under the proposed alternative. The catch of haddock and cod would not be limited in the Eastern U.S./Canada Area, so that there would be greater opportunity to catch available fish. Because there would still be Annual Catch Limits for GB cod and haddock (stock-wide ACLs), the amount of catch from the Eastern U.S./Canada Area would still be limited. There would be greater overall revenue in FY 2011 as a result of the increased access to other stocks in the Eastern U.S./Canada Area, under the No Action Alternative. The No Action Alternative would essentially represent a management strategy that does not address the transboundary aspect of cod, haddock, and yellowtail flounder, and the likely resulting level of fishing mortality on the transboundary stocks would be higher, and may be unsustainable. The long term economic impacts of the No Action Alternative are more likely to be negative than the proposed Alternative, due to the increase biological risk associated with the No Action Alternative. Stock rebuilding and the associated revenue that is likely to result from an increasing stock size could be jeopardized by the No Action Alternative.

In contrast with the No Action Alternative, the Preferred Alternative would have short term negative economic impacts, due to the fact that the harvest of the shared stocks would be constrained by the TACs.

9.4.1.5 Yellowtail Flounder Allocations for the Scallop Fishery

Option 2: Revised Allocations

The amount of GB and SNE/MA yellowtail flounder allocated to the scallop fishery in Option 2 is based on 90 percent of the estimated yellowtail flounder catch by the fishery. This is the same percentage as was used to determine the FW 44 allocations for FW 2011 and 2012, but because of revised estimates of the expected catch the ACL for both stocks is lower in this option than what was adopted by FW 44. The allocation of yellowtail flounder between the scallop and groundfish fisheries may affect the fishing opportunities of the respective fleets. Determining the exact impact of the allocations is difficult because of the different management measures between the two fisheries. In particular, the AMs that apply to the fisheries shape the extent of the impacts. Section 8.4.1.5 described the analytic approach used to evaluate the impacts; only the results are provided here. Since the Council selected a management program for the scallop fishery before specifying yellowtail flounder allocations, only the results for the selected scallop management program are shown here and compared to the Proposed Action.

As discussed in section 8.4.1.5, while the vessels that receive revenue for the yellowtail flounder change based on how much is allocated to each fishery, changes in net benefits to the nation are due only to the different costs and prices between the fisheries and the extent to which scallop fishermen do not land the yellowtail flounder they are allocated (either because of illegal discards or because catches are reduced below the estimate). The value of yellowtail flounder represents a revenue shift between the two fisheries.

Table 135 – Revenue shift associated with allocation of GB yellowtail flounder to scallop fishery under Option 2, FY 2011 - 2012

Alternative	Year	Sub-ACL (mt)	lb	Revenue
Proposed/No Action	2011	153.0	337,304	$451,987
Proposed/No Action	2012	298.4	657,853	$881,523

Price per pound for yellowtail = $ 1.34 (GB; FY 2010)

Table 136 – Revenue shift associated with allocation of SNE/MA yellowtail flounder to scallop fishery under Option 2, FY 2011 - 2012

Alternative	Year	Sub-ACL (mt)	lb	Revenue
Proposed/No Action	2011	48.2	106,262	$142,391
Proposed/No Action	2012	70.1	154,542	$207,087

Price per pound for yellowtail = $ 1.34 (GB; FY 2010)

As mentioned in section 8.4.1.5, a possible impact from allocating yellowtail flounder to the scallop fishery is that it may limit opportunities for groundfish fishermen to target other stocks. In the extreme, the groundfish fishery might lose all the revenue that would be caught with the yellowtail flounder. This likely overstates the actual secondary impacts as not all of the species are caught on the same tows and fishermen may be able to adjust their behavior in the same stock area to mitigate the loss of yellowtail flounder. As discussed in section 8.4.1.4, the ratio of yellowtail flounder revenues to total groundfish revenues on GB is about 19:1; in the SNE/MA area it is only 7.5:1. Using these factors, the revenue at risk on GB is $8.6 million in 2011 and $16.7 million in 2012. For the SNE/MA stock area, it is $1.1 million in 2011 and $1.2 million in 2012 (Table 137 and Table 138). Discounted to 2011, the combined total is $27 million ($26.4 million) at a discount rate of 3% (7%).

Table 137 – Secondary revenue at risk for the groundfish fishery associated with allocation of GB yellowtail flounder to scallop fishery under Proposed/No Action alternative, FY 2011 - 2013

Alternative	Year	Sub-ACL (mt)	lb	Revenue
Proposed/No Action	2011	153.0	337,304	$8,587,753
Proposed/No Action	2012	298.4	657,853	$16,748,937

Price per pound for yellowtail = $ 1.34 (GB; FY 2010)

Table 138 – Secondary revenue at risk for the groundfish fishery associated with allocation of SNE/MA yellowtail flounder to scallop fishery under Proposed/No Action alternative, FY 2011 - 2013

Alternative	Year	Sub-ACL (mt)	lb	Revenue
Proposed/No Action	2011	48.2	106,262	$1,067,933
Proposed/No Action	2012	70.1	154,542	$1,159,065

Price per pound for yellowtail = $ 1.34 (GB; FY 2010); used as proxy due to insufficient data for a stock specific value

Table 139 – Summary of groundfish revenues at risk under the Option 2; discounted to 2011

Proposed Action	**Total Revenues at Risk - Undiscounted**	**Discounted at 3%**	**Discounted at 7%**
2011	$9,655,686	$9,655,686	$9,655,686
2012	$17,908,002	$17,386,410	$16,736,450
Total	$27,563,688	$27,042,096	$26,392,136

The economic effects of this allocation are also felt by the scallop fishery because scallop fishing activity can be constrained if the yellowtail flounder ACL is exceeded and an AM is triggered. As was done for the Proposed Action, one way to evaluate the effects is to consider the same percentage of scallop revenues at risk rather than as a loss. The effects will be felt one year after the overage.

Under Option 2 the scallop fishery would be allocated 90 percent of the GB and SNE/MA yellowtail flounder than the median estimated catch in 2011 and 2012. As a result, there is a possibility that the scallop fishery AM will be triggered. The AM is designed to reduce future yellowtail flounder catches by the same percentage as the overage. Since the yellowtail flounder sub-ACLs are is 90 percent of the amount of yellowtail flounder the scallop fishery is expected to catch in 2011 and 2012, ten percent of the revenues from these stock areas are at risk in 2012 and 2013 with this option (because the AM is implemented the year after an overage). This totals $66,936,239. The present value of this revenue is $64,021,277 ($60,469,983) in 2011 at a discount rate of 3% (7%).

Whne compared to the Proposed Action, which is also the No Action alternative, the revenues at risk in this option are over $50 million higher (see Table 120).

Table 140 – Scallop fishery revenues at risk, Option 2; discounted to 2011

Year	Landings at risk (GB area)	Landings at risk (SNE area)	Total landings at risk	Revenues at risk (2010 prices)	Revenues at risk – Discounted (3%)	Revenues at risk – Discounted (3%)
2012	1,135,369	3,249,360	4,384,729	32,797,772	$31,842,498	$30,652,123.80
2013	869,494	3,762,591	4,632,085	34,138,467	$32,178,779	$29,817,859.11
Total	2,004,863	7,011,951	9,016,814	66,936,239	64,021,277	$60,469,983

9.4.2 Fishery Program Administration

9.4.2.1 Implementation of Additional Sectors

<u>Option 1 – No Action</u>

Taking no action would not authorize any of the proposed state permit banks from operating during FY 2011. The proposed SHS III sector would also be unable to operate during FY 2011. However, at least for the SHS III sector, taking no action may have a small adverse economic impact since vessels owners would still be able to remain in, or join, the existing SHS that has already been authorized. The SHS operations plan and Amendment 16 provide for inter-sector trading of ACE so the potential members of SHS III would not be precluded from being able to lease their ACE to other sectors. Depending on how sector costs for monitoring and the sector manager are levied among sector members, having a lease-only sector may result in costs savings to lease-only members since there would be no monitoring or reporting requirements other than what is required to register trades. Taking No Action on the lease-only sectors would therefore have a slight negative economic impact

Option 2 – Implement New Sectors for FY 2011

This option could have authorized two additional sectors for the FY 2011: the Northeast Fisheries Sector XIV, and the Sustainable Harvest Sector II. Having implemented these two sectors may have had a small positive economic impact since vessels owners would have more options for which sectors to join. However, vessels are able to remain in, or join, the existing SHS and NEFS sectors that have already been authorized. The SHS and NEFS operations plans and Amendment 16 provide for inter-sector trading of ACE so the potential members of SHS II and NEFS XIV would not be precluded from being able to lease their ACE to other sectors.

9.4.2.2 Monitoring Requirements for Handgear A and Handgear B Permitted Vessels and Small Vessel Exemption Vessels

Option 1 – No Action

As analyzed in Section 8.4.2.2, taking No Action on this measure would have continued the dockside monitoring program for these vessels at a cost of $9,841. However, in conjunction with the following measure that removes the industry requirement to fund dockside monitoring, it is unclear what the cost would be to NMFS in FY 2011 and FY 2012 since it has not yet been determined what the coverage levels will be.

9.4.2.3 Monitoring Requirements for Commercial Groundfish Fishing Vessels

Option 1: No Action

Taking no action would leave the requirements for dockside monitoring unchanged. That is, the requirement for 20% of dockside monitoring (reduced from 50% during FY 2010) during FY 2011 would be retained. For a description of the costs associated with this monitoring requirement, see Section 8.4.2.3

9.4.2.4 Distribution of PSC from Canceled Permits

Option 1: No Action

Assuming equivalent PSC utilization rates and cost of fishing the economic value derived from available ACL would be unchanged whether the PSC from cancelled permits is allocated to the common pool under this option or equally distributed to all permits (Option 2). However, PSC utilization rates in terms of landings and the cost of fishing varies. An economically optimal allocation would allocate PSC from cancelled permits to the most profitable vessels whether they are in the common pool or in a sector. Neither this option nor Option 2 contemplates making allocations of cancelled PSC in this manner. However, if, on average, vessels that fish in the common pool are less profitable than sector vessels, then Option 2 would result in an improvement in economic efficiency as compared to this option.

9.4.2.5 Submission of Sector Rosters

Option 1: No Action

Taking no action would leave the requirement to submit sector rosters on September 1 unchanged. This option is unlikely to have any meaningful economic impact but may decrease the flexibility in time with which potential sector members can weigh their options.

9.4.3 Commercial and Recreational Fishery Measures

9.4.3.1 General Category Scallop Dredge Exemption – Modification of Restrictions

Option 1: No Action

This option would constrain the economic value of landed scallops and may result in reduced IFQ scallop share values in comparison to Option 2, which allows generally category vessels an exemption to fish in the Great South Channel. However, if fishing with a scallop dredge is found to interfere with yellowtail flounder spawning then this option may allow for higher overall landings due to greater spawning potential. Note that this does not necessarily mean that the No Action alternative should be adopted since the efficiency gains from the general category scallop dredge exemption may outweigh the losses associated with lower yellowtail spawning.

9.4.3.2 Gulf of Maine Cod Spawning Protection Area

Option 1: No Action

Taking no action would leave the recreational measures that were implemented under Amendment 16 and FW44 unchanged. Based on party/charter logbook data, during FY 2007 to FY 2009 the total number of recreational party/charter trips taken in the GOM declined from 6,537 trips during FY 2007 to 4,704 trips during FY 2009 (Table 122). Likewise, the number of passengers has been declining in direct proportion as the number of trips as the average number of passengers per trip has held steady at an average of 18 paying customers. Nevertheless, assuming an average of approximately $60 per person (Gentner and Steinback) gross receipts to party charter operators offering trips to the Gulf of Maine have declined by almost $2 million from just over $7 million during FY 2007 to $5.1 million during FY 2009. Whether this reduction is due, in part, to recessionary pressures or to a change in the demand for recreational party/charter trips is uncertain. Nevertheless, taking no action would not exacerbate what appears to be a distinct downward trend in the Gulf of Maine party/charter sector.

9.4.3.3 Handgear Permit Management Measures

Option 1: No Action

Taking No Action on the rolling closures would leave economic opportunities available to handgear permit holders unchanged, and would not improve economic opportunity compared to the Proposed Action.

Taking no action for Handgear A or Handgear B to link cod trip limits to the specific stock areas would leave existing economic opportunities unchanged. The majority of handgear fishing takes place in the GOM and taking no action would provide no incentive or reason to switch from the GOM to GB.

Option 2: Rolling Closure Exemption for Handgear A Vessels

This option would provide largely the same economic benefits as the Proposed Action on handgear permit access to the sector rolling closures. However, it would provide an even greater benefit to the Handgear A vessels relative to other common pool vessels since it allows access to even more closed areas than does the Proposed Action.

9.5 Social Impacts

The social impacts of alternatives to the Proposed Action are evaluated using the same criteria described in Section 8.5.

9.5.1 Updates to Status Determination Criteria, Formal Rebuilding Programs, and Annual Catch Limits

9.5.1.1 Revised Status Determination Criteria

Option 1: No Action

Under the No Action alternative, the status of pollock would remain as adopted in Framework 44 and major social impacts would not be expected to occur when compared to that action. The status of pollock would be considered as described in Amendment 16. It should be noted that the adoption of the No Action alternative would entail the failure to incorporate best available science in the setting of status determination criteria, and would not be consistent with the M-S Act. This could affect *formation of attitudes* by creating the appearance that management measures were out of date and inflexible.

9.5.1.2 Revised GB Yellowtail Flounder Rebuilding Mortality Targets

Option 1: No Action

This option would rebuild this stock more quickly than the other options under consideration by targeting rebuilding by 2014 with a 75 percent probability of success. The 2010 assessment of this stock (TRAC 2010) indicated that a fishing mortality of F=0 would need to be adopted to achieve this goal (although the assessment noted that goal could not be achieved even under this fishing mortality). A fishing mortality of F=0 would mean all fishing would cease.

This measure would clearly result in major social impacts to all people associated with the fishery, as well as to the general public. All industry members who fish on this stock would be adversely affected, as would fish dealers and processors and many other people. Unemployment would likely increase as a result of the decline in fishing activity. Unemployment creates huge problems for communities both on an economic and personal level. The shut-down of the fishery would also delegitimize the management process and lead to much public anger, especially when there are other options considered that would not have this effect.

Option 2 – Revised Rebuilding Target for GB Yellowtail Flounder

Four alternative rebuilding strategies were being considered for this measure, all of which targeted a rebuilding at a slower pace than under the No Action alternative. The three options under consideration that were not selected are as follows:

Sub-Option B: Use a fishing mortality target that is calculated to rebuild the stock by 2016 with a 60 percent probability of success
Sub-Option C: Use a fishing mortality target that is calculated to rebuild the stock by 2016 with a 75 percent probability of success
Sub-Option D: Use a fishing mortality target that is calculated to rebuild the stock by 2019 with a 60 percent probability of success

Any of these options would have positive social impacts compared to the No Action alternative. They would all result in increased effort and landing of this stock when compared to the No Action alternative, which would provide for some increased occupational opportunities, although the exact amount of the effort increase is difficult to predict in a mixed-stock fishery. An increase in available GB yellowtail flounder could enable sectors and the common pool to operate longer before reaching their ACE and ACL, which would help create a more stable market and facilitate long-range planning for industry participants. Adoption of these options will also instill a sense of fairness that the rebuilding plans were re-considered in a way that promoted economic growth and incorporated best available science to not be unreasonable restrictive. Each option will have the same effect; the magnitude of that effect will be determined by how much the chosen strategy increases available catch over the applicable time frame.

9.5.1.3 Annual Catch Limit Specifications

Option 1: No Action

This No Action option does not modify the OFLs/ABCs/ACLs for GB cod, GB haddock, GB yellowtail flounder, white hake, and pollock that were adopted by FW 44 (NEFMC 2010). All of the elements of the ACLs would remain the same, such as the allocations of GB and SNE/MA yellowtail flounder to the scallop fishery that were adopted in that same action.

The No Action alternative for specifications, if adopted, would entail the failure by the Council to adopt ACLs for the fishery that would correspond to management measures adopted in this action, as well as a lack of TACs for the U.S./Canada area. A description of the social impacts of using ACLs in the management of the groundfish fishery can be found in Amendment 16. As with the other measures related to status determination criteria and setting of catch levels, the failure to incorporate the best available science and use the most up-to-date method of setting ACLs is likely to have the biggest social impact in the area of *formation of attitudes*. Participants in the fishery will likely view the management process as having less legitimacy if the ACLs do not match the management measures.

9.5.1.4 U.S./Canada Resource Sharing Understanding TACs

Option 1: No Action

This option would not implement the recommendations of the TMGC and there would be no resultant TAC for GB cod, haddock, or yellowtail flounder in the U.S./Canada area for FY 2011. This would be expected to have negative long-term social impacts, as it would be more difficult to meet rebuilding targets without a localized TAC. A slower rebuilding timeframe would lead to fewer *occupational opportunities* due to smaller stock size over the long term. Additionally, the failure of the U.S. to uphold their agreement with Canada could lead to poor *formation of attitudes* on a high level and could negatively impact future negotiations if the Canadians do not believe that agreements will be upheld.

9.5.1.5 Yellowtail Flounder Allocations for the Scallop Fishery

Option 2: Revised Allocations

An estimate of the yellowtail flounder that will be caught by the scallop fishery in FY 2011 – FY 2013 if it harvests its projected yield was developed for four scallop management scenarios. In FW 44, the Council based the FY 2011 and 2012 yellowtail flounder allocation to the scallop fishery on 90 percent of this expected catch. The estimates were updated for this action and Scallop Fraemwork 22 and the expected catc his lower than before.

This option, similar to the No Action alternative, is difficult to analyze. The 90% allocation to the scallop fleet would be less than in previous years. It is also difficult to determine whether these allocations could constrain either scallop or groundfish catch. In general, if catches are constrained in one fishery, that fishery will experience negative social impacts including changes in behaviors and possible increases in discarding. If it is perceived that the catches are constrained in one fishery while disproportionally benefitting the other, it may lead to social tension between the two fisheries. There has been little evidence to date that this tension is present, though when compared to No Action, this option is more likely to create tension within the scallop fishing industry since it is more likely AM would be triggered.

9.5.2 Fishery Program Administration

9.5.2.1 Implementation of Additional Sectors

Option 1: No Action

If the No Action alternative is selected, there will be no additional sectors approved for operation in FY 2011. This is most likely to cause *disruptions in daily living*, as fishery participants that wanted to join the proposed sectors will not be able to join the sectors they prefer and will be forced to choose between joining the existing sectors and fishing in the common pool.

Additionally, *formation of attitudes* could be affected if sector applicants feel that their proposals were unfairly denied when several new sectors were approved in Amendment 16 for the last fishing year.

Option 2: Implement New Sectors for FY 2011

This measure is largely administrative in nature and is not, in itself, likely to have major impacts on any of the social factors when compared to the No Action alternative. The new sectors, as proposed in this option, may create *changes in occupational opportunities and community infrastructure*, because each sector may have jobs associated with it and provide more geographical options for participants in the fishery. Also, an increase in options for sector membership may mitigate *disruptions in daily living* if participants can find sectors that are more geographically or socially suitable to their interests. The Amendment 16 analysis of social impacts concluded that increased sector membership would reduce regulatory discarding, so the creation of new sectors in this option will also have that effect if it encourages a larger percent of fishermen to join sectors or shifts effort into those sectors.

9.5.2.2 Monitoring Requirements for Handgear A and Handgear B Permitted Vessels and Small Vessel Exemption Vessels

Option 1 – No Action

Under the No Action alternative, vessels with Handgear A, Handgear B, and Small Vessel Exemption permits would be subject to the same requirements for dockside monitoring as other common pool vessels. Measures adopted in Amendment 16 require that all common pool vessels would be subject to dockside monitoring beginning in FY 2012, when the hard TAC AM is implemented for common pool vessels. The current required level of coverage is for 20 percent of trips to be monitored.

This option would have some effect on the handgear and small vessel exemption fleets. These fleets land small amounts of groundfish, and in comparison to revenues the cost of dockside monitoring is high. Payment for dockside monitoring could lead to decreased profitability for these fleets and could potentially impact fishing operations and change occupational opportunities as operators cut other costs in order to pay for monitoring. However, the revenues from this portion of the fleet have not decreased more substantially than those associated with other permit types, so it is difficult to predict whether this option would actually change behavior in a different way than the suite of management measures as a whole.

9.5.2.3 Monitoring Requirements for Commercial Groundfish Fishing Vessels

Option 1: No Action

Under the No Action option, the monitoring requirements adopted by Amendment 16 for commercial groundfish fishing vessels would continue. This includes both at-sea monitoring at a level sufficient to meet requirements and dockside monitoring of 20 percent of trips. At-sea monitoring must, at a minimum, meet the CV standard of the SBRM and the level of required coverage will be specified by NMFS. The at-sea and dockside monitoring costs are currently being provided by NMFS at the required level, although the industry is expected to begin paying for the services in FY 2012. The costs associated with this option will lead to negative social impacts, although the relatively high level of monitoring itself is expected to have positive impacts.

As with any measure that increases the operating costs of the fishery without guaranteeing a matching increase in revenue, this option may cause disruptions in daily living or changes in occupational opportunities if fishing practices need to be altered to make up for lost revenue. However, the use of the higher level of monitoring is expected to lead to the positive social impacts of reducing regulatory discarding and developing more accurate data which will inform management and ensure fairness in regulations.

9.5.2.4 Distribution of PSC from Canceled Permits

Option 1: No Action

Under the No Action alternative, when a limited access permit that is eligible for a sector is canceled, the PSC associated with that permit is assigned to the common pool. The most obvious social impact of this practice is that it appears to unfairly benefit participants in the common pool fishery, as their PSC will effectively have a higher value when converted to catch as the PSC associated with sector operators will. If there is any impact, it will be that people have a negative attitude about the fairness of the process.

9.5.2.5 Submission of Sector Rosters

Option 1: No Action

Under this option, there would be no changes to current requirements, adopted in Amendment 16, that sectors must submit final sector rosters to NMFS by September 1 for the next fishing year.

The September 1st submission date has the potential to make long-term planning difficult and therefore impact occupational opportunities and daily living for would-be sector participants. Fishermen would need to decide eight months prior to the start of the fishing year in which sector, if any, they would like to participate. It may not be possible for fishermen or sector managers to be able to formulate a profitable business plan that far in advance. Because of this uncertainty, NMFS has changed the deadline for sector roster submission for FYs 2010 and 2011. The changing date could lead those considering sector membership to not know for sure when the deadline will be and makes planning and decision making difficult.

9.5.3 Commercial and Recreational Fishery Measures

9.5.3.1 General Category Scallop Dredge Exemption – Modification of Restrictions

Option 1: No Action

The No Action option maintains two seasonal closures in the Great South Channel Scallop Exemption Area that are designed to protect spawning yellowtail flounder. These closures were adopted when the exemption was implemented in August, 2006. The EA supporting the action (NMFS 2006) justifies the closures as necessary to protect rebuilding stocks of yellowtail flounder but provides no analysis or rationale for creating the closures for the General Category Scallop Fishery when groundfish fishing is allowed in the area at the same time, and limited access scallop vessels are not subject to the same restrictions. The EA does not provide evidence describing the specific impacts of scallop dredge fishing on yellowtail flounder spawning activity.

This option, although it is merely a continuation of the current regulations, is likely to lead to negative attitudes toward the equitability of the management process. Because groundfish and limited access scallop vessels are not subject to the seasonal closures, it has the appearance of singling out one segment of the fishery for burdensome restrictions. Now that the General Category fishery is operating under ITQs, there is a hard cap on catch and it is no longer possible that there will be an unlimited number of trips in the area during yellowtail spawning. This leaves very little justification for these closures that will dispel the unfair image.

9.5.3.2 Gulf of Maine Cod Spawning Protection Area

Option 1: No Action

The No Action alternative maintains current management measures in the inshore GOM for commercial and recreational vessels. The commercial management measures differ for vessels in the common pool and vessels in sectors. Vessels in the common pool are not allowed to fish in the inshore area during April, May, and June because of the existing rolling closures. Vessels in sectors are allowed to fish in the rolling closures during June and can request other exemptions from the rolling closures (none have been granted to date). With respect to the recreational fishery, the measures in place include a minimum fish size, bag limit, and seasonal prohibition on possession of GOM cod (November 1 – April 15). These measures are designed primarily to control fishing mortality of this stock and while they may provide some protection to spawning fish the measures were not specifically designed for that purpose.

The No Action alternative is not expected to have significant social impacts. The regulations have been in place for several years and are largely accepted by the fishing community to be effective in meeting mortality targets. The area is popular for recreational fishing during the spring months, and the rolling closures work to protect some of the spawning population from disruptive commercial gear. There is a chance that the No Action alternative could impact attitudes of fishermen toward the regulation process. There may be a low level of tension between the recreational and commercial components of the fishery when it is perceived that one group has opportunities that are not allowed to the other. Permitting recreational fishing in the area during the rolling closures for commercial gear could marginally heighten that tension.

9.5.3.3 Handgear A Cod Trip Limits

Option 1: No Action

The No Action regulations for Handgear A permits mandate a 300 lb. trip limit for these permits. The trip limit adjusts (higher or lower) proportional to the trip limit for common pool DAS vessels. This includes any in-season adjustment to the GOM cod trip limits implemented by the Regional Administrator. In-season adjustments are based on whether catches need to be slowed or increased to achieve the common-pool ACL for GOM cod. Under the No Action alternative, Handgear A vessels would also be subject to all the rolling closures that affect common pool vessels.

Trip limits are most likely to affect *regulatory discarding* and *formation of attitudes*. In general, trip limits can affect the structure of a fishery. If the trip limit is set very low, the inshore sector of the fleet can sometimes manage to fish economically, while the offshore sector of the fleet cannot cover trip expenses to direct fishing effort on the species managed by the trip limit. Since Handgear A vessels tend to fish inshore, this means they can sometimes profit in the presence of trip limits, but still feel constraints. Social impacts have resulted because the trip limits themselves hold a socially-undesirable characteristic – *regulatory discarding*. In the Handgear A fishery, cod are generally the target species so discards of the stock should not be as large when fishing with certain other gear types.

Option 2: Rolling Closure Exemption for Handgear A Vessels

Under this option, Handgear A vessels will be exempt from all GOM rolling closures implemented by Amendment 13. Access to future closed areas (such as the GOM cod spawning protection area in Section 4.3.2) will be determined when the measure is adopted.

The impacts of this option, in comparison to the No Action option, can be seen as related to the impacts of the Gulf of Maine spawning closure option. Allowing Handgear A vessels to fish in the rolling closure areas could produce positive social effects for participants, in that they will have access to more fishing grounds near their homeports and have increased occupational opportunities there during the months of the exemption. However, allowing only this portion of the fleet into the area could create perceptions of inequity among the common pool as a whole.

Compared to the No Action alternative, this could increase perceptions of inequity in some communities. This often exacerbates conflicts between segments of the industry, which create social impacts in the form of intracommunity conflicts and loss of community cohesion. These perceptions are tempered by the fact that Handgear A vessels are already subject to unique management measures under the No Action option, so these impacts are not expected to be major. Handgear A vessels also have the option to join sectors, and the extent of the impacts of proposed trip limits will depend upon whether permits ultimately fish in sectors.

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10.0 Applicable Law

10.1 Magnuson-Stevens Fishery Conservation and Management Act

10.1.1 Consistency with National Standards

Section 301 of the Magnuson-Stevens Act requires that regulations implementing any fishery management plan or amendment be consistent with the ten national standards listed below.

Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry.
Amendment 16 to the Northeast Multispecies FMP adopted measures designed to end overfishing on the groundfish stocks that were subject to excessive fishing pressure at the time of its development. This action adjusts those measures in a way that is designed to maximize optimum yield while preventing overfishing and continuing rebuilding plans. For overfished fisheries, the Magnuson-Stevens Act defines optimum yield as the amount of fish which provides for rebuilding to a level consistent with producing the maximum sustainable yield from the fishery. The measures are designed to achieve the fishing mortality rates, and yields, necessary to rebuild the overfished stocks as well as to keep fishing mortality below overfishing levels for stocks that are not in a rebuilding program. The measures in Section 4.1 that adopt status determination criteria and ACLs set controls on catch to ensure that the appropriate fishing mortality rates are implemented. Changes to fishery program administration in Section 4.2 and commercial and recreational fishery measures in Section 4.3 implement and adjust programs to achieve the desired mortality levels.

Conservation and management measures shall be based on the best scientific information available.
The proposed action is based on the most recent estimates of stock status available for each of twenty stocks included in the management unit. These estimates are in the form of information provided by the Northeast Fisheries Science Center in the GARM III proceedings. In the case of Atlantic wolffish, stock status was estimated by the NEFSC in the proceedings of the Data Poor Working Group (DPWG). The more recent (2010) TRAC proceedings and SARC 50 for pollock were also used to update stock status. For all stocks under the GARM III, stock size and fishing mortality in calendar year 2007 was estimated based on catch, trawl survey, observer, and other data through 2007. Management targets for this action are also based on the results of the GARM III and the DPWG, which contain a comprehensive review of fishing mortality thresholds and biomass targets for the groundfish complex. Additionally, the proposed mortality limits were determined based on the scientific advice of the SSC, which recommends ABCs to the Council.

With respect to bycatch information, the action uses bycatch information from the most recent assessments. Bycatch data from observer reports, vessel logbooks, or other sources must be rigorously reviewed before conclusions can be drawn on the extent and amount of bycatch. While additional observer data has been collected since the most recent assessments were completed, it has not been analyzed or reviewed through the stock assessment process and thus cannot be used.

The economic analyses in this document are based primarily on landings, revenue, and effort information collected through the NMFS data collection systems used for this fishery.

To the extent practicable, an individual stock of fish shall be managed as a unit throughout its range, and interrelated stocks of fish shall be managed as a unit or in close coordination.
The proposed action manages each individual groundfish stock as a unit throughout its range. Management measures specifically designed for one stock, including ACLs and trip limits, are applied to the entire range of the stock. In addition, the groundfish complex as a whole is managed in close coordination. Management measures are designed and evaluated for their impact on the fishery as a whole.

Conservation and management measures shall not discriminate between residents of different states. If it becomes necessary to allocate or assign fishing privileges among various United States fishermen, such allocation shall be (A) fair and equitable to all such fishermen; (B) reasonably calculated to promote conservation; and (C) carried out in such a manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges.
The proposed management measures do not discriminate between residents of different states. They are applied equally to all permit holders, regardless of homeport or location. While the measures do not discriminate between permit holders, they do have different impacts on different participants. This is because of the differences in the distribution of fish and the varying stock levels in the complex. For example, the measures designed to protect spawning GOM cod in the Whaleback area have more impacts on fishermen who fish in that area and target that stock. Some of these impacts may be localized, as often communities near the stock may have developed small boat fisheries that target it. These distributive impacts are difficult to avoid given the requirement to rebuild overfished stocks. Even if the measures are designed to treat all permit holders the same, the fact that fish stocks are not distributed evenly, and that individual vessels may target specific stocks, means that distributive impacts cannot be avoided.

This action also authorizes four sectors that are described as state operated permit banks. The action does not impose requirements on how these sectors will operate. As with all sectors, the organizers have considerable flexibility to design their sector organization and operating rules.

Conservation and management measures shall, where practicable, consider efficiency in the utilization of fishery resources; except that no such measure shall have economic allocation as its sole purpose.
The Gulf of Maine cod spawning protection area in Section 4.3.2 could reduce the efficiency of fishing vessels. These measures are considered practicable since they allow management measures to be selective in protecting spawning cod and ultimately enhancing stock health. By carefully designing the area to protect spawning cod, there may be less of a need for overall reductions in fishing effort which allows the harvest of healthier stocks such as GB haddock. Many of the other measures adopted in this action increase efficiency, including the general category scallop dredge exemption in Section 4.3.1and the handgear management measures in Section 4.3.3. None of the measures in this action have economic allocation as their sole purpose – all are designed to contribute to the control of fishing mortality.

Conservation and management measures shall take into account and allow for variations among, and contingencies in, fisheries, fishery resources, and catches.

The primary effort controls used in this management plan – effort controls and sectors - allow each vessel operator to fish when and how it best suits his or her business. Vessels can make short or long trips, and can fish in any open area at any time of the year. The measures allow for the use of different gear, vessel size, and fishing practices. The specific measures adopted in this action do not reduce this flexibility.

Conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication.
While some of the measures used in the management plan, and proposed by this action, tend to increase costs, those measures are necessary for achieving the plan's objectives. As an example, measures that reduce the efficiency of fishing vessels, including the Gulf of Maine cod spawning protection area, tend to increase the costs of fishing vessels since for a given amount of time fishing catches are reduced. This measure accomplishes other goals, however, by protecting spawning cod aggregations and fostering a healthy stock. The measures do not duplicate other regulatory efforts. Other measures, including the removal of the requirement for industry to fund at-sea monitoring, have cost-minimization as their main purpose. Management of multispecies in federal waters is not subject to coordinated regulation by any other management body. Absent Council action, a coordinated rebuilding effort to restore the health of the overfished stocks would not occur.

The Council considered the costs and benefits of a range of alternatives to achieve the goals and objectives of this FMP. It considered the costs to the industry of taking no action relative to adopting the measures herein. The expected benefits are greater in the long-term if stocks are rebuilt, though it is clear there are substantial short-term declines in revenue and possible increases in costs that can be expected.

Conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities in order to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse impacts on such communities.
Consistent with the requirements of the Magnuson-Stevens Act to prevent overfishing and rebuild overfished stocks, the proposed action will restrict fishing activity through the implementation of a GOM cod spawning closure in the Whaleback area, and will increase fishing opportunities through other measures such as increased ACLs on stocks like pollock and GB yellowtail flounder. Analyses of the impacts of these measures show that landings and revenues are likely to decline for many participants in upcoming years due to the rebuilding programs in place for many stocks. In the short term, these declines will probably have negative impacts on fishing communities throughout the region, but particularly on those ports that rely heavily on groundfish. These declines are unavoidable given the M-S Act requirements to rebuild overfished stocks. The need to control fishing mortality means that catches cannot be as high as would likely occur with less stringent management measures.

Conservation and management measures shall, to the extent practicable, (A) minimize bycatch and (B) to the extent bycatch cannot be avoided, minimize the mortality of such bycatch.
Many measures adopted in Amendment 16 were designed to limit the discards of both groundfish and some other species, including the sector management program, and this action is expected to continue those benefits with no substantial changes.

Conservation and management measures shall, to the extent practicable, promote safety of human life at sea.

Measures adopted in Amendment 16 were designed to improve safety in spite of low ACLs anticipated by Framework 44 and subsequent actions in the near future. The flexibility inherent in sector management and the ability to use common pool DAS at any time are key elements of the measures that promoted safety. The Proposed Action, in conjunction with Amendment 16 measures, is the best option for achieving the necessary mortality reductions while having the least impact on vessel safety. One measure in particular that may promote safety is allowing Handgear A and B vessels into the seasonal closed areas. This would minimize the chance that they could steam offshore in order to access fishing areas, and thus reduce the safety risk associated with being far offshore in small vessels.

10.1.2 Other M-SFCMA requirements

Section 303 (a) of FCMA contains 14 required provisions for FMPs. These are discussed below. It should be emphasized that the requirement is imposed on the FMP. In some cases noted below, the M-S Act requirements are met by information in the Northeast Multispecies FMP, as amended. Any fishery management plan that is prepared by any Council, or by the Secretary, with respect to any fishery, shall—

(1) contain the conservation and management measures, applicable to foreign fishing and fishing by vessels of the United States, which are-- (A) necessary and appropriate for the conservation and management of the fishery to prevent overfishing and rebuild overfished stocks, and to protect, restore, and promote the long-term health and stability of the fishery; (B) described in this subsection or subsection (b), or both; and (C) consistent with the National Standards, the other provisions of this Act, regulations implementing recommendations by international organizations in which the United States participates (including but not limited to closed areas, quotas, and size limits), and any other applicable law;

Foreign fishing is not allowed under this management plan or this action and so specific measures are not included to specify and control allowable foreign catch. The measures in this management plan are designed to prevent overfishing and rebuild overfished stocks. There is one international agreement that is germane to multispecies management. On December 20, 2010, the International Fisheries Clarification Act stipulated that the U.S./Canada Resource Sharing Understanding, implemented through Amendment 13, can be considered an international agreement for the purposes of setting ACLs. The proposed measures are consistent with that Understanding.

(2) contain a description of the fishery, including, but not limited to, the number of vessels involved, the type and quantity of fishing gear used, the species of fish involved and their location, the cost likely to be incurred in management, actual and potential revenues from the fishery, any recreational interest in the fishery, and the nature and extent of foreign fishing and Indian treaty fishing rights, if any;

Amendment 16 included a thorough description of the multispecies fishery from 2001 through 2008, including the gears used, number of vessels, landings and revenues, and effort used in the fishery. This action provides a summary of that information and additional relevant information about the fishery in Section 7.5.3.

(3) assess and specify the present and probable future condition of, and the maximum sustainable yield and optimum yield from, the fishery, and include a summary of the information utilized in making such specification;

The present biological status of the fishery is described in Section 7.2. Likely future conditions of the resource are described in Section 8.1.1.3. Impacts resulting from other measures in the management plan other than the specifications included here can be found in Amendment 16. The maximum sustainable yield for each stock in the fishery is defined in Amendment 16 and optimum yield for the fishery is defined in Amendment 9.

(4) assess and specify-- (A) the capacity and the extent to which fishing vessels of the United States, on an annual basis, will harvest the optimum yield specified under paragraph (3); (B) the portion of such optimum yield which, on an annual basis, will not be harvested by fishing vessels of the United States and can be made available for foreign fishing; and (C) the capacity and extent to which United States fish processors, on an annual basis, will process that portion of such optimum yield that will be harvested by fishing vessels of the United States;

U.S. fishing vessels are capable of, and expected to, harvest the optimum yield from this fishery as specified in Amendment 16 and Frameworks 44 and 45. U.S. processors are also expected to process the harvest of U.S. fishing vessels. None of the optimum yield from this fishery can be made available to foreign fishing.

(5) specify the pertinent data which shall be submitted to the Secretary with respect to commercial, recreational, and charter fishing in the fishery, including, but not limited to, information regarding the type and quantity of fishing gear used, catch by species in numbers of fish or weight thereof, areas in which fishing was engaged in, time of fishing, number of hauls, and the estimated processing capacity of, and the actual processing capacity utilized by, United States fish processors;

Current reporting requirements for this fishery have been in effect since 1994 and were originally specified in Amendment 5. They were slightly modified in Amendments 13 and 16, and VMS requirements were adopted in FW 42. The requirements include Vessel Trip Reports (VTRs) that are submitted by each fishing vessel. Dealers are also required to submit reports on the purchases of regulated groundfish from permitted vessels. Current reporting requirements are detailed in 50 CFR 648.7.

(6) consider and provide for temporary adjustments, after consultation with the Coast Guard and persons utilizing the fishery, regarding access to the fishery for vessels otherwise prevented from harvesting because of weather or other ocean conditions affecting the safe conduct of the fishery; except that the adjustment shall not adversely affect conservation efforts in other fisheries or discriminate among participants in the affected fishery;

Provisions in accordance with this requirement were implemented in earlier actions, and continue with this action. For common pool vessels, the carry-over of a small number of DAS is allowed from one fishing year to the next. If a fisherman is unable to use all of his DAS because of weather or other conditions, this measure allows his available fishing time to be used in the subsequent fishing year. Sectors will also be allowed to carry forward a small amount of ACE into the next fishing year. This will help sectors react should adverse weather interfere with harvesting the entire ACE before the end of the year. Neither of these practices requires consultation with the Coast Guard.

(7) *describe and identify essential fish habitat for the fishery based on the guidelines established by the Secretary under section 305(b)(1)(A), minimize to the extent practicable adverse effects on such habitat caused by fishing, and identify other actions to encourage the conservation and enhancement of such habitat;*

Essential fish habitat was defined for Atlantic wolffish in Amendment 16, and for all stocks in an earlier action. A summary of the EFH can be found in Section 7.1.3.

(8) *in the case of a fishery management plan that, after January 1, 1991, is submitted to the Secretary for review under section 304(a) (including any plan for which an amendment is submitted to the Secretary for such review) or is prepared by the Secretary, assess and specify the nature and extent of scientific data which is needed for effective implementation of the plan;*

Scientific and research needs are not required for a framework adjustment. Current research needs are identified in Amendment 16.

(9) *include a fishery impact statement for the plan or amendment (in the case of a plan or amendment thereto submitted to or prepared by the Secretary after October 1, 1990) which shall assess, specify, and describe the likely effects, if any, of the conservation and management measures on-- (A) participants in the fisheries and fishing communities affected by the plan or amendment; and (B) participants in the fisheries conducted in adjacent areas under the authority of another Council, after consultation with such Council and representatives of those participants;*

Impacts of this framework on fishing communities directly affected by this action and adjacent areas can be found in Section 8.5.

(10) *specify objective and measurable criteria for identifying when the fishery to which the plan applies is overfished (with an analysis of how the criteria were determined and the relationship of the criteria to the reproductive potential of stocks of fish in that fishery) and, in the case of a fishery which the Council or the Secretary has determined is approaching an overfished condition or is overfished, contain conservation and management measures to prevent overfishing or end overfishing and rebuild the fishery;*

Objective and measurable Status Determination Criteria for all species in the management plan are presented in Amendment 16, with the exception of Atlantic pollock, which is revised in this framework using information from the most recent assessment (NEFSC 2010). A full explanation of how the criteria were determined can be found in the GARM III (NEFSC 2008) and Data Poor Working Group documents (DPWG 2009).

(11) *establish a standardized reporting methodology to assess the amount and type of bycatch occurring in the fishery, and include conservation and management measures that, to the extent practicable and in the following priority-- (A) minimize bycatch; and (B) minimize the mortality of bycatch which cannot be avoided;*

A Standardized Bycatch Reporting Methodology omnibus amendment was adopted by the Council in June 2007. That methodology applies to this framework. None of the measures in this framework are expected to increase bycatch beyond what was considered in Amendment 16.

(12) *assess the type and amount of fish caught and released alive during recreational fishing under catch and release fishery management programs and the mortality of such fish,*

and include conservation and management measures that, to the extent practicable, minimize mortality and ensure the extended survival of such fish;

This management plan does not include a catch and release recreational fishery management program and thus does not address this requirement.

(13) include a description of the commercial, recreational, and charter fishing sectors which participate in the fishery and, to the extent practicable, quantify trends in landings of the managed fishery resource by the commercial, recreational, and charter fishing sectors;

As noted above, the description of the commercial, recreational, and charter fishing sectors was fully developed in Amendment 16, and is updated and summarized in this document (Section 7.5.3).

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

This proposed action does not allocate harvest restrictions or stock benefits to the fishery. Such allocations were adopted in Amendment 16, while this action adjusts catch limits for some stocks within the existing allocation structure. This action also proposes that PSC from canceled permits is redistributed to all remaining permits in the fishery; while not considered an allocative measure, that action does benefit all participants in the fishery equally.

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

Annual Catch Limits specifications were adopted in Framework 44, with updates to several stocks included in this framework. The ACL process was described in Amendment 16. Specifications were developed in a way to ensure that overfishing does not occur in accordance with Amendment 16 and all relevant laws.

10.1.3 EFH Assessment

This essential fish habitat (EFH) assessment is provided pursuant to 50 CFR 600.920(e) of the EFH Final Rule to initiate EFH consultation with the National Marine Fisheries Service.

10.1.3.1 Description of Action

The purpose of the Framework 45 (Northeast Multispecies FMP) Proposed Action is to adopt modifications to management measures that will incorporate new information relative to effective program administration and setting catch levels that are necessary to achieve the fishing mortality targets required by Amendment 16.

In general, the activity described by this Proposed Action, fishing for groundfish species, occurs off the New England and Mid-Atlantic coasts within the U.S. EEZ. Thus, the range of this activity occurs across the designated EFH of all Council-managed species (see Amendment 11 to the Northeast Multispecies FMP for a list of species for which EFH was designated, the maps of the distribution of EFH, and descriptions of the characteristics that comprise the EFH). EFH designated for species managed under the Secretarial Highly Migratory Species FMPs are not affected by this action, nor is any EFH designated for species managed by the South Atlantic Council as all of the relevant species are pelagic and not directly affected by benthic habitat impacts.

The Proposed Action is described in Section 4.0. The Proposed Action includes the following general measures:

- Measures to update ACL specifications for FY 2011-2012
- Fishery program administration measures
- Measures affecting effort control in the commercial and recreational fishery

A list of specific measures and a summary of the habitat impacts of the proposed measures is found in Sections 4.0 and 8.2.

It is not possible at this time to thoroughly assess some of the proposed measures (distribution of PSC from canceled permits, for example) since some aspects of future fishing behavior are not known. Several other proposed measures (those which are not listed below) are not expected to affect EFH as they are either administrative in nature or are expected to have neutral or no habitat impacts.

10.1.3.2 Assessing the Potential Adverse Impacts

Refer to the Habitat Impacts of the Proposed Action (Section 8.2, summarized in Section 8.2.4) for a tabular look at the summary impacts of the proposed measures. Nearly all measures are expected to have neutral impacts on habitat.

Measures with Potential Negative Effects on EFH

Table 141 – Expected negative habitat impacts of Proposed Action relative to No Action alternative

Proposed Measure	Expected Relative Habitat Impacts	Rationale
US/Canada TACs	-/0	Would lead to a decrease in catches in comparison with No Action, and slightly lower groundfish fishing effort. No significant impacts on EFH expected.
ACL specifications	-/0	For species with a decreased catch limit, could decrease fishing effort. No significant impacts on EFH expected.

Measures with Potential Positive Effects on EFH

Table 142 – Expected positive habitat impacts of Proposed Action relative to No Action alternative

Proposed Measure	Expected Relative Habitat Impacts	Rationale
Revised status determination criteria for pollock	+/0	Would likely lead to an increase in catch limits, and possibly increase fishing effort. No significant impacts on EFH expected.
Removal of General Category scallop dredge exemption area	+/0	Could increase general category effort in GSC; possible increase in impacts in that area due to increased fishing on vulnerable habitats
ACL specifications	+/0	For species with an increased catch limit, could increase fishing effort. No significant impacts on EFH expected.
Revised GB YTF rebuilding targets	+/0	Could lead to higher catches in the short term, increasing fishing effort. No significant impacts on EFH expected.

10.1.3.3 Minimizing or Mitigating Adverse Impacts

Section 8.2 (habitat impacts of Proposed Action) demonstrates that the overall habitat impacts of all the measures combined in this action have neutral impacts relative to the baseline habitat protections established under Amendment 13 to the Northeast Multispecies FMP. As such, additional measures to mitigate or minimize adverse effects of the multispecies fishery on EFH beyond those established under Amendment 13 are not necessary.

10.1.3.4 Conclusions

Because there are no adverse impacts associated with this action, no EFH consultation is required.

10.2 National Environmental Policy Act (NEPA)

NEPA provides a mechanism for identifying and evaluating the full spectrum of environmental issues associated with federal actions, and for considering a reasonable range of alternatives to avoid or minimize adverse environmental impacts. This document is designed to meet the requirements of both the M-S Act and NEPA. The Council on Environmental Quality (CEQ) has issued regulations specifying the requirements for NEPA documents (40 CFR 1500 – 1508), as has NOAA in its agency policy and procedures for NEPA in NAO 216-6 §5.04b.1. All of those requirements are addressed in this document, as referenced below.

10.2.1 Environmental Assessment

The required elements of an Environmental Assessment (EA) are specified in 40 CFR 1508.9(b) and NAO 216-6 §5.04b.1. They are included in this document as follows:

- The need for this action is described in Section 3.2;
- The alternatives that were considered are described in Sections 4.0 (Proposed Action) and 5.0 (alternatives to the Proposed Action);
- The environmental impacts of the Proposed Action are described in Section 8.0;
- The agencies and persons consulted on this action are listed in Section 10.2.4.

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

- An Executive Summary can be found in Section 1.0.
- A table of contents can be found in Section 2.0.
- Background and purpose are described in Section 3.0.
- A summary of the document can be found in Section 1.0.
- A brief description of the affected environment is in Section 7.0.
- Cumulative impacts of the Proposed Action are described in Section 8.7.
- A determination of significance is in Section 10.2.2.
- A list of preparers is in Section 10.2.3.
- The index is in Section 11.3.

10.2.2 Finding of No Significant Impact (FONSI)

National Oceanic and Atmospheric Administration Order (NAO) 216-6 (revised May 20, 1999) provides nine criteria for determining the significance of the impacts of a final fishery management action. These criteria are discussed below:

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

Response: This action cannot be reasonably expected to jeopardize the sustainability of any target species that may be affected by the action. Analysis of the proposed measures in Section 8.1 indicates that fishing mortality on some groundfish stocks will decline as a result of the Proposed Action, while fishing mortality on other stocks is expected to increase while staying within annual catch limits that are designed to protect stock rebuilding and sustainability. Further, indications are that stock size for all stocks that are below B_{msy} should increase between 2011 and 2012 as a result of the measures, helping to keep these stocks on the rebuilding trajectories adopted by Amendments 13 and 16. None of the measures are expected to have a large impact on habitat that could threaten the sustainability of any target resource.

(2) *Can the Proposed Action reasonably be expected to jeopardize the sustainability of any non-target species?*

Response: This action cannot be reasonable expected to jeopardize the sustainability of any non-target species that may be affected by the action. The proposed measures will set or continue relatively low ACLs and maintain trip limits that should reduce interactions between groundfish fishing vessels and other species. There are no indications that groundfish fishing activity is currently jeopardizing the sustainability of non-target species.

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

Response: The Proposed Action cannot be reasonably expected to cause substantial damage to the ocean and coastal habitats and/or essential fish habitat as defined under the Magnuson-Stevens Act and identified in the FMP. As discussed in Section 8.2.4, some of the proposed measures are expected to have neutral to beneficial impacts on habitat since they include additional reductions in fishing effort, while others have minor increases in impact due to revised catch limits.

(4) *Can the Proposed Action be reasonably expected to have a substantial adverse impact on public health or safety?*

Response: Nothing in the Proposed Action can be reasonably expected to have a substantial adverse impact on public health or safety. Measures adopted in Amendment 16 were designed to improve safety in spite of low ACLs anticipated by Framework 44 and subsequent actions. The flexibility inherent in sector management and the ability to use common pool DAS at any time are key elements of the measures that promoted safety. The Proposed Action, in conjunction with Amendment 16 measures, is the best option for achieving the necessary mortality reductions while having the least impact on vessel safety.

(5) *Can the Proposed Action reasonably be expected to adversely affect endangered or threatened species, marine mammals, or critical habitat of these species?*

Response: The Proposed Action cannot be reasonably expected to adversely affect endangered or threatened species. As discussed in Section 8.3, these species are expected to have very minimal impacts from the minor changes in fishing effort that are proposed by this action.

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

Response: The Proposed Action is not expected to have a substantial impact on biodiversity and/or ecosystem function with the affected area. The use of ACLs will tightly control catches of target and incidental regulated groundfish stocks. Catches of target and incidental catch species under this program will be consistent with the mortality targets of Amendment 16, and thus will not have a substantial impact on predator-prey relationships or biodiversity. Particular measures within this action will have no more than minimal adverse impacts to EFH. It is therefore reasonable to expect that there will not be substantial impact on biodiversity or ecosystem function.

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

Response: The environmental assessment documents that no significant natural or physical effects will result from the implementation of the Proposed Action. The Proposed Action is designed to implement modifications to continue the groundfish rebuilding programs that were implemented as a result of Amendments 13 and 16 to the Northeast Multispecies FMP. As described in Section 8.1, the action is expected to continue the rebuilding trajectories for most stocks that have been adopted. The action cannot be reasonably expected to have a substantial impact on habitat or protected species (see Sections 8.2 and 8.3), as the impacts are expected to fall within the range of those resulting from Amendment 16. The action's potential social and economic impacts are also addressed in the environmental assessment (see Sections 8.5 and 8.4, respectively) and more specifically in the Executive Order 12866 review (Section 10.11.1) and the Initial Regulatory Impact Review (Section 10.11).

NMFS has determined that despite the potential socio-economic impacts resulting from this action, there is no need to prepare an EIS. The purpose of NEPA is to protect the environment by requiring Federal agencies to consider the impacts of their Proposed Action on the human environment, defined as "the natural and physical environment and the relationship of the people with that environment." This EA for Framework 45 describes and analyzes the proposed measures and alternatives and concludes there will be no significant impacts to the natural and physical environment. While some fishermen, shore-side businesses and others may experience impacts to their livelihood, these impacts in and of themselves do not require the preparation of an EIS, as supported by NEPA's implementing regulations at 40 C.F.R. 1508.14. Consequently, because the EA demonstrates that the action's potential natural and physical impacts are not significant, the execution of a FONSI remains appropriate under Criteria 7.

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

Response: The effects of the proposed measures on the quality of human environment are not expected to be highly controversial. The need to rebuild groundfish stocks is well-documented. While there has been some debate over how quickly to rebuild those stocks and the desired biomass for each stock, legal requirements established by the M-S Act render these discussions moot. These issues were also resolved with the adoption of Amendment 16, and with the exception of the GB yellowtail flounder rebuilding strategy this action does not modify those rebuilding plans. The effects of modifying the GB yellowtail flounder rebuilding schedule are not expected to be controversial since the proposed action was supported by industry and will allow catch on other stocks to be more fully optimized while staying within the boundaries of the M-S Act requirements.

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

Response: No, the Proposed Action cannot be reasonably expected to result in substantial impacts to unique areas or ecological critical areas. The only designated HAPC in the areas affected by this action is protected by an existing closed area that would not be affected by this action. In addition, vessel operations around the unique historical and cultural resources encompassed by the Stellwagen Bank National Marine Sanctuary would not likely be altered by this action. As a result, no substantial impacts are expected from this action.

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

Response: The Proposed Action is not expected to result in highly uncertain effects on the human environment or involve unique or unknown risks. The effort control measures used in this action are similar to those adopted in past management actions, and these prior actions have reduced fishing mortality on many stocks and initiated stock rebuilding. The administrative measures are merely minor modifications that were anticipated by Amendment 16. While there is a degree of uncertainty over how fishermen will react to the proposed measures, the analytic tools used to evaluate the measures attempt to take that uncertainty into account and reflect the likely results as a range of possible outcomes. For example, the economic analysis in Section 8.4 illustrates the distribution of results that are expected rather then provide only a point estimate. Although there is some uncertainty associated with the analyses is the number of permits that will belong with sectors when this action is implemented, the analyses address several scenarios for membership. Since ultimately the availability of a choice of whether to join a sector will serve to mitigate social and economic impacts, this uncertainty cannot be seen as a significant source of risk. Overall, the impacts of the Proposed Action can be, and are, described with a relative amount of certainty.

(11) *Is the Proposed Action related to other actions with individually insignificant, but cumulatively significant impacts?*

Response: The Proposed Action is not related to other actions with individually insignificant but cumulatively significant impacts. Recent management actions in this fishery include FW 42, FW 43, Amendment 16, and FW 44. FW 42 developed specific measures implementing programs adopted by Amendment 13; each was determined to be insignificant. FW 43 adopted limits on groundfish bycatch by mid-water trawl herring vessels and was not determined to have a significant effect on either the groundfish or herring fisheries. Amendment 16 had significant impacts and thus required the preparation of an EIS, while Framework 44 set specifications as required under Amendment 16. The measures in this action were anticipated by Amendment 16 and thus cannot be said to have different cumulative impacts that were not foreseen and addressed in the amendment. Therefore, the Proposed Action, when assessed in conjunction with the actions noted above, would not have significant impacts on the natural or physical environment.

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

Response: The Proposed Action is not likely to affect objects listed in the National Register of Historic Places or cause significant impact to scientific, cultural, or historical resources. The only object in the fishery area that is listed in the National Register of Historic Places is the wreck of the steamship *Portland* within the Stellwagen Bank National Marine Sanctuary. The current regulations allow fishing within the Stellwagen Bank National Marine Sanctuary. The Proposed Action would not regulate current fishing practices within the sanctuary. However, vessels typically avoid fishing near the wreck to avoid tangling gear on the wreck. Therefore, this action would not result in any adverse affects to the wreck of the *Portland*.

(13) *Can the Proposed Action reasonably be expected to result in the introduction or spread of a non-indigenous species?*

Response: This action would not result in the introduction or spread of any non-indigenous species, as it would not result in any vessel activity outside of the Northeast region.

(14) *Is the Proposed Action likely to establish a precedent for future actions with significant effects or represent a decision in principle about a future consideration?*

Response: No, the Proposed Action is not likely to establish precedent for future actions with significant effects. The Proposed Action adopts measures that are designed to react to the necessity to reduce fishing mortality for several groundfish stocks in order to achieve the fishing mortality targets adopted by Amendment 16 and Framework 44 and to fine-tune the sector administration program in order to make it more effective. As such, these measures are designed to address a specific problem and are not intended to represent a decision about future management actions that may adopt different measures.

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

Response: The Proposed Action is intended to implement measures that would offer further protection of marine resources and would not threaten a violation of Federal, state, or local law or requirements to protect the environment. In fact, this action was developed in order to support Amendment 16 and Framework 44, which implemented several new requirements of the law.

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

Response: As specified in the responses to the first two criteria of this section, the proposed action is not expected to result in cumulative adverse effects that would have a substantial effect on target or non-target species. This action would maintain fishing mortality within M-S Act requirements for several groundfish stocks, with no expected increase in mortality for non-target and non-groundfish stocks.

Applicable Law
National Environmental Policy Act (NEPA)

FONSI STATEMENT: In view of the information presented in this document and the analysis contained in the supporting Environmental Assessment prepared for Framework Adjustment 45 to the Northeast Multispecies Fishery Management Plan, it is hereby determined that Framework Adjustment 45 will not significantly impact the quality of the human environment as described above and in the supporting Environmental Assessment. In addition, all beneficial and adverse impacts of the Proposed Action have been addressed to reach the conclusion of no significant impacts. Accordingly, preparation of an EIS for this action is not required.

for PATRICIA KURKUL
Northeast Regional Administrator, NOAA

4/13/11
Date

10.2.3 List of Preparers; Point of Contact

Questions concerning this document may be addressed to:

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

This document was prepared by:

Talia Bigelow, New England Fishery Management Council (NEFMC)
Michelle Bachman, NEFMC
Deirdre Boelke, NEFMC
Daniel Caless, NMFS Northeast Regional Office (NERO)
Timothy Cardiasmenos, NERO
Douglas Christel, NERO
Steven Correia, Massachusetts Division of Marine Fisheries (MA DMF)
Patricia Fiorelli, NERO
Mark Grant, NERO
Dr. Demet Haksever, NEFMC
Anne Hawkins, NEFMC
Jessica Melgey, NEFMC
Susan Murphy, NERO
Thomas Nies, NEFMC (plan coordinator)
Dr. Paul Nitschke, Northeast Fisheries Science Center (NEFSC)
Loretta O’Brien, NEFSC
Dr. Eric Thunberg, NEFSC
Thomas Warren, NERO

10.2.4 Agencies Consulted

The following agencies were consulted in the preparation of this document:

Mid-Atlantic Fishery Management Council

New England Fishery Management Council, which includes representatives from the following additional organizations:

- Connecticut Department of Environmental Protection
- Rhode Island Department of Environmental Management
- Massachusetts Division of Marine Fisheries
- New Hampshire Fish and Game
- Maine Department of Marine Resources

National Marine Fisheries Service, NOAA, Department of Commerce

United States Coast Guard, Department of Homeland Security

10.2.5 Opportunity for Public Comment

The Proposed Action was developed during the period June 2010 through November 2010 and was discussed at the following meetings. Opportunities for public comment were provided at each of these meetings.

NEFMC Council	Eastland Park Hotel, Portland ME	6/24/2010
Groundfish Oversight	Holiday Inn, Mansfield MA	9/9/2010
NEFMC Council	Hotel Viking, Newport RI	9/30/2010
Groundfish Oversight	Sheraton Harborside, Portsmouth NH	10/27/2010
NEFMC Council	Ocean Edge Resort, Brewster MA	11/18/2010

10.3 Endangered Species Act

Section 7 of the Endangered Species Act requires federal agencies conducting, authorizing or funding activities that affect threatened or endangered species to ensure that those effects do not jeopardize the continued existence of listed species. The NEFMC has concluded, at this writing, that the proposed framework adjustment and the prosecution of the multispecies fishery is not likely to jeopardize any ESA-listed species or alter or modify any critical habitat, based on the discussion of impacts in this document and on the assessment of impacts in the Amendment 16 Environmental Impact Statement.

The Council does acknowledge that endangered and threatened species may be affected by the measures proposed, but impacts should be minimal especially when compared to the prosecution of the fishery prior to implementation of Amendment 16. The NEFMC is now seeking the concurrence of the National Marine Fisheries Service with respect to Framework Adjustment 45.

For further information on the potential impacts of the fishery and the proposed management action on listed species, see Section 8.3 of this document.

10.4 Marine Mammal Protection Act

The NEFMC has reviewed the impacts of the Proposed Action on marine mammals and has concluded that the management actions proposed are consistent with the provisions of the MMPA. Although they are likely to affect species inhabiting the multispecies management unit, the measures will not alter the effectiveness of existing MMPA measures, such as take reduction plans, to protect those species based on overall reductions in fishing effort that have been implemented through the FMP

For further information on the potential impacts of the fishery and the proposed management action on marine mammals, see Section 8.3 of this document.

10.5 Coastal Zone Management Act

Section 307(c)(1) of the Federal CZMA of 1972 requires that all Federal activities that directly affect the coastal zone be consistent with approved state coastal zone management programs to the maximum extent practicable. Pursuant to Section 930.36(c) of the regulations implementing the Coastal Zone Management Act, NMFS made a general consistency determination that the Northeast Multispecies Fishery Management Plan (FMP), including Amendment 16, and Framework Adjustment 45, is consistent to the maximum extent practicable with the enforceable policies of the approved coastal management program of Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, and North Carolina. This general consistency determination applies to the current NE Multispecies Fishery Management Plan (FMP), and all subsequent routine Federal actions carried out in accordance with the FMP such as Framework Adjustments and specifications. A general consistency determination is warranted because Framework Adjustments to the FMP are repeated activities that adjust the use of management tools previously implemented in the FMP. A general consistency determination avoids the necessity of issuing separate consistency determinations for each incremental action. This determination was submitted to the above states on October 21, 2009. To date, the states of North Carolina, Rhode Island, Virginia, Connecticut, New Hampshire, and Pennsylvania have concurred with the General Consistency Determination. Consistency was inferred for those states that did not respond.

10.6 Administrative Procedure Act

This action was developed in compliance with the requirements of the Administrative Procedure Act, and these requirements will continue to be followed when the proposed regulation is published. Section 553 of the Administrative Procedure Act establishes procedural requirements applicable to informal rulemaking by Federal agencies. The purpose of these requirements is to ensure public access to the Federal rulemaking process, and to give the public adequate notice and opportunity for comment. At this time, the Council is not requesting any abridgement of the rulemaking process for this action.

10.7 Data Quality Act

Pursuant to NOAA 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 the information (including statistical information) disseminated by or for Federal agencies. The following section addresses these requirements.

10.7.1 Utility of Information Product

The information presented in this document is helpful to the intended users (the affected public) by presenting a clear description of the purpose and need of the Proposed Action, the measures proposed, and the impacts of those measures. A discussion of the reasons for selecting the Proposed Action is included so that intended users may have a full understanding of the Proposed Action and its implications.

Until a proposed rule is prepared and published, this document is the principal means by which the information contained herein is available to the public. The information provided in this document is based on the most recent available information from the relevant data sources. The development of this document and the decisions made by the Council to propose this action are the result of a multi-stage public process. Thus, the information pertaining to management measures contained in this document has been improved based on comments from the public, the fishing industry, members of the Council, and NOAA Fisheries Service.

This document is available in several formats, including printed publication, CD-ROM, and online through the Council's web page in PDF format. The Federal Register notice that announces the proposed rule and the final rule and implementing regulations will be made available in printed publication, on the website for the Northeast Regional Office, and through the Regulations.gov website. The Federal Register documents will provide metric conversions for all measurements.

10.7.2 Integrity of Information Product

Prior to dissemination, information associated with this action, independent of the specific intended distribution mechanism, is safeguarded from improper access, modification, or destruction, to a degree commensurate with the risk and magnitude of harm that could result from the loss, misuse, or unauthorized access to or modification of such information. All electronic information disseminated by NOAA Fisheries Service adheres to the standards set out in Appendix III, "Security of Automated Information Resources," of OMB Circular A-130; the Computer Security Act; and the Government Information Security Act. All confidential information (e.g., dealer purchase reports) is safeguarded pursuant to the Privacy Act; Titles 13, 15, and 22 of the U.S. Code (confidentiality of census, business, and financial information); the Confidentiality of Statistics provisions of the Magnuson-Stevens Act; and NOAA Administrative Order 216-100, Protection of Confidential Fisheries Statistics.

10.7.3 Objectivity of Information Product

For purposes of the Pre-Dissemination Review, this document is considered to be a "Natural Resource Plan." Accordingly, the document adheres to the published standards of the Magnuson-Stevens Act; the Operational Guidelines, Fishery Management Plan Process; the Essential Fish Habitat Guidelines; the National Standard Guidelines; and NOAA Administrative Order 216-6, Environmental Review Procedures for Implementing the National Environmental Policy Act.

This information product uses information of known quality from sources acceptable to the relevant scientific and technical communities. Stock status (including estimates of biomass and fishing mortality) reported in this product are based on either assessments subject to peer-review through the Stock Assessment Review Committee or on updates of those assessments prepared by scientists of the Northeast Fisheries Science Center. These update assessments were reviewed by the SAW 50 (NEFSC 2010), the Groundfish Assessment Review Meeting III (GARM III; NEFSC 2008), and the Northeast Data Poor Stocks Working Group (DPWG 2009), which all included participation by independent stock assessment scientists. Landing and revenue information is based on information collected through the Vessel Trip Report and Commercial Dealer databases. Information on catch composition, by tow, is based on reports collected by the NOAA Fisheries Service observer program and incorporated into the sea sampling or observer database systems. These reports are developed using an approved, scientifically valid sampling process. In addition to these sources, additional information is presented that has been accepted and published in peer-reviewed journals or by scientific organizations. Original analyses in this document were prepared using data from accepted sources, and the analyses have been reviewed by members of the Groundfish Plan Development Team/Monitoring Committee.

Despite current data limitations, the conservation and management measures proposed for this action were selected based upon the best scientific information available. The analyses conducted in support of the Proposed Action were conducted using information from the most recent complete calendar years, through 2009, and in some cases includes information that was collected during the first eight months of calendar year 2010. Complete data were not available for calendar year 2010. The data used in the analyses provide the best available information on the number of harvesters in the fishery, the catch (including landings and discards) by those harvesters, the sales and revenue of those landings to dealers, the type of permits held by vessels, the number of DAS used by those vessels, the catch of recreational fishermen and the location of those catches, and the catches and revenues from various special management programs. Specialists (including professional members of plan development teams, technical teams, committees, and Council staff) who worked with these data are familiar with the most current analytical techniques and with the available data and information relevant to the groundfish fishery.

The policy choices are clearly articulated, in Section 4.0 of this document, as the management alternatives considered in this action. The supporting science and analyses, upon which the policy choices are based, are summarized and described in Section 8.0 of this document. All supporting materials, information, data, and analyses within this document have been, to the maximum extent practicable, properly referenced according to commonly accepted standards for scientific literature to ensure transparency.

The review process used in preparation of this document involves the responsible Council, the Northeast Fisheries Science Center, the Northeast Regional Office, and NOAA Fisheries Service Headquarters. The Center's technical review is conducted by senior level scientists with specialties in population dynamics, stock assessment methods, demersal resources, population biology, and the social sciences. The Council review process involves public meetings at which affected stakeholders have opportunity to provide comments on the document. Review by staff at the Regional Office is conducted by those with expertise in fisheries management and policy, habitat conservation, protected species, and compliance with the applicable law. Final approval of the action proposed in this document and clearance of any rules prepared to implement resulting regulations is conducted by staff at NOAA Fisheries Service Headquarters, the Department of Commerce, and the U.S. Office of Management and Budget.

10.8 Executive Order 13132 (Federalism)

This E.O. established nine fundamental federalism principles for Federal agencies to follow when developing and implementing actions with federalism implications. The E.O. also lists a series of policy making criteria to which Federal agencies must adhere when formulating and implementing policies that have federalism implications. However, no federalism issues or implications have been identified relative to the measures proposed in FW 45. This action does not contain policies with federalism implications sufficient to warrant preparation of an assessment under E.O. 13132. The affected states have been closely involved in the development of the proposed management measures through their representation on the Council (all affected states are represented as voting members of at least one Regional Fishery Management Council). No comments were received from any state officials relative to any federalism implications that may be associated with this action.

10.9 Executive Order 13158 (Marine Protected Areas)

The Executive Order on Marine Protected Areas requires each federal agency whose actions affect the natural or cultural resources that are protected by an MPA to identify such actions, and, to the extent permitted by law and to the maximum extent practicable, in taking such actions, avoid harm to the natural and cultural resources that are protected by an MPA. The E.O. directs federal agencies to refer to the MPAs identified in a list of MPAs that meet the definition of MPA for the purposes of the Order. The E.O. requires that the Departments of Commerce and the Interior jointly publish and maintain such a list of MPAs. As of the date of submission of this FMP, the list of MPA sites has not been developed by the departments. No further guidance related to this Executive Order is available at this time.

10.10 Paperwork Reduction Act

The purpose of the PRA is to control and, to the extent possible, minimize the paperwork burden for individuals, small businesses, nonprofit institutions, and other persons resulting from the collection of information by or for the Federal Government. The authority to manage information and recordkeeping requirements is vested with the Director of the Office of Management and Budget (OMB). This authority encompasses establishment of guidelines and policies, approval of information collection requests, and reduction of paperwork burdens and duplications.

FW 45 continues existing collection of information requirements implemented by previous amendments to the FMP that are subject to the PRA, including:

- Reporting requirements for SAPs and the Category B (regular) DAS Program
- Mandatory use of a Vessel Monitoring System (VMS) by all vessels using a groundfish DAS
- Changes to possession limits, which will change the requirements to notify NMFS of plans to fish in certain areas
- Provisions to allow vessel operators to notify NMFS of plans to fish both inside and outside the Eastern U.S./CA area on the same fishing trip

10.11 Regulatory Impact Review

10.11.1 Executive Order 12866

The purpose of E.O 12866 is to enhance planning and coordination with respect to new and existing regulations. This E.O. requires the Office of Management and Budget (OMB) to review regulatory programs that are considered to be "significant." Section 10.11 of this document represents the RIR, which includes an assessment of the costs and benefits of the Proposed Action, in accordance with the guidelines established by E.O. 12866. The analysis included in the RIR shows that this action is a not "significant regulatory action" because it will not affect in a material way the economy or a sector of the economy.

E.O. 12866 requires a review of proposed regulations to determine whether or not the expected effects would be significant, where a significant action is any regulatory action that may

- 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, jobs, the environment, public health or safety, or State, local, or tribal governments or communities;
- Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;
- Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or
- Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.

The discussion below describes the anticipated economic impacts of the proposed action and is limited only to a determination of whether the action would have a significant impact based on economic criteria alone.

A more detailed discussion of economic impact is provided in Section 8.4. The discussion to follow provides a summary of those findings. The proposed action would change the reference points for several stocks, would adopt a new rebuilding program for GB yellowtail flounder, would set FY 2011 ACLs for all stocks as well as set the TACs for stock subject to the U.S./Canada resource sharing agreement and make yellowtail founder allocations to the scallop fishery. The proposed action would implement several new sectors all of which would be lease-only and all but one would be state run permit banks. Finally the proposed action would make a number of fishery administration changes including eliminating dockside monitoring costs as well as delaying the requirement for industry funding of at-sea monitoring.

10.11.1.1 Summary of Impacts on Fishing Revenue

The economic impacts of changes in biological reference points or rebuilding schedules manifest themselves in the effect of these changes in the setting of ACLs. Taking into account observed year-to-date ACL use rates and discard rates by sectors and the common pool, the expected commercial revenues (assuming 2010 prices) would be $79.8 million during FY 2011 and $72.5 million during FY 2012. This decline in revenue is due to the lower ACLs associated with expected changes in stock size for several stocks. Although it is unknown exactly what FY 2010 fishing revenues will end up being until April, 2011, aggregate revenues have been running approximately 5% ahead of FY 2009 levels. Assuming this trend continues through the end of FY 2010, expected revenues from groundfish would be $83.7 million. This means that estimated groundfish revenues during FY 2011 would be about $4 million lower as compared to FY 2010. Note that the potential impacts associated with the U.S./Canada TACs as well as the proposed allocation of yellowtail flounder to the scallop fishery were embedded in the estimated gross revenues associated with the commercial ACLs, so no additional impacts beyond that already reported may be expected.

For the most part, the remaining set of proposed actions may be expected to have implications for the cost of fishing. As such, they may result in improved profitability for both sector and common pool vessels. Approval of the five new sectors including four state permit banks and an additional lease-only sector would provide vessel owners with more options from which to obtain leased ACE. One of the concerns expressed during FY 2010, particularly for owner-operators or individuals that owned only a few permits, was that allocations of ACE were not sufficient to be economically viable. While intra-sector and inter-sector trading is allowed, this does not mean that vessel owners will be able to acquire the desired quantity at a price they are willing and able to afford. Depending on how state permit banks choose to operate, they may provide vessel owners who lack the means to afford a lease through a private transaction with an alternative. Overall, increasing the number of sectors, and increasing the number of lease-only sectors may facilitate price discovery. Efficient markets enable competitive prices to be established, and limits the ability of market participants from trading on asymmetric information or exerting some form of monopoly power. Competitive markets require both a large number of buyers and a large number of sellers, and transparency in setting prices. Although there remain no requirements to report intra-sector trades, increasing the number of transactions through increasing the number of lease-only sectors may serve the purpose of providing more information on the value or market price for ACE.

The Proposed Action may remove dockside monitoring requirements for all vessels, and if not for all vessels, then at least for vessels that hold either a DAS exempt (Category C) or a Handgear A or B permit. Although the cost of dockside monitoring has been subsidized by the NMFS for at least 2010, the commercial fishery was expected to bear the cost of dockside monitoring under Amendment 16. Based on a preliminary estimate of dockside monitoring costs for the entire fishing year, the cost savings to the groundfish fleet of removing the requirement would be $281 thousand. The proposed action would also delay the requirement for industry funding of at-sea monitoring scheduled for implementation during FY 2012 until a later date. Based on projected numbers of trips, costs for at-sea monitors, and the expected coverage rate, industry would save an estimated $5 million per year. Nevertheless, putting off these costs does not make the need for at-sea monitoring go away. If the cost of at-sea monitoring is not picked up by the NMFS then the uncertainty that this may cause in catch accounting may be end up being reflected in higher buffers for scientific and/or management uncertainty in the setting of ACLs.

In addition to these changes in monitoring, the Proposed Action would implement a number of measures that would remove certain requirements for some segments of the groundfish fleet or provide exemptions from certain requirements. While these measures are likely to result in some generally positive economic benefit either in terms of increased fishing opportunities or cost savings the impacts of these measures cannot be reliably quantified and the cumulative economic impact is likely to be relatively small. These measures include an exemption for general category IFQ scallop from a yellowtail spawning closure, an exemption for Handgear A permit holders to specified rolling closures, and modifications to the way the cod trip limit is administered for Handgear A and B permit holders.

The Proposed Action would implement one measure affecting recreational fishing for both private boat and party/charter or for-hire anglers. This measure would implement a spawning closure to all recreational fishing with gear capable of catching groundfish during April-June in an area called the "Whaleback" area in the Gulf of Maine. Since the closure area is comparatively small, available data cannot reliably provide an estimate of either the number of private boat trips or the number of recreational anglers that may be affected by the proposed closure. According to VTR data from party/charter operators, the proposed spawning closure would affect about 2.6% of anglers that took a party/charter trip in the GOM. Note that the spawning closure would affect all recreational groundfish fishing trips whether or not cod was the targeted species. Although, the proposed closure would have a relatively small impacts on total anglers (hence sales by party/charter operators) there appear to be a small number of operators that do a substantial amount of their business by taking for-hire recreational trips to the closure area. For these vessels, potential revenue effects ranged from less than $1,000 to over $42,000. For a small number of operators, losses would range from 6-7% of annual gross sales.

10.11.1.2 Determination of Significance

Based on estimated commercial gross revenues from groundfish, revenues during FY 2011 may be expected to be slightly lower ($4 million) as compared to FY 2010. During FY 2012 expected revenues may be expected to be an additional $7 million lower compared to FY 2010. However, at least part of this increase may be offset by cost savings associated with removing the requirement for both dockside and at-sea monitoring. Some efficiency gains may also be forthcoming if the approval of 5 lease-only sectors results in improved price discovery and access to larger quantities of ACE. The cumulative effects of the remaining set of fishery program administration changes are likely to be small since many of them affect a component of the groundfish fishery that accounts for substantially less than 1% of the fishery. For these reasons the Proposed Action would not have more than a $100 million impact on the economy, and is therefore not significant for purposes of E.O. 12866.

10.11.2 Regulatory Flexibility Act

Economic Analysis of Small Entity Impacts

The proposed action would set ACLs for groundfish stocks for FY 2011 and 2012, change dockside and at-sea monitoring requirements, specify distribution of PSC from cancelled permits, implement 5 new sectors including 4 state-run permit banks, create an exemption from a spawning closure for general category IFQ vessels, make modifications to handgear and DAS-exempt vessels regulations, and would implement a spawning closure in the Whaleback area of the Gulf of Maine.

These measures would affect regulated entities engaged in commercial fishing for scallops and groundfish. The Whaleback spawning closure would affect regulated entities engaged in the for-hire recreational fishery in the Gulf of Maine. The size standard for commercial fishing (NAICS Code 114111) is $4 million in sales while the size standard for party/charter operators (part of NAICS Code 487210) is $7 million. Although multiple vessels may be owned by a single owner, available tracking of ownership is not readily available to reliably ascertain affiliated entities. Therefore, for purposes of analysis each permitted vessel is treated as a single small entity. Since some regulatory measures will have general effects for a large class of regulated entities, while others have been proposed to address very specific regulatory objectives, the potential generalized impacts will be discussed first followed by a discussion of regulatory impacts for specific groups of vessels. The economic impacts of each proposed measure is discussed in more detail in Section 8.4 of this EA. The anticipated impacts on small regulated entities are summarized in the following.

Impacts on Groundfish Permit Holders of General Measures

The proposed ACLs, changes in dockside and at-sea monitoring, the change in PSC distribution from cancelled permits, and authorization of new sectors will affect all federally-permitted vessels holding a commercial multispecies permit. During the current permit year a total of 2419 permits were issued including 133 Handgear A permits, 1080 Handgear B permits, and 1206 limited access permits of either category A, C, D, E, or F. According to dealer reports, in the year-to-date, 1284 vessels had reported at least some sales of any species including 72 Handgear A, 479 Handgear B, and 733 other limited access permit holders. However, a smaller number of permit holders have participated in the groundfish fishery at least as of December, 2010. These participating vessels include 18 Handgear A permits, 50 Handgear B permits, and 329 other limited access permits.

Assuming ACL use rates and discard rates continue for the remainder of the fishing year, the estimated revenue associated with the proposed FY 2011 ACLs would be approximately $80 million whereas using the same assumptions the estimated groundfish revenues during FY 2010 will be $84 million: an anticipated reduction in groundfish sales of about 5% or approximately $12,000 per vessel for limited access permit holders.

The Proposed Action would provide some regulatory relief in that the requirement to pay for dockside monitoring would be removed and the requirement for industry funding of at-sea monitoring during FY 2012 would be postponed. The combination of these two measures would result in an estimated cost savings to the industry of $5.28 million. The manner in which these cost savings would accrue among participating vessels is uncertain. Nevertheless, these costs would not be borne by participating groundfish vessels.

The Proposed Action would change the manner in which any PSC attached to cancelled permits would be distributed. Specifically, PSC attached to any cancelled permits would be distributed equally among all remaining eligible permit holders. The impact of this action is uncertain but is likely to be relatively small since only a small number of permits have been cancelled to date. Since the PSC attached to any given permit has some value to a sector, the likelihood is low that enough permits would be cancelled such that the redistribution of PSC through this action would make an unprofitable fishing business marginally profitable. Nevertheless, the action would provide at least some additional economic opportunity and would at least increase the amount of ACE that may be available to the leasing market.

Approval of the five new sectors including four state permit banks and an additional lease-only sector would provide vessel owners with more options from which to obtain leased ACE. One of the concerns expressed during FY 2010, particularly for owner-operators or individuals that owned only a few permits, was that allocations of ACE were not sufficient to be economically viable. While intra-sector and inter-sector trading is allowed, this does not mean that vessel owners will be able to acquire the desired quantity at a price they are willing and able to afford. Depending on how state permit banks choose to operate, they may provide vessel owners who lack the means to afford a lease through a private transaction with an alternative. Overall, increasing the number of sectors, and increasing the number of lease-only sectors, may facilitate price discovery. Efficient markets enable competitive prices to be established, and limit the ability of market participants to trade on asymmetric information or to exert some form of monopoly power. Competitive markets require both a large number of buyers and a large number of sellers, and transparency in setting prices. Although there remain no requirements to report intra-sector trades, increasing the number of transactions through increasing the number of lease-only sectors may serve the purpose of providing more information on the value or market price for ACE.

Impacts to DAS-Exempt and Handgear Permit Holders

The Proposed Action would provide for regulatory relief from dockside monitoring and would provide the same rolling closure exemptions to Handgear A and B vessels, and would change the manner in which the cod trip limit is administered for handgear vessels. If the dockside monitoring requirement is not removed then the Proposed Action would still remove the dockside monitoring requirement for DAS-exempt and for Handgear A and Handgear B permit holders. Vessels in these permit categories average less than 30' and have substantially lower gross sales compared to vessels in other permit categories. As such, the cost of dockside monitoring represents a proportionally larger share of total sales and may make some of these vessels unprofitable. Specifically, the estimated cost of dockside monitoring would represent about 0.4% of groundfish revenue during FY 2011. Based on number of trips and days fished during 2009, had these small vessels been required to pay for dockside monitoring at FY 2011 rates, it would have represented 5.2%, 2.3%, and 3.7% of groundfish sales for DAS-exempt, Handgear A and Handgear B permit holders, respectively.

The Proposed Action would provide Handgear A and Handgear B permit holders with a regulatory exemption from the same rolling closures provided to sectors. This exemption would provide regulatory relief that would improve economic opportunity for these handgear permits. Since the rolling closures were originally selected because of comparatively high catch rates, handgear permit holders may be expected to be able fish at their trip limit in, perhaps, less time compared to alternative fishing locations. Whether this option would result in a realized economic gain to handgear permit holders is uncertain.

The Proposed Action would link the cod trip limit with the trip limit in each stock area, which would provide an economic opportunity and incentive to fish in multiple stock areas. The number of handgear permit holders that may be able to take advantage of this option is uncertain. Accessing the GB stock area for a substantial number of fishery participants may require at least a temporary relocation of their fishing business because of the limited range of their vessels. For those handgear vessels that do routinely fish on GB, the Proposed Action would assure that the cod trip limit was linked to the cod stock that they are actually fishing on rather than fishing effort occurring in the GOM.

In addition to linking any required cod trip limit adjustments to the stock area, the proposed action would adjust the manner in which the Handgear A trip limit is made. Specifically, the GOM cod trip limit would keep the cod trip limit at 300 lbs. per trip until the DAS common pool trip limit dropped below 300 pounds. Once this trigger is reached the Handgear A trip limit will be the same as that of the DAS common pool. Taking no action would mean that the Handgear A trip limit would be adjusted in the same proportion as that of the common pool trip limit. As such, taking no action would not change the economic opportunities available to Handgear A permit holders whereas the Proposed Action would enable Handgear A permit holders to retain up to 300 pounds of cod for a longer period of time. Furthermore, even if the trip limit is lowered below 300 pounds Handgear A permit holders would still be able to retain more cod than they would under No Action. The realized economic impacts of this option are uncertain but may be expected to be positive.

Impacts on General Category Scallop IFQ Permits

The Proposed Action would exempt general category IFQ permit holders from a spawning closure to protect yellowtail flounder in the Great South Channel. The number of vessels that may take advantage of this regulatory relief is uncertain. Nevertheless, this option would provide the opportunity to improve the economic value of landed scallops and may result in improved IFQ scallop share values. That is, provided the exemption would make it possible to harvest the same quantities of scallop at a lower cost, the economic value in terms of profitability would be improved. This improved profitability would be reflected in higher IFQ share values.

Impacts on the Recreational Angler For-Hire Operators

The Proposed Action would close the Whaleback area in the Gulf of Maine to protect aggregations of spawning cod to all recreational fishing with gear capable of catching groundfish during April-June. This would apply to all potential party/charter operators regardless of whether they targeted cod or not. The potential loss in gross sales to the GOM party/charter sector as a whole, assuming no alternative fishing locations are sought, would be proportional to the share of anglers on affected GOM trips. However, since not all party/charter operators take trips within the proposed spawning closure the potential revenue reductions would be taken only by party/charter vessels operating in the area. The number of party/charter operators taking one or more affected trips ranged from 13 during FY 2007 to 18 operators during FY 2008. Some of these operators took trips in each fishing year from 2007 to 2009 while others may have taken passengers for hire during only one of the three fishing years. Only 6 party/charter vessels took at least one trip within the proposed spawning closure in all three fishing years while 10 operators took at least one trip during both FY 2008 and FY 2009. For purposes of analysis these 10 vessels are considered the most likely to be affected since they reflect more recent participation as well as including the 6 vessels that also took passengers for hire in the spawning closure area during FY 2007. Gross sales by the 10 participating party/charter operators were $1.8 million and $1.5 million during FY 2008 and FY 2009, respectively. Gross sales associated with trips taken within the proposed spawning closure were $112 thousand and $103 thousand, respectively: a loss of approximately 6-7% or about $10 thousand per vessel. Note the potential loss ranged from less than $1,000 to a high of just over $42,000 depending on the fishing year. These values represent an upper bound estimate since it is likely that party/charter operators may be able to seek out alternative fishing locations.

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11.0 References

11.1 Glossary

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

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

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

Anadromous species: fish that spawn in fresh or estuarine waters and migrate to ocean waters

Amphipods: A small crustacean of the order Amphipoda, such as the beach flea, having a laterally compressed body with no carapace.

Anaerobic sediment: Sediment characterized by the absence of free oxygen.

Anemones: Any of numerous flowerlike marine coelenterates of the class Anthozoa, having a flexible cylindrical body and tentacles surrounding a central mouth.

Annual Catch Entitlement (ACE): Pounds of available catch that can be harvested by a particular sector. Based on the total PSC for the permits that join the sector.

Annual total mortality: Rate of death expressed as the fraction of a cohort dying over a period compared to the number alive at the beginning of the period (# total deaths during year / numbers alive at the beginning of the year). Optimists convert death rates into annual survival rate using the relationship
S=1-A.

ASPIC (A Surplus Production Model Incorporating Covariates): A non-equilibrium surplus production model developed by Prager (1995). ASPIC was frequently used by the Overfishing Definition Panel to define B_{MSY} and F_{MSY} reference points. The model output was also used to estimate rebuilding timeframes for the Amendment 9 control rules.

Bay: An inlet of the sea or other body of water usually smaller than a gulf; a small body of water set off from the main body; e.g. Ipswich Bay in the Gulf of Maine.

Benthic community: *Benthic* means the bottom habitat of the ocean, and can mean anything as shallow as a salt marsh or the intertidal zone, to areas of the bottom that are several miles deep in the ocean. *Benthic community* refers to those organisms that live in and on the bottom. (*In* meaning they live within the substrate; e.g, within the sand or mud found on the bottom. See *Benthic infauna*, below)

Benthic infauna: See *Benthic community*, above. Those organisms that live *in* the bottom sediments (sand, mud, gravel, etc.) of the ocean. As opposed to *benthic epifauna*, that live *on* the surface of the bottom sediments.

Benthivore: Usually refers to fish that feed on benthic or bottom dwelling organisms.

Berm: A narrow ledge typically at the top or bottom of a slope; e.g. a berm paralleling the shoreline caused by wave action on a sloping beach; also an elongated mound or wall of earth.

Biogenic habitats: Ocean habitats whose physical structure is created or produced by the animals themselves; e.g, coral reefs.

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

B_{MSY}: The stock biomass that would produce MSY when fished at a fishing mortality rate equal to F_{MSY}. For most stocks, B_{MSY} is about ½ of the carrying capacity. The proposed overfishing definition control rules call for action when biomass is below ¼ or ½ B_{MSY}, depending on the species.

$B_{threshold}$: 1) A limit reference point for biomass that defines an unacceptably low biomass i.e., puts a stock at high risk (recruitment failure, depensation, collapse, reduced long term yields, etc). 2) A biomass threshold that the SFA requires for defining when a stock is overfished. A stock is overfished if its biomass is below $B_{threshold}$. A determination of overfished triggers the SFA requirement for a rebuilding plan to achieve B_{target} as soon as possible, usually not to exceed 10 years except certain requirements are met. In Amendment 9 control rules, $B_{threshold}$ is often defined as either $1/2B_{MSY}$ or 1/4 B_{MSY}. $B_{threshold}$ is also known as $B_{minimum}$.

B_{target}: A desirable biomass to maintain fishery stocks. This is usually synonymous with B_{MSY} or its proxy.

Biomass weighted F: A measure of fishing mortality that is defined as an average of fishing mortality at age weighted by biomass at age for a ranges of ages within the stock (e.g., ages 1^+ biomass weighted F is a weighted average of the mortality for ages 1 and older, age 3^+ biomass weighted is a weighted average for ages 3 and older). Biomass weighted F can also be calculated using catch in weight over mean biomass. See also fully-recruited F.

Biota: All the plant and animal life of a particular region.

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

Bottom roughness: The inequalities, ridges, or projections on the surface of the seabed that are caused by the presence of bedforms, sedimentary structures, sedimentary particles, excavations, attached and unattached organisms, or other objects; generally small scale features.

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

Bottom tending static gear: All fishing gear that operates on or near the ocean bottom that I snot actively worked; instead, the effectiveness of this gear depends on species moving to the gear which is set in a particular manner by a vessel, and later retrieved. Some examples of bottom tending static gear are gillnets, traps, and pots.

Boulder reef: An elongated feature (a chain) of rocks (generally piled boulders) on the seabed.

Bryozoans: Phylum aquatic organisms, living for the most part in colonies of interconnected individuals. A few to many millions of these individuals may form one colony. Some bryozoans encrust rocky surfaces, shells, or algae others form lacy or fan-like colonies that in some regions may form an abundant component of limestones. Bryozoan colonies range from millimeters to meters in size, but the individuals that make up the colonies are rarely larger than a millimeter. Colonies may be mistaken for hydroids, corals or seaweed.

Burrow: A hole or excavation in the sea floor made by an animal (as a crab, lobster, fish, burrowing anemone) for shelter and habitation.

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

Capacity: the level of output a fishing fleet is able to produce given specified conditions and constraints. Maximum fishing capacity results when all fishing capital is applied over the maximum amount of available (or permitted) fishing time, assuming that all variable inputs are utilized efficiently.

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

Closed Area Model: A General Algebraic Modeling System (GAMS) model used to evaluate the effectiveness of effort controls used in the Northeast Multispecies Fishery. Using catch data from vessels in the fishery, the model estimates changes in exploitation that may result from changes in DAS, closed areas, and possession limits. These changes in exploitation are then converted to changes in fishing mortality to evaluate proposed measures.

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

Commensalism: See *Mutualism*. An interactive association of two species where one benefits in some way, while the other species is in no way affected by the association.

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

Control rule: A pre-determined method for determining fishing mortality rates based on the relationship of current stock biomass to a biomass target. Amendment 9 overfishing control rules define a target biomass (B_{MSY} or proxy) as a management objective. The biomass threshold ($B_{threshold}$ or B_{min}) defines a minimum biomass below which a stock is considered overfished.

Cohort: see yearclass.

Crustaceans: Invertebrates characterized by a hard outer shell and jointed appendages and bodies. They usually live in water and breathe through gills. Higher forms of this class include lobsters, shrimp and crawfish; lower forms include barnacles.

Days absent: an estimate by port agents of trip length. This data was collected as part of the NMFS weighout system prior to May 1, 1994.

Days-at-sea (DAS): the total days, including steaming time that a boat spends at sea to fish. Amendment 13 categorized DAS for the multispecies fishery into three categories, based on each individual vessel's fishing history during the period fishing year 1996 through 2001. The three categories are: Category A: can be used to target any groundfish stock; Category B: can only be used to target healthy stocks; Category C: cannot be used until some point in the future. Category B DAS are further divided equally into Category B (regular) and Category B (reserve).

DAS "flip": A practice in the Multispecies FMP that occurs when a vessel fishing on a Category B (regular) DAS must change ("flip") its DAS to a Category A DAS because it has exceeded a catch limit for a stock of concern.

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

Diatoms: Small mobile plants (algæ) with silicified (silica, sand, quartz) skeletons. They are among the most abundant phytoplankton in cold waters, and an important part of the food chain.

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

Dissolved nutrients: Non-solid nutrients found in a liquid.

Echinoderms: A member of the Phylum Echinodermata. Marine animals usually characterized by a five-fold symmetry, and possessing an internal skeleton of calcite plates, and a complex water vascular system. Includes echinoids (sea urchins), crinoids (sea lillies) and asteroids (starfish).

Ecosystem-based management: a management approach that takes major ecosystem components and services—both structural and functional—into account, often with a multispecies or habitat perspective

Egg stage: One of several marked phases or periods in the development and growth of many animals. The life history stage of an animal that occurs after reproduction and refers to the developing embryo, its food store, and sometimes jelly or albumen, all surrounded by an outer shell or membrane. Occurs before the *larval* or *juvenile stage*.

Elasmobranch: Any of numerous fishes of the class Chondrichthyes characterized by a cartilaginous skeleton and placoid scales: sharks; rays; skates.

Embayment: A bay or an indentation in a coastline resembling a bay.

Emergent epifauna: See *Epifauna*. Animals living upon the bottom that extend a certain distance above the surface.

Epifauna: See *Benthic infauna*. *Epifauna* are animals that live on the surface of the substrate, and are often associated with surface structures such as rocks, shells, vegetation, or colonies of other animals.

Essential Fish Habitat (EFH): Those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. The EFH designation for most managed species in this region is based on a legal text definition and geographical area that are described in the Habitat Omnibus Amendment (1998).

Estuarine area: The area of an estuary and its margins; an area characterized by environments resulting from the mixing of river and sea water.

Estuary: A water passage where the tide meets a river current; especially an arm of the sea at the lower end of a river; characterized by an environment where the mixing of river and seawater causes marked variations in salinity and temperature in a relatively small area.

Eutrophication: A set of physical, chemical, and biological changes brought about when excessive nutrients are released into the water.

Euphotic zone: The zone in the water column where at least 1% of the incident light at the surface penetrates.

Exclusive Economic Zone (EEZ): a zone in which the inner boundary is a line coterminous with the seaward boundary of each of the coastal States and the outer boundary is line 200 miles away and parallel to the inner boundary

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

Exploitable biomass: The biomass of fish in the portion of the population that is vulnerable to fishing.

Exploitation pattern: Describes the fishing mortality at age as a proportion of fully recruited F (full vulnerability to the fishery). Ages that are fully vulnerable experience 100% of the fully recruited F and are termed fully recruited. Ages that are only partially vulnerable experience a fraction of the fully recruited F and are termed partially recruited. Ages that are not vulnerable to the fishery (including discards) experience no mortality and are considered pre-recruits. Also known as the partial recruitment pattern, partial recruitment vector or fishery selectivity.

Exploitation rate (u): The fraction of fish in the exploitable population killed during the year by fishing. This is an annual rate compared to F, which is an instantaneous rate. For example, if a population has 1,000,000 fish large enough to be caught and 550,000 are caught (landed and discarded) then the exploitation rate is 55%.

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

Fishing mortality (F): A measurement of the rate of removal of fish from a population caused by fishing. This is usually expressed as an instantaneous rate (F) and is the rate at which fish are harvested at any given point in a year. Instantaneous fishing mortality rates can be either fully recruited or biomass weighted. Fishing mortality can also be expressed as an exploitation rate (see exploitation rate) or less commonly, as a conditional rate of fishing mortality (m, fraction of fish removed during the year if no other competing sources of mortality occurred. Lower case m should not be confused with upper case M, the instantaneous rate of natural mortality).

$F_{0.1}$: a conservative fishing mortality rate calculated as the F associated with 10 percent of the slope at origin of the yield-per-recruit curve.

F_{MAX}: a fishing mortality rate that maximizes yield per recruit. F_{MAX} is less conservative than $F_{0.1}$.

F_{MSY}: a fishing mortality rate that would produce MSY when the stock biomass is sufficient for producing MSY on a continuing basis.

$F_{threshold}$: 1) The maximum fishing mortality rate allowed on a stock and used to define overfishing for status determination. Amendment 9 frequently uses F_{MSY} or F_{MSY} proxy for $F_{threshold.}$ 2) The maximum fishing mortality rate allowed for a given biomass as defined by a control rule.

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

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

Furrow: A trench in the earth made by a plow; something that resembles the track of a plow, as a marked narrow depression; a groove with raised edges.

Glacial moraine: A sedimentary feature deposited from glacial ice; characteristically composed of unsorted clay, sand, and gravel. Moraines typically are hummocky or ridge-shaped and are located along the sides and at the fronts of glaciers.

Glacial till: Unsorted sediment (clay, sand, and gravel mixtures) deposited from glacial ice.

Grain size: the size of individual sediment particles that form a sediment deposit; particles are separated into size classes (e.g. very fine sand, fine sand, medium sand, among others); the classes are combined into broader categories of mud, sand, and gravel; a sediment deposit can be composed of few to many different grain sizes.

Growth overfishing: Fishing at an exploitation rate or at an age at entry that reduces potential yields from a cohort but does not reduce reproductive output (see recruitment overfishing).

Halocline: The zone of the ocean in which salinity increases rapidly with depth.

Habitat complexity: Describes or measures a habitat in terms of the variability of its characteristics and its functions, which can be biological, geological, or physical in nature. Refers to how complex the physical structure of the habitat is. A bottom habitat with *structure-forming organisms*, along with other three dimensional objects such as boulders, is more complex than a flat, featureless, bottom.

Highly migratory species: tuna species, marlin, oceanic sharks, sailfishes, and swordfish

Hydroids: Generally, animals of the Phylum Cnidaria, Class Hydrozoa; most hydroids are bush-like polyps growing on the bottom and feed on plankton, they reproduce asexually and sexually.

Immobile epifaunal species: See *epifauna*. Animals living on the surface of the bottom substrate that, for the most part, remain in one place.

Individual Fishing Quota (IFQ): federal permit under a limited access system to harvest a quantity of fish, expressed by a unit or units representing a percentage of the total allowable catch of a fishery that may be received or held for exclusive use by an individual person or entity

Juvenile stage: One of several marked phases or periods in the development and growth of many animals. The life history stage of an animal that comes between the *egg* or *larval stage* and the *adult stage*; juveniles are considered immature in the sense that they are not yet capable of reproducing, yet they differ from the larval stage because they look like smaller versions of the adults.

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

Land runoff: The part of precipitation, snowmelt, or irrigation water that reaches streams (and thence the sea) by flowing over the ground, or the portion of rain or snow that does not percolate into the ground and is discharged into streams instead.

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

Lethrinids: Fish of the genus *Lethrinus*, commonly called emperors or nor'west snapper, are found mainly in Australia's northern tropical waters. Distinctive features of Lethrinids include thick lips, robust canine teeth at the front of the jaws, molar-like teeth at the side of the jaws and cheeks without scales. Lethrinids are carnivorous bottom-feeding fish with large, strong jaws.

Limited-access permits: permits issued to vessels that met certain qualification criteria by a specified date (the "control date").

Lutjanids: Fish of the genus of the Lutjanidae: snappers. Marine; rarely estuarine. Some species do enter freshwater for feeding. Tropical and subtropical: Atlantic, Indian and Pacific Oceans.

Macrobenthos: See *Benthic community* and *Benthic infauna*. Benthic organisms whose shortest dimension is greater than or equal to 0.5 mm.

Maturity ogive: A mathematical model used to describe the proportion mature at age for the entire population. A_{50} is the age where 50% of the fish are mature.

Mean biomass: The average number of fish within an age group alive during a year multiplied by average weight at age of that age group. The average number of fish during the year is a function of starting stock size and mortality rate occurring during the year. Mean biomass can be aggregated over several ages to describe mean biomass for the stock. For example the mean biomass summed for ages 1 and over is the 1^+ mean biomass; mean biomass summed across ages 3 and over is 3^+ mean biomass.

Megafaunal species: The component of the fauna of a region that comprises the larger animals, sometimes defined as those weighing more than 100 pounds.

Mesh selectivity ogive: A mathematical model used to describe the selectivity of a mesh size (proportion of fish at a specific length retained by mesh) for the entire population. L_{25} is the length where 25% of the fish encountered are retained by the mesh. L_{50} is the length where 50% of the fish encountered are retained by the mesh.

Meter: A measure of length, equal to 39.37 English inches, the standard of linear measure in the metric system of weights and measures. It was intended to be, and is very nearly, the ten millionth part of the distance from the equator to the north pole, as ascertained by actual measurement of an arc of a meridian.

Metric ton: A unit of weight equal to a thousand kilograms (1kgs = 2.2 lbs.). A metric ton is equivalent to 2,205 lbs. A thousand metric tons is equivalent to 2.2 million lbs.

Microalgal: Small microscopic types of algae such as the green algae.

Microbial: Microbial means of or relating to microorganisms.

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

Mobile organisms: organisms that are not confined or attached to one area or place, that can move on their own, are capable of movement, or are moved (often passively) by the action of the physical environment (waves, currents, etc.).

Molluscs: Common term for animals of the phylum Mollusca. Includes groups such as the bivalves (mussels, oysters etc.), cephalopods (squid, octopus etc.) and gastropods (abalone, snails). Over 80,000 species in total with fossils back to the Cambrian period.

Mortality: see Annual total mortality (A), Exploitation rate (u), Fishing mortality (F), Natural mortality (M), and instantaneous total mortality (Z).

Motile: Capable of self-propelled movement. A term that is sometimes used to distinguish between certain types of organisms found in water.

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

Mutualism: See *Commensalism*. A symbiotic interaction between two species in which both derive some benefit.

Natural disturbance: A change caused by natural processes; e.g. in the case of the seabed, changes can be caused by the removal or deposition of sediment by currents; such natural processes can be common or rare at a particular site.

Natural mortality: A measurement of the rate of death from all causes other than fishing such as predation, disease, starvation, and pollution. Commonly expressed as an instantaneous rate (M). The rate of natural mortality varies from species to species, but is assumed to be M=0.2 for the five critical stocks. The natural mortality rate can also be expressed as a conditional rate (termed n and not additive with competing sources of mortality such as fishing) or as annual expectation of natural death (termed v and additive with other annual expectations of death).

Nearshore area: The area extending outward an indefinite but usually short distance from shore; an area commonly affected by tides and tidal and storm currents, and shoreline processes.

Nematodes: a group of elongated, cylindrical worms belonging to the phylum Nematoidea, also called thread-worms or eel-worms. Some non-marine species attack roots or leaves of plants, others are parasites on animals or insects.

Nemerteans: Proboscis worms belonging to the phylum Nemertea, and are soft unsegmented marine worms that have a threadlike proboscis and the ability to stretch and contract.

Nemipterids: Fishes of the Family Nemipteridae, the threadfin breams or whiptail breams. Distribution: Tropical and sub-tropical Indo-West Pacific.

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

Northwest Atlantic Analysis Area (NAAA): A spatial area developed for analysis purposes only. The boundaries of this the area are within the 500 fathom line to the east, the coastline to the west, the Hague line to the north, and the North Carolina/ South Carolina border to the south. The area is approximately 83,550 square nautical miles, and is used as the denominator in the EFH analysis to determine the percent of sediment, EFH, and biomass contained in an area, as compared to the total NAAA.

Nutrient budgets: An accounting of nutrient inputs to and production by a defined ecosystem (e.g., salt marsh, estuary) versus utilization within and export from the ecosystem.

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

Oligochaetes: See *Polychaetes*. Oligochaetes are worms in the phylum Annelida having bristles borne singly along the length of the body.

Open access: describes a fishery or permit for which there is no qualification criteria to participate. Open-access permits may be issued with restrictions on fishing (for example, the type of gear that may be used or the amount of fish that may be caught).

Opportunistic species: Species that colonize disturbed or polluted sediments. These species are often small, grow rapidly, have short life spans, and produce many offspring.

Optimum Yield (OY): the amount of fish which A) will provide the greatest overall benefit to the nation, particularly with respect to food production and recreational opportunities, and taking into account the protection of marine ecosystems; B) is prescribed as such on the basis of the maximum sustainable yield from the fishery, as reduced by any relevant economic, social, or ecological factor; and C) in the case of an overfished fishery, provides for rebuilding to a level consistent with producing the maximum sustainable yield in such fishery

Organic matter: Material of, relating to, or derived from living organisms.

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

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

Peat bank: A bank feature composed of partially carbonized, decomposed vegetable tissue formed by partial decomposition of various plants in water; may occur along shorelines.

Pelagic gear: Mobile or static fishing gear that is not fixed, and is used within the water column, not on the ocean bottom. Some examples are mid-water trawls and pelagic longlines.

Phytoplankton: Microscopic marine plants (mostly algae and diatoms) which are responsible for most of the photosynthetic activity in the oceans.

Piscivore: A species feeding preferably on fish.

Planktivore: An animal that feeds on plankton.

Polychaetes: Polychaetes are segmented worms in the phylum Annelida. Polychaetes (poly-chaetae = many-setae) differ from other annelids in having many setae (small bristles held in tight bundles) on each segment.

Porosity: The amount of free space in a volume of a material; e.g. the space that is filled by water between sediment particles in a cubic centimeter of seabed sediment.

Possession-limit-only permit: an open-access permit (see above) that restricts the amount of multispecies a vessel may retain (currently 500 pounds of "regulated species").

Potential Sector Contribution (PSC): The percentage of the available catch a limited access permit is entitled to after joining a sector. Based on landings history as defined in Amendment 16. The sum of the PSC's in a sector is multiplied by the groundfish sub-ACL to get the ACE for the sector.

Pre-recruits: Fish in size or age groups that are not vulnerable to the fishery (including discards).

Prey availability: The availability or accessibility of prey (food) to a predator. Important for growth and survival.

Primary production: The synthesis of organic materials from inorganic substances by photosynthesis.

Recovery time: The period of time required for something (e.g. a habitat) to achieve its former state after being disturbed.

Recruitment: the amount of fish added to the fishery each year due to growth and/or migration into the fishing area. For example, the number of fish that grow to become vulnerable to fishing gear in one year would be the recruitment to the fishery. "Recruitment" also refers to new year classes entering the population (prior to recruiting to the fishery).

Recruitment overfishing: fishing at an exploitation rate that reduces the population biomass to a point where recruitment is substantially reduced.

Regulated groundfish species: cod, haddock, pollock, yellowtail flounder, winter flounder, witch flounder, American plaice, windowpane flounder, white hake and redfish. These species are usually targeted with large-mesh net gear.

Relative exploitation: an index of exploitation derived by dividing landings by trawl survey biomass. This measure does not provide an absolute magnitude of exploitation but allows for general statements about trends in exploitation.

Retrospective pattern: A pattern of systematic over-estimation or underestimation of terminal year estimates of stock size, biomass or fishing mortality compared to that estimate for that same year when it occurs in pre-terminal years.

Riverine area: The area of a river and its banks.

Saurids: Fish of the family Scomberesocidae, the sauries or needlefishes. Distribution: tropical and temperate waters.

Scavenging species: An animal that consumes dead organic material.

Sea whips: A coral that forms long flexible structures with few or no branches and is common on Atlantic reefs.

Sea pens: An animal related to corals and sea anemones with a featherlike form.

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

Sediment suspension: The process by which sediments are suspended in water as a result of disturbance.

Sedentary: See *Motile* and *Mobile organisms*. Not moving. Organisms that spend the majority of their lives in one place.

Sedimentary bedforms: Wave-like structures of sediment characterized by crests and troughs that are formed on the seabed or land surface by the erosion, transport, and deposition of particles by water and wind currents; e.g. ripples, dunes.

Sedimentary structures: Structures of sediment formed on the seabed or land surface by the erosion, transport, and deposition of particles by water and wind currents; e.g. ripples, dunes, buildups around boulders, among others.

Sediment types: Major combinations of sediment grain sizes that form a sediment deposit, e.g. mud, sand, gravel, sandy gravel, muddy sand, among others.

Spawning adult stage: See *adult stage*. Adults that are currently producing or depositing eggs.

Spawning stock biomass (SSB): the total weight of fish in a stock that sexually mature, i.e., are old enough to reproduce.

Species assemblage: Several species occurring together in a particular location or region

Species composition: A term relating the relative abundance of one species to another using a common measurement; the proportion (percentage) of various species in relation to the total on a given area.

Species diversity: The number of different species in an area and their relative abundance

Species richness: See *Species diversity*. A measurement or expression of the number of species present in an area; the more species present, the higher the degree of species richness.

Species with vulnerable EFH: If a species was determined to be “highly” or “moderately” vulnerable to bottom tending gears (otter trawls, scallop dredges, or clam dredges) then it was included in the list of species with vulnerable EFH. Currently there are 23 species and life stages that are considered to have vulnerable EFH for this analysis.

Status Determination: A determination of stock status relative to $B_{threshold}$ (defines overfished) and $F_{threshold}$ (defines overfishing). A determination of either overfished or overfishing triggers a SFA requirement for rebuilding plan (overfished), ending overfishing (overfishing) or both.

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

Stock assessment: determining the number (abundance/biomass) and status (life-history characteristics, including age distribution, natural mortality rate, age at maturity, fecundity as a function of age) of individuals in a stock

Stock of concern: a regulated groundfish stock that is overfished, or subject to overfishing.

Structure-forming organisms: Organisms, such as corals, colonial bryozoans, hydroids, sponges, mussel beds, oyster beds, and seagrass that by their presence create a three-dimensional physical structure on the bottom. See *biogenic habitats*.

Submerged aquatic vegetation: Rooted aquatic vegetation, such as seagrasses, that cannot withstand excessive drying and therefore live with their leaves at or below the water surface in shallow areas of estuaries where light can penetrate to the bottom sediments. SAV provides an important habitat for young fish and other aquatic organisms.

Surficial sediment: Sediment forming the sea floor or land surface; thickness of the surficial layer may vary.

Surplus production: Production of new stock biomass defined by recruitment plus somatic growth minus biomass loss due to natural deaths. The rate of surplus production is directly proportional to stock biomass and its relative distance from the maximum stock size at carrying capacity (K). B_{MSY} is often defined as the biomass that maximizes surplus production rate.

Surplus production models: A family of analytical models used to describe stock dynamics based on catch in weight and CPUE time series (fishery dependent or survey) to construct stock biomass history. These models do not require catch at age information. Model outputs may include stock biomass history, biomass weighted fishing mortality rates, MSY, F_{MSY}, B_{MSY}, K, (maximum population biomass where stock growth and natural deaths are balanced) and r (intrinsic rate of increase).

Survival rate (S): Rate of survival expressed as the fraction of a cohort surviving the a period compared to number alive at the beginning of the period (# survivors at the end of the year / numbers alive at the beginning of the year). Pessimists convert survival rates into annual total mortality rate using the relationship A=1-S.

Survival ratio (R/SSB): an index of the survivability from egg to age-of-recruitment. Declining ratios suggest that the survival rate from egg to age-of-recruitment is declining.

TAC: Total allowable catch. This value is calculated by applying a target fishing mortality rate to exploitable biomass.

Taxa: The plural of taxon. Taxon is a named group or organisms of any rank, such as a particular species, family, or class.

Ten-minute- "squares" of latitude and longitude (TMS): Are a measure of geographic space. The actual size of a ten-minute-square varies depending on where it is on the surface of the earth, but in general each square is approximately 70-80 square nautical miles in this region. This is the spatial area that EFH designations, biomass data, and some of the effort data have been binned into for analysis purposes in various sections of this document.

Topography: The depiction of the shape and elevation of land and sea floor surfaces.

Total Allowable Catch (TAC): The amount (in metric tons) of a stock that is permitted to be caught during a fishing year. In the Multispecies FMP, TACs can either be "hard" (fishing ceases when the TAC is caught) or a "target" (the TAC is merely used as an indicator to monitor effectiveness of management measures, but does not trigger a closure of the fishery).

Total mortality: The rate of mortality from all sources (fishing, natural, pollution) Total mortality can be expressed as an instantaneous rate (called Z and equal to F + M) or Annual rate (called A and calculated as the ratio of total deaths in a year divided by number alive at the beginning of the year)

Trophic guild: Trophic is defined as the feeding level within a system that an organism occupies; e.g., predator, herbivore. A guild is defined as a group of species that exploit the same class of environmental resources in a similar way. The trophic guild is a utilitarian concept covering both structure and organization that exists between the structural categories of trophic groups and species.

Turbidity: Relative water clarity; a measurement of the extent to which light passing through water is reduced due to suspended materials.

Two-bin (displacement) model: a model used to estimate the effects of area closures. This model assumes that effort from the closed areas (first bin) is displaced to the open areas (second bin). The total effort in the system is then applied to the landings-per-unit-effort (LPUE) in open areas to obtain a projected catch. The percent reduction in catch is calculated as a net result.

Vulnerability: In order to evaluate the potential adverse effects of fishing on EFH, the vulnerability of each species EFH was determined. This analysis defines vulnerability as the likelihood that the functional value of EFH would be adversely affected as a result of fishing with different gear types. A number of criteria were considered in the evaluation of the vulnerability of EFH for each life stage including factors like the function of habitat for shelter, food and/or reproduction.

Yield-per-recruit (YPR): the expected yield (weight) of individual fish calculated for a given fishing mortality rate and exploitation pattern and incorporating the growth characteristics and natural mortality.

Yearclass: also called cohort. Fish that were spawned in the same year. By convention, the "birth date" is set to January 1st and a fish must experience a summer before turning 1. For example, winter flounder that were spawned in February-April 1997 are all part of the 1997 cohort (or year-class). They would be considered age 0 in 1997, age 1 in 1998, etc. A summer flounder spawned in October 1997 would have its birth date set to the following January 1 and would be considered age 0 in 1998, age 1 in 1999, etc.

Z: instantaneous rate of total mortality. The components of Z are additive (i.e., Z = F+M)

Zooplankton: See *Phytoplankton*. Small, often microscopic animals that drift in currents. They feed on detritus, phytoplankton, and other zooplankton. They are preyed upon by fish, shellfish, whales, and other zooplankton.

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11.3 Index

Appendix I

SSC's Recommendations on ABCs for the Northeast Multispecies Fishery

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New England Fishery Management Council
50 WATER STREET | NEWBURYPORT, MASSACHUSETTS 01950 | PHONE 978 465 0492 | FAX 978 465 3116
John Pappalardo, *Chairman* | Paul J. Howard, *Executive Director*

To: Paul J. Howard, Executive Director
From: Steve Cadrin, Chairman, Scientific and Statistical Committee
Date: September 20, 2010

Subject: **Acceptable Biological Catch Recommendations for Pollock, Georges Bank Yellowtail Flounder, Southern Windowpane Flounder, Northern Windowpane Flounder, Ocean Pout and Gulf of Maine Winter Flounder**

The Scientific and Statistical Committee (SSC) was asked to:
1) Consider the pollock assessment results of the 50th Stock Assessment Workshop (SAW50) and provide the Council FY 2011 – 2014 Acceptable Biological Catch (ABC) recommendations consistent with the interim control rules adopted in Amendment 16 and the following levels of risk:
    a. An ABC that has approximately a 40 percent probability of overfishing (i.e. less than a median risk of overfishing) in any single year for FY 2011 – FY 2014.
    b. An ABC that has approximately a 10 percent probability of overfishing in any single year for FY 2011 – FY 2014.
    c. Low risk that the stock will be overfished during FY 2011 – FY 2014.
2) Review Gulf of Maine winter flounder catches for 2009 and additional survey information collected since the 3rd Groundfish Assessment Review Meeting (GARM III) and evaluate whether this information affects the current ABC recommendation. If so, provide an updated ABC recommendation for fishing years 2011 – 2012.
3) Review the 2010 assessment of Georges Bank yellowtail flounder from the 2010 Transboundary Resources Assessment Committee (TRAC) and recommend ABCs for the fishing mortality that is consistent with the following rebuilding strategies under Council consideration:
    a. Rebuild by 2014 with a 75 percent probability of success (this is current approved rebuilding strategy and must be considered as the No Action alternative).
    b. Rebuild by 2016 with a 50 percent probability of success.
    c. Rebuild by 2016 with a 60 percent probability of success.
    d. Rebuild by 2016 with a 75 percent probability of success.
4) Review additional survey information, if available, and recommend revised 2011-2012 ABCs for ocean pout, as well as northern and southern windowpane flounder, as appropriate.

On August 25-26, 2010 the SSC reviewed the following information and associated presentations developed by the Groundfish Plan Development Team (PDT), SAW50, GARM III, and the 2010 TRAC for groundfish species:
1. Terms of Reference Memo to the SSC from Paul Howard.
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3. Northeast Fisheries Science Center. 2010. 50th Northeast Regional Stock Assessment Workshop (50th SAW): Assessment Summary Report. NEFSC Ref. Do. 10-09.
4. NEFSC 2010. 50th Northeast Regional Stock Assessment Workshop: (50th SAW) Assessment Report.

5. O'Boyle, Robert. 2010. SARC 50 Panel Summary Report.
6. Bell, Michael C. 2010. 50th Northeast Regional Stock Assessment Workshop (50th SAW): reviewer comments.
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9. Wheeler, John P. 50th Northeast Regional Stock Assessment Workshop (50th SAW): reviewer comments.
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11. Transboundary Resource Assessment Committee. 2010. Georges Bank Yellowtail Flounder: TRAC Status Report 2010/03.
12. Assessment of GB Yellowtail Flounder for 2010. TRAC Ref. Doc. XX-XX. When published, will be available at: http://www2.mar.dfo-mpo.gc.ca/science/TRAC/rd.html
13. Northeast Fisheries Science Center. 2008. Report of the 3d Groundfish Assessment Review Meeting (GARM III): O.: Ocean Pout. NEFSC Ref. Doc. 08-16.
14. Northeast Fisheries Science Center. 2008. Report of the 3d Groundfish Assessment Review Meeting (GARM III): P.: Gulf of Maine/Georges Bank Windowpane Flounder. NEFSC Ref. Doc. 08-16.
15. Northeast Fisheries Science Center. 2008. Report of the 3d Groundfish Assessment Review Meeting (GARM III): Q.: Southern New England/Mid-Atlantic Bight Windowpane Flounder. Gulf of Maine Winter Flounder. NEFSC Ref. Doc. 08-16.
16. Groundfish PDT memo dated July 13, 2009: Groundfish ABCs/OFLs
17. Groundfish PDT memo dated August 7, 2009: Groundfish ABCs/OFLs

<u>Pollock</u>
A new benchmark stock assessment was developed for pollock by SAW50. Pollock was previously assessed using a survey index method by GARM III in 2008 and was determined to be overfished and subject to overfishing. In 2009, the SSC established the ABC for fishing years 2010–2012 by applying 75%F_{MSY} to the most recent 3-year average survey estimate of exploitable stock biomass. The SAW50 assessment is based on an age-structured model, and stock status was revised to not overfished and overfishing not occurring.

The SSC endorses the SAW50 Review Panel's recommendation to accept the revised assessment of pollock as a basis for revising ABC recommendations. However, there were considerable uncertainties in the assessment, an important one being the apparent partial selection of larger and older pollock by the fisheries and surveys (termed 'dome-shaped selectivity'). A domed-shaped selectivity implies that there are fish in the population that are not available to either the fishery or the survey. This could be due to larger Pollock out swimming the survey and fishing gears or to them being in untrawlable or untrawled areas. As a result of the domed - shaped selectivity, only 39% of total stock biomass in 2009 is exploitable, and 61% of total stock biomass is not vulnerable to the fishery. A sensitivity analysis that assumed complete survey retention of large, old pollock (termed 'flat-topped selectivity') resulted in lower biomass estimates and suggests that uncertainty associated with selectivity is greater than statistical estimates of imprecision. However the sensitivity analysis also indicated that the stock is not overfished.

Although sensitivity analyses provide a crude evaluation of uncertainty, they cannot be used to quantify probability of overfishing, as requested in the terms of reference. In June 2009, the SSC concluded that "*in the absence of better information on what an appropriate buffer should be between the OFL and the ABC, a relatively simple ABC and robust specification could be applied to all groundfish stocks, in all stages of rebuilding or long-term maintenance of optimum yield… ABC should be determined as the catch associated with 75% of F_{MSY}.*" The SSC noted that despite the major changes in stock assessment methods and the change in perception of stock status, the revised estimate of maximum sustainable yield (MSY) is similar to previous estimates.

Using projections from the SAW50 assessment at 75%F_{MSY}, the ABC recommendations are 16,900 mt in 2011; 15,400 mt in 2012 mt; 15,600 mt in 2013; and 16,000 mt in 2014. Scenario analyses indicate that ABCs based on 75%F_{MSY} have low risk of overfishing and low risk of leading to an overfished stock by 2015 if the domed survey selectivity estimated by the SAW50 assessment is true. However, if selectivity is actually flat-topped, ABCs based on the SAW50 assessment and 75%F_{MSY} have high risk of overfishing (risk>50%) and a moderate risk of leading to an overfished stock by 2015 (risk between 25% and 50%).

1. **The SSC recommends that Acceptable Biological Catch of pollock is 16,900 mt in 2011; 15,400 mt in 2012 mt; 15,600 mt in 2013; and 16,000 mt in 2014.**

<u>Gulf of Maine Winter Flounder</u>
In 2008, GARM III attempted to assess Gulf of Maine winter flounder but none of the alternative assessment models was accepted by the review panel. Panelists concluded that "*…it is highly likely that biomass is below B_{MSY}, and that there is a substantial probability that it is below ½ B_{MSY}.*" In 2009, the SSC recommended ABC based on 75% of the most recent three-year average catch (238 mt). In June 2010, the Council approved a motion to ask the SSC to examine any recent fisheries independent and fisheries dependent data collected since GARM III for Gulf of Maine winter flounder and to evaluate whether this new information would affect their current ABC recommendation for Gulf of Maine winter flounder.

Conflicting signals persist in the updated information provided by the PDT which continue to confound attempts to assess the Gulf of Maine winter flounder stock. The PDT developed an alternative approach to deriving ABC that is consistent with the ABC control rule for groundfish and which is based on survey data that have been used to assess Gulf of Maine winter flounder. Area-swept survey estimates of exploitable biomass suggest that the current ABC (238 mt) represents a more conservative exploitation rate than 75%F_{MSY}. The SSC concluded that an area-swept survey approach to deriving ABC may provide a better scientific basis for ABC than the current approach, which is based on recent average catch, and is appropriate for the uncertainties in the data and the possibility that the stock is overfished.

The SSC requested an evaluation by the PDT of candidate ABCs for 2011 based on area-swept survey biomass estimates, including a 75%F_{MSY} option and further exploration of survey data properties (e.g., confidence intervals, geographic distributions, inter-annual variability, trawl mensuration) to be considered by the SSC in November 2010. A benchmark assessment is scheduled for spring 2011, so any revision for ABC would be an interim until a peer-review assessment is developed.

2. **The SSC recommends that a revised interim Acceptable Biological Catch of Gulf of Maine winter flounder in 2011 that is based on area-swept survey biomass be considered.**

Georges Bank Yellowtail Flounder

Georges Bank yellowtail flounder was assessed by the TRAC in July 2010. Based on the new assessment and the rebuilding alternatives under consideration by the Council, the SSC was asked to review the ABC for this stock and recommend new ABCs consistent with the assessment and the fishing mortality that is consistent with the rebuilding strategies under consideration.

The 2010 TRAC assessment has a retrospective inconsistency in which recent estimates of stock size were revised downward approximately 40% when the analysis was updated with new data. Despite considerable uncertainties in the assessment and the systematic overestimation of stock size, the SSC endorses the 2010 TRAC estimates as the basis for ABC recommendations. The accepted assessment method for Georges Bank yellowtail flounder does not adjust for retrospective inconsistency. Using the 2010 TRAC assessment and projection methods, the stock cannot rebuild to B_{MSY} by 2014 with a 75% probability of success, even if ABC=0. An ABC of 1,998 would allow rebuilding to B_{MSY} by 2016 with 50% probability. Probability of successful rebuilding by 2016 is expected to increase to 60% if ABC is 1,486 mt and to 75% if ABC is 590 mt.

The inconsistency in estimates of recent stock size primarily results from over-estimating the abundance of the 2005 yearclass. The catches associated with rebuilding options have low probability of overfishing, even if recent overestimation of abundance continues. However, the expected rebuilding under these catch options may not be realized if overestimation continues. Similarly, if future recruitment is less than that assumed in the projections, then the expected rebuilding will not be realized. Estimates of recruitment for the last 30 years have been less than the median recruitment assumed in projections and the B_{MSY} estimate. Although there are uncertainties in the stock assessment and stock projections, the SSC concludes that these are insufficient to modify catch advice based on rebuilding scenarios. Although recent retrospective inconsistency is substantial, it may not continue if it was indeed associated with the 2005 year class. Concerns about recent recruitment affect both the short-term projections and the rebuilding target (B_{MSY}), so alternative assumptions of future recruitment would require re-estimation of B_{MSY}. Therefore the SSC recommends consideration of a revised estimate of B_{MSY} at the next benchmark assessment that accounts for lower recruitment in the last 30 years.

The Transboundary Management Guidance Committee (TMGC) concluded that the most appropriate Total Allowable Catch for the combined Canadian and USA fishery for Georges Bank yellowtail for the 2011 fishing year is 1,900 mt. This catch is expected to allow rebuilding in the short-term (10% increase in 2011), and result in a low risk of overfishing, even if the retrospective inconsistency persists.

3. **The SSC recommends that Acceptable Biological Catch for Georges Bank yellowtail in 2011 depends on the Council's desired rebuilding objectives:**
    a. **The current rebuilding strategy (rebuild by 2014 with a 75% probability of) requires that ABC=0 mt;**
    b. **rebuilding by 2016 with a 50% probability of success requires that ABC=1,998 mt;**
    c. **rebuilding by 2016 with a 60% probability of success requires that ABC=1,486 mt; and**
    d. **rebuilding by 2016 with a 75% probability of success requires that ABC=590mt.**
    e. **The rebuilding target, B_{MSY}, should be reconsidered by the next benchmark assessment to account for lower recruitment in the last 30 years.**

Index-Based Stocks

Ocean pout and the two windowpane flounder stocks are assessed using a trawl survey index. In 2009, the SSC recommended ABCs for 2010 to 2012 fishing years based on 75% of the F_{MSY} proxy applied to the most recent three-year average estimate of stock size and agreed to review these ABCs as new survey information became available. Updated surveys indicate approximately a 5% reduction in ocean pout and greater reductions for windowpane stocks. However, updated survey data are from the new Bigelow survey system, and conversions between the Albatross survey and the Bigelow survey are considered to be preliminary. More extensive evaluation of other flatfish species (e.g., Georges Bank yellowtail flounder) indicate that survey conversion factors should vary by fish length. Therefore the SSC does not recommend revising ABCs for index-based groundfish stocks.

4. The SSC recommendations that Acceptable Biological Catch for index-based groundfish stocks should not be revised.

New England Fishery Management Council
50 WATER STREET | NEWBURYPORT, MASSACHUSETTS 01950 | PHONE 978 465 0492 | FAX 978 465 3116
John Pappalardo, *Chairman* | Paul J. Howard, *Executive Director*

To: Paul J. Howard, Executive Director
From: Steve Cadrin, Chairman, Scientific and Statistical Committee
Date: September 20, 2010

Subject: **Acceptable Biological Catch Recommendations for Pollock, Georges Bank Yellowtail Flounder, Southern Windowpane Flounder, Northern Windowpane Flounder, Ocean Pout and Gulf of Maine Winter Flounder**

The Scientific and Statistical Committee (SSC) was asked to:

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    c. Low risk that the stock will be overfished during FY 2011 – FY 2014.
6) Review Gulf of Maine winter flounder catches for 2009 and additional survey information collected since the 3rd Groundfish Assessment Review Meeting (GARM III) and evaluate whether this information affects the current ABC recommendation. If so, provide an updated ABC recommendation for fishing years 2011 – 2012.
7) Review the 2010 assessment of Georges Bank yellowtail flounder from the 2010 Transboundary Resources Assessment Committee (TRAC) and recommend ABCs for the fishing mortality that is consistent with the following rebuilding strategies under Council consideration:
    a. Rebuild by 2014 with a 75 percent probability of success (this is current approved rebuilding strategy and must be considered as the No Action alternative).
    b. Rebuild by 2016 with a 50 percent probability of success.

c. Rebuild by 2016 with a 60 percent probability of success.
d. Rebuild by 2016 with a 75 percent probability of success.

8) Review additional survey information, if available, and recommend revised 2011-2012 ABCs for ocean pout, as well as northern and southern windowpane flounder, as appropriate.

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Georges Bank yellowtail flounder was assessed by the TRAC in July 2010. Based on the new assessment and the rebuilding alternatives under consideration by the Council, the SSC was asked to review the ABC for this stock and recommend new ABCs consistent with the assessment and the fishing mortality that is consistent with the rebuilding strategies under consideration.

The 2010 TRAC assessment has a retrospective inconsistency in which recent estimates of stock size were revised downward approximately 40% when the analysis was updated with new data. Despite considerable uncertainties in the assessment and the systematic overestimation of stock size, the SSC endorses the 2010 TRAC estimates as the basis for ABC recommendations. The accepted assessment method for Georges Bank yellowtail flounder does not adjust for retrospective inconsistency. Using the 2010 TRAC assessment and projection methods, the stock cannot rebuild to B_{MSY} by 2014 with a 75% probability of success, even if ABC=0. An ABC of 1,998 would allow rebuilding to B_{MSY} by 2016 with 50% probability. Probability of successful rebuilding by 2016 is expected to increase to 60% if ABC is 1,486 mt and to 75% if ABC is 590 mt.

The inconsistency in estimates of recent stock size primarily results from over-estimating the abundance of the 2005 yearclass. The catches associated with rebuilding options have low probability of overfishing, even if recent overestimation of abundance continues. However, the expected rebuilding under these catch options may not be realized if overestimation continues. Similarly, if future recruitment is less than that assumed in the projections, then the expected rebuilding will not be realized. Estimates of recruitment for the last 30 years have been less than the median recruitment assumed in projections and the B_{MSY} estimate. Although there are uncertainties in the stock assessment and stock projections, the SSC concludes that these are insufficient to modify catch advice based on rebuilding scenarios. Although recent retrospective inconsistency is substantial, it may not continue if it was indeed associated with the 2005 year class. Concerns about recent recruitment affect both the short-term projections and the rebuilding target (B_{MSY}), so alternative assumptions of future recruitment would require re-estimation of B_{MSY}. Therefore the SSC recommends consideration of a revised estimate of B_{MSY} at the next benchmark assessment that accounts for lower recruitment in the last 30 years.

The Transboundary Management Guidance Committee (TMGC) concluded that the most appropriate Total Allowable Catch for the combined Canadian and USA fishery for Georges Bank yellowtail for the 2011 fishing year is 1,900 mt. This catch is expected to allow rebuilding in the short-term (10%

increase in 2011), and result in a low risk of overfishing, even if the retrospective inconsistency persists.

7. **The SSC recommends that Acceptable Biological Catch for Georges Bank yellowtail in 2011 depends on the Council's desired rebuilding objectives:**
    a. **The current rebuilding strategy (rebuild by 2014 with a 75% probability of) requires that ABC=0 mt;**
    b. **rebuilding by 2016 with a 50% probability of success requires that ABC=1,998 mt;**
    c. **rebuilding by 2016 with a 60% probability of success requires that ABC=1,486 mt; and**
    d. **rebuilding by 2016 with a 75% probability of success requires that ABC=590mt.**
    e. **The rebuilding target, B_{MSY}, should be reconsidered by the next benchmark assessment to account for lower recruitment in the last 30 years.**

Index-Based Stocks

Ocean pout and the two windowpane flounder stocks are assessed using a trawl survey index. In 2009, the SSC recommended ABCs for 2010 to 2012 fishing years based on 75% of the F_{MSY} proxy applied to the most recent three-year average estimate of stock size and agreed to review these ABCs as new survey information became available. Updated surveys indicate approximately a 5% reduction in ocean pout and greater reductions for windowpane stocks. However, updated survey data are from the new Bigelow survey system, and conversions between the Albatross survey and the Bigelow survey are considered to be preliminary. More extensive evaluation of other flatfish species (e.g., Georges Bank yellowtail flounder) indicate that survey conversion factors should vary by fish length. Therefore the SSC does not recommend revising ABCs for index-based groundfish stocks.

8. **The SSC recommendations that Acceptable Biological Catch for index-based groundfish stocks should not be revised.**

Appendix II

Groundfish Plan Development Team (PDT)

Development of Annual Catch Limits (ACLs)

for

2011 to 2014

I. Document Purpose:

Pursuant to Amendment 16, this PDT document describes pertinent information regarding the development of ACLs for the 2010 to 2012 specification period.

II. Background:

The ACLs were developed based upon the Science and Statistical Committee's (SSC) recommended Acceptable Biological Catch (ABC) for 2010 to 2012, and in accordance with the draft Amendment 16 "Administrative Process for Setting Multispecies ACLs". The focus of this discussion is the consideration of management uncertainty, but is built upon the recommendations of the SSC and the previous work of the PDT (August 7, 2009 Memorandum from PDT to SSC; July 13, 2009 Memorandum from PDT to SSC).

III. Abstract:

From the single recommended ABC values for each stock, ACLs were calculated in a two step process: (1) The division of the ABC into fishery components, and (2) downward adjustment of components to account for management uncertainty. The division of the ABC into subcomponents is based upon Amendment 16 allocation decisions, and percentages assigned by the PDT that reflect anticipated groundfish and non-groundfish fisheries (in order to categorize and account for all sources of fishing mortality). A working concept of management uncertainty was created to facilitate discussions, and qualitative elements with which to evaluate management uncertainty defined. A common default percentage reduction of the ABC subcomponent was set (5 %) to account for management uncertainty, and then particular stocks or stock/subcomponent combinations were identified that should have a higher or lower percentage reduction (based upon the defined elements of management uncertainty).

IV. Details:

Subdivision of ABC into subcomponents.

Amendment 16 contains the percentage splits of the ABC among fishery subcomponents (i.e. commercial and recreational), which are not intended to be subject to modification by the PDT. Other subdivisions of the ABC are recommendations of the PDT, made in conjunction with the development of ACLs, based upon pertinent fishery information and, in consultation with pertinent Council committees. For example, there may be calculations for Canada catch, state "off-the-top" subtraction, non-specified fisheries, herring fishery, scallop fishery, groundfish common pool, groundfish private recreational, groundfish charter/party, and U.S./Canada. Further information on the proposed subcomponents are in the September 14, 2009 memorandum from the PDT to the Groundfish Committee.

Create a simplified working concept of management uncertainty and identify qualitative elements of management uncertainty.

Management uncertainty is the likelihood that management measures will result in a level of catch $\geq$ catch objective. The *effectiveness* of management measures is a useful term that is related to management uncertainty (lower effectiveness of management measures results in greater management uncertainty, i.e., greater likelihood that measures will result in a catch that exceeds the catch level objective). The national standard guidelines state that two sources of management uncertainty should be accounted for: (1) Uncertainty in the ability of managers to constrain catch so the ACL is not exceeded; and (2) uncertainty in quantifying the true catch amounts (i.e., estimation errors). The purpose of setting an ACL(s) is to prevent catch from exceeding the ABC.

> The principal <u>elements</u> relating to management uncertainty that may be considered are the following:
>
> **Enforceability** - Can the management measures be effectively enforced at sea or on land through the use of uniform and unambiguous criteria that can be easily complied with by fishery participants?
> **Monitoring Adequacy -** Timeliness **–** Are all relevant data collected, recorded, and made available shortly after completion of fishing operations? Completeness **–** Is all information related to all aspects of fishing operations and relevant to management of the fishery (e.g., kept catch, discards, landings, species composition, amount/type/size of gear used, area fished, effort expended, etc.) collected and recorded? Accuracy **–** Does the information collected correctly reflect fishing operations (e.g., area fished, species and amounts kept/discarded, days-at-sea fished, etc.) or is verifiable and/or automated in order to minimize the possibility of data entry errors?]
> **Precision** - Can the management tools be used in a manner that will result in the desired amount of catch, or is there an inherent weakness or imprecision to the tool (complexity of FMP, no mechanism to slow or stop fishing effort, etc). Are there other factors that are pertinent to determining the effectiveness of management measures?
> **Latent Effort –** Is there excessive latent fishing effort in the FMP that could be reactivated and undermine effectiveness of FMP, or is the latent effort eliminated or controlled (e.g., Category C DAS)?
> **Other Fishery Catch –** Can the FMP regulate or limit catch of groundfish by other fisheries, including state, exempted, and recreational fisheries? Is the level of such catch highly variable, stable, or of a deminimus nature?

Set a default percentage reduction of the ABC to account for management uncertainty for most stocks, and identify relative uncertainty among stocks and stock/fishery components.

The PDT discussion focused on two aspects of accounting for management uncertainty: (1) Distinguishing relative amounts of management uncertainty between stocks, and stock/fishery component combinations, and (2) Determining the appropriate percentage adjustment of the ABC.

<u>Distinguishing relative amounts of management uncertainty between stocks and stock/fishery component combinations</u>:
This evaluation includes determining whether particular stock and fishery segment combination are associated with greater or lesser management uncertainty than others (e.g., sector GOM cod versus common pool GOM cod, versus private recreational vs party/charter). Most stocks and segments of the fishery will be categorized identically with respect to management uncertainty due to the common management measures applied to many stocks and/or a current lack of information to assign management uncertainty with more precision, and be assigned a standard percentage reduction from the ABC. If a particular stock or fishery segment may be subject to notable uncertainty, then an alternate adjustment from the ABC would apply to account for notable uncertainty (relatively high or low management uncertainty).

For this initial development of ACLs, for most stocks and stock/fishery component combinations it is difficult to predict whether there will be meaningful differences in management uncertainty among such components. Management measures for vessels fishing in either the common pool or sectors will be substantially different from the status quo management measures. Furthermore, the number of permits that will actually participate in sectors, and the number that will remain in the common pool, will not be known until just prior to the start of the fishing year. Amendment 16 analysis indicates that for most stocks, measures will achieve the desired fishing mortality goals. Due to the substantive changes in management measures in the future, analysis of historic performance of fishery management measures is of limited use for predicting future management uncertainty at this time.

In most cases there is no strong evidence that justifies a conclusion that different stocks or stock/fishery components have different management uncertainty. For example, evaluating whether the management uncertainty associated with the common pool versus sectors: Although there is the hypothesis that the sector management regime of Amendment 16 will result in the more effect control of catch (as well as more efficient fishing operations, approaching optimal yield, etc), that system will be new, and the level of management uncertainty associated with that system may not be substantively different from the common pool. The success of sectors will depend upon many novel fishing behaviors, organizations, monitoring systems etc. Not-withstanding the limitation of current data, the PDT did evaluate past catch information in order to glean insights into the fishery as a whole.

Comparisons were made between recent catches and target TACs (TTACs), using a calendar year basis since that is how mortality is calculated: since Amendment 13, 87 TTACs have been specified and 9 have been exceeded. Since the amendment was in effect for a full calendar year (e.g. since 2005), the SNE/MA yellowtail flounder TTAC was exceeded three times (2006, 2007, 2008), white hake was exceeded in 2008, and GB yellowtail flounder was exceeded in 2007. While these comparisons suggest the management system generally controlled catches, fishing mortality still exceeded targets, and measures were designed to achieve mortality targets, not to attain a particular catch. In addition to past management uncertainty (due to various elements of the FMP), scientific uncertainty also was relevant to historic catch levels. It is impossible to parse out the relative roles of scientific and management uncertainty in evaluating past catch levels. For that reason, comparisons of historic catch to TTAC are not particularly useful in providing guidance on estimating management uncertainty.

After various fishery-dependant data from the 2010 fishing year has been compiled and analyzed, it is more likely that evidence of differences in the elements of management uncertainty among components of the fishery could be used to further distinguish management uncertainty. It is anticipated that future ACL specification cycles may be able to better distinguish management certainty among stocks or stock/fishery components. Although it is conceivable that adjustments to ACLs prior to the next specification cycle may be desired, it may be difficult to make such adjustments due to the time required to analyze data and implement modified ACLs.

Determining the appropriate percentage adjustment of the ABC:
The amount of adjustment of the ABC was the second topic. One theoretical method discussed was to base the amount of adjustment down from ABC based upon the consequences of exceeding the ABC. Based upon a particular amount of catch in excess of the ABC, and the resultant impact on future catch levels, the ACL could be determined. This method was not pursued because it would have been based upon an assumed amount of overage for each stock. For the reasons discussed above, it is very difficult to determine the appropriate assumptions. A similar rationale for GB haddock was discussed that would have set management uncertainty to close to zero, based on the fact that it is highly unlikely that catch will approach ABC, given the stock size and multiple aspects of the FMP and fishery that will constrain haddock catch. It was concluded however that this approach, based on stock status and the nature of the fishery, was more of a risk assessment evaluation that would be difficult to apply across all stocks.

A third approach discussed briefly by the PDT was the use of a discard rate or observer coverage rate as a numerical basis upon which to derive management uncertainty, particular for sectors. This approach is rooted in the assumption that management uncertainty for sectors (fishing under hard TACs) will be closely related to the ability of managers to accurately monitor the fishery catch. Specifically, accurate monitoring will relate to both the amount of illegal and/or under-reported discards, and the level of observers or at-sea monitors in the fishery. This method, although logical, would rely heavily upon untested assumptions.

The PDT recommendation of a five percent adjustment for management uncertainty as a default was based upon several factors. The adjustment should be meaningful, and serve the function of a buffer, so that if the management measures and monitoring of the catch result in excessive catch, the catch will not exceed the ABC. Arguably, an adjustment in the ABC of only one or two percent may not serve its purpose, given the FMP uncertainties previously discussed. Secondly, five percent is within the range of uncertainty attributed to the closed area model (10%), used to analyze the effectiveness of most of the management measures. Notwithstanding the uncertainties of the FMP, a default percentage of greater than five percent is not warranted, given the more restrictive management measures proposed (compared to status quo), the Amendment 16 analysis, and the recent levels of fishing mortality, many of which are at historic lows.

The PDT next considered deviations from the default. Ideally, any deviations should be tailored to the management history of individual stocks, but as already noted there is limited information with which to base such differences. The PDT decided to recommend a standard adjustment for stocks with less uncertainty of 3 percent, setting the ACL at 97 percent of the ABC. Fro stocks with more uncertainty, the PDT originally recommended a standard adjustment of 10 percent, setting the ACL at 90 percent of the ABC. The Council noted, however, that there was no justification presented by the PDT to justify a larger adjustment for stocks with more uncertainty than is used for stocks with less uncertainty and directed the PDT to us an adjustment of 7 percent.

Analyze individual stocks in the context of the FMP for *elements* of management uncertainty to determine if particular stocks will be subject to more or less uncertainty than most.

Georges Bank yellowtail flounder

Georges Bank yellowtail flounder has been managed under a hard TAC in the context of the U.S./Canada Management Area rules since 2004. The Regional Administrator has the authority to modify management measures in-season (including trip limits, closures, days-at-sea, trips, and gear) in order to prevent both over-harvest and under-harvest of the TAC. The incorporation of in-season adjustment capability in the FMP is essentially an in-season accountability measure, and provides a relatively high level of *management precision*. Of the five completed fishing years since 2004, the TAC was only exceeded once (FY 2007, total catch was 9% over TAC). The principal reason for that overage was due to reporting and monitoring delays. Since that time, NMFS implemented changes to the monitoring procedures that will reduce the likelihood that *monitoring adequacy* will contribute to a TAC overage. For these reasons, the management uncertainty for GB yellowtail flounder is less than the fishery-wide uncertainty, and an adjustment of 3% is recommended.

Southern New England (SNE) Yellowtail Flounder

As discussed above, although there are limitations to the utility of historic information in assessing management uncertainty, the PDT considered historical catch patterns for this stock as relevant. That the catch of this stock exceeded the target TAC three times since 2004 is of concern. For fishing years 2006, 2007, and 2008, the catch to TAC ratio was 2.53, 1.86, and 1.62, respectively. The *management precision* of the FMP with respect to SNE yellowtail flounder has been relatively low historically. Secondly, there are higher discard rates of this stock than many other groundfish stocks, including *discards from other fisheries* such as fluke and scallop. For these reasons, the PDT concluded that the stock has greater management uncertainty than the fishery wide level, and an adjustment of 7% is recommended.

Gulf of Maine Haddock and Gulf of Maine Cod (Recreational sub-ACLs)
The proportional standard errors (pse) associated with the recreational data for these stocks is approximately 10%, and there is consensus that the *monitoring adequacy* of the recreational fishery is less than that associated with the commercial fishery. For these reasons, the PDT concluded that the fishery sub-components for these stocks have greater management uncertainty than the fishery wide level, and an adjustment of 7% is recommended.

SNE winter flounder, windowpane north, windowpane south, ocean pout, and Atlantic wolfish: These stocks either need significant reductions in fishing mortality or continued low levels of fishing mortality. Newly proposed management measures such as the restricted gear areas for the common pool, prohibitions on retention, and expanded sector management as well as the difficulty in achieving high *monitoring adequacy* of stocks that are either not targeted and/or encountered in low numbers, combine to create a situation where there is less *management precision* and greater management uncertainty. For these reasons, the PDT concluded that these stocks have greater management uncertainty than the fishery wide level, and an adjustment of 7% is recommended.

Gulf of Maine Haddock and GB Haddock Sub-Components for the Herring Fishery
The herring fishery is allocated .2 percent of the “TAC” for these haddock stocks. Although there is a haddock monitoring system in place in the herring fishery, the system was not designed to distinguish one haddock stock from another. Due to this weakness in the *monitoring adequacy* the PDT concluded that these ACL-subcomponents should be subject to the 7% adjustment.

Yellowtail Flounder Sub-Component for the scallop fishery
For FY 2010, there will be no downward adjustment of the yellowtail founder sub-component for scallop fishery (3 stocks of yellowtail). For future years, the downward adjustment may depend on the specific AMs adopted. Further work is needed on this issue, including whether the adjustment should be determined by the scallop or groundfish FMPs.

Appendix III

Calculation of Northeast Multispecies Annual Catch Limits, FY 2011 - FY 2014

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This appendix documents the calculation of Northeast Multispecies Overfishing Levels (OFLs), Acceptable Biological Catches (ABCs), and Annual Catch Limits (ACLs) for FY 2010 - FY 2014 that are implemented in Framework Adjustment 45. The general approach for all stocks is to first determine the OFL, then determine the ABC. The ABC is distributed to various components of the fishery, and then an adjustment is made to these "sub-ABCs" to determine the ACLs, sub-ACLs, or other sub-components.

In this management action, new OFLs/ABCs/ACLs are proposed for GB yellowtail flounder and pollock because of the completion of updated assessments. In addition, revised US/Canada area TACs modified the U.S. ABCs and ACLs for GB cod and GB haddock. White hake OFLs/ABCs/ACLs were republished without change in order to correct an error published in the *Federal Register*. This appendix only describes the calculations for these stocks. For other stocks, please see Appendix III to FW 44.

This action sets OFLs/ABCs/ACLs for different time periods. Pollock values are set for the period FY 2011 – 2014. Pollock specifications will be revisited in FY 2013 with all other groundfish stocks, placing this stock on the same adjustment schedule as other stocks. GB yellowtail flounder is set for FY 2011 – 2012; this stock is assessed each year by the TRAC and the specifications will be revisited in FY 2011.

Determining OFL and ABC

Stocks with Age-Based Assessments and Projections

Catch levels (including OFLs, ABCs, and ACLs) for the following stocks are based on age-based projections:

GB cod
GB haddock
GB yellowtail flounder
White Hake
Pollock

For most stocks, the projections were performed using the Northeast Fisheries Science Center's (NEFSC) AGEPRO projection model; the exception is white hake which used a projection model developed by SCAA/ASP. For GB cod, GB haddock, and white hake the most recent assessment was completed in GARM III (NEFSC 2008), and the terminal year in the assessment is 2007. GB yellowtail flounder was assessed by the Transboundary Resource Assessment Committee (TRAC) in 2010, with a terminal year of 2009. Pollock was assessed by the Stock Assessment Review Committee (SARC) in 2010 with a terminal year of 2009.

There are a number of assumptions that must be made to complete the projections. All of these assumptions are potential sources of error. The assumptions for recruitment, selectivity, and weights-at-age, and other initial conditions that were used were those recommended by the GARM and TRAC review panels.

For GB cod, GB haddock, and white hake, since the first year for ACLs is 2010 an additional assumption must be made in the projections for the years between the terminal year and 2010. For the assessments with a terminal year of 2007, an estimate of 2008 catch developed by the NEFSC was input into the projection model. While these catches were calculated using the same techniques as were used by GARM III, the values have not been subject to a peer review and could be modified in the future when an assessment is completed. The 2008 catches used are shown in Table 3.

For GB Cod, GB haddock, ad white hake, the catch assumption for 2009 was based on an estimate of 2009 fishing mortality. This estimate was developed after considering the expected impacts of the Northeast Multispecies interim action that was implemented May 1, 2009. For most stocks, the expected change in exploitation predicted to result from the interim action were applied to the 2008 mortality that results from the updated 2008 catch to get an estimate of the 2009 mortality. An exception was made for two stocks affected by the U.S./Canada Resource Sharing Understanding. The first exception is for GB haddock. The interim action analysis could not reliably predict GB haddock mortality because much of the catch comes from the Canadian fishery in recent years and this is not affected by U.S. management measures. The Canadian fishery has nearly harvested its TAC in recent years, so the 2009 TAC of 19,000 mt was assumed caught. The 2009 U.S. catch was assumed to be the same as the 2008 catch of 6,000 mt. Total 2009 GB haddock catch assumed was 25,000 mt. The 2009 catch assumption is not as critical for this stock since recent catches are well below catch projections for future years. The second exception is for Atlantic halibut. The 2009 catch was assumed to be 100 mt, a 40 percent increase from the four year average catch but only a 20 percent increase from the 2007 catch. An increase seems warranted since the Canadian TAC is increasing by 15 percent from 2008 to 2009 (only a small portion of this TAC is taken from the stock area used in the U.S. assessment).

For GB yellowtail flounder, the terminal year is 2009 and an assumption for catch is needed for 2010. For GB yellowtail flounder, consistent with the approach of the TRAC, the catch in 2010 was assumed to be the combined U.S. and Canadian quotas of 1,956 mt.

For pollock the ABC is being calculated for 2011 and beyond and the terminal year of the assessment is 2009; an assumption must be made for the catch in 2010 (the “bridge” year). In the past, the PDT has estimated annual catch for the bridge year using at least six or seven months of preliminary landings data. These landings were expanded to the full year based on the proportion of landings that occurred during the six or seven month period in previous years. This approach is not possible this year for two reasons. First, the preliminary landings data has not been published by NERO. Second, the implementation of sectors on May 1, 2010, creates doubt over whether past temporal landings patterns will persist.

Because of this uncertainty over estimating the 2010 catch the PDT examined the sensitivity of the 2011 ABC to the 2010 catch assumption. As shown in Figure 1 and Table 1, the 2011 catch at 75 percent of F_{MSY} is not very sensitive to the 2010 catch assumption. Catching only half the ABC in 2010 increases the 2011 catch by only 9 percent, and increases the 2011 SSB_{MSY} by only 7 percent. Given the insensitivity of the projection to the 2010 catch assumption, the PDT used the catch at 75 percent of F_{MSY} for 2010 (19,839 mt) for the short term projections. This is a conservative assumption by the PDT as pollock catches have not exceeded 12,200 mt since 1989.

Figure 1 – Pollock projection sensitivity to 2010 catch assumption.

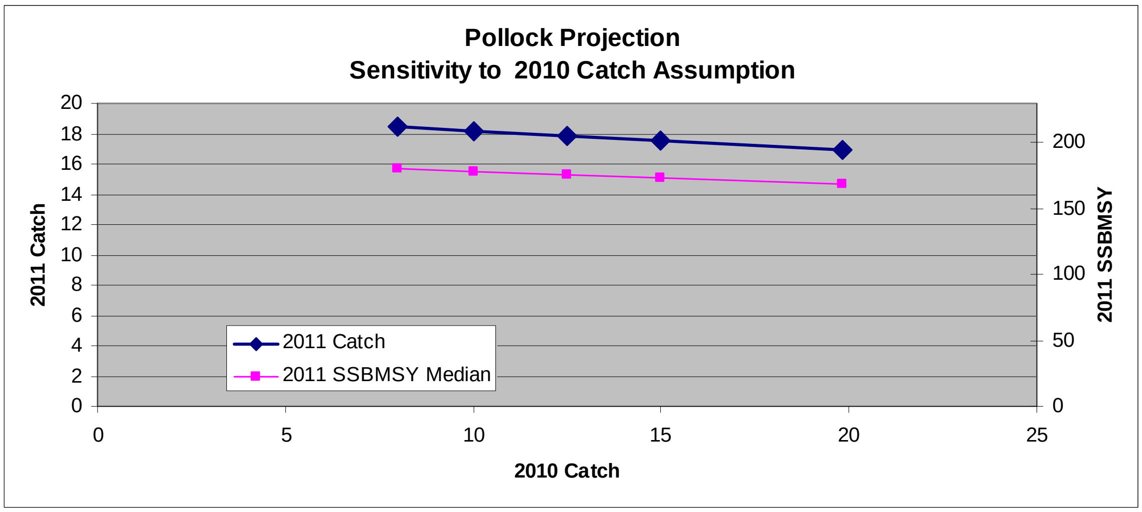

Table 1 – Pollock projection sensitivity to 2010 catch assumption

2010 F	2010 Catch (K mt)	% Change from 19.8K mt	2011 Catch at 75% FMSY	% Change from 16.9K mt	2011 SSBMSY	% change from 168.273
0.31	19.839		16.914		168.273	
0.23	15	-24.4%	17.525	3.7%	173.118	2.9%
0.19	12.5	-37.0%	17.841	5.5%	175.58	4.3%
	10	-49.6%	18.162	7.4%	178.045	5.8%
0.119	8	-59.7%	18.419	9.0%	180.02	7.0%

When calculating the OFL in future years, F_{MSY} is used as the fishing mortality in the projection. An iterative approach is used where the ABC is input as the catch in year 1 to determine the OFL for year 2, etc. When calculating the ABC, either 75% of F_{MSY} or Frebuild is used (whichever is lower; this is consistent with the ABC control rules recommended by the Science and Statistical Committee (SSC) and adopted in Amendment 16).

Mortality targets used for setting ABCs are shown in Table 4. Projection output used for setting ABCs is in Appendix IV for GB yellowtail flounder and pollock. Since the OFLs and ABCs for GB cod, GB haddock, and white hake have not been changed, please see Appendix IV of FW 44 for the relevant projection output.

Distribution of ABCs

Because the Council wants the ability to consider a different adjustment for management uncertainty for different components of the fishery, ABCs were first distributed to the components prior to applying the management uncertainty adjustment in setting ACLs. In effect, this creates “sub-ABCs” for each stock. A brief description of the components follows:

ABC: Acceptable Biological Catch for the entire stock.

Canadian Share/Allowance: An amount from the stock that Canadian vessels are expected to harvest. For GB cod, GB haddock, and GB yellowtail flounder, this is based on the Canadian allocation under the TMGC (but see the GB yellowtail flounder discussion below). For other stocks with substantial Canadian catches this is based on an estimate of Canadian catch.

U.S. ABC: That portion of the ABC available to U.S. fishermen after accounting for Canadian harvests.

State waters: Portion of the U.S. ABC expected to be harvested from state waters, outside of the federal management plan.

Other sub-components: Portion of the U.S. ABC expected to be harvested by unidentified non-groundfish fishery components. These are not attributed to specific components because individual amounts are small.

Scallops: Portion of U.S. ABC either allocated to, or expected to be harvested by, the U.S. scallop fishery.

Groundfish: Portion of the U.S. ABC available to the groundfish fishery (including recreational and commercial vessels). This ABC has several sub-components:

Commercial: Portion of the U.S. ABC available to commercial vessels; this is further sub-divided into sector and common-pool portions.

Recreational: Portion of the U.S. ABC available to commercial vessels.

MWT: Portion of the ABC available to herring mid-water trawl vessels. Currently only applies to the two haddock stocks.

Table 5 summarizes the distribution of the U.S. ABC to the various sub-components, while Table 6 provides the resulting ABCs. Details for specific stocks are provided below.

a. GB cod: The Canadian fishery harvests a portion of the ABC as specified by the US/Canada Understanding; in FY 2011 the Canadian share is 850 mt. A similar percentage was assumed for FY 2012, though this may be changed next year by the TMGC. This is the only change from the ABC distribution in FW 44, but it affects the calculation of other elements.

b. GB haddock: The Canadian fishery harvests a portion of the ABC as specified by the US/Canada Understanding; in FY 2011 the Canadian share is 12,540 mt. A similar percentage was assumed for FY 2012, though this may be changed next year by the TMGC. This is the only change from the ABC distribution in FW 44, but it affects the calculation of other elements.

c. GB yellowtail flounder: The Canadian fishery harvests a portion of the ABC as specified by the US/Canada Understanding; in FY 2011 the Canadian share is 855 mt. A similar percentage was assumed for FY 2012, though this may be changed next year by the TMGC. There is no state waters component because the stock area does not include state waters. Five percent is considered an “other subcomponent” caught in other fisheries. As described in the framework text, there is an allocation to the scallop fishery that is based on an estimate of the amount the fishery is expected to harvest if the scallop yield is taken. These amounts were set in FW 44 and are not changed by this action.

d. Pollock: The 2009 ACL process for pollock described adjustments to the ABC as follows:

“h. Pollock: Recreational harvest increased to 912 mt in 2008, about 2.5 times the harvest from 2005 through 2007 and 24 percent of the ABC. Since 2001, about half of the recreational harvest has been from state waters. The PDT allowed 400 mt for recreational harvest, reflecting the approximate average amount harvested from 2003 through 2007. This value is split between state waters and the “other sub-components” category. Canadian catches in 2008 were 650 mt, but Canadian TACs are expected to decline on the order of 20 percent in 2010. The PDT allowed 520 mt for Canadian catches (80 percent of 2008).” (FW 44; NEFMC 2010). The NERO emergency action followed a similar approach, but used the percentages that result from the 2009 adjustments and applied them to the new ABC.

There are two changes to the assessment that affect the ABC and ACL calculations. First, Canadian catches are not included so there isn’t an adjustment for Canadian catch. Second, the assessment assumes 100 percent discard mortality of recreational pollock, so recreational catches are based on A+B1+B2, and not just harvest (A+B1) as in 2009.

Recreational catch (A+B1+B2) of pollock has averaged 1,008 mt for the period 2004 – 2009 (using assessment values; st. dev = 425 mt). The 2008 catch was more than double this average, at 1,867 mt, but this seems to have been an anomalous year. The recreational catch, on average, was 11.8 percent of the removals (range 8 percent t o 15.3 percent).

If the recreational catch allowance is based on recent catches, a value of 1,200 mt would be consistent with recent catches (2007-2009 average of 1,174 mt). If the recreational catch allowance is based on a percentage, 11.8 percent translates into 1,999 mt, a catch that has not been observed. An alternative might be to use the average plus one standard deviation, or 1,425 mt. The PDT agreed to use 1,200 mt based on the recent 2007-2009 average. It is important to note that this is not an explicit allocation, but it does affect the amount of catch available to the commercial fishery. Should recreational catch continue to exceed five percent of the removals the Council may consider a specific allocation to the recreational fishery.

On average, 50 percent of the recreational catch has been outside three miles. 600 mt of the estimated recreational catch will be assumed to come from state waters and 600 mt will be included in the “other subcomponents” in federal waters.

A NMFS analysis of commercial catches of pollock in state waters outside the FMP concluded that 2005 catches were less than one percent of the harvest. Total state waters pollock catch will be assumed to be 600 mt (recreational catch) plus one percent of the ABC.

Amendment 16 allows for 5 percent for “other subcomponents” in federal waters. The total will be 5 percent of the ABC plus an additional 600 mt for recreational catches.

To summarize the pollock adjustments:

The updated pollock assessment does not include Canadian catches so no adjustment is made to the ABC for Canadian catches. One percent of the ABC was allowed for commercial catches in state waters, and five percent was allowed for incidental catches by other fisheries in federal waters. The 2007-2009 average of recreational catch is 1,174 mt; this was rounded up to 1,200 mt. Half of this catch was added to the state waters sub-component and half was added to the federal waters other subcomponent.

ACLs

After the ABCs are distributed to the various components, they are adjusted for management uncertainty. As discussed in Appendix II, the default sets the ACL at 95 percent of the ABC. For stocks with less management uncertainty the ACL is set at 97 percent of the ABC; for stocks with more uncertainty it is set at 93 percent of the ACL. Adjustments are shown in Table 7. The rationale for deviation from 95 percent for specific stocks is provided below for GB yellowtail flounder. FW 44 describes the management uncertainty adjustments for GB cod, GB haddock, and white hake.

a. GB yellowtail flounder: The management uncertainty is less for this stock because this stock has been successfully managed with a hard TAC for several years and there are in-season AMs (Regional Administrator authority to modify in-season measures including trip limits, closures, gear restrictions, etc.). Therefore, the PDT set the ACL at 97 percent of the ABC. The same percentage is used for the scallop fishery in FY 2011 and FY 2012.

In addition to reducing the GB yellowtail flounder ABC for management uncertainty an additional adjustment is required in order to comply with the TACs established under the provisions of the U.S./Canada Resource Sharing Understanding. The total U.S. and Canadian catch for 2011 is 1,900 mt, slightly less than the ABC of 1,998 mt. When the ABC is distributed and management uncertainty adjustments are applied the result is a U.S. total ACL of 1,067.6 mt. The total U.S. ACL cannot exceed the TAC for the U.S., or 1,045 mt in FY 2011, so the U.S. ACL must be reduced by 23 mt. A proportional reduction is taken from the other sub-components and groundfish sub-ACLs; since the scallop sub-ACL specified in FW 44 was an amount this remains unchanged.

Table 2 – Adjustment to GB yellowtail flounder to comply with TMGC guidance

ABC	US ABC	Scallop ABC	Scallop ACL	Other Subc	Groundfish ABC	Groundfish ACL	Total US ACL
Before adjustment for TMGC guidance							
1998	1098.9	207	200.8	54.9	837.0	811.8	**1067.6**
After adjustment for TMGC guidance							
			200.8	53.5		790.7	**1045.0**

Incidental Catch TACs

Part of the commercial non-sector ACL is allocated to the incidental catch TACs that limit catches of stocks of concern in the Category B (regular) DAS program and certain SAPs. Table 8 and Table 9 are reproduced from Amendment 16, but remove pollock since that stock is no longer a stock of concern.

Table 3 – 2008 catch used in age-based projections

Stock	Actual 2008 Catch[1] Landings	Commercial discards[2]	Recreational Landings or Harvest[3]	Canada	Total 2008 Catch
GB Cod	3,207	366	32	1,529	5,134
GB Haddock	5,744	343		14,814	20,901
White Hake	1,876				1,876

Notes:

1. Actual 2008 catch as calculated by NEFSC in July 2009. These numbers are preliminary until incorporated into an assessment.

Table 4 – Mortality targets used to calculate ABCs, FY 2011 – 2014

Species	Stock	Basis for Target Fishing Mortality	Targeted Fishing Mortality	F_{msy}
Cod	**GB**	75% F_{MSY}	0.184	0.2466
Haddock	**GB**	75% F_{MSY}	0.26	0.35
Yellowtail Flounder	**GB**	Frebuild	0.138	0.254
White Hake	**GB/GOM**	Frebuild	0.084	0.125
Pollock	**GB/GOM**	75% F_{MSY}	0.31	F_{5-7}=0.25 (F_{FR7}=0.41)

Table 5 – Distribution of ABC to fishery components. Values in gray text may change in future as a result of US/CA negotiations. Sector PSC is based on preliminary sector rosters and may change.

Stock	Year	ABC	Canadian Share/ Allowance	US ABC	State Waters	Other Sub-Components	Scallops	Groundfish	Comm Groundfish	Rec Groundfish	Sector PSC	MWT
GB Cod	2011	5,616	850	4,766	0.01	0.04		0.95	0.95		0.96	
	2012	6,214	850	5,364	0.01	0.04		0.95	0.95		0.96	
GB Haddock	2011	46,784	12,540	34,244	0.01	0.04		0.948	0.95		0.98	0.002
	2012	39,846	10,830	29,016	0.01	0.04		0.948	0.95		0.98	0.002
GB Yellowtail	2011	1,998	855	1,099	0.00	0.05	0.188	0.762	0.76		0.97	
	2012	2,222	855	1,222	0.00	0.05	0.259	0.691	0.69		0.97	
White Hake	2011	3,295		3,295	0.01	0.04		0.95	0.95		0.98	
	2012	3,638		3,638	0.01	0.04		0.95	0.95		0.98	
Pollock	2011	16,900		16,900	0.05	0.09		0.87	0.87		0.96	
	2012	15,400		15,400	0.05	0.09		0.86	0.86		0.96	
	2013	15,600		15,600	0.05	0.09		0.86	0.86		0.96	
	2014	16,000		16,000	0.05	0.09		0.87	0.87		0.96	

Table 6 – Distribution of ABC to fishery components. Values in gray text may change in future as a result of US/CA negotiations.

Stock	Year	ABC	Canadian Share/ Allowance	US ABC	State Waters	Other Sub-Compo-nents	Scallops	Groundfish	Comm Groundfish	Rec Groundfish	Sector PSC	Non-Sector	MWT
GB Cod	2011	5,616	850	4,766	48	191	0	4,528	4,528	0	4,347	181	0
	2012	6,214	850	5,364	54	215	0	5,096	5,096	0	4,892	204	0
GB Haddock	2011	46,784	12,540	34,244	342	1,370	0	32,463	32,463	0	31,814	649	68
	2012	39,846	10,830	29,016	290	1,161	0	27,507	27,507	0	26,957	550	58
GB Yellowtail	2011	1,998	855	1,099	0	55	207	837	837	0	812	25	0
	2012	2,222	855	1,222	0	61	317	844	844	0	819	25	0
White Hake	2011	3,295		3,295	33	132	0	3,130	3,130	0	3,068	63	0
	2012	3,638		3,638	36	146	0	3,456	3,456	0	3,387	69	0
Pollock	2011	16,900		16,900	769	1,445	0	14,686	14,686	0	14,099	587	0
	2012	15,400		15,400	754	1,370	0	13,276	13,276	0	12,745	531	0
	2013	15,600		15,600	756	1,380	0	13,464	13,464	0	12,925	539	0
	2014	16,000		16,000	760	1,400	0	13,840	13,840	0	13,286	554	0

Table 7 – ACL adjustments

Stock	Year	State Waters	Other Sub-Components	Scallops	Groundfish	Comm/Non_Sector Groundfish	Rec Groundfish	Sector PSC	MWT
GB Cod	1	1	1	0.95	0.95	0.95	0.95	1	1
	1	1	1	0.95	0.95	0.95	0.95	1	1
GB Haddock	1	1	1	0.95	0.95	0.95	0.95	0.93	1
	1	1	1	0.95	0.95	0.95	0.95	0.93	1
GB Yellowtail	1	1	0.97	0.97	0.97	0.95	0.97	1	1
	1	1	0.97	0.97	0.97	0.95	0.97	1	1
White Hake	1	1	1	0.95	0.95	0.95	0.95	1	1
	1	1	1	0.95	0.95	0.95	0.95	1	1
Pollock	1	1	1	0.95	0.95	0.95	0.95	1	1
	1	1	1	0.95	0.95	0.95	0.95	1	1
	1	1	1	0.95	0.95	0.95	0.95	1	1
	1	1	1	0.95	0.95	0.95	0.95	1	1

Table 8 – Proposed incidental catch TACs for major stocks of concern (mt). TACs are for the fishing year. TACs shown are metric tons, live weight. Note: GB cod and GB yellowtail flounder TAC is determined annually and cannot be estimated in advance. Values are dependent on ACLs, which have not yet been determined.

	Percentage of ACL
GB cod	Two
GOM cod	One
GB Yellowtail	Two
CC/GOM yellowtail	One
SNE/MA Yellowtail	One
Plaice	Five
Witch Flounder	Five
SNE/MA Winter Flounder	One
GB Winter Flounder	Two
White Hake	Two

Table 9 - Proposed allocation of incidental catch TACs for major stocks of concern to Category B DAS programs (shown as percentage of the incidental catch TAC)

	Category B (regular) DAS Program	CAI Hook Gear SAP	Eastern US/CA Haddock SAP	Southern CAII Haddock SAP
GOM cod	100%	NA	NA	
GB cod	50%	16%	34%	
CC/GOM yellowtail	100%	NA	NA	
Plaice	100%	NA	NA	
White Hake	100%	NA	NA	
SNE/MA Yellowtail	100%	NA	NA	
SNE/MA Winter Flounder	100%	NA	NA	
Witch Flounder	100%	NA	NA	
GB Yellowtail	50%	NA	50%	
GB Winter Flounder	50%	NA	50%	

Appendix IV

Acceptable Biological Catch (ABC)

Projection Output

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AGEPRO VERSION 3.3

 PROJECTION RUN: fish at Fref=0.25

 INPUT FILE: C:\DOCUMENTS AND SETTINGS\TAN\MY DOCUMENTS\PROJECTION_FILES\GB_YTF\GBYT_TRAC2010_50%2016.IN
 OUTPUT FILE: C:\DOCUMENTS AND SETTINGS\TAN\MY DOCUMENTS\PROJECTION_FILES\GB_YTF\GBYT_TRAC2010_50%2016.OUT
 NUMBER OF SIMULATIONS PER BOOTSTRAP REALIZATION:   10
 TOTAL NUMBER OF SIMULATIONS:   10000
 NUMBER OF FEASIBLE SIMULATIONS:   10000
 PROPORTION OF SIMULATIONS THAT ARE FEASIBLE:   1.00000000000000
 NUMBER OF BOOTSTRAP REALIZATIONS:   1000

 NUMBER OF RECRUITMENT MODELS:   1
 PROBABLE RECRUITMENT MODELS:   15
 RECRUITMENT MODELS BY YEAR
 YEAR    RECRUITMENT MODELS
   2010  15
   2011  15
   2012  15
   2013  15
   2014  15
   2015  15
   2016  15
   2017  15
   2018  15
   2019  15
   2020  15

 RECRUITMENT MODEL PROBABILITIES BY YEAR
 YEAR    MODEL PROBABILITY
   2010  1.00000000000000
   2011  1.00000000000000
   2012  1.00000000000000
   2013  1.00000000000000
   2014  1.00000000000000
   2015  1.00000000000000
   2016  1.00000000000000
   2017  1.00000000000000
   2018  1.00000000000000
   2019  1.00000000000000
   2020  1.00000000000000

 RECRUITMENT MODEL SAMPLING FREQUENCIES BY YEAR
 YEAR    MODEL SAMPLING FREQUENCIES
   2010  10000
```

2011	10000
2012	10000
2013	10000
2014	10000
2015	10000
2016	10000
2017	10000
2018	10000
2019	10000
2020	10000

MIXTURE OF F AND QUOTA BASED CATCHES

YEAR	F	QUOTA (THOUSAND MT)
2010		1.956
2011	0.138	
2012	0.138	
2013	0.138	
2014	0.138	
2015	0.138	
2016	0.138	
2017	0.191	
2018	0.191	
2019	0.191	
2020	0.191	

SPAWNING STOCK BIOMASS (THOUSAND MT)

YEAR	AVG SSB (000 MT)	STD
2010	15.173	2.383
2011	16.164	2.533
2012	19.783	3.827
2013	25.934	7.565
2014	32.242	9.878
2015	38.531	11.599
2016	44.270	12.901
2017	47.525	13.309
2018	48.521	13.207
2019	48.960	13.084
2020	49.212	13.019

PERCENTILES OF SPAWNING STOCK BIOMASS (000 MT)

YEAR	1%	5%	10%	25%	50%	75%	90%	95%	99%
2010	10.312	11.645	12.234	13.407	15.031	16.603	18.474	19.362	21.536
2011	10.802	12.439	13.083	14.284	15.985	17.781	19.536	20.685	22.995
2012	13.187	14.579	15.386	16.941	19.114	22.093	25.363	27.015	30.064
2013	14.911	16.778	17.946	20.183	23.925	30.192	37.625	41.018	46.560

2014	16.952	19.478	20.947	24.227	30.461	38.931	45.760	50.330	59.569
2015	19.281	22.400	24.411	29.404	37.399	45.914	54.144	59.688	69.359
2016	22.026	25.435	28.061	34.478	43.189	52.470	61.860	67.614	78.608
2017	23.598	27.669	30.921	37.861	46.211	55.921	65.577	71.088	82.835
2018	24.249	28.859	32.147	38.870	47.334	57.091	66.346	72.061	83.580
2019	24.641	29.506	32.787	39.316	47.744	57.133	66.669	72.493	83.250
2020	25.290	29.932	32.956	39.595	48.069	57.662	66.730	72.427	83.234

ANNUAL PROBABILITY THAT SSB EXCEEDS THRESHOLD: 43.200 THOUSAND MT

YEAR	Pr(SSB >= Threshold Value) FOR FEASIBLE SIMULATIONS
2010	0.000
2011	0.000
2012	0.000
2013	0.029
2014	0.146
2015	0.325
2016	0.500
2017	0.597
2018	0.628
2019	0.643
2020	0.648

Pr(SSB >= Threshold Value) AT LEAST ONCE:= 0.797

PERCENTILES OF SPAWNING BIOMASS AT AGE VECTOR (MT)
IN YEAR: 2010

AGE	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	261.4	352.9	400.7	506.5	649.5	810.4	1019.7	1143.9	1378.3
3	783.5	1037.7	1173.9	1481.9	1913.5	2433.6	3029.9	3326.5	4064.9
4	2442.8	3062.6	3443.8	4048.2	4943.3	5987.9	7023.4	7694.5	9428.2
5	2803.1	3322.0	3563.9	4009.8	4592.8	5224.2	5884.2	6267.7	6900.8
6+	1612.2	1910.7	2049.8	2306.2	2641.5	3004.7	3384.3	3604.9	3969.0

PERCENTILES OF SPAWNING BIOMASS AT AGE VECTOR (MT)
IN YEAR: 2011

AGE	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	1235.7	1292.3	1323.3	1383.0	1442.3	1511.5	1571.8	1610.1	1672.7
3	576.9	778.7	885.0	1119.2	1436.0	1787.4	2252.8	2530.5	3050.7
4	758.5	994.7	1134.9	1419.0	1850.4	2360.7	2958.5	3247.6	3944.8
5	2272.5	2913.3	3268.9	3870.3	4729.8	5784.2	6830.8	7516.1	9310.4
6+	3691.0	4413.9	4755.2	5389.0	6206.9	7109.9	8080.3	8613.1	9499.2

PERCENTILES OF SPAWNING BIOMASS AT AGE VECTOR (MT)
IN YEAR: 2012

AGE	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	821.9	1119.8	1220.6	2098.3	2590.0	5635.6	9223.0	10615.6	12269.2
3	2734.3	2859.5	2928.2	3060.3	3191.6	3344.6	3478.1	3562.8	3701.3
4	559.5	755.3	858.3	1085.5	1392.8	1733.6	2185.0	2454.4	2958.9
5	730.7	958.2	1093.3	1367.0	1782.6	2274.2	2850.1	3128.5	3800.2
6+	5690.2	6561.2	7078.5	7912.5	8975.9	10247.7	11632.0	12454.9	14257.1

PERCENTILES OF SPAWNING BIOMASS AT AGE VECTOR (MT)
IN YEAR: 2013

AGE	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	847.8	1124.0	1244.7	2104.3	2596.9	5657.9	9304.0	10616.5	12413.7
3	1818.7	2477.8	2700.8	4643.1	5731.0	12470.4	20408.4	23490.0	27149.0
4	2652.0	2773.4	2840.1	2968.1	3095.5	3243.9	3373.3	3455.5	3589.9
5	539.0	727.6	826.9	1045.7	1341.8	1670.1	2104.9	2364.4	2850.4
6+	5311.5	6123.9	6486.3	7222.5	8261.2	9183.6	10382.3	11086.2	12216.6

PERCENTILES OF SPAWNING BIOMASS AT AGE VECTOR (MT)
IN YEAR: 2014

AGE	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	797.9	1119.0	1231.5	2108.9	2598.5	5717.2	9399.5	10616.2	12392.0
3	1876.0	2487.1	2754.2	4656.3	5746.3	12519.8	20587.8	23492.0	27468.8
4	1763.9	2403.2	2619.5	4503.3	5558.5	12094.9	19793.9	22782.8	26331.6
5	2554.8	2671.8	2736.0	2859.3	2982.0	3125.0	3249.7	3328.8	3458.3
6+	4783.4	5422.8	5778.9	6387.2	7174.6	8050.4	8874.9	9447.4	10527.8

PERCENTILES OF SPAWNING BIOMASS AT AGE VECTOR (MT)
IN YEAR: 2015

AGE	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	804.3	1119.5	1238.4	2109.5	2593.8	5637.7	9267.3	10616.3	12274.2
3	1765.6	2476.1	2724.9	4666.5	5749.8	12650.8	20798.9	23491.4	27420.6
4	1819.5	2412.2	2671.3	4516.1	5573.3	12142.8	19967.9	22784.7	26641.8
5	1699.3	2315.1	2523.5	4338.3	5354.7	11651.6	19068.4	21947.7	25366.5
6+	5868.4	6414.9	6735.2	7272.2	7951.1	8709.6	9394.9	9892.5	10784.5

PERCENTILES OF SPAWNING BIOMASS AT AGE VECTOR (MT)
IN YEAR: 2016

AGE	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	800.3	1120.4	1232.4	2096.1	2593.1	5653.7	9643.9	10616.9	12388.6

3	1779.8	2477.1	2740.4	4668.0	5739.4	12474.9	20506.4	23491.5	27160.2
4	1712.4	2401.6	2642.9	4526.0	5576.7	12269.9	20172.7	22784.1	26595.1
5	1752.8	2323.8	2573.4	4350.6	5369.0	11697.7	19236.0	21949.5	25665.2
6+	6840.4	7588.0	8181.5	9569.8	11055.5	16875.2	23914.5	26467.9	29969.8

PERCENTILES OF SPAWNING BIOMASS AT AGE VECTOR (MT)
IN YEAR: 2017

AGE	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	841.4	1118.3	1259.1	2098.6	2584.3	5668.8	9407.6	10565.0	12351.2
3	1745.3	2443.5	2687.7	4571.4	5655.3	12330.2	21032.4	23154.4	27018.3
4	1688.5	2350.1	2599.8	4428.5	5445.0	11835.0	19454.6	22286.5	25767.0
5	1613.6	2263.0	2490.4	4264.9	5254.9	11562.0	19008.8	21469.5	25060.6
6+	7583.6	8974.8	9891.7	11581.5	15774.2	22278.3	27756.0	30928.7	37334.4

PERCENTILES OF SPAWNING BIOMASS AT AGE VECTOR (MT)
IN YEAR: 2018

AGE	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	836.4	1114.7	1226.0	2101.0	2580.7	5618.0	9135.6	10555.1	12318.1
3	1822.6	2422.4	2727.5	4546.0	5598.0	12279.6	20378.6	22885.7	26754.9
4	1622.5	2271.6	2498.6	4249.8	5257.4	11462.6	19552.4	21525.1	25117.1
5	1542.6	2147.1	2375.2	4046.0	4974.7	10812.7	17774.1	20361.4	23541.2
6+	8208.8	9885.3	10897.5	13237.2	18256.9	24073.9	29509.4	32893.4	39379.7

PERCENTILES OF SPAWNING BIOMASS AT AGE VECTOR (MT)
IN YEAR: 2019

AGE	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	832.3	1117.5	1230.8	2095.8	2583.2	5674.3	9226.5	10554.9	12216.7
3	1811.8	2414.6	2655.7	4551.2	5590.3	12169.6	19789.4	22864.3	26683.3
4	1694.4	2252.0	2535.6	4226.1	5204.1	11415.5	18944.6	21275.3	24872.2
5	1482.3	2075.4	2282.8	3882.7	4803.2	10472.4	17863.4	19665.7	22947.4
6+	8804.0	10492.8	11594.2	14559.9	19104.9	24651.0	30143.2	33503.4	39551.5

PERCENTILES OF SPAWNING BIOMASS AT AGE VECTOR (MT)
IN YEAR: 2020

AGE	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	820.5	1113.9	1222.2	2099.1	2580.5	5632.8	9246.7	10555.5	12386.5
3	1802.8	2420.6	2666.1	4540.0	5595.7	12291.6	19986.3	22863.9	26463.6
4	1684.3	2244.7	2468.9	4230.9	5196.9	11313.2	18396.9	21255.4	24805.7
5	1548.0	2057.4	2316.5	3861.1	4754.5	10429.4	17308.2	19437.5	22723.7
6+	9181.5	10955.0	12164.9	15160.2	19416.5	24987.1	30237.8	33434.3	39440.0

MEAN BIOMASS (THOUSAND MT) FOR AGES: 1 TO 6

YEAR	AVG MEAN B (000 MT)	STD
2010	17.097	2.511
2011	21.482	3.943
2012	28.146	7.440
2013	34.479	9.943
2014	40.617	11.688
2015	46.721	13.056
2016	52.376	14.226
2017	55.374	14.590
2018	56.322	14.511
2019	56.777	14.409
2020	56.995	14.365

PERCENTILES OF MEAN STOCK BIOMASS (000 MT)

YEAR	1%	5%	10%	25%	50%	75%	90%	95%	99%
2010	11.766	13.379	14.013	15.238	16.942	18.702	20.391	21.540	23.874
2011	14.402	16.009	16.844	18.569	20.891	23.899	27.079	28.791	31.964
2012	16.863	18.918	20.059	22.487	26.381	32.412	39.393	42.952	48.318
2013	18.865	21.528	23.118	26.478	32.712	41.151	48.155	52.740	62.081
2014	21.167	24.374	26.415	31.418	39.462	48.052	56.417	61.940	71.504
2015	24.200	27.664	30.291	36.808	45.653	55.003	64.449	70.366	81.174
2016	26.670	31.007	34.496	42.045	50.990	61.418	71.378	77.810	90.281
2017	28.226	33.402	37.219	44.748	54.036	64.759	74.844	81.204	94.497
2018	28.979	34.516	38.342	45.855	55.043	65.476	75.882	82.221	94.214
2019	29.607	35.097	38.700	46.350	55.663	66.022	76.283	82.123	94.469
2020	30.221	35.280	38.893	46.495	55.775	66.554	76.099	82.376	94.088

ANNUAL PROBABILITY THAT MEAN BIOMASS EXCEEDS THRESHOLD: 0.000 THOUSAND MT

YEAR	Pr(MEAN B >= Threshold Value) FOR FEASIBLE SIMULATIONS
2010	1.000
2011	1.000
2012	1.000
2013	1.000
2014	1.000
2015	1.000
2016	1.000
2017	1.000
2018	1.000
2019	1.000
2020	1.000

Pr(MEAN B >= Threshold Value) AT LEAST ONCE:= 1.000

F WEIGHTED BY MEAN BIOMASS FOR AGES: 1 TO 6

YEAR	AVG F_WT_B	STD
2010	0.117	0.017
2011	0.095	0.012
2012	0.083	0.014
2013	0.084	0.012
2014	0.091	0.013
2015	0.097	0.013
2016	0.101	0.013
2017	0.143	0.017
2018	0.144	0.016
2019	0.145	0.016
2020	0.145	0.016

PERCENTILES OF F WEIGHTED BY MEAN BIOMASS FOR AGES: 1 TO 6

YEAR	1%	5%	10%	25%	50%	75%	90%	95%	99%
2010	0.082	0.091	0.096	0.105	0.115	0.128	0.139	0.146	0.163
2011	0.065	0.071	0.076	0.087	0.099	0.104	0.108	0.110	0.112
2012	0.055	0.061	0.064	0.071	0.083	0.094	0.101	0.104	0.109
2013	0.058	0.064	0.068	0.074	0.085	0.094	0.099	0.102	0.107
2014	0.062	0.069	0.073	0.081	0.092	0.101	0.108	0.112	0.118
2015	0.067	0.074	0.079	0.088	0.098	0.107	0.114	0.117	0.122
2016	0.070	0.079	0.084	0.093	0.102	0.111	0.117	0.120	0.124
2017	0.102	0.113	0.120	0.132	0.145	0.156	0.164	0.168	0.173
2018	0.104	0.115	0.122	0.134	0.146	0.157	0.164	0.168	0.173
2019	0.105	0.116	0.123	0.134	0.146	0.157	0.164	0.168	0.173
2020	0.105	0.117	0.123	0.134	0.147	0.157	0.165	0.168	0.173

ANNUAL PROBABILITY THAT F WEIGHTED BY MEAN BIOMASS EXCEEDS THRESHOLD: 0.000

YEAR	Pr(F_WT_B > Threshold Value) FOR FEASIBLE SIMULATIONS
2010	1.000
2011	1.000
2012	1.000
2013	1.000
2014	1.000
2015	1.000
2016	1.000
2017	1.000
2018	1.000
2019	1.000
2020	1.000

TOTAL STOCK BIOMASS (THOUSAND MT)

YEAR	AVG TOTAL B (000 MT)	STD

2010	14.927	2.273
2011	15.659	2.581
2012	17.094	2.572
2013	22.999	6.937
2014	29.160	9.461
2015	35.617	11.246
2016	42.170	13.024
2017	46.962	13.843
2018	48.329	13.749
2019	48.862	13.599
2020	49.185	13.522

PERCENTILES OF TOTAL STOCK BIOMASS (000 MT)

YEAR	1%	5%	10%	25%	50%	75%	90%	95%	99%
2010	10.311	11.589	12.075	13.244	14.783	16.300	18.053	18.929	20.974
2011	10.251	11.871	12.495	13.767	15.477	17.275	19.031	20.225	22.638
2012	11.735	13.301	14.050	15.250	16.921	18.684	20.505	21.614	24.020
2013	13.705	15.208	16.177	17.984	20.600	26.741	34.654	37.447	41.814
2014	15.250	17.554	18.886	21.460	27.098	35.859	42.178	46.598	55.948
2015	17.720	20.555	22.269	26.229	34.471	42.767	50.996	56.273	65.838
2016	20.225	23.662	25.810	32.113	41.233	50.293	59.864	65.609	76.683
2017	22.721	26.490	29.380	36.726	45.682	55.772	65.626	71.644	84.090
2018	23.548	27.743	31.120	38.227	47.118	57.005	66.747	73.062	85.074
2019	24.148	28.916	31.976	38.846	47.465	57.651	67.484	73.015	84.235
2020	24.371	29.137	32.347	39.179	48.033	57.867	67.358	73.276	85.061

ANNUAL PROBABILITY THAT TOTAL STOCK BIOMASS EXCEEDS THRESHOLD: 0.000 THOUSAND MT

YEAR	Pr(B >= Threshold Value) FOR FEASIBLE SIMULATIONS
2010	1.000
2011	1.000
2012	1.000
2013	1.000
2014	1.000
2015	1.000
2016	1.000
2017	1.000
2018	1.000
2019	1.000
2020	1.000

Pr(B >= Threshold Value) AT LEAST ONCE:= 1.000

RECRUITMENT UNITS ARE: 1000.00000000000 FISH

YEAR AVG

CLASS	RECRUITMENT	STD
2010	38485.442	28668.288
2011	39163.524	29003.230
2012	39488.953	29129.036
2013	38817.261	28759.533
2014	39199.314	29378.076
2015	39277.657	29099.073
2016	38837.671	28727.417
2017	39202.253	28866.820
2018	39081.174	29012.600
2019	38924.510	29064.179
2020	39035.873	29019.347

PERCENTILES OF RECRUITMENT UNITS ARE: 1000.00000000000 FISH

YEAR CLASS	1%	5%	10%	25%	50%	75%	90%	95%	99%
2010	7808.663	10638.685	11596.353	19935.845	24606.780	53543.023	87625.755	100857.071	116567.468
2011	8054.749	10678.770	11825.482	19992.345	24672.396	53755.116	88395.992	100865.531	117940.417
2012	7580.769	10631.555	11699.810	20036.319	24687.402	54317.642	89302.423	100862.883	117733.654
2013	7641.620	10635.818	11766.113	20042.425	24642.913	53562.552	88046.854	100863.474	116615.332
2014	7603.145	10644.928	11708.718	19914.928	24636.777	53714.976	91625.048	100869.210	117701.738
2015	8032.715	10676.166	12020.671	20035.437	24671.694	54119.151	89813.381	100862.657	117915.024
2016	7992.132	10651.212	11714.965	20076.087	24660.029	53682.504	87295.026	100858.909	117705.488
2017	7952.563	10677.926	11760.918	20026.723	24683.574	54220.627	88163.470	100857.162	116736.245
2018	7840.100	10644.094	11678.540	20058.207	24657.669	53824.056	88356.225	100863.272	118358.524
2019	7864.147	10617.689	11687.601	19920.801	24634.613	54051.729	88724.003	100859.131	116239.649
2020	7565.710	10610.033	11585.786	19956.398	24670.493	53899.930	89596.723	100859.889	119048.539

LANDINGS (000 MT)

YEAR	AVG LANDINGS (000 MT)	STD
2010	1.956	0.000
2011	2.022	0.328
2012	2.253	0.363
2013	2.830	0.691
2014	3.671	1.101
2015	4.521	1.375
2016	5.298	1.577
2017	7.923	2.257
2018	8.119	2.235
2019	8.203	2.210
2020	8.246	2.196

PERCENTILES OF LANDINGS (000 MT)

YEAR	1%	5%	10%	25%	50%	75%	90%	95%	99%
2010	1.956	1.956	1.956	1.956	1.956	1.956	1.956	1.956	1.956

2011	1.349	1.539	1.622	1.779	1.998	2.225	2.472	2.606	2.902
2012	1.538	1.714	1.810	1.988	2.222	2.485	2.739	2.900	3.202
2013	1.779	1.970	2.089	2.318	2.658	3.215	3.913	4.224	4.680
2014	2.019	2.301	2.465	2.792	3.431	4.391	5.255	5.738	6.752
2015	2.300	2.674	2.896	3.410	4.355	5.409	6.391	7.052	8.206
2016	2.640	3.041	3.337	4.079	5.167	6.294	7.436	8.167	9.448
2017	3.950	4.578	5.094	6.258	7.720	9.370	10.962	11.946	13.893
2018	4.065	4.804	5.330	6.482	7.911	9.546	11.132	12.109	14.059
2019	4.150	4.931	5.468	6.581	7.991	9.613	11.182	12.170	14.006
2020	4.234	5.014	5.510	6.621	8.052	9.633	11.218	12.161	14.024

PERCENTILES OF POPULATION NUMBERS AT AGE VECTOR (000s FISH)
IN YEAR: 2010

AGE	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	11745.7	12281.9	12577.5	13142.3	13706.3	14358.7	14926.7	15289.2	15882.5
2	2031.9	2742.6	3114.3	3936.0	5044.6	6293.2	7891.3	8883.7	10693.5
3	2185.6	2923.1	3289.8	4147.0	5357.9	6775.6	8404.1	9304.5	11326.9
4	5409.8	6696.7	7498.8	8786.0	10668.6	12849.8	14963.3	16423.0	19862.2
5	4590.1	5360.3	5744.1	6427.1	7320.5	8309.3	9287.8	9919.2	10863.8
6+	1986.8	2320.2	2486.4	2782.0	3168.7	3596.7	4020.3	4293.6	4702.5

PERCENTILES OF POPULATION NUMBERS AT AGE VECTOR (000s FISH)
IN YEAR: 2011

AGE	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	7808.7	10638.7	11596.4	19935.8	24606.8	53543.0	87625.8	100857.1	116567.5
2	9589.4	10028.6	10269.5	10732.6	11193.1	11729.8	12197.8	12494.9	12980.9
3	1607.1	2169.3	2465.5	3117.9	4000.6	4979.6	6276.0	7049.8	8499.0
4	1629.2	2136.4	2437.5	3047.9	3974.4	5070.5	6354.5	6975.3	8472.9
5	3613.6	4632.5	5197.9	6154.3	7521.0	9197.5	10861.8	11951.4	14804.6
6+	4417.1	5282.3	5690.7	6449.1	7427.9	8508.6	9669.8	10307.4	11367.9

PERCENTILES OF POPULATION NUMBERS AT AGE VECTOR (000s FISH)
IN YEAR: 2012

AGE	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	8054.7	10678.8	11825.5	19992.3	24672.4	53755.1	88396.0	100865.5	117940.4
2	6378.2	8689.8	9472.0	16283.8	20099.1	43734.6	71573.8	82381.3	95213.7
3	7617.4	7966.3	8157.7	8525.5	8891.3	9317.6	9689.4	9925.4	10311.5
4	1201.7	1622.2	1843.6	2331.4	2991.5	3723.6	4693.0	5271.6	6355.3
5	1162.0	1523.7	1738.4	2173.7	2834.5	3616.2	4532.0	4974.7	6042.8
6+	6809.6	7852.0	8471.0	9469.1	10741.7	12263.6	13920.3	14905.1	17061.8

PERCENTILES OF POPULATION NUMBERS AT AGE VECTOR (000s FISH)
IN YEAR: 2013

AGE	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	7580.8	10631.6	11699.8	20036.3	24687.4	54317.6	89302.4	100862.9	117733.7

2	6579.2	8722.6	9659.2	16330.0	20152.7	43907.8	72202.9	82388.2	96335.2
3	5066.6	6902.8	7524.2	12935.2	15965.9	34740.9	56855.2	65440.2	75633.7
4	5696.0	5956.9	6100.0	6375.1	6648.6	6967.4	7245.4	7421.9	7710.6
5	857.1	1156.9	1314.8	1662.8	2133.6	2655.6	3347.0	3759.7	4532.5
6+	6356.4	7328.6	7762.3	8643.3	9886.3	10990.3	12424.7	13267.1	14619.9

PERCENTILES OF POPULATION NUMBERS AT AGE VECTOR (000s FISH)
IN YEAR: 2014

AGE	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	7641.6	10635.8	11766.1	20042.4	24642.9	53562.6	88046.9	100863.5	116615.3
2	6192.1	8684.0	9556.5	16365.9	20165.0	44367.3	72943.3	82386.0	96166.3
3	5226.2	6928.8	7672.9	12971.8	16008.5	34878.5	57354.9	65445.7	76524.5
4	3788.6	5161.7	5626.3	9672.5	11938.7	25978.0	42514.3	48933.9	56556.3
5	4062.4	4248.4	4350.5	4546.7	4741.8	4969.1	5167.4	5293.2	5499.1
6+	5724.4	6489.5	6915.7	7643.7	8586.0	9634.1	10620.8	11305.9	12598.9

PERCENTILES OF POPULATION NUMBERS AT AGE VECTOR (000s FISH)
IN YEAR: 2015

AGE	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	7603.1	10644.9	11708.7	19914.9	24636.8	53715.0	91625.0	100869.2	117701.7
2	6241.8	8687.5	9610.7	16370.9	20128.6	43750.5	71917.8	82386.5	95252.8
3	4918.7	6898.2	7591.3	13000.4	16018.2	35243.5	57943.0	65443.9	76390.4
4	3908.0	5181.1	5737.5	9699.9	11970.6	26080.9	42888.0	48938.0	57222.4
5	2702.0	3681.3	4012.7	6898.4	8514.6	18527.4	30321.0	34899.4	40335.7
6+	7022.8	7676.9	8060.2	8702.9	9515.3	10422.9	11243.1	11838.5	12906.0

PERCENTILES OF POPULATION NUMBERS AT AGE VECTOR (000s FISH)
IN YEAR: 2016

AGE	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	8032.7	10676.2	12020.7	20035.4	24671.7	54119.2	89813.4	100862.7	117915.0
2	6210.3	8694.9	9563.8	16266.8	20123.6	43875.1	74840.5	82391.2	96140.2
3	4958.2	6901.0	7634.3	13004.3	15989.3	34753.6	57128.4	65444.3	75664.8
4	3678.0	5158.2	5676.5	9721.2	11977.8	26353.9	43327.8	48936.7	57122.1
5	2787.2	3695.2	4092.0	6917.9	8537.4	18600.8	30587.5	34902.4	40810.8
6+	8186.0	9080.7	9791.0	11452.4	13230.4	20194.9	28619.0	31674.7	35865.5

PERCENTILES OF POPULATION NUMBERS AT AGE VECTOR (000s FISH)
IN YEAR: 2017

AGE	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	7992.1	10651.2	11715.0	20076.1	24660.0	53682.5	87295.0	100858.9	117705.5
2	6561.2	8720.4	9818.6	16365.2	20152.1	44205.2	73360.7	82385.9	96314.4
3	4933.2	6906.9	7597.1	12921.6	15985.3	34852.5	59450.1	65448.1	76369.7
4	3707.6	5160.3	5708.7	9724.2	11956.3	25987.5	42718.6	48937.0	56579.5
5	2623.2	3678.8	4048.5	6933.1	8542.5	18795.5	30901.2	34901.4	40739.2
6+	9278.1	10980.2	12102.0	14169.3	19298.9	27256.2	33957.9	37839.6	45676.6

PERCENTILES OF POPULATION NUMBERS AT AGE VECTOR (000s FISH)
IN YEAR: 2018

AGE	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	7952.6	10677.9	11760.9	20026.7	24683.6	54220.6	88163.5	100857.2	116736.2
2	6522.2	8692.2	9560.3	16383.6	20124.5	43809.0	71239.4	82308.6	96056.7
3	5151.8	6847.2	7709.5	12849.8	15823.3	34709.5	57602.1	64688.6	75625.2
4	3562.7	4988.0	5486.4	9331.7	11544.2	25169.6	42933.4	47265.0	55152.3
5	2507.7	3490.3	3861.2	6577.3	8087.0	17577.4	28894.0	33100.0	38269.3
6+	10043.0	12094.1	13332.4	16195.0	22336.4	29453.1	36103.2	40243.3	48178.8

PERCENTILES OF POPULATION NUMBERS AT AGE VECTOR (000s FISH)
IN YEAR: 2019

AGE	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	7840.1	10644.1	11678.5	20058.2	24657.7	53824.1	88356.2	100863.3	118358.5
2	6489.9	8714.0	9597.8	16343.3	20143.7	44248.2	71948.1	82307.2	95265.7
3	5121.2	6825.0	7506.7	12864.3	15801.5	34398.4	55936.5	64627.9	75422.8
4	3720.5	4944.9	5567.6	9279.8	11427.2	25066.3	41598.8	46716.5	54614.7
5	2409.7	3373.8	3710.9	6311.8	7808.3	17024.2	29039.3	31969.1	37303.9
6+	10771.2	12837.4	14184.9	17813.3	23373.8	30159.2	36878.5	40989.5	48389.0

PERCENTILES OF POPULATION NUMBERS AT AGE VECTOR (000s FISH)
IN YEAR: 2020

AGE	1%	5%	10%	25%	50%	75%	90%	95%	99%
1	7864.1	10617.7	11687.6	19920.8	24634.6	54051.7	88724.0	100859.1	116239.6
2	6398.1	8686.4	9530.6	16369.0	20122.5	43924.6	72105.5	82312.2	96589.6
3	5095.8	6842.2	7536.1	12832.6	15816.6	34743.3	56493.0	64626.8	74801.7
4	3698.4	4928.9	5421.1	9290.3	11411.5	24841.7	40396.0	46672.7	54468.5
5	2516.5	3344.6	3765.8	6276.7	7729.1	16954.4	28136.6	31598.1	36940.3
6+	11233.1	13402.9	14883.1	18547.7	23755.0	30570.4	36994.3	40905.1	48252.7

REALIZED F SERIES

YEAR	AVG F	STD
2010	0.145	0.023
2011	0.138	0.000
2012	0.138	0.000
2013	0.138	0.000
2014	0.138	0.000
2015	0.138	0.000
2016	0.138	0.000
2017	0.191	0.000
2018	0.191	0.000
2019	0.191	0.000
2020	0.191	0.000

PERCENTILES OF REALIZED F SERIES

YEAR	1%	5%	10%	25%	50%	75%	90%	95%	99%
2010	0.098	0.110	0.115	0.129	0.142	0.160	0.176	0.184	0.208
2011	0.138	0.138	0.138	0.138	0.138	0.138	0.138	0.138	0.138
2012	0.138	0.138	0.138	0.138	0.138	0.138	0.138	0.138	0.138
2013	0.138	0.138	0.138	0.138	0.138	0.138	0.138	0.138	0.138
2014	0.138	0.138	0.138	0.138	0.138	0.138	0.138	0.138	0.138
2015	0.138	0.138	0.138	0.138	0.138	0.138	0.138	0.138	0.138
2016	0.138	0.138	0.138	0.138	0.138	0.138	0.138	0.138	0.138
2017	0.191	0.191	0.191	0.191	0.191	0.191	0.191	0.191	0.191
2018	0.191	0.191	0.191	0.191	0.191	0.191	0.191	0.191	0.191
2019	0.191	0.191	0.191	0.191	0.191	0.191	0.191	0.191	0.191
2020	0.191	0.191	0.191	0.191	0.191	0.191	0.191	0.191	0.191

ANNUAL PROBABILITY FULLY-RECRUITED F EXCEEDS THRESHOLD: 0.250

YEAR	Pr(F > Threshold Value) FOR FEASIBLE SIMULATIONS
2010	0.000
2011	0.000
2012	0.000
2013	0.000
2014	0.000
2015	0.000
2016	0.000
2017	0.000
2018	0.000
2019	0.000
2020	0.000

```
 AGEPRO VERSION 3.3

 PROJECTION RUN: new base, fixw8   0.75*F40 projection

 INPUT FILE: C:\DOCUMENTS AND SETTINGS\TAN\MY
DOCUMENTS\PROJECTION_FILES\POLLOCK\POLLOCK_NEW_BASE_075XF40_FW45.IN
 OUTPUT FILE: C:\DOCUMENTS AND SETTINGS\TAN\MY
DOCUMENTS\PROJECTION_FILES\POLLOCK\POLLOCK_NEW_BASE_075XF40_FW45.OUT
 NUMBER OF SIMULATIONS PER BOOTSTRAP REALIZATION:   100
 TOTAL NUMBER OF SIMULATIONS:   100000
 NUMBER OF FEASIBLE SIMULATIONS:   100000
 PROPORTION OF SIMULATIONS THAT ARE FEASIBLE:   1.00000000000000
 NUMBER OF BOOTSTRAP REALIZATIONS:   1000

 NUMBER OF RECRUITMENT MODELS:   1
 PROBABLE RECRUITMENT MODELS:   14
 RECRUITMENT MODELS BY YEAR
 YEAR    RECRUITMENT MODELS
   2010  14
   2011  14
   2012  14
   2013  14
   2014  14
   2015  14
   2016  14
   2017  14
   2018  14
   2019  14

 RECRUITMENT MODEL PROBABILITIES BY YEAR
 YEAR    MODEL PROBABILITY
   2010  1.00000000000000
   2011  1.00000000000000
   2012  1.00000000000000
   2013  1.00000000000000
   2014  1.00000000000000
   2015  1.00000000000000
   2016  1.00000000000000
   2017  1.00000000000000
   2018  1.00000000000000
   2019  1.00000000000000
```

RECRUITMENT MODEL SAMPLING FREQUENCIES BY YEAR

YEAR	MODEL SAMPLING FREQUENCIES
2010	100000
2011	100000
2012	100000
2013	100000
2014	100000
2015	100000
2016	100000
2017	100000
2018	100000
2019	100000

MIXTURE OF F AND QUOTA BASED CATCHES

YEAR	F	QUOTA (THOUSAND MT)
2010		19.839
2011	0.310	
2012	0.310	
2013	0.310	
2014	0.310	
2015	0.310	
2016	0.310	
2017	0.310	
2018	0.310	
2019	0.310	

SPAWNING STOCK BIOMASS (THOUSAND MT)

YEAR	AVG SSB (000 MT)	STD
2010	196.136	28.512
2011	169.946	26.696
2012	152.900	23.146
2013	141.498	20.553
2014	134.150	18.414
2015	128.799	16.761
2016	124.742	16.085
2017	121.302	16.075
2018	118.945	16.006
2019	116.888	16.183

PERCENTILES OF SPAWNING STOCK BIOMASS (000 MT)

YEAR	1%	5%	10%	25%	50%	75%	90%	95%	99%
2010	138.506	153.837	160.766	175.906	194.339	213.491	233.043	249.508	270.663
2011	116.873	130.383	136.639	150.742	168.365	185.819	205.397	220.453	241.569
2012	107.934	118.130	124.075	136.459	151.375	166.330	183.572	196.653	216.034
2013	100.551	110.121	116.143	127.272	140.068	153.637	168.831	179.465	197.064
2014	97.633	106.097	111.437	121.499	132.834	145.051	158.482	167.289	184.002
2015	95.301	103.312	108.250	117.115	127.565	139.045	151.004	158.521	173.860
2016	92.598	100.558	105.226	113.394	123.415	134.752	146.188	153.275	167.673
2017	89.603	97.442	101.847	109.860	119.890	131.321	142.678	149.957	164.289
2018	87.556	95.270	99.612	107.532	117.539	128.932	140.298	147.483	161.814
2019	85.391	92.923	97.346	105.327	115.444	127.055	138.488	145.757	160.475

ANNUAL PROBABILITY THAT SSB EXCEEDS THRESHOLD: 91.000 THOUSAND MT

YEAR	Pr(SSB >= Threshold Value) FOR FEASIBLE SIMULATIONS
2010	1.000
2011	1.000
2012	0.999
2013	0.999
2014	0.998
2015	0.997
2016	0.994
2017	0.986
2018	0.978
2019	0.965

Pr(SSB >= Threshold Value) AT LEAST ONCE:= 1.000

MEAN BIOMASS (THOUSAND MT) FOR AGES: 1 TO 9

YEAR	AVG MEAN B (000 MT)	STD
2010	196.731	29.073
2011	176.542	26.394
2012	163.598	23.258
2013	154.288	20.672
2014	147.633	18.819
2015	142.621	17.799
2016	138.785	17.612
2017	135.763	17.653
2018	133.698	17.630
2019	131.897	17.774

PERCENTILES OF MEAN STOCK BIOMASS (000 MT)

YEAR	1%	5%	10%	25%	50%	75%	90%	95%	99%
2010	139.534	152.975	160.583	175.780	194.745	213.991	235.528	251.560	274.055
2011	124.655	136.663	143.733	157.934	174.763	191.904	211.355	226.063	247.848
2012	117.312	128.116	134.840	147.436	162.062	177.229	194.382	206.312	225.940
2013	113.223	122.772	128.879	140.028	152.822	166.584	181.669	191.474	210.001
2014	109.927	118.963	124.550	134.502	146.239	159.205	172.559	181.057	197.893
2015	106.731	115.674	120.930	130.072	141.278	153.768	166.248	173.980	189.572
2016	103.584	112.400	117.388	126.288	137.373	149.832	162.155	169.968	185.459
2017	100.883	109.433	114.338	123.181	134.302	146.811	159.165	167.171	182.842
2018	99.047	107.352	112.316	121.133	132.204	144.801	157.102	164.914	180.533
2019	97.031	105.359	110.246	119.293	130.369	143.088	155.595	163.428	179.061

ANNUAL PROBABILITY THAT MEAN BIOMASS EXCEEDS THRESHOLD: 0.000 THOUSAND MT

YEAR	Pr(MEAN B >= Threshold Value) FOR FEASIBLE SIMULATIONS
2010	1.000
2011	1.000
2012	1.000
2013	1.000
2014	1.000
2015	1.000
2016	1.000
2017	1.000
2018	1.000
2019	1.000

Pr(MEAN B >= Threshold Value) AT LEAST ONCE:= 1.000

F WEIGHTED BY MEAN BIOMASS FOR AGES: 1 TO 9

YEAR	AVG F_WT_B	STD
2010	0.103	0.015
2011	0.096	0.003
2012	0.095	0.003
2013	0.102	0.005
2014	0.110	0.007
2015	0.116	0.008
2016	0.118	0.008
2017	0.117	0.012
2018	0.116	0.014
2019	0.116	0.014

PERCENTILES OF F WEIGHTED BY MEAN BIOMASS FOR AGES: 1 TO 9

YEAR	1%	5%	10%	25%	50%	75%	90%	95%	99%
2010	0.072	0.079	0.084	0.093	0.102	0.113	0.124	0.129	0.142
2011	0.089	0.092	0.093	0.095	0.097	0.098	0.100	0.101	0.103
2012	0.087	0.090	0.091	0.093	0.095	0.097	0.099	0.100	0.102
2013	0.090	0.094	0.096	0.099	0.102	0.105	0.108	0.109	0.113
2014	0.093	0.098	0.100	0.105	0.110	0.114	0.118	0.121	0.125
2015	0.097	0.102	0.105	0.110	0.116	0.121	0.127	0.130	0.135
2016	0.099	0.104	0.107	0.113	0.118	0.124	0.129	0.131	0.137
2017	0.093	0.099	0.103	0.109	0.116	0.125	0.133	0.139	0.150
2018	0.088	0.095	0.099	0.106	0.115	0.124	0.134	0.140	0.151
2019	0.088	0.095	0.099	0.107	0.116	0.125	0.135	0.141	0.152

ANNUAL PROBABILITY THAT F WEIGHTED BY MEAN BIOMASS EXCEEDS THRESHOLD: 0.000

YEAR	Pr(F_WT_B > Threshold Value) FOR FEASIBLE SIMULATIONS
2010	1.000
2011	1.000
2012	1.000
2013	1.000
2014	1.000
2015	1.000
2016	1.000
2017	1.000
2018	1.000
2019	1.000

TOTAL STOCK BIOMASS (THOUSAND MT)

YEAR	AVG TOTAL B (000 MT)	STD
2010	209.991	29.982
2011	185.141	28.283
2012	168.881	24.644
2013	157.601	21.731
2014	149.968	19.513
2015	144.435	18.023
2016	140.321	17.463
2017	136.870	17.482
2018	134.508	17.427
2019	132.446	17.605

PERCENTILES OF TOTAL STOCK BIOMASS (000 MT)

YEAR	1%	5%	10%	25%	50%	75%	90%	95%	99%
2010	150.166	165.491	172.708	188.819	207.884	228.251	249.712	266.810	289.220
2011	129.775	142.853	149.843	164.828	183.397	201.525	222.516	239.023	261.725
2012	120.032	131.306	138.335	151.607	167.191	183.329	201.244	214.417	235.279
2013	114.392	124.496	130.810	142.538	156.124	170.397	186.355	197.070	216.018
2014	110.991	120.210	125.967	136.456	148.552	161.755	175.848	184.799	202.507
2015	108.095	117.028	122.380	131.827	143.097	155.646	168.300	176.366	192.148
2016	105.201	114.020	119.083	127.989	138.964	151.283	163.492	171.159	186.366
2017	101.982	110.762	115.638	124.437	135.456	147.823	160.121	167.839	183.411
2018	100.107	108.489	113.377	122.083	133.057	145.436	157.667	165.496	180.883
2019	97.822	106.117	111.068	119.908	130.906	143.611	155.847	163.653	179.095

ANNUAL PROBABILITY THAT TOTAL STOCK BIOMASS EXCEEDS THRESHOLD: 0.000 THOUSAND MT

YEAR	Pr(B >= Threshold Value) FOR FEASIBLE SIMULATIONS
2010	1.000
2011	1.000
2012	1.000
2013	1.000
2014	1.000
2015	1.000
2016	1.000
2017	1.000
2018	1.000
2019	1.000

Pr(B >= Threshold Value) AT LEAST ONCE:= 1.000

RECRUITMENT UNITS ARE: 1000.00000000000 FISH

YEAR CLASS	AVG RECRUITMENT	STD
2010	20858.431	10135.925
2011	20855.715	10147.301
2012	20866.268	10165.038
2013	20935.568	10182.315
2014	20857.808	10117.210
2015	20932.443	10256.242
2016	20907.712	10156.169
2017	20836.449	10188.119
2018	20848.144	10129.011

2019	20935.524	10205.664

PERCENTILES OF RECRUITMENT UNITS ARE: 1000.00000000000 FISH

YEAR CLASS	1%	5%	10%	25%	50%	75%	90%	95%	99%
2010	7383.738	8350.831	10429.448	13660.782	19253.094	24290.830	34872.183	42378.975	54795.335
2011	7385.157	8352.685	10461.037	13663.069	19246.940	24282.490	34890.231	42625.129	54628.610
2012	7388.598	8307.931	10438.468	13665.701	19244.744	24285.602	34877.937	42732.090	54779.126
2013	7385.099	8384.385	10474.506	13674.456	19266.573	24288.142	34907.252	42724.655	54861.803
2014	7388.053	8355.289	10485.872	13668.514	19255.065	24290.912	34881.028	42047.046	54817.863
2015	7387.039	8368.315	10465.166	13669.880	19251.848	24289.049	34916.834	43261.166	55000.291
2016	7391.101	8363.928	10504.687	13679.767	19256.436	24286.171	34879.578	42652.260	54746.476
2017	7383.690	8294.311	10414.599	13653.447	19228.447	24281.605	34888.183	42837.449	54813.711
2018	7386.711	8352.705	10439.475	13665.995	19249.487	24280.923	34859.308	42489.246	54733.511
2019	7390.206	8374.457	10476.713	13672.921	19264.028	24294.555	34938.992	42995.746	54832.754

LANDINGS (000 MT)

YEAR	AVG LANDINGS (000 MT)	STD
2010	19.839	0.000
2011	17.043	2.692
2012	15.553	2.299
2013	15.714	2.248
2014	16.176	2.326
2015	16.505	2.263
2016	16.379	2.288
2017	15.956	2.808
2018	15.533	3.029
2019	15.398	3.040

PERCENTILES OF LANDINGS (000 MT)

YEAR	1%	5%	10%	25%	50%	75%	90%	95%	99%
2010	19.839	19.839	19.839	19.839	19.839	19.839	19.839	19.839	19.839
2011	11.684	12.977	13.700	15.099	16.913	18.615	20.496	21.893	24.439
2012	10.939	12.036	12.689	13.977	15.396	16.912	18.560	19.799	21.568
2013	11.085	12.333	12.904	14.148	15.558	17.033	18.716	19.703	21.576
2014	11.616	12.760	13.364	14.582	15.957	17.610	19.320	20.286	22.568
2015	12.093	13.160	13.784	14.911	16.269	17.938	19.493	20.530	22.706
2016	12.028	13.062	13.657	14.759	16.137	17.732	19.455	20.591	22.695
2017	10.983	12.072	12.740	13.966	15.551	17.498	19.809	21.334	24.019
2018	10.128	11.323	12.035	13.360	15.111	17.270	19.696	21.226	24.181
2019	9.991	11.176	11.894	13.220	14.956	17.161	19.564	21.102	24.037

REALIZED F SERIES

YEAR	AVG F	STD
2010	0.316	0.048
2011	0.310	0.000
2012	0.310	0.000
2013	0.310	0.000
2014	0.310	0.000
2015	0.310	0.000
2016	0.310	0.000
2017	0.310	0.000
2018	0.310	0.000
2019	0.310	0.000

PERCENTILES OF REALIZED F SERIES

YEAR	1%	5%	10%	25%	50%	75%	90%	95%	99%
2010	0.216	0.241	0.258	0.283	0.310	0.346	0.380	0.397	0.439
2011	0.310	0.310	0.310	0.310	0.310	0.310	0.310	0.310	0.310
2012	0.310	0.310	0.310	0.310	0.310	0.310	0.310	0.310	0.310
2013	0.310	0.310	0.310	0.310	0.310	0.310	0.310	0.310	0.310
2014	0.310	0.310	0.310	0.310	0.310	0.310	0.310	0.310	0.310
2015	0.310	0.310	0.310	0.310	0.310	0.310	0.310	0.310	0.310
2016	0.310	0.310	0.310	0.310	0.310	0.310	0.310	0.310	0.310
2017	0.310	0.310	0.310	0.310	0.310	0.310	0.310	0.310	0.310
2018	0.310	0.310	0.310	0.310	0.310	0.310	0.310	0.310	0.310
2019	0.310	0.310	0.310	0.310	0.310	0.310	0.310	0.310	0.310

ANNUAL PROBABILITY FULLY-RECRUITED F EXCEEDS THRESHOLD: 0.410

YEAR	Pr(F > Threshold Value) FOR FEASIBLE SIMULATIONS
2010	0.037
2011	0.000
2012	0.000
2013	0.000
2014	0.000
2015	0.000
2016	0.000
2017	0.000
2018	0.000
2019	0.000

Appendix V

Summary of Past, Present, or Reasonably Foreseeable Future Actions

APPENDIX V

The actions summarized in the table below are presented in chronological order, and codes indicate whether an action relates to the past (P), present (Pr), or reasonably foreseeable future (RFF). When any of these abbreviations occur together, it indicates that some past actions are still relevant to the present and/or future. A brief explanation of the rationale for concluding what effect each action has (or will have) had on each of the VECs is provided in the table and is not repeated here.

Table I-1. Impacts of Past, Present and Reasonably Foreseeable Future Actions on the five VECs. These actions do not include those which were considered to have little impact on the fishery or actions under consideration in this frameworkt.

Action	Description	Impacts on Regulated Groundfish Stocks	Impacts on Non-groundfish species	Impacts on Endangered and Other Protected Species	Impacts on Habitat – Including Non-fishing Effects	Impacts on Human Communities
MULTISPECIES FISHERY-RELATED ACTIONS						
P Prosecution of the groundfish fisheries by foreign fleets in the area that would become the U.S. EEZ (prior to implementation of the MSA)	Foreign fishing pressure peaked in the 1960s and slowly declined until passage of the MSA in 1974 and implementation of the Multispecies FMP	**Direct High Negative** Foreign fishing depleted many groundfish stocks	**Potentially Direct High Negative** Limited information on discarding, but fishing effort was very high and there were no gear requirements to reduce bycatch	**Potentially Direct High Negative** Limited information on protected resources encounters, but fishing effort was very high	**Potentially Direct High Negative** Limited information on habitat, but fishing effort was very high	**Potentially Indirect Negative** Revenue from fishing was split between foreign and domestic communities, rather than just domestic communities
P Original FMP implemented in 1977	Established management of cod, haddock and yellowtail via catch quotas, quota allocations by vessel class and catch limits	**Direct Positive** Provided slight effort reductions and regulatory tools available to rebuild and manage stocks	**Indirect Positive** Reduced directed fishing effort on cod, haddock and yellowtail which resulted in discard/bycatch reductions	**Indirect Positive** Reduced fishing effort, thus reduced interactions with protected species	**Indirect Positive** Reduced fishing effort, thus reduced gear interactions with habitat	**Indirect Positive** Increased probability of long term sustainability

Action	Description	Impacts on Regulated Groundfish Stocks	Impacts on Non-groundfish species	Impacts on Endangered and Other Protected Species	Impacts on Habitat – Including Non-fishing Effects	Impacts on Human Communities
MULTISPECIES FISHERY-RELATED ACTIONS CONTINUED						
P Interim Plan (1982)	Implemented GB seasonal closed areas, minimum fish size requirements in GB and GOM and permit requirements	**Direct Positive** Reduced directed fishing effort	**Indirect Positive** Reduced directed fishing effort which resulted in discard/bycatch reductions	**Indirect Positive** Reduced fishing effort, thus reduced interactions with protected species	**Indirect Positive** Reduced fishing effort, thus reduced gear interactions with habitat	**Indirect Positive** Increased probability of long term sustainability
P Multispecies Plan (1986)	Revised FMP to include pollock, redfish, winter flounder, American plaice, witch flounder, windowpane flounder and white hake. Allowed additional minimum fish size restrictions, extended GB spawning area closures and a SNE closure to protect yellowtail flounder	**Direct Positive** Reduced directed fishing effort and provided the opportunity to manage additional groundfish species	**Indirect Positive** Reduced directed fishing effort which resulted in discard/bycatch reductions	**Indirect Positive** Reduced fishing effort, thus reduced interactions with protected species	**Indirect Positive** Reduced fishing effort, thus reduced gear interactions with habitat	**Indirect Positive** Increased probability of long term sustainability

Action	Description	Impacts on Regulated Groundfish Stocks	Impacts on Non-groundfish species	Impacts on Endangered and Other Protected Species	Impacts on Habitat – Including Non-fishing Effects	Impacts on Human Communities
MULTISPECIES FISHERY-RELATED ACTIONS CONTINUED						
[P] Amendments 1-4 to the Multispecies FMP (1987-1991)	Implemented closure in SNE/MA to protect yellowtail, extended GB RMA, added minimum mesh size requirements to SNE, excluded scallop dredge vessels from SNE closure, incorporated silver hake, red hake and ocean pout into the FMP	**Direct Positive** Reduced directed fishing effort and provided the opportunity to manage additional groundfish species	**Indirect Positive** Reduced directed fishing effort which resulted in discard/bycatch reductions	**Indirect Positive** Reduced fishing effort, thus reduced interactions with protected species	**Indirect Positive** Reduced fishing effort, thus reduced gear interactions with habitat	**Indirect Positive** Increased probability of long term sustainability
[P] Multispecies Emergency Action (1994)	Implemented 500-lb haddock trip limit, expanded CA II closure time and area, prohibited scallop dredge vessels from possessing haddock from Jan-Jun and prohibited pair-trawling for multispecies	**Direct Positive** Reduced directed fishing effort	**Indirect Positive** Reduced directed fishing effort which resulted in discard/bycatch reductions	**Indirect Positive** Reduced fishing effort, thus reduced interactions with protected species	**Indirect Positive** Reduced fishing effort, thus reduced gear interactions with habitat	**Indirect Positive** Increased probability of long term sustainability

Action	Description	Impacts on Regulated Groundfish Stocks	Impacts on Non-groundfish species	Impacts on Endangered and Other Protected Species	Impacts on Habitat – Including Non-fishing Effects	Impacts on Human Communities
MULTISPECIES FISHERY-RELATED ACTIONS CONTINUED						
P, Pr Amendment 5 to the FMP (1994)	Made the above Emergency Action measures permanent, enacted a moratorium on new participants in the fishery, reduced DAS for most vessels by 50% over a 5-7 year period, implemented mandatory reporting and observer requirements, etc.	**Direct High Positive** Reduced directed fishing effort and capped the number of participants allowed to direct on the fishery	**Indirect Positive** Reduced directed fishing effort which resulted in discard/bycatch reductions	**Indirect Positive** Reduced fishing effort, thus reduced interactions with protected species	**Indirect Positive** Reduced fishing effort, thus reduced gear interactions with habitat	**Mixed** Increased probability of long term sustainability by limiting the number of participants in the directed fishery. However, there was a negative impact for fishermen and communities where participation was reduced
, Pr Emergency Action (1994)	Implemented additional closed areas, prohibited scallop vessels from fishing in the closed areas, disallowed any fishery using mesh smaller than minimum mesh requirements, prohibited retaining regulated species with small mesh, etc.	**Direct High Positive** Reduced directed fishing effort	**Indirect Positive** Reduced directed fishing effort which resulted in discard/bycatch reductions	**Indirect Positive** Reduced fishing effort, thus reduced interactions with protected species	**Indirect Positive** Reduced fishing effort, thus reduced gear interactions with habitat	**Mixed** Increased probability of long term sustainability but effort reductions result in short term lost revenues for fishermen and communities

Action	Description	Impacts on Regulated Groundfish Stocks	Impacts on Non-groundfish species	Impacts on Endangered and Other Protected Species	Impacts on Habitat – Including Non-fishing Effects	Impacts on Human Communities
MULTISPECIES FISHERY-RELATED ACTIONS CONTINUED						
P, Pr Framework 9 (1985)	Made the above Emergency Action measures permanent	**Direct High Positive** Reduced directed fishing effort	**Indirect Positive** Reduced directed fishing effort which resulted in discard/bycatch reductions	**Indirect Positive** Reduced fishing effort, thus reduced interactions with protected species	**Indirect Positive** Reduced fishing effort, thus reduced gear interactions with habitat	**Mixed** Increased probability of long term sustainability but effort reductions result in short term lost revenues for fishermen and communities
P, Pr Amendment 7 to the Multispecies FMP (1996)	Accelerated Amendment 5 DAS reduction schedule, implemented seasonal GOM closures, implemented 1,000 lb haddock trip limit, expanded the 5% bycatch rule, etc.	**Direct High Positive** Reduced directed fishing effort	**Indirect Positive** Reduced directed fishing effort which resulted in discard/bycatch reductions	**Indirect Positive** Reduced fishing effort, thus reduced interactions with protected species	**Indirect Positive** Reduced fishing effort, thus reduced gear interactions with habitat	**Mixed** Increased probability of long term sustainability but effort reductions result in short term lost revenues for fishermen and communities

Action	Description	Impacts on Regulated Groundfish Stocks	Impacts on Non-groundfish species	Impacts on Endangered and Other Protected Species	Impacts on Habitat – Including Non-fishing Effects	Impacts on Human Communities
MULTISPECIES FISHERY-RELATED ACTIONS CONTINUED						
P, Pr Framework 20 (1997)	Implemented GOM cod daily trip limit of 1,000 lb, increased the haddock daily trip limit to 1,000 lb and added gillnet effort-reduction measures such as net limits	**Mixed** Reduced directed fishing effort but allowed for an increase in haddock landings	**Mixed** Gillnet restrictions and reduced effort on cod helped reduce discards/bycatch but this may have been offset by increased effort on haddock	**Indirect Positive** Although the haddock daily trip limit increased, gillnet restrictions provide an overall positive impact	**Mixed** Reduced cod daily trip limit would be offset by increase haddock daily landing limit	**Mixed** Reduced revenues from a smaller cod daily trip limit could be offset by the increased haddock daily landing limit but gillnet effort reductions also have negative eco/soc impacts
P, Pr Framework 24 (1998)	Implemented an adjustment to GOM cod daily trip limit by requiring vessels to remain in port and run their DAS clock for a cod overage and implemented the DAS carryover provisions	**Direct Low Positive** Implemented minor effort reductions	**Indirect Low Positive** Implemented minor effort reductions which resulted in minor discard/bycatch reductions	**Indirect Low Positive** Slightly reduced fishing effort, thus reduced interactions with protected species	**Indirect Low Positive** Reduced fishing effort, thus reduced gear interactions with habitat	**Mixed** Vessels must remain in port with their clock running for a cod overage which has a negative impact but vessels may carryover DAS from one fishing year into the next.
P, Pr Framework 25 (1998)	Implemented GOM inshore closure areas, the year-round WGOM closure, the CLCA and reduced the GOM cod daily trip limit to 700 lb	**Direct Low Positive** Implemented effort reductions via reduced cod trip limit and closure areas	**Indirect Low Positive** Reduced directed fishing effort which resulted in discard/bycatch reductions	**Indirect Positive** Effort controls result in reduced interactions with protected species	**Indirect High Positive** Closure areas and effort controls reduce gear interactions with habitat	**Mixed** Increased probability of long term sustainability but short term negative eco/soc impacts

Action	Description	Impacts on Regulated Groundfish Stocks	Impacts on Non-groundfish species	Impacts on Endangered and Other Protected Species	Impacts on Habitat – Including Non-fishing Effects	Impacts on Human Communities
MULTISPECIES FISHERY-RELATED ACTIONS CONTINUED						
P, Pr Framework 26 (1999)	Expansion of April GOM inshore closure area and, additional seasonal inshore GOM and GB area closures	**Direct Low Positive** Implemented effort reductions via closure areas	**Indirect Low Positive** Reduced directed fishing effort which resulted in discard bycatch reductions	**Indirect Positive** Effort controls result in reduced interactions with protected species	**Indirect High Positive** Closure areas and effort controls reduce gear interactions with habitat	**Mixed** Increased probability of long term sustainability but short term negative eco/soc impacts
P, Pr, RFF Amendment 11 (1998)	Designated EFH for all species in the multispecies FMP and required Federal agencies to consult with NMFS on actions that may adversely effect EFH	**Indirect Low Positive** A consultation with NFMS that leads to the protection of multispecies EFH is beneficial to multispecies stocks	**Indirect Low Positive** A consultation with NFMS that leads to the protection of multispecies EFH is beneficial to other stocks that share the same EFH as multispecies stocks	**Indirect Low Positive** Consultation with NFMS that leads to the protection of multispecies EFH is beneficial to protected resources that share a need for the same habitat that multispecies stocks require	**Direct High Positive** Consultation with NMFS on activities that may adversely effect habitat provides NMFS the opportunity to mitigate or even prevent EFH impacts	**Indirect Low Positive** For instances where NMFS consults on projects impacting multispecies EFH, the overall health of the stocks should improve which would lead to long term sustainability

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MULTISPECIES FISHERY-RELATED ACTIONS CONTINUED						
[P, Pr] Framework 27 (1999)	Established large GOM rolling closures, modified CLCA, decreased GOM daily trip limit to 200 lb with subsequent reduction to 30 lb, increased haddock trip limit to 2,000 lb and increased minimum mesh size	**Mixed** Reduced directed fishing effort while also allowing the haddock trip limit to increase	**Mixed** A reduction in directed effort helped minimize bycatch and discards but increased haddock trip limit was somewhat offsetting	**Mixed** Reduced directed effort helps minimize protected species encounters but this was somewhat offset by the increased haddock trip limit	**Indirect Positive** Reduced directed effort and closed areas help improve habitat, this may be slightly offset by the increased haddock trip limit	**Mixed** Short term negative from closed areas and the reduced cod trip limit which were not offset by the increased haddock trip limit. Long term positive because of increased probability of sustainable stocks
[P] Interim Rule (1999)	Revised GOM cod trip limit to 100 lb/day up to 500 lb max and revised the DAS running clock to allow a 1-day overage only	**Direct Positive** Reduced directed fishing effort	**Indirect Positive** Reduced directed fishing effort which resulted in discard/bycatch reductions	**Indirect Low Positive** Effort controls result in reduced interactions with protected species	**Indirect Low Positive** Effort controls result in reduced habitat interactions	**Mixed** Increased probability of long term sustainability but short term negative eco/soc impacts
[P, Pr, RFF] Amendment 9 (1999)	Prohibited used of brush sweep trawl gear, added halibut to the FMP with a 1-fish per trip possession limit	**Direct Positive** Reduced directed fishing effort	**Indirect Positive** Reduced directed fishing effort which resulted in discard/bycatch reductions	**Indirect Low Positive** Effort controls result in reduced interactions with protected species	**Indirect High Positive** Effort controls result in reduced habitat interactions	**Mixed** Increased probability of long term sustainability but short term negative eco/soc impacts

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MULTISPECIES FISHERY-RELATED ACTIONS CONTINUED						
P, Pr Framework 31 (2000)	Increased GOM Daily limit to 400 lb/day up to 4,000/lb per trip, added Feb GOM inshore closure and extended 1999 Interim Rule running clock measure	**Mixed** Increased cod directed fishing effort while also reducing effort via closure area and cod running clock measure	**Mixed** Increased effort on cod could lead to greater discards/bycatch which would be somewhat offset by effort reductions via closure area and cod running clock measure	**Mixed** Increased cod effort could increase interactions but somewhat offset by effort reductions via closure area and cod running clock measure	**Indirect Low Positive** Minor positive impacts from inshore closure area	**Mixed** Short term positive from increased cod trip limit but long-term sustainability of the cod resource was effected
P, Pr Framework 33 (2000)	Added GB seasonal closure area, added conditional GOM closure areas and increase haddock trip limit to 3,000 lb	**Mixed** Increased haddock directed fishing effort while also reducing effort via closure areas	**Mixed** Increased effort on haddock could lead to greater discards/bycatch which would be somewhat offset by effort reductions via closure areas	**Mixed** Increased haddock effort could increase interactions but somewhat offset by effort reductions via closure areas	**Indirect Low Positive** Minor positive impacts from closure areas	**Mixed** Short term positive from increased haddock trip limit but negative impacts resulting from closure areas

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MULTISPECIES FISHERY-RELATED ACTIONS CONTINUED						
P, Pr, RFF Interim Action (Settlement Agreement; 2002)	Restricted DAS use, modified DAS clock for trip vessels, added year-round closure of CLCA, expanded rolling closures, prohibited front-loading DAS clock, increased GOM trawl and gillnet mesh size, added new limitations on Day gillnets and further restricted charter/party vessels	**Direct High Positive** Implemented substantial directed fishing reductions	**Indirect High Positive** Implemented substantial directed fishing reductions which also reduced discards/bycatch	**Indirect Positive** Fishing reductions and expanded closure areas reduce protected species interactions	**Indirect High Positive** Fishing reductions and expanded closure areas reduce negative impacts to habitat	**Mixed** Short term impacts due to restrictions were highly negative but positive regarding the long term sustainability of the fishery

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MULTISPECIES FISHERY-RELATED ACTIONS CONTINUED						
[P, Pr, RFF] Interim Action (Settlement Agreement Continued; 2002)	Continued above interim measures, further reduced DAS allocations, prohibited issuance of additional handgear permits, eliminated GOM Jan and Feb closures, increased SNE trawl and GB/SNE gillnet mesh sizes, further limited day and trip gillnets, added longline gear restrictions, added possession limit and restrictions on yellowtail catch and increased GOM cod daily trip limit to 500/4,000 lb max	**Direct High Positive** Implemented substantial directed fishing reductions	**Indirect High Positive** Implemented substantial directed fishing reductions which also reduced discards/bycatch	**Indirect Positive** Fishing reductions reduce protected species interactions	**Indirect Positive** Fishing reductions reduce negative impacts to habitat	**Mixed** Short term impacts due to restrictions were highly negative but improving the long term sustainability of the fishery was positive

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MULTISPECIES FISHERY-RELATED ACTIONS CONTINUED						
P, Pr, RFF Amendment 13 (2004)	Adopted new rebuilding periods and a new rebuilding program that included periodic adjustments and default DAS reductions to reduce effort over time, allowed DAS to be leased or transferred, created sector allocation and special access programs to allow access to stocks that can support an increase in catch	**Direct High Positive** Implemented substantial directed fishing reductions	**Mixed** Implemented substantial directed fishing reductions which also reduced discards/bycatch. However, the mores stringent restrictions created pressure to direct on other stocks (e.g., monkfish)	**Indirect Positive** Fishing reductions reduce protected species interactions	**Indirect Positive** Fishing reductions reduce negative impacts to habitat	**Mixed** Short term impacts due to restrictions were highly negative but improving the long term sustainability of the fishery was positive
P, Pr, RFF Framework 40A (2004)	Created additional SAPs to target healthy stocks	**Direct Positive** Directing effort toward healthy stocks relieved pressure on stocks of concern	**Indirect Negative** Increased bycatch of monkfish and skates	**Negligible** Although effort increased slightly, no effort shifts impacting protected species are known to have occurred	**Negligible** Although effort increased slightly, no effort shifts impacting habitat are known to have occurred	**Indirect Positive** Provided vessels the opportunity for greater revenue while relieving pressure on stocks of concern

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MULTISPECIES FISHERY-RELATED ACTIONS CONTINUED						
P, Pr, RFF Framework 40B (2005)	Relaxed DAS leasing and transfer requirements, created new yellowtail flounder SAP, provided greater opportunity for vessels to participate in the GB Cod Hook Sector, removed the net trip limit for gillnets, etc.	**Negligible** Mix of alternatives, some of which slightly increased effort and others that slightly decreased effort. Overall, changes did not threaten rebuilding targets established by Amendment 13	**Indirect Low Negative** Mix of alternatives that primarily had little impact on discards/bycatch with the exception of removing the net trip limit for gillnets which increased monkfish effort	**Negligible** Slight effort changes did not have measurable impacts to protected species	**Negligible** Slight effort changes did not have measurable impacts to habitat	**Indirect Low Positive** Slight changes to the leasing and transfer programs along with greater opportunities to participate in SAPs provides an opportunity for greater revenue
P, Pr, RFF Framework 41 (2005)	Allowed for participation in the Hook Gear Haddock SAP by non-Sector vessels	**Direct Low Positive** Encouraged effort on haddock, a healthy stock, and thus away from other stocks of concern	**Indirect Low Negative** Although directed effort shifted to a healthier stock, there was an overall effort increase resulting in a greater opportunity for bycatch/discards	**Negligible** Slight effort changes did not have measurable impacts to protected species	**Negligible** Slight effort changes did not have measurable impacts to habitat	**Indirect Low Positive** Greater opportunity to fish for a healthy stock provides increased revenue

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[P] Emergency Action (2006)	Implemented differential A DAS of 1.4:1, restricted the B Regular DAS program and US/CA Haddock SAP and reduced trip limits on cod, yellowtail, etc.	**Direct High Positive** Implemented effort reductions that anticipated achieving mortality reductions needed to keep stocks on track to rebuild	**Mixed** Effort reductions lead to reduced discards/bycatch but the B Regular DAS program increased monkfish and skate bycatch	**Negligible** Effort changes did not have measurable impacts to protected species	**Negligible** Effort changes did not have more than minimal impacts to habitat	**Mix** Short term effort reductions have a negative impact on revenues but increase long term sustainability of stocks
MULTISPECIES FISHERY-RELATED ACTIONS CONTINUED						
P, Pr, RFF Framework 42 (2006)	Reduced the number of A DAS available, modified differential DAS counting to 2:1 in the GOM and SNE, reduced trip limits for several stocks, increased recreations minimum fish sizes, required use of VMS by all vessels, modified the SAPs, limited the bycatch of monkfish and skates for vessels using a haddock separator trawl, etc.	**Direct High Positive** Implemented effort reductions that anticipated achieving mortality reductions needed to keep stocks on track to rebuild	**Indirect Positive** Effort reductions lead to reduced discards/bycatch and measures were implemented to control monkfish and skate bycatch	**Indirect Low Positive** Overall effort reductions have a positive impact, particularly to protected species in high use areas such as the GOM and SNE where strict differential counting rules are in effect	**Indirect Low Positive** Overall effort reductions have a positive impact	**Mixed** Effort reductions have a significant negative impact to vessel owners and communities, primarily due to loss of revenues. Over the long term however, stocks should remain sustainable

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MULTISPECIES FISHERY-RELATED ACTIONS CONTINUED						
P, Pr, RFF Framework 43 (2006)	Established a haddock incidental bycatch limit in the herring fishery on GB	**Mixed** While the incidental haddock allowance allows some legal catch of haddock which has a negative impact, the area is closed after the bycatch cap is reached which prohibits further harvest (positive impact)	**Negligible** The herring fishery is fairly clean and the increased haddock bycatch problem arose from strong 2003 and 2004 year classes. Allowing legal retention of haddock bycatch should not alter fishing practices in a manner that would impact species taken as bycatch	**Negligible** Although attaining the bycatch cap could reduce effort on GB, the extent of this reduction was not expected to have an overall impact on protected species	**Negligible** Gear used to target herring have been found not to have an impact on habitat	**Mixed** Allowing herring vessels to continue fishing practices on GB has a positive impact on those vessels and communities. However, the loss of the potential haddock catch has a negative impact on fishermen targeting groundfish
P, P, RFF Amendment 16 (2010)	Modifies rebuilding mortality targets and status determination criteria, adopts ACL/AM requirements, modifies effort controls, expands sector policies, implements 17 additional sectors, modifies SAPs, changes DAS leasing and transfer programs	**Direct High Positive** Suite of measures reduces fishing mortality on groundfish stocks to continue rebuilding	**Indirect Positive** Reduced effort from common-pool and sector measures expected to reduce discards of non-target species	**Indirect Low Postive** If common pool and sector measures reduce overall groundfishfishing effort, this will likely reduce protected species impacts	**Direct Low Positive** Fishing effort reductions from common pool and sector measurres should reduce interactions with EFH	**Mixed** Combination of effort controls and sector measures likely to reduce number of vessels, crew, communities participating in fishery, but remaining participants may be more profitable

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MULTISPECIES FISHERY-RELATED ACTIONS CONTINUED						
P, P, RFF Framework 44 (2011)	Specify OFLs/ABC/ACLs for groundfish; authroized in-season adjustments for common pool vessels;adopted YTF allocations for scallop fishery	**Positive** Established catch limits consistent with mortality targets and measures to insure targets are not exceeded	**No impact/neutral**	**Mixed** YTF allocations may reduce scallop effortif they limit fishery, reduce interactions with protected species	**Negligible**	**Minor/Mixed** Revenues should increase over time but short term losses expeceted
RFF Framework 46	Specify OFLs/ABC/ACLs for groundfish, FY 2012 -2014	**Direct Positive** Continue stock rebuiding	**Negligible** Analysis not complete but minimal impacts expected	**Negligible** Analysis not complete but minimal impacts expected	**Negligible** Analysis not complete but minimal impacts expected	
RFF Framework 47	Adjust MWT haddock cap measures	**Unknown/minor** Measures not yet developed; will not increase total catch so impacts expected to be minor	**Negligble** Changes in distribution ofMWT effort possible, depending measures	**Unknown/minor** Depending on measures may shift MWT fishing effort	**Negligible**	**Minor/Mixed** Measurs may be vieweddifferently by herringand groundfish industries
RFF Amendment 17	Consider accumulation limits and measures to maintain fleet diversity	**Negligble** Will not change total groundfish catch	**Minor/Mixed** Will not change total catch but could conceivably divert effort into other fisheries	**Minor** May change types of fishing activity	**Minor** May change distribiution of catch by gears used in the fishery	**Mixed** While some communities may support ownership caps or other measures to maintaint fleet diversity, others my view this as an inefficient way to manage

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MULTISPECIES FISHERY-RELATED ACTIONS CONTINUED						
[RFF] Sector EAs (2011)	Sector EAs would be prepared for each sector approved under this Amendment. These documents would assess impacts from exemptions granted to individual sectors that go beyond the universal exemptions	**Negligible** Because exemptions granted to sectors must strive to have neutral impacts compared to common pool vessels, impacts would be negligible	**Negligible** Because exemptions granted to sectors must strive to have neutral impacts compared to common pool vessels, impacts would be negligible	**Negligible** Because exemptions granted to sectors must strive to have neutral impacts compared to common pool vessels, impacts would be negligible	**Negligible** Because exemptions granted to sectors must strive to have neutral impacts compared to common pool vessels, impacts would be negligible	**Low Positive** Because one of the intents of sectors is to provide participants greater freedom to maximize their operations, revenues would be expected to be slightly higher
OTHER FISHERY-RELATED ACTIONS						
[P, Pr, RFF] Atlantic Sea Scallop FMP – a series of amendment and framework actions from the mid-1990s through the present	Implementation of the Atlantic Sea Scallop FMP and continued management of the fishery, primarily through effort controls	**Direct Positive** Effort reductions taken over time have resulted in a sustainable scallop fishery	**Indirect Positive** Effort reductions taken over time also reduced bycatch, including gear modifications that improved bycatch escapement	**Mixed** Effort reductions taken over time reduced interactions with protected species however, turtle interactions remain problematic	**Indirect Positive** Effort reductions reduced gear contact with habitat and the current rotational access program focuses fishing effort on sandy substrates which are less susceptible to habitat impacts	**Indirect Positive** Initial negative impacts due to effort reductions have been supplanted by a sustainable, profitable fishery

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OTHER FISHERY-RELATED ACTIONS CONTINUED						
[P, Pr, RFF] Monkfish FMP – a series of amendment and framework actions from implementation of the FMP in 1999 through the present	Implementation of the monkfish FMP and continued management of the fishery, primarily through effort controls	**Direct Positive** Effort reductions have resulted in a fishery that is no longer overfished, nor is overfishing occurring	**Indirect Positive** Effort reductions taken over time also reduced bycatch	**Indirect Positive** Reducing effort reduced opportunities for interactions with protected species	**Indirect Positive** Reducing effort reduced opportunities for habitat interactions	**Indirect Positive** Reducing effort has created a sustainable fishery
[Pr, RFF] Large Whale Take Reduction Plan Amendment (2008)	Removed the DAM program, will implement sinking ground lines for lobster gear, includes more trap/pot and gillnet fisheries under the protection plan and requires additional markings on gear to improve information regarding where and how entanglements occur	**Negligible** Changes implemented through the amendment are not expected to have substantial changes on groundfish	**Negligible** Changes implemented through the amendment are not expected to have substantial changes on non-groundfish species	**Direct Positive** New regulations implemented to protect large whales are expected to have a positive impact on large whales by reducing incidental takes	**Negligible** Changes implemented through the amendment are not expected to have substantial changes to habitat	**Indirect Negative** Changes implemented through the amendment require some gear changes for gillnet fisheries which have minor negative economic impacts

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OTHER FISHERY-RELATED ACTIONS CONTINUED						
RFF Harbor Porpoise Take Reduction Plan Amendment (~2010)	Options are currently under development to reduce takes of harbor porpoise toward the long-term zero mortality rate goal	**Unknown** If current measures such as closure areas and the use of pingers are expanded upon or modified, it could impact groundfish	**Unknown** If current measures such as closure areas and the use of pingers are expanded upon or modified, it could impact non-groundfish species	**Direct Positive** Changes to protect harbor porpoise have a positive impact on protected species	**Unknown** If current measures such as closure areas and the use of pingers are expanded upon or modified, it could impact habitat	**Unknown** If current measures such as closure areas and the use of pingers are expanded upon or modified, it could impact human communities
RFF Essential Fish Habitat Omnibus Amendment (~2010/2011)	This amendment would revised EFH designations for all New England fisheries, possibly establish new HAPCs and consider measures to further protect critical habitat	**Unknown** If new measures are implemented to protect habitat, they would likely have a positive impact on groundfish	**Unknown** If new measures are implemented to protect habitat, they could have a positive impact non-groundfish species	**Unknown** If new measures are implemented to protect habitat, they could potentially impact protected species	**Direct Positive** New measures implemented to protect habitat would have a positive impact on habitat	**Unknown** If new measures are implemented to protect habitat, they would likely impact human communities
P, Pr RFF Amendment 3 to the Skate FMP (2010)	This amendment addresses rebuilding of winter and thorny skates and reduce mortality on little and smooth skates; reduces trip limits, adopts ACLs and AMs	**Minor Negative** Lower skate possession limits and closures may cause vessels to use DAS for groundfish	**Mixed** Actions taken to reduce skate mortality; they could leadto increased targeting of non-groundfish species	**Unknown** If actions are taken to reduce skate mortality, they could impact protected species	**Unknown** If actions are taken to reduce skate mortality, they could impact habitat	**Minor negative** Actions taken to reduce skate mortality negatively impact human communities

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NON FISHERY-RELATED ACTIONS						
P, Pr, RFFA Agriculture runoff	Nutrients applied to agriculture land are introduced into aquatic systems	**Indirect Negative** Reduced habitat quality in the immediate project area	**Indirect Negative** Reduced habitat quality in the immediate project area	**Direct Negative** Reduced habitat quality in the immediate project area	**Indirect Negative** Reduced habitat quality in the immediate project area	**Indirect Negative** Reduced habitat quality negatively affects resource viability and can lead to reduced income from fishery resources
P, Pr, RFFA Port maintenance	Dredging of wetlands, coastal, port and harbor areas for port maintenance	**Indirect Negative** Localized decreases in habitat quality	**Indirect Negative** Localized decreases in habitat quality	**Direct Negative** Reduced habitat quality in the immediate project area	**Indirect Negative** Localized decreases in habitat quality in the immediate project area	**Indirect Negative** Reduced habitat quality negatively affects resource viability in the immediate project area
P, Pr, RFFA Offshore disposal of dredged materials	Disposal of dredged materials	**Indirect Negative** Localized decreases in habitat quality in the immediate project area	**Indirect Negative** Localized decreases in habitat quality in the immediate project area	**Direct Negative** Reduced habitat quality in the immediate project area	**Indirect Negative** Localized decreases in habitat quality in the immediate project area	**Indirect Negative** Reduced habitat quality negatively affects resource viability in the immediate project area

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NON FISHERY-RELATED ACTIONS CONTINUED						
P, Pr, RFFA Beach nourishment	Offshore mining of sand for beaches	**Indirect Negative** Localized decreases in habitat quality in the immediate project area	**Indirect Negative** Localized decreases in habitat quality in the immediate project area	**Direct Negative** Reduced habitat quality in the immediate project area	**Indirect Negative** Localized decreases in habitat quality in the immediate project area	**Mixed** Positive for mining companies, possibly negative for fisheries
	Placement of sand to nourish beach shorelines	**Indirect Negative** Localized decreases in habitat quality in the immediate project area	**Indirect Negative** Localized decreases in habitat quality in the immediate project area	**Direct Negative** Reduced habitat quality in the immediate project area	**Indirect Negative** Localized decreases in habitat quality in the immediate project area	**Positive** Improves beaches and can help protect homes along the shore line
P, Pr, RFFA Marine transportation	Expansion of port facilities, vessel operations and recreational marinas	**Indirect Negative** Localized decreases in habitat quality in the immediate project area	**Indirect Negative** Localized decreases in habitat quality in the immediate project area	**Direct Negative** Reduced habitat quality in the immediate project area	**Indirect Negative** Localized decreases in habitat quality in the immediate project area	**Mixed** Positive for some interests, potential displacement for others
P, Pr, RFFA Installation of pipelines, utility lines and cables	Transportation of oil, gas and energy through pipelines, utility lines and cables	**Indirect Negative** Initially localized decreases in habitat quality in the immediate project area	**Indirect Negative** Initially localized decreases in habitat quality in the immediate project area	**Indirect Negative** Initially localized decreases in habitat quality in the immediate project area	**Potentially Direct Negative** Initially reduced habitat quality in the immediate project area	**Mixed** End users benefit from improved pipelines, cables, etc., but reduced habitat quality may impact fisheries and revenues

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NON FISHERY-RELATED ACTIONS CONTINUED						
Pr, RFFA Liquefied Natural Gas (LNG) terminals (w/in 5 years)	Transportation of natural gas via tanker to terminals located offshore and onshore (Several LNG terminals are proposed, including ME, MA, NY, NJ and MD)	**Indirect Negative** Initially localized decreases in habitat quality in the immediate project area	**Indirect Negative** Initially localized decreases in habitat quality in the immediate project area	**Indirect Negative** Initially localized decreases in habitat quality in the immediate project area	**Potentially Direct Negative** Localized decreases in habitat quality possible in the immediate project area	**Mixed** End users benefit from a steady supply of natural gas but reduced habitat quality may impact fisheries and revenues
RFFA Offshore Wind Energy Facilities (w/in 5 years)	Construction of wind turbines to harness electrical power (Several facilities proposed from ME through NC, including off the coast of MA)	**Indirect Negative** Initially localized decreases in habitat quality in the immediate project area	**Indirect Negative** Initially localized decreases in habitat quality in the immediate project area	**Potentially Direct Negative** Localized decreases in habitat quality possible in the immediate project area	**Potentially Direct Negative** Localized decreases in habitat quality possible in the immediate project area	**Mixed** End users benefit from a clean energy production but reduced habitat quality may impact fisheries and revenues