DRAFT
Framework Adjustment 3
To the
Northeast Skate Complex FMP
and 2016-2017 Specifications

June 1, 2016

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

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Initial Framework Meeting: November 12, 2015
Final Framework Meeting: December 2, 2015
Preliminary Submission: March 18, 2016
Final Submission:

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 Skate Complex Fishery Management Plan (FMP) specifies the management measures for seven skate species (barndoor, clearnose, little, rosette, smooth, thorny and winter skates) off the New England and Mid-Atlantic coasts. The FMP has been updated through a series of amendments, framework adjustments and specification packages. Amendment 3 to the FMP established a control rule for setting the Skate Allowable Biological Catch (ABC) based on survey biomass indices and median exploitation ratios; the ABC was set to equal the Annual Catch Limit (ACL).

This framework action and specifications would implement changes to specifications based on updated data and research and would add a new seasonal allocation of the skate wing fishery TAL.

The *need* for this action is to set the annual catch limit specifications (ABC, ACL, ACT, and TALs) for FY 2016 and FY 2017 to maintain the skate fisheries while adequately minimizing the risk of overfishing the seven skate stocks. This action also proposes to change the skate wing seasonal management by apportioning a percentage of the wing TAL to each season. There are several *purposes*: to adopt specifications, to adopt possession limits and to modify the seasonal management of the wing fishery.

Proposed Action

Under the provision of the M-S Act, the Council submits proposed management actions to the Secretary of Commerce for review. The Secretary of Commerce can approve, disapprove, or partially approve the action proposed by the Council. In the following alternative descriptions, measures identified as Preferred Alternatives constitute the Council's proposed management action.

If the Preferred Alternatives identified in this document are adopted, this action would implement a range of measures designed to achieve mortality targets and net benefits from the fishery. Details of the measures summarized below can be found in Section 4.0.

The Preferred Alternatives include:

- *Updates to Annual Catch Limit*
    - *Revised Annual Catch Limit Specifications.* The preferred alternative would adopt a new Annual Catch Limit (ACL), Annual Catch Target (ACT) and Total Allowable Landings (TALs) for the wing and bait fisheries. The aggregate skate ABC/ACL would decrease from 35,479 mt to 31,081 mt. The ACT would likewise decrease from 26,609 mt to 23,311 mt. The TAL would decrease from 16,385 mt to 12,872 mt. Following final action by the Council, the PDT discovered an error in the formula used to calculate the proportion of dead discards. The corrected specifications are as follows: the aggregate skate ABC/ACL would remain at **31,081** mt, the ACT would remain at **23,311** mt, the TAL would decrease to **12,590** mt, the wing TAL would decrease to **8,372** mt, and the bait TAL would decrease to **4,218** mt.

- *Skate Wing Possession Limit Alternatives*
    - The preferred alternative would retain the status quo trip limits for the skate wing fishery. The possession limit is expected to allow the fishery to remain open year round.

- *Skate Bait Possession Limit Alternatives*
  - The preferred alternative would retain the status quo trip limits for the skate bait fishery.

- *Wing Fishery Seasonal Management Alternatives*
  - The preferred alternative would apportion a percentage of the wing TAL to each season and establish an in-season trigger for season one. It would maintain status quo trip limits for the skate wing fishery. This was established to help insure that the fishery remains open year round.

Summary of Environmental Consequences

The environmental impacts of all of the alternatives under consideration are described in Section 7.0. Biological impacts are described in Section 7.1, impacts on essential fish habitat are described in Section 7.3, impacts on endangered and other protected species are described in Section 7.4, the economic impacts are described in Section 7.5, and social impacts are described in Section 7.6. Summaries of the impacts of the Preferred Alternatives are provided in the following paragraphs. As required by NEPA, the Preferred Alternatives are compared to the No Action alternative.

Biological Impacts
The reduction in the ACL under the preferred alternative would be expected to positively impact overall skate biomass based on the relationship between catch and biomass. The preferred alternative would have a neutral impact on the skate resource, and minor positive impacts when compared to the No Action. Compared to the No Action alternative, the revised ACL would minimize the risk of overfishingthe complex. The status quo skate wing possession limit would have low negative biological impacts and were designed to allow the fishery to maximize harvest of the TAL when compared to the two action alternatives. The status quo skate bait possession limit would have low negative biological impacts when compared to the action alternative. The preferred alternative for the revised seasonal management of the wing fishery is expected to have neutral to low negative impacts. The corrected proportion of dead discards in the catch formula would not be expected to alter the overall conclusions of the biological impacts analysis conducted for Option 2. The ACL would not be affected, retaining the positive benefits to the stock complex from lowering the ACL, based on the established relationship between catch and biomass.

Essential Fish Habitat (EFH) Impacts
The preferred alternatives are expected to have low negative to low positive impacts on EFH similar to No Action alternatives. Fishing behavior is not expected to change in response to the reduced ACL as the preferred alternatives include status quo trip limits in both fisheries. The revised seasonal management of the wing fishery would not be expected to result in additional impacts on EFH compared to the No Action alternative. However, it is uncertain whether there are habitat usage implications associated with seasonal shifts in effort. The corrected proportion of dead discards in the catch formula would further lower the TAL, while not affecting the aggregate skate ABC. This would not be expected to affect the overall conclusions of the completed Essential Fish Habitat impacts analysis.

Impacts on Endangered and Other Protected Species
The preferred alternatives are expected to have low positive to low negative impacts on protected species. The reduced ACL may result in less directed fishing effort and potentially reduced interactions with protected species when compared to the No Action alternative. The preferred possession limit alternatives represent the status quo and are not expected to result in changes in fishing behavior and would have neutral to low negative impacts. The revised seasonal management of the wing fishery would not be expected to result in additional impacts on EFH compared to the No Action alternative because fishing would have the potential to decrease or remain similar to current operating conditions, resulting in low

positive to low negative impacts. The corrected proportion of dead discards in the catch formula would not be expected to affect the overall conclusions of the completed protected resources impacts analysis.

Economic Impacts
The preferred alternatives are expected to have low to medium short-term negative economic impacts. The reduced ACL would be expected to reduce landings and therefore revenue when compared to the No action alternative. The preferred possession limit alternatives represent the status quo and are not expected to result in changes in fishing behavior but when combined with the proposed reduced TAL would have negative economic impacts if the likelihood of incidental possession limit being implemented prior to the end of the fishing year increased along with the likelihood of triggering Accountability Measures. The revised seasonal management of the wing fishery would also have negative economic impacts when combined with the proposed reduced TAL because of the potential for the incidental possession limit to be triggered and the potential to under- or over-achieve the TAL depending on future fishing behavior patterns. The corrected proportion of dead discards in the catch formula would not be expected to affect the overall conclusions of the completed economic impacts analysis. The further reduction in allowable landings would further decrease catch and effort in the wing and bait fisheries; this would be expected to contribute to the negative short-term economic impacts.

Social Impacts
The preferred alternatives are expected to have low negative social impacts, except for the bait possession limit alternative. The reduced ACL would be expected to reduce landings when compared to the No action alternative. The preferred wing possession limit alternative represent the status quo and are not expected to result in changes in fishing behavior but when combined with the proposed reduced TAL would have negative social impacts if the likelihood of incidental possession limit being implemented prior to the end of the fishing year increased along with the likelihood of triggering Accountability Measures. The preferred bait possession limit would have low positive social impacts because it would allow vessels to maximize landings while potentially minimizing operating costs. The revised seasonal management of the wing fishery would also have negative social impacts when combined with the proposed reduced TAL because of the potential for the incidental possession limit to be triggered and the potential to under- or over-achieve the TAL depending on future fishing behavior patterns. The corrected proportion of dead discards in the catch formula would not be expected to affect the overall conclusions of the completed social impacts analysis. The further reduction in allowable landings would further decrease catch and effort in the wing and bait fisheries; this would be expected to contribute to the low negative social impacts.

Alternatives to the Proposed Action

If the Proposed Action is based on the Preferred Alternatives there are a number of alternatives that would not be adopted. These alternatives are briefly described below.

- *Updates to Annual Catch Limit*
    - *Annual Catch Limit Specifications*. The No Action alternative would not adopt new specifications for the NE skate complex. Specifications from 2014-2015 would continue into FY 2016.
- *Skate Wing Possession Limit Alternatives*
    - *Skate Wing Possession Limit.* Option 2 would reduce wing possession limits to a lower level that would reduce the likelihood of triggering an AM and of achieving the TAL. Option 3 is projected to exceed the TAL before the end of the fishing year.

- *Skate Bait Possession Limit Alternatives*
  - *Bait Possession Limit.* The action alternative would reduce the possession limit, which would reduce the likelihood the fishery would achieve its TAL and is included in the document to meet requirements in regulations.
- *Wing Fishery Seasonal Management Alternatives*
  - The No Action alternative would not modify the seasonal management of the wing fishery. Option 3 would modify the seasonal management of the wing fishery and would also institute a mandatory incidental possession limit

Impacts of Alternatives to the Proposed Action

Biological Impacts
The No Action alternative would not incorporate updated survey and discard mortality rate information allowing for a higher than recommended catch, which could negatively impact the complex, although in recent years, the skate fishery has not achieved these catch levels. The No Action alternative would have a moderate, negative impact on the skate resource. The skate wing possession limits would either reduce targeted fishing effort with the potential to increase discarding or result in exceeding the TAL before the end of the fishing year. The No Action modification to the seasonal management of the wing fishery would have neutral impacts; Option 3 would have neutral to low negative impacts depending on the level of discarding that would occur during the time mandatory incidental possession limit time period.

Essential Fish Habitat (EFH) Impacts
The No Action alternative for specifications would allow for increase fishing effort which would increase impacts to EFH relative to the action alternative. Reduced possession limits would decrease impacts on EFH relative to the No Action alternative. The No Action and Option 3 for modification of the seasonal management of the wing fishery would have neutral impacts.

Impacts on Endangered and Other Protected Species
The No Action alternative for specifications would allow for increased fishing effort which would have potentially higher interactions with protected resources as a higher TAL would be expected to result in more fishing, resulting in low negative impacts. Reduced possession limits would decrease impacts on protected species relative to the No Action alternative, unless it resulted in a change in fishing behavior. The No Action and Option 3 for modification of the seasonal management of the wing fishery would have low negative to low positive impacts.

Economic Impacts
The No Action alternative would not incorporate updated survey information allowing for a higher than recommended catch, which may negatively impact the complex. The No Action alternative would be expected to result in future declines in biomass and catch, more restrictive regulations, and failure to reach optimum yield, which would result in a negative and potentially significant economic impact to the fishery. The skate possession limits would either reduce targeted fishing effort with the potential to increase discarding or result in triggering the incidental possession limit prior to the end of the fishing year and/or under- or over-achieving the TAL. The No Action modification to the seasonal management of the wing fishery and Option 3 would have negative impacts the magnitude of which would depend on when in the fishing year the incidental possession limit was triggered or if the TAL was under or over achieved.

Social Impacts
The No Action alternative would not incorporate updated survey information allowing for a higher than recommended catch, which may negatively impact the complex. The No Action alternative would allow for higher short-term catches but could have negative impacts if the stock declined in biomass. The skate

possession limits would either reduce targeted fishing effort with the potential to increase discarding or result in triggering the incidental possession limit prior to the end of the fishing year and/or under- or over-achieving the TAL resulting in negative impacts. The No Action modification to the seasonal management of the wing fishery and Option 3 would have negative impacts the magnitude of which would depend on when in the fishing year the incidental possession limit was triggered or if the TAL was under or over achieved.

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2.4 List of Acronyms

ABC	Allowable biological catch
ACL	Annual Catch Limit
ALWTRP	Atlantic Large Whale Take Reduction Plan
AM	Accountability Measure
APA	Administrative Procedures Act
ASMFC	Atlantic States Marine Fisheries Commission
CAI	Closed Area I
CAII	Closed Area II
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)
DPWG	Data Poor Working Group
DSEIS	Draft Supplemental Environmental Impact Statement
EA	Environmental Assessment
EEZ	exclusive economic zone
EFH	essential fish habitat
EIS	Environmental Impact Statement
ESA	Endangered Species Act
F	Fishing mortality rate
FEIS	Final Environmental Impact Statement
FMP	fishery management plan
FW	framework
FY	fishing year
GARFO	Greater Atlantic Regional Fisheries Office
GARM	Groundfish Assessment Review Meeting
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
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
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
NEFMC	New England Fishery Management Council
NEFSC	Northeast Fisheries Science Center
NEPA	National Environmental Policy Act
NERO	Northeast Regional Office
NLSA	Nantucket Lightship closed area
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NT	net tonnage
OBDBS	Observer database system
OLE	Office for Law Enforcement (NMFS)
OY	optimum yield
PBR	Potential Biological Removal
PDT	Plan Development Team
PRA	Paperwork Reduction Act
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
SIA	Social Impact Assessment
SNE	Southern New England
SNE/MA	Southern New England-Mid-Atlantic
SSB	spawning stock biomass
SSC	Social Science Committee
TAC	Total allowable catch
TAL	Total allowable landings
TED	Turtle excluder device

TEWG	Turtle Expert Working Group
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
YPR	Yield per recruit

3.0 INTRODUCTION AND BACKGROUND

3.1 Management 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 Skate Complex Fishery Management Plan (FMP) specifies the management measures for seven skate species (barndoor, clearnose, little, rosette, smooth, thorny and winter skate) off the New England and Mid-Atlantic coasts. The seven species are managed as a stock complex. The FMP has been updated through a series of amendments and framework adjustments.

Amendment 3 to the FMP implemented a new ACL management framework that capped catches at levels determined from survey biomass indices and median exploitation ratios, and addressed the rebuilding of smooth and thorny skates. Framework Adjustment 1 set a seasonal skate wing possession limits to keep the fishery open year round. Specifications for FY 2012 and FY 2013 were set in the 2012 Specifications package that resulted in an increase in ACL for the complex. Framework Adjustment 2 set specifications for FY 2014 and FY 2015, which decreased the ACL for the complex, and also modified the VTR and dealer reporting codes for the skate wing and bait fisheries.

This framework is primarily intended to set specifications for FY 2016 and FY 2017.

3.2 Purpose and Need for the Action (EA, RFA)

The purpose of this action is to analyze changes in stock condition, update scientific information on skates, and make necessary adjustments to management measures (including catch limits) to 1) set an Annual Catch Limit (ACL) for FY 2016 and FY 2017 that is consistent with conditions and scientific uncertainty and 2) achieve optimum yield. Following procedures using the median exploitation ratio (catch/survey biomass) as a conservative reference point (biomass tends to increase more frequently when catches are at or below this level) to set the ABC and ACL, the catch limits are expected to prevent overfishing. Overfishing of skates, unlike other stocks, is measured as an outcome, a rate of change in biomass which cannot be predicted with existing skate population models.

The need for this action is to set the annual catch limit specifications (ABC, ACL, ACT, and TALs) for FY 2016 and FY 2017 to maintain the skate fisheries while adequately minimizing the risk of overfishing the seven skate species. Without these catch limits and management measures, unregulated fishing for skates would increase to the point that could ultimately cause stocks to become overfished and depleted. In addition, thorny skate is overfished and in a rebuilding plan. Since it had been overfished, barndoor skate is in a rebuilding program but has not yet met the target. Smooth skate is also in a rebuilding plan. Annual catch limits (and associated in-season and post-season accountability measures) prevent fishing from increasing to unsustainable levels. Revised discard mortality rate estimates for trawl gear are available for little, smooth, thorny and winter skates and little and winter skate in scallop dredge gear; all revised estimates are incorporated into the specifications.

3.3 Brief History of the Northeast Skate Complex Management Plan

Table 1 describes the seven species in the Northeast Region’s skate complex, including each species common name(s), scientific name, size at maturity, and general distribution.

Table 1 - Species description for skates in the management unit.

SPECIES COMMON NAME	SPECIES SCIENTIFIC NAME	GENERAL DISTRIBUTION	SIZE AT MATURITY cm (TL)	OTHER COMMON NAMES
Winter Skate	*Leucoraja ocellata*	Inshore and offshore Georges Bank (GB) and Southern New England (SNE) with lesser amounts in Gulf of Maine (GOM) or Mid Atlantic (MA)	Females: 76 cm Males: 73 cm 85 cm	Big Skate Spotted Skate Eyed Skate
Barndoor Skate	*Dipturus laevis*	Offshore GOM (Canadian waters), offshore GB and SNE (very few inshore or in MA region)	Males (GB): 108cm Females (GB): 116 cm	
Thorny Skate	*Amblyraja radiata*	Inshore and offshore GOM, along the 100 fm edge of GB (very few in SNE or MA)	Males (GOM): 87 cm Females (GOM): 88 cm 84 cm	Starry Skate
Smooth Skate	*Malacoraja senta*	Inshore and offshore GOM, along the 100 fm edge of GB (very few in SNE or MA)	56 cm	Smooth-tailed Skate Prickly Skate
Little Skate	*Leucoraja erinacea*	Inshore and offshore GB, SNE and MA (very few in GOM)	40-50 cm	Common Skate Summer Skate Hedgehog Skate Tobacco Box Skate
Clearnose Skate	*Raja eglanteria*	Inshore and offshore MA	61 cm	Brier Skate
Rosette Skate	*Leucoraja garmani*	Offshore MA	34 – 44 cm; 46 cm	Leopard Skate

Abbreviations are for Gulf of Maine (GOM), Georges Bank (GB), Southern New England (SNE), and the Mid-Atlantic (MA) regions.

Skates are harvested in two very different fisheries, one for lobster bait and one for wings for food. The fishery for lobster bait is a more historical and directed skate fishery, involving vessels primarily from Southern New England ports that target a combination of little skates (>90%) and, to a much lesser extent, juvenile winter skates (<10%). The catch of juvenile winter skates mixed with little skates is difficult to differentiate due to their nearly identical appearance.

The fishery for skate wings evolved in the 1990s as skates were promoted as "underutilized species," and fishermen shifted effort from groundfish and other troubled fisheries to skates and dogfish. The wing fishery is more of an incidental fishery that includes a larger number of vessels located throughout the region. Vessels tend to catch skates when targeting other species like groundfish, monkfish, and scallops and land them if the price is high enough. A description of available information about these fisheries can be found in Section 6.5.1.

The Northeast skate complex was assessed in November 1999 at the 30th Stock Assessment Workshop (SAW 30) in Woods Hole, Massachusetts. The work completed at SAW 30 indicated that four of the seven species of skates were in an overfished condition: winter, barndoor, thorny and smooth. In addition, overfishing was thought to be occurring on winter skate (NEFSC, 2000). The FMP initially set limits on fishing related to the amount of groundfish, scallop, and monkfish DAS and measures in these and other FMPs to control the catch of skates. Initially, it was thought that barndoor, smooth, rosette, and thorny skates were overfished and that overfishing of winter skate was occurring.

Amendment 3 became effective on July 16, 2010, implementing a new ACL management framework that capped catches at specific levels determined from survey biomass indices and median exploitation ratios. In addition to the ACL framework and accountability measures, the amendment also included technical measures that reduced the skate wing possession limit from 20,000 (45,400 whole weight) to 5,000 (11,350 whole weight) lbs. of skate wings, established a 20,000 lbs. whole skate bait limit for vessels with skate bait letters of authorization, and allocated the skate bait quotas into three seasons proportionally to historic landings.

Framework Adjustment 1 evaluated alternatives for setting a lower skate wing possession limit to keep landings below the 9,209 mt TAL and keep the fishery open year around. As a result of the Framework Adjustment 1 analysis, the Council set a 2,600 lbs. skate wing possession limit from May 1 to Aug 31, 2011 and a 4,100 lbs. skate wing possession limit from Sep 1, 2011 to Apr 30, 2011.

During the end of the 2010 fishing year (Jan – Apr), the Skate PDT developed the analyses needed to update the ACL with new data, including calibrations of the survey tow data collected by the new FSV Bigelow in 2009-2011 and recent discard mortality research for little and winter skates captured by vessels using trawls.

In June 2011, the Council requested that the Regional Administrator (RA) initiate an Emergency Action to adjust the 2011 ACL specifications, based on the new analysis and calibrated survey data through spring 2011. A proposed rule was published on August 30, 2011 (FR 76(168) p53872; http://www.nero.noaa.gov/nero/regs/frdoc/11/11SkatePR.pdf) to raise the ACL specifications accordingly.

Specifications for FY 2012 and FY 2013 were set following the Amendment 3 ACL methodology; the assumed discard rate was updated using the 2008-2010 dead discards. The re-estimated discard rate also incorporates new discard mortality estimates for little (20%) and winter (12%) skates captured by trawls.

Framework Adjustment 2 (NEFMC, 2014) set specifications for FY 2014 and FY 2015 also following the Amendment 3 ACL methodology. It also incorporated final discard mortality rate estimates for little

(22%), winter (9%), smooth (60%), and thorny (23%) skate for trawl gear. Framework Adjustment 2 also modified the VTR and dealer reporting codes for the skate wing and bait fisheries.

3.4 Maximum Sustainable Yield (MSY) and Optimum Yield (OY)

Principally, due to problems with species identification in commercial catches, the Skate FMP did not derive or propose an MSY estimate for skate species or for the skate complex. Catch histories for individual species were unreliable and probably underreported. Furthermore, the population dynamics of skates was largely unknown so measures of carrying capacity or productivity were not available on which to base estimates of MSY.

One of the major purposes of Amendment 3 was to set catch limits to prevent overfishing. If overfishing is defined as an unsustainable level of exploitation, then a suitable candidate for MSY is the catch that when exceeded generally leads to declines in biomass MSY. This value, estimated by the Skate PDT and approved as an ABC by the SSC, is the median exploitation ratio (catch/relative biomass). If and when the biomass of skates is at the target, the maximum catch that would not exceed the median exploitation ratio can serve as a proxy for MSY (Hilborn and Walters 1992).

Table 2 **-** Exploitation ratios and survey values for managed skates, with estimates of annual catch limits, and maximum sustainable yield that take into account the 2012-2014 discard rate using DPWS catch data using the selectivity ogive method to assign species to catch[1].

	Catch/biomass index (thousand mt catch/kg per tow)	Stratified mean survey weight (kg/tow)	
Species	Median	2012-2014	MSY Target
Barndoor	2.76	1.41	1.57
Clearnose	3.35	0.77	0.66
Little	2.09	6.75	6.15
Rosette	2.51	0.048	0.048
Smooth	2.74	0.19	0.27
Thorny	1.40	0.13	4.13
Winter	1.91	5.06	5.66
Annual Catch Limit (ACL/ABC)		31,081	
MSY			36,860

Because the numeric estimates of MSY were unavailable in the Skate FMP, a quantitative estimate of optimum yield was also not previously specified. The Skate FMP defined optimum yield as equating "to the yield of skates that results from effective implementation of the Skate FMP."

Although the Skate FMP had no quantitative estimate of MSY, it defined optimum yield as equating "to the yield of skates that results from effective implementation of the Skate FMP." Amendment 3 redefined the estimate of optimum yield as 75% of MSY. Thus using the updated catch/biomass exploitation ratios and adjusted survey biomass values, the revised estimate of optimum yield is 27,645 mt.

[1] The survey biomass value for little skate is the arithmetic average of the 2013-2015 spring surveys.

At current skate biomass, the ACT will be set at 23,311 mt, allowing for a 25% buffer from the ACL to account for scientific and management uncertainty. Deducting the 2012-2014 discards to account for bycatch results in an aggregate TAL of 12,590 mt.

3.5 ABC and ACL Specifications

ABC and ACL specifications are derived from the median catch/biomass exploitation ratio for time series up to 2014 and the three year average stratified mean biomass for skates, using the 2013-2015 spring survey data for little skate and the 2012-2014 fall survey data for other managed skate stocks. For skates, the Council set the ACL equal to the ABC because the skate ABC is inherently conservative and the associated exploitation ratio is less than that which is risk neutral (and theoretically equivalent to F_{MSY}). TALs are set according to Amendment 3 procedures that assume that future discards will be equivalent to the average rate from the most recent three years (2012-2014), and that state landings will approximate 2.6% of the total landings.

The updated specifications are presented in Section 4.1.1 and the analysis of the data is presented in Section 7.0. The new data include survey biomass tow data collected by the FSV Bigelow, which have been calibrated to the FSV Albatross IV units using peer reviewed methods. The catch data include new estimates of discard mortality for little, smooth, thorny and winter skates captured by trawl gear, and little and winter skate captured by scallop dredge gear.

3.6 Stock Status

Stock status is described in more detail in Section 6.1.2. Based on survey data through spring 2015 and catch data through calendar year 2014, little and clearnose skate biomass are above the target, rosette skate biomass is at the target, and barndoor, smooth, and winter skate biomass are between the threshold and target. Thorny skate biomass is well below the threshold and is therefore overfished, a status that has existed since 1987 (if overfishing had been defined at that time).

3.7 Essential Fish Habitat (EFH)

Section 4.6 of the Skate FMP (available at http://www.nefmc.org/skates/fmp/skate_final_fmp_sec3.PDF) described and identified EFH for all seven managed skate species, based on the observed distribution of eggs, juvenile, and adult skates. The section includes maps based on the distribution of juveniles and adults. In general, no information was available on the distribution of eggs and skates do not have a larval life stage, instead hatching (i.e. emerging from egg cases) as juvenile skates.

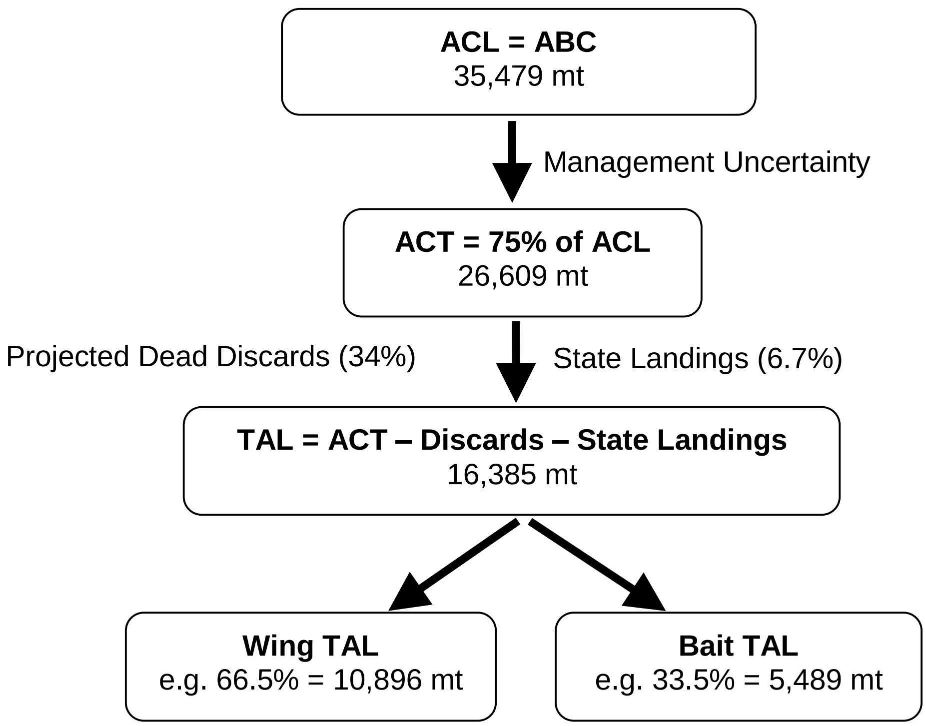
This specification document proposes no changes to skate EFH descriptions or designations, but Amendment 2 to the Skate FMP will be approved as a part of a developing Omnibus EFH Amendment that will re-evaluate skate EFH.

4.0 Alternatives Under Consideration

4.1 Updates to Annual Catch Limits

4.1.1 Option 1: No Action

The ACL parameters and limits would remain unchanged from the final ACL specifications for the 2014-2015 fishing years (see diagram below) in the final regulations for the specifications package and would not incorporate all of the updated scientific data and information.

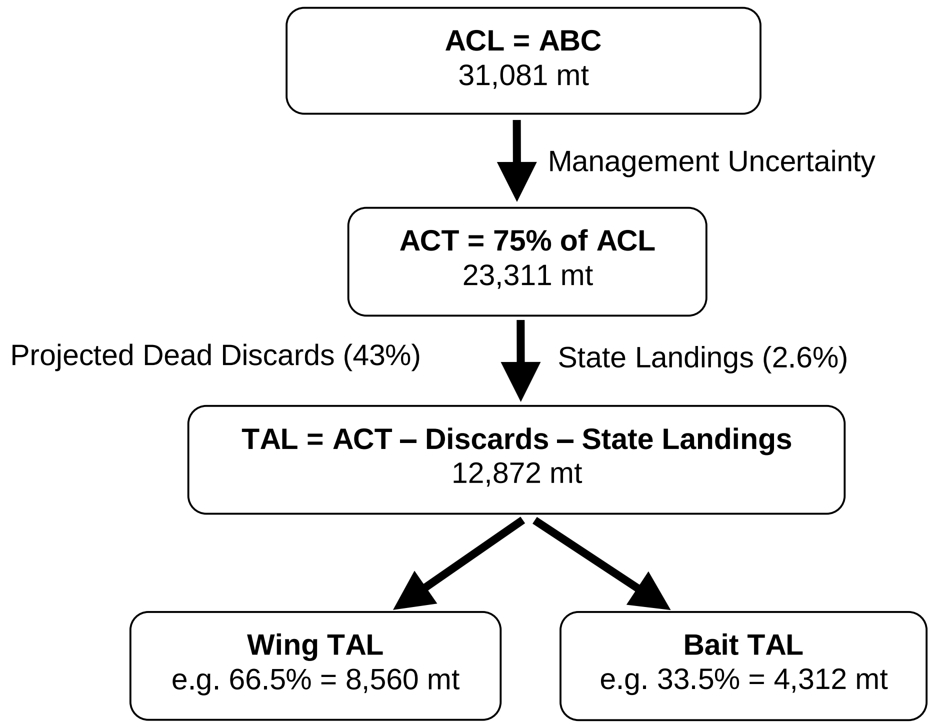


Rationale: The No Action alternative would not incorporate the updated survey biomass indices and discard mortality rate estimates. The ACL would be maintained at a higher level than the revised data would suggest is appropriate over the time period when specifications are being set. The No Action alternative may result in a slightly higher risk of overfishing than the Preferred Alternative, but in recent years the catch levels under this alternative have not been achieved in the fishery, and the ABC calculation is inherently risk-averse for the stock complex.

4.1.2 Option 2: Revised Annual Catch Limit Specifications (*Preferred Alternative*)

ABC and ACL specifications are derived from the median catch/biomass exploitation ratio for time series up to 2014 and the three year average stratified mean biomass for skates, using the 2013-2015 spring survey data for little skate and the 2012-2014 fall survey data for the other managed skate species. For skates, the Council set the ACL to be equal to the ABC. TALs are set according to Amendment 3 procedures that assume that future discards would be equivalent to the average rate from the most recent three years (2012-2014); state landings would approximate to 2.6% of the total landings, which represents the latest 3 year average of state landings.

The ABC/ACL specifications would be adjusted to be consistent with new scientific information and the approved ACL framework procedures in Amendment 3. The aggregate skate ABC/ACL would decrease to **31,081** mt. The ACL is a limit that would trigger AMs if catches exceed this amount. The ACT would likewise decrease to **23,311** mt. After deducting amounts for projected dead discards (calculated from applying the weighted discard mortality rate to the total discards from 2012-2014.The projected dead discards is calculated from the ratio between 2012-2014 dead discards and total catch), the TAL would decrease to **12,872** mt. The proportion of dead discards in the catch increased to **43%**, primarily due to an increase in overall skate discards. The incorporation of revised discard mortality rates in scallop dredge gear for winter (34%) and little (48%) skate slightly reduced the historic catch and affected the catch/biomass medians; it also slightly reduced the amount of discards attributed to dead discards for this gear type.



Addendum: Following final action by the Council, the PDT discovered an error in the formula used to calculate the proportion of dead discards. This error resulted in an underestimation in the projected dead discards of 2%. This error does not affect the ABC or ACT; its effects are only on the TALs. The corrected specifications are as follows: the aggregate skate ABC/ACL would remain at **31,081** mt, the ACT would remain at **23,311** mt, the TAL would decrease to **12,590** mt, the wing TAL would decrease to **8,372** mt, and the bait TAL would decrease to **4,218** mt.

Rationale: This alternative would make the specifications (catch and landings limits) more consistent with the procedures approved in Amendment 3 and with updated science that has been analyzed by the Skate PDT and peer reviewed by the SSC. Framework 3 is not intended to develop alternative ACL/ACT/TAL calculation methodologies; instead it enacts the existing methodology in the FMP using updated data. The Council's Skate Oversight Committee discussed whether there was any justification to revise the 25% uncertainty buffer applied in the ACT (e.g., more or less scientific or management uncertainty), but determined that no changes were warranted at this time. The SSC reviewed the revised catch/biomass medians and those used in the previous specifications package and approved the use of the revised medians as they were consistent with previous decisions by the SSC to incorporate the most recently available discard mortality rate estimates. According to the Amendment 3 procedures, it would allow the fishery to achieve optimum yield, nearly all derived from catches of little and winter skates. This alternative meets the requirements to prevent overfishing and the FMP goals to rebuild overfished stocks, whereas the No Action alternative is slightly less risk-averse. Biomass of little and winter skates have decreased from the 2011-2013 (and 2010-2012) period used in FW2, and contribute the majority of landings in the skate bait and skate wing fisheries, respectively.

4.2 Skate Wing Possession Limit Alternatives

4.2.1 Option 1: No Action (*Preferred Alternative*)

The No Action alternative would maintain the Framework Adjustment 1 skate wing possession limits. These limits begin with a **2,600** lbs. possession limit from May 1 to Aug 31 and then increase to **4,100** lbs. possession limit from Sep 1 to Apr 30, or until the 85% TAL trigger has been met and it appears that without adjustment the fishery would exceed the annual TAL. This alternative would not alter the 85% trigger for the incidental trip limit.

Rationale for alternative: In FY2014 the wing fishery achieved 97.3% of its TAL, maintaining the current trip limits would allow the fishery to maximize its ability to achieve the TAL.

4.2.2 Option 2: Revised Skate Wing Possession Limit

The seasonal skate wing possession limit for May 1 to Aug 31 would decrease to ***2,000*** lbs. The seasonal skate wing possession limit for Sep 1 to Apr 30 would likewise decrease to ***3,000*** lbs. This alternative would not alter the 85% trigger for the incidental trip limit.

Rationale for alternative: This is a more conservative choice with a greater chance that the skate wing fishery will remain open for the entire fishing year. Fishermen and processors have indicated that keeping the fishery open for the entire fishing year creates economic stability, retains important foreign markets, and reduces discards. FW1 possession limit analysis associates these lower limits with a smaller TAL; lower trip limits may unnecessarily restrict the fishery.

4.2.3 Option 3: Revised Skate Wing Possession Limit

This alternative would raise the trip limit to *2,500 to 3,000* lbs, which would be constant throughout the fishing year. This alternative is likely to shut the fishery down before the end of the fishing year as there is no seasonality to the trip limits, which was designed to reduce the likelihood that the incidental trip limit would be triggered. This alternative would not alter the 85% trigger for the incidental trip limit.

Rationale: This alternative was selected in order to provide a reasonable range of alternatives for analysis as required by NEPA. The possession limit included in this alternative was originally implemented under Amendment 3 to the Northeast Skate FMP. This possession limit was derived by a possession limit analysis conducted for Amendment 3 and was considered to be an appropriate possession limit to include for this analysis.

4.3 Bait Possession Limit Alternatives

4.3.1 Option 1: No Action (*Preferred Alternative*)

This alternative would maintain the skate bait possession limit at 25,000 lbs. Vessels that obtain a Skate Bait Letter of Authorization from the NMFS Regional Office would be able to retain up to 25,000 lbs. of whole skates provided that they comply with related rules and size limits.

Rationale: This alternative is included to meet MSA requirements. Skate bait possession limits must be specified in addition to the skate wing possession limits.

4.3.2 Option 2: Revised Skate Bait Possession Limit

This alternative would reduce the skate bait possession limit to **20,000** lbs. Vessels that obtain a Skate Bait Letter of Authorization from the NMFS Regional Office would be able to retain up to 20,000 lbs. of whole skates provided that they comply with related rules and size limits.

Rationale: This alternative was selected in order to provide a reasonable range of alternatives for analysis as required by NEPA. The possession limit included in this alternative was originally implemented under Amendment 3 to the Northeast Skate FMP and was modified in FW1. It was considered to be an appropriate possession limit to include for this analysis as the bait fishery had previously operated under this possession limit.

4.4 Wing Fishery Seasonal Management Alternatives

4.4.1 Option 1: No Action

The No Action alternative would maintain the seasonal structure established in Framework Adjustment 1 for skate wing possession limits. The fishing year would be remain divided into two seasons: season 1 (May 1 to Aug 31) and season 2 (Sep 1 to Apr 30) This alternative would not alter the 85% trigger for the incidental trip limit.

Rationale for alternative: In FY2014, skate landings were highest in the first 2 months of the fishing year when under the lower season 1 wing possession limit as established in FW1.

4.4.2 Option 2: Modification of Wing fishery Seasonal Management (*Preferred Alternative*)

This alternative would create seasonal TALs for the wing fishery consistent with the existing seasonal skate wing possession limits. The first season would be allocated a percentage of the annual wing TAL based on the three year moving average of the most recent 3 fishing years (May through August) (representing 57% or 4,872 mt in 2016 and 2017) for May 1 to August 31. The seasonal skate wing possession limit for May 1 to Aug 31 would remain at **2,600** lbs. Once 85% of the allocated TAL is reached between May 1 and August 17, the incidental possession limit of 500 lbs would be implemented. Between August 18 and August 31, the Regional Administrator would use discretion as to whether or not the 500 lb incidental possession limit should be implemented. Any unused portion of the TAL would be rolled over into the latter part of the fishing year. The second season would be allocated the remainder of the annual TAL (representing 43% or 3,681 in 2016 and 2017) for September 1 to April 30. The seasonal skate wing possession limit for Sep 1 to Apr 30 would remain at **4,100** lbs. Once 85% of the allocated TAL is reached between September 1 and April 30, the Regional Administrator would have the discretion to implement the incidental possession limit if the fishery is projected to exceed the TAL.

Rationale for alternative: This alternative would help mitigate impacts on industry from a change in specifications, while allowing the fishery to remain open for the entire fishing year. Fishermen and processors have indicated that keeping the fishery open for the entire fishing year creates economic stability, retains important foreign markets, and reduces discards. This would also be less likely to impact fishing operations in other fisheries.

4.4.3 Option 3: Revised Skate Wing Seasonal Structure

This alternative would create seasonal TALs for the wing fishery. The first season would be allocated a percentage of the annual wing TAL based on the three year moving average of the most recent 3 fishing years (May through August) (representing 57% or 4,872 mt in 2016 and 2017). The seasonal skate wing possession limit for May 1 to July 31 would remain at **2,600** lbs. Once 85% of the allocated TAL is reached between May 1 and July 17, the incidental possession limit of 500 lbs would be implemented. Between July 18 and July 31, the Regional Administrator would use discretion as to whether or not the 500 lb incidental possession limit should be implemented. Any unused portion of the TAL would be rolled over into the latter part of the fishing year. Between August 1 and September 15, the incidental possession limit of 500 lbs would be implemented, regardless of whether the in-season trigger point had been reached. The remainder of the fishing year (September 16 – April 30) would be allocated the remainder of the annual TAL (representing 43% or 3,681 in 2016 and 2017). The seasonal skate wing possession limit for September 16 to April 30 would remain at **4,100** lbs. Once 85% of the allocated TAL is reached between September 1 and April 30, the Regional Administrator would have the discretion to implement the incidental possession limit if the fishery is projected to exceed the TAL.

Rationale for alternative: This alternative would help mitigate impacts on industry from a change in specifications, while allowing the fishery to remain open for the entire fishing year. Fishermen and processors have indicated that keeping the fishery open for the entire fishing year creates economic stability, retains important foreign markets, and reduces discards. This would also be less likely to impact fishing operations in other fisheries.

5.0 Considered but Rejected Alternatives

No management issues arose during the development of this specifications package that were not adopted as alternatives by the Council.

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6.0 AFFECTED ENVIRONMENT (SAFE report /EA)

This document serves two purposes: an update of the Stock Assessment and Fishery Evaluation Report (SAFE) and a Description of the Affected Environment (Section 7) for the Environmental Assessment (EA) for the 2012-2013. Since the document serves as Section 7 of the EA in Amendment 3, it is numbered beginning with Section 7 in this stand-alone SAFE Report to reduce confusion. There are therefore no Sections 1-6 in the stand-alone SAFE Report.

This section is intended to provide background information for assessing the impacts, to the extent possible, of the proposed management measures on related physical, biological, and human environments. It includes a description of the stocks and the physical environment of the fishery as well as life history information, habitat requirements, and stock assessments for relevant stocks and a discussion of additional biological elements such as endangered species and marine mammals. This descriptive section also describes the human component of the ecosystem, including socioeconomic and cultural aspects of the commercial and recreational fisheries and the impacts of other human activities on the fisheries in question. Much of the information contained in this section is a compilation of information used to make choices from a range of alternatives during the development of the proposed management action.

This Stock Assessment and Fishery Evaluation (SAFE) Report was prepared by the New England Fishery Management Council's Skate Plan Development Team (PDT). It presents available biological, physical, and socioeconomic information for the Northeast's region skate complex and its associated fisheries. It also serves as the Affected Environment description for the Environmental Assessment associated with FW 2.

Table 1 presents the seven species in the northeast region's skate complex, including each species common name(s), scientific name, size at maturity (total length, TL), and general distribution.

6.1 Biological Environment

6.1.1 Species Distribution

In general, barndoor skate are found along the deeper portions of the Southern New England continental shelf and the southern portion of Georges Bank, extending into Canadian waters. They are also caught by the survey as far south as NJ during the spring. Clearnose skates are caught by the NMFS surveys in shallower water along the Mid-Atlantic coastline, but are known to extend into unsurveyed shallower areas and into the estuaries, particularly in Chesapeake and Delaware Bays. These inshore areas are surveyed by state surveys and the Mid-Atlantic NEAMap Survey (http://www.vims.edu/research/departments/fisheries/programs/multispecies_fisheries_research/neamap/index.php).

Little skate are found along the Mid-Atlantic, Southern New England, and Gulf of Maine coastline, in shallower waters than barndoor, rosette, smooth, thorny, and winter skates. Rosette, smooth, and thorny are typically deep-water species. The survey catches rosette skate along the shelf edge in the Mid-Atlantic region, while smooth and thorny are found in the Gulf of Maine and along the northern edge of Georges Bank. Winter skate are found on the continental shelf of the Mid-Atlantic and Southern New England regions, as well as Georges Bank and into Canadian waters. Winter skate are typically caught in deeper waters than little skate, but partially overlap the distributions of little and barndoor skates.

6.1.2 Stock status

The stock status relies entirely on the annual NMFS trawl survey. The fishing mortality reference points are based on changes in survey biomass indices. If the three-year moving average of the survey biomass index for a skate species declines by more than the average CV of the survey time series, then fishing mortality is assumed to be greater than F_{MSY} and it is concluded that overfishing is occurring for that species (NEFSC 2007a). The average CVs of the indices are given by species in Table 3. Except for little skates, the abundance and biomass trends are best represented by the fall survey, which has been updated through 2014 (Table 3). Little skate abundance and biomass trends are best represented by the spring survey, which has been updated through 2015 (Table 3). Details about long term trends in abundance and biomass are given in the SAW 44 Report (NEFSC 2007a) and in the Amendment 3 FEIS (Section 7.1.2).

Based on survey data updated through fall 2014/spring 2015, only thorny skate remained in an overfished condition (Table 3).

For barndoor skate, the 2012-2014 NEFSC average of the fall survey biomass index of 1.41 kg/tow was above the biomass threshold reference point; the species is not overfished but is not yet rebuilt (Table 3). The most recent 3 year moving average is above the 2011-2013 index by 16.5%; overfishing is not occurring.

For clearnose skate, the 2012-2014 NEFSC average of the fall survey biomass index of 0.77 kg/tow was above the biomass threshold reference point and the biomass target; the species is not overfished (Table 3). The most recent 3 year moving average is below the 2011-2013 index by 23.3%; overfishing is not occurring.

For little skate, the 2013-2015 NEFSC average of the spring survey biomass index of 6.75 kg/tow was above the biomass threshold reference point and the biomass target; the species is not overfished (Table 3). The most recent 3 year moving average is below the 2012-2014 index by 3.4%; overfishing is not occurring.

For rosette skate, the 2012-2014 NEFSC average of the fall survey biomass index of 0.048 kg/tow was above the biomass threshold reference point; the species is not overfished (Table 3). The most recent 3 year moving average is above the 2011-2013 index by 14.6%; overfishing is not occurring.

For smooth skate, the 2012-2014 NEFSC average of the fall survey biomass index of 0.19 kg/tow was above the biomass threshold reference point; the species is not overfished but not yet rebuilt (Table 3). The most recent 3 year moving average is below the 2011-2013 index by 12.5%; overfishing is not occurring.

For thorny skate, the 2012-2014 NEFSC average of the fall survey biomass index of 0.13 kg/tow was well below the biomass threshold reference point; the species is overfished (Table 3). The most recent 3 year moving average is above the 2011-2013 index by 8.7%; overfishing is not occurring.

For winter skate, the 2012-2014 NEFSC average of the fall survey biomass index of 5.06 kg/tow was above the biomass threshold reference point; the species is not overfished (Table 3). The most recent 3 year moving average is above the 2011-2013 index by 2%; overfishing is not occurring.

Table 3 - Summary by species of recent survey indices, survey strata used and biomass reference points.

	Barndoor	Clearnose	Little	Rosette	Smooth	Thorny	Winter
Survey (kg/tow) Time Series Basis Strata Set	Autumn 1963-1966 Offshore 1-3-, 34-40	Autumn 1975-2007 Offshore 61-76, Inshore 17, 20, 23, 26, 29, 32, 35, 38, 41, 44	Spring 1982-2008 Offshore 1-30, 34-40, 61-76, Inshore 2,5,8,11,14,17,20, 23,26,29,32,35,38, 41,44-46,56,59-61,64-66	Autumn 1967-2007 Offshore 61-76	Autumn 1963-2007 Offshore 1-30, 34-40	Autumn 1963-2007 Offshore 1-30, 34-40	Autumn 1967-2007 Offshore 1-30, 34-40, 61-76
2006	1.17	0.48	3.33	0.059	0.21	0.74	2.52
2007	0.76	0.90	4.01	0.068	0.09	0.32	3.74
2008	1.11	1.23	6.29	0.029	0.10	0.20	9.62
2009	1.13	0.89	6.62	0.064	0.21	0.25	11.33
2010	1.10	0.68	10.63	0.028	0.18	0.28	8.09
2011	1.02	1.32	6.88	0.034	0.30	0.18	6.65
2012	1.54	0.93	7.54	0.040	0.21	0.08	5.29
2013	1.07	0.77	6.90	0.056	0.14	0.11	2.95
2014	1.62	0.61	6.54[a]	0.053	0.22	0.21	6.95
2015			6.82				
2008-2010 3-yr average	1.11	0.93	7.85	0.040	0.16	0.24	9.68
2009-2011 3-yr average	1.08	0.96	8.04	0.042	0.23	0.24	8.69
2010-2012 3-yr average	1.22	0.97	8.35	0.033	0.23	0.18	6.68
2011-2013 3-yr average	1.21	1.01	7.11	0.042	0.22	0.12	4.96
2012-2013 3-yr average	1.41	0.77	6.99[a]	0.048	0.19	0.13	5.06
2013-2015 3-yr average			6.75[a]				
Percent change 2010-12 compared to 2009-11	+12.6	+1.3	+3.8	-21.7	+0.8	-24.1	-23.2
Percent change 2011-13 compared to 2010-12	-1.0	+3.1	-14.9	+28.8	-5.0	-31.9	-25.7
Percent change 2012-14 compared to 2011-13	+16.5	-23.3	-1.6	+14.6	-12.5	+8.7	+2.0
Percent change 2013-15 compared to 2012-14			-3.4				
Percent change for overfishing status determination in FMP	-30	-40	-20	-60	-30	-20	-20
Biomass Target	1.57	0.66	6.15	0.048	0.27	4.13	5.66
Biomass Threshold	0.78	0.33	3.07	0.024	0.13	2.06	2.83
Current Status	Not Overfished Overfishing is Not Occurring	Not Overfished Overfishing is Not Occurring	Not Overfished Overfishing is Not Occurring	Not Overfished Overfishing is Not Occurring	Not Overfished Overfishing is Not Occurring	Overfished Overfishing is Not Occurring	Not Overfished Overfishing is Not Occurring

[a] No survey tows completed south of Delaware in spring 2014. Values for 2014 were adjusted for missing strata (i.e., Offshore 61-68, Inshore 32,35, 38, 41, 44) but may not be fully comparable to other surveys which sampled all strata.

6.1.3 Biological and Life History Characteristics

The Essential Fish Habitat Source Documents prepared by the Northeast Fisheries Science Center (NEFSC) of the National Marine Fisheries Service for each of the seven skate species provide most available biological and habitat information on skates. Any updated information will be provided below. These technical documents are available at http://www.nefsc.noaa.gov/nefsc/habitat/efh/ and contain the following information for each skate species in the northeast complex:

- Life history, including a description of the eggs and reproductive habits
- Average size, maximum size and size at maturity
- Feeding habits
- Predators and species associations
- Geographical distribution for each life history stage
- Habitat characteristics for each life history stage
- Status of the stock (in general terms, based on the Massachusetts inshore and NEFSC trawl surveys)
- A description of research needs for the stock
- Graphical representations of stock abundance from NEFSC trawl survey and Massachusetts inshore trawl survey data
- Graphical representations of percent occurrence of prey from NEFSC trawl survey data

Please refer to the source documents (http://www.nefsc.noaa.gov/nefsc/habitat/efh/) for more detailed information on the above topics. All additional biological information is presented below.

The seven species of the northeast skate complex follow a similar life history strategy but differ in their biological characteristics. This section describes any information made available after the publication of the EFH documents. And a detailed summary of the biological and life history characteristics was included in the FEIS for Amendment 3 (NEFMC 2009).

Barndoor Skate

Barndoor skates have been reported to reach a maximum size of 152 cm and 20 kg weight (Bigelow & Schroeder, 1953). The maximum observed length in the NEFSC trawl survey was 140 cm total length in the 2007 survey. In a study conducted in Georges Bank Closed Area II the largest individual observed was 133.5 cm, with total lengths ranging from 20.0 to 133.5 cm.

Gedamke et al. (2005) examined barndoor skates in the southern section of Georges Bank Closed Area II. Length at 50% maturity was 116.3 cm TL and 107.9 cm TL for females and males, respectively. The oldest age observed was 11 years. Age at maturity was estimated to be 6.5 years and 5.8 years for females and males, respectively. The von Bertalanffy parameters were also determined: L_∞ = 166.3 cm TL; k = 0.1414 yr^{-1}; t_o = -1.2912 yr. Coutré et al. (2013) re-examined life history parameters of barndoor skate in the Closed Areas I and II on Georges Bank; changes occurred in von Bertalanffy parameters (L_∞ = 155 cm TL; k = 0.10 yr^{-1}) and an increase in age at 50% maturity compared to Gedamke et al. (2005). Coutré et al. (2013) suggest barndoor skate are subject to density dependence effects based on the plasticity in life history parameters observed in the 10 year gap between studies. Based on the predictive equations from Frisk *et al*. (2001) and the Northeast Fisheries Science Center (NEFSC) survey maximum observed length of 136 cm TL, L_{mat} is estimated at 102 cm TL and A_{mat} is estimated at 8 years (NEFSC, 2000). In another study, clasper length measurements on males from Georges Bank show that male sexual maturity occurs at approximately 100 cm TL.

Sosebee (2005) used body morphometry to determine the size of maturity (females: 96 to 105 cm TL; males: 100 cm TL) on samples obtained from the NEFSC trawl survey ranging from Gulf of Maine to Cape Hatteras. Egg production is estimated to range between 69 – 85 eggs/female/year (Parent et al. 2008). As part of a captive breeding program, the egg incubation was determined to range from 342 – 494 days. As part of the same study, successful hatch rate was 73% (Parent et al. 2008). Previous fecundity estimates were 47 eggs per year (Packer et al. 2003a). Hatchlings range in size from 193 mm TL, 128 mm disk width and 32 g body mass.

Barndoor skates are benthivorous and piscivorous, a large portion of the diet formed by forage fishes. Overall, the diet of barndoor skates was dominated by herrings Pandalid shrimps and *Cancer* crabs. Up to 8,000 mt of a particular prey item can be removed by this skate in any given year. The amount of food consumed was related to the size of the skate. Small skates (<=80 cm TL) consumed approximately 5 kg per year of prey items, while large skates (>80 cm TL) consumed approximately 10 to 20 kg per year (Link and Sosebee, 2008). The total consumptive demand for this species is estimated to range between 4,000 and 16,000 mt per year, with total consumption dominated by mature skates.

Clearnose Skate

Gelsleichter (1998) examined the vertebral centra of clearnose skates that were collected from Chesapeake Bay and the northwest Atlantic Ocean. The oldest male was aged at 5+ years, with the oldest female being 7+ years. This study suggests that clearnose skate experience rapid growth over during a relatively short life span.

Sosebee (2005) used body morphometry to determine size at maturity (females: 59 to 65 cm TL; males: 56 cm TL) on samples obtained from the NEFSC trawl survey ranging from Gulf of Maine to Cape Hatteras. Fecundity was estimated to be 35 eggs/year (Packer et al. 2003b).

Clearnose skates are benthivorous, a large portion of the diet comprised of benthic megafauna (crabs and miscellaneous crustaceans). Overall, the diet of clearnose skates was dominated by other crabs, *Cancer* crabs and squids. Up to 8,000 – 10,000 mt of a particular prey item can be removed by this skate in any given year, but values are typically on the order of 2,000 to 4,000 mt. Small skates (<= 60 cm TL consumed approximately 1 - 2 kg per year of prey items, while large skates (>60cm TL) consumed approximately 5 kg per year (Link and Sosebee, 2008). The total consumptive demand for this species is estimated to range between 2,000 and 18,000 mt per year, with total consumption dominated by mature skates.

Little Skate

Frisk and Miller (2006) examined vertebral samples of little skate to identify any latitudinal patterns in the northwestern Atlantic. Maximum observed age was 12.5 years. The oldest aged little skate from the mid-Atlantic was 11 years. The oldest individuals from the Gulf of Maine and Southern New England – Georges Bank were 11 years or older. Von Bertalanffy curves were fit for the northwestern Atlantic ($k = 0.19$, $L_\infty = 56.1$ cm TL, $t_o = -1.77$, $p < 0.0001$, $n = 236$) and for individual regions (GOM: $k = 0.18$, $L_\infty = 59.31$ cm TL, $t_o = -1.15$, $p < 0.0001$; SNE-GB: $k = 0.20$, $L_\infty = 54.34$ cm TL, $t_o = -1.22$, $p < 0.0001$; mid-Atlantic: $k = 0.22$, $L_\infty = 53.26$ cm, $t_o = -1.04$, $p < 0.0001$).

Sosebee (2005) used body morphometry to determine size at maturity (male – 39 cm TL; females – 40 – 48 cm TL) on samples obtained from the NEFSC trawl survey ranging from Gulf of Maine to Cape Hatteras. Fecundity was estimated to be 30 eggs per year (Packer et al. 2003 c). Palm et al. (2011) estimated an average fecundity of 46 eggs per captive female over the course of one year; the highest number of eggs was laid in June; the minimum occurred in March. Egg viability was 74.1%. Size at hatching varied with month; spring hatchlings were larger than other times of the year. Little skate are capable of reproducing year round but no reproductive peaks were observed (Williams et al. 2013).

Cicia et al. (2012) showed temperature influences survivability in little skate when exposed to air; little skates in summer exhibited higher mortality rates for air exposure times compared to winter.

Little skates are benthivorous which was reflected by the large portion of the diet that benthic macrofauna (polychaetes and amphipods) and benthic megafauna (crabs and bivalves) comprised. Overall, the diet of little skates was dominated by benthic invertebrates. Up to 8,000 mt of a particular prey item can be removed by this skate in any given year. This diet may overlap but not necessarily compete directly with flounders.

The amount of food consumed was related to the size of the skate. Small skates (<= 30 cm TL) consumed approximately 500 g per year of prey items, while large skates (>30 cm TL) consumed approximately 2.5 kg per year (Link and Sosebee, 2008). The total consumptive demand for this species is estimated to range between 100,000 and 350,000 mt per year, with total consumption dominated by mature skates.

Smooth Skate

Natanson et al. (2007) aged smooth skate from New Hampshire and Massachusetts waters. Maximum ages were estimated to be 14 and 15 years for females and males respectively. Longevity was estimated to be 23 years for females and 24 years for males. Male and females exhibited significantly different growth rates. Accordingly different growth models were required to fit the male and female growth data. Parameters for the von Bertalanffy equation for the males were determined to be k = 0.12, L_∞ = 75.4 cm TL, with L_o required to be set at 11 cm TL (Natanson et al. 2007). Growth models applied to females overestimated the size at birth thus requiring the use of back-calculated data resulting in von Bertalanffy parameters of: k = 0.12, L_∞ = 69.6 cm TL, L_o = 10 TL (Natanson et al. 2007). Sulikowski et al. (2007) determined, in a study conducted in the Gulf of Maine that in their sample mature females ranged in size from 508 to 630 mm TL and for males 550 to 660 mm TL. Based on morphological characteristics in females (ovary weight, shell gland weight, diameter of largest follicles, and pattern of ovarian follicle development) and histological analysis of males (mature spermatocysts in testes) Sulikowski et al. (2007) determined that in the Gulf of Maine smooth skate are capable of reproducing year round.

The reproductive cycles of the two sexes are thought to be synchronous (Sulikowski et al. 2007). Kneebone et al. (2007) examined hormonal concentrations of male and female smooth skate in the Gulf of Maine further confirming the ability of this species to reproduce throughout the year. Information is needed on the fecundity and egg survival of this species.

Sosebee (2005) used body morphometry to determine size at maturity to be approximately 33 – 49 cm TL for females and 49 cm TL for males on samples obtained from the NEFSC trawl survey ranging from Gulf of Maine to Cape Hatteras.

Swain et al. (2013) modeled the mortality rate of small and large smooth skate and showed decreased mortality for small skate and an increase for larger skates (larger juveniles only) between the 1970s and 2000s in 4T and 4VW areas. The changes in mortality rates differed with area examined; an increase in natural mortality was hypothesized in the 4T and 4VW areas for large skates.

Smooth skates are benthivorous, a large portion of the diet comprised of benthic megafauna (pandalids and euphausiids). Overall, the diet of smooth skates was dominated by pandalid shrimp and euphausiids. Up to 2,000 mt of a particular prey item can be removed by this skate in any given year, but values are typically on the order of 500 to 1,000 mt. The amount of food consumed was related to the size of the skate. Small skates (<= 30 cm TL) consumed approximately 0.5 - 1 kg per year of prey items, while large skates (>30 cm TL) consumed approximately 2 - 3 kg per year (Link and Sosebee, 2008). The total consumptive demand for this species is estimated to range between 1,000 and 5,000 mt per year, with total consumption dominated by mature skates.

Rosette Skate

Sosebee (2005) used body morphometry to determine size at maturity (males = 33 cm TL; females = 33 – 35 cm TL) on samples obtained from the NEFSC trawl survey ranging from Gulf of Maine to Cape Hatteras. Age and growth data are currently unavailable for rosette skate, as is information on the fecundity and egg survival.

Rosette skates are benthivorous, a large portion of the diet comprised of benthic macrofauna (amphipods and polychaetes) and benthic megafauna (crabs and shrimps). Overall, the diet of rosette skates was dominated by benthic macrofauna and to a lesser extent pandalid shrimps, squids and *Cancer* crabs. Up to 70 mt of a particular prey item can be removed by this skate in any given year, but more typically 10 – 30 mt. Small skates (<=30 cm TL) consumed approximately 200 g per year of prey items, while large skates (>30 cm TL) consumed approximately 800 g per year (Link and Sosebee, 2008). The total consumptive demand for this species is estimated to range between 50 and 500 mt per year, with total consumption dominated by mature skates.

Thorny Skate

Sulikowski et al (2005a) aged thorny skate in western Gulf of Maine and found oldest age estimated to be 16 years for both females and males (corresponding length – 105 cm and 103 cm). Von Bertalanffy Growth parameters for male thorny skates were calculated to be k = 0.11, L_∞ = 127 cm TL, t_o = -0.37; calculated estimates for female thorny skates were: k = 0.13, L_∞ = 120 cm TL, t_o = -0.4 (Sulikowski et al. 2005a). The maximum observed length from the NEFSC trawl survey is 111cm TL. Maximum sizes examined in the Gulf of Maine were 103 cm TL and 105 cm TL for males and females, respectively (Sulikowski et al. 2005a).

Sulikowski et al. (2006) used morphological and hormonal criteria to determine the age and size at sexual maturity in the western Gulf of Maine. For females, 50% maturity occurred at approximately 11 years and 875 mm TL; while for males approximately 10.90 years and 865 mm TL. This species is capable of reproducing year round (Sulikowski et al. 2005a) based on morphological characteristics.

Sosebee (2005) used body morphometry to determine size at maturity to be approximately 36 - 38 cm TL for females and 49 cm TL for males on samples obtained from the NEFSC trawl survey ranging from Gulf of Maine to Cape Hatteras.

Parent et al. (2008) estimated mean annual fecundity to be 40.5 eggs per year based on 2 captive females producing 81 eggs in 1 year. The observed hatching success is 37.5% (Parent et al. 2008).

Swain et al. (2013) modeled the mortality rate of small and large thorny skate and showed decreased mortality for small skate and an increase for larger skates (adults and larger juveniles) between the 1970s and 2000s in 4T and 4VW areas. The changes in mortality rates differed with area examined; an increase in natural mortality was hypothesized in the 4T and 4VW areas for large skates.

Thorny skates are benthivorous and their piscivorous, a large portion of the diet formed by forage fishes. Overall, the diet of thorny skates was dominated by herrings, squid, polychaetes, silver hake and other fish. Up to 80,000 mt of a particular prey item can be removed by this skate in any given year. The amount of food consumed was related to the size of the skate. Small skates (<=30 cm TL) consumed approximately 500 g per year of prey items, while medium (30-60 cm TL) and large skates (>60 cm TL) consumed approximately 1.5 kg and 12 kg per year, respectively (Link and Sosebee, 2008). The total consumptive demand for this species is estimated to range between 10,000 and 40,000 mt per year.

Winter Skate

Sulikowski et al. (2003) aged winter skate in western Gulf of Maine and determined the oldest age estimated to be 18 and 19 years for females and males, respectively (corresponding length – 94.0 cm and 93.2 cm). Verification of the periodicity of the vertebral bands was determined to be annual with the opaque band being formed in June - July using marginal increment analysis. Von Bertalanffy Growth parameters for male winter skates were calculated to be $k = 0.074$, $L_\infty = 121.8$ cm TL, $t_o = -1.418$; calculated estimates for female winter skates were: $k = 0.059$, $L_\infty = 137.4$ cm, $t_o = -1.609$ (Sulikowski et al. 2003). Growth curves fit to data from this study were found to overestimate maximum total length compared to observed lengths. This may result from a low representation of maximum sized individuals. The maximum reported length is 150 cm TL. Maximum sizes examined in the Gulf of Maine were 93.2 cm total length and 94.0 cm total length for males and females, respectively (Sulikowski et al. 2003).

Frisk and Miller (2006) examined vertebral samples of winter skate from the northwestern Atlantic. Maximum observed age was 20.5 years (a male winter skate of 74 cm TL); the oldest female was estimated to be 19.5 years (76 cm TL). Von Bertalanffy curves were fit for the northwestern Atlantic ($k = 0.07$, $L_\infty = 122.1$ cm TL, $t_o = -2.07$, $p < 0.0001$, $n = 229$) and for the GOM region ($k = 0.064$, $L_\infty = 131.40$ cm TL, $t_o = -1.53$).

In the southern Gulf of St Lawrence, winter skate reached a maximum size of 68 cm total length; males and females were mature between 40 and 41 cm TL or around 5 years (Kelly and Hanson, 2013).

Winter skates are capable of reproducing year-round but exhibit one peak in the annual cycle (Sulikowski et al. 2004). Peak reproductive activity occurs during June – August. Size at maturity has been shown to vary with latitude. Size at maturity is 76cm for females and 73 cm for males (Sulikowski et al. 2005b). Sosebee (2005) used body morphometry to determine size at maturity to be approximately 65 - 73 cm TL for females and 49 - 60 cm TL for males on samples obtained from the NEFSC trawl survey ranging from Gulf of Maine to Cape Hatteras. Fecundity in the southern Gulf of St Lawrence was estimated to be low (Kelly and Hanson, 2013).

Swain et al. (2013) modeled the mortality rate of small and large winter skate and showed decreased mortality for small skate and an increase for larger skates (adults only) between the 1970s and 2000s in 4T and 4VW areas. The changes in mortality rates differed with area examined; an increase in natural mortality was hypothesized in the 4T and 4VW areas for large skates. Benoit et al. (2011) attribute the increase in natural mortality on winter skate to be due to grey seal predation.

Frisk et al (2010) investigated the increase in winter skate abundance in the 1980s and concluded that it was likely due to an increase in recruitment combined with adult migration. A stock assessment model was developed for the stock, however, the five parameter base model did not fit the observed data well.

Winter skate tend to inhabit warmer waters, when possible (Kelly and Hanson, 2013) and may migrate to deeper waters in winter to avoid colder temperatures in the southern Gulf of St. Laurence.

Winter skates are benthivorous and piscivorous, a large portion of the diet formed by forage fishes. Overall, the diet of winter skates was dominated by forage fish, squid and benthic macrofauna. Up to 80,000 mt of a particular prey item can be removed by this skate in any given year. The amount of food consumed was related to the size of the skate. Medium sized (31-60 cm TL) skates consumed approximately 2 kg per year of prey items, while large skates (>60 cm TL) consumed approximately 9 kg per year (Link and Sosebee, 2008). The total consumptive demand for this species is estimated to range between 20,000 and 180,000 mt per year. In the southern Gulf of St Lawrence, winter skate less than 40 cm TL ate mainly shrimp and gammarid amphipods; larger skates ate more fishes and Atlantic rock crab (Kelly and Hanson, 2013).

6.1.4 Discards and discard mortality

Since skate discards are high across many fisheries, the estimates of total skate catch are sensitive to the discard mortality rate assumption, and have direct implications for allowable landings in the skate fisheries. Data on immediate- and delayed (i.e. post-release) mortality rates of discarded skates and rays is extremely limited. Only six published studies have estimated discard mortality rates in these species; for an outline of these studies see the literature review in the 2012-2013 specifications package (NEFMC 2012). Benoit (2006) estimated acute discard mortality rates of winter skates caught in Canadian bottom trawl surveys, the SSC in 2009 decided to use a 50% discard mortality rate assumption for all skates and gears for the purposes of setting the Skate ACL, based on this paper.

Since the Council adopted a 50% discard mortality assumption for setting the ACL in Amendment 3, based on a literature review by the Skate PDT and advice from the Council's SSC, more relevant research data and analysis has been collected on skate mortality by scallop dredge vessels. When Amendment 3 was developed, this discard mortality assumption was largely derived from published studies, most of which were for species and locations different from those covered in the FMP because no other data existed.

The 2012 specifications package revised the assumed discard mortality rate for little and winter skate based on an experiment in progress examining discard mortality for these species in trawl gear. While the data were preliminary, the Council's SSC reviewed the methodology and the preliminary results of the new discard mortality research and determined the new discard mortality values for little skate (0.20) and winter skate (0.12) to be the best scientific information available compared to the literature review; the new values were applied to little and winter skates captured by trawls and discarded under normal commercial practices. These new data were applied to estimate total discard mortality by gear and species and the last three years of data were used to project a 36.3% dead discard mortality rate (dead discards divided by total catch) for the 2012-2013 specification cycle.

Mandelman et al. (2013) examined the immediate and short-term discard mortality rate of little, smooth, thorny and winter skates in the Gulf of Maine. Tow durations lasted 15-20 min (control), 2 h (moderate) and 4 h (extended). The PDT recommended using the pooled moderate and extended tow times as they most closely reflected commercial practices. Full details of the study can be found in the paper by Mandelman et al. (2013) and were presented to the SSC. The SSC approved revising the discard mortality rate estimates for little (22%), smooth (60%), thorny (23%) and winter (9%) skates for otter trawl, consistent with their previous recommendation to use the preliminary estimates from this study. The SSC did not support using this study to revise the assumed 50% discard mortality rate for gillnet gear.

Knotek (2015) examined the immediate and short-term discard mortality rate of little, winter, and barndoor skates in scallop dredge gear by evaluating reflex impairment and injury indexes. A total of 295 tows were conducted on 6 research cruises; tow duration ranged from 10-90 minutes. On deck exposure time ranged from 0-30 minutes. The PDT recommended using the discard mortality rate estimates for little and winter skate only, as the researchers considered the sample size was insufficient for an accurate estimate for barndoor skate. The SSC approved revising the discard mortality rate estimates for little (48%) and winter skate (34%) for scallop dredge gear based on this study.

6.1.5 Estimated discards by gear

Another way to evaluate the potential interactions between skate fishing and barndoor, smooth, and thorny skate distributions is to examine estimated discards. Discards were estimated through calendar year 2014 by gear (Table 4). Discards are estimated for a calendar year, rather than the fishing year, because they rely on the NMFS area allocation landings tables to expand observed discard/kept-all ratios to total based on landings by gear, area and quarter. The observed D/K-all ratios were derived from the Sea Sampling Observer and the At Sea Monitoring programs and included both sector and non-sector vessels, but were not stratified on that basis. The projected discard rate is calculated using a three-year average of the discards of skates/landings of all species.

Total estimated discards for 2014 were 42,732 mt (Table 4). Discards increase by just 0.04% over the 2013 estimates. The assumed discard rate for 2014 is 43%. Projected dead discards are estimated to be 10,095 mt. Total live and dead discards for the Northeast Skate Complex for all gear types are contrasted in Table 5. Based upon SSC recommendations in 2008, an assumed discard mortality rate of 50% is applied for all gears and species, except for otter trawl gear, which has been updated based on Mandelman et al. 2013, and scallop dredge gear, which has been updated based on Knotek (2015).

Table 4 – Estimated discards (mt) of skates (all species) by gear type, 1968 - 2014

Year	Longline	Otter Trawl	Sink Gillnet	Scallop Dredge	Total
1968	597	88739	46	7930	97313
1969	797	83466	38	4966	89268
1970	779	70101	29	3969	74878
1971	1175	55085	29	4059	60348
1972	1230	51538	45	4175	56988
1973	1320	54758	46	3872	59996
1974	1330	54082	82	4129	59624
1975	1421	42753	87	6439	50699
1976	888	42854	135	10921	54798
1977	684	48657	216	15206	64764
1978	1317	58447	255	20025	80045
1979	1623	66408	223	20148	88402
1980	1347	69345	285	19096	90072
1981	799	69384	350	19850	90383
1982	601	81269	175	17869	99913
1983	578	82378	185	18725	101867
1984	462	79784	217	17031	97494
1985	458	64137	196	14680	79471
1986	570	63677	257	17565	82069
1987	914	60170	225	28442	89752
1988	873	58234	252	30640	89999
1989	747	58017	140	35986	94890
1990	600	86464	421	38151	125636
1991	1497	53025	212	34358	89091
1992	2751	33009	376	32646	68783
1993	97	29822	321	22037	52277
1994	48	81814	492	11155	93509
1995	58	34704	793	28578	64133
1996	55	41433	550	19828	61866
1997	60	13455	484	17396	31394
1998	59	46867	469	15263	62658
1999	47	13440	847	15149	29483
2000	40	23962	973	9918	34893
2001	42	29584	608	7016	37250
2002	128	21840	2856	13785	38609
2003	48	35985	965	15982	52981
2004	20	36113	948	9310	46390

2005	145	33385	1596	10691	45817
2006	212	22912	1222	10663	35009
2007	73	31527	1812	13019	46432
2008	176	23373	2028	10012	35589
2009	307	25610	1988	7290	35196
2010	478	21302	2402	13366	37548
2011	147	26528	3181	9640	39496
2012	100	24483	2596	9097	36277
2013	720	31417	1896	8684	42716
2014	26	27135	2556	13014	42732

Table 5 - Total Live and Dead Discards (mt) of Skates (all species) for all gear types from 1968 - 2014

Year	Live Discards	Dead Discards
1968	97,313	21,839
1969	89,268	18,543
1970	74,878	16,009
1971	60,348	13,862
1972	56,988	12,594
1973	59,996	13,318
1974	59,624	13,250
1975	50,699	11,967
1976	54,798	14,563
1977	64,764	16,948
1978	80,045	21,207
1979	88,402	22,709
1980	90,072	21,795
1981	90,383	21,519
1982	99,913	22,247
1983	101,867	22,794
1984	97,494	21,897
1985	79,471	17,649
1986	82,069	20,236
1987	89,752	25,446
1988	89,999	25,431
1989	94,890	28,444
1990	125,636	35,770
1991	89,091	31,543
1992	68,783	25,250
1993	52,277	16,968
1994	93,509	23,223
1995	64,133	21,880
1996	61,866	19,365
1997	31,394	11,417
1998	62,658	16,745
1999	29,483	10,655
2000	34,893	10,425
2001	37,250	9,621
2002	38,609	12,603
2003	52,981	15,474
2004	46,390	11,828
2005	45,817	13,460
2006	35,009	11,035
2007	46,432	14,207
2008	35,589	11,495
2009	35,196	9,327
2010	37,548	12,019
2011	39,496	14,161
2012	36,277	10,857
2013	42716	12538
2014	42732	13556

6.1.6 Evaluation of Fishing Mortality and Stock Abundance

Benchmark assessment results from SAW 44 are given in NEFSC (2007a; 2007b). Because the analytic models that were attempted did not produce reliable results, the status of skate overfishing is determined based on a rate of change in the three year moving average for survey biomass. These thresholds vary by species due to normal inter-annual survey variability. Details about the overfishing reference points and how they were chosen are given in NEFSC (2000).

The latest results for 2014 (2015 spring survey for little skate) are given in Table 3. At this time, overfishing occurring on thorny and winter skate species.

6.1.7 Non-Target Species

The skate wing fishery is largely an incidental fishery; fishing effort is expended targeting more profitable species managed under separate FMPs, e.g. NE multispecies and monkfish FMPs. These fisheries have ACLs, effort controls (DAS), possession limits, gear restrictions, and other measures that constrain overall effort on skates. For a full description of the fishing impacts on trips targeting NE multispecies and monkfish please refer to Framework 55 to the NE Multispecies FMP and Framework 9 of the Monkfish FMP (www.nefmc.org). A small number of trips could be described as targeting skates; bycatch on these trips are limited. Monkfish and dogfish comprise the majority of this bycatch and are described below.

NE Multispecies

The Northeast Multispecies FMP manages twenty stocks under a dual management system which breaks the fishery into two components: sectors and the common pool. For stocks that permit fishing, each sector is allotted a share of the each stock's ACL that consists of the sum of individual sector member's potential sector contribution based on their annual catch entitlements. Sector allocations are strictly controlled as hard total allowable catch limits and retention is required for all stocks managed under an ACL. Overages are subject to accountability measures including payback from the sector's allocation for the following year. Common pool vessels are allocated a number of days at sea (DAS) and their effort further is controlled by a variety of measures including trip limits, closed areas, minimum fish size and gear restrictions varying between stocks. Only a very small portion of the ACL is allotted to the common pool. For more detail regarding control of fishing effort on NE Multispecies, please see Framework 55 of the NE Multispecies FMP.

6.1.7.1 Monkfish

Life History: Monkfish, *Lophius americanus*, also called goosefish, occur in the western North Atlantic from the Grand Banks and northern Gulf of St. Lawrence south to Cape Hatteras, North Carolina. Monkfish occur from inshore areas to depths of at least 2,953 ft. (900 m). Monkfish undergo seasonal onshore-offshore migrations. These migrations may relate to spawning or possibly to food availability.

Female monkfish begin to mature at age 4 with 50 percent of females maturing by age 5 (about 17 in [43 cm]). Males generally mature at slightly younger ages and smaller sizes (50 percent maturity at age 4.2 or 14 in [36 cm]). Spawning takes place from spring through early autumn. It progresses from south to north, with most spawning occurring during the spring and early summer. Females lay a buoyant egg raft or veil that can be as large as 39 ft. (12 m) long and 5 ft. (1.5 m) wide, and only a few mm thick. 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 3 in (8 cm).

Population Management and Status: NMFS implemented the Monkfish FMP in 1999 (NEFMC and MAFMC 1998). The FMP included measures to stop overfishing and rebuild the stocks through a number of measures. These measures included:

- 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;
- Mandatory time out of the fishery during the spawning season; and
- A framework adjustment process.

The Monkfish 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. In recent years the monkfish fishery has fallen fall short of reaching its TAL, despite a healthy stock status. In 2014, limited access monkfish vessels were allocated 45.2 DAS, of which 32 could be used in the southern management area. Additional information on monkfish management can be found on the NEFMC website (http://www.nefmc.org/monk/index.html).

6.1.7.2 Dogfish

Life History: The spiny dogfish, *Squalus acanthias*, occurs in the western North Atlantic from Labrador to Florida. Regulators consider spiny dogfish 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. They 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 31 in (80 cm), but can vary from 31 to 33 in (78 cm to 85 cm) depending on the abundance of females.

Population Management and Status: The NEFMC and MAFMC jointly develop the spiny dogfish FMP for federal waters. The Atlantic States Marine Fisheries Commission (ASMFC) also developed a plan for state waters. Spawning stock biomass of spiny dogfish declined rapidly in response to a directed fishery during the 1990's. NFMS initially implemented management measures for spiny dogfish in 2001. These measures have been effective in reducing landings and fishing mortality. NMFS declared the spiny dogfish stock rebuilt for the purposes of U.S. management in May 2010.Based upon the 2015 updated stock assessment performed by the Northeast Fisheries Science Center, the spiny dogfish stock is not presently overfished and overfishing is not occurring. The spiny dogfish fishery is managed with an ACL, commercial quota, and possession limits (currently 4,000 lb per trip). Similar to skates, there is a large degree of overlap between spiny dogfish and NE Multispecies trips where dogfish are landed incidentally to groundfish.

6.2 Protected Resources

6.2.1 Species Present in the Area

Numerous protected species inhabit the environment within the Skate FMP management unit (**Table 6**). These species are under NMFS jurisdiction and are afforded protection under the Endangered Species Act of 1973 (ESA) and/or the Marine Mammal Protection Act of 1972 (MMPA).

Table 6 - Species protected under the Endangered Species Act and/or Marine Mammal Protection Act that may occur in the operation area for the Skate fishery

Species	Status	Potentially affected by this action?
Cetaceans		
North Atlantic right whale (*Eubalaena glacialis*)	Endangered	Yes
Humpback whale (*Megaptera novaeangliae*)	Endangered	Yes
Fin whale (*Balaenoptera physalus*)	Endangered	Yes
Sei whale (*Balaenoptera borealis*)	Endangered	Yes
Blue whale (*Balaenoptera musculus*)	Endangered	No
Sperm whale (*Physeter macrocephalus*	Endangered	No
Minke whale (*Balaenoptera acutorostrata*)	Protected	Yes
Pilot whale (*Globicephala spp*.)[2]	Protected	Yes
Risso's dolphin (*Grampus griseus*)	Protected	Yes
Atlantic white-sided dolphin (*Lagenorhynchus acutus*)	Protected	Yes
Short Beaked Common dolphin (*Delphinus delphis*)[3]	Protected	Yes
Spotted dolphin (*Stenella frontalis*)	Protected	No
Bottlenose dolphin (*Tursiops truncatus*)[4]	Protected	Yes
Harbor porpoise (*Phocoena phocoena*)	Protected	Yes
Sea Turtles		
Leatherback sea turtle (*Dermochelys coriacea*)	Endangered	Yes
Kemp's ridley sea turtle (*Lepidochelys kempii*)	Endangered	Yes
Green sea turtle, North Atlantic DPS (*Chelonia mydas*)[5]	Threatened	Yes
Loggerhead sea turtle (*Caretta caretta*), Northwest Atlantic DPS	Threatened	Yes
Hawksbill sea turtle (*Eretmochelys imbricate*)	Endangered	No
Fish		
Shortnose sturgeon (*Acipenser brevirostrum*)	Endangered	No
Atlantic salmon (*Salmo salar*)	Endangered	Yes

Atlantic sturgeon *(Acipenser oxyrinchus)*		
Gulf of Maine DPS	Threatened	Yes
New York Bight DPS, Chesapeake Bay DPS, Carolina DPS & South Atlantic DPS	Endangered	Yes
Cusk (*Brosme brosme)*	Candidate	Yes
Thorny skate (*Amblyraja radiata*)	Candidate	Yes
Porbeagle shark (*Lamna nasus*)	Candidate	Yes
Pinnipeds		
Harbor seal (*Phoca vitulina*)	Protected	Yes
Gray seal (*Halichoerus grypus*)	Protected	Yes
Harp seal (*Phoca groenlandicus*)	Protected	Yes
Hooded seal (*Cystophora cristata*)	Protected	Yes
Critical Habitat		
North Atlantic Right Whale[6]	ESA-listed	No
Northwest Atlantic DPS of Loggerhead Sea Turtle	ESA-listed	No

Notes:
[1] On April 21, 2015, a proposed rule was issued to change the ESA listing status of humpback whales (80 FR 22303). After an extensive scientific status review, 14 DPSs were identified: 2 proposed as threatened, 2 as endangered, and 10 as not warranted for listing. The DPS found in U.S. Atlantic waters, the West Indies DPS, is proposed to be delisted.
[2] There are two species of pilot whales: short finned (*G. melas melas*) and long finned (*G. macrorhynchus*). Due to the difficulties in identifying the species at sea, they are often just referred to as *Globicephala spp*.
[3] Prior to 2008, this species was called "common dolphin."
[4] This includes the Western North Atlantic Offshore, Northern Migratory Coastal, and Southern Migratory Coastal Stocks of Bottlenose Dolphins.
[5] On April 6, 2016, a final rule was issued removing the current range-wide listing of green sea turtles and, in its place, listing eight green sea turtle DPSs as threatened and three DPSs as endangered (81 FR 20058). The green sea turtle DPS in the Northwest Atlantic, and where the Council fisheries operate is considered the North Atlantic DPS of green sea turtles; this DPS is considered threatened under the ESA.
[6] Originally designated June 3, 1994 (59 FR 28805); Expanded on January 27, 2016 (81 FR 4837).

Cusk, porbeagle shark, and thorny skate, a NMFS "candidate species" under the ESA, occurs in the affected environment of the skate fishery (Table 6). Candidate species are those petitioned species that NMFS is actively considering for listing as endangered or threatened under the ESA and also include those species for which NMFS has initiated an ESA status review through an announcement in the *Federal Register*. Candidate species are those petitioned species that NMFS is actively considering for listing as endangered or threatened under the ESA and also include those species for which NMFS has initiated an ESA status review through an announcement in the Federal Register. Once a species is proposed for listing the conference provisions of the ESA apply (see 50 CFR 402.10); however, candidate species receive no substantive or procedural protection under the ESA. As a result, cusk, porbeagle shark, and thorny skate, will not be discussed further in this and the following sections. However, for additional information on these species, please visit http://www.nmfs.noaa.gov/pr/species/esa/candidate.htm

6.2.2 Species and Critical Habitat Not Likely Affected by the Proposed Action

Based on available information, it has been determined that this action is not likely to affect spotted dolphin, shortnose sturgeon, hawksbill sea turtles, blue whales, or sperm whales. Further, this action is not likely to adversely affect Atlantic salmon, the Northwest Atlantic Distinct Population Segment (DPS) of loggerhead or North Atlantic right whale critical habitats. This determination has been made because either the occurrence of the species is not known to overlap with the skate fishery and/or there have never been documented interactions between the species and the skate fishery (Waring et al. 2014; Waring et al. 2015; NMFS 2013; NMFS NEFSC FSB 2015; http://www.nefsc.noaa.gov/fsb/take_reports/nefop.html). In the case of critical habitat, this determination has been made because either the habitat does not occur within the range of the multispecies fishery or the fishery will not affect the primary constituent elements of the critical habitat, and therefore, will result in the destruction or adverse modification of critical habitat (NMFS 2014a; NMFS 2015).

6.2.3 Species Potentially Affected by the Proposed Action

The skate fishery may affect multiple protected species of cetacean, sea turtles, pinnipeds, and fish (Table 6). Of primary concern is the potential for the fishery to interact (e.g., bycatch, entanglement) with these species. To understand the potential risk of an interaction, it is necessary to consider (1) species occurrence in the affected environment of the fishery and how the fishery will overlap in time and space with this occurrence; and (2) records of protected species interaction with particular fishing gear types. Information on species occurrence in the affected environment of the multispecies fishery is presented in this section, while information on protected species interactions with fishery gear is presented in Section 6.2.4.

6.2.3.1 Sea Turtles

Status and Trends. **Table 7 Table 7** includes the four ESA listed species of sea turtles that occur in the affected environment of the multispecies fisheries. Three of the four species are considered hard-shelled turtles (i.e., green, loggerhead, and Kemp's ridley). Additional background information on the range-wide status of the other four species, as well as a description and life history of the species, can be found in a number of published documents, including sea turtle status reviews and biological reports (Conant et al. 2009; Hirth 1997; NMFS & USFWS 1995; 2007b; c; 2013; NOAA 2007; TEWG 1998; 2000; 2009; NMFS and USFWS 2015; Seminoff et al. 2015), and recovery plans for the loggerhead sea turtle (Northwest Atlantic DPS; NMFS & USFWS 2008), leatherback sea turtle (NMFS & USFWS 1992) (NMFS and USFWS 1998a), Kemp's ridley sea turtle (NMFS & USFWS 2011), and green sea turtle (NMFS & USFWS 1991)(NMFS and USFWS 1998b).

Table 7 - Sea turtle species found in the affected environment of the skate fishery

Species	Listed At	Status
Green[1]	Species Level	Endangered: Breeding populations in Florida and on the Pacific coast of Mexico Threatened: Other populations
Kemp's ridley	Species Level	Endangered

Species	Listed At	Status
Loggerhead	Distinct Population Segment	Northwest Atlantic DPS: Threatened
Leatherback	Species Level	Endangered
Notes: [1]Green sea turtle status may change. On March 23, 2015, a proposed rule was issued to remove the current range-wide listing and, in its place, list eight DPSs as threatened and three as endangered (80 FR 15272).		

***Occurrence and Distribution*.** The multispecies fishery occurs in waters north of 35ºN, where sea turtles occur seasonally. A general overview of sea turtle occurrence and distribution in the continental shelf waters of the Northwest Atlantic Ocean is below to assist in understanding how the multispecies fishery overlaps in time and space with the occurrence of sea turtles.

Hard-shelled sea turtles

Distribution. In U.S. Northwest Atlantic waters, hard-shelled turtles commonly occur throughout the continental shelf from Florida to Cape Cod, MA, although their presence varies with the seasons due to changes in water temperature (Braun-McNeill et al. 2008; Braun & Epperly 1996; Epperly, Braun & Chester 1995; Epperly, Braun, Chester, et al. 1995; Mitchell et al. 2003; Shoop & Kenney 1992; TEWG 2009). While hard-shelled turtles are most common south of Cape Cod, MA,they are known to occur in the Gulf of Maine (GOM). Loggerheads, the most common hard-shelled sea turtle in the GAR, feed as far north as southern Canada. Loggerheads have been observed in waters with surface temperatures of 7°C to 30°C, but water temperatures ≥11°C are most favorable (Epperly, Braun, Chester, et al. 1995; Shoop & Kenney 1992). Sea turtle presence in U.S. Atlantic waters is also influenced by water depth. While hard-shelled turtles occur in waters from the beach to beyond the continental shelf, they are most commonly found in neritic waters of the inner continental shelf (Blumenthal et al. 2006; Braun-McNeill & Epperly 2004; Griffin et al. 2013; Hawkes et al. 2006; Hawkes et al. 2011; Mansfield et al. 2009; McClellan & Read 2007; Mitchell, et al. 2003; Morreale & Standora 2005).

Seasonality. Hard-shelled sea turtles occur year-round in waters off Cape Hatteras, North Carolina and south. As coastal water temperatures warm in the spring, loggerheads begin to migrate to inshore waters of the southeast United States and also move up the Atlantic Coast (Braun-McNeill & Epperly 2004; Epperly, Braun & Chester 1995; Epperly, Braun, Chester, et al. 1995; Epperly, Braun & Veishlow 1995; Griffin, et al. 2013; Morreale & Standora 2005), occurring in Virginia foraging areas as early as late April and on the most northern foraging grounds in the GOM in June (Shoop & Kenney 1992). The trend is reversed in the fall as water temperatures cool. The large majority leave the GOM by September, but some remain in Mid-Atlantic and Northeast areas until late fall (i.e., November). By December, sea turtles have migrated south to waters offshore of North Carolina, particularly south of Cape Hatteras, and further (Epperly, Braun, Chester, et al. 1995; Griffin, et al. 2013; Hawkes, et al. 2011; Shoop & Kenney 1992).

Leatherback sea turtles

Leatherback sea turtles also engage in routine migrations between northern temperate and tropical waters (Dodge et al. 2014; James et al. 2005; James et al. 2006; NMFS & USFWS 1992). Leatherbacks, a pelagic species, are known to use coastal waters of the U.S. continental shelf (Dodge, et al. 2014; Eckert et al. 2006; James, et al. 2005; Murphy et al. 2006). They have a greater tolerance for colder water than hard-shelled sea turtles. They are also found in more northern waters later in the year, with most leaving the Northwest Atlantic shelves by mid-November (Dodge, et al. 2014; James, et al. 2005; James, et al. 2006).

6.2.3.2 Large Cetaceans

Status and Trends**.** **Table 8** is the species of large whales occurring in the affected area. For additional information on the biology, status, and distribution of each species, refer to: Waring et al. (2014), Waring et al. (2015), and NMFS (1991; 2005; 2010a; 2011; 2012).

Occurrence and Distribution**.** Right, humpback, fin, sei, and minke whales are found throughout the waters of the Northwest Atlantic Ocean. In general, these species follow an annual pattern of migration between low latitude wintering/calving grounds (south of 35ºN) and high latitude spring/summer foraging grounds (primarily north of 41ºN) (NMFS 1991; 2005; 2010a; 2011; 2012; Waring, et al. 2014, Waring, et al. 2015). This, however, is a simplification of whale movements, particularly as it relates to winter movements. It remains unknown if all individuals of a population migrate to low latitudes in the winter, although, increasing evidence suggests that for some species (e.g., right and humpback whales), some portion of the population remains in higher latitudes throughout the winter (Brown et al. 2002; Clapham et al. 1993; Cole et al. 2013; Khan et al. 2010; 2011; 2012; Khan et al. 2009; NOAA 2008; Swingle et al. 1993; Vu et al. 2012; Waring, et al. 2014; Waring, et al. 2015). Although further research is needed to provide a clearer understanding of large whale movements and distribution in the winter, the distribution and movements of large whales to foraging grounds in the spring/summer is well understood. Movements of whales into higher latitudes coincide with peak productivity in these waters. As a result, the distribution of large whales in higher latitudes is strongly governed by prey availability and distribution, with large numbers of whales coinciding with dense patches of preferred forage (Baumgartner et al. 2003; Baumgartner & Mate 2003; Brown, et al. 2002; Kenney 2001; Kenney et al. 1986; Kenney et al. 1995; Mayo & Marx 1990; Payne et al. 1986; Payne et al. 1990; Schilling et al. 1992). These foraging areas are consistently returned to annually, and therefore, can be considered important, high use areas for whales.

Table 8 - Species of large whales occurring in the affected area

Species	Listed Under the ESA	Protected Under the MMPA	MMPA Strategic Stock
North Atlantic Right Whale	Yes-Endangered	Yes	Yes
Humpback Whale	Yes-Endangered	Yes	Yes
Fin Whale	Yes-Endangered	Yes	Yes
Sei Whale	Yes-Endangered	Yes	Yes
Minke Whale	No	Yes	No

As the affected area of the multispecies fishery occurs in waters north of 35ºN, and whales may be present in these waters throughout the year, the multispecies fishery and large whales are likely to co-occur in the affected area. To further assist in understanding how the multispecies fishery overlaps in time and space with the occurrence of large whales, Table 9 gives an overview of species occurrence and distribution in the continental shelf waters of the affected environment of the multispecies fishery. For additional information on the biology, status, and range wide distribution of each whale species, refer to: Waring et al. (2014), Waring et al. (2015), and NMFS (1991; 2005; 2010a; 2011; 2012).

Table 9 - Large cetacean occurrence in the GOM, GB, SNE, and Mid-Atlantic sub-regions of the skate fishery

Species	Prevalence and Approximate Months of Occurrence
North Atlantic Right Whale	• Distributed throughout all continental shelf waters of the GOM, GB, and Mid-Atlantic (SNE included) throughout the year. • New England waters (GOM and GB regions): **Foraging Grounds**. Important foraging grounds include: › Cape Cod Bay (January-April); › Great South Channel (April-June) › GOM (e.g., Jordan Basin; Wilkinson Basin; Cashes Ledge; Platts Bank; April - October); › northern edge of GB (May-July); • Mid-Atlantic waters: Migratory pathway to/from northern (high latitude) foraging and southern calving grounds (primarily November-April). • Increasing evidence of wintering areas (approximately November – January) in: › Cape Cod Bay; › Jeffreys and Cashes Ledges; › Jordan Basin; and › Massachusetts Bay (e.g., Stellwagen Bank).
Humpback	• Distributed throughout all continental shelf waters of the Mid-Atlantic (SNE included), GOM, and GB throughout the year. • New England waters (GOM and GB regions): **Foraging Grounds** (approximately March-November). • Mid-Atlantic waters: Migratory pathway to/from northern (high latitude) foraging and southern (West Indies) calving grounds. • Increasing evidence of wintering areas (for juveniles) in Mid-Atlantic (e.g., waters in the vicinity of Chesapeake and Delaware Bays; peak presence approximately January through March) and Southeastern coastal waters.
Fin	• Distributed throughout all continental shelf waters of the Mid-Atlantic (SNE included), GOM, and GB sub-regions throughout the year. • Mid-Atlantic waters: › Migratory pathway to/from northern (high latitude) foraging and southern (low

Species	Prevalence and Approximate Months of Occurrence
	latitude) calving grounds; › Possible offshore calving area (October-January) • New England/SNE waters (GOM, GB, and SNE regions): **Foraging Grounds** (greatest densities March-August; lower densities September-November). • Important foraging grounds include: > Massachusetts Bay (esp. Stellwagen Bank) > Great South Channel > waters off Cape Cod (~40-50 meter contour) > western GOM (esp. Jeffrey's Ledge) > Eastern perimeter of GB > Mid-shelf area off the east end of Long Island. • Evidence of wintering areas in mid-shelf areas east of New Jersey, Stellwagen Bank; and eastern perimeter of GB.
Sei	• Uncommon in shallow, inshore waters of the Mid-Atlantic (SNE included), GB, and GOM; however, occasional incursions during peak prey availability and abundance. • Primarily found in deep waters along the shelf edge, shelf break, and ocean basins between banks. • Spring through summer, found in greatest densities in offshore waters of the GOM and GB (eastern margin into the Northeast Channel area; along the southwestern edge in the area of Hydrographer Canyon).
Minke	• Widely distributed throughout continental shelf waters of the Mid-Atlantic (SNE included), GOM, and GB during the spring, summer and fall; however, spring through summer found in greatest densities in the GOM and GB.

Sources**:** NMFS 1991, 2005, 2010b, 2011, 2012; Hain *et al.* 1992; Payne et al. 1984; Good 2008; Hamilton and Mayo 1990; Schevill *et al*. 1986; Watkins and Schevill 1982; Payne *et al*.1990; Winn et al. 1986; Kenney et al. 1986, 1995; Khan *et al*. 2009, 2010, 2011, 2012; Brown *et al*. 2002; NOAA 2008; 50 CFR 224.105; CETAP 1982; Clapham *et al*. 1993; Swingle *et al*. 1993; Vu *et al*. 2012; Baumgartner *et al*. 2011; Cole *et al*. 2013; Risch *et al*. 2013; Waring *et al*. 2014; Waring et al. 2015; 81 FR 4837 (January 27, 2016).

6.2.3.3 Small Cetacean

Status. **Table 10**includes the species of small cetaceans (dolphins and porpoises) occurring in the affected area. For additional information on the biology, status, and range wide distribution of each small cetacean species, refer to Waring et al. (2014), and Waring et al. (2015).

Occurrence and Distribution**.** Small cetaceans are found throughout the waters of the Northwest Atlantic Ocean. In the affected area, they can be found throughout the year from Cape Hatteras, NC (35°N), to the

Canadian border (Waring, et al. 2014, Waring, et al. 2015). Within this range; however, there are seasonal shifts in species distribution and abundance. As the affected area of the multispecies fishery occurs in waters north of 35ºN, and small cetaceans may be present in these waters throughout the year, the multispecies fisheries and small cetaceans are likely to co-occur.

Table 10 - Small cetaceans that occur in the affected environment of the skate fishery

Species	Listed Under the ESA	Protected Under the MMPA	MMPA Strategic Stock
Atlantic White Sided Dolphin	No	Yes	No
Short-Finned Pilot Whale	No	Yes	No
Long-Finned Pilot Whale	No	Yes	No
Risso's Dolphin	No	Yes	No
Short Beaked Common Dolphin	No	Yes	No
Harbor Porpoise	No	Yes	No
Bottlenose Dolphin (*Western North Atlantic Offshore Stock*)	No	Yes	No
Bottlenose Dolphin (*Western North Atlantic Northern Migratory Coastal Stock*)	No	Yes	Yes[1]
Bottlenose Dolphin (*Western North Atlantic Southern Migratory Coastal Stock*)	No	Yes	Yes[2]

Notes:
[1,2] Considered a strategic stock under the MMPA as identified stocks are designated as depleted under the MMPA. Depleted, is defined by the MMPA as any case in which: (1) the Secretary, after consultation with the Marine Mammal Commission and the Committee of Scientific Advisors on Marine Mammals established under MMPA title II, determines that a species or population stock is below its optimum sustainable population; (2) a State, to which authority for the conservation and management of a species or population stock is transferred under section 109, determines that such species or stock is below its optimum sustainable population; or (3) a species or population stock is listed as an endangered species or a threatened species under the ESA.

Source: Waring *et al*. 2014 and Waring *et al*. 2015

To understand how the skate fishery overlaps in time and space with the occurrence of small cetaceans, an overview of species occurrence and distribution in the continental shelf waters of the affected environment of the multispecies fishery is in Table 11. Waring et al. (2014) has additional information on the biology, status, and range distribution of each species.

Table 11 - Small cetacean occurrence in the GOM, GB, SNE, and Mid-Atlantic sub-regions of the skate fishery

Species	Prevalence and Approximate Months of Occurrence (if known)
Atlantic White Sided Dolphin	• Distributed throughout the continental shelf waters (primarily to 100 m) of the Mid-Atlantic (north of 35°N), SNE, GB, and GOM sub-regions; however, most common in the SNE, GB, and GOM sub-regions (i.e., shelf waters from Hudson Canyon (~ 39ºN) and into GB, Massachusetts Bay, and the GOM). • Seasonal shifts in distribution: ***January-May**: low densities found from GB to Jeffreys Ledge; ***June-September**: Large densities found from GB, through the GOM; ***October-December**: intermediate densities found from southern GB to southern GOM. • South of GB (SNE and Mid-Atlantic sub- regions), low densities found year round, with waters off Virginia and North Carolina representing southern extent of species range during winter months.
Short Beaked Common Dolphin	• Regularly found throughout the continental shelf-edge-slope waters (primarily 100-2,000 m) of the Mid-Atlantic, SNE, and GB sub-regions (esp. in Oceanographer, Hydrographer, Block, and Hudson Canyons). • Occasionally found in the GOM. • Seasonal shift in distribution: ***January-May**: occur from Cape Hatteras, NC, to GB * **Mid-summer-autumn**: moves onto GB; *Peak abundance* found on GB in the autumn.
Risso's Dolphin	• Common in the continental shelf edge waters of the Mid-Atlantic, SNE, and GB sub-regions; rare in the GOM sub-region. • From approximately March-November: distributed along continental shelf edge from Cape Hatteras, NC, to GB. • From approximately December-February: distributed in continental shelf edge of the Mid-Atlantic (SNE and Mid-Atl. sub-regions).
Harbor Porpoise	• Distributed throughout the continental shelf waters of the Mid-Atlantic (north of 35°N), SNE, GB, and GOM sub-regions. • Seasonal shifts in distribution: ***July-September**: Concentrated in the northern GOM (primarily in waters less than 150 meters); low numbers can be found on GB. ***October-December**: widely dispersed in waters from NJ to Maine; seen from the coastline to deep waters (>1,800 meters). ***January-March**: intermediate densities in waters off New Jersey to North Carolina (SNE and Mid-Atl sub-regions); low densities found in waters off New York to GOM. ***April-June**: widely dispersed from New Jersey to Maine; seen from the coastline to deep waters (>1,800 meters).
Bottlenose	**Western North Atlantic Offshore Stock** • Spring-Summer: Primarily distributed along the outer continental

Species	Prevalence and Approximate Months of Occurrence (if known)
Dolphin	shelf/edge-slope of the Mid-Atlantic, SNE, and GB sub-regions. • Winter: Distributed in waters south of 35°N **Western North Atlantic Northern Migratory Stock** • Summer (July-August): distributed from the coastal waters from the shoreline to approximately the 25-m isobaths between the Chesapeake Bay mouth and Long Island, New York (Mid-Atl and SNE sub-regions). • Winter (January-March): Distributed in coastal waters south of 35ºN. **Western North Atlantic Southern Migratory Stock** • Spring and Summer (April-August): Distributed along coastal waters from North Carolina to Virginia (Mid-Atl and SNE sub- regions). • Fall and Winter (October-March): Distributed in coastal waters south of 35°N.
Pilot Whales: Short- and Long-Finned	**Short- Finned Pilot Whales** • Primarily occur south of 40ºN (Mid-Atl and SNE sub-regions); although low numbers have been found along the southern flank of GB, but no further than 41ºN. • Distributed primarily in the continental shelf edge-slope waters of Mid-Atlantic and SNE sub-regions from approximately May through December, with individuals moving to more southern waters (i.e., 35°N and south) beginning in the fall. **Long-Finned Pilot Whales** • Range from 35°N to 44°N • Winter to early spring (approximately November through April): primarily distributed along the continental shelf edge-slope of the Mid-Atlantic, SNE, and GB sub-regions. • Late spring through fall (approximately May through October): movements and distribution shift onto/within GB, the Great South Channel, and the GOM. **Area of Species Overlap:** between 38°N and 40°N (Mid-Atl and SNE sub-regions)

Note: Information presented in table is representative of small cetacean occurrence in the Northwest Atlantic continental shelf waters out to the 2,000 m isobath.
Sources: Waring et al. (1992; 2007; 2014; 2015); Payne and Heinemann (1993); Payne et al. (1984); Jefferson et al. (2009).

6.2.3.4 Pinnipeds

Status and Trends. **Table 12** provides the species of pinnipeds that occur in the affected environment of the multispecies fishery. Waring et al. (2014) and Waring et al. (2015) has additional information.

Table 12 - Pinniped species that occur in the affected environment of the skate fishery

Species	Listed Under the ESA	Protected Under the MMPA	MMPA Strategic Stock
Harbor Seal	No	Yes	No
Gray Seal	No	Yes	No
Harp Seal	No	Yes	No
Hooded Seal	No	Yes	No

***Occurrence and Distribution*.** Pinnipeds are found in the nearshore, coastal waters of the Northwest Atlantic Ocean. In the affected area, they are primarily found throughout the year or seasonally from New Jersey to Maine. However, increasing evidence indicates that some species (e.g., harbor seals) may be extending their range seasonally into waters as far south as Cape Hatteras, North Carolina (35ºN) (Waring, et al. 2007; Waring, et al. 2014; Waring, et al. 2015). As the affected area of the multispecies fishery is in waters north of 35ºN, and pinnipeds may be present in these waters year-round, the multispecies fishery and pinnipeds are likely to co-occur. A general overview of species occurrence and distribution in the affected environment of the multispecies fishery is in Table 13. For additional information, refer to Waring et al. (2007; 2014; Waring, et al. 2015).

Table 13 - Pinniped occurrence in the GOM, GB, SNE, and Mid-Atlantic sub-regions of the skate fishery

Species	Prevalence and Approximate Months of Occurrence (if known)
Harbor Seal	Primarily distributed in waters from NJ to ME; however, increasing evidence that their range is extending into waters as far south as Cape Hatteras, NC (35ºN). *Seasonal distribution:* *__Year Round__: Waters of Maine *__September-May__: Waters from New England to New Jersey; potential for some animals to extend range into waters as far south as Cape Hatteras, NC.
Gray Seal	Distributed in waters from New Jersey to Maine *Seasonal distribution:* *__Year Round__: Waters from Maine to Massachusetts *__September-May__: Waters from Rhode Island to New Jersey
Harp Seal	Winter-Spring (approximately January-May): Waters from Maine to New Jersey.
Hooded Seal	Winter-Spring (approximately January-May): Waters of New England.
Sources: Waring et al. (2007, for hooded seals); Waring et al. (2014); Waring et al. (2015).	

6.2.3.5 Atlantic Sturgeon

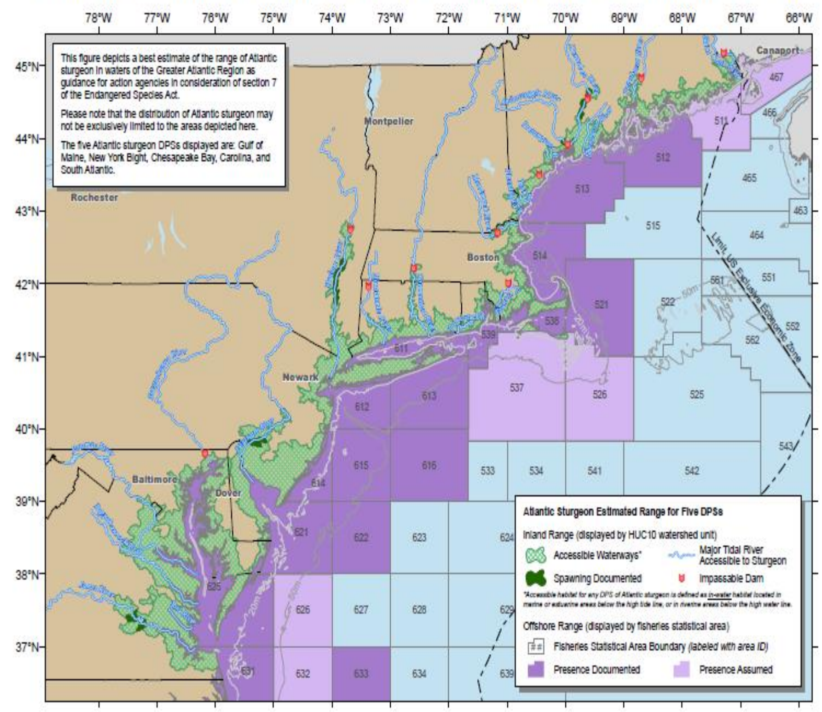
***Status*. Table 14** lists the 5 DPSs of Atlantic sturgeon likely to occur in the affected area. For additional information, refer to 77 FR 5880 and 77 FR 5914 (finalized February 6, 2012), as well as the Atlantic Sturgeon Status Review Team's (ASSRT) 2007 status review of Atlantic sturgeon (ASSRT 2007).

Table 14 - Atlantic sturgeon DPSs listed under the ESA

Species	Listed Under the ESA
Gulf of Maine (GOM) DPS	Threatened
New York Bight (NYB) DPS	Endangered
Chesapeake Bay (CB) DPS	Endangered
Carolina DPS	Endangered
South Atlantic (SA) DPS	Endangered

***Occurrence and Distribution*.** The marine range of U.S. Atlantic sturgeon extends from Labrador, Canada, to Cape Canaveral, Florida. All five DPSs of Atlantic sturgeon have the potential to be located anywhere in this marine range (Figure 1) (ASSRT 2007; Dadswell 2006; Dadswell et al. 1984; Dovel & Berggren 1983; Dunton et al. 2010; Erickson et al. 2011; Kynard et al. 2000; Laney et al. 2007; O'Leary et al. 2014; Stein et al. 2004b; Waldman et al. 2013; Wirgin et al. 2012b).

Figure 1 - Estimated range of Atlantic sturgeon distinct population segments



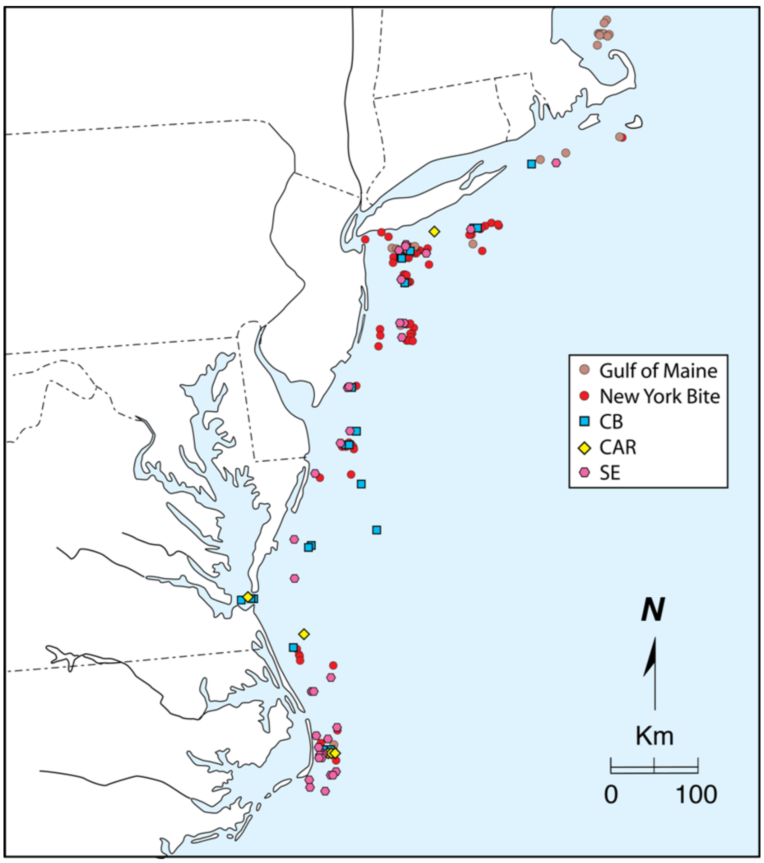
Based on fishery-independent and dependent data, as well as data collected from tracking and tagging studies, in the marine environment, Atlantic sturgeon appear to primarily occur inshore of the 50 m depth contour (Dunton, et al. 2010; Erickson, et al. 2011; Stein et al. 2004a; Stein, et al. 2004b). However, Atlantic sturgeon are not restricted to these depths, as excursions into deeper continental shelf waters have been documented (Collins & Smith 1997; Dunton, et al. 2010; Erickson, et al. 2011; Stein, et al. 2004a; b; Timoshkin 1968). Data from fishery-independent surveys and tagging and tracking studies also indicate that Atlantic sturgeon undertake seasonal movements along the coast. Tagging and tracking studies found that satellite-tagged adult sturgeon from the Hudson River concentrated in the southern part of the Mid-Atlantic Bight, at depths >20 m, during winter and spring, while in the summer and fall, Atlantic sturgeon concentrations shifted to the northern portion of the Mid-Atlantic Bight at depths <20 m (Erickson, et al. 2011). A similar seasonal trend was found by Dunton et al. (2010); analysis of fishery-independent survey data indicated a coastwide distribution of Atlantic sturgeon during the spring and fall; a southerly (e.g., North Carolina, Virginia) distribution during the winters; and a centrally located (e.g., Long Island to Delaware) distribution during the summer. Although studies such as Erickson et al. (2011) and Dunton et al. (2010) provide some indication that Atlantic sturgeon are undertaking seasonal movements horizontally and vertically along the U.S. eastern coastline, there is no evidence to date that all Atlantic sturgeon make these seasonal movements. For instance, during inshore surveys conducted by the NEFSC in the GOM, Atlantic sturgeon have been caught in the fall, winter, and spring between the Saco and Kennebec Rivers (Dunton, et al. 2010).

Within the marine range of Atlantic sturgeon, several marine aggregation areas have been identified adjacent to estuaries and/or coastal features formed by bay mouths and inlets along the U.S. eastern seaboard; depths in these areas are generally ≤25 m (Dunton, et al. 2010; Erickson, et al. 2011; Laney, et al. 2007; Stein, et al. 2004b). Although additional studies are still needed to clarify why these particular sites are chosen by Atlantic sturgeon, there is some indication that they may serve as thermal refuge, wintering sites, or marine foraging areas (Dunton, et al. 2010; Erickson, et al. 2011; Stein, et al. 2004b). The following are the currently known marine aggregation sites located within the range of the multispecies fishery:

- Waters off North Carolina, including Virginia/North Carolina border (Laney, et al. 2007);
- Waters off the Chesapeake and Delaware Bays (Dunton, et al. 2010; Erickson, et al. 2011; Oliver et al. 2013; Stein, et al. 2004b);
- New York Bight (e.g., waters off Sandy Hook, New Jersey, and Rockaway Peninsula, New York; Dunton, et al. 2010; Erickson, et al. 2011; O'Leary, et al. 2014; Stein, et al. 2004b);
- Massachusetts Bay (Stein, et al. 2004b);
- Long Island Sound (Bain et al. 2000; Savoy & Pacileo 2003; Waldman, et al. 2013);
- Connecticut River Estuary (Waldman, et al. 2013);
- Kennebec River Estuary (termed a "hot spot" for Atlantic sturgeon by Dunton, et al. 2010).

In addition, since listing of the five Atlantic sturgeon DPSs, several genetic studies have occurred to address DPS distribution and composition in marine waters. Genetic analysis has been conducted on Atlantic sturgeon captured (fishery-independent) from aggregations in Long Island Sound and the Connecticut River (summer aggregations; Waldman, et al. 2013), as well as the New York Bight, specifically the coastal waters off the Rockaway Peninsula (spring and fall aggregations; O'Leary, et al. 2014). Results from these studies showed that these aggregations, regardless of location, were comprised of all five DPSs, with the NYB DPS consistently identified as the main contributor of the mixed aggregations, followed by the GOM, CB, SA, and Carolina DPSs. In a similar assessment, genetic analysis was conducted on Atlantic sturgeon captured (fishery-dependent) during the Northeast Fisheries Observer Program and At Sea Monitoring Program, which ranges from Maine to North Carolina. Results from this assessment affirmed that in waters of the Mid-Atlantic, all five DPSs co-occur (**Figure 2**), with the percentage of each DPS estimated to be as follows: 51% NYB DPS; 22% SA DPS; 13% CB DPS; 11% GOM DPS; 2% Carolina DPS; and 1% Canadian stock (Damon-Randall et al. 2013). However, these results have not been examined relative to the amount of observed fishing effort throughout the area. In a study by Wirgin et al. (2012b), genetic analysis revealed that the summer assemblage of Atlantic sturgeon in Minas Basin, Inner Bay of Fundy, Canada, was comprised not only of Canadian origin Atlantic sturgeon, but also Atlantic sturgeon from the GOM DPS (34-64% contribution to the mixed assemblage) and NYB DPS (1-2% contribution to the mixed assemblage). Although additional studies are needed to further clarify the DPS distribution and composition in non-natal estuaries and coastal locations, these studies provide some initial insight on DPS distribution and co-occurrence in particular areas along the U.S. eastern sea board.

Figure 2 - Capture locations and DPS of origin assignments for observer program specimens



Source: Map by Dr. Isaac Wirgin (Damon-Randall, et al. 2013).
Note: N=173

Based on the above studies and available information, as the affected area of the multispecies fishery occurs in waters north of 35ºN, and Atlantic sturgeon from any of the 5 DPSs may be present in these waters throughout the year, the multispecies fisheries and Atlantic sturgeon of the 5 DPSs are likely to co-occur in the affected area.

6.2.3.6 Atlantic Salmon (Gulf of Maine DPS)

The wild populations of Atlantic salmon are listed as endangered under the ESA. Their freshwater range occurs in the watersheds from the Androscoggin River northward along the Maine coast to the Dennys

River, while the marine range of the GOM DPS extends from the GOM (primarily northern portion of the GOM), to the coast of Greenland (Fay et al. 2006; NMFS & USFWS 2005). In general, smolts, post-smolts, and adult Atlantic salmon may be present in the GOM and coastal waters of Maine in the spring (beginning in April), and adults may be present throughout the summer and fall months (Baum 1997; Fay, et al. 2006; Hyvarinen et al. 2006; Lacroix & Knox 2005; Lacroix & McCurdy 1996; Lacroix et al. 2004; NMFS & USFWS 2005; Reddin 1985; Reddin & Friedland 1993; Reddin & Short 1991). For additional information on the on the biology, status, and range wide distribution of the GOM DPS of Atlantic salmon, refer to NMFS and USFWS (2005); Fay et al. (2006). Based on the above information, as the multispecies fishery operates throughout the year, and is known to operate in the GOM, it is possible that the fishery will overlap in time and space with Atlantic salmon migrating northeasterly between U.S. and Canadian waters.

6.2.4 Interactions Between Gear and Protected Resources

Protected species described in Section 6.2.3 are all known to be vulnerable to interactions with various types of fishing gear. Available information on gear interactions with a given species (or species group) is in the sections below. These sections are not a comprehensive review of all fishing gear types known to interact with a given species; emphasis is only being placed on those primary gear types used in the skate fishery that are known to pose an interaction risk to the species under consideration (i.e., sink gillnet and bottom trawl gear).

6.2.4.1 Marine Mammals

Pursuant to the MMPA, NMFS publishes a List of Fisheries (LOF) annually, classifying U.S. commercial fisheries into one of three categories based on the relative frequency of incidental serious injuries and/or mortalities of marine mammals in each fishery.[2] The categorization in the LOF determines whether participants in that fishery are subject to certain provisions of the MMPA such as registration, observer coverage, and take reduction plan requirements. Individuals fishing in Category I or II fisheries must comply with requirements of any applicable take reduction plan.

Categorization of fisheries is based on the following two-tiered, stock-specific approach:

- **Tier 1-** considers the cumulative fishery mortality and serious injury for a particular stock. If the total annual mortality and serious injury rates within a stock resulting from all fisheries are ≤ 10% of the stock's potential biological removal rate (PBR), all fisheries associated with this stock fall into Category III.[3] -If mortality and serious injury rates are >10% of PBR, the following Tier 2, analysis occurs.
- **Tier 2 -**considers fishery-specific mortality and serious injury for a particular stock. Specifically, this analysis compares fishery-specific annual mortality and serious injury rates to a stock's PBR to designate the fishery as a Category I, II, or III fishery (**Table 15**).

The following discussion on fishery interactions with marine mammals (large cetaceans, and small cetaceans and pinnipeds) use the Tier 2 classifications of fisheries (Table 15).

[2] The most recent LOF was issued December 29, 2014; 79 FR 77919.
[3] PBR is defined by the MMPA as 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.

Table 15 - Descriptions of the Tier 2 fishery classification categories

Category	Level of incidental mortality or serious injury of marine mammals	Annual mortality and serious injury of a stock in a given fishery is…
Category I	frequent	≥50% of the PBR level
Category II	occasional	1% - 50% of the PBR level
Category III	remote likelihood, or no known	≤1% of the PBR level
Source: 50 CFR 229.2		

6.2.4.1.1 Large Cetaceans

Bottom Trawl Gear

With the exception of one species, there has been no confirmed serious injury or mortality, or documented interactions with large whales and trawl gear. The one exception is minke whales. Minke whales are the only species of large whales that have been observed seriously injured and killed in trawl gear. In bottom trawl gear, the frequency of minke whale interactions have declined since 2006 (estimated annual mortality=3.7 whales), with zero observed interactions in 2010 and 2011, and the annual average estimated mortality and serious injury from the Northeast bottom trawl fishery from 2007 to 2011 equaling 1.8 whales (Waring et al. 2014; Waring et al. 2015). Based on this information, trawl gear is likely to pose a low interaction risk to any large whale species and therefore, is expected to be a low source of serious injury or mortality to any large whale (i.e., will not contribute to the exceedance of any whale species PBR level).

Gillnet Gear

Atlantic large whales are at risk of becoming entangled in fishing gear because the whales feed, travel and breed in many of the same ocean areas utilized for commercial fishing. The greatest entanglement risk to large whales is posed by fixed fishing gear (e.g., sink gillnet and trap/pot gear) comprised of lines (vertical or ground) that rise into the water column. Any line can become entangled in the mouth (baleen), flippers, and/or tail of the whale when the animal is transiting or foraging through the water column (Hartley et al. 2003; Johnson et al. 2005; Kenney 2001; NMFS 2014b; Waring, et al. 2014; Waring et al. 2015; Whittingham, Garron, et al. 2005; Whittingham, Hartley, et al. 2005). For instance, in a study of right and humpback whale entanglements, Johnson et al. (2005) attributed: 1) 89% of entanglement cases, where gear could be identified, to fixed gear consisting of pot and gillnets; and 2) entanglement of one or more body parts of large whales (e.g., mouth and/or tail regions) to four different types of line associated with fixed gear the buoy line, groundline, floatline, and surface system lines).[4] Although available data, such as Johnson et al. (2005), provide insight into large whale entanglement risks with fixed fishing gear, to date, due to uncertainties surrounding the nature of the entanglement event, as well as unknown biases associated with reporting effort and the lack of information about the types and amounts of gear being used, determining which part of fixed gear creates the most entanglement risk for large whales is difficult. As a result, any type or part of fixed gear is considered to create an entanglement risk to large whales and should be considered potentially dangerous to large whale species (Johnson, et al. 2005).

[4] Buoy line connects the gear at the bottom to the surface system. Groundline in trap/pot gear connects traps/pots to each other to form trawls; in gillnet gear, groundline connects a gillnet or gillnet bridle to an anchor or buoy line. Floatline is the portion of gillnet gear from which the mesh portion of the net is hung. The surface system includes buoys and high-flyers, as well as the lines that connect these components to the buoy line.

The effects of entanglement to large whales range from no injury to death (Angliss & DeMaster 1998; Johnson, et al. 2005; Moore & van der Hoop 2012; NMFS 2014b). The risk of injury or death in the event of an entanglement may depend on the characteristics of the whale involved (species, size, age, health, etc.), the nature of the gear (e.g., whether the gear incorporates weak links designed to help a whale free itself), human intervention (e.g., the feasibility or success of disentanglement efforts), or other variables (NMFS 2014b). Although the interrelationships among these factors are not fully understood, and the data needed to provide a more complete characterization of risk are not available, to date, available data do indicate that the entanglement in fishing gear is a significant source of serious injury or mortality for Atlantic large whales (Table 16) (Waring, et al. 2014; Waring et al. 2015; Henry *et al.* 2015).

Table 16 summarizes confirmed human-caused serious injury and mortality to humpback, fin, sei, minke, and North Atlantic right whales along the Gulf of Mexico Coast, U.S. East Coast, and Atlantic Canadian Provinces from 2009 to 2013 (Henry et al. 2015); the data provided in Table 27 is specific to confirmed serious injury or mortality to whales from entanglement in fishing gear. As many entanglement events go unobserved, and because the gear type, fishery, and/or country of origin for reported entanglement events are often not traceable, it is important to recognize that the information presented in Table 16 likely underestimates the rate of large whale serious injury and mortality due to entanglement. Further, scarring data suggests that entanglements may be occurring more frequently than the observed incidences indicate (i.e., Table 16; NMFS 2014). For instance, a study conducted by Robbins *et al.* (2009) analyzed entanglement scars observed in photographs taken during 2003-2006. This analysis suggests high rates of entanglements of GOM humpback whales in fishing gear. In an analysis of the scarification of right whales, 519 of 626 (82.9%) whales examined during 1980-2009 were scarred at least once by fishing gear (Knowlton *et al*. 2012). Further research using the North Atlantic Right Whale Catalogue has indicated that, annually, between 8.6% and 33.6% of right whales have been involved in entanglements (Knowlton *et al*. 2012). Based on this information, care should be taken when interpreting entanglement data as it is likely more incidences of entanglement are occurring than observation alone indicates.

Table 16 - Summary of confirmed serious injury or mortality to fin, minke, humpback, sei, and North Atlantic right whales from 2009-2013 due to fisheries entanglements.[1]

Species	Total Confirmed Entanglement: Serious Injury	Total Confirmed Entanglement: Mortality	Entanglement Events: Total Annual Injury and Mortality Rate
North Atlantic Right Whale	12	6	3.4
Humpback Whale	33	8	8.4
Fin Whale	7	3	1.75
Sei Whale	0	0	0
Minke Whale	23	13	6.5

Notes:
[1]Information presented in Table 27 is based on confirmed serious injury and mortality events along the Gulf of Mexico Coast, US East Coast, and Atlantic Canadian Provinces; it is not specific to US waters only.

***Sources*:** Henry *et al.* 2015; Waring *et al*. 2015.

Pursuant to the MMPA, NMFS publishes a LOF annually, classifying U.S. commercial fisheries into one of three categories based on the relative frequency of incidental serious injurious and mortalities of marine mammals in each fishery. Large whales, in particular, humpback, fin, minke, and North Atlantic right whales, are known to interact with Category I and II fisheries in the (Northwest) Atlantic Ocean. As humpback, fin, and North Atlantic right whales are listed as endangered under the ESA, these species are considered strategic stocks under the MMPA (Section 6.2.3). Section 118(f)(1) of the MMPA requires the preparation and implementation of a Take Reduction Plan (TRP) for any strategic marine mammal stock that interacts with Category I or II fisheries. In response to its obligations under the MMPA, in 1996, NMFS established the Atlantic Large Whale Take Reduction Team (ALWTRT) to develop a plan (Atlantic Large Whale Take Reduction Plan (ALWTRP or Plan)) to reduce serious injury to, or mortality of large whales, specifically, humpback, fin, and North Atlantic right whales, due to incidental entanglement in U.S. commercial fishing gear.[5] In 1997, the ALWTRP was implemented; however, since 1997, the Plan has been modified as NMFS and the ALWTRT learn more about why whales become entangled and how fishing practices might be modified to reduce the risk of entanglement. In fact, two recent adjustments include the Sinking Groundline Rule (72 FR 57104, October 5, 2007;), and the Vertical Line Rule (79 FR 36586, June 27, 2014; 79 FR 73848, December 12, 2014; 80 FR 14345, March 19, 2015; 80 FR 30367, May 28, 2015).[6]

The Plan consists of regulatory (e.g., universal gear requirements, modifications, and requirements; area- and season- specific gear modification requirements and restrictions; time/area closures) and non-regulatory measures (e.g., gear research and development, disentanglement, education and outreach) that, in combination, seek to assist in the recovery of North Atlantic right, humpback, and fin whales by addressing and mitigating the risk of entanglement in gear employed by commercial fisheries, specifically trap/pot and gillnet fisheries (http://www.greateratlantic.fisheries.noaa.gov/Protected/whaletrp/; 73 FR 51228; 79 FR 36586; 79 FR 73848; 80 FR 14345; 80 FR 30367). Specifically, the Plan identifies gear modification requirements and restrictions for Category I and II gillnet and trap/pot fisheries in the Northeast, Mid-Atlantic, and Southeast regions of the U.S.; these fisheries must comply with all regulations of the Plan.[7]

Table 17 has the specified gear modification requirements and restrictions under the ALWTRP for trap/pot or gillnet fisheries in the Northeast or Mid-Atlantic region of the U.S. As the affected environment of the proposed action will not extend into the Southeast region, those provisions of the Plan will not be discussed further. Details on the gear modification requirements and restrictions under the ALWTRP are at: http://www.greateratlantic.fisheries.noaa.gov/Protected/whaletrp/.

Except for the universal gear requirements, the additional gear modification requirements and restrictions identified in Table 17 will vary by location (i.e., management areas) and dates. Table 18, Figure 3, and **Figure 4** provide the Management Areas recognized by the ALWTRP in the Northeast and Mid-Atlantic.

[5] The measures identified in the ALWTRP are also beneficial to the survival of the minke whale, which are also known to be incidentally taken in commercial fishing gear.

[6] The most recent Vertical Line Rule focused on trap/pot vertical line reduction as the ALWTRT determined that gillnets represent <1% of the total vertical lines on the east coast and that the impacts from this gear on large whales is minimal (Appendix 3A, NMFS 2014b); however, even with the new Rule, gear will still be subject to existing restrictions under the ALWTRP for gillnet gear.

[7] The fisheries currently regulated under the ALWTRP include: Northeast/Mid-Atlantic American lobster trap/pot; Atlantic blue crab trap/pot; Atlantic mixed species trap/pot; Northeast sink gillnet; Northeast anchored float gillnet; Northeast drift gillnet; Mid-Atlantic gillnet; Southeastern U.S. Atlantic shark gillnet; and Southeast Atlantic gillnet (NMFS 2014b).

Details on the specific gear modification requirements and restrictions in each Management Area are at http://www.greateratlantic.fisheries.noaa.gov/Protected/whaletrp/.

Table 17 - Summary of gear modification requirements and restrictions for the Northeast and Mid-Atlantic trap/pot and gillnet fisheries under the Atlantic Large Whale Take Reduction Plan

Fishery	Gear Modification Requirement and Restrictions
Trap/Pot	**Northeast and Mid-Atlantic** • Trap/Pot Universal (including sinking groundline), Weak Link, and Gear Marking Requirements **Northeast** • Minimum Number of Traps per Trawl Requirement • Seasonal Closure Areas
Gillnet	**Northeast and Mid-Atlantic** • Gillnet Universal Requirements (including sinking groundline) • Gillnet Gear Marking Requirements • Gillnet Weak Link Requirements • Seasonal Closure Areas • Anchored Gillnet Anchoring Requirements • Drift Gillnet Night Fishing & Storage Restrictions

Table 18 - Northeast and Mid-Atlantic Gillnet or Trap/Pot Management Areas under the Atlantic Large Whale Take Reduction Plan

Fishery	Management Areas
Northeast Trap/Pot	• Northern Inshore State Trap/Pot Waters • Massachusetts Restricted Area • Stellwagen Bank/Jeffreys Ledge Restricted Area • Great South Channel Restricted Trap/Pot Area • Northern & Southern Nearshore Trap/Pot Waters • Offshore Trap/Pot Waters • Jeffreys Ledge Gear Marking Area • Jordan Basin Gear Marking Area
Northeast Gillnet	• Cape Cod Bay Restricted Area • Stellwagen Bank/Jeffreys Ledge Restricted Area • Great South Channel Restricted Gillnet Area • Other Northeast Gillnet Waters • Jeffreys Ledge Gear Marking Area • Jordan Basin Gear Marking Area
Mid-Atlantic Trap/Pot	• Southern Nearshore Trap/Pot Waters • Offshore Trap/Pot Waters
Mid-Atlantic Gillnet	• Other Northeast Gillnet Waters • Mid/South Atlantic Gillnet Waters

Figure 3 - Trap/Pot Management Area under the Atlantic Large Whale Take Reduction Plan

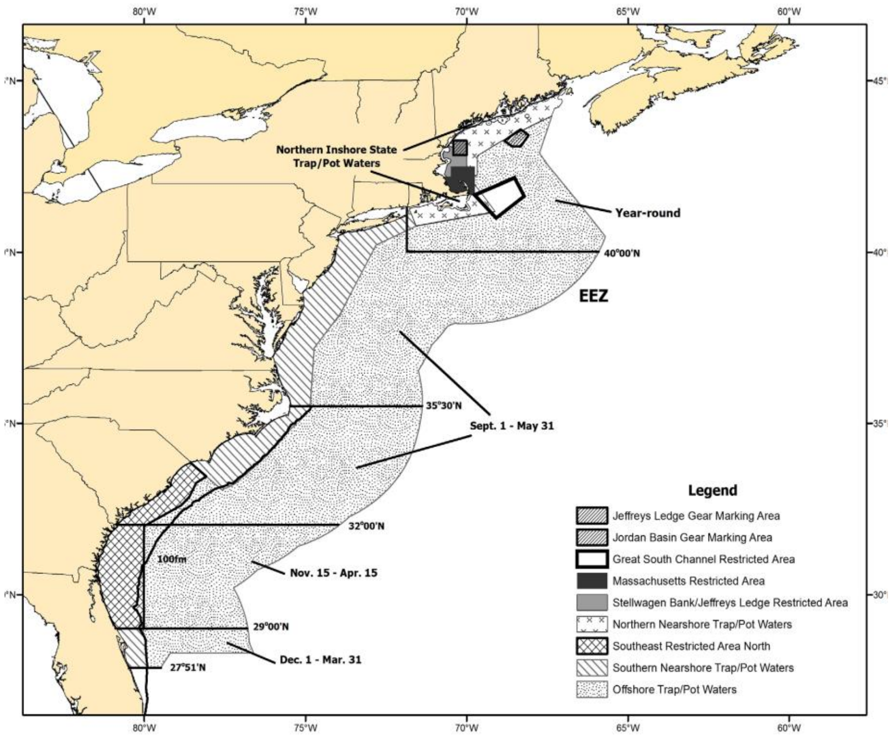
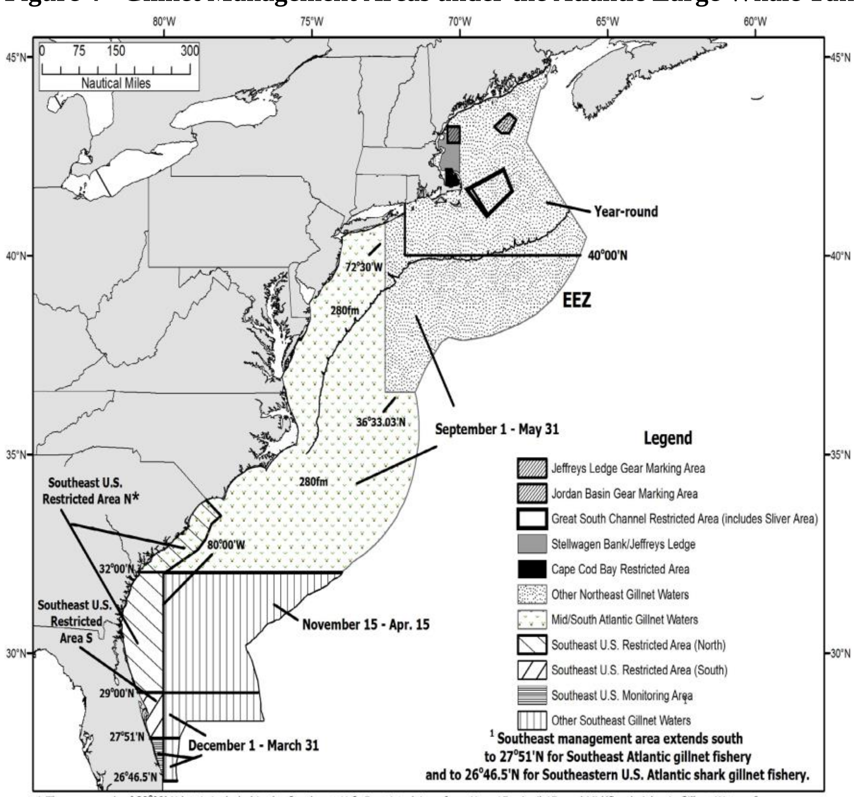


Figure 4 - Gillnet Management Areas under the Atlantic Large Whale Take Reduction Plan



* The area north of 32°00' N lat. is included in the Southeast U.S. Restricted Area from Nov. 15 - April 15, and Mid/South Atlantic Gillnet Waters from Sept. 1 - Nov. 14 and April 16 - May 31.

6.2.4.1.2 Small Cetaceans and Pinnipeds

Gillnet and Bottom Trawl Gear

Small cetaceans and pinnipeds are vulnerable to interactions with various forms of gillnet or trawl gear (Table 19). Small cetacean and pinniped species that have been observed incidentally injured and/or killed by Category I and II gillnet or trawl fisheries (see LOF 79 FR 77919 (December 29, 2014)) that operate in the affected environment of the Habitat Omnibus Amendment are provided in Table 19.[8] Based on the best available information provided in Waring et al. (2014), Waring et al. (2015), and the December 29, 2014, LOF (79 FR 77919), of the fisheries considered in Table 19, Northeast and Mid-Atlantic gillnet fisheries, followed by the Northeast and Mid-Atlantic bottom trawl fisheries (Category I and II fisheries, respectively) pose the greatest risks of serious injury and mortality to small cetaceans and pinnipeds (i.e., approximately 83.0% of the total mean annual mortality to marine mammals (small cetaceans + seals, large whales excluded) is attributed to gillnet fisheries, 16% attributed to bottom trawl, 0.41% attributed to mid-water trawl; Figure 5).[9]

Table 19 – Small cetacean and pinniped species observed seriously injured and/or killed by Category I and II gillnet or trawl fisheries in the affected environment of the skate fishery.

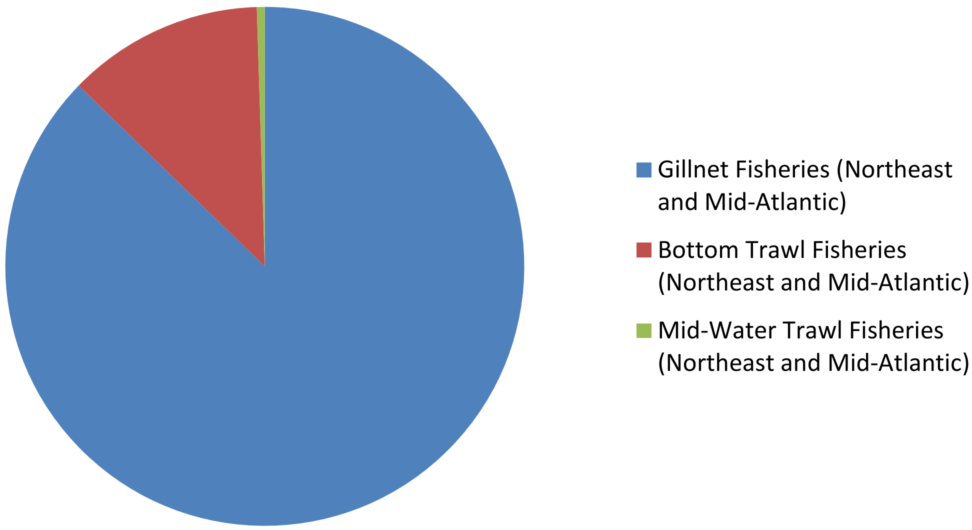
Fishery	Category	Species Observed or reported Injured/Killed
Northeast Sink Gillnet	I	Bottlenose dolphin (offshore)
		Harbor porpoise
		Atlantic white sided dolphin
		Short-beaked common dolphin
		Risso's dolphin
		Pilot whales (spp)
		Harbor seal
		Hooded seal
		Gray seal
		Harp seal
Mid-Atlantic Gillnet	I	Bottlenose dolphin (Northern Migratory coastal)
		Bottlenose dolphin (Southern Migratory coastal)
		Bottlenose dolphin

[8] Mid-Atlantic gillnet, mid-water trawl, and bottom trawl fisheries were included in Table 62 as the MMPA LOF (79 FR 77919; December 29, 2014)) describes the spatial/temporal distribution of effort in these fisheries as extending into portions of the affected environment of the Amendment (i.e., SNE).
[9] The Northeast anchored float gillnet fishery was not included in the analysis as mean annual mortality estimates have not been provided for the species affected by this fishery (Waring et al. 2014; Waring et al. 2015).

		(Northern NC estuarine)
		Bottlenose dolphin (Southern NC estuarine)
		Bottlenose dolphin (offshore)
		White-sided dolphin
		Harbor porpoise
		Short-beaked common dolphin
		Risso's dolphin
		Harbor seal
		Harp seal
		Gray seal
Mid-Atlantic Mid-Water Trawl-Including Pair Trawl	II	Risso's dolphin
		White-sided dolphin
		Bottlenose dophin (offshore)
		Short-beaked common dolphin
		Pilot whales (spp)
Northeast Mid-Water Trawl-Including Pair Trawl	II	White-sided dolphin
		Short-beaked common dolphin
		Pilot whales (spp)
		Gray seal
		Harbor seal
Northeast Bottom Trawl	II	Harp seal
		Harbor seal
		Gray seal
		Pilot whales (spp)
		Short-beaked common dolphin
		White-sided dolphin
		Harbor porpoise
		Bottlenose dolphin (offshore)
		Risso's dolphin
Mid-Atlantic Bottom Trawl	II	White-sided dolphin
		Pilot whales (spp)
		Short-beaked common dolphin
		Risso's dolphin
		Bottlenose dolphin (offshore)

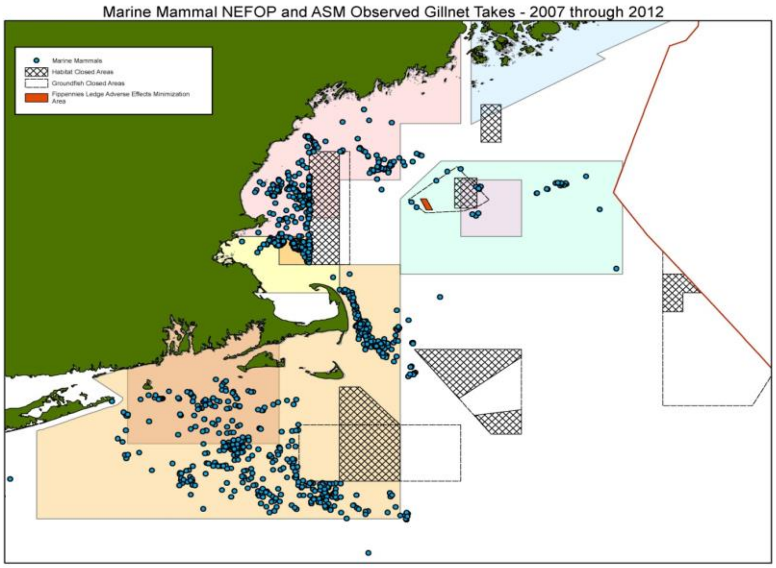
		Gray seal
		Harbor seal
Northeast Anchored Float Gillnet	II	Harbor seal
		White-sided dolphin
Sources: Waring et al. 2014; Waring et al. 2015; LOF 79 FR 77919 (December 29, 2014).		

Figure 5 – 2008-2012 total mean annual mortality of small cetaceans and pinnipeds by Category I and II gillnet or trawl fisheries.



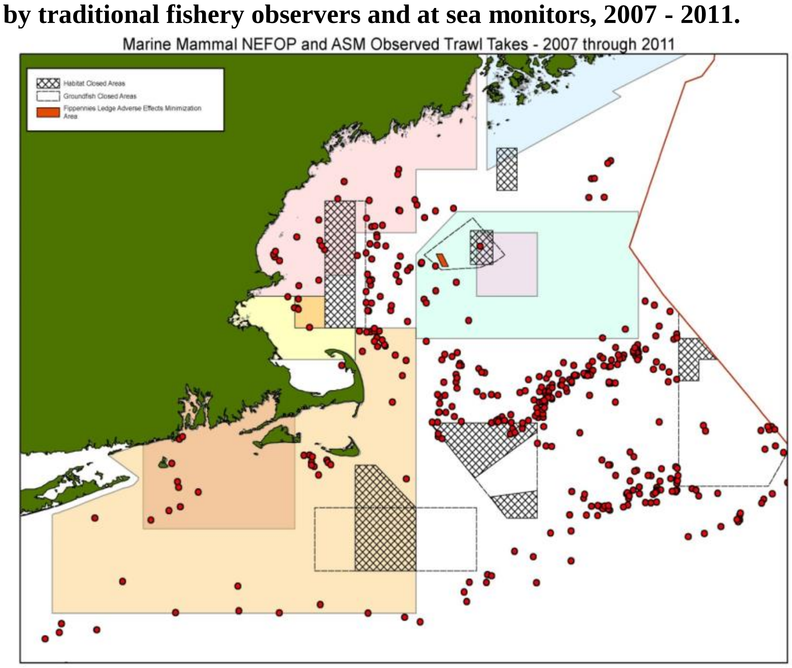
Although there are multiple Category I and II fisheries that result in the serious injury and morality of small cetaceans and pinnipeds, the risk of an interaction with a specific fishery is affected by multiple factors, including where and when fishing effort is focused, the type of gear being used, and how effort overlaps in time and space with specific species in the affected area. For instance, the following figures (Figure 5 and Figure 6) depict observed marine mammal takes (large whales excluded) in gillnet and trawl gear in the GOM, GB, and SNE sub-regions of the multispecies fisheries from 2007-2011. Over these last five years, there appears to be particular areas of the GOM, GB, and SNE sub-regions where fishing effort is overlapping in time and space with small cetacean or pinniped occurrence (Figure 5 and Figure 6); similar trends are seen during 2008-2012 (see Waring et al. 2015; maps depicting cumulative years are still in development, although individual maps/year can be found in this latter document). Although uncertainties such as shifting fishing effort patterns and data on true density (or even presence/absence) for some species remain, the available NEFOP and ASM data (Figure 5 and Figure 6) do provide some insight into areas in the ocean where the likelihood of interacting with a particular species is high and therefore, provides a means to consider potential impacts of future shifts or changes in fishing effort on small cetaceans and pinnipeds.

Figure 5 - Map of marine mammal bycatch in gillnet gear in the Northeast (excluding large whales) observed by traditional fishery observers and at sea monitors, 2007 - 2011.



Notes: Small cetacean and pinnipeds have been observed taken primarily in: (1) the waters west of the GOM Habitat/Groundfish closed area: Harbor seals, harp seals, and harbor porpoise; (2) off of Cape Cod, MA: Gray seals, harbor seals, and harbor porpoise; (3) west of the NLCA (Groundfish closed area): Harbor porpoise, short- beaked common dolphin, gray seals, harp seals, and harbor seals; and (4) waters off southern Massachusetts and Rhode Island: Gray seals and harbor seals, and some harbor porpoise and short-beaked common dolphin.

Figure 6 - Map of marine mammal bycatch in trawl gear in the Northeast (excluding large whales) observed by traditional fishery observers and at sea monitors, 2007 - 2011.



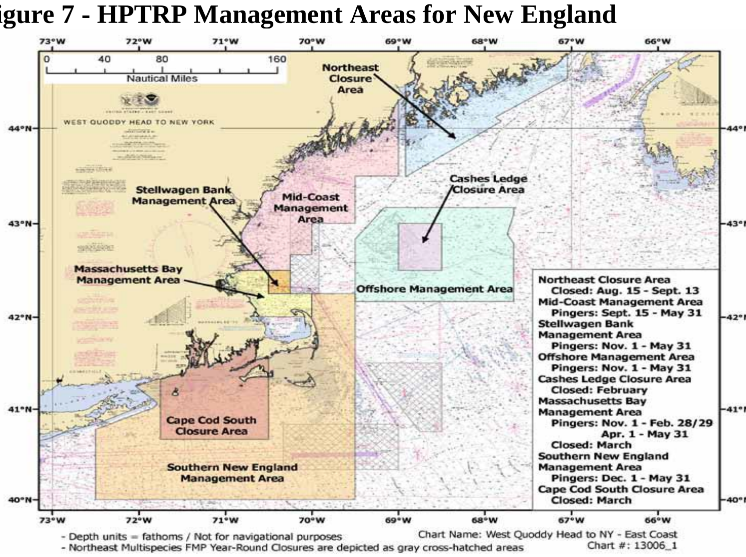
Notes: Small cetacean and pinnipeds observed taken primarily in: (1) the waters between and around CA I and CA II (Groundfish closed areas): Short-beaked common dolphin, pilot whales, white-sided dolphins, gray seals, and some risso's dolphins and harbor porpoise; and (2) eastern side of the GOM Habitat/Groundfish closed area: White-sided dolphins, and some pilot whales and harbor seals.

Numerous species of small cetaceans and pinnipeds interact with Category I and II fisheries in the Atlantic Ocean; however, several species in **Error! Reference source not found.** have experienced such great losses to their populations as a result of interactions with Category I and II fisheries that they are now considered strategic stocks under the MMPA. These species include several stocks of bottlenose dolphins, and until recently, the harbor porpoise.[10]. Section 118(f)(1) of the MMPA requires the preparation and implementation of a TRP for any strategic marine mammal stock that interacts with Category I or II fisheries. As a result, the Harbor Porpoise TRP (HPTRP or Plan) and the Bottlenose Dolphin TRP (BDTRP or Plan) were developed and implemented for these species. The following is an overview for each TRP. Additional information on each TRP can be found at: http://www.greateratlantic.fisheries.noaa.gov/protected/porptrp/ or http://www.nmfs.noaa.gov/pr/interactions/trt/bdtrp.htm.

Harbor Porpoise Take Reduction Plan (HPTRP). To address the high levels of incidental take of harbor porpoise in the groundfish sink gillnet fishery, a Take Reduction Team was formed in 1996. A rule (63 FR 66464) to implement the Harbor Porpoise Take Reduction Plan, and therefore, to reduce harbor porpoise bycatch in U.S. Atlantic gillnets was published on December 2, 1998, and became effective on January 1, 1999; the Plan was amended on February 19, 2010 (75 FR 7383), and October 4, 2013 (78 FR 61821). Since gillnet operations differ between the New England and Mid-Atlantic regions, the following measures were devised for each region.

New England Region: The New England component of the HPTRP pertains to all fishing with sink gillnets and other gillnets capable of catching multispecies in New England waters from Maine through Rhode Island. This portion of the Plan includes time and area closures, as well as closures to multispecies gillnet fishing unless pingers are used in the manner prescribed in the TRP regulations (Figure 7). Details are in 50 CFR 229.33 and the outreach guide at: http:// www.greateratlantic.fisheries.noaa.gov/protected/porptrp/doc/hptrpnewenglandguide_2015.pdf.

Figure 7 - HPTRP Management Areas for New England

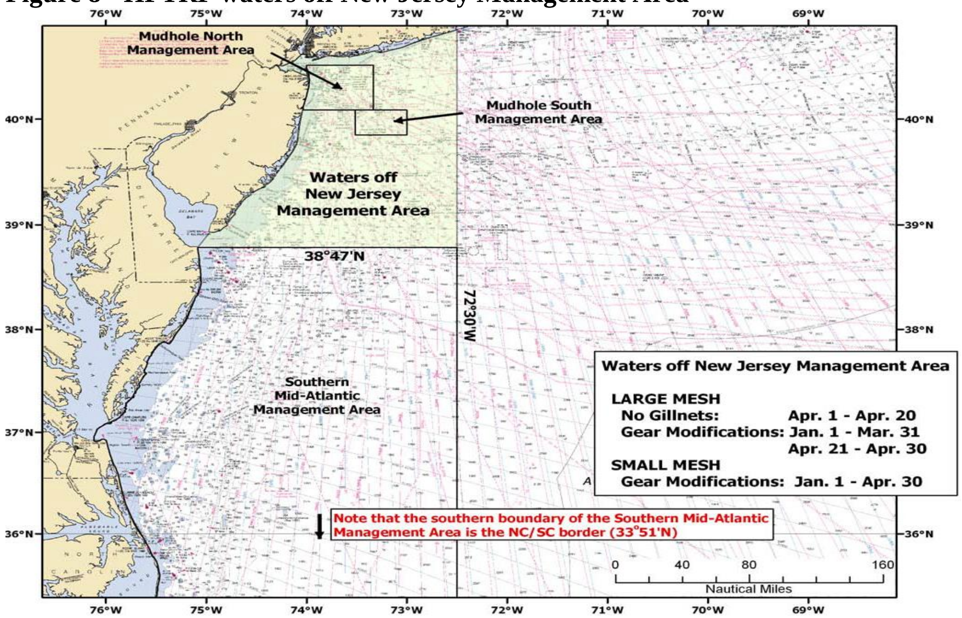


Mid-Atlantic Region: The Mid-Atlantic portion of the HPTRP includes the shoreline from the southern shoreline of Long Island, New York to the N. Carolina/S. Carolina border. It includes four management areas (Waters off New Jersey, Mudhole North (located in waters off New Jersey Management Area),

[10] In the most recent stock assessment report (Waring et al.2015); harbor porpoise were no longer designated as a strategic stock.

Mudhole South (located in waters off New Jersey Management Area), and Southern Mid-Atlantic), each with time and area closures to gillnet fishing unless the gear meets certain specifications. During regulated periods, gillnet fishing in each management area of the Mid-Atlantic is regulated differently for small mesh (>5 inches to <7 inches) and large (7-18 inches) mesh gear. The Plan includes some time and area closures in which gillnet fishing is prohibited regardless of the gear specifications. Figure 8 and Figure 9 depict the Mid-Atlantic Management Areas. Details are in 50 CFR 229.34 and the outreach guide:
http://www.greateratlantic.fisheries.noaa.gov/protected/porptrp/doc/hptrpmidatlanticguide_2015.pdf.

Figure 8 - HPTRP waters off New Jersey Management Area



Notes:

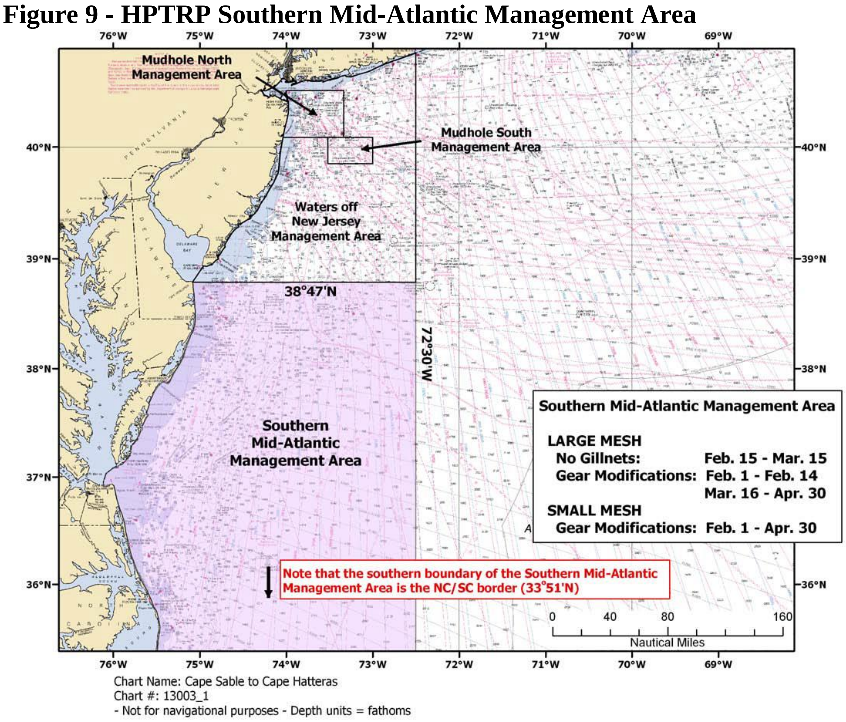
Mudhole North Management Area Small Mesh
Gear Modification: Jan. 1- Apr. 30
No Gillnet: Feb. 15-Mar. 15

Mudhole South Management Area Small Mesh
Gear Modification: Jan. 1- Jan.31; Mar. 16-Apr.30
No Gillnet: Feb. 1-Mar.15

Mudhole North Management Area Large Mesh
Gear Modification: Jan. 1- Apr. 30
No Gillnet: Feb. 15-Mar. 15; Apr. 1-Apr. 20

Mudhole South Management Area Large Mesh
Gear Modification: Jan. 1- Jan.31; Mar. 16-Mar. 31; Apr. 21- Apr. 30
No Gillnet: Feb. 1-Mar.15; Apr. 1- Apr. 20

Figure 9 - HPTRP Southern Mid-Atlantic Management Area



Bottlenose Take Reduction Plan.

In April 2006, NMFS published a final rule to implement the Bottlenose Dolphin TRP for the WNA coastal stock of bottlenose dolphin (April 26, 2006, 71 FR 24776) to reduce the incidental mortality and serious injury in the Mid-Atlantic gillnet fishery and eight other coastal fisheries operating within the dolphin's distributional range.[11] The measures contained in the Bottlenose Dolphin TRP include gillnet effort reduction, gear proximity requirements, gear or gear deployment modifications, and outreach and educational measures to reduce dolphin bycatch below the marine mammals stock's PBR. On July 31, 2012 (77 FR 45268), the Bottlenose Dolphin TRP was amended to permanently continue nighttime fishing restrictions of medium mesh gillnets operating in North Carolina coastal state waters. The Bottlenose Dolphin TRP was most recently amended on February 9, 2015 (80 FR 6925) to reduce the incidental serious injury and mortality of strategic stocks of bottlenose dolphins in Virginia pound net fishing gear, and to provide consistent state and federal regulations for Virginia pound net fishing gear. For additional details on the Bottlenose Dolphin TRP please visit: http://www.nmfs.noaa.gov/pr/interactions/trt/bdtrp.htm.

Atlantic Trawl Gear Take Reduction Strategy

In 2006, the Atlantic Trawl Gear Take Reduction Team was convened to address the incidental mortality and serious injury of long-finned pilot whales (*Globicephala melas*), shortfinned pilot whales (*Globicephala macrorhynchus*), common dolphins (*Delphinus delphis*), and white sided dolphins (*Lagenorhynchus acutus*) incidental to bottom and mid-water trawl fisheries operating in both the Northeast and Mid-Atlantic regions. Because none of the marine mammal stocks of concern to the Atlantic Trawl Gear Take Reduction Team are classified as a "strategic stock," nor do they currently

[11] The final rule issued on April 26, 2006,for the BDTRP also revised the large mesh size restriction under the Mid-Atlantic large mesh gillnet rule for conservation of endangered and threatened sea turtles to provide consistency among Federal and state management measures.

interact with a Category I fishery, it was determined at the time that development of a take reduction plan was not necessary.[12]

In lieu of a take reduction plan, the Atlantic Trawl Gear Take Reduction Team agreed to develop an Atlantic Trawl Gear Take Reduction Strategy. The Strategy identifies informational and research tasks, as well as education and outreach needs the Atlantic Trawl Gear Take Reduction Team believes are necessary, to provide the basis for decreasing mortalities and serious injuries of marine mammals to insignificant levels approaching zero mortality and serious injury rates. The Strategy also identifies several potential voluntary measures that can be adopted by certain trawl fishing sectors to potentially reduce the incidental capture of marine mammals. For additional details on the Strategy, please visit: http://www.greateratlantic.fisheries.noaa.gov/Protected/mmp/atgtrp/

6.2.4.2 Sea Turtles

Sea turtles are widely distributed in the waters of the Northwest Atlantic (Section 6.2.3), so they often occupy many of the same ocean areas used for commercial fishing and therefore, interactions with fishing gear are possible. Sea turtles have been incidentally injured or killed in various gear types (e.g., gillnets, bottom trawls, hook and line gear, dredge); however, of the gear types that could be possibly used in the skate fishery, bottom trawl and gillnet pose the greatest risk to sea turtles. Most of the observed interactions of sea turtles with fishing gear, including bottom trawl and gillnet gear, has been in the Mid-Atlantic (see Murray 2011; Warden 2011; Murray 2013;Murray 2015). As few sea turtle interactions have been observed in the GOM and GB regions of the Northwest Atlantic, there is insufficient data available to conduct a robust model-based analysis on sea turtle interactions with trawl or gillnet gear in these regions and therefore, produce a bycatch estimate for these regions. As a result, the bycatch estimates and discussion below are based on observed sea turtle interactions in gillnet, trawl, or dredge gear in the Mid-Atlantic.

Bottom Trawl Gear

Green, Kemp's ridley, leatherback, loggerhead, and unidentified sea turtles have been documented interacting with bottom trawl gear. However, estimates are available only for loggerhead sea turtles. Warden (2011) estimated that from 2005-2008, the average annual loggerhead interactions in bottom trawl gear in the Mid-Atlantic[13] (i.e., south of Cape Cod, Massachusetts, to approximately the North Carolina/South Carolina border) was 292 (CV=0.13, 95% CI=221-369), with an additional 61 loggerheads (CV=0.17, 95% CI=41-83) interacting with trawls, but released through a Turtle Excluder Device (TED; see below for details on TEDs). Most recently, Murray (2015) estimated that from 2009-2013, the total average annual loggerhead interactions in bottom trawl gear in the Mid-Atlantic (i.e., defined by the boundaries of the Mid-Atlantic Ecological Production; roughly waters west of 71^{o}W to the North Carolina/South Carolina border) was 231 (CV=0.13, 95% CI=182-298). Of the 231 total average annual loggerhead interactions, approximately 33 of those were adult equivalents (Murray 2015). Bycatch estimates provided in Warden (2011) and Murray (2015) are a decrease from the average annual

[12] A strategic stock is defined under the MMPA as a marine mammal stock: for which the level of direct human-caused mortality exceeds the potential biological removal level; which, based on the best available scientific information, is declining and is likely to be listed as a threatened species under the ESA within the foreseeable future; or which is listed as a threatened or endangered species under the ESA, or is designated as depleted under the MMPA.

[13] Warden (2011) and Murray (2013) define the mid-Atlantic slightly differently, but both include waters north to Massachusetts. See the respective papers for a more complete description of these areas.

loggerhead bycatch in bottom otter trawls during 1996-2004, which Murray (2008) estimated at 616 sea turtles (CV=0.23, 95% CI over the nine-year period: 367-890). This decrease is likely due to decreased fishing effort in high-interaction areas (Warden 2011). Most recently, Murray (2015) estimated total loggerhead interactions (with bottom otter trawl gear) attributable to managed species from 2009-2013; specifically, an estimated average annual take of five loggerhead (95% CI=1-11) was attributed to the skate fishery. In addition, based on observer data, leatherback, Kemp's ridley, and loggerhead sea turtles have been observed in bottom trawl gear associated with trips where the target species, the top landed species, or the top landed species per haul was skate (*spp.*) (NMFS NEFSC FSB 2015).

Gillnet Gear

Northeast Fisheries Observers have documented green, Kemp's ridley, leatherback, loggerhead, and unidentified sea turtles in various types of gillnet gears (drift sink, drift float, anchored sink, and drift large pelagic). This section; however, does not include information on the large pelagic drift gillnet fishery, instead the focus of this section is on sea turtle interactions with gillnet gear situated on the ocean bottom (anchored or unanchored).

Murray (2013) conducted an assessment of loggerhead and unidentified hard-shell turtle interactions in Mid-Atlantic gillnet gear from 2007-2011. Based on 2007-2011 NEFOP data, interactions between these species and commercial gillnet gear in the Mid-Atlantic averaged 95 hard-shelled turtles and 89 loggerheads (equivalent to 9 adults) annually. [14] However, average interactions in large mesh gear in warm, southern Mid-Atlantic waters have declined relative to those from 1996-2006 (Murray 2009), as did the total commercial effort (Murray 2013). Murray (2013) also estimated interactions by managed species landed in gillnet gear from 2007-2011. For instance, an estimated average annual bycatch of loggerhead and non-loggerhead hard shelled sea turtles for trips primarily landing skate was 16 loggerheads (95% CI =9-23) and one non-loggerhead hard shelled sea turtles (95% CI=1-2)..

Beginning in the spring of 1995, and continuing in subsequent years, large numbers of sea turtles were stranding along the coastline of North Carolina. These stranding events coincided with the monkfish and dogfish large mesh gillnet fisheries operating offshore, and in fact, some of the stranded turtles coming ashore had large mesh gillnet gear wrapped around their body. Because of the documented strandings and subsequent investigation, NMFS enacted the Mid-Atlantic large mesh gillnet rule in waters of the EEZ on December 3, 2002 (67 FR 71895); this rule was subsequently revised on April 26, 2006 (71 FR 24776). The Mid-Atlantic large mesh gillnet rule, establishes seasonally-adjusted gear restrictions by closing portions of the Mid-Atlantic EEZ to fishing with gillnets with a mesh size ≥ 7–inch (17.8–cm) stretched mesh to protect migrating sea turtles.

Factors Affecting Sea Turtle Interactions

Although sea turtles have the potential to interact with multiple gear types, the risk of an interaction is affected by multiple factors, including where and when fishing effort is focused, the type of gear being used, environmental conditions, and sea turtle occurrence and distribution. Murray and Orphanides (2013) recently evaluated fishery-independent and dependent data to identify environmental conditions associated with turtle presence and the subsequent risk of a bycatch encounter if fishing effort is present; It was concluded that fishery independent encounter rates were a function of latitude, sea surface temperature (SST), depth, and salinity. When the model was fit to fishery dependent data (gillnet, bottom

[14] At Sea Monitoring (ASM) data was also considered in Murray (2013); however, as the ASM program began 1 May 2010, trips (1,085 hauls), trips observed by at-sea monitors from May 2010 – December 2011 were pooled with the NEFOP data. Further, as most of the ASM trips occur in the Gulf of Maine, only a small portion (9%) of ASM data was used in the Murray (2013) analysis.

trawl, and scallop dredge), Murray and Orphanides (2013) found a decreasing trend in encounter rates as latitude increases; an increasing trend as SST increases; a bimodal relationship between encounter rates and salinity; and higher encounter rates in depths between 25 and 50 m. Similar findings were found in Warden (2011a), Murray (2013), and Murray (2015a,b).

6.2.4.3 Atlantic Sturgeon

Bottom Trawl and Gillnet Gear

As in Section 6.2.3.5, the marine range of U.S. Atlantic sturgeon extends from Labrador, Canada, to Cape Canaveral, Florida. All five DPSs of Atlantic sturgeon have the potential to be located anywhere in this marine range, although genetic analyses suggests that the distribution of each varies within that range (Dunton, et al. 2010; King et al. 2001; Laney, et al. 2007; O'Leary, et al. 2014; Waldman, et al. 2013; Wirgin et al. 2012a). Three separate publications using different information sources reached the same conclusion; Atlantic sturgeon occur primarily in waters <50 m (although deeper waters are also used), aggregate in certain areas, and exhibit seasonal movement patterns (Dunton, et al. 2010; Erickson, et al. 2011; Stein, et al. 2004a). These characteristics of Atlantic sturgeon occurrence and distribution result in Atlantic sturgeon occupying many of the same ocean areas utilized for commercial fishing and therefore, occupying areas in which interactions with fishing gear are possible.

There are three documents, covering three time periods, that use data collected by the NEFOP to describe bycatch of Atlantic sturgeon: Stein et al. (2004a) for 1989-2000; ASMFC (2007) for 2001-2006; and Miller and Shepard (2011) for 2006-2010. None of these provide estimates of Atlantic sturgeon bycatch by DPS. Information in all three documents indicate that sturgeon bycatch occurs in gillnet and trawl gear, with the most recent document estimating, based on NEFOP and VTR data from 2006-2010, that annual bycatch of Atlantic sturgeon was 1,342 and 1,239, respectively. Specifically, Miller and Shepard (2011) observed Atlantic sturgeon interactions in trawl gear with small (<5.5 in) and large (≥5.5 in) mesh sizes, as well as gillnet gear with small (<5.5 in), large (5.5-8 in), and extra-large mesh (>8 in) sizes. Although Atlantic sturgeon were observed to interact with trawl and gillnet gear with various mesh sizes, based on NEFOP data, they concluded that gillnet gear, in general, posed a greater risk of mortality to Atlantic sturgeon than did trawl gear. Estimated mortality rates in gillnet gear were 20.0%, while those in otter trawl gear were 5.0%. Similar conclusions were reached in Stein et al. (2004a) and ASMFC (2007) reports, in which both studies also concluded, after review of NEFOP data from 1989-2000 and 2001-2006, that observed mortality is much higher in gillnet gear than in trawl gear. Based on the information presented in these three documents, factors thought to increase the risk of Atlantic sturgeon bycatch, and therefore death, in gillnet gear include:

- Setting gillnet gear at depths <40 m;
- Using gillnet gear with mesh sizes >10 in;
- Setting gillnet gear during spring, fall, and winter months;

- Long soak times (i.e., >24 h); and
- Setting gear during warmer water temperatures

Although Atlantic sturgeon deaths have rarely been reported in otter trawl gear (ASMFC 2007; Dunton et al. 2015; NMFS NEFSC FSB 2015), it is important to recognize that effects of an interaction may occur long after the interaction (Davis 2002; Broadhurst et al. 2006; Beardsall et al. 2013). Based on physiological data obtained from Atlantic sturgeon captured in otter trawls, Beardsall et al. (2013) suggests that factors such as longer tow times (i.e., >60 min), prolonged handling of sturgeon (>10 min on deck), and the type of trawl gear/equipment used, may increase the risk of physiological disruption or impairment (e.g., elevated cortisol levels, immune suppression, impaired osmoregulation, exhaustion) to Atlantic sturgeon captured in otter trawls and therefore, may result in an increased risk of post-release mortality. Post-release exhaustion, even after a 60 minute trawl capture, results in behavioral disruption to Atlantic sturgeon and caution that repeated bycatch events may compound post-release behavioral effects to Atlantic sturgeon which in turn, may effect essential life functions of Atlantic sturgeon (e.g., predator avoidance, foraging, migration to foraging or spawning sites) and therefore, Atlantic sturgeon survival (Beardsall, et al. 2013). Although that study provides some initial insight into the post-release effects to Atlantic sturgeon captured in trawl gear, additional studies are needed to clearly identify the "after" effects of a trawl interaction. As it is remains uncertain what the overall impacts to Atlantic sturgeon survival are from trawl interactions, trawls should not be completely discounted as a form of gear that poses a mortality risk to Atlantic sturgeon.

6.2.4.4 Atlantic Salmon

Bottom Trawl and Gillnet Gear

As in Section 6.2.3.6, the marine range of the GOM DPS extends from the GOM (primarily northern portion), to the coast of Greenland (Fay, et al. 2006; NMFS & USFWS 2005). Although the marine distribution of Atlantic salmon likely overlaps with commercial fisheries, there have been a low number of observed interactions with fisheries and various gear types. According to the Biological Opinion issued by GARFO on December 16, 2013, NMFS NEFOP and At-Sea Monitoring Programs documented 15 individual salmon incidentally caught on over 60,000 observed commercial fishing trips from 1989 through August 2013 (Kocik et al. 2014; NMFS 2013a). Atlantic salmon were observed in gillnet (11/15) and bottom otter trawl gear (4/15), with ten listed as "discarded" and five as mortalities (Kocik pers. comm. 2013 in NMFS 2013a). The genetic identity of these captured salmon is unknown; however, all 15 fish are considered to be part of the GOM DPS, although some may have originated from the Connecticut River restocking program (i.e., those caught south of Cape Cod, Massachusetts).

The above information suggests that interactions with Atlantic salmon are rare events (Kocik, et al. 2014; NMFS 2013a). However, it is important to recognize that observer program coverage is not 100%. As a result, it is likely that some interactions with Atlantic salmon have occurred, but have not been observed or reported.

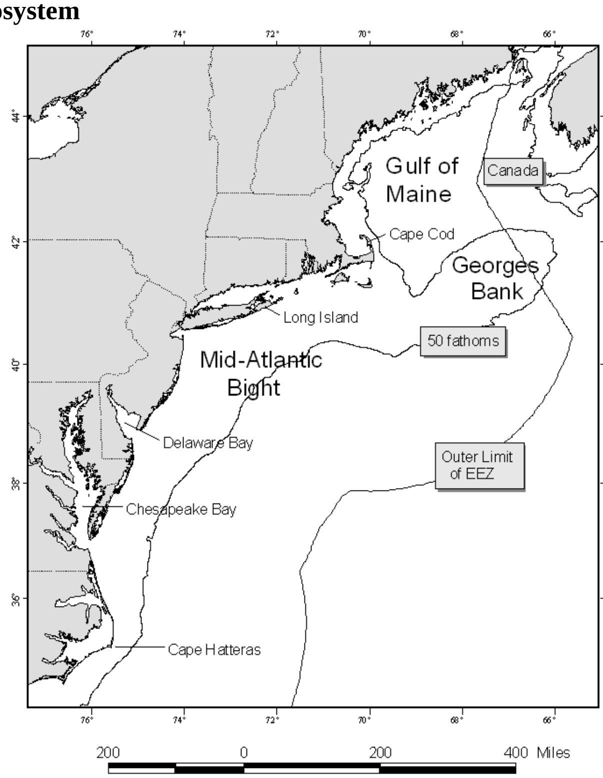
6.3 Physical Environment

The Northeast U.S. Shelf Ecosystem has been described as including the area from the Gulf of Maine south to Cape Hatteras, extending from the coast seaward to the edge of the continental shelf, including the slope sea offshore to the Gulf Stream. The continental slope includes the area east of the shelf, out to a depth of 2000 m. Four distinct sub-regions comprise the NOAA Fisheries Northeast Region: the Gulf of Maine, Georges Bank, the Mid-Atlantic Bight, and the continental slope (see Map 1 and Map 2).

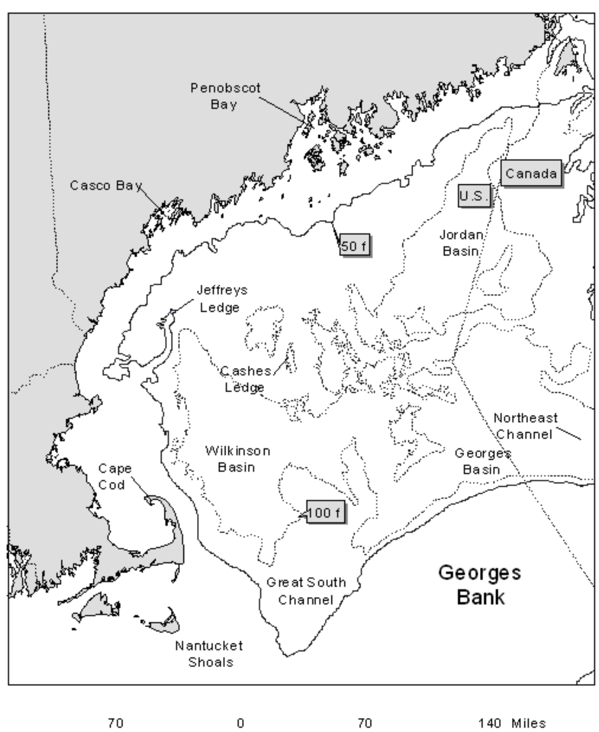
The Gulf of Maine is an enclosed coastal sea, characterized by relatively cold waters and deep basins, with a patchwork of various sediment types. Georges Bank is a relatively shallow coastal plateau that slopes gently from north to south and has steep submarine canyons on its eastern and southeastern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

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

Map 1 - Northeast shelf ecosystem



Map 2 - Gulf of Maine.



Gulf of Maine

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

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

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

Coastal sediments exhibit a high degree of small-scale variability. Bedrock is the predominant substrate along the western edge of the GOM north of Cape Cod in a narrow band out to a depth of about 60 m. Rocky areas become less common with increasing depth, but some rock outcrops poke through the mud covering the deeper sea floor. Mud is the second most common substrate on the inner continental shelf. Mud predominates in coastal valleys and basins that often abruptly border rocky substrates. Many of these basins extend without interruption into deeper water. Gravel, often mixed with shell, is common adjacent to bedrock outcrops and in fractures in the rock. Large expanses of gravel are not common, but do occur near reworked glacial moraines and in areas where the seabed has been scoured by bottom currents. Gravel is most abundant at depths of 20 - 40 m, except in eastern Maine where a gravel-covered plain exists to depths of at least 100 m. Bottom currents are stronger in eastern Maine where the mean tidal range exceeds 5 m. Sandy areas are relatively rare along the inner shelf of the western GOM, but are more common south of Casco Bay, especially offshore of sandy beaches.

Georges Bank

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

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

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

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

Mid-Atlantic Bight

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

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

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

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

Sand waves are usually found in patches of 5 - 10 with heights of about 2 m, lengths of 50 - 100 m and 1 - 2 km between patches. Sand waves are primarily found on the inner shelf, and often observed on sides of sand ridges. They may remain intact over several seasons. Megaripples occur on sand waves or separately on the inner or central shelf. During the winter storm season, they may cover as much as 15% of the inner shelf. They tend to form in large patches and usually have lengths of 3 - 5 m with heights of 0.5 - 1 m. Megaripples tend to survive for less than a season. They can form during a storm and reshape the upper 50 - 100 cm of the sediments within a few hours. Ripples are also found everywhere on the shelf, and appear or disappear within hours or days, depending upon storms and currents. Ripples usually have lengths of about 1 - 150 cm and heights of a few centimeters.

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

The northern portion of the Mid-Atlantic Bight is sometimes referred to as southern New England. Most of this area was discussed under Georges Bank; however, one other formation of this region deserves note. The mud patch is located just southwest of Nantucket Shoals and southeast of Long Island and Rhode Island. Tidal currents in this area slow significantly, which allows silts and clays to settle out. The mud is mixed with sand, and is occasionally resuspended by large storms. This habitat is an anomaly of the outer continental shelf.

Artificial reefs are another significant Mid-Atlantic habitat, formed much more recently on the geologic time scale than other regional habitat types. These localized areas of hard structure have been formed by shipwrecks, lost cargoes, disposed solid materials, shoreline jetties and groins, submerged pipelines, cables, and other materials (Steimle and Zetlin 2000). While some of materials have been deposited specifically for use as fish habitat, most have an alternative primary purpose; however, they have all become an integral part of the coastal and shelf ecosystem. It is expected that the increase in these materials has had an impact on living marine resources and fisheries, but these effects are not well known.

In general, reefs are important for attachment sites, shelter, and food for many species, and fish predators such as tunas may be attracted by prey aggregations, or may be behaviorally attracted to the reef structure.

6.4 Essential Fish Habitat

EFH descriptions and maps for the skate species can be found in the FMP for the Skate Complex and for the other NEFMC-managed species in the NEFMC's 1998 Omnibus EFH amendment. Skate EFH maps are also available for viewing via the Essential Fish Habitat Mapper: http://sharpfin.nmfs.noaa.gov/website/EFH_Mapper/map.aspx. The current EFH text descriptions are linked from this location.

A more detailed discussion of habitat types, as well as biological and physical effects of fishing by various gears in the skate fishery is provided in the 2008 SAFE Report, or Section 7.4.6 of Skate Amendment 3 (NEFMC 2009). An up-dated summary of gear effects research studies that are relevant to the NE region will be included in the revised gear effects section of the NEFMC Omnibus EFH Amendment 2 (Phase 2), which is currently being developed.

6.5 Human Communities/Socio-Economic Environment

The purpose of this section is to describe and characterize the various fisheries in which skates are caught. Descriptive information on the fisheries is included, and where possible, quantitative commercial fishery and economic information is presented.

6.5.1 Overview of the Skate Fishery

The seven species in the Northeast Region skate complex (Maine to North Carolina) are distributed along the coast of the northeast United States from near the tide line to depths exceeding 700 m (383 fathoms). Skates are not known to undertake large-scale migrations, but they do 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 six to twelve months, with the young having the adult form at the time of hatching (Bigelow and Schroeder 1953). A description of the available biological information about these species can be found in Section 6.1.

Skates are harvested in two very different fisheries, one for lobster bait and one for wings for food. Small, whole skates are among the preferred baits for the regional American lobster (*Homarus americanus*) fishery. The fishery for lobster bait is a more historical and directed skate fishery, involving vessels primarily from Southern New England ports that target a combination of little skates (>90%) and, to a much lesser extent, juvenile winter skates (<10%). The catch of juvenile winter skates mixed with little skates is difficult to differentiate due to their nearly identical appearance.

The bait fishery is largely based out of Rhode Island with other ports (New Bedford, Martha's Vineyard, Block Island, Long Island, Stonington, Chatham and Provincetown) also identified as participants in the directed bait fishery. There is also a seasonal gillnet incidental catch fishery as part of the directed monkfish gillnet fishery, in which skates (mostly winter skates) are sold both for lobster bait and as cut wings for processing. Fishermen have indicated that the market for skates as lobster bait has been relatively consistent. The directed skate fishery by Rhode Island vessels occurs primarily in federal waters less than 40 fathoms from the Rhode Island/Connecticut/New York state waters boundary east to the waters south of Martha's Vineyard and Nantucket out to approximately 69 degrees. The vast majority of the landings are caught south of Block Island in federal waters. Effort on skates increases in state waters seasonally to accommodate the amplified effort in the spring through fall lobster fishery. Skates caught for lobster bait are landed whole by otter trawlers and either sold 1) fresh, 2) fresh salted, or 3) salted and strung or bagged for bait by the barrel. Inshore lobster boats usually use 2 – 3 skates per string, while offshore boats may use 3 – 5 per string. Offshore boats may actually “double bait” the pots during the winter months when anticipated weather conditions prevent the gear from being regularly tended. The presence of sand fleas and parasites, water temperature, and anticipated soak time between trips are determining factors when factoring in the amount of bait per pot.

Size is a factor that drives the dockside price for bait skates. For the lobster bait market, a “dinner plate” is the preferable size to be strung and placed inside lobster pots. Little and winter skates are rarely sorted prior to landing, as fishermen acknowledge that species identification between little skates and small winter skates is very difficult. Quality and cleanliness of the skate are also factors in determining the price paid by the dealer, rather than just supply and demand. The quantity of skates landed on a particular day has little effect on price because there has been ready supply of skates available for bait from the major dealers, and the demand for lobster bait has been relatively consistent. Numerous draggers and lobster vessels have historically worked out seasonal cooperative business arrangements with a stable pricing agreement for skates.

Due to direct, independent contracts between draggers and lobster vessels landings of skates are estimated to be under-documented. While bait skates are always landed (rather than transferred at sea) they are not always reported because they can be sold directly to lobster vessels by non-federally permitted vessels, which are not required to report as dealers.

Lobster bait usage varies regionally and from port to port, based upon preference and availability. Some lobstermen in the northern area (north of Cape Cod) prefer herring, mackerel, menhaden and hakes (whiting and red hake) for bait, which hold up in colder water temperatures; however, the larger offshore lobster vessels still indicate a preference for skates and Acadian redfish in their pots. Some offshore boats have indicated they will use soft bait during the summer months when their soak time is shorter. Skates used by the Gulf of Maine vessels are caught by vessels fishing in the southern New England area.

The other primary market for skates in the region is the wing market. Larger skates, mostly captured by trawl gear, have their pectoral flaps, or wings, cut off and sold into this market. The fishery for skate wings evolved in the 1990s as skates were promoted as “underutilized species,” and fishermen shifted effort from groundfish and other troubled fisheries to skates and dogfish. Attempts to develop domestic markets were short-lived, and the bulk of the skate wing market remains overseas. Winter, thorny, and barndoor skates are considered sufficient in size for processing of wings, but due to their overfished status, possession and landing of thorny and barndoor skates has been prohibited since 2003. Winter skate is therefore the dominant component of the wing fishery, but illegal thorny and barndoor wings still occasionally occur in landings (90 day finding for Thorny Skate). The assumed effectiveness of prohibition regulations is thought to be 98% based on recent work that examined port sampling data (90 day finding for Thorny Skate). That means 98% or more of the skates being landed for the wing market are winter skates, so regulations for the wing fishery primarily have an impact on that species.

The wing fishery is a more incidental fishery that involves a larger number of vessels located throughout the region. Vessels tend to catch skates when targeting other species like groundfish, monkfish, and scallops and land them if the price is high enough.

The southern New England sink gillnet fishery targets winter skates seasonally along with monkfish. Highest catch rates are in the early spring and late fall when the boats are targeting monkfish, at about a 5:1 average ratio of skates to monkfish. Little skates are also caught incidentally year-round in gillnets and sold for bait. Several gillnetters indicated that they keep the bodies of the winter skates cut for wings and also salt them for bait. Gillnetters have become more dependent upon incidental skate catch due to cutbacks in their fishery mandated by both the Monkfish and Multispecies FMPs. Gillnet vessels use 12-inch mesh when monkfishing, catching larger skates. Southern New England fishermen have reported increased catches of barndoor skates in the last few years.

Only in recent years have skate wing landings been identified separately from general skate landings. Landed skate wings are seldom identified to species by dealers. Skate processors buy whole, hand-cut, and/or onboard machine-cut skates from vessels primarily out of Massachusetts and Rhode Island. Because of the need to cut the wings, it is relatively labor-intensive to fish for skates. Participation in the skate wing fishery, however, has recently grown due to increasing restrictions on other, more profitable groundfish species. It is assumed that more vessels land skate wings as an incidental catch in mixed fisheries than as a targeted species.

New Bedford emerged early-on as the leader in production, both in landed and processed skate wings, although skate wings are landed in ports throughout the Gulf of Maine and extending down into the Mid-Atlantic. New Bedford still lands and processes the greatest share of skate wings. Vessels landing skate wings in ports like Portland, ME, Portsmouth, NH, and Gloucester, MA are likely to be landing them incidentally while fishing for species like groundfish and monkfish.

The current market for skate wings remains primarily an export market. France, Korea, and Greece are the leading importers. There is a limited domestic demand for processed skate wings from the white tablecloth restaurant business. Winter skates landed by gillnet vessels are reported to go almost exclusively to the wing market. Fishermen indicate that dealers prefer large-sized winter skates for the wing market (over three pounds live weight).

6.5.1.1 Catch

The skate fishery caught 79% of the overall ACL in FY 2014 (Table 20); this was an increase on FY 2013 landings (Table 19). No AMs were triggered in FY 2014 as there was no overage. The wing fishery caught 97.3% of the wing TAL; the bait fishery caught 82% of the bait TAL. State landings in FY 2014 were 329 mt. Total live discards in 2014 were 42,732 mt and dead discards were 12,098.

Table 19 - FY 2013 Catch and Landings of Skates Compared to Management Specifications

Management Specification	Specification Amount	Catch/Landings (mt)	Percent Landed or Caught
ABC/ACL	50,435	27,922	55%
ACT (75% of ABC)	37,826	27,992	74%
Assumed Discards + State Landings	16,265	13,253	NA
TAL Bait	7,223	5,596	77%
TAL Wings	14,338	7,981	56%

Table 20 – Skate catch and landings (mt) in FY 2014

Management Specification	Specification Amount	Catch/Landings (mt)	Percent Landed or Caught
ABC/ACL	35,479	28,032	79%

ACT (75% of ABC)	26,609	28,032	105%
Assumed Discards + State Landings	10,224	11,781	NA
TAL Bait	5,849	4,499	82%
TAL Wings	10,896	10,605	97.3%

6.5.1.2 Recreational skate catches

In general, skates have little to no recreational value and are not intentionally pursued in any recreational fisheries. Catch information (2009-2012) for Atlantic coast skates from MRIP is presented in Table 21. Recreational skate catches have fluctuated between 2010 and 2014 with a high of 51,962 lbs occurring in 2013 (Table 21).

Recreational *harvest* of skates (MRFSS A+B1 data), where skates were retained and/or killed by the angler, vary by species and state (please refer to the MRIP website for these data http://www.st.nmfs.noaa.gov/st1/recreational/queries/). The vast majority of skates caught by recreational anglers are considered released alive, but do not account for post-release mortality caused by hooking and handling.

New Jersey, New York, Rhode Island, and Virginia reported the largest recreational skate catches over the time series (please refer to the MRIP website for these data http://www.st.nmfs.noaa.gov/st1/recreational/queries/). Recreational fishers in Maine did not report catching any skates between 2009 and 2013. Landings by species varied by state; clearnose skate was caught by more states further south (please refer to the MRIP website for these data http://www.st.nmfs.noaa.gov/st1/recreational/queries/).

Reliability of skate recreational catch estimates from MRFSS is a concern. Total catch estimates (A+B1+B2), however, appear to be more reliable than harvest estimates (A+B1 only). Since skates are not valuable and heavily-fished recreational species, the number of MRFSS intercepts from which these estimates are derived is likely to have been very low. The fewer intercepts from which to extrapolate total catch estimates there are, the less reliable the total catch estimates will be.

Table 21 - Estimated recreational skate harvest (lbs) by species, 2010-2014 (A+B1)

	Winter	**Smooth**	**Clearnose**	**Little**	**Total**
2010	4,505	0	45,432	0	49,937
2011	0	173	37,130	1,423	38,726
2012	1,772	0	4,818	0	6,590
2013	359	0	30,014	21,589	51,962
2014	110	0	5,851	39,543	45,504

Source: NMFS/MRIP (PSE >50 for all values indicating imprecise estimates)
http://www.st.nmfs.noaa.gov/recreational-fisheries/access-data/run-a-data-query/index
No reported harvest for species not listed.

6.5.1.3 Landings by fishery and DAS declaration

Note that NMFS estimates commercial skate landings from the dealer weighout database and reports total skate landings according to *live weight* (i.e., the weight of the whole skate). This means that a conversion factor is applied to all wing landings so that the estimated weight of the entire skate is reported and not just the wings. While *live weight* is necessary to consider from a biological and stock assessment perspective, it is important to remember that vessels' revenues associated with skate landings are for *landed weight* (vessels in the wing fishery only make money for the weight of wings they sell, not the weight of the entire skate from which the wings came).

Due to the relative absence of recreational skate fisheries, virtually all skate landings are derived from regional commercial fisheries. Skates have been reported in New England fishery landings since the late 1800s. However, commercial fishery landings never exceeded several hundred metric tons until the advent of distant-water fleets during the 1960s (for a full description of historic landings please refer to Amendment 3, NEFMC, 2009). Total skate landings have fluctuated between two levels between FY 2009 and 2012 (Table 22). The fluctuations in landings are largely attributable to the wing fishery as landings in the bait fishery have remained relatively stable (Table 23). It is not clear what is driving the trend in wing landings as quota is not thought to be limiting to the fishery. One potential explanation is the decrease in winter skate survey index that suggests fewer winter skate were available to the fishery.

Table 22 – Total Landings in the Skate Fisheries

Fishing Year	Landings (in lbs)
2009	41,634,696
2010	32,347,014
2011	41,103,304
2012	33,084,082
2013	29,931,854
2014	34,419,687
Grand Total	212,520,637

Table 23 – Landings by Skate Fishery Type

FY	Disposition	Landings (in lbs)
2009	Bait	9,049,822
	Wing	32,584,874
2010	Bait	10,020,271
	Wing	22,326,743
2011	Bait	10,861,122
	Wing	30,242,182
2012	Bait	10,789,031
	Wing	22,295,051
2013	Bait	11,245,043
	Wing	19,232,756
2014	Bait	9,386,666
	Wing	24,642,900
Grand Total		212,676,461

Total fishing revenue from all species on active skate vessels increased slightly in 2014 (Table 24).

Table 24 - Total fishing revenue (all species) from active skate vessels

Year	Total Revenue
2009	1,260,423,620
2010	697,188,765
2011	714,315,861
2012	705,152,600
2013	567,234,143
2014	578,739,701
Grand Total	4,523,054,690

Landings by DAS declaration indicate that a large portion of bait is landed while on a multispecies (sector and common pool) trip (Table 25). Landings under a monkfish declaration may be underestimated because of reporting. A large amount of total skate landings have no associated declaration. The majority of the wing landings are associated with multispecies trips, however, those associated with monkfish trips closely followed. The skate wing fishery is predominantly an incidental fishery, where skate wings are harvested on trawl and gillnet trips primarily targeting more valuable NE multispecies (cod, haddock, flounders, etc.) and/or monkfish. Therefore, the fishing effort associated with the skate wing fishery can be directly tied to effort patterns and constraints in these other fisheries. Fishing effort for skate wings will tend to only increase when DAS allocations and usage increase (and vice versa), which may occur independently of skate quotas. Similarly, the rate and magnitude of skates discarded by these fisheries are directly proportional to DAS usage.

Table 25 - Total skate landings (lbs live weight) by DAS program, FY2014

VMS Declaration	Bait	Wing
Mults Sector	3,104,650	10,640,649
Mults Common	303,450	332,955
Monkfish	29,864	9,811,186
Scallop	NA	42,082
Unmatched/No Declaration	4,212,412	2,293,265
DOF	1,736,170	988,655
Total	9,386,546	24,108,792

Source: NMFS, Fisheries Statistics Office

6.5.1.4 Trends in number of vessels

The number of skate permits has declined between FY 2009 and 2014. On a broader time scale, between FY2003 and 2014, there was an increase in skate permits with a high occurring in 2007 (Table 26).

Table 26 - Number of Skate Permits issued

AP_Year	Number of skate permits issued
2003	1,968
2004	2,391
2005	2,632
2006	2,675

2007	2,685
2008	2,633
2009	2,574
2010	2,503
2011	2,326
2012	2,265
2013	2,202
2014	2,147

The number of active permits has decreased between 2009 and 2014 (Table 27). This decrease may contribute to the observed trend in wing landings shown in Table 23, with fewer active permits in years with lower landings.

Table 27 - Number of Active Permits between 2009 and 2012

FY	Number of active permits
2009	578
2010	551
2011	569
2012	527
2013	455
2014	450

6.5.1.5 Trends in revenue

Skate revenue increased in FY2014, which was likely driven by the high percentage of the wing TAL being achieved (Table 28). The increase in revenue is largely attributable to changes in wing revenue and landings (Table 29).

Table 28 – Total Skate Revenue

FY	Revenue
2009	$ 7,380,043
2010	$ 7,786,423
2011	$ 8,419,911
2012	$ 6,645,435
2013	$ 7,450,280
2014	$ 9,292,251
Grand Total	$ 46,974,343

Table 29 - Total Skate Revenue by Fishery (Bait and Wing)

FY	Disposition	Revenue
2009	Bait	$ 872,669
	Wing	$ 6,507,374
2010	Bait	$ 2,624,844
	Wing	$ 5,161,579

2011	Bait	$ 1,128,278
	Wing	$ 7,291,633
2012	Bait	$ 1,113,427
	Wing	$ 5,532,008
2013	Bait	$ 1,206,310
	Wing	$ 5,955,972
2014	Bait	$ 1,149,535
	Wing	$ 7,861,515
Grand Total		$ 46,405,144

6.5.2 Fishing Communities

There are over 100 communities that are homeport to one or more Northeast groundfish fishing vessels. These ports occur throughout the coastal northeast and mid-Atlantic. Consideration of the social impacts on these communities from proposed fishery regulations is required as part of the National Environmental Policy Act (NEPA) of 1969 and the Magnuson Stevens Fishery Conservation and Management Act, 1976. Before any agency of the federal government may take "actions significantly affecting the quality of the human environment," that agency must prepare an Environmental Assessment (EA) that includes the integrated use of the social sciences (NEPA Section 102(2)(C)). National Standard 8 of the MSA stipulates that "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 economic impacts on such communities" (16 U.S.C. § 1851(a)(8)).

A "fishing community" is defined in the Magnuson-Stevens Act, as amended in 1996, as "a community which is substantially dependent on or substantially engaged in the harvesting or processing of fishery resources to meet social and economic needs, and includes fishing vessel owners, operators, and crew and United States fish processors that are based in such community" (16 U.S.C. § 1802(17)). Determining which fishing communities are "substantially dependent" on, and "substantially engaged" in, the groundfish fishery can be difficult. In recent amendments to the fishery management plan the council has categorized communities dependent on the groundfish resource into primary and secondary port groups so that community data can be cross-referenced with other demographic information. Descriptions of 24 of the most important communities involved in the multispecies fishery and further descriptions of North East fishing communities in general can be found on North East Fisheries Science Center's website (http://www.nefsc.noaa.gov/read/socialsci/community_profiles/).

Although it is useful to narrow the focus to individual communities in the analysis of fishing dependence there are a number of potential issues with the confidential nature of the information. There are privacy concerns with presenting the data in such a way that proprietary information (landings, revenue, etc.) can be attributed to an individual vessel or a small group of vessels. This is particularly difficult when presenting information on small ports and communities that may only have a small number of vessels and that information can easily be attributed to a particular vessel or individual.

6.5.2.1 Overview of Ports

There were a total of 75 ports where skate were landed in 2014. They include ports from all states in the Northeast Skate Complex management area (ME to VA). Skate bait was landed in 17 ports in 2014 with skate wings landed in 69 ports. This represented an increase in landings and number of ports for the wing fishery on 2013 (66 bait ports), while the bait fishery decreased in terms of landings and number of ports (18 ports in 2013). Chatham and New Bedford dominate skate wing landings, while Point Judith dominates skate bait landings.

Only 30 ports received at least $10,000 in FY 2012 from skate; 14 ports received at least $100,000 per year. New Bedford, MA, Point Judith, RI, and Chatham, MA were the highest grossing ports. There are 43 ports that landed at least 10,000 lbs of skate. As expected the top ports in landings were Point Judith, Chatham and New Bedford.

Table 30 outlines commercial landings of skates by individual states from FY2010 – FY2014. Massachusetts and Rhode Island continue to dominate the skate fishery. Skate landings fluctuate by year in both fisheries. Skate bait was landed primarily in Point Judith, Newport, Fall River, and New Bedford. Point Judith’s landings have accounted for 52-69% of bait landings between 2010 and 2014. Point Judith landings have increased somewhat in recent years, while landings in Newport, Fall River, and New Bedford have decreased. Other ports such as Montauk have individual vessels which sell skate directly to lobster and other pot fishermen for bait, though there are no major skate bait dealers here. Bait skate is primarily landed by trawlers, often as a secondary species while targeting monkfish or groundfish. Since 2003, with the implementation of the original Skate FMP, all vessels landing skate must be on a groundfish Day-at-Sea (DAS).

New Bedford is one of the major skate wing or food skate ports. Skate wings are also landed significantly in Chatham, Point Judith, and Barnegat Light. Both trawlers and gillnets catch food skate. Some trawlers target skate, with others catching skate as a bycatch. Most of the gillnet vessels are targeting skate and are based largely in Chatham but also in New Bedford. There is a very small skate wing fleet in Virginia, though it has dramatically declined in recent years. Most of these are monkfish gillnets though some draggers caught skate as a bycatch at the height of the fishery.

Table 30 - Total Skate landings by fishery and state

FY	Disposition	State	Revenue (in $)	Landings (in lbs)
2010	Bait	CT	1,558,923	324,744
		MA	318,938	1,597,765
		MD	934	8,496
		NJ	67,462	516,887
		RI	757,737	7,241,592
		VA	1,871	9,287
	Bait Total		2,705,865	9,698,771
	Food	CT	138,799	257,297
		MA	2,653,140	12,023,762
		MD	52,169	152,001
		ME	4,647	10,012
		NC	5,962	17,361
		NH	2,134	6,966
		NJ	615,459	2,661,722
		NY	527,283	2,125,907
		RI	1,097,133	4,341,377
		VA	99,618	578,910
	Food Total		7,902,209	31,874,086
2011	Bait	CT	5,465	23,990
		MA	299,643	2,478,875
		MD	120	13,270
		NJ	615,259	575,919
		NY	75	227
		RI	796,114	7,766,581
		VA	301	2,300
	Bait Total		1,716,977	10,861,162
	Food	CT	122,699	587,629
		MA	4,121,567	15,921,991
		MD	18,389	96,489
		ME	2,208	7,334
		NC	1,117	4,976
		NH	2,740	9,751
		NJ	798,549	3,651,948
		NY	476,145	2,233,289
		RI	1,696,104	7,043,150
		VA	93,890	510,380
	Food Total		7,333,408	30,066,937
2012	Bait	CT	5,394	23,425
		MA	195,430	1,533,632
		MD	104	10,400
		NJ	326,415	752,578
		NY	62	357

		RI	868,893	8,467,734
		VA	91	905
	Bait Total		1,396,389	10,789,031
	Food	CT	147,345	644,500
		MA	2,932,446	11,788,996
		MD	8,664	23,433
		ME	1,182	3,707
		NC	114	411
		NH	1,592	4,737
		NJ	394,687	1,551,747
		NY	515,501	2,182,001
		RI	1,376,632	5,220,311
		VA	81,920	359,282
	Food Total		5,460,083	21,779,125
2013	Bait	CT	13,265	68,572
		MA	217,023	1,856,490
		MD	619	14,591
		NJ	144,415	998,360
		NY	15	68
		RI	836,709	8,306,442
		VA		
	Bait Total		1,212,046	11,244,523
	Food	CT	171,096	605,048
		MA	3,106,360	9,398,122
		MD	13,835	47,618
		ME	451	651
		NC	6,806	17,766
		NH	13,247	1,030
		NJ	515,258	2,004,837
		NY	515,603	1,889,876
		RI	1,495,381	4,779,463
		VA	113,296	442,659
	Food Total		5,951,333	19,187,070
2014	Bait	CT	56,557	557,668
		MA	11,173	91,007
		MD	402	18,660
		NJ	288,027	780,849
		NY	472	9,186
		RI	793,369	7,929,296
		VA		
	Bait Total		1,150,000	9,386,666
	Food	CT	142,925	493,959
		MA	4,446,038	13,335,943
		MD	9,066	28,237
		ME	201	511
		NC	13,644	46,701

		NH	**37,338**	**47,892**
		NJ	**603,064**	**2,032,391**
		NY	**648,489**	**2,088,751**
		RI	**1,818,667**	**6,026,349**
		VA	**47,316**	**210,670**
	Food Total		**7,766,748**	**24,311,404**

6.5.3 Skate Fishing Areas

Vessels landing bait skate generally fish in the inshore waters of SNE, are most often trawlers, and frequently fish in an exempted fishery (Figure 10).

Vessels landing skates for the wing market generally fish on Georges Bank, in the Great South Channel near Cape Cod, or west of the Nantucket Lightship Area in Southern New England (SNE) waters (Figure 11). Gillnet wing vessels often also fish east of Cape Cod.

Vessels that land skate as a bycatch often fish in Massachusetts Bay and on Georges Bank. Scallop dredges with general category permits often catch skate while fishing in the Great South Channel. There is also a mixed monkfish/skate fishery west of the Nantucket Lightship Area and off northern New Jersey, near Point Pleasant.

Figure 10 - Skate bait landings by statistical area for FY 2014

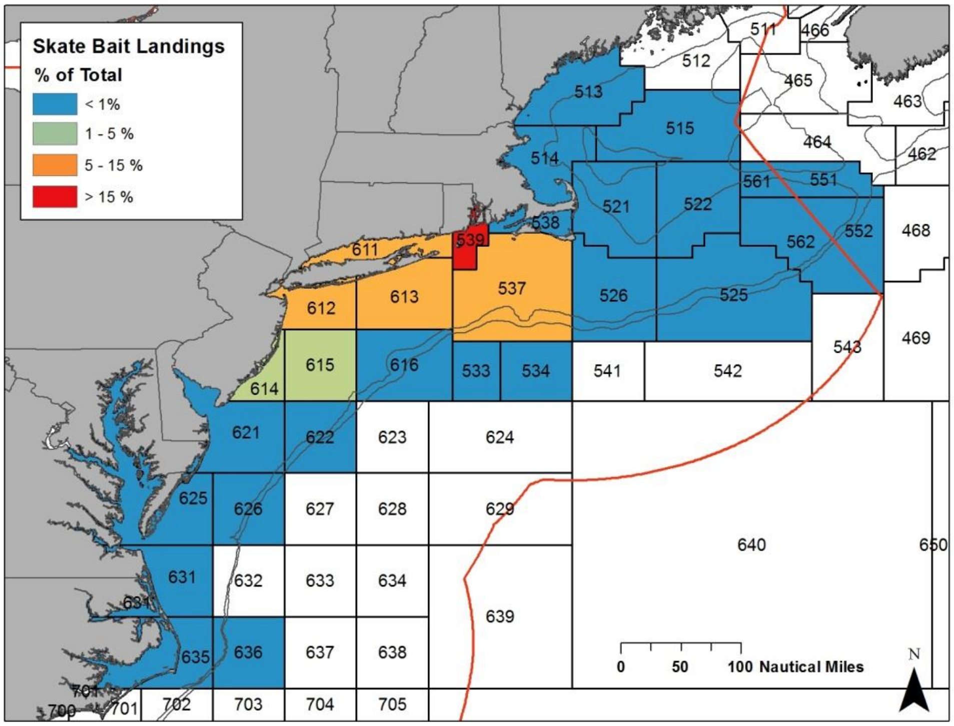
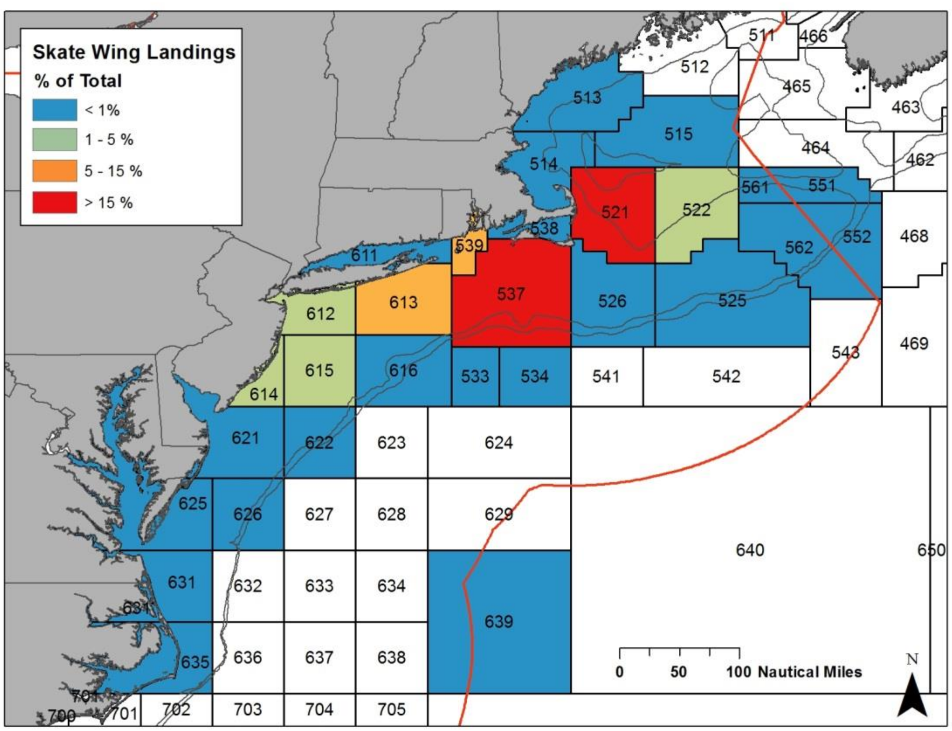


Figure 11 - Skate wing landings by statistical area for FY 2014



7.0 Environmental Consequences of the Alternatives

7.1 Biological Impacts

7.1.1 Updates to Annual Catch Limits

7.1.1.1 Option 1: No Action (ACL= ABC of 35,479 mt, ACT of 26,609 mt, TAL of 16,385 mt, Wing TAL =10,896 mt, Bait TAL 5,489 mt)

The No Action alternative would maintain the ACL specifications as those established in Framework 2 (NEFMC, 2014). This would potentially allow a higher than recommended catch with a slightly higher risk of overfishing than the Preferred Alternative. Barndoor, thorny and smooth skates are in rebuilding plans, but only thorny skate is overfished. Overfishing is no longer occurring on thorny skate, however, the 0.1 kg/tow increase in survey indices in 2014 does not indicate a vast improvement in rebuilding. Allowing a higher ACL than is deemed appropriate by the survey indices (See Option 2, ACL=31,081), could potentially slow the progress in rebuilding of this species. This alternative would not incorporate all of the updated scientific information; it would not utilize the most recent survey indices or revised discard mortality rate estimates for scallop dredge gear. Therefore, the No Action alternative could have a potentially higher risk of minor negative impacts on the skate resource compared to Option 2. However, in recent years, the skate fishery has not achieved this level of catch, so even if this alternative were implemented, the potential negative impacts are unlikely to be realized. If the TALs or ACL were exceeded, the Skate FMP also includes AMs that would apply in subsequent years to reduce the risk of additional overages in landings and catch. Additionally, the ABC control rule for the skate complex is inherently conservative and risk-averse, and has never been exceeded.

The Skate FMP primarily controls skate landings, while deducting projections of anticipated dead skate discards from the ACT. Variability in the skate discard rate, and uncertainty in discard mortality rates is part of the reason why the buffer between the ACL and ACT has been specified at 25%. In some years when dead skate discards have ended up higher than originally projected, the ACT has been exceeded, but never the ACL, minimizing the risk of overfishing. If this alternative was implemented, the TAL may not be achieved and/or some level of discards may be converted to landings as compared to Option 2. Therefore, this alternative does have a slightly higher risk of negatively impacting the stock by potentially allowing higher landings than that suggested by the most recent information described in Option 2. However, overall impacts of this alternative are only expected to be slightly negative and would most likely not result in overfishing.

7.1.1.2 Option 2: Revised Annual Catch Limit Specifications (ACL= ABC of 31,081 mt, ACT of 23,311 mt, TAL of 12,872 mt, Wing TAL =8,560 mt, Bait TAL 4,312 mt) (*Preferred Alternative*)

Option 2 would revise the ACL for the skate complex using the most recent best available science – revised survey indices and discard mortality rate estimates. The revised ACL was calculated using the revised median catch/biomass exploitation ratio (updated with the revised discard mortality rate estimates for scallop dredge gear for little and winter skates) and the most recent 3 year moving average of the relevant NEFSC trawl survey (Table 34). Catches at or below the median catch/biomass exploitation ratio have shown a tendency for biomass to increase more frequently and by a greater amount than catches that were above the median exploitation ratio [see Appendix I of Amendment 3 (NEFMC 2009)].

The biological impacts of the ACL and allocations to discards and catch result mainly from minimizing the risk of overfishing and keeping catches below a level that has been shown in Amendment 3 to produce larger and more frequent increases in skate biomass[15]. Variations in landings and discards may cause catch to exceed the ACT and any overages of the risk-averse ACT will be absorbed by the 25% management uncertainty buffer. Any overage of the TAL greater than 5% will trigger accountability measures, which results in a reduction of the in-season possession limit trigger for the relevant fishery. If the ACL is exceeded then the management uncertainty buffer would be increased by 1% for each 1% ACL overage. Thus it is highly unlikely that skate catches will exceed the ACL. A more detailed review of this analysis is given in Appendix 1, Document 4 of Amendment 3 (NEFMC 2009).

Skates are ubiquitous in most fisheries and are caught by most gear types. A smaller number of trips landed the full wing possession limit, in either season 1 or season 2, indicating a smaller directed fishery (Figure 12 and Figure 13); the majority of landings were below the incidental wing possession limit, suggesting that the incidental fishery takes advantage of the additional revenue from skates. The impact on fisheries is a little uncertain; the wing fishery had not achieved its TAL between FYs 2010 and 2013, however, it achieved 97.3% of the TAL in FY 2014 (Table 31). If the assumption is made that FY2014 is more representative of the current wing fishery, then the reduced ACL may affect fishing (both incidental and directed). The reduced ACL may impact fisheries that also land skate, e.g. monkfish because of the high levels of skates also caught in this fishery. The bait fishery achieved the highest level of its TAL in FY 2010 (98.5%) but has achieved less than 85% in subsequent fishing years suggesting bait fishery operations may not be as negatively impacted by the revised specifications (Table 32).

Table 31 – Landings and percent of TAL achieved in the wing fishery between FY2010 and FY2014

Fishing year	TAL	Landings	Percent of TAL
2010	9209	4330	47
2011	14338	11790	82
2012	15538	10113	65
2013	14338	7981	56
2014	11169	10605	97

Table 32 – Landings and percent of TAL achieved in the bait fishery between FY2010 and FY2014

Fishing year	TAL	Landings	Percent of TAL
2010	4,639	4,571	99
2011	7223	4132	57
2012	7827	5504	70
2013	7223	5596	77
2014	5626	4499	82

The decrease in ACL would be expected to positively impact overall skate biomass based on the relationship between catch and biomass. The decreased ACL would potentially decrease overall skate landings, however, the extent of such a reduction is uncertain as it depends on the ability of the wing fishery to achieve its TAL, which would result in low positive impacts. However, reduced landings may increase discards. Increased discards of targeted skates in the wing fishery would occur if the incidental trip limit was triggered early in the fishing year; once 85% of the wing TAL is achieved in-season, the RA has the discretion, based on projections, to allow fishing to continue or to implement the incidental trip limit. Increased discards would increase the proportion of dead discards, which could have further impacts on the TAL when setting specifications (e.g. discards increased from the 2014-2015

[15] Projections based on analytical models are not available however because the attempted analytical stock assessment models have not been reliable for management (NEFSC 2007b).

specifications, which contributed to lowering the TAL). Recent work on discard mortality rate estimates of winter skate and little skate have resulted in reductions from the assumed discard mortality rate estimates (50%) for scallop dredge gear established in A3 to 34% and 48%, respectively. Total and dead skate discards increased in 2013 and 2014 (Table 33) despite no large changes occurring in the distribution of pounds of skate landed in recent fishing years (Figure 12, Figure 13, Figure 15).

Table 33 – Total and dead skate discards for calendar years 2012 - 2014

Year	Total Discards (mt)	Dead Discards (mt)
2012	36277	10270
2013	42716	12093
2014	42732	12098

A certain level of discarding is expected as landing barndoor, thorny and smooth skate (in the GOM) is currently prohibited. Only if effort shifts away from where these species are found could a change positively impact these species. Therefore we expect a neutral impact on the skate resource, and slightly more positive impacts when compared to the No Action.

Table 34 - Current and proposed 2016-2017 specifications including changes in input parameters: C/B exploitation medians, updated stratified mean biomass in FSV Albatross IV units, and an average mean discard mortality rate weighted by estimated discards by species and fishing gear.

	Current Specifications	**Proposed 2016-2017 Specifications**
	2010-2012 survey; 2010-2012 discards	**2012-2014* survey; 2012-2014 discards**
ACL specifications		
ABC/ACL (mt)	35,479	31,081
ACT (mt)	27,275	23,311
TAL (mt)	18,001	13,216
Assumed state landings	1206	344
Federal TAL	16,795	12,872
Wing TAL	11,169	8,560
Bait TAL	5,626	4,312
C/B medians		
Barndoor	2.64	2.76
Clearnose	3.98	3.35
Little	2.14	2.09
Rosette	2.57	2.51
Smooth	2.80	2.74
Thorny	1.27	1.40
Winter	1.83	1.91
Survey biomass (mean kg/tow)		
Barndoor	1.22	1.62
Clearnose	0.97	0.61
Little	7.11	6.82
Rosette	0.033	0.053
Smooth	0.23	0.22
Thorny	0.18	0.21
Winter	6.68	6.95
Discard rate	34%	43%

* 2015 spring survey index used for little skate

Addendum: The corrected proportion of dead discards in the catch formula estimated the projected dead discards for F Y2016 and 2017 to be 45%. This would not be expected to alter the overall conclusions of the biological impacts analysis conducted for Option 2. The ACL would not be affected, retaining the positive benefits to the stock complex from lowering the ACL, based on the established relationship between catch and biomass. The more accurate estimation of projected dead discards would be expected to further decrease landings, which would have low positive impacts on the skate resource.

7.1.2 Skate Wing Possession Limit Alternatives

7.1.2.1 Option 1: No Action – 2,600 lbs from May 1 to Aug 31; 4,100 lbs from Sept 1 to Apr 30 (*Preferred Alternative*)

The No Action alternative would keep the current possession limits as set in Framework Adjustment 1. An analysis conducted in FW1 indicated that mortality decreased as possession limits decreased. This alternative therefore is expected to have low negative impacts on the skate complex when compared to Option 2 because this option allows a higher possession limit, but more positive impacts when compared to Option 3. In 2010, wing possession limits were set at 5,000 lbs that resulted in a short directed fishery before the 85% TAL trigger was reached resulting in an incidental trip limit of 500 lbs for the remainder of the fishing year. The incidental trip limit, if triggered early in the season, can greatly increase skate discards and could hinder more profitable fishing if a high level of skate is encountered that can't be landed and makes fishing difficult. Therefore the No Action alternative would have positive impacts when compared to Option 3.

The skate specifications methodology was designed to prevent overfishing of the skate complex. Provided the wing fishery does not exceed its TAL, this alternative would not be expected to negatively impact the skate complex. Approximately 97% of the wing TAL set in the in FW2 was achieved in FY2014, revised specifications outlined in Section 4.1.2 represent a reduction of approximately 12% in ABC but approximately a 20% reduction in wing TAL. If FY2014 is more representative of the current fishery, the proposed wing TAL could be exceeded in FY2016 and FY 2017. Option 1 would also be more likely to result in the implementation of the incidental trip limit before the end of the fishing year if more of the TAL is achieved as in FY2014. This would be expected to increase discards and would result in low negative impacts to the skate resource if it increased the risk of exceeding the ACL. Any overages of the risk-averse ACT will be absorbed by the 25% management uncertainty buffer. Any overages of the ACL will trigger accountability measures. Thus, overall, it is highly unlikely that skate catches will exceed the ACL. It is not possible to predict future fishing behavior, which results in a potential range of biological impacts. If a lower amount of the wing TAL was achieved as in FYs2010-2013, Option 1 would have low negative impacts. However, if a higher amount of the wing TAL was achieved as in FY2014, this alternative would have low to moderate negative impacts on the complex.

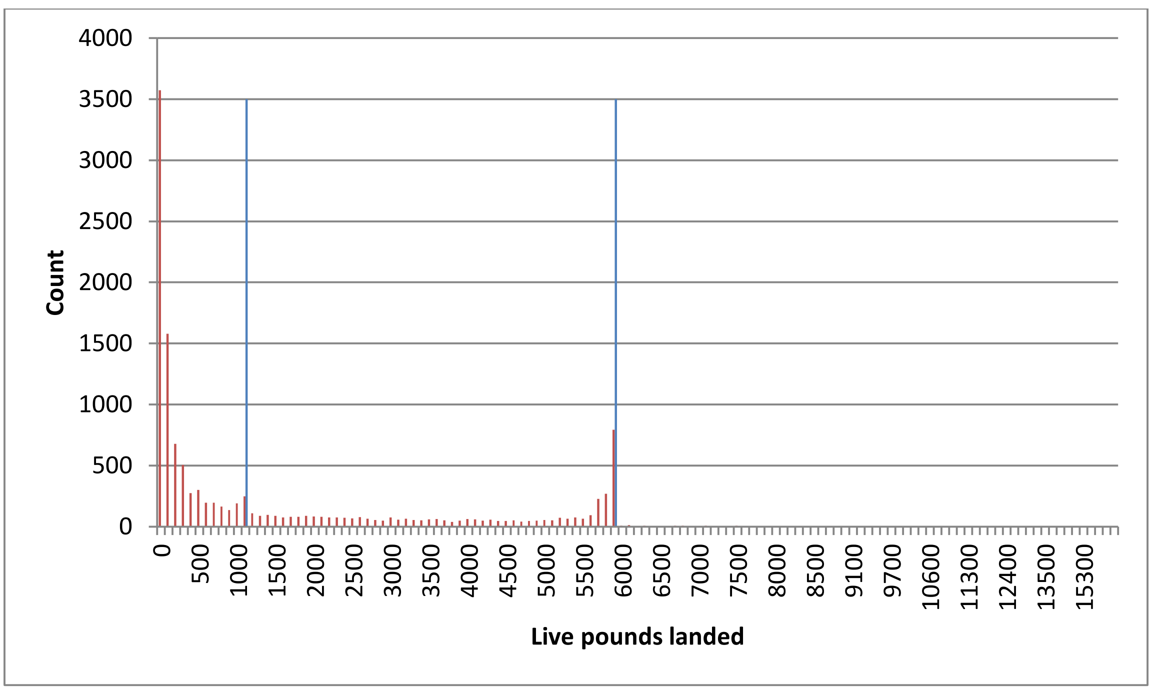
7.1.2.2 Option 2: Revised Skate Wing Possession Limit – 2,000 lbs from May 1 to Aug 31; 3,000 lbs from Sept 1 to Apr 30

Option 2 would reduce the trip limits to a level that would be less likely to trigger the incidental trip limit. The limits were set to prevent overages of the TAL, not reduce overall effort on skate. This measure would reduce directed effort and allow the fishery to be executed for the entire fishing year, however, it is likely to increase discards of skate and not impact overall skate effort. It would be expected to have a positive impact on the complex as skate mortality is expected to decrease with decreasing possession limits (FW1; NEFMC, 2011).

The main biological effect of the skate wing possession limit is on the discard mortality, as a proportion of total catch. With a low possession limit, the fishery may not be able to land the allocated TAL and optimum yield will not be achieved. With a high possession limit, the fishery may reach the 85% TAL trigger early in the season (as it did during FY 2010) and skates will be discarded on trips that target other species and whose catch exceeds the 500 lbs. incidental skate wing limit[16]. In FY2014, 85% of the wing TAL was achieved in February, however, the fishery was not projected to exceed the TAL and the incidental trip limit was not implemented. The TAL trigger results in a 500 lbs trip limit for the remainder of the FY resulting in the closure of the directed skate fishery. This effect may be exacerbated by vessels fishing for skates in state waters in response to the stricter skate regulations in Federal waters and by vessels that target other species in lieu of skates, but continue to discard incidental catches of skates. In order to minimize biological impacts on skates and other species, the skate wing possession limit should be set at a level that will 1) allow the fishery to take the skate wing TAL and 2) will not close the directed skate fishery early. It is also possible that the effects on barndoor, smooth, and thorny skates will be greater if the skate fishery closes early and vessels shift effort onto other species that may have a greater interaction with these skates.

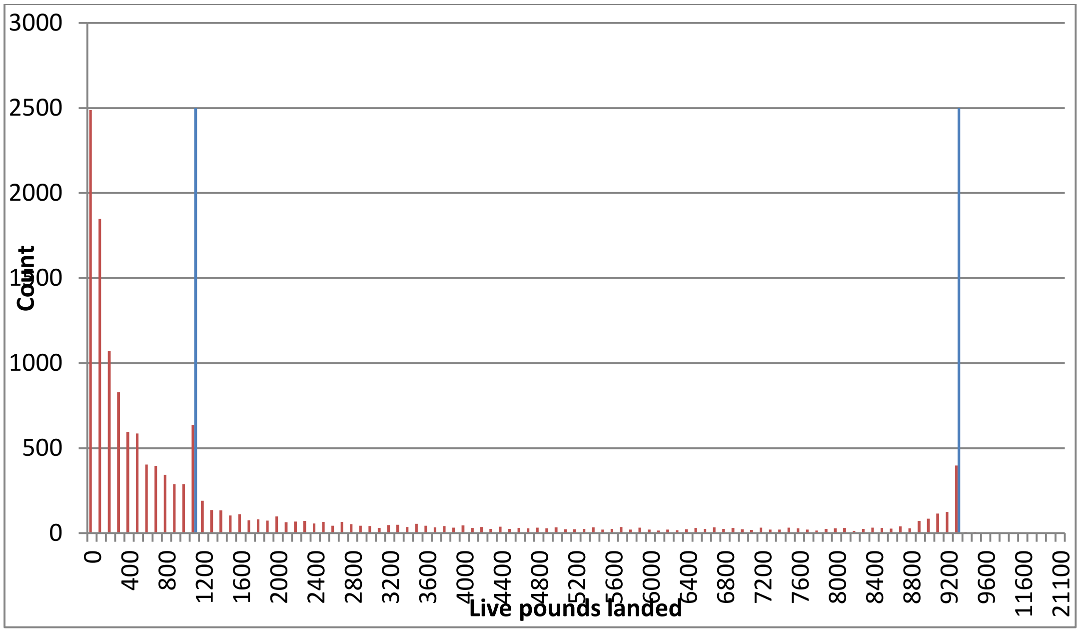
Based on an examination of seasonal wing landings for FY2013 and FY2014 combined, approximately 1,563 trips would have exceeded the proposed trip limits under Option 2, compared to over 9,000 below the season 1 possession limit (Figure 12 and Figure 13). Depending on the level of fishing activity, this alternative may impede the fishery from landing its TAL (FY2010-2013 conditions) or it may reduce the likelihood of the incidental trip limit being implemented before the end of the fishing year (FY2014 conditions).

Figure 12- Frequency of trips landing wings (disposition food) by weight for FY 2013 and FY 2014 in Season 1 (May 1 – August 31)



[16] Framework Adjustment 1 (NEMFC 2011) considered and proposed raising the incidental skate possession limit from 500 to 1,250 lbs. to reduce discards but this measure was disapproved by NMFS.

Figure 13 - Frequency of trips landing wings (disposition food) by weight for FY2013 and FY2014 in Season 2 (Sept 1 - Apr 30)



Examining the relationship between monthly landings and price shows a similar trend in live pounds landed and species value in FY2014 (Figure 14). The fishery landed more skate at the beginning of the fishing year under the lower trip limit. In FY 2014, there could be more vessels landing skates, existing vessels in the skate fishery took more trips, or vessels landed more of their skate catch when targeting other species. The only changes in impacts caused by the first two responses above are economic. The last response (landing more skates that are caught while targeting other species) might not change the amount of skates captured, but fewer skates would be discarded (and, as a result, fewer would as a result survive when the discard mortality is less than 100%). Option 2 would have slightly more positive impacts compared to Option 1and 3 because of decrease possession limits which are expected to decrease mortality.

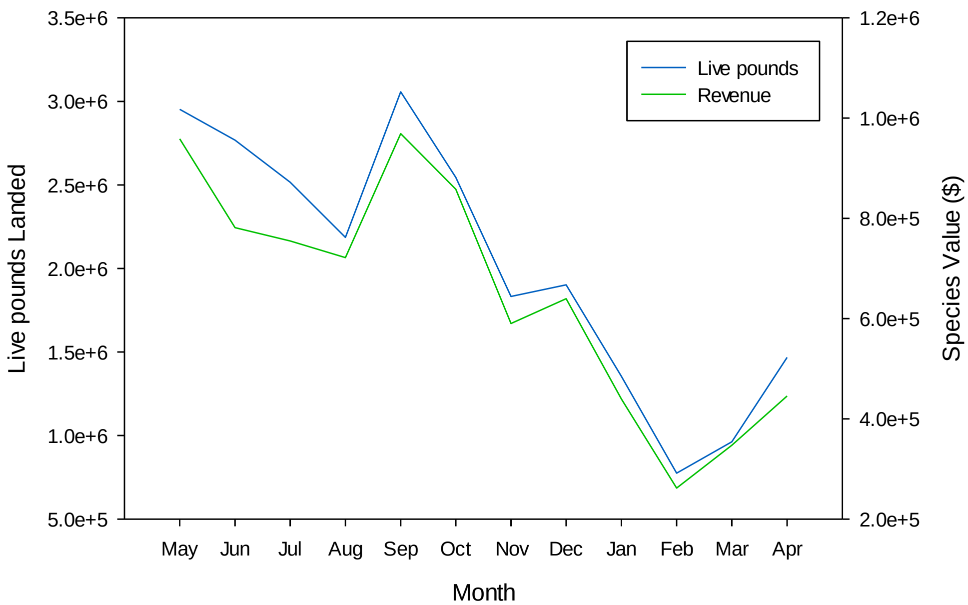


Figure 14 - Relationship of live pounds landed and species value in FY2014

7.1.2.3 Option 3: Revised Skate Wing Possession Limit – 2,500 – 3,000 lbs year round

This Option would result in a single trip limit that was maintained throughout the year. This Option would be expected to have greater negative biological impacts than Option 1 but could have similar negative impacts compared to Option 2, depending on the possession limit selected. This Option would be more likely to result in an overage of the TAL and triggering of the incidental trip limit (Table 39) when compared to behavior in previous fishing years. In 2010, wing possession limits were set at 5,000 lbs year round that resulted in a short directed fishery before the 85% TAL trigger was reached resulting in an incidental trip limit of 500 lbs for the remainder of the fishing year. The incidental trip limit, if triggered early in the season, can greatly increase skate discards and could hinder more profitable fishing if a high level of skate is encountered that can't be landed and makes fishing difficult. The trip limits were designed to prevent an overage of the TAL and not to reduce fishing effort on skate. This Option would not prevent the likelihood of overfishing occurring on a species; after the incidental trip limit was triggered, the level of discarding of skate would increase. The incidental trip limit would reduce directed skate trips but could shift effort onto other species managed under other FMPs. Therefore Option 3 would have a moderate negative impact on the skate resource.

7.1.3 Bait Possession Limit Alternatives

7.1.3.1 Option 1: No Action – 25,000 lbs year round (*Preferred Alternative*)

This alternative would maintain the skate bait possession limit at 25,000 lbs. An analysis conducted in FW1 indicated that mortality decreased as possession limits decreased. This alternative therefore is expected to have low negative impacts on the skate complex when compared to Option 2. However, the skate specifications were designed to prevent overfishing of the complex. The bait fishery has not exceeded its TAL in recent fishing years (Table 32). The frequency of trips landing bait by weight exhibited a more varied distribution than seen in the wing fishery indicating the two fisheries operate differently (Figure 15). Provided the bait fishery does not exceed its TAL, this alternative would have minimal impacts to the skate complex. This alternative would have neutral to low negative impacts on the complex because it would not be expected to allow the skate bait TAL to be exceeded.

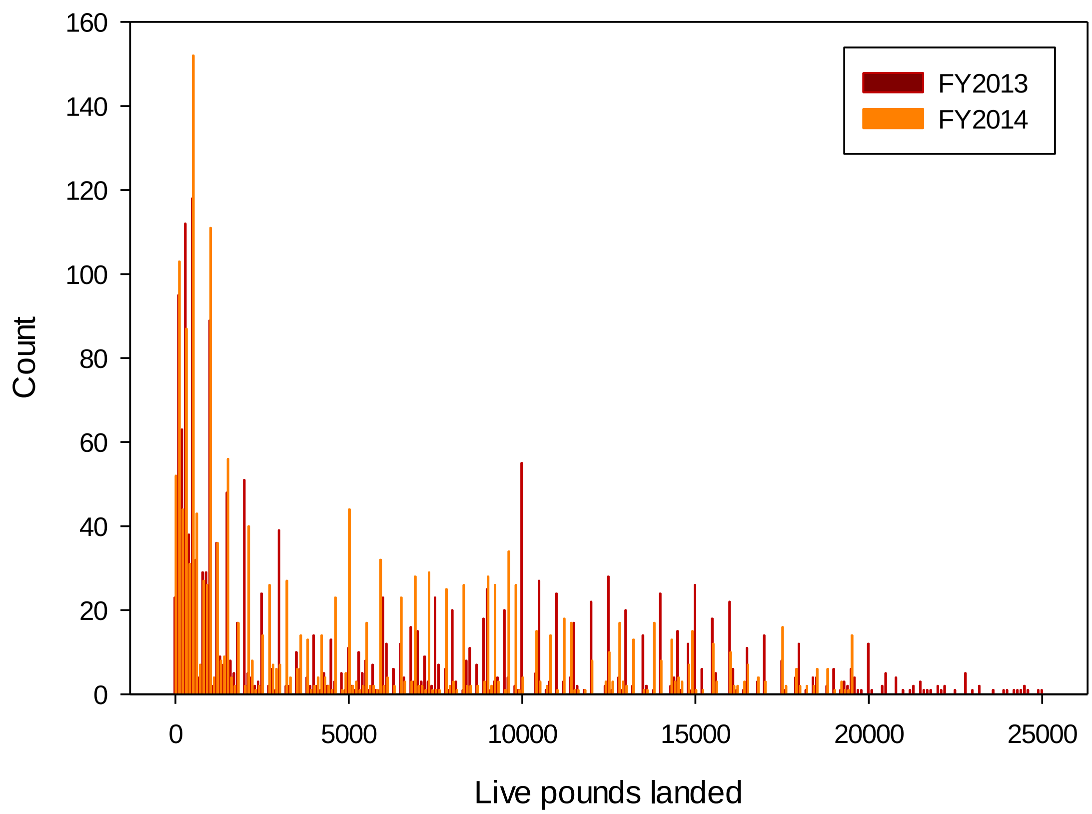


Figure 15 – Frequency of trips landings bait by weight for FY2013 and FY2014

7.1.3.2 Option 2: Revised Skate Bait Possession Limit – 20,000 lbs year round

This Option would reduce the skate bait possession limit to 20,000 lbs. An analysis conducted in FW1 indicated that mortality decreased as possession limits decreased. Because this alternative would reduce the possession limit a small reduction in mortality would be expected. This alternative therefore is expected to have low positive impacts on the skate complex when compared to Option 2. However, the skate specifications were designed to prevent overfishing of the complex. The bait fishery has not exceeded its TAL in recent fishing years. In order to achieve its TAL, the bait fishery may compensate for the reduced possession limit by increasing the number of trips taken, depending on the level of costs associated with extra trips and availability of DAS for more profitable fishing activity. Provided the bait fishery does not exceed its TAL, this alternative is not expected to negatively impact the skate complex. This alternative would have neutral to low positive impacts on the complex because it may cause the skate bait TAL to be underachieved.

7.1.4 Wing Fishery Seasonal Management Alternatives

7.1.5 Option 1: No Action

The No Action alternative would maintain the seasonal structure established in Framework Adjustment 1 for skate wing possession limits. The fishing year would remain divided into two seasons: season 1 (May 1 to Aug 31) and season 2 (Sep 1 to Apr 30). This would maintain the current levels of fishing opportunities for vessels. Therefore no change in fishing effort would be expected under Option 1. Additional risks to species that go above and beyond what has been considered are not expected. Therefore the status quo conditions would not be expected to result in additional takes of species that would jeopardize them.

7.1.6 Option 2: Modification of Wing fishery Seasonal Management (*Preferred Alternative*)

This alternative would create seasonal TALs for the wing fishery consistent with the existing seasonal skate wing possession limits. The first season would be allocated a percentage of the annual wing TAL based on the three year moving average of the most recent 3 fishing years (May through August) (representing 57% or 4,872 mt in 2016 and 2017) for May 1 to August 31. Once 85% of the allocated TAL is reached between May 1 and August 17, the incidental possession limit of 500 lbs would be implemented. Between August 18 and August 31, the Regional Administrator would use discretion as to whether or not the 500 lb incidental possession limit should be implemented. The second season would be allocated the remainder of the annual TAL (representing 43% or 3,681 in 2016 and 2017) for September 1 to April 30. Once 85% of the allocated TAL is reached between September 1 and April 30, the Regional Administrator would have the discretion to implement the incidental possession limit if the fishery is projected to exceed the TAL. The impact of possession limits on fishing effort is unknown as skates are typically landed on trips targeting groundfish, monkfish or scallops. Therefore it is not clear that changing the skate possession limit changes the level of overall fishing effort. There is a fairly consistent trend in monthly landings with higher amounts of live pounds landed occurring in the summer months, with the lowest live pounds landed typically occurring in February (Figure 16). Figure 17 shows aggregated landings in live pounds and landed pounds over FY2010 to FY2014 in addition to associated revenues. Option 2 would be expected to affect the timing of fishing more than the amount and location of fishing occurring, unless effort shifted to areas with reduced encounters with skates but this shift would not be expected to move to a different statistical area.

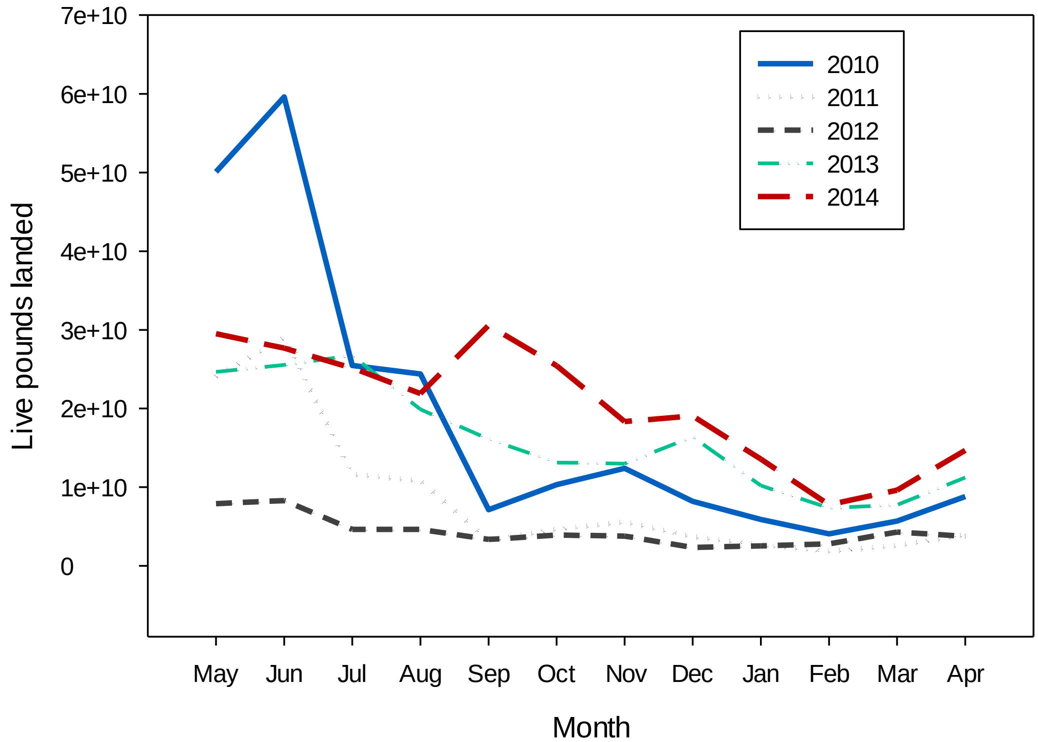


Figure 16 – Monthly landings (live pounds) in the wing fishery (disposition food) for FYs 2010-2014

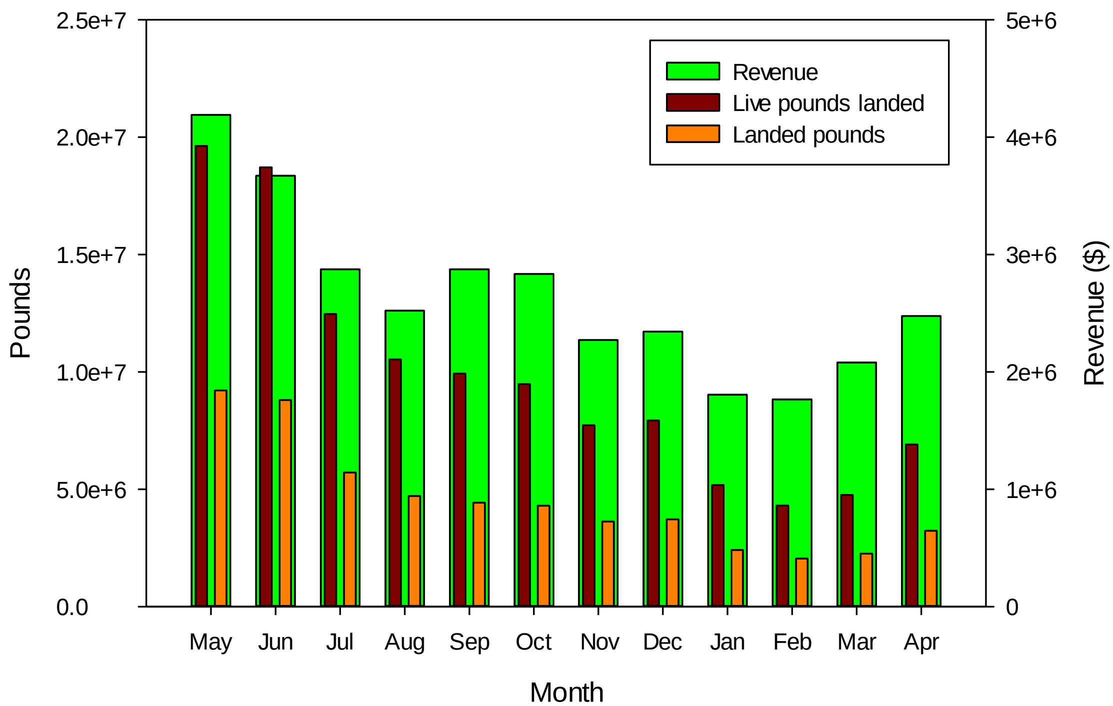


Figure 17 – Total live pounds landed, landed pounds and revenue for the wing fishery (disposition food) for FYs2010-2014

Figure 17 indicates that higher revenues from skate wings (disposition food) typically occur from May until October for FYs 2010-2014. August has typically shown lower revenues over the same time period, however, lowest values were observed in February.

Option 2 would have neutral to low negative impacts on the skate resources as it apportions part of the annual quota to each season; low negative impacts could occur if the incidental trip limit was implemented in either season, which would increase discards.

7.1.7 Option 3: Revised Skate Wing Seasonal Structure

This alternative would create seasonal TALs for the wing fishery consistent with the existing seasonal skate wing possession limits. The first season would be allocated a percentage of the annual wing TAL based on the three year moving average of the most recent 3 fishing years (May through August) (representing 57% or 4,872 mt in 2016 and 2017). Once 85% of the allocated TAL is reached between May 1 and July 17, the incidental possession limit of 500 lbs would be implemented. Between July 18 and July 31, the Regional Administrator would use discretion as to whether or not the 500 lb incidental possession limit should be implemented. Between August 1 and September 15, the incidental possession limit of 500 lbs would be implemented, regardless of whether the in-season trigger point had been reached. The remainder of the fishing year (September 16 – April 30) would be allocated the remainder of the annual TAL (representing 43% or 3,681 in 2016 and 2017). Once 85% of the allocated TAL is reached between September 1 and April 30, the Regional Administrator would have the discretion to implement the incidental possession limit if the fishery is projected to exceed the TAL. The impact of possession limits on fishing effort is unknown as skates are typically landed on trips targeting groundfish, monkfish or scallops. Therefore it is not clear that changing the skate possession limit changes the level of fishing effort. The mandated incidental possession limit would reduce directed fishing effort on skates, which may affect the amount of fishing occurring in that time period. Vessels may shift fishing effort to areas of lower skate density to reduce skate encounters that can be time consuming, however, the shift would not be expected to move to a different statistical area.

Option 3 would have similar impacts to Option 2 with regards to the seasonal apportioning of annual TAL and the structure of the in-season triggers. However, Option 3 would also require a mandatory period of incidental trip limit from August to mid-September. Figure 17 shows lower landings occurring in August over the most recent 5 fishing years, this suggests that the overall fishery would be affected by the mandatory incidental trip limit but the impact would be less than if it was to occur earlier in the summer.

The incidental trip limit would affect the skate resource if it increased discards. As discussed under Section 7.1.1.2, increased discards could affect future specifications and would not benefit skates in rebuilding plans. Annual discards were examined for all gear types for 2013 and 2014 (Figure 18); as noted above, discards in these two years were higher than those observed in 2012. Discards between 2013 and 2014 were variable with month. Focusing on the period of mandatory incidental trip limit, August and September had moderate levels of overall discards, compared to the rest of the year. Magnitude of discards varies with gear type, suggesting that a FMP wide application of this may have differing impacts on discards. Discards attributed to otter trawl gear dominate overall discards. Discards attributed to longline gear are relatively low, however, in 2013 discards peaked in September in this gear type (Figure 19). Discards attributed to otter trawl gear represent the largest contribution to discards and show a peak in discards in mid-summer and late fall (Figure 20). Overall discards attributed to gillnet gear were relatively low (Figure 21) in 2013 and 2014. The data do show discards in August and September to be relatively low. Discards from scallop dredge gear were the second highest contributors to total discards but showed different patterns between 2013 and 2014 (Figure 22).

The number of trips occurring each month indicates that a relatively high number of trips are still occurring in August and September over the last 5 fishing years (Figure 23). The annual breakdown of trips by individual fishing year shows a similar annual pattern but also suggests that the overall number of trips may have decreased in FY2013 and FY2014, at a time when discards increased (Figure 24).

Option 3 would have neutral to low negative impacts on the skate resources as it apportions part of the annual quota to each season and has a trigger in each season for the incidental trip limit; low negative impacts would occur if the incidental trip limit increased overall discards from August 1 to September 15.

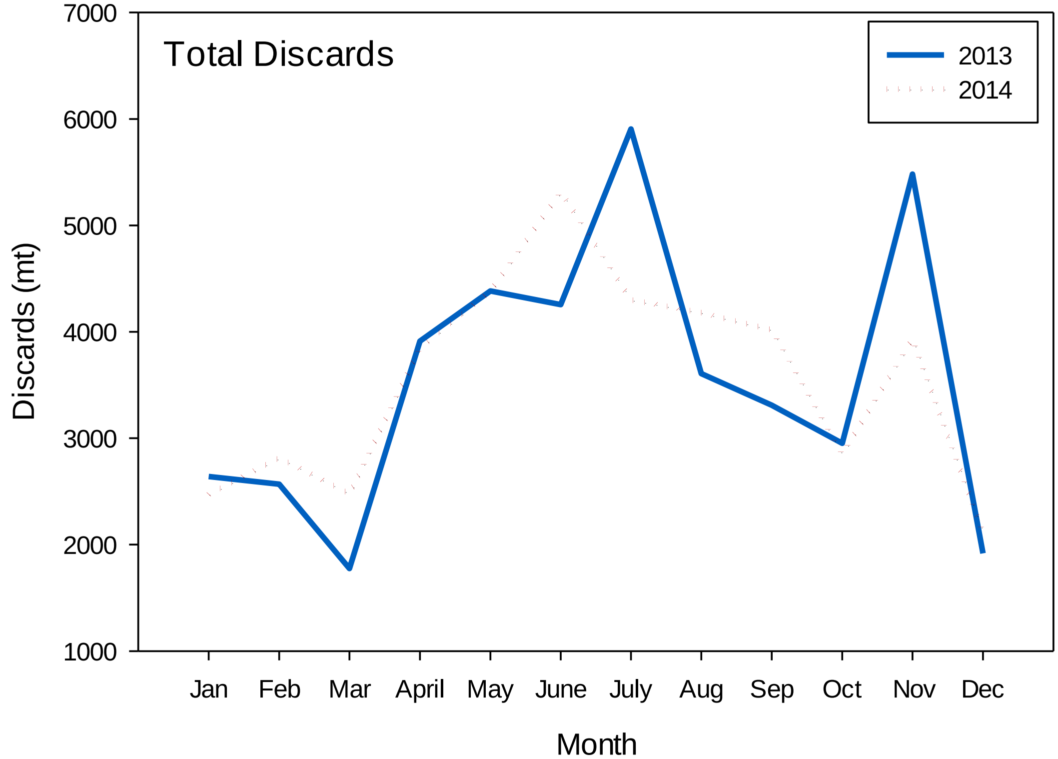


Figure 18 -Total skate discards (in mt) for calendar years 2013 and 2014

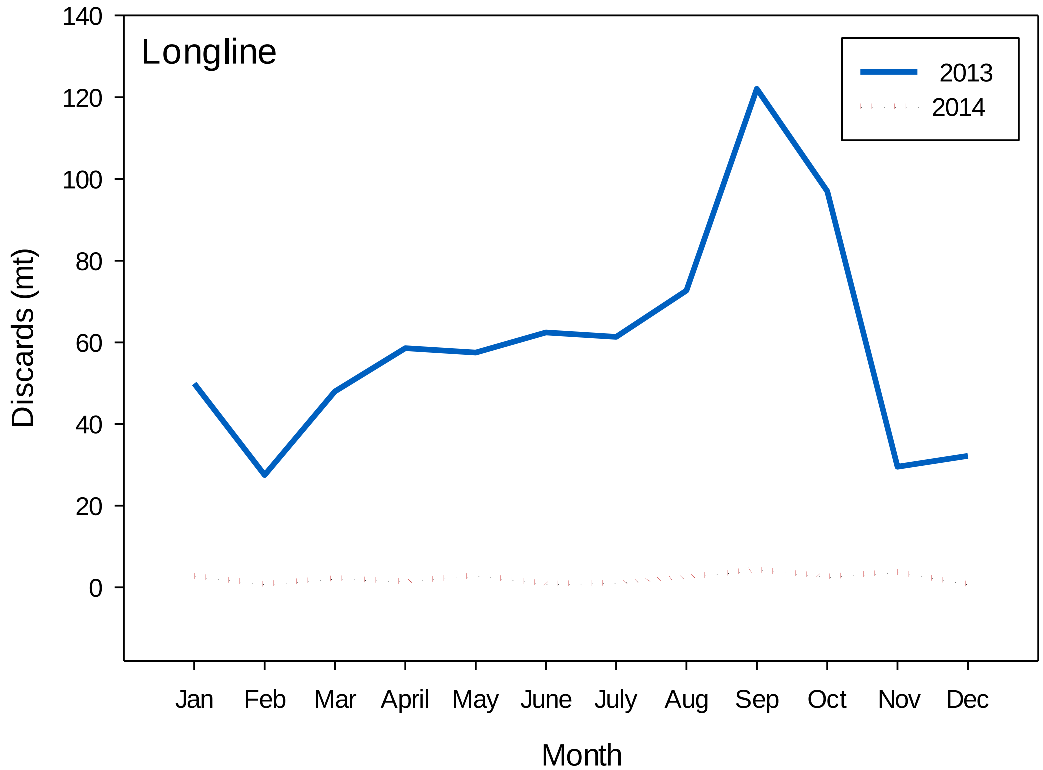


Figure 19 - Longline skate discards (in mt) for calendar years 2013 and 2014

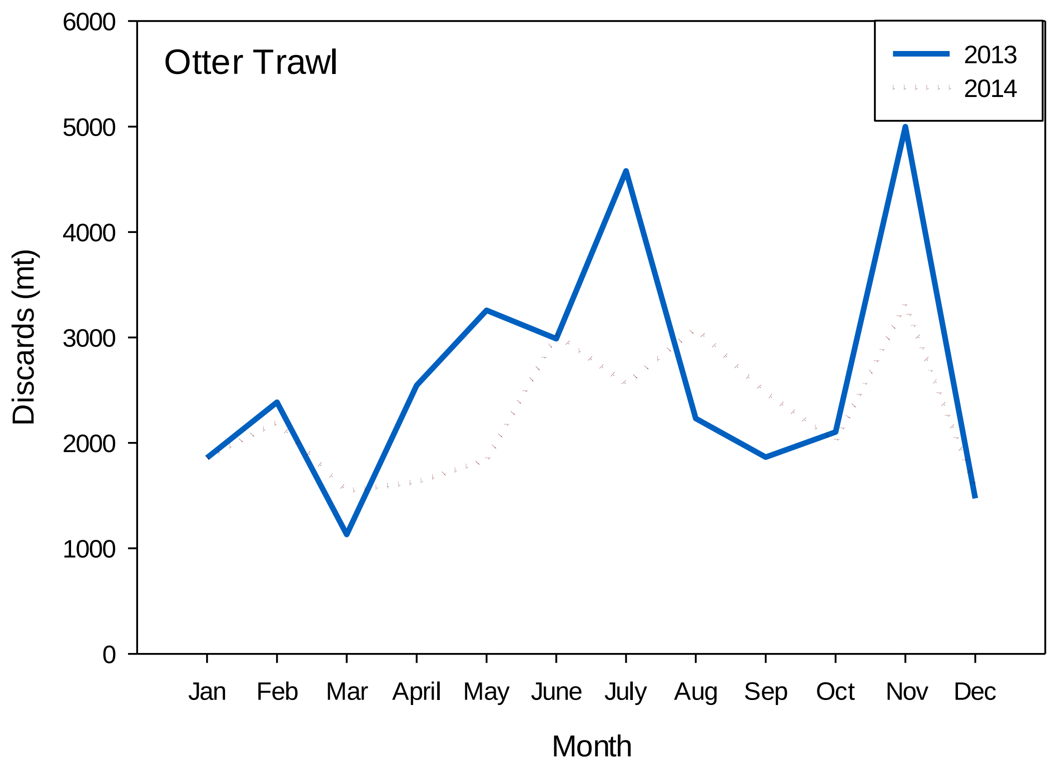


Figure 20 - Otter trawl skate discards (in mt) for calendar years 2013 and 2014

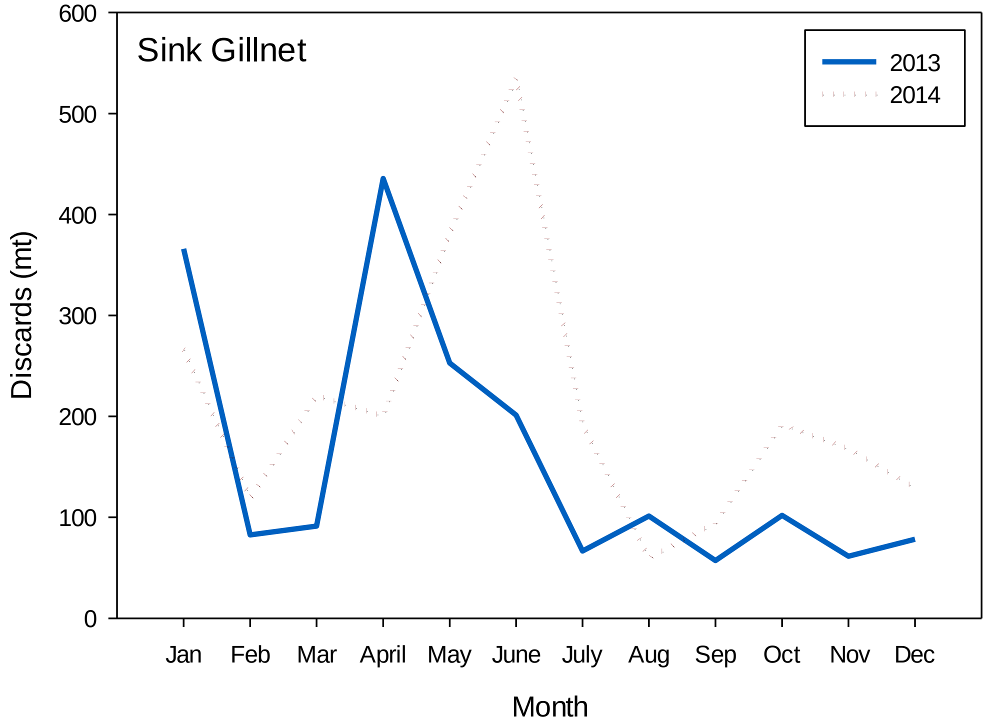


Figure 21 - Sink Gillnet skate discards (in mt) for calendar years 2013 and 2014

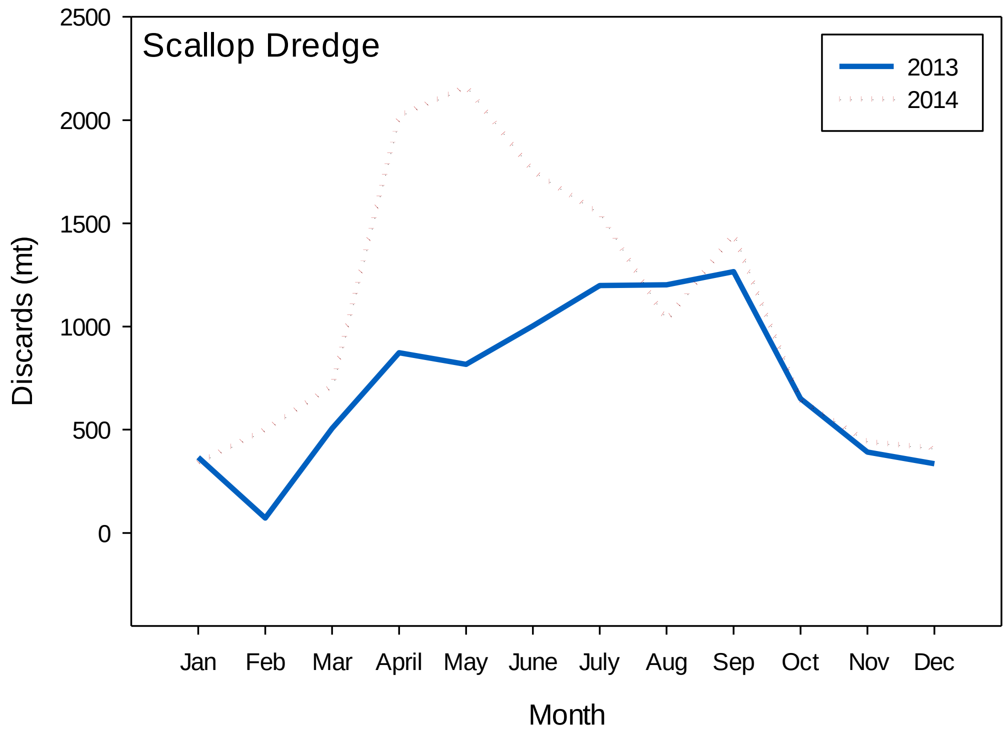


Figure 22 - Scallop dredge skate discards (in mt) for calendar years 2013 and 2014

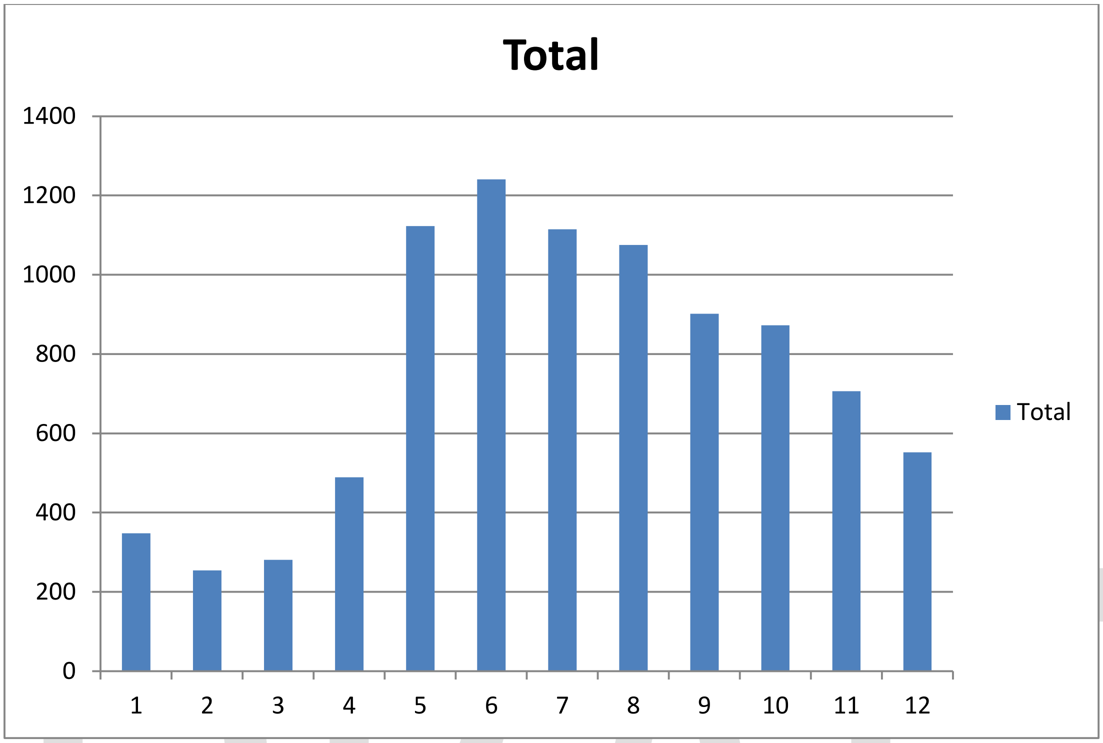


Figure 23 - Count of trips by month for FYs 2010-2014

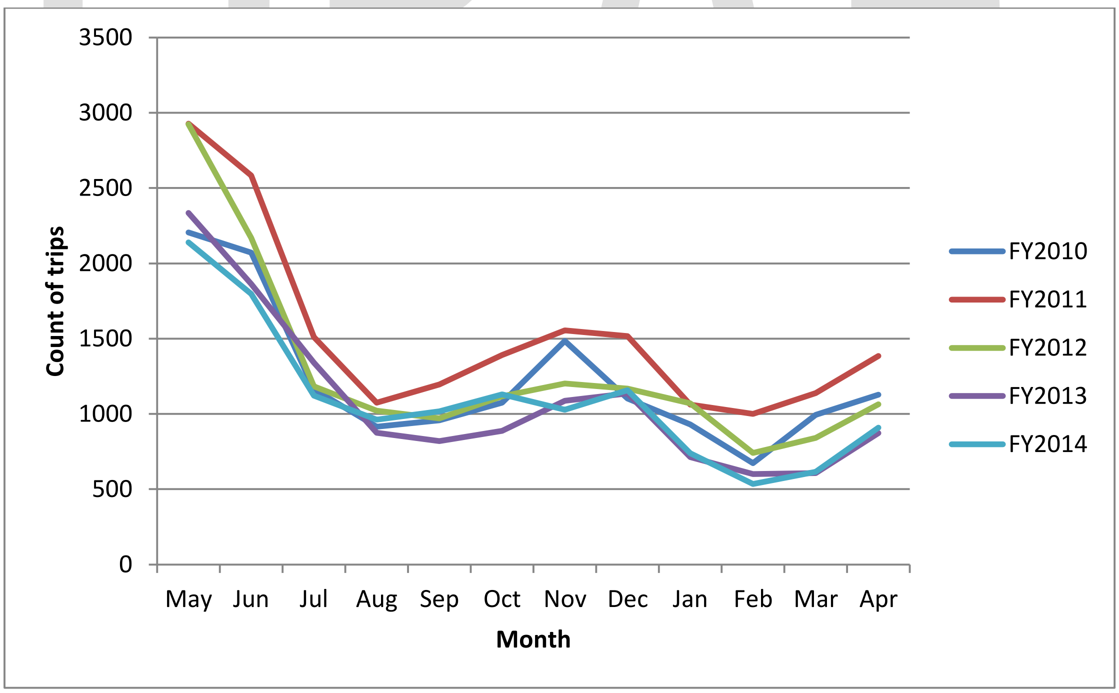


Figure 24 - Count of trips in the wing fishery (disposition food) by FY

7.2 Biological Impact on non-target species and other discarded species

7.2.1 Annual Catch Limit Alternatives

The skate wing fishery is largely an incidental fishery prosecuted during fishing under other FMPs as previously mentioned. Catch of non-skate species on trips landing skates are controlled by the DAS limits, sector rules, or other discard limiting measures in other FMPs. For information regarding recent limits in other fisheries, please refer to the discussion of cumulative effects (Section 7.7). On the small portion of trips where skates are directly targeted, common non-target species include monkfish and spiny dogfish.

Vessels that target skates in lieu of other fish while on a DAS are likely to catch and possibly discard lower amounts of other species. Because these discards are controlled by measures in other fisheries, the impacts to non-skate species from annual catch limit alternatives are negligible above those already analyzed for actions in the other FMPs.

7.2.2 Skate Wing Possession Limit Alternatives

The Skate FMP requires that all vessels landing skates on a DAS trip comply with the wing possession limit; any non-DAS trip has an incidental trip limit of 500 lbs of skate wing. If fishing effort is similar to FY2014, higher trip limits would be more likely to trigger the incidental trip limit. The incidental trip limit would result in less fishing for skates and possibly increased targeting of other species to make up the difference in skate landings and revenue. Because the catch of the other species, including landings and discards, are accounted for under other FMPs, the wing possession limit alternatives are expected to have negligible impacts to non-skate species above those already analyzed for actions in the other FMPs.

7.2.3 Bait Possession Limit Alternatives

The Skate FMP requires that all vessels landing whole skates in quantities approaching 25,000 lbs a Letter of Authorization is required. Analysis of the frequency of trips landing bait by weight for fishing effort in FYs 2013 and 2014 indicated a wide range of landings occurring. The bait fishery is a directed fishery that fishes more on an order by order basis. Because the of the directed nature of this fishery, the bait possession limit alternatives are expected to have negligible impacts to non-skate species above those already analyzed for actions in the other FMPs.

7.2.4 Wing Fishery Seasonal Management Alternatives

This alternative is expected to alter timing of fishing more than fishing behavior and therefore would not be expected to have any great impact on non-target species beyond that analyzed under Section 7.2.2.

7.3 Essential Fish Habitat (EFH) Impacts

7.3.1 Updates to Annual Catch Limits

7.3.1.1 Option 1: No Action (ACL= ABC of 35,479 mt, ACT of 26,609 mt, TAL of 16,385 mt, Wing TAL =10,896 mt, Bait TAL 5,489 mt)

Option 1 would maintain current specification levels from FYs 2014 and 2015 for FYs 2016 and 2017.

- The aggregate skate ABC/ACL would stay at 35,479 mt.
- The ACT would stay at 27,275 mt.
- The TAL would stay at 18,001 mt.

The TAL is allocated amongst the bait and wing fisheries. Each fishery has its own possession limit. By regulation, the wing fishery can only land clearnose and winter skates as they are above the preferred market size (little skates are too small) and are not prohibited from possession like barndoor, thorny, or smooth skates. Winter skates constitute the bulk of the catch. The bait fishery is also prohibited from possessing or landing barndoor, thorny, and smooth skates, and generally prefers to take smaller animals, i.e. little skates and juvenile winter skates. In FYs 2013 and 2014, the fishery did not reach either the bait TAL or the wing TAL, but 2014 landings closely approached the wing limit (Table 35).

EFH impacts are related to the amount and location of fishing effort, and the gear type used. Skates are caught using both gillnets and bottom trawls. Gillnets have a much smaller footprint overall than otter trawls because they are a fixed gear, and the quality of the per unit area impact is also lower (Stevenson *et al*. 2004, NEFMC 2011[17]). In addition, EFH for northeast skate species was determined to have a low vulnerability to sink gillnet gear (Stevenson *et al*. 2004). Combining these two findings, the gillnet component of the skate fishery is not causing adverse effects to EFH. Bottom otter trawls, on the other hand, have a relatively large area swept footprint and also a larger per unit area impact (Stevenson et al. 2004, NEFMC 2011). Bottom trawl per unit area impact aggregated over this larger footprint causes adverse effects to EFH. Because the skate fishery is largely an incidental fishery, measures that affect fishing effort in fisheries such as NE multispecies and monkfish may influence EFH impacts attributed to the skate fishery.

Option 1 would produce minor negative impacts to the EFH resource as effort is largely controlled by regulations in other fisheries, but the magnitude of impacts is not expected to differ from the status quo. Option 1 may have low negative impacts on EFH compared to Option 2 as fishing effort would not be reduced under this Option.

Table 35 – Catch relative to TAL in FY 2013 and 2014

	2013		2014	
	Specification Amount	Catch/Landings (mt)	Specification Amount	Catch/Landings
TAL (Bait + Wing)	21,561	13,577	16,385	16,251
TAL Bait	7,223	5,596	5,849	4,499

[17] New England Fishery Management Council (2011). The Swept Area Seabed Impact (SASI) approach: a tool for analyzing the effects of fishing on Essential Fish Habitat. 257pp. Available online at www.nefmc.org/library/omnibus-habitat-amendment-2.

TAL Wings	14,338	7,981	10,896	10,605

7.3.1.2 Option 2: Revised Annual Catch Limit Specifications (ACL= ABC of 31,081 mt, ACT of 23,311 mt, TAL of 12,872 mt, Wing TAL =8,560 mt, Bait TAL 4,312 mt) (*Preferred Alternative*)

Option 2 would adjust skate specifications for fishing years 2016-2017 as follows:

- The aggregate skate ABC/ACL would decrease from 35,479 to **31,081** mt.
- The ACT would likewise decrease from 27,275 to **23,311** mt.
- The TAL would decrease from 18,001 to **12,872** mt. (8,560 wing, 4,312 bait)

The lower Option 2 TALs are similar to the landings in 2013, as shown in Table 35, however, landings in 2014 exceeded the Option 2 wing TAL and were similar to the Option 2 bait TAL. Thus, under Option 2, catch and effort in the wing fishery is expected to decline relative to Option 1/No Action, and therefore the adverse impacts of Option 2 are lower than the impacts associated with Option 1.

Addendum: The corrected proportion of dead discards in the catch formula would further lower the TAL, while not affecting the aggregate skate ABC. This would not be expected to affect the overall conclusions of the completed Essential Fish Habitat impacts analysis. The further reduction in allowable landings would further decrease catch and effort in the wing and bait fisheries. This would be expected to have more positive effects on EFH when compared to Option 1.

7.3.2 Skate Wing Possession Limit Alternatives

7.3.2.1 Option 1: No Action – 2,600 lbs from May 1 to Aug 31; 4,200 lbs from Sept 1 to Apr 30 (*Preferred Alternative*)

Option 1 would maintain the Framework Adjustment 1 skate wing possession limits of **2,600** lbs. from May 1 to Aug 31 and **4,100** lbs. from Sep 1 to Apr 30, or until the 85% TAL trigger has been met and it appears that without adjustment the fishery would exceed the annual TAL. Reaching the 85% trigger may lead to an incidental limit of 500 lbs, if such a limit is deemed necessary by the Regional Administrator to prevent overage of the TAL. This alternative does not alter the 85% trigger. Under the Option 1/No Action possession limits, especially in combination with the lower Option 2 specifications, it is expected that the 85% trigger may be reached earlier, such that the fishery may not remain open throughout the year for directed trips. However, effort and therefore impacts are capped by the overall TAL, and total impact on EFH is controlled by fishing effort in the multispecies and monkfish fisheries, where the vast majority of skate landings are derived. Thus, this alternative may affect the seasonality of fishing activity, frontloading effort into the early part of the fishing year, but not the overall magnitude of effort and impacts to EFH. Fish use habitats differently for shelter or feeding as they grow, such that fishing activities conducted in one season may have less impact on a particular individual than activities occurring at another time of year. However, considering the diversity of managed species that occupy habitats within the footprint of the skate fishery, it is uncertain whether a more summer-oriented fishery vs. a more year round fishery would have positive or negative benefits overall on fish habitat usage, and overall impacts of Option 1 on EFH are uncertain.

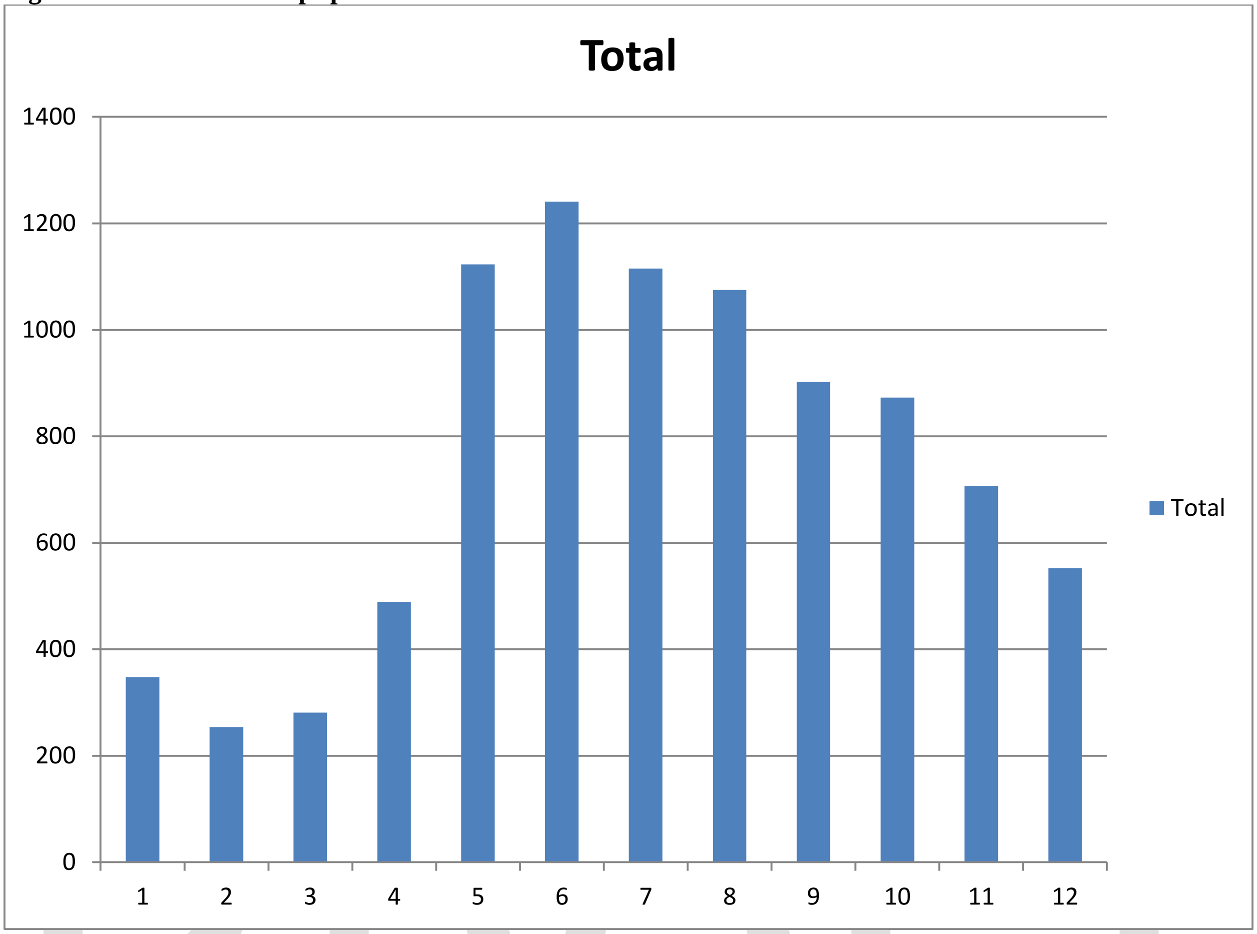
7.3.2.2 Option 2: Revised Skate Wing Possession Limits – 2,000 lbs from May 1 to Aug 31; 3,000 lbs from Sept 1 to Apr 30

Option 2 would decrease the wing possession limits to 2,000 lbs. (May 1 to Aug 31) and 3,000 lbs. (Sep 1 to Apr 30). This change in possession limit could affect the fishery's ability to achieve the wing TAL, could redistribute effort seasonally, or both. Although vessels do not hit the possession limit on every trip (Figure 12 and Figure 13), the lower limits could decrease landings in the wing fishery (which would likely happen under the lower Option 2 wing TAL specification regardless of the possession limit option selected). The potential for lower wing landings overall can be inferred from the fact that roughly 1,500 of the FY 2013 and FY 2013 wing trips would have been above the limits suggested in this alternative (Section 7.1.2.2). If effort in the wing fishery declines, impacts to EFH would likely decline for this option relative to Option1/No Action limits. In addition to lower wing effort overall under this option, it is expected that the lower possession limits will allow the fishery to operate across a longer season before the incidental limit is triggered. Thus, it is possible that the overall magnitude of effort and EFH impacts may be similar, just redistributed more evenly throughout the fishing year. As noted under Option 1 above, there could be habitat usage implications associated with seasonal shifts in effort, but the positive or negative implications of these seasonal shifts are difficult to evaluate and will probably vary by managed species. Combining potential reductions in wing fishery effort with seasonal shifts, it is expected that Option 2 will have slightly positive to neutral impacts on EFH relative to Option 1/No Action. As stated previously, under any of these options, overall EFH impacts are influenced by effort in the multispecies and monkfish fisheries.

7.3.2.3 Option 3: Revised Skate Wing Possession Limit – 2,500 - 3,000 lbs year round

Option 3 would change the possession limit to 2,500 to 3,000 lbs. year round. Given a fixed TAL and similar number of trips, higher catches per trip could trigger the 85% TAL limit earlier in the year, thus shifting fishing effort earlier into the fishing year relative to Option 1/No Action (see discussion of this in the biological impacts section 7.1). The higher the possession limit, the more likely the incidental possession limit would be triggered earlier in the fishing year. There is precedent for such a pattern, as the 85% TAL trigger was reached earlier in FY 2010 when the possession limit was higher (5,000 lbs). Higher trips limits could also reduce discards, and could lead to more efficient harvest of the TAL. For example, discards in 2012 were approximately 36,000 mt, and discards in the most recent completed fishing years were roughly 42,000 mt under lower trip limits. Less fishing time would reduce impacts to EFH. Overall, in terms of EFH impacts, Option 3 probably has neutral to slightly positive impacts relative to Option 1/No Action, although those impacts may be distributed differently throughout the year, and neutral impacts relative to Option 2, which could have lower landings overall, but a greater number of trips due to the lower possession limit. To the extent that catch rates for large winter skate vary seasonally, it may be more efficient to target these skates during particular times of year. Given a fixed TAL, more efficient fishing will reduce habitat impacts as compared to less efficient fishing. As noted under Option 1 above, there could be habitat usage implications associated with seasonal shifts in effort, but the positive or negative implications of these seasonal shifts are difficult to evaluate and will probably vary by managed species. In recent years, effort in terms of number of trips has peaked during the early summer (Figure 25), and the higher possession limit would probably reinforce this trend, as compared to the lower Option 3 possession limits which could spread effort more evenly throughout the summer and fall. As stated previously, under any of these options, overall EFH impacts are influenced by effort in the multispecies and monkfish fisheries.

Figure 25 – Number of trips per month between FY 2010-2014



7.3.3 Bait Possession Limit Alternatives

7.3.3.1 Option 1: No Action – 25,000 lbs year round (*Preferred Alternative*)

This alternative would maintain the skate bait possession limit at 25,000 lbs. Vessels that obtain a Skate Bait Letter of Authorization would be able to retain up to 25,000 lbs. of whole skates. Option 1 may have low negative impacts on EFH compared to Option 2 as fishing effort would not be reduced under this Option.

7.3.3.2 Option 2: Revised Skate Bait Possession Limit – 20,000 lbs year round

This alternative would reduce the skate bait possession limit from 25,000 lbs. to **20,000** lbs. The lower bait limit would probably decrease effort in the bait fishery, which is largely conducted on an order by order basis. It is possible that if orders remain high an increased number of trips might be necessary, however, per-trip costs incurred by fishing may limit potential increases. Thus, impacts to EFH would likely decline under these lower limits relative to No Action limits. Option 2 would have low positive impacts on EFH compared to Option 1 as fishing effort would likely be reduced under this Option.

7.3.4 Wing Fishery Seasonal Management Alternatives

7.3.5 Option 1: No Action, No Seasonal Sub-division of TALs

The No Action alternative would maintain the seasonal structure established in Framework Adjustment 1 for skate wing possession limits. The fishing year would remain divided into two seasons: season 1 (May 1 to Aug 31) and season 2 (Sep 1 to Apr 30) with possession limits specific to each, but no limit on the percent of the TAL that could be harvested in the first season. Setting aside possible changes in the wing TAL or possession limits, seasonal patterns in effort, and therefore in habitat impacts, would be expected to remain similar to what is currently observed. Therefore, Option 1 would have neutral impacts on EFH.

7.3.6 Option 2: Modification of Wing fishery Seasonal Management (*Preferred Alternative*)

This alternative would create seasonal TALs for the wing fishery consistent with the existing seasonal skate wing possession limits. The first season would be allocated a percentage of the annual wing TAL based on the three year moving average of the most recent 3 fishing years (May through August) (representing 57% or 4,872 mt in 2016 and 2017) for May 1 to August 31. Once 85% of the allocated TAL is reached between May 1 and August 17, the incidental possession limit of 500 lbs would be implemented. Between August 18 and August 31, the Regional Administrator would use discretion as to whether or not the 500 lb incidental possession limit should be implemented. The second season would be allocated the remainder of the annual TAL (representing 43% or 3,681 in 2016 and 2017) for September 1 to April 30. Once 85% of the allocated TAL is reached, the Regional Administrator would have the discretion to implement the incidental possession limit if the fishery is projected to exceed the TAL. Option 2 would be expected to affect the timing of fishing more than the amount of fishing. Therefore, Option 2 would not be expected to result in additional impacts on EFH relative to Option 1/No Action. As noted above, there could be habitat usage implications associated with seasonal shifts in effort, but the positive or negative implications of these seasonal shifts are difficult to evaluate and will probably vary by managed species.

7.3.7 Option 3: Revised Skate Wing Seasonal Structure

This alternative would create seasonal TALs for the wing fishery consistent with the existing seasonal skate wing possession limits. The first season would be allocated a percentage of the annual wing TAL based on the three year moving average of the most recent 3 fishing years (May through August) (representing 57% or 4,872 mt in 2016 and 2017). Once 85% of the allocated TAL is reached between May 1 and July 17, the incidental possession limit of 500 lbs would be implemented. Between July 18 and July 31, the Regional Administrator would use discretion as to whether or not the 500 lb incidental possession limit should be implemented. Between August 1 and September 15, the incidental possession limit of 500 lbs would be implemented, regardless of whether the in-season trigger point had been reached. The remainder of the fishing year (September 16 – April 30) would be allocated the remainder of the annual TAL (representing 43% or 3,681 in 2016 and 2017). Once 85% of the allocated TAL is reached, the Regional Administrator would have the discretion to implement the incidental possession limit if the fishery is projected to exceed the TAL. The mandated incidental possession limit during August and September would reduce directed fishing effort on skates during that time period, which may affect the amount of fishing occurring in that time period. Vessels may shift fishing effort to areas of lower skate density to reduce skate encounters that could be costly/time consuming if the skates would be discarded. Overall, Option 2 would be expected to affect the timing of fishing more than the amount of fishing. Therefore, Option 3 would not be expected to result in additional impacts on EFH relative to Option 1/No Action. The August/September incidental limit could lead to larger changes in the seasonal distribution of effort as compared to Option 2, but this six week period is already a time of lower effort in the gillnet fishery, so the regulation could simply be reinforcing existing patterns of effort. As noted above, there could be habitat usage implications associated with seasonal shifts in effort, but the positive or negative implications of these seasonal shifts are difficult to evaluate and will probably vary by managed species.

7.4 Impacts on Endangered and Other Protected Species (ESA, MMPA)

The protected resources that may be impacted by interactions with fishing gear used to catch skates are identified in Section 6.2**Error! Reference source not found.**.

7.4.1 Updates to Annual Catch Limits

7.4.1.1 Option 1: No Action (ACL= ABC of 35,479 mt, ACT of 26,609 mt, TAL of 16,385 mt, Wing TAL =10,896 mt, Bait TAL 5,489 mt)

The No Action alternative would maintain the ACL limits as those established in Framework 2 (NEFMC, 2014). As a result, fishing behavior would remain similar to current operating conditions (e.g., no spatial or temporal shifts in effort; no changes in gear type, quantity, or relative soak/tow time).

MMPA Protected Species Impacts

Impacts of the No Action on marine mammals (i.e., species of cetaceans and pinnipeds) are somewhat uncertain as quantitative analysis has not been performed. However, we have considered, to the best of our ability, available information on marine mammal interactions with commercial fisheries, including the skate fishery over the last 5 or more years (Waring *et al*. 2014, Waring et al. 2015, NEFOP/ASM observer site). Aside from several large whale species (e.g., North Atlantic right, humpback, and fin), harbor porpoise, and several stocks of bottlenose dolphin, there has been no indication that takes of any other marine mammal species in commercial fisheries has exceeded potential biological removal (PBR) thresholds, and therefore, gone above and beyond levels which would result in the inability of each species population to sustain itself (Waring *et al*. 2014, 2015). Although, as noted above, several species of large whales, harbor porpoise and several stocks of bottlenose dolphin have experienced levels of take that have resulted in the exceedance of each species PBR threshold, take reduction plans have been implemented to reduce bycatch in the fisheries affecting these species(Atlantic Large Whale Take Reduction Plan, Harbor Porpoise Take Reduction Plan, and the Bottlenose Dolphin Take Reduction Plan; see affected environment for details); these plans are still in place and are continuing to assist in decreasing bycatch levels for these species. Although the information presented in Waring *et al*. (2014, 2015) is a collective representation of commercial fishery interactions with marine mammals, and does not address the effects of any FMP specifically, the information does demonstrate that fishery operations over the last 5 or more years have not resulted in a collective level of take that threatens the continued existence of marine mammal populations (aside from those species noted above).

In conjunction with the above, additional analysis on the impacts of the operation of fisheries in the northeast region have also been conducted by NMFS, pursuant to section 7 of the ESA, for ESA-listed species of marine mammals. Specifically, in a Biological Opinion issued by NMFS in 2013, it was concluded that the operation of the skate fishery, in addition to seven other FMPs, may affect, but will not jeopardize the continued existence of any ESA listed species of marine mammals. Since issuance of the 2013 Opinion, there has been no indication that these fisheries have changed in any significant manner such that levels of take have gone above and beyond those considered by NMFS in its assessment of fisheries affects to listed species (if they had, NMFS would have re-reinitiated the Opinions). As a result, we do not expect impacts to ESA-listed species of marine mammals under the No Action (i.e., status quo conditions) to be different from those already considered by NMFS (NMFS 2013). Specifically, fishing behavior under the No Action is not expected to introduce any new risks or additional takes to ESA listed species that have not already been considered by NMFS to date. As a result, the No Action is not expected to result in interactions with protected species that are above and beyond levels previously considered by NMFS. Based on this, the No Action, and the resultant fishing behavior under this Alternative, is not, as concluded by NMFS, expected to result in levels of take that would jeopardize the continued existence of ESA listed species of marine mammals.

Based on the above information, and the fact that the skate fishery must comply with specific take reduction plans (i.e., HPTRP, the BDTRP, ALWTRP); and that voluntary measures exist that reduce serious injury and mortality to marine mammal species incidentally caught in trawl fisheries (see the Atlantic Trawl Gear Take Reduction Team), the No Action is expected to have low negative to neutral impacts on marine mammal species. Relative to Option 2, Option 1, which has a higher Annual Catch Limits than Option 2, may result in more negative impacts to marine mammals as higher allocations may result in increases in fishing effort, which may equate to increased interactions with marine mammals.

ESA Listed Species

Ascertaining the potential impacts of the No Action on ESA-listed species (i.e., certain species of whales, sea turtles, and fish)are difficult and somewhat uncertain, as quantitative analysis has not been performed. However, we have considered, to the best of our ability, how the fishery has operated in regards to listed species since 2013, when NMFS issued a Biological Opinion (Opinion) on the operation of seven commercial fisheries, including the skate FMP, and its impact on ESA listed species (NMFS 2013). The 2013 Opinion concluded that the seven fisheries may affect, but would not jeopardize the continued existence of any ESA listed species. The Opinion included an incidental take statement authorizing the take of specific numbers of ESA listed species of sea turtles, Atlantic salmon, and Atlantic sturgeon [18]. The skate FMP is currently covered by the incidental take statement authorized in NMFS 2013 Opinion.

Since 2013, the specifications for the skate fishery has either increased, decreased, or remained stable; however, fishing behavior over this time period has never resulted in the exceedance of NMFS authorized take of any ESA listed species (NMFS 2013). Therefore, the specifications under *status quo* conditions, and the resultant fishing behavior under these conditions, are not expected to introduce any new risks or additional takes to ESA listed species that have not already been considered and authorized by NMFS to date. As a result, impacts of the No Action on ESA listed species are not expected to be different from those already considered by NMFS (NMFS 2013) and therefore, are not, as concluded by NMFS, expected to result in levels of take that would jeopardize the continued existence of ESA listed species. For these reasons, the *status quo* conditions would likely have low negative impacts on ESA listed species.

Relative to Option 2, Option 1, with slightly higher Annual Catch Limits than Option 2, may result in more negative impacts to ESA listed species as higher allocations may result in increased fishing effort, which may equate to increased interactions with ESA listed species.

7.4.1.2 Option 2: Revised Annual Catch Limit Specifications (ACL= ABC of 31,081 mt, ACT of 23,311 mt, TAL of 12,872 mt, Wing TAL =8,560 mt, Bait TAL 4,312 mt) (*Preferred Alternative*)

Option 2 would revise the ACL for the skate complex; specifically, annual catch limit specifications will be reduced from the 2014-2015 fishing year. The reduction in the ACL may result in less directed fishing effort. Further, since the possession of skates mostly requires vessels to be fishing on a NE Multispecies,

[18] The 2013 Opinion did not authorize take of ESA listed species of whales; however, it assessed interaction risks to these species and based on the best available information, concluded that the summer flounder, scup, and black sea bass fisheries, in addition to the other six FMPs assessed, would not jeopardize the continued existence of any ESA listed species of whales (NMFS 2013).

Scallop, or Monkfish DAS, fishing effort on skates are largely constrained by other FMPs. As a result, fishing effort would not only be restricted by the revised specifications, but also by the above nature of the fishery and the associated AMs that account for any overage of ACLs.

Based on this information, impacts to protected species are not expected to be any greater than those under status quo conditions (see Option 1, Section 7.1.1.1), and in fact, may be less than status quo conditions. Specifically, fishing effort is likely to remain similar to status quo conditions or potentially decrease; the latter potentially equates to less fishing time, and therefore, gear being present in the water for a shorter duration. As protected species (ESA listed and MMPA species) interactions with gear, regardless of listing status, is greatly influenced by the amount of gear, and the duration of time gear is in the water, any decrease in either of these factors will reduce the potential for protected species interactions with gear and therefore, reduce the potential for serious injury or mortality to these species. As a result, Option 2 may have some positive impacts on protected species. Taking this into consideration, while Option 2 is likely to have more of a positive impact on protected species relative to Option 1 (No Action), as interactions may still occur under Option 2, and the reduction in specifications is not significant relative to status quo allocations (Option 1), overall, Option 2 is likely to have low positive to low negative impacts on protected species.

As noted above, relative to Option 1, Option 2 is likely to have a more positive impact on protected species than Option 1 as fishing effort may decrease under this Option and therefore, interactions with protected species also have the potential to decrease.

Addendum: The corrected proportion of dead discards in the catch formula would further lower the TAL, while not affecting the aggregate skate ABC. This would not be expected to affect the overall conclusions of the completed protected resources impacts analysis. The further reduction in allowable landings would further decrease catch and effort in the wing and bait fisheries. This would be expected to have more positive effects on protected resources when compared to Option 1.

7.4.2 Skate Wing Possession Limit Alternative

7.4.2.1 Option 1: No Action – 2,600 lbs from May 1 to Aug 31; 4,100 lbs from Sept 1 to Apr 30 (*Preferred Alternative*)

The No Action alternative would maintain the seasonal wing possession limits as established in FW 1. The impact of possession limits on fishing effort is unknown as skates are typically landed on trips targeting groundfish, monkfish or scallops. The maintenance of the existing possession limits would not allow for an increase in directed fishing effort. Based on this information, impacts on protected species (ESA listed and MMPA species) are expected to be similar to those described in Section 7.4.1.1 (i.e., low negative to neutral).

Relative to Options 2, Option 1 would have more of a negative impact on protected resources. Relative to Option 3, Option 1 would have neutral impacts on protected resources.

7.4.2.2 Revised Skate Wing Possession Limit – 2,000 lbs from May 1 to Aug 31; 3,000 lbs from Sept 1 to Apr 30

Option 2 would reduce the wing possession limit for skates. It is not clear that changing the skate possession limit changes the level of fishing effort as an analysis of the frequency of pounds landed indicates that the majority of trips are landing at or below the incidental possession limit of 500 lbs (Figure 12 and Figure 13). Any trips over the incidental possession limit would be considered to be part of the directed fishery. If however, the reduction in the possession limit reduces directed fishing effort on skates, interactions with protected species could decrease. Vessels may shift fishing effort to areas of lower skate density and potential modify the duration of time gear is set (i.e., decrease soak time) to reduce skate encounters; however, effort shifts would be expected to stay within a statistical area and therefore, would not result in the introduction of new fishing effort into areas not previously exposed to skate fishing. Based on this information, with the potential for effort to be less than, but no greater than current operating conditions, we do not expect this Option to introduce any new risks to protected species that have not already been considered previously (NMFS 2013; Waring et al. 2014, Waring et al. 2015). Further, with the potential for effort, including gear soak time, to decrease, interaction risks to protected species may be reduced under Option 2. As a result, we expect impacts to protected species to be similar to those described in Section 7.1.1.2 (i.e. low positive to low negative).

Relative to Option 1 and 3, Option 2 is expected to have more of a positive impact on protected species as fishing effort may decrease under this Option and therefore, interactions with protected species also have the potential to decrease.

7.4.2.3 Option 3: Revised Skate Wing Possession Limit – 2,500 to 3,000 lbs year round

Option 3 would raise the wing trip limit to 2,500 to 3,000 lbs which is projected to trigger the incidental trip limit before the end of the fishing year. This Option removes the seasonal trip limits currently used in the fishery, and instead, implements a year round wing trip limit of 2,500 to 3,000 lbs; this trip limit would be constant throughout the fishing year. Should this option be implemented, the skate fishery is likely to be shut down before the end of the fishing year as there is no seasonality to the trip limits, the latter of which help to reduce the likelihood that the incidental trip limit will be triggered. Specifically, over the last several years, analysis of the frequency of pounds landed under seasonal trip limits indicate that the majority of trips are landing at or below the incidental possession limit of 500 lbs (i.e., below 85%TAL). However, under a year round possession limit, the incidental trip limit is likely to be triggered within the fishing year, as has been seen previously in this fishery when it operated under such conditions. When a TAL is likely to be binding before the end of the fishing year, an incentive for derby-style fishing exists where individual permit-holders intensify skate landings prior to the triggering of AMs. Although existing data is not sufficient to estimate how effort will change or shift, there is likely to be some intensification of fishing effort under this option.

Based on the above information, interactions with protected species have the potential to increase if effort intensifies to such an extent that effort, both in time and space, increases, resulting in increased interaction risks to protected species. However, should the incidental trip limit be attained earlier in the fishing year, there is the potential, with a trip limit reduced down to 500 lb, that for several months of the fishing year, effort will be significantly reduced or constrained to avoid exceeding the TAL. The latter affords some positive impacts to protected species as effort, including gear soak time and number of days fished, is likely to decrease, thereby reducing potential interactions with protected species. Based on this information, we expect that impacts to protected species under Option 3 to be negative to low positive. Relative to Option 1 and 2, Option 3 is expected to have more of a negative impact on protected species.

Impacts on non-ESA listed species and ESA listed species would be similar to those described in Section 7.4.1.1 (i.e., low negative to neutral).

Option 3 would have more of a positive impact on protected species compared to Option 1, but would have similar impacts when compared to Option 2.

7.4.3 Skate Bait Possession Limit Alternatives

7.4.3.1 Option 1: No Action – 25,000 lbs year round (*Preferred Alternative*)

The No Action alternative would maintain the current trip limit of 25,000 lbs with a Letter of Authorization. This would not change current fishing effort and would likely not change the impacts on protected species as established in previous management actions. As a result, we expect impacts on protected species to be similar to those described in Section 7.4.1.1.

Relative to Option 2, impacts of Option 1 could be neutral to low negative. As only a small number of trips land the full bait trip limit in a fishing year, the likelihood that any changes in possession limit, as proposed by Option 2, would result in changes in fishing behavior that differ from status quo conditions is unlikely. Should the latter be the case, relative to Option 2, impacts of Option 1 on protected species would be neutral. However, as described below in Section 7.4.3.2, although unlikely, should fishing effort decrease under Option 2, then Option 1, would have more of a negative impact on protected species relative to Option 2.

7.4.3.2 Option 2: Revised Skate Bait Possession Limit – 20,000 lbs year round

Option 2 would lower the bait possession limit to 20,000 lbs with a Letter of Authorization. This would have a positive impact on protected species if fishing effort was impacted (i.e., reduced) by the reduction, however, this may be unlikely as only a small number of trips land the current bait possession limit. As a result, fishing effort may remain similar to current operating conditions. Based on this information, with the potential for fishing effort to decrease or remain similar to current operating conditions, impacts on protected species would be similar to those described in Section 7.4.1.2 (i.e., low positive to low negative).

Relative to Option 1, impacts of Option 2 could be neutral to low positive. As only a small number of trips land the full bait trip limit in a fishing year, the likelihood that any changes in possession limit, as proposed by Option 2, would result in changes in fishing behavior that differ from status quo conditions is unlikely. Should the latter be the case, relative to Option 1, impacts of Option 2 on protected species would be neutral. However, as described above, although unlikely, should fishing effort decrease under Option 2, relative to Option 1, Option 2 would have more of a positive impact on protected species.

7.4.4 Wing Fishery Seasonal Management Alternatives

7.4.4.1 Option 1: No Action

The No Action alternative would maintain the seasonal structure established in Framework Adjustment 1 for skate wing possession limits. The fishing year would remain divided into two seasons: season 1 (May 1 to Aug 31) and season 2 (Sep 1 to Apr 30). This would maintain the current levels of fishing opportunities for vessels. Therefore no change in fishing effort would be expected under Option 1. Based on this information, we expect impacts on protected species to be similar to those described in Section 7.4.1.1.

Option 1 would be expected to have neutral impacts on protected resources. Option 1 would have similar neutral impacts compared to Options 2 and 3.

7.4.5 Option 2: Revised Skate Wing Possession Limit (*Preferred Alternative*)

This alternative would create seasonal TALs for the wing fishery consistent with the existing seasonal skate wing possession limits. The first season would be allocated a percentage of the annual wing TAL based on the three year moving average of the most recent 3 fishing years (May through August) (representing 57% or 4,872 mt in 2016 and 2017) for May 1 to August 31. Once 85% of the allocated TAL is reached between May 1 and August 17, the incidental possession limit of 500 lbs would be implemented. Between August 18 and August 31, the Regional Administrator would use discretion as to whether or not the 500 lb incidental possession limit should be implemented. The second season would be allocated the remainder of the annual TAL (representing 43% or 3,681 in 2016 and 2017) for September 1 to April 30. Once 85% of the allocated TAL is reached between September 1 and April 30, the Regional Administrator would have the discretion to implement the incidental possession limit if the fishery is projected to exceed the TAL. The impact of possession limits on fishing effort is unknown as skates are typically landed on trips targeting groundfish, monkfish or scallops. Therefore it is not clear that changing the skate possession limit seasonally changes the level of fishing effort. If however, the hard in-season trigger is reached, the incidental possession limit reduces directed fishing effort on skates, and therefore, interactions with protected species could decrease. Vessels may shift fishing effort to areas of lower skate density which has the potential to modify the duration of time gear is set (i.e., decrease soak time) to reduce skate encounters; however, effort shifts would be expected to stay within a statistical area and therefore, would not result in the introduction of new fishing effort into areas not previously exposed to skate fishing. Based on this information, with the potential for effort to be less than, but no greater than current operating conditions, we do not expect this Option to introduce any new risks to protected species that have not already been considered previously (NMFS 2013; Waring et al. 2014, Waring et al. 2015). Further, with the potential for effort, including gear soak time, to decrease, interaction risks to protected species may be reduced under Option 2. Based on this information, impacts to protected species would be similar to those described in Section 7.4.1.2 (i.e., low positive to low negative).

Relative to Option 1, Option 2 may have more of a positive impact on protected species with the potential for effort to decrease under this Option. Relative to Option 3, impacts to protected species would be neutral.

7.4.6 Option 3: Revised Skate Wing Possession Limit

This alternative would create seasonal TALs for the wing fishery consistent with the existing seasonal skate wing possession limits. The first season would be allocated a percentage of the annual wing TAL based on the three year moving average of the most recent 3 fishing years (May through August) (representing 57% or 4,872 mt in 2016 and 2017). Once 85% of the allocated TAL is reached between May 1 and July 17, the incidental possession limit of 500 lbs would be implemented. Between July 18 and July 31, the Regional Administrator would use discretion as to whether or not the 500 lb incidental possession limit should be implemented. Between August 1 and September 15, the incidental possession limit of 500 lbs would be implemented, regardless of whether the in-season trigger point had been reached. The second season would be allocated the remainder of the annual TAL (representing 43% or 3,681 in 2016 and 2017) for September 1 to April 30. Once 85% of the allocated TAL is reached between September 1 and April 30, the Regional Administrator would have the discretion to implement the incidental possession limit if the fishery is projected to exceed the TAL. The impact of possession limits on fishing effort is unknown as skates are typically landed on trips targeting groundfish, monkfish or scallops. Therefore it is not clear that changing the skate possession limit changes the level of fishing effort. If however, the hard in-season trigger is reached, the incidental possession limit reduces directed fishing effort on skates, and therefore, interactions with protected species could decrease. Vessels may shift fishing effort to areas of lower skate density which has the potential to modify the duration of time gear is set (i.e., decrease soak time) to reduce skate encounters; however, effort shifts would be expected to stay within a statistical area and therefore, would not result in the introduction of new fishing effort into areas not previously exposed to skate fishing. Based on this information, with the potential for effort to be less than, but no greater than current operating conditions, we do not expect this Option to introduce any new risks to protected species that have not already been considered previously (NMFS 2013; Waring et al. 2014, Waring et al. 2015). Further, with the potential for effort, including gear soak time, to decrease, interaction risks to protected species may be reduced under Option 2. Based on this information, impacts to protected species would be similar to those described in Section 7.4.1.2 (i.e., low positive to low negative).

Relative to Option 1, Option 2 may afford more of a positive impact to protected species with the potential for fishing effort to decrease under this Option. Relative to Option 3, impacts of Option 2 on protected species are likely to be neutral.

7.5 Economic Impacts

7.5.1 Updates to Annual Catch Limits Alternatives

Alternatives for updating the ACL are described in Section 4.1. The Preferred Alternative (Option 2) would lower TAL for both the skate wing and bait fisheries.

7.5.1.1 Option 1: No Action (ACL= ABC of 35,479 mt, ACT of 26,609 mt, TAL of 16,385 mt, Wing TAL =10,896 mt, Bait TAL 5,489 mt)

Under the No Action Alternative, no changes to the ACL or TAL would be made. No additional economic impacts beyond those already analyzed in previous plan amendments and framework adjustments would be expected for the duration of this action (the status quo ACL would reduce the risk of closing the directed skate wing fishery before the end of the fishing year; refer to A3 and FW1 for the complete analyses). Although recent landings have been below the TAL, this alternative has a higher possibility of allowing landings to exceed the TAL compared with Option 2, which uses updated survey data (see 7.5.1.2). Based on dealer data, total skate revenue in FY 2013 and 2014 was $7,163,379 and $8,917,870 respectively; if the average price per pound of skate wings remains within the recent range (~$0.25.lb), the total revenue from skate wings would not be expected to significantly decrease. Long-term, Option 1 would be expected to result in future declines in biomass and catch, more restrictive regulations, and failure to reach optimum yield, which would result in a negative and potentially significant economic impact to the fishery. Option 1 would be expected to have overall negative economic impacts because the TAL would be set too high with long-term implications for the stock. Compared to Option 2, Option 1 would have more neutral short-term economic impacts but higher negative long-term economic impacts.

Table 36 - Total Skate Landings and Revenue by Fishing Year (Source: NMFS Dealer data)

	Total Landings (in live lbs)	Total Revenue
2010	31,894,625	$ 7,908,341
2011	40,928,099	$ 9,050,385
2012	32,586,156	$ 6,856,472
2013	30,431,615	$ 7,163,379
2014	33,707,610	$ 8,917,870

7.5.1.2 Option 2: Revised Annual Catch Limit Specifications (ACL= ABC of 31,081 mt, ACT of 23,311 mt, TAL of 12,872 mt, Wing TAL =8,560 mt, Bait TAL 4,312 mt) (*Preferred Alternative*)

Under this alternative, the TAL would be reduced from 18,001 metric tons to 12,872 metric tons. Reductions in the ACL and TAL themselves do not necessarily mandate changes in management measures, reductions in fishery effort, or changes in fishery profits. Under Option 2, the TAL (12,872 mt) is below the total catch by federally reporting vessels in FY 2013 (13,803 mt) and FY 2014 (15,289 mt). Relative to Option 1: No Action, this alternative has a higher probability of triggering AMs because the reduction in the TAL increases the likelihood of it being exceeded if fishing behavior and the possession limit does not change. The overall impact of Option 2 would depend largely on future fishing behavior, which is difficult to predict. If fishing effort does not increase, Option 2 would be expected to have neutral long-term economic impacts because landings would likely be similar to recent fishing years. If the incidental possession limit was triggered before the end of the fishing year, Option 2 could have medium short-term negative impacts because this would reduce revenue per trip or affect fishing for other more economically valuable species. Alternatively, compared to Option 1, Option 2 would have long-term neutral economic impacts.

An in-season adjustment to possession limits, subject to the discretion of the Regional Administrator, is triggered when catch of skate wings reaches 85% of the wing TAL (7,276 mt) or 90% for the skate bait fishery (3,880.8 mt), as established in Framework Adjustment 1 and Amendment 3 to the Northeast Skate Complex FMP. For either fishery, a lower TAL increases the likelihood of triggering the in-season adjustment. This would also have negative short-term economic impacts with the severity depending on when in the fishing year the in-season trigger was reached for either fishery; the incidental possession limit would effectively prevent any directed fishing for skate (either wing or bait). While the long-term economic benefits of both skate fisheries depend on meeting, but not exceeding, the TAL, short-term negative economic impacts may accrue to the targeted skate fishery as a result of this alternative, in the event that the incidental possession limit was implemented.

The magnitude of the impact of an early triggering of the in-season possession limit adjustment depends on two factors: the number of vessels that target skates, which would therefore be affected by reduced trip possession limits, and the probability of triggering AMs under this alternative compared to the status quo. To avoid exceeding the TAL, revised trip possession limits could be necessary, and are discussed and evaluated for economic impacts in Section 7.5.2 and Section 7.5.3. Revised trip possession limits would be the primary driver of short-term economic impacts from a revised TAL under the assumption that the TAL is optimally set.

Addendum: The corrected proportion of dead discards in the catch formula would further lower the TAL, while not affecting the aggregate skate ABC. This would not be expected to affect the overall conclusions of the completed economic impacts analysis. The further reduction in allowable landings would further decrease catch and effort in the wing and bait fisheries; this would be expected to contribute to the negative short-term economic impacts. Overall, Option 2 would be expected to have long-term neutral economic impacts because the ABC would be lowered to reflect changes in biomass (based on updated survey data), which would protect the longevity of the stock complex.

7.5.2 Skate Wing Possession Limit Alternatives

7.5.2.1 Option 1: No Action – 2,600 lbs from May 1 to Aug 31; 4,100 lbs from Sept 1 to Apr 30 (*Preferred Alternative*)

When combined with Updates to ACL **Alternative 1: No Action (Section 7.5.1.1)**, this alternative would not affect short-term economic benefits beyond those analyzed in Framework Adjustment 1, which set seasonal skate wing possession limits and specifications. Long-term, negative economic impacts would occur only if the long-term health of the stock was to decline, as would be expected if an ACL is set at an amount higher than that determined by the most recent survey data and if possession limits were set too high. On the other hand, long-term, negative economic impacts would also occur if the ACL is not achieved on a consistent basis; the fishery would not reach its optimum yield.

When combined with Updates to ACL **Alternative 2: Revised ACL Specifications (Section 7.5.1.2)**, the wing possession limits associated with this alternative could potentially result in more frequent triggering of AMs, and the incidental possession limit, due to the combination of the in-season adjustment threshold remaining at 85% of TAL and a lower TAL. The distribution and estimated magnitude of the economic impact of a lower TAL combined with status quo possession limits is different for FY2013 and FY2014 (Table 37).

Table 37 - Landings in excess of Option 1 proposed trip possession limits (FY2013-FY2014) based on simulation analysis

	Actual Landings			Option 2: Revised Skate Wing Possession Limits				
	Total Landings (1,000 lbs.)	**Total Revenue ($1,000)**	**TAL (1,000 lbs.)**	**Proposed TAL (1,000 lbs.)**	**Revenue loss of Opt. 1 ($1,000)**	**Landings in excess of Opt. 1 (1,000 lbs.)**	**Truncated total landings (1,000 lbs.)**	**Percent of "Option 2: Revised Annual Catch Limit Specification" TAL**
2013	19,187	5,951	31,609	18,871	$851 (14.3%)	1,863	17,324	91.8%
2014	24,320	7,767	24,623	18,871	1,723 (22.1%)	5,348	18,972	100.5%

Source: SAFIS/CFDBS; includes all non-bait landings from federal permit-holders converted to live weight

Based on the simulation analysis, Option 1: No Action, combined with the preferred Updates to ACL Alternative – Option 2: Revised ACL Specifications, would trigger an in-season possession limit adjustment in February under 2013 conditions and in November under 2014 conditions. Whether this option would significantly affect a substantial number of permit-level or affiliate ("ownership group") level entities is analyzed in Section **Error! Reference source not found.**, for the preferred option.

Option 1 would have overall uncertain (ranging between neutral to medium negative) economic impacts. It would have neutral long-term economic impacts, if the TAL is set based on most recent survey data, stock structure remains stable, and status quo possession limits are maintained. However, medium negative impacts would be expected if the incidental possession limit is triggered before the end of the fishing year as indicated in the simulation analysis (February 2013 and November 2014). Option 1 would have similar long-term neutral and medium short-term negative impacts when compared to Option 3. Option 1 would differ in impacts to Option 2, which has medium short-term negative impacts but medium positive to low negative long-term impacts.

7.5.2.2 Option 2: Revised Skate Wing Possession Limits – 2,000 lbs from May 1 to Aug 31; 3,000 lbs from Sept 1 to Apr 30

This alternative is described in Section 4.4.1. The total number of unique permits landing skate wings during FY2013 and FY2014 was 441 and 433 respectively. Of these, 117 and 205 unique permits, respectively, landed greater than 2,000 lbs of wings from May 1 to Aug 31 (summer season) or greater than 3,000 lbs from Sep 1 to Apr 30 (winter season) during FY 2013 and FY2014. Some unique permits recorded trip landings within 100 lbs of the season's trip possession limit. These trips are most likely to be "skate targeting" trips.

A simulation of the effects of revised trip possession limits was performed based on FY2013 and FY2014 data. While future fishing behavior and effort may vary significantly from past effort due to exogenous influences such as weather, ex-vessel prices, and the availability of other species, recent fishing behavior and effort is the best feasible predictor of future effort. The results discussed here do not account for future, unknown changes in fishery dynamics, but provide a reasonable and feasible estimate of the impact of alternative trip possession limits.

Under FY2013 and FY2014 conditions, 2,137,143 pounds live weight (969 mt live weight) and 5,452,256 pounds live weight (2473 mt live weight), respectively, would not have been landed under Option 2. In addition, some number of trips targeting skate that did occur in FY2013 and FY2014 would not have taken place at all as a result of the incidental possession limits being triggered prior to the end of the fishing year (November through April, under FY2014 conditions). In general, this would occur when the expected revenue under the trip limits would be less than the expected total cost of the trip itself.

Table 39, Option 422, shows the change in (live) landings and revenues for FY2013 and FY2014, and the truncated landings, assuming that all trips occurring at the higher 2013-2014 limits would still occur, but with landings truncated at the proposed limits.

Based on the simulation analysis, total skate wing landings in FY2013 would have been at least 2,137 thousand pounds lower under the proposed trip possession limits. For FY2014, total skate wing landings would have been at least 5,452 thousand pounds lower. Total skate wing landings for FY2013 and FY2014 would have been 17,049 and 18,868 thousand pounds, respectively. In both cases, the total skate landings would not have exceeded the TAL proposed in this action (Section 4.1.2). Although FY2014 had the highest landings of the last three years, the total landings that fishing year would have equaled exactly the TAL set in Alternative 2: Revised Annual Catch Limit Specifications, under Option 2 possession limits.

Under this option for FY2013, a total of 89 permits (150 in 2014), all of which may qualify as small businesses at both the permit level and the affiliate (or "ownership group" level), would have lost greater than 5% of total permit revenue, and 60 vessels (119 in 2014) would have lost greater than 10% of total permit revenue.

While revenues are not perfectly correlated with profits, a change in revenue represents a decrease in economic well-being for the permit-holder. Option 2 would likely result in landings below the proposed TAL, at least under FY2013 conditions (Table 39). Not achieving a TAL due to possession limits signifies a real and negative economic impact to the skate wing fishery ($1.7 million under 2014 conditions, or 22.2 %; Table 2). Furthermore, trip possession limits may encourage increased discarding, leading to declines in stocks relative to optimum levels.

Compared with Option 1, Option 2 would be expected to have medium short-term negative economic impacts, under FY2014 conditions, but low negative impacts (estimated -10.7% revenue loss versus -14.3% for Option 1), under FY2013 conditions. Option 2 would have medium long-term neutral economic impacts, under 2014 conditions, but low negative impacts under FY2013 conditions (TAL under achieved by approximately 10%). Option 2 would have similar short-term negative economic impacts when compared to Option 3.

7.5.2.3 Option 3: Revised Skate Wing Possession Limits – 2500, 2600, 2700, 2800, 2900, 3000 lbs year round

This alternative would eliminate the seasonal possession limits and replace them with a constant skate wing possession limit ranging from 2500 to 3000 lbs (5675-6810 live lbs). This alternative is described in detail in Section 4.4.3. These options are labeled 423a-423f in Table 39.

The economic benefit of an increased possession limit depends on the corresponding skate wing TAL. To estimate the likelihood of exceeding a proposed TAL, a counterfactual trip landing was generated for every trip in FY2013 and FY2014. To simulate landings under a 2500 to 3000 lbs possession limit, the landings were set at either (1) the possession limit *if and only if* the actual trip landings were more than 100 live lbs below the actual possession limit (in live pounds), or (2) the actual trip landings *if* the actual trip landings was within 100 live lbs of the actual possession limit (in live pounds). Trips within 100 live lbs of the possession limit would be considered a "skate targeting / maximizing" trip, and would be assigned a counterfactual landing.

The counterfactual represents a likely upper-bound for landings. Although trips within 100 live lbs of the possession limit may be accurately assumed to be "skate targeting / maximizing," the actual landings of these trips under the higher proposed possession limits may not consistently reach the new limit. This is a methodological limit on analysis; complete information on actual catch under higher possession limits is not observable in the data and is thus not feasibly available for the May through August season.

Based on the simulation analysis, under FY2014 conditions, the TAL would likely have been exceeded, except for the 2600 lbs possession limit (Table 39, options 423 a-f). FY2014 represented a high year for skate landings; in the FY2014 counterfactual, the incidental possession limit would have been triggered in January or December (April, March, or February for 2013 conditions), and the wing TAL would have been exceeded in the previous month (the way the analysis was run if 85% of the TAL was reach in month A the incidental possession limit was implemented in month B). The amounts that counterfactual catch would have exceeded the TAL are shown in Table 39.

FY2014 counterfactual landings suggest that the skate wing fishery triggered the incidental possession limit in December or January of FY2014 under Option 3 and under Preferred Alternative Option 2: Revised ACL Specification. When a TAL is likely to be limiting before the end of the fishing year, an incentive for derby-style fishing exists where individual permit-holders intensify skate landings prior to the triggering of the incidental possession limit or exceeding the TAL. Existing data is not sufficient to estimate how effort would shift (or the intensity of the derby-style fishing) given that skates are not frequently targeted, and are landed only as sellable by-catch by some permit-holders.

Table 39 shows the truncated and/or counterfactual landings, if the incidental possession limit was triggered, under these possession limits. Under this scenario, the 500 pound landed weight (1135 pound live weight) possession limit is imposed later into FY2013 than in FY2014. Based on the simulation analysis, the result is lost revenue, ranging from 13.5% to 15.9% in 2013 and 19.1% to 23.4% in 2014 and lost landings, ranging from 1.8 to 2.3 million pounds in 2013, 4.6 to 5.6 in 2014. The TAL, however, would not be achieved in FY2013 and somewhat exceeded in FY2014 (except under the 2,600 lbs possession limit). On the other hand, the costs associated with changing the possession limit from thousands to 500 landed pounds may result in a large number of skate 'trips' not occurring during February through April (2013 conditions) and December through April (2014 conditions). Drastic changes in ex-vessel prices, although not measured, from the heavy to the light landing periods also are likely.

Option 3 would be expected to have high negative economic impacts, varying over its six sub-options, because of the estimated revenue losses associated with Option 3 (it has the highest percent losses in FY2013, and exceeds the TAL in 2014). The range of possession limits under Option 3 is compared to Option 1, indicating similar negative short-term impacts between the two options; however, the magnitude varies with possession limit (Table 38). The same applies when comparing long-term economic impacts between Options 1 and 3. When compared to Option 2, overall Option 3 has more negative short-term and long-term (under FY2013 conditions) economic impacts. Option 3 has more positive long-term economic impacts compared to Option 2 under FY2014 conditions.

Table 38 – Summary of impacts for Options 1 and 3 – skate wing possession limits

	Short run:		Long run:	
Option:	2013	2014	2013	2014
1	Medium negative	Medium negative	Neutral	Neutral
423 a	High negative	Low negative	High negative	Low negative
423 b	Low negative	High negative	Medium negative	Medium positive
423 c	High negative	Medium negative	Medium negative	Neutral
423 d	High negative	Low negative	Low negative	Low negative
423 e	Low negative	Low negative	Low positive	Medium negative
423 f	High negative	Low negative	Low negative	Medium negative

7.5.3 Bait Possession Limit Alternatives

7.5.3.1 Option 1: No Action – 25,000 lbs year round (*Preferred Alternative*)

This action would keep the skate bait possession limit constant at 25,000 lbs. For the bait fishery, 77% and 82% of the TAL was achieved in FY2013 and FY2014, respectively, under status quo possession limits. Total federally-reported skate bait landings in FY2013 and FY2014 were 5,596 mt and 4,499 mt, respectively. While skate bait landings were lower in FY2014, this amount would exceed the proposed TAL of 4,312 mt and the trigger amount (90% of TAL).

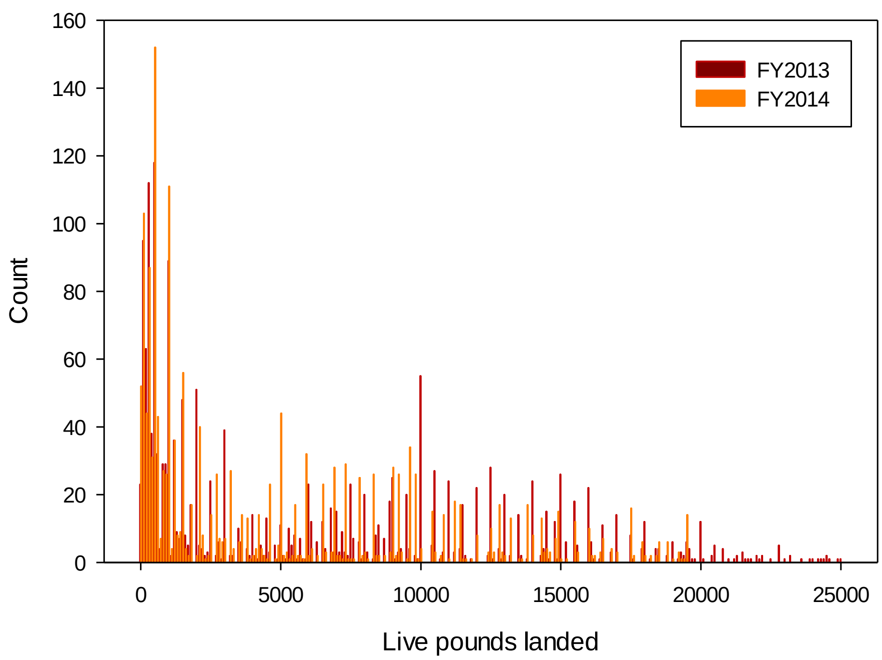


Figure 26 - Count of trip by landed pounds of skate bait for FY2013 and FY2014

In FY2013, 9 trips landed within 1,000 lbs of the possession limit. In 2014, 15 out of the 1,766 federally-reported skate bait trips came within 1,000 lbs of the 25,000 lbs trip limit. Figure 26 shows a widespread distribution of skate bait landings across total number of skate bait trips. However, the bait fishery operates largely to order and would be expected to adjust landings in order to not exceed the 90% in-season trigger or the TAL. Option 1 would be expected to have low negative impacts because of the reduction in the TAL combined with the status quo possession limits would result in a higher likelihood of triggering AMs. Compared to Option 2, Option 1 would have similar negative economic impacts.

7.5.3.2 Option 2: Revised Skate Bait Possession Limit – 20,000 lbs year round

This action would lower the skate bait possession limit to 20,000 lbs. In FY2013, 47 trips out of 1,823 landed greater than the proposed possession limit. In FY2014, 46 out of 1,765 trips landed greater than the proposed possession limit. In FY2013 and FY2014, a total of 2,092,937 live lbs of skate bait were landed in excess of the proposed possession limits. This amount represents approximately 10% of all FY2013-FY2014 bait landings. Although vessels who reach the lower proposed possession limit can shift additional catch to other trips to offset potential losses, the impact of this proposed possession limit would be expected to result in an economic loss, assuming that TAL is not exceeded under either possession limit.

A reduction in landings for a fishery that has not reached its TAL would represent a real, negative economic loss in comparison to Option 1: No Action. If the fishery adjusts landings as expected, the TAL is not likely to be exceeded, nor is the 90% AM trigger expected to be reached, under either possession limit. Therefore, no future benefits are gained through a reduction in catch and the proposed constraining possession limit constitutes an un-necessary economic loss for the skate fishery. Option 2 would have low negative economic impacts on the bait fishery. Compared to Option 1, Option 2 would have similar negative economic impacts.

7.5.4 Wing Fishery Seasonal Management Alternatives

7.5.5 Option 1: No Action

The No Action alternative would maintain the seasonal structure established in Framework Adjustment 1 for skate wing possession limits. The fishing year would remain divided into two seasons: season 1 (May 1 to Aug 31) and season 2 (Sep 1 to Apr 30). This would maintain the current levels of fishing opportunities for vessels. Option 1 would have the same economic impacts as Option 1, Skate Wing Possession Limits (Section 7.1.2.1), depending on the ACL Specifications alternative chosen (see Section 7.5.2.1).

7.5.6 Option 2: Modification of Wing fishery Seasonal Management (*Preferred Alternative*)

This alternative would create seasonal TALs for the wing fishery consistent with the existing seasonal skate wing possession limits (2600 and 4100 landed pounds) and alternative limits (2000 and 3000 landed pounds). These options are labeled 422a and 442b in Table 39. The first season would be allocated 57 % of the annual TAL (representing 10,756,684 live pounds in 2016 and 2017) for May 1 to August 31. For Option 442a, the preferred Option, once 85% of the allocated TAL is reached between May 1 and August 17, the incidental possession limit (500 pounds landed weight) will be imposed. For Option 442b, once 85% of the allocated TAL is reached between May 1 and August 31, the incidental possession limit (500 pounds landed weight) will be imposed.

Any unused portion of the first season TAL would be reallocated automatically to the second season.

The second season would be allocated 43% of the annual TAL (representing 8,114,692 live pounds in 2016 and 2017) for September 1 to April 30. Once 85% of the allocated TAL is reached between September 1 and April 30; the Regional Administrator would have the discretion to implement the incidental possession limit if the fishery is projected to exceed the TAL.

Table 39 shows the expected impacts for Option 442a on the skate fishery under FY2013 conditions (no incidental possession limit occurs) and FY2014 conditions (incidental possession limit would be triggered during August 18-31 and January-April, according to simulations). Based on the simulation analysis, under 2013-2014 conditions, revenues declined 3.5% and 15.2% respectively, while landings declined, by 851 and 3,719 thousand pounds. The truncated total landings would not achieve the TAL in FY2013, but would exceed it by 9.2% in 2014.

Option 2 (442a) would have the lowest negative short-term economic impacts, because the estimated revenue loss is less than that of Option 1 under both 2013 and 2014 conditions. Option 2 (442a) would have low long-term negative economic impacts compared to Option 1; it is much closer to TAL under 2013 conditions, but would exceed the TAL under FY2014 conditions.

The alternative skate wing possession limits of 2000/3000 landed pounds are also shown in Table 39 (Option 442b). The incidental possession limit would not be triggered under FY2013 conditions, but starts in February in 2014. Revenue loss is 10.7% and 19.3%, respectively; lost landings are 2.1 and 3.7 million live pounds. TAL is not achieved in 2013 by nearly 10%, and exceeded by 3.8% in 2014.

Option 2 (442b) would have low short-term negative economic impacts, because of the estimated revenue loss associated with this option, compared to Option 1. Option 2 (442b) would have low negative economic impacts when compared to Option 1, because it achieves a lower amount of the TAL. Compared to Option 3, Option 2 would have similar low negative short-term and low positive long-term economic impacts.

7.5.7 Option 3: Revised Skate Wing Seasonal Structure

This alternative would create seasonal TALs for the wing fishery consistent with the existing seasonal skate wing possession limits, or for seasonal possession limits of 2000/3000. The first season would be allocated 57 % of the annual TAL (representing 10,756,684 live pounds in 2016 and 2017) for May 1 to July 31. Between August 1 and September 15, the incidental possession limit of 500 lbs would be implemented, regardless of whether the in-season trigger point had been reached.

Any amount of seasonal TAL not achieved during May through August is applied to the second season TAL.

The second season would be allocated 43% of the annual TAL (representing 8,114,692 live pounds in 2016 and 2017) for September 1 to April 30, along with any shortfall from the first season. Once 85% of the allocated TAL is reached between September 1 and April 30, the Regional Administrator would have the discretion to implement the incidental possession limit if the fishery is projected to exceed the TAL.

The difference between Option 3 and Option 2 is the automatic imposition of the 500 pound wing weight possession limit in August. The impacts of Option 3's two alternatives are presented in Table 39. Based on the simulation analysis, Option 443a, possession limits of 2600/4100/500, results in an estimated 10.8% loss in revenue under FY2013 conditions (-19.3% estimated revenue loss in FY2014) and an estimated landings loss of 2.4 million pounds (-4.7 million lb estimated loss in FY2014). Simulation results indicated that Option 443b, with possession limits 2000/3000/500, would result in an 18.6% estimated revenue loss under FY2013 conditions (-24.4% in 2014) and estimated lost landings of 3.8 million pounds (-6 million lbs in FY2014).

Option 3 (443a) would have low negative short-term economic impacts and low negative long-term impacts, compared to Options 1 and 2. Option 3 (443b) would have high negative economic impacts in the short run and medium long-term negative (2013/2014) impacts, when compared to Options 1 and 2.

Table 39 - Revenues, landings, and percent TAL achieved for all options, with alternative trip possession limits (FY2013-FY2014)

FY 2013							
OPTION	LIMITS	THRESHOLD	REVENUE	PERCENT	LANDINGS	TRUNCATED	PERCENT
		MONTH	LOSS	LOSS	LOSS	LANDINGS	of TAL
422	2000/3000		$637,332	10.7%	2,137,143	17,049,949	90.3%
423a	2500	April	$876,844	14.7%	2,289,656	16,897,436	89.5%
423b	2600	April	$806,002	13.5%	2,061,398	17,125,694	90.7%
423c	2700	March	$945,131	15.9%	2,210,793	16,976,299	90.0%
423d	2800	March	$883,773	14.9%	2,003,425	17,183,667	91.1%
423e	2900	March	$823,737	13.8%	1,799,741	17,387,351	92.1%
423f	3000	February	$926,721	15.6%	1,953,701	17,233,391	91.3%
442a	2600/4100		$210,163	3.50%	851,259	18,335,833	97.2%
442b	2000/3000		$637,332	10.7%	2,137,143	17,049,949	90.3%
443a	2600/4100/500		$642,961	10.8%	2,398,665	16,788,427	89.0%
443b	2000/3000/500		$1,107,452	18.6%	3,838,600	15,348,492	81.3%
		ACTUAL	ACTUAL	TAL			
		REVENUES	LANDINGS				
		$5,951,333	19,187,092	18,871,376			

CONTINUED

Table 39 - Revenues, landings, and percent TAL achieved for all options, with alternative trip possession limits (FY2013-FY2014)

FY 2014							
OPTION	LIMITS	THRESHOLD	REVENUE	PERCENT	LANDINGS	TRUNCATED	PERCENT
		MONTH	LOSS	LOSS	LOSS	LANDINGS	of TAL
422	2000/3000	January	$1,727,761	22.2%	5,452,256	18,868,687	100.0%
423a	2500	January	$1,618,025	20.8%	5,063,848	19,257,095	102.0%
423b	2600	December	$1,820,491	23.4%	5,643,964	18,676,979	99.0%
423c	2700	December	$1,732,063	22.3%	5,365,922	18,955,021	100.4%
423d	2800	December	$1,647,399	21.2%	5,099,781	19,221,162	101.9%
423e	2900	December	$1,563,998	20.1%	4,837,583	19,483,360	103.2%
423f	3000	December	$1,481,824	19.1%	4,579,289	19,741,654	104.6%
442a	2600/4100	Aug. 18-31	$1,181,083	15.2%	3,719,855	20,601,088	109.2%
		January					
442b	2000/3000	February	$1,498,631	19.3%	4,736,611	19,584,332	103.8%
443a	2600/4100/500	February	$1,502,999	19.3%	4,727,351	19,593,592	103.8%
443b	2000/3000/500	April	$1,896,029	24.4%	6,014,723	18,306,220	97.0%
		ACTUAL	ACTUAL	TAL			
		REVENUES	LANDINGS				
		$7,767,870	24,320,943	18,871,376			

Source: SAFIS/CFDBS; includes all non-bait landings from federal permit-holders converted to live weight

Distribution of Impacts from Triggering Accountability Measures

The number of vessels affected by triggering skate wing incidental possession limits and accountability measures is shown, for all options except Option 1 (Section 7.5.2.1), in Figure 27. Each page shows the numbers of vessels affected under each option. Following the analysis above, numbers are shown for 2013 and 2014 conditions.

Each chart in Figure 27 has the number of vessels (FREQUENCY) on the y-axis, and the percent revenue loss by groups (MIDPOINT). Thus, the first bar represents the number of vessels that have less than 15% loss of revenue for each option. On the other hand, the number of vessels with greater than a 15% loss of revenue is the sum of all the bars to the right of the first bar. One can visualize the options with the greatest and least losses by comparing the height of these bars.

This discussion focuses on Option 442a, the preferred alternative and shown on the fourth page of Figure 1, comparing it to all the other feasible alternatives. Looking at the top chart on each page, 2013, the preferred Option 442a results in the lowest number of vessels losing more than 15% of their skate revenues (the numbers below the bars represent midpoints; 10 is the midpoint between 0.1 and 15 percent). For Options 422, 423a, 423f, 442b, 443a and 443b, the number of vessels losing more than 15% of revenues is 25, 51, 54, 25, 26 and 51, respectively. The preferred Option 442a results in only 3 vessels losing more than 15% of their skate revenues. Under 2014 conditions, the number of vessels losing more than 15% revenues is much higher. For Options 422, 423a, 423f, 442b, 443a and 443b, the number of vessels losing more than 15% of revenues is 98, 91, 96, 86, 73 and 79, respectively. The preferred Option 442a estimates 70 vessels losing more than 15% of their skate revenues.

Focusing more closely on the higher losses under FY2014 conditions, the preferred Option 442a shows 255 vessels with no revenue loss (of the 363 shown in the first bar, midpoint 10), while Options 422, 423a, 423b, 442b, 443a and 443b, the number of vessels with zero revenue loss are 228, 239, 236, 240, 261, and 261, respectively. These numbers are included in Midpoint 10, were VALUEPERCENT is the percent revenue lost.

Further analysis of FY2014 shows the numbers of vessels and the total skate revenues lost. Of the total $1,818,083 skate revenues lost under the preferred Option 442a, three vessels would lose over $50,000 ($165,704 total skate loss) and thirteen lose between $25,000 and $50,000 ($439,054 total skate loss). The preferred option has the lowest total loss in skate revenues, of all the options.

Finally, to show the real impact on skate vessels and affiliates, analysis should compare their losses under alternative accountability measures with their total fishing revenue, not just skate revenue (Section **Error! Reference source not found.**). The analysis in Section 8.11.2 (Table 42 and Table 43) is more precise and a truer measure of impact. A vessel that only fishes for skate is affected more than a vessel that fishes for other species as well, and a sole vessel is affected more than a vessel that is a member of an affiliate group.

Figure 27 - Number of skate vessels by percent revenue loss, FY2013 and FY2014

Options described in Table 3

FREQUENCY = Number of vessels

MIDPOINT = Percent revenue loss group:

10 = 0 to 15

20 = 15 to 25

30 = 25 to 35

40 = 35 to 45

50 = 45 to 55

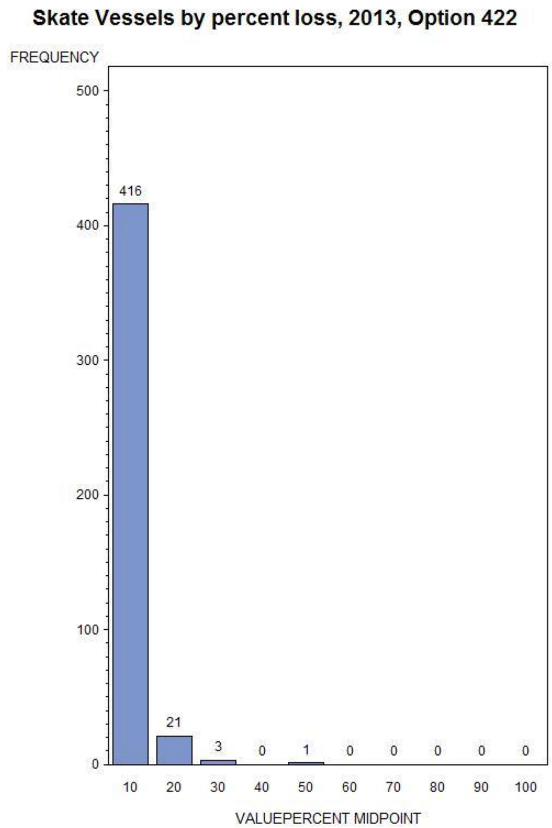
60 = 55 to 65

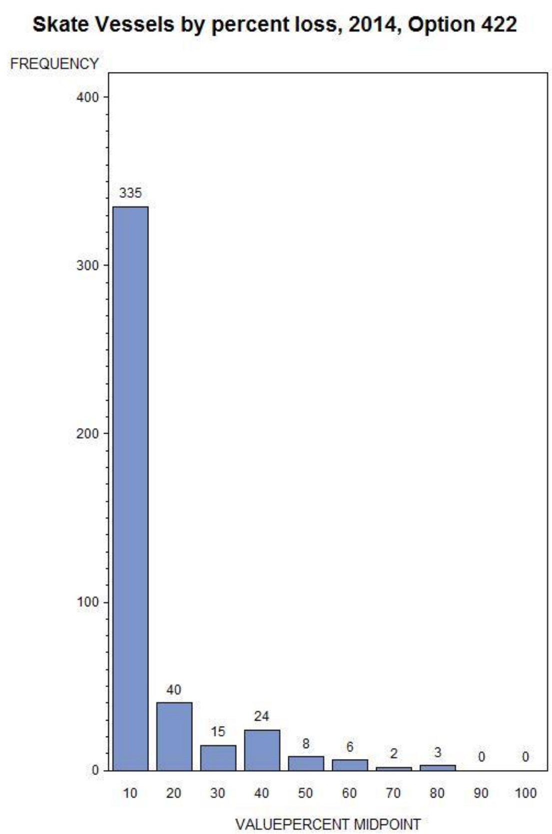
70 = 65 to 75

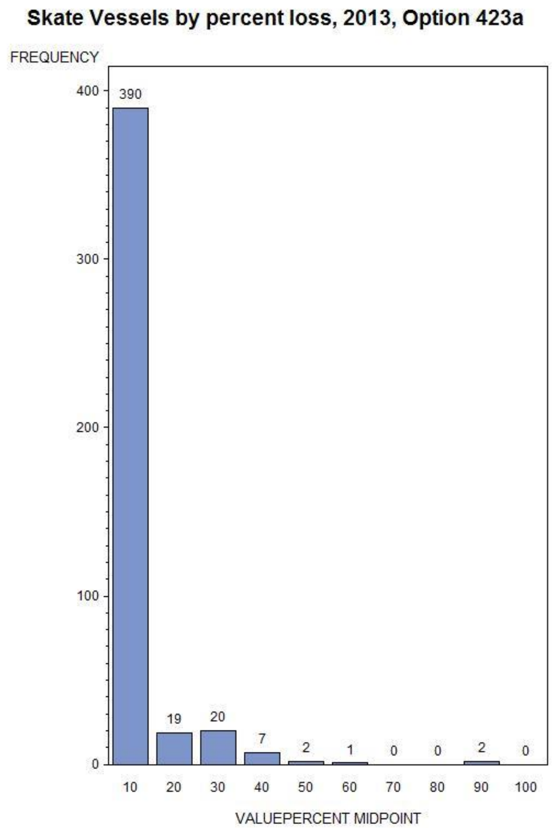
80 = 75 to 85

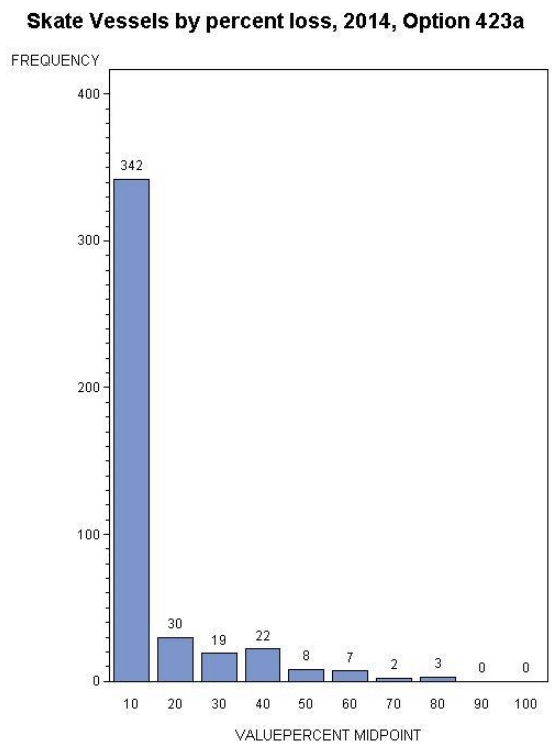
90 = 85 to 95

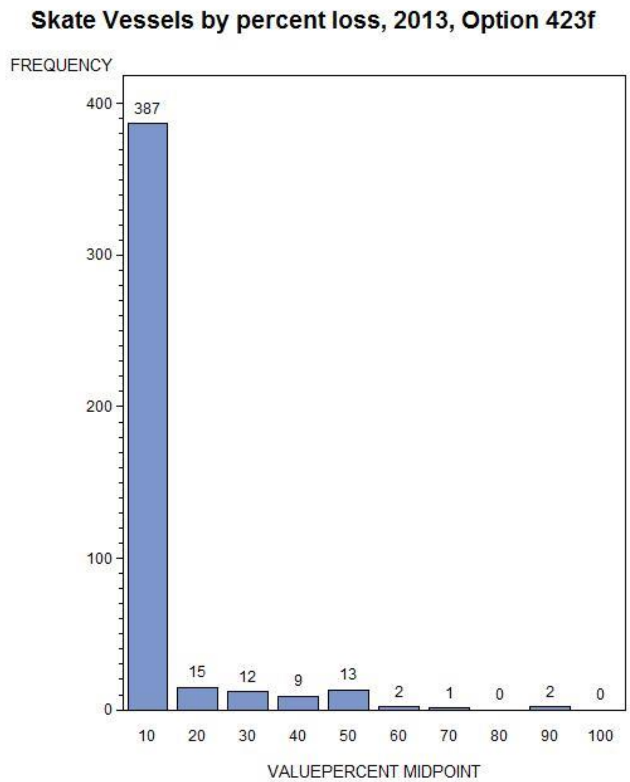
90 = 95 to 100

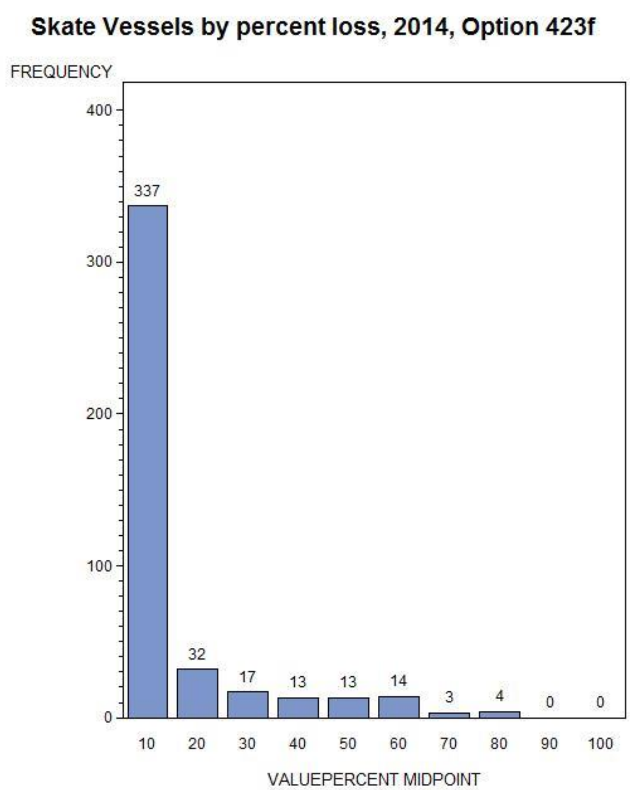

Skate Vessels by percent loss, 2013, Option 422
FREQUENCY
500
400
300
200
100
0
416
21
3
0
1
0
0
0
0
0
10
20
30
40
50
60
70
80
90
100
VALUEPERCENT MIDPOINT

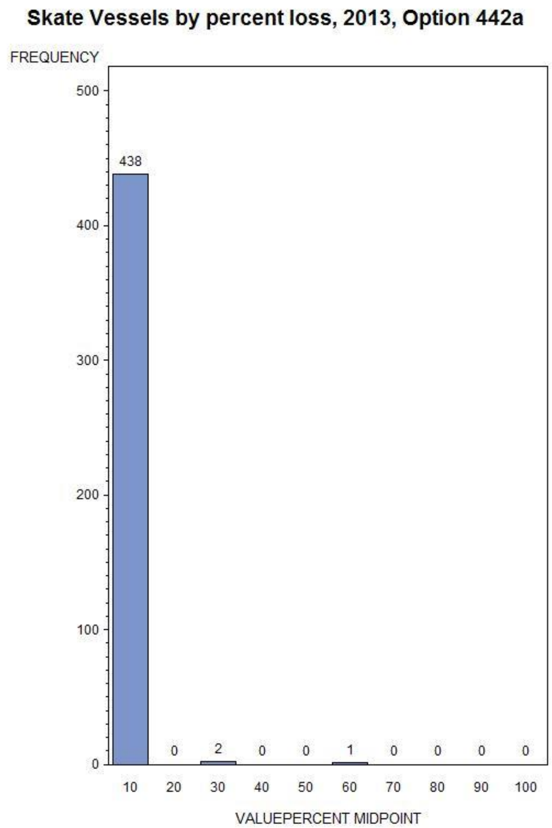

Skate Vessels by percent loss, 2014, Option 422
FREQUENCY
400
300
200
100
0
335
40
15
24
8
6
2
3
0
0
10
20
30
40
50
60
70
80
90
100
VALUEPERCENT MIDPOINT

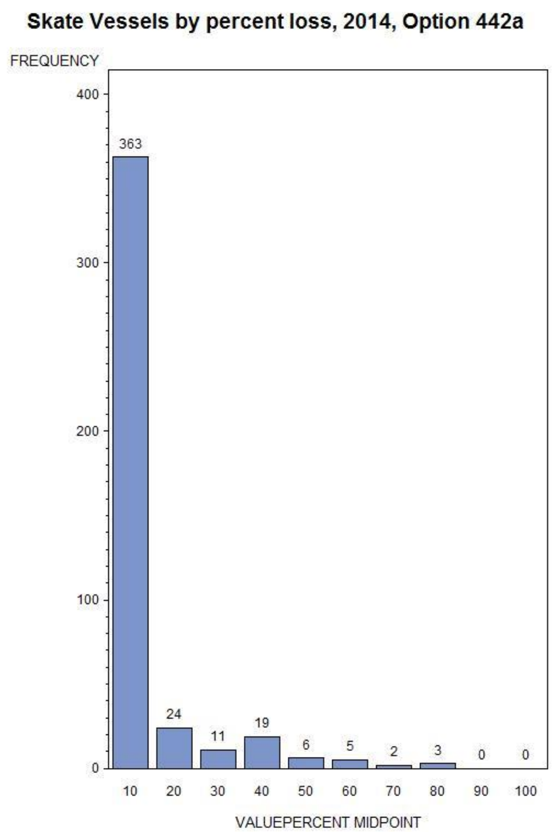

Skate Vessels by percent loss, 2013, Option 423a
FREQUENCY
400
300
200
100
0
390
19
20
7
2
1
0
0
2
0
10 20 30 40 50 60 70 80 90 100
VALUEPERCENT MIDPOINT


Skate Vessels by percent loss, 2014, Option 423a
FREQUENCY
400
300
200
100
0
342
30
19
22
8
7
2
3
0
0
10 20 30 40 50 60 70 80 90 100
VALUEPERCENT MIDPOINT

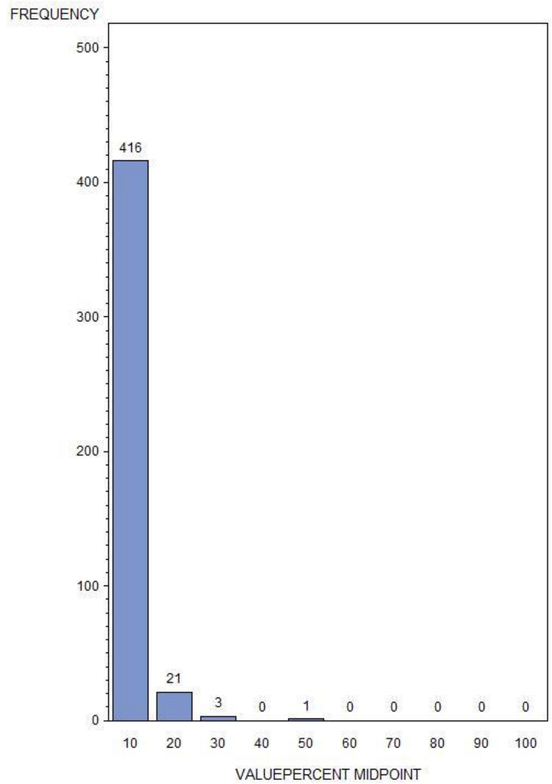

Skate Vessels by percent loss, 2013, Option 423f
FREQUENCY
400
300
200
100
0
387
15
12
9
13
2
1
0
2
0
10
20
30
40
50
60
70
80
90
100
VALUEPERCENT MIDPOINT


Skate Vessels by percent loss, 2014, Option 423f
FREQUENCY
400
300
200
100
0
337
32
17
13
13
14
3
4
0
0
10
20
30
40
50
60
70
80
90
100
VALUEPERCENT MIDPOINT

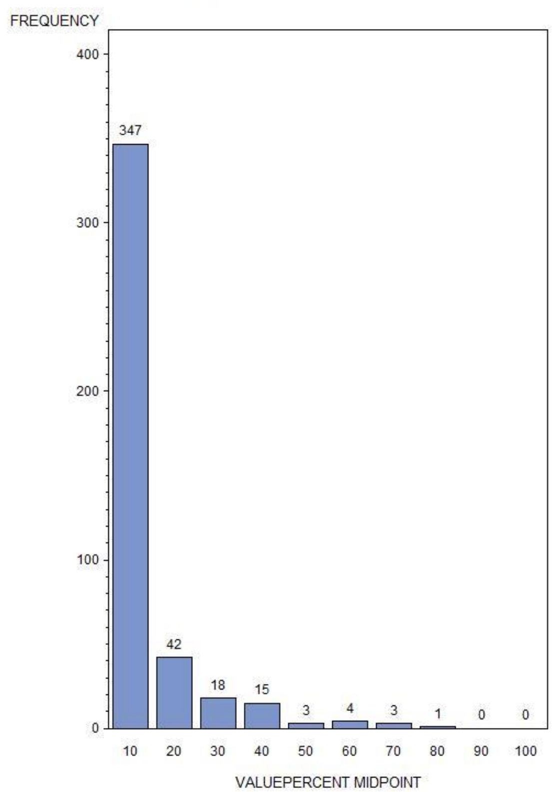

Skate Vessels by percent loss, 2013, Option 442a
FREQUENCY
500
400
300
200
100
0
438
0
2
0
0
1
0
0
0
0
10
20
30
40
50
60
70
80
90
100
VALUEPERCENT MIDPOINT

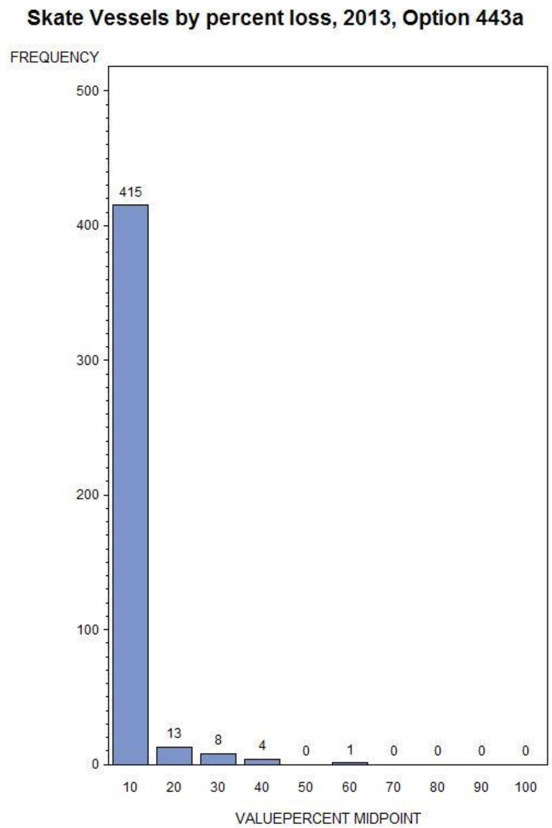

Skate Vessels by percent loss, 2014, Option 442a
FREQUENCY
400
300
200
100
0
363
24
11
19
6
5
2
3
0
0
10
20
30
40
50
60
70
80
90
100
VALUEPERCENT MIDPOINT

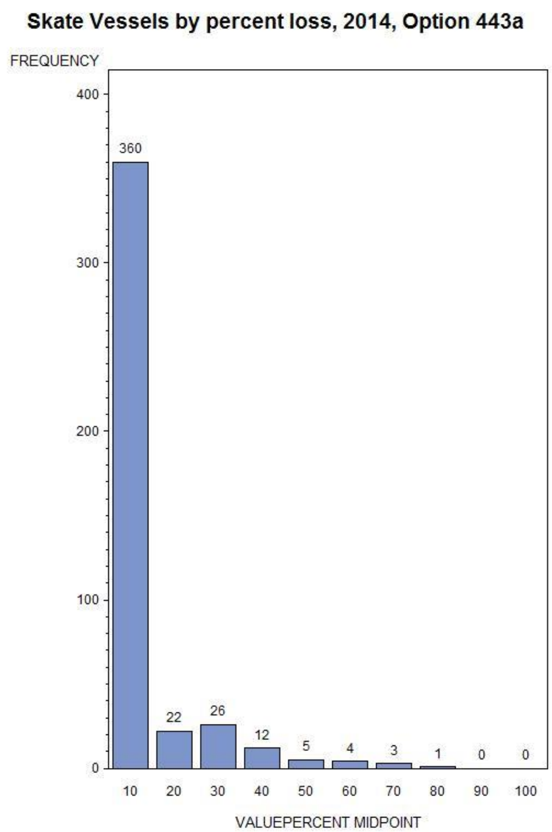
Skate Vessels by percent loss, 2013, Option 442b



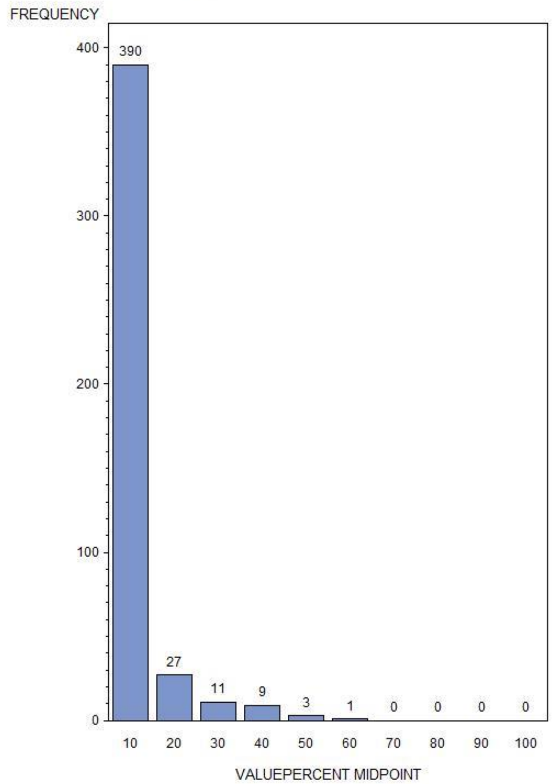
Skate Vessels by percent loss, 2014, Option 442b



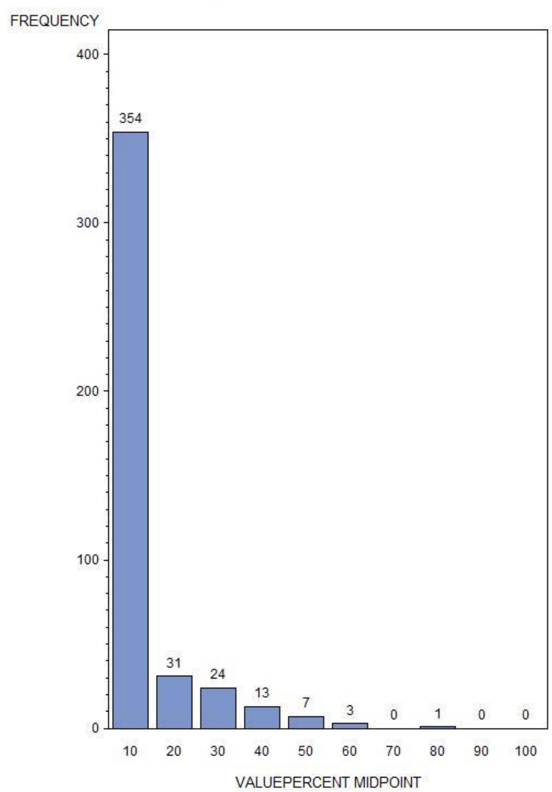

Skate Vessels by percent loss, 2013, Option 443a
FREQUENCY
500
400
300
200
100
0
415
13
8
4
0
1
0
0
0
0
10
20
30
40
50
60
70
80
90
100
VALUEPERCENT MIDPOINT


Skate Vessels by percent loss, 2014, Option 443a
FREQUENCY
400
300
200
100
0
360
22
26
12
5
4
3
1
0
0
10
20
30
40
50
60
70
80
90
100
VALUEPERCENT MIDPOINT

Skate Vessels by percent loss, 2013, Option 443b



Skate Vessels by percent loss, 2014, Option 443b



7.6 Social Impacts

7.6.1 Updates to Annual Catch Limits

ACL alternatives are described in Section 4.1 and include decreases in the ACL, in the aggregate skate ACL, and in the skate bait and skate wing fishery TALs.

7.6.1.1 No Action (ACL= ABC of 35,479 mt, ACT of 26,609 mt, TAL of 16,385 mt, Wing TAL =10,896 mt, Bait TAL 5,489 mt)

Under the No Action Alternative, the skate catch limits would be those proposed in FW2. No additional impacts on human communities beyond those already analyzed in the FW2 EA are expected. The FW2 EA determined that the action would have neutral to low negative economic and social benefits, mainly from the potential increase in the probability of triggering the AM, by exceeding the TAL. Maintaining the status quo possession limits might increase the probability of triggering that AM. The FW2 specifications were below FY2011 total catch but above FY2012 catch. This indicated that the current possession limits may not result in an overage of the wing TAL. The two seasonal skate wing possession limits implemented in FW1 (2,600 lbs for May 1 through August 31, and 4,100 lbs for September 1 through April 30) were also expected to increase efficiency and revenue in the skate wing fishery by allowing more landings when prices are typically higher, and when winter skates can generally be captured closer to shore. In FY2014, 97.3% of the wing TAL was achieved under the status quo specifications and possession limits; in FY2013 only 56% was achieved. For the bait fishery, 77% and 82% of the TAL was achieved in FY2013 and FY2014, respectively, under status quo possession limits. Option 1 would have more positive impacts than Option 2 by allowing for higher TALs but may have some low negative long-term impacts if the stock further declined in biomass.

7.6.1.2 Option 2: Revised Annual Catch Limit Specifications (ACL= ABC of 31,081 mt, ACT of 23,311 mt, TAL of 12,872 mt, Wing TAL =8,560 mt, Bait TAL 4,312 mt) (*Preferred Alternative*)

Under Option 2, the specifications are calculated using updated NEFSC trawl survey data and revised discard mortality rate estimates for two of the seven skate species in scallop dredge gear. The reduced ACL and TAL have the potential to impact fishing behavior and profits; the reduction also would increase the potential of the AM being triggered before the end of the fishing year. Based on FY2014 landings, the revised specifications may result in an overage of the wing TAL. The bait fishery achieved 82% of its TAL in FY2014, indicating a lower potential to trigger the AM under the proposed specifications. Compared to Option 1, Option 2 would have a higher likelihood of triggering the incidental possession limit of 500 lbs and, potentially, the AM for the wing fishery. The incidental possession limit may have low negative impacts because it reduces additional revenue from skate resources and may impede harvesting of other targeted species if large amounts of skate are encountered that cannot be landed. Option 2 would have low negative impacts because of the reduction in the TAL and therefore potential landings that would negatively affect communities. Option 2 would have more negative social impacts compared to Option 1.

Addendum: The corrected proportion of dead discards in the catch formula would further lower the TAL, while not affecting the aggregate skate ABC. This would not be expected to affect the overall conclusions of the completed social impacts analysis. The further reduction in allowable landings would further decrease catch and effort in the wing and bait fisheries; this would be expected to contribute to the low negative social impacts.

7.6.2 Skate Wing Possession Limit Alternatives

7.6.2.1 Option 1: No Action – 2,600 lbs from May 1 to Aug 31; 4,100 lbs from Sept 1 to Apr 30 (*Preferred Alternative*)

This option would maintain the current skate wing possession limits established in FW1. Option 1 would have neutral social impacts if the incidental possession limit was not triggered during the fishing year. Option 1 might have more negative impacts compared to Option 2 if in-season incidental limit is triggered before the end of the fishing year. Based on a simulation analysis conducted as part of the economic impacts, a comparison of FY2013 and 2014 landings to the proposed TAL in the wing fishery would allow for a high percentage of the TAL to be achieved but also indicates a higher likelihood of the incidental possession limit being triggered before the end of the fishing year. However, in FY2014, the wing fishery achieved 85% of its TAL in February but since the fishery was not projected to exceed the TAL it was allowed to complete the fishing year, resulting in 97.3% of the TAL being achieved. The combination of the reduced TAL and status quo possession limit could result in low negative impacts if the incidental possession limit was triggered, particularly if fishing for other, more economically valuable species is affected. Option 1 would have lower negative social impacts when compared to Option 3 and similar low negative impacts when compared to Option 2.

7.6.2.2 Option 2: Revised Skate Wing Possession Limits – 2,000 lbs from May 1 to Aug 31; 3,000 lbs from Sept 1 to Apr 30

Option 2 would reduce the trip limit in both seasons to 2,000 lbs from May to Aug 31 and 3,000 lbs from Sep 1 to Apr 30. This option would be more likely to reduce the likelihood of the incidental possession limit being triggered before the end of the fishing year compared to Option 1 but may negatively impact landings if fishermen are encountering more skates than they can land. Option 2 would have low negative social impacts because it would reduce the possession limit, which would reduce the ability of fishermen to achieve the wing TAL. Based on the economic impacts, under FY2014 conditions, the in-season possession limit would be expected to be implemented before the end of the fishing year but 100% of the TAL would be expected to be achieved. If the incidental possession limit restricts fishing activity on skate and other species, such as monkfish, Option 2 would have low negative social impacts. Compared to Option 1, Option 2 would have neutral to low negative impacts on fishermen as the likelihood of an AM being triggered is reduced but it makes it more difficult for fishermen to achieve the total TAL, particularly if current fishing patterns no longer resemble those in FY2014. Option 2 would have less negative social impacts when compared to Option 3 and similar low negative social impacts to Option 1.

7.6.2.3 Option 3: Revised Skate Wing Possession Limits – 2,500 to 3,000 lbs year round

This Option would set the skate wing trip limit between 2,500 to 3,000 lbs and remove the seasonal component. Based on the simulation analysis conducted as part of the economic analysis, the higher the possession limit, the higher percentage of the TAL could be achieved. However, depending on whether fishing behavior more closely resembles FY2013 or FY2014, the higher end of this range of possession limits could result in exceeding the TAL (as was simulated for FY2014). The simulation analysis also indicated that 85% of the wing TAL would be achieved prior to the end of the fishing year; the higher possession limits would be expected to reach the 85% mark earlier in the FY. Both the potential to trigger an AM and the incidental possession limit would have negative social impacts because of reduced fishing opportunities if skate restricts fishing for more economically valuable fish. Option 3 would have negative social impacts because of the increased likelihood of triggering the incidental possession limit. Option 3 has slightly more negative impacts compared to Options 1 and 2.

7.6.3 Skate Bait Possession Limit Alternatives

7.6.3.1 Option 1: No Action – 25,000 lbs year round (*Preferred Alternative*)

This Option would maintain the current skate bait possession limit at 25,000 lbs, with a Letter of Authorization. The trip limit is unlikely to result in an overage of the TAL and would have neutral social impacts on the fishery. For the bait fishery, 77% and 82% of the TAL was achieved in FY2013 and FY2014, respectively, under status quo possession limits. The bait fishery differs in operation to the wing fishery by fishing to complete orders and therefore would be expected to adjust to accommodate the reduced TAL even under status quo possession limits. Maintaining the status quo possession limits would be expected to have low positive social impacts because it would allow vessels to maximize landings while potentially minimizing operating costs. Compared to Option 2, Option 1 would have more positive impacts on the fishery.

7.6.3.2 Option 2: Revised Skate Bait Possession Limit – 20,000 lbs year round

Option 2 would reduce the skate possession limit to 20,000 lbs, with a letter of Authorization. This would have negative social impacts on the fishery as it would reduce the possession limit on a fishery that has not exceeded the TAL and is not likely to. The bait fishery has under achieved its TAL in recent fishing years; FW2 reduced the bait TAL for FY2014. Option 2 would have low negative social impacts because would make it more difficult for the fishery to achieve the TAL and would reduce efficiency, mainly by not allowing vessels to maximize landings while minimizing operating costs. Option 2 would have more negative impacts compared to Option 1.

7.6.4 Wing Fishery Seasonal Management Alternatives

7.6.5 Option 1: No Action

The No Action alternative would maintain the seasonal structure established in Framework Adjustment 1 for skate wing possession limits. The fishing year would remain divided into two seasons: season 1 (May 1 to Aug 31) and season 2 (Sep 1 to Apr 30). This would maintain the current levels of fishing opportunities for vessels. However, based on the economic impacts analysis, Option 1 would have similar, low negative, impacts to Option 1 for the wing possession limits (Section 7.6.2.1).

7.6.6 Option 2: Modification of Wing fishery Seasonal Management (*Preferred Alternative*)

This alternative would create seasonal TALs for the wing fishery consistent with the existing seasonal skate wing possession limits. The first season would be allocated a percentage of the annual wing TAL based on the three year moving average of the most recent 3 fishing years (May through August) (representing 57% or 4,872 mt in 2016 and 2017) for May 1 to August 31. The second season would be allocated the remainder of the annual TAL (representing 43% or 3,681 in 2016 and 2017) for September 1 to April 30. Once 85% of the allocated TAL is reached between September 1 and April 30, the Regional Administrator would have the discretion to implement the incidental possession limit if the fishery is projected to exceed the TAL. Based on the economic analysis, the fishery was projected to trigger the incidental limit in the second season using both sets of possession limits based on FY2014 conditions, and was also projected to exceed the TAL under the higher possession limits. Neutral to low negative impacts would be expected if the triggering of the incidental possession limit early in season 2 affected the targeting of other more economically valuable species and the directed skate fishery. Option 2 would have neutral to low negative social impacts because of the potential to trigger the incidental possession limit. Option 2 would have similar neutral to low negative impacts to Option 3 but if could have less negative impacts compared to Option 1 if social impacts tend more towards neutral.

7.6.7 Option 3: Revised Skate Wing Seasonal Structure

This alternative would create seasonal TALs for the wing fishery consistent with the existing seasonal skate wing possession limits. The first season would be allocated a percentage of the annual wing TAL based on the three year moving average of the most recent 3 fishing years (May through August) (representing 57% or 4,872 mt in 2016 and 2017). Between August 1 and September 15, the incidental possession limit of 500 lbs would be implemented, regardless of whether the in-season trigger point had been reached before July 17. The remainder of the fishing year (September 16 – April 30) would be allocated the remainder of the annual TAL (representing 43% or 3,681 in 2016 and 2017). Once 85% of the allocated TAL is reached between September 16 and April 30, the Regional Administrator would have the discretion to implement the incidental possession limit if the fishery is projected to exceed the TAL. Option 3 would have neutral to low negative social impacts because of the triggering of the incidental possession limit in season 2 under the higher possession limits and exceeding the TAL ,based on FY2014 conditions. The fishery, under the lower possession limits, was projected to reach April before the incidental possession limit was triggered, however, the RA would have the discretion to implement that 500 lbs limit, resulting in more neutral impacts. Option 3 would have similar neutral to low negative impacts to Option 2 but if could have less negative impacts compared to Option 1 if social impacts tend more towards neutral.

7.7 Cumulative Effects Analysis

The need for a cumulative effects analysis (CEA) is referenced in the CEQ regulations implementing NEPA (40 CFR Part 1508.25). CEQ regulations define cumulative impacts as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other action." The purpose of this CEA is to consider the effects of the Proposed Action and the combined effects of many other actions on the human environment over time that would be missed if each action were evaluated separately. CEQ guidelines recognize that it is not practical to analyze the cumulative effects of an action from every conceivable perspective; 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 3 together with past, present, and reasonably foreseeable future actions that affect the skate 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 (VECs): The CEA focuses on VECs, specifically including:

- Physical environment/habitat (including EFH);
- Regulated stocks (skate complex);
- Non-target species and bycatch;
- Protected resources/endangered species; and
- Human communities.

Temporal and Geographic Scope of the Analysis: The temporal range that will be considered for habitat, allocated target species, non-allocated target species and bycatch, and human communities, extends from 2010, the year that Amendment 3 was implemented, through May 1, 2014 the beginning of the next fishing year. While the effects of actions prior to Amendment 3 are considered (see Amendment 3 for a full cumulative effects analysis), the cumulative effects analysis for this action is focused primarily on Amendment 3 and subsequent actions because Amendment 3 implemented ACLs for skates and included major changes to management of the skate fishery. For endangered and 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 the expected implementation of this framework (May 1, 2014) and 2019.

The broad geographic scope considered for cumulative effects to habitat, allocated target species, and non-allocated target species and bycatch consists of the range of species, primary ports, and geographic areas (habitat) discussed in Section 6.0 (Affected Environment) of the document. Similarly, the range of each endangered and protected species as presented in Section **Error! Reference source not found.** of his document will be the broad geographic scope for that VEC, however, the most likely geographic scope for all cumulative effects will be the Gulf of Maine, Georges Bank, and Southern New England waters where most of the skate fishery occurs. The geographic scope for the human communities will consist of those primary port communities from which vessels fishing for skates originate.

7.7.1 Summary of Direct/Indirect Impacts of the Proposed Action

The direct and indirect effects on the VECs from the revised ACL analyzed in this supplemental EA (Preferred Alternative) compared to what the impacts would be if the skate specifications approved are those described in the No Action Alternative are summarized in Table 40 below. The nomenclature used is the following:

- Physical Environment: positive = actions that improve or reduce disturbance of habitat; negative = actions that degrade or increase disturbance of habitat;
- Biological Environment: positive = actions that increase stock size; negative = actions that decrease stock size;
- 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

Table 40 - Summary of Direct and Indirect Effects of the Alternatives

Alternative	Valued Ecosystem Components (VECs)				
	Physical Env	Biological Environment			Human Communities
	Habitat/EFH	Allocated Target Species	Non-Allocated Target Species and Bycatch	Protected Resources	Skate fishery participants
Annual Catch Limits alternatives described in Section 4.1					
No-Action Alternative	Low Negative	Moderate Negative	Negligible	Low Negative	High Negative
Proposed Alternative	Low Positive	Neutral to Low Positive	Negligible	Low Positive	Medium Negative
Skate wing fishery possession limit alternatives described in Section 4.2					
No-Action Alternative	Uncertain	Low Negative	Negligible	Low Negative	Neutral to Medium Negative
Proposed Alternative 1	Low Positive to Neutral	Low Positive	Negligible	Low Positive	Medium Negative
Proposed Alternative 2	Neutral to Low Positive	Moderate Negative	Negligible	Low Positive to Low Negative	High Negative
Skate bait fishery possession limit alternatives described in Section 4.3					
No-Action Alternative	Low Negative	Low Negative	Negligible	Neutral to Low Negative	Low Negative
Proposed Alternative	Low Positive	Neutral to Low Positive	Negligible	Neutral to Low Positive	Low Negative
Wing fishery seasonal management alternatives described in Section 4.4					
No-Action Alternative	Neutral	Neutral	Negligible	Low Negative	Neutral to Medium Negative
Proposed Alternative 1	Neutral	Neutral to Low Negative	Negligible	Low Positive to Low Negative	Low Negative
Proposed Alternative 2	Neutral	Neutral to Low Negative	Negligible	Low Positive to Low Negative	Low Negative

Impacts to the physical and biological environment from the proposed action were assessed and found to be negligible. In general, the reduced allowable amounts of skate catch and landings are not likely to result in considerable changes in fishing effort. Fishing effort for skates is largely controlled by DAS in the groundfish, monkfish, and scallop fisheries. The amount of fishing effort in the fishery in FY 2016-2017 is likely to be similar FY 2013 effort and will be within the scope of fishing effort analyzed in Amendment 3 and FW1, as well as in recent actions in the DAS fisheries noted above.

7.7.2 Past, Present and Reasonably Foreseeable Future Actions

Detailed information on the past, present, and reasonably foreseeable future actions that may impact this action can be found in the FEIS for Amendment 3 and in the FW1 EA (Section 6.6.10). The information on relevant past, present and reasonably foreseeable future actions and their impacts are summarized in this section.

Other Fishing Effects: Past, Present and Reasonably Foreseeable Future Skate and Related Management Actions

The following is a summary of the past, present, and reasonably foreseeable future fishing actions and effects thought most likely to impact this cumulative effects assessment. The three FMP's that have had the greatest impact on skate fishery VECs, other than the Skate FMP, are the Atlantic Sea Scallop, Monkfish, and NE Multispecies FMPs, because of the spatial overlap of the fisheries, the relatively high level of incidental catch of skate in those fisheries, and the fact that more than 90 percent of the skate permit holders are also permitted in one or the other of those three fisheries. For additional information on the cumulative effects and to view the complete summary of the history of the Skate FMP, please see Amendment 3 (NEFMC 2009) and Section 6.6.10 of the FW1 EA (NEMFC 2011).

Past and Present Actions:

Skates. Amendment 3 to the Skate FMP implemented an ACL and AMs for the skate complex and was designed to reduce skate discards and landings sufficiently to rebuild stocks of thorny and smooth skates, and to prevent other skates from becoming overfished. Skate FW1, implemented in May 2011, reduced skate possession limits and adjusted other measures to lengthen the fishing season for the directed skate wing fishery. Skate FW2, implemented in September 2014, reduced skate specifications and revised the skate dealer and VTR codes in order to improve species specific reporting.

NE Multispecies. Amendment 16 and FW 44 to the NE Multispecies FMP are regulations that have effectively reduced fishing effort for skates as well as other targeted groundfish. FW 45 implemented a variety of measures including revision of biological reference points, updated ACLs for several groundfish stocks, and established new closed areas to protect spawning cod. Framework 46 was implemented in September 14, 2011 and modified the provisions that restrict mid-water trawl catches of haddock. Framework Adjustment 47 was implemented May 1, 2012 and set specifications for some groundfish stocks for FY 2012-2014, modified AMs for the groundfish fishery and the administration of the scallop fishery AMs, revised common pool management measures. Framework Adjustment 48 (FW 48) was partially implemented on September 30, 2013. That action proposed revised status determination criteria for several stocks, modified the sub-ACL system, adjusted monitoring measures for the groundfish fishery, and changed several accountability measures (AMs). Framework Adjustment 50 was also implemented on September 30, 2013 which set specifications for many groundfish stocks and modified the rebuilding program for SNE/MA winter flounder. Framework Adjustment 53 incorporated any status changes for groundfish stocks, set specifications for several groundfish stocks, re-configured the GOM cod rolling closures, prohibited possession of GOM cod for the recreational fishery, established a mechanism for setting default catch limits in the event a future management action was delayed, and specified that the maximum available carryover may be reduced if up to 10 percent of the unused sector sub-ACL, plus the total ACL for the upcoming fishing year exceeds the ABC.

Monkfish. Monkfish Amendment 5 implemented ACL and AMs for the monkfish fishery, and updated the biological reference points for monkfish stocks. FW 7 reduced the ACT for the monkfish Northern Fishery Management Area (NFMA) and increased the allocated DAS to 40 days per vessel; possession limits for the NFMA for permit categories A and C were set at 1,250 lbs tail weight and 600 lbs tail weight for B and D permit categories. Monkfish FW8, implemented in July 2014, increased monkfish DAS allocations and landings limits, allowed vessels issued a limited access monkfish Category H permit to fish throughout the Southern Fishery Management Area, enabled vessels to use an allocated monkfish-only DAS at any time throughout the fishing year, and revised biological reference points for the monkfish stocks in the Northern and Southern Fishery Management Areas based on the updated stock assessment.

Atlantic Sea Scallops. Amendment 15 to the Scallop FMP implemented ACLs and AMs for the scallop fishery. It also included updates to EFH, biological reference points, the research set-aside program, and other measures to improve the limited access general category fishery. Framework 21 set specifications and area access programs for FY2010. FW 22 implemented fishery specifications for 2011 and 2012 to prevent overfishing on scallops and help improve the yield-per-recruit in the resource. It built upon the measures implemented by Amendment 15, and adjusted DAS and access area trip allocations, and implemented measures to minimize fishery interactions with endangered sea turtles. FW 23 had provisions to improve the effectiveness of the accountability measure adopted under A15 for the yellowtail flounder sub-ACL, to consider specific changes to the general category NGOM management program to address potential inconsistencies, to consider modifications to the vessel monitoring system to improve fleet operations, and included measures to minimize impacts on sea turtles with a turtle deflector dredge. Groundfish Framework Adjustment 49/Scallop FW adjustment 24 is a joint Northeast Multispecies/Atlantic Sea Scallop action that modifies the dates for scallop vessel access to the year-round groundfish closed areas; this action was implemented on May 20, 2013. Framework 25, implemented June 2014, set specifications for the Atlantic sea scallop fishery for fishing year 2014, including days-at-sea allocations, individual fishing quotas, and sea scallop access area trip allocations. Framework 26, implemented May 2015, set fishing specifications for 2015, including catch limits, days-at sea allocations, individual fishing quotas, and sea scallop access area trip allocations. In addition, Framework 26 closed a portion of the Elephant Trunk Access Area and extended the boundaries of the Nantucket Lightship Access Area to protect small scallops, adjusted the State Waters Exemption Program, allowed for Vessel Monitoring System declaration changes for vessels to steam home with product on board, implemented a proactive accountability measure to protect windowpane flounder and yellowtail flounder, aligned two gear measures designed to protect sea turtles, and implemented other measures to improve the management of the scallop fishery. FW 26 set specifications for FY2015 and closed a portion of the Elephant Trunk Access Area and extended the boundaries of the Nantucket Lightship Access Area, adjusted the State Waters Exemption Program, allowed for Vessel Monitoring System declaration changes, implemented a proactive AM to protect windowpane and yellowtail flounder, aligned two gear measures, and implemented other measures.

Spiny Dogfish. Along with skates, spiny dogfish are one of the primary incidental species in the NE multispecies fishery. Spiny dogfish have historically been landed more with bottom gillnets rather than bottom trawls. Specifications for FY 2010 and 2011 included an overall commercial quota (15 million lbs in 2010; 20 million lbs in 2011) and a 3,000-lb trip limit. Fishing effort is largely constrained by NE Multispecies and Monkfish DAS. A3 to the spiny dogfish FMP established a research set aside program, updated EFH definitions, and included year-end rollover of management measures and revisions to the quota allocation scheme. Specifications for FY2014 and 2015 included an overall commercial quota (25,073 mt in 2014; 24,976 in 2015) and a 4,000 lb trip limit.

American Lobster. Since the skate bait fishery supplies a large proportion of bait to lobster trap fisheries, regulations affecting lobster fishing effort may influence demand for skate products. NMFS is in rulemaking to limit future access and control trap fishing effort in Lobster Management areas 2 (southern MA and RI waters) and the Outer Cape Area (east of Cape Cod, MA). This action will address measures to: implement a trap transferability system in these areas, as well as Area 3 (the offshore Area from ME to NC); allow trap transfers among qualifiers; and impose a trap reduction or conservation tax on any trap transfers. Another action proposes to limit future access into the lobster trap fishery in Lobster Area 1 (the inshore Gulf of Maine). This action is intended to discourage lobster non-trap vessels from entering the lobster trap fishery, and discourage lobster trap vessels fishing in other lobster management areas from entering the Area 1 lobster trap fishery. NMFS also modified the timing of the Lobster Conservation Management Area 4 seasonal closure, effective December 2015, in order to reduce fishing effort in Area 4 consistent with ASMFC's Interstate FMP for American Lobster.

Atlantic Herring. The impacts of the herring fishery on skates catch is considered negligible. However, the 2013-2015 herring specifications increase the ABC to 114,000 mt. Herring are often used as lobster bait in the Gulf of Maine and the Area 1A TAC increased to 29,775 mt. As the supply of herring bait for the lobster fishery declines, it could result in increased demand for skate bait.

Mid-Atlantic Species. Skates are occasionally caught as bycatch in various fisheries managed by the Mid-Atlantic Fishery Management Council (e.g., summer flounder, scup, black sea bass, bluefish). NMFS has recently proposed regulations implementing the Mid-Atlantic ACL Omnibus Amendment, which will implement ACLs and AMs for all species managed by the Mid-Atlantic Council. As many of these fisheries are jointly managed with the Atlantic States Marine Fisheries Commission (ASMFC), seasons, quotas, trip limits, and other measures are specified by state agencies. The implementation of ACLs and AMs for these fisheries will help constrain total catch of these species, as well as bycatch of non-target species like skates.

Large Whales. The Atlantic Large Whale Take Reduction Program (ALWTRP) requires the use of sinking groundlines, which may have a negligible to low negative impact on habitat due to associated bottom sweep by the groundline. In addition, required use of weak links in gillnets may result in floating "ghost gear," which could snag on and damage bottom habitat.

Future Actions:

Skates. Skate fishery specifications for FY 2016 and FY 2017 would replace the management measures implemented by FW2. Without approval of the proposed action in this specifications document, the ACL specifications would revert back to ones set by FW2. The Council prioritized an action to consider limiting access to the skate fishery; control dates for skate uses other than bait and for the bait fishery have previously been set.

NE Multispecies. FW 55, if approved by NMFS, would update status determination criteria and set specifications for the majority of groundfish stocks and stocks managed by the U.S./Canada Resource Sharing agreement (Eastern Georges Bank cod, Eastern Georges Bank haddock, and Georges Bank yellowtail flounder). FW55 also would implement an additional sector, modify the process for approving new Northeast Groundfish Sectors, revise the definition of the haddock separator trawl, modify aspects of the ASM program including goals and objectives and coverage rates, modify the distribution of U.S. TACs for Eastern/Western Georges Bank cod, and modify GOM cod protection measures.

Monkfish. FW 9, if approved by NMFS, would allow Category C and D vessels to declare a NE multispecies DAS while at sea in the Northern Fishery Management Area, would eliminate the trip limit when on a combined NE multispecies and monkfish DAS, and would modify the minimum mesh requirements for standup gillnets on a monkfish DAS in the Southern Fishery Management Area. Specifications for FY2017 and 2018 are also expected to be set during 2016.

Atlantic Sea Scallops. The Council is currently developing FW 27 to the Scallop FMP. The action is expected to set specifications for FY 2016 and default measures for FY 2017 including OFL, ABC, scallop ACLs and associated set-asides, day-at-sea allocations, general category fishing allocations, and area rotation schedule and allocations for the 2014 fishing year.

Spiny Dogfish. The Mid-Atlantic Fishery Management Council and NEFMC are currently developing an action to set specifications for spiny dogfish for FY2016 through FY2018.

Essential Fish Habitat. Reasonably foreseeable future actions that will likely affect habitat include the EFH Omnibus Amendment (undergoing final revisions to the EIS at this time). The EFH Omnibus Amendment will provide for a review and update of EFH designations, identify HAPCs, as well as provide an update on the status of current knowledge of gear impacts. It will also include new proposals for management measures for minimizing the adverse impact of fishing on EFH that will affect all species managed by the NEFMC.

Sea Turtles. The Strategy for Sea Turtle Conservation and Recovery in Relation to Atlantic Ocean and Gulf of Mexico ("Strategy") is a gear-based approach to addressing sea turtle bycatch. NMFS is considering increasing the size of the escape opening for Turtle Excluder Devices (TEDs) in the summer flounder fishery, expanding the use of TEDs to other trawl fisheries, and modifying the geographic scope of the TED requirements (74 FR 88 May 8, 2009).

Atlantic Sturgeon. Atlantic sturgeon has been proposed for listing under the Endangered Species Act (ESA). The Biological Opinion regarding Atlantic Sturgeon issued on December 16, 2013 did not find listing of sturgeon or any additional measures to reduce interactions with sturgeon to be necessary.

Non-Fishing Effects: Past, Present and Reasonably Foreseeable Future Actions

Non-fishing activities that occur in the marine nearshore and offshore environments and their watersheds can cause the loss or degradation of habitat and/or affect the species that reside in those areas. Section 6.6.10.2 in the FW1 EA provides a summary of past, present, and reasonably foreseeable non-fishing activities and their expected effects on VECs in the affected environment. The following discussions of impacts are based on past assessments of activities and assume these activities will likely continue into the future as projects are proposed.

Construction/Development Activities and Projects: Construction and development activities include, but are not limited to, point source pollution, agricultural and urban runoff, land (roads, shoreline development, wetland loss) and water-based (beach nourishment, piers, jetties) coastal development, marine transportation (port maintenance, shipping, marinas), marine mining, dredging and disposal of dredged material and energy-related facilities. These activities can introduce pollutants (through point and non-point sources), cause changes in water quality (temperature, salinity, dissolved oxygen, suspended solids), modify the physical characteristics of a habitat or remove/replace the habitat altogether. Many of these impacts have occurred in the past and present and their effects would likely continue in the reasonably foreseeable future. It is likely that these projects would have negative impacts caused from disturbance, construction, and operational activities in the area immediately around the affected project area. However, given the wide distribution of the affected species, minor overall negative effects to offshore habitat, protected resources, allocated target stocks, and non-allocated target species and bycatch are anticipated since the affected areas are localized to the project sites, which involve a small percentage of the fish populations and their habitat. Thus, these activities for most biological VECs would likely have an overall low negative effect due to limited exposure to the population or habitat as a whole. Any impacts to inshore water quality from these permitted projects, including impacts to planktonic, juvenile, and adult life stages, are uncertain but likely minor due to the transient and limited exposure. It should be noted that 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 allocated target stocks, non-allocated target species and bycatch, and protected resources.

Restoration Projects: Other regional projects that are restorative or beneficial in nature include estuarine wetland restoration; offshore artificial reef creation, which provides structure and habitat for many aquatic species; and eelgrass (*Zostera marina*) restoration, which provides habitat for many juvenile fishes. Due to past and present adverse impacts from human activities on these types of habitat, restorative projects likely have slightly positive effects at the local level.

Protected Resources Rules: The NMFS final Rule on Ship Strike Reduction Measures (73 FR 60173, October 10, 2008) is a non-fishing action in the US-controlled North Atlantic that is likely to affect endangered species and protected resources. The goal of this rule is to significantly reduce the threat of ship strikes on North Atlantic right whales and other whale species in the region. Ship strikes are considered the main threat to North Atlantic right whales; therefore, NMFS anticipates this regulation will result in population improvements to this critically endangered species.

Energy Projects: Cape Wind Associates (CWA) has received approval to construct a wind farm on Horseshoe Shoal, located between Cape Cod and Nantucket Island in Nantucket Sound, MA. The CWA project would have 130 wind turbines located as close as 4.1 miles off the shore of Cape Cod in an area of approximately 24 square miles with the turbines being placed at a minimum of 1/3 of a mile apart. The potential impacts associated with the CWA offshore wind energy project include the construction, operation, and removal of turbine platforms and transmission cables; thermal and vibration impacts; and changes to species assemblages within the area from the introduction of vertical structures. Other offshore projects that can affect VECs include the construction of offshore liquefied natural gas (LNG) facilities such as the project "Neptune." As it related to the impacts of the Proposed Action, the Neptune project is expected to have small, localized impacts where the pipelines and buoy anchors contact the bottom.

7.7.3 Summary of Cumulative Effects

The following analysis summarizes the cumulative effects of past, present, and reasonably foreseeable future actions in combination with the proposed action on the VECs identified in this section.

Physical Environment/Habitat/EFH

The management measures described above in the NE Multispecies, Scallop, Monkfish, and Skate FMPs, largely have positive effects on habitat due to reduced fishing efforts, consequently reducing gear interaction with habitat. The other FMP actions that reduce fishing effort generally result in fewer habitat and gear interactions, resulting in low positive effects on habitat. The ALWTRP resulted in low negative to negligible effects on habitat due to the possibility of groundline sweep on the bottom and "ghost gear." The proposed TED requirements would possibly have negative effects on habitat due to potential slight increases in towing time. However, this gear is still being tested. The effects of the proposed action on habitat are considered neutral. Overall, the cumulative effect of past, present, and reasonably foreseeable future fishing actions has resulted in low positive effects on habitat.

Climate change is expected to have an impact on the physical characteristics and habitat aspects of marine ecosystems, and possibly change the very nature of these ecosystems. Increased frequency and intensity of extreme weather events, like hurricanes, may change the physical structure of coastal areas. Water circulation, currents, and the proportion of source waters/freshwater intrusion have been observed to be changing (Ecosystem Status Report, NEFSC, 2011) which influences salinity, water column stratification, transport of nutrients, and food web processes. All of these factors, in addition to others like ocean acidification and changes to water chemistry (Rebuck et al. in prep), threaten living elements of the marine environment, such as corals and shellfish, and may be related to the observed shifts in the planktonic community structure that forms the basis of the marine food web (ecosystem status report).

While the impact analysis in this action is focused on direct and indirect impacts to the physical environment and EFH, there are a number of non-fishing impacts that must be considered when assessing cumulative impacts. Many of these activities are concentrated near-shore and likely work either additively or synergistically to decrease habitat quality. Other non-fishing factors such as climate change and ocean acidification are also thought to play a role in the degradation of habitat. The effects of these actions, combined with impacts resulting from years of commercial fishing activity, have negatively affected habitat. However, impacts from the proposed action were found to be negligible. Therefore, when considering the cumulative effects of this action in combination with past, present, and reasonably foreseeable future actions, no significant impacts to the physical environment, habitat or EFH from the proposed action are expected.

Target Species

The management measures described above are expected to have overall neutral to low positive impacts on target species (skates). Effort limits in the NE Multispecies, Monkfish, and Scallop FMPs are likely to constrain skate catches, while the Skate FMP and the proposed action are likely to convert more skate dead discards into landings (relatively neutral fishing mortality) and divert some fishing activity to trips targeting skates.

Future measures that will likely restrict fishing effort (EFH Omnibus) will also have positive effects on target species. Future measures such as the TED requirements would likely result in positive effects to target species because they may help reduce bycatch. Overall, the cumulative effect of past, present, and reasonably foreseeable future fishing actions has resulted in positive effects on target species. The decline in allowable herring landings could open up new markets for alternative lobster baits, some of it filled by either whole skate landings or by the carcasses of skates landed for the wing market.

Climate change is already impacting fishery resources by shifting distributions, abundances, and phenology of species and the communities that depend on them. For example, cold water species are shifting northward. Some of these shifts are in response to warming waters and some are in response to changes in population abundance and age-structure. Water temperatures are known to exert significant influence different life stages, on reproductive and developmental processes, growth rates, and increase the likelihood of disease. With shifting species distribution, loss of habitat, and changes in mortality, the ability of some fish stocks to respond to harvesting pressure may be reduced, while the ability of some fish stocks may be increased.

These impacts are expected to intensify in the future, increasing the need for a better understanding of which fishery resources are the most vulnerable. NMFS has developed a tool for rapidly assessing and indexing the vulnerability of fish stocks to climate change. The index can help fishery managers identify high vulnerability stocks and more effectively target limited research and assessment resources on stocks of highest concern. The methodology combines a stock's exposure and sensitivity (which includes adaptive capacity) to estimate overall vulnerability. The methodology was published in October 2015 (Morrison, et. al., 2015). Pilot tests have found the methodology to be robust across temperate and tropical ecosystems. A full assessment was expected to be run in the northeast U.S. for all managed fish and shellfish species in the Spring of 2014 (Nelson et al. in prep) but is not available at this time.

As found in the cumulative effects analysis for FW1, the long-term trend has been positive for cumulative impacts to target species. While thorny skate remains overfished, effort reductions in the NE

Multispecies, Monkfish, and Scallop FMPs have allowed other skate stocks to rebuild, and the rebuilding process for others is underway. Due to differences in effort and species distributions, only marginal increases in barndoor, smooth, and thorny skates catch is expected to result from the proposed action, certainly not enough to cause a stock to become overfished and not enough to derail increases in stock biomass for rebuilding stocks. Further, indirect impacts from the effort reductions in other FMPs are also thought to contribute to skate mortality reductions. These factors, when considered in conjunction with the proposed action which would have negligible impacts to target species due to the implementation of the recommended ACL, would not have any significant cumulative impacts.

Non-Target Species and Bycatch

Actions that reduce fishing effort have had positive effects on non-target species and bycatch because in general, less fishing effort results in less impact to non-allocated target species and bycatch. Conversely, actions that increase fishing effort are considered to have low negative effects on non-target species and bycatch because more fishing generally results in more bycatch. Increases in directed skate fishing effort are likely to come from diverted fishing activity targeting other species, due in part to the requirement to have a multispecies, scallop, or monkfish DAS limited access permit. And when this occurs, it would decrease catch of non-target species that occur more frequently in other areas than those where vessels fish for skates.

Catch of primary non-target species in the skate fishery is monitored and controlled through other FMPs. TED requirements would likely have a positive effect on non-target species and bycatch and discards as they would likely exclude some of these species from capture in the cod end. Overall, the cumulative effect of past, present, and reasonably foreseeable future fishing actions has resulted in positive effects on non-target species and bycatch.

Skates are typically harvested incidentally to fishing for other more valuable species. The primary non-target and bycatch species analyzed for the purposes of this EA are monkfish, spiny dogfish, groundfish, and prohibited skates (barndoor, thorny, and smooth). Management efforts in the past have led to these species being managed under their own FMP. While some groundfish stocks remain in an overfished condition, or subject to overfishing, actions in the NE Multispecies FMP (e.g. Amendment 16) are attempting to control mortality on these stocks. Monkfish, spiny dogfish, barndoor skate, and smooth skate are no longer overfished or experiencing overfishing. Only thorny skate remains overfished but is no longer experiencing overfishing, however, there is little overlap between skate or groundfish fishing effort and thorny skate distribution (e.g. deep basins in the Gulf of Maine) (NEFMC 2009). Mortality and effort controls such as NE Multispecies, Monkfish, and Scallop DAS collectively help reduce bycatch of non-target species. Impacts to all of these species from the proposed action were found to be negligible, and the proposed action would not result in any significant cumulative direct or indirect impacts.

Protected Resources

Past and present actions in fisheries that catch skates (groundfish, monkfish, scallop) have had negligible or positive effects on protected resources. Management plans for marine mammals have implemented effort restrictions and had positive affects by reducing injuries and deaths. Future positive impacts are likely.

For sea turtles, changes to both their marine and terrestrial environment due to climate change pose a challenge. Recent studies suggest that warming temperatures at nesting beaches could have the strongest impacts on sea turtle populations due to reduced nest success and recruitment (Santidrian-Tomillo et al. 2012; Saba et al. 2012). Additionally, increased severity of extreme weather events may create erosion and damage to turtle nest and nesting sites (Goldenberg et al 2001; Webster et al 2005, IPCC 2007), resulting in a further reduction in nest success and recruitment. These potential declines in the success of nesting could have profound effects on the abundance and distribution of sea turtles. Moreover, warming air temperature can also affect the demography of sea turtle populations because the sex ratio of hatchling sea turtles is determined by the temperature during incubation in nesting beaches. Female offspring are produced at warmer temperatures and thus climate change could lead to a lower ratio of males in the population. Changes in water circulation near nesting beaches could affect the early life history stages of sea turtles by transporting passively-drifting hatchlings to waters that may have increased predation rates (Shillinger et al. 2012). Furthermore, prey availability and quality may also be affected by climate change but these projections are far less certain.

Marine mammals are subject to impacts from global climate change through climate variability, water temperature changes, changes to ocean currents, changes in impact primary productivity and prey species availability. For example, shifts in zooplankton patch formation, which have already been observed, could affect the feeding opportunities and therefore populations of North Atlantic Right Whales (NEQ website). Susceptibility to disease, changes in toxicant exposure, and decreased reproductive success with rising ocean temperatures and related climate-ecosystem changes is also of concern (Burek et. al, 2008). Species that migrate to feeding grounds in polar regions (including many baleen whale populations) may be more susceptible to climate change in the near-term since conditions in the polar regions are changing more rapidly than in temperate regions.

The proposed action is not expected to increase the potential for gear interactions with protected species. This action would likely have neutral to low positive impacts on protected resources. Historically, the implementation of FMPs has resulted in reductions in fishing effort and as a result, past fishery management actions are thought to have had a slightly positive impact on strategies to protect protected species. Gear entanglement continues to be a source of injury or mortality, resulting in some adverse effects on most protected species to varying degrees. One of the goals of future management measures will be to decrease the number of marine mammal interactions with commercial fishing operations. The cumulative result of these actions to meet mortality objectives will be slightly positive for protected resources. The effects from non-fishing actions are also expected to be low negative as the potential for localized harm to VECs exists. The combination of these past actions along with future initiatives to reduce turtle interactions through the Sea Turtle Strategy when considered with the proposed action would not result in significant cumulative impacts.

Human Communities

The effects of past, present, and reasonably foreseeable future fishery management actions have been slightly positive on nearly all VECs with the exception of human communities. Mandated reductions in fishing effort have resulted in negative economic impacts to human communities. Management measures designed to benefit protected resources and restrict fishing effort have low negative effects on the human communities. However, the implementation of annual catch limits and expansion of opportunities through numerous sectors and achievement of the larger goal of fishing groundfish stocks at sustainable rates and rebuilding groundfish stocks to of scallops, spiny dogfish, and monkfish have also helped increase revenue and positive economic impacts. Overall, the cumulative effect of past, present, and reasonably foreseeable future fishing actions has resulted in negative effects on human communities.

As both the physical and ecological elements of the coastal and marine environments change through the impacts described in this section, there will be increasing challenges for the communities and individuals that depend on healthy and productive coasts and marine fisheries. The dynamics of certain fisheries may change entirely. Human communities also face a variety of other threats from changing climate including to human health concerns, energy, transportation, water resources, and food production.

The proposed action would have neutral impacts on human communities; the decrease in allowable landings of skates reduces landings to levels observed in recent fishing years. The status quo possession limits would allow the fisheries to maximize potential of achieving the TAL. Therefore, the proposed action when taken into consideration with past, present, and reasonably foreseeable future actions is not expected to have significant cumulative impacts. Table 41 summarizes the cumulative effects resulting from implementation of the proposed action and CEA baseline.

Table 41 - Cumulative Effects resulting from implementation of the proposed action and CEA Baseline.

		Biological Impacts				
		Habitat Impacts	Allocated Target Species	Non-allocated Target Species and Bycatch	Endangered/ Protected Species	Human Community Impacts
Cumulative Effect Baseline	Effects of Past, Present, and Reasonably Foreseeable Future Non-Fishing Actions	Low negative / negligible	Low negative / negligible	Low negative / negligible	Low negative / negligible	Low negative / negligible
	Effects of Past, Present, and Reasonably Foreseeable Future Fishing Actions	Positive	Positive	Positive	Negligible / positive	Negative
Direct and Indirect Effects of Proposed /Supplemental Action		Negligible	Negligible	Negligible	Negligible	Negligible
Cumulative Effects Summary of Effects from implementation of Proposed Action and Cumulative Effect Baseline		Negligible	Negligible	Negligible	Negligible	Negligible

8.0 Applicable Law

8.1 MAGNUSON-STEVENS FISHERY MANAGEMENT AND CONSERVATION ACT (MSA)

Section 301 of the Magnuson-Stevens Act requires that FMPs contain conservation and management measures that are consistent with the ten National Standards. The most recent Skate FMP changes implemented by Amendment 3 and FW1 address how the proposed management actions comply with the National Standards (refer to Section 6.1 of Amendment 3 and Section 7.1 of the FW1 EA). Under Amendment 3, the NEFMC adopted conservation and management measures that would rebuild overfished skate stocks to achieve, on a continuing basis, the optimum yield for US fishing industry using the best scientific information available consistent with National Standards 1 and 2. The Skate FMP and implementing regulations manage all seven skate species throughout their entire US range, as required by National Standard 3. Amendment 3 (Section 6.1) and FW1 (Section 7.1) describes how the measures implemented under that action do not discriminate among residents of different states consistent with National Standard 4, do not have economic allocation as their sole purpose (National Standard 5), account for variations in these fisheries (National Standard 6), avoid unnecessary duplication (National Standard 7), take into account fishing communities (National Standard 8), addresses bycatch in fisheries (National Standard 9), and promote safety at sea (National Standard 10). By proposing to meet the National Standards requirements of the Magnuson-Stevens Act through future FMP amendments and framework actions, the NEFMC will ensure that overfishing is prevented, overfished stocks are rebuilt, and the maximum benefits possible accrue to the ports and communities that depend on these fisheries and the Nation as a whole.

The proposed action would comply with all elements of the Magnuson-Stevens Act, including the National Standards, and the Skate FMP. This action is being taken in response to new data that indicate an increase in skate biomass, new research on little and winter skate discard mortality, and new information about how the wing fishery responds to various possession limits. The FW1 EA, completed prior to the development of the updated skate ACL, did not contain an analysis of the revised ACL and associated catch limits. Therefore, this EA analyzes the impacts of the revised ABC, ACL, and TALs for skates and adjustments to wing and bait fishery possession limits, in compliance with applicable laws requirement for an analysis of proposed measures.

8.2 National Environmental Policy Act (NEPA)

8.2.1 Finding of No Significant Impacts (FONSI)

This supplemental EA updates the Finding of No Significant Impact (FONSI) consistent with the conclusions derived in the Amendment 3 SEIS, the FW1 EA, and this document.

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

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

Response: The Proposed Action would not jeopardize the sustainability of any of the target species (primarily winter and little skates) affected by the action. The Preferred Alternative adopts catch limits or management measures that are consistent with target fishing levels that have been identified as promoting rebuilding and/or sustaining stock sizes.

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

Response: The Proposed Action is not expected to jeopardize the sustainability of any non-target species. Fishing for skates is typically done on trips targeting more valuable species such as groundfish and monkfish. Effort and catch in these fisheries are controlled by DAS and/or sectors and trip limits. Changes in skate catch limits, therefore, are not expected to influence the sustainability of other species caught on trips that land skates.

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 is not expected to allow substantial damage to the ocean and coastal habitats and/or Essential Fish Habitat (EFH) as defined under the Magnuson-Stevens Act and identified in the FMP. This action is not expected to result in increases in total fishing effort but may result in shifts to/from areas where vessels target skates depending on the level of TAL caught.

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

Response: The Proposed Action is not expected to have a substantial adverse impact on public health and safety. The reduced amount of allowable skate landings combined with the status quo possession limits are not projected to shorten the fishing year based on landings in recent years.

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

Response: On December 16, 2013 NMFS completed a biological opinion regarding the combined impacts of the northeast regional fisheries. Overall, it was concluded that fishing (including monkfish, groundfish and skate FMPs) is likely to adversely affect but not likely to jeopardize any endangered or threatened species, marine mammals, or critical habitat. However, given the incidental nature of the skate fishery, any impacts from this action will be very minor. As discussed in Section 7.4, 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 ecosystem function within the Gulf of Maine, Georges Bank, or Southern New England regions, where the skate fishery primarily occurs. The proposed action is not expected to increase fishing effort in the directed skate fishery or in any of the fisheries that catch skate. Effort restrictions in the multispecies, monkfish, and scallop fisheries have proven effective at limiting the impacts of fishing.

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

Response: There are no significant social and economic impacts of the Proposed Action that are interrelated with natural or physical environmental effects. The Proposed Action would maintain possession limits at a level that is likely to enable the skate fishery to remain open year around, while addressing the overfishing status of a targeted skate species. While fishing industry members that fish for skates would benefit socially and economically by the approval of this action, it is not related with any impacts associated with the biological or physical environment. Such impacts are negligible.

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

Response: The effects of the Proposed Action on the quality of human environment are not expected to be highly controversial. The Proposed Action would not modify the majority of measures proposed by FW2, primarily only the decrease in the ACL and TALs and the establishment of seasonal allocations in the wing fishery. The Proposed Action is not expected to negatively impact habitat, allocated target species, non-allocated target species and bycatch, or protected resources. The methodology of ACL calculation was established in Amendment 3 to the FMP; the Preferred Alternatives don't change that method, rather it only updates the input data. While uncertainty exists in the stock assessment and ABC estimation method for skates, this action is based on the best scientific data available.

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

Response: This action merely revises catch and landings limits for the skate fishery for fishing years 2016 and 2017. Other types of commercial fishing already occur in this area and although it is possible that historic or cultural resources such as shipwrecks could be present, vessels try to avoid fishing too close to wrecks due to the possible loss or entanglement of fishing gear. Therefore, it is not likely that the proposed action would result in substantial impacts to unique areas.

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

Response: The effects of the Proposed Action on the human environment are not expected to be highly uncertain or involve unique or unknown risks. Vessels fishing for skates will primarily use trawl and gillnet gear, and maintain traditional fishing practices which will have no greater impact on habitat, protected species, and limit bycatch species than under current conditions. The skate fishery has been successfully managed under the FMP, and the trends in biomass for nearly all managed skates are encouraging. Therefore, the effects on the human environment are not uncertain or involve unique or unknown risks.

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

Response: The cumulative effects analysis presented in Section 7.7 considers the impacts of the Proposed Action in combination with relevant past, present, and reasonably foreseeable future actions and concludes that no significant cumulative impacts are expected from the approval of the revised catch limits for skates. Further, the Proposed Action would not have any significant impacts when considered individually or in conjunction with any of the other actions presented (fishing related and non-fishing related).

12. *Are the Preferred Alternatives 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 impacts of the proposed measures on the human environment are described in Section **Error! Reference source not found.** of the EA. This action merely revises catch and landings limits in the skate fishery for fishing years 2016 and 2017. Although there are shipwrecks present in the area where fishing occurs, including some registered on the National Register of Historic Places, vessels typically avoid fishing too close to wrecks due to the possible loss or entanglement of fishing gear. Therefore, it is not likely that the proposed action would adversely affect the historic resources listed above.

13. *Can the proposed action reasonably be expected to result in the introduction or spread of a non-indigenous species?*

Response: No non-indigenous species would be introduced during the Proposed Action because the increase in catch affects the scope of current fishing practices and does not introduce new methods. No non-indigenous species would be used or transported during fishing activities. Therefore, the Proposed Action would not be expected to result in the introduction or spread of a non-indigenous species.

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

Response: Amendment 3 established a process in the Skate FMP to estimate ACL and associated catch limits for skates. These catch limits are determined in relation to estimates of skate catch and biomass trends. Significant effects are unlikely, because any future changes to catch limits are constrained by the biomass estimates, and a sustainable proportion of catch from the resource. Most other direct and indirect impacts of the proposed action are not likely to establish any precedents for future actions with significant effects.

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 not expected to threaten a violation of federal, state, or local law or requirements imposed for the protection of the environment. Vessels fishing for skates are required to comply with all local, regional, and national laws and permitting requirements.

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: The Proposed Action is not expected to result in cumulative adverse effects that could have a substantial effect on target or non-target species. As stated in Section 7.7, impact on resources encompassing skates, groundfish, and other stocks is expected to be minimal.

DETERMINATION
In view of the information presented in the FW2 EA and this document, the analysis contained in the supporting EA prepared for the approval of revised catch limits for skates, it is hereby determined that the approval of the revised Skate ABC and catch limits will not significantly impact the quality of the human environment as described above and in the supporting EA. In addition, all beneficial and adverse impacts of the Proposed Action have been addressed to reach the conclusion of no significant impacts. Accordingly, preparation of an Environmental Impact Statement (EIS) for this action is not necessary.

__________________________ ____________________
John K. Bullard Date
Regional Administrator Greater Atlantic Region, NMFS

8.2.2 List of preparers; point of contact

Questions concerning this document may be addressed to:
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The information contained in this document was prepared throughout the cooperative efforts of the Skate Plan Development Team members, and other members of the staffs of NMFS and the New England Fishery Management Council. Contributors are:

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8.2.3 Agencies consulted

This proposed action was developed by the New England Fishery Management Council in coordination with the National Marine Fisheries Service.

8.2.4 Opportunity for public comment

The Preferred Alternatives were developed during the period August 2015 through December 2015 and were discussed at the following meetings. Opportunities for public comment were provided at each of these meetings.

Date	Meeting Type	Location
8/10/2015	Skate PDT	Mariners House, Boston, MA
9/1/2015	Science and Statistical Committee	Hilton Garden Inn, Boston, MA
10/21/2015	Joint Advisory Panel and Skate Oversight Committee	Radisson Airport Hotel, Warwick, RI
9/29-10/1/2015	Council Meeting	Radisson Plymouth, Plymouth, MA
10/28/2015	Skate PDT Conference Call	
11/12/2015	Joint Advisory Panel and Skate Oversight Committee	Radisson Airport Hotel, Warwick, RI
12/1-12/3/2015	Council Meeting	Holiday Inn by the Bay, Portland, ME

8.3 Endangered Species Act (ESA)

Section 7 of the ESA requires Federal agencies conducting, authorizing, or funding activities that affect threatened or endangered species to ensure that those effects do not jeopardize the continued existence of listed species. In a Biological Opinion dated December 16, 2013, NMFS determined that fishing activities conducted under the Skate FMP and its implementing regulations are not likely to jeopardize the continued existence of any endangered or threatened species under the jurisdiction of NMFS or result in the destruction or adverse modification of critical habitat. An informal consultation under the ESA for FW1 measures was conducted. This action is consistent with, and does not affect the analysis and conclusions of the FW1 EA regarding compliance with the ESA. For further information, refer to Section 8.2 of the FW1 EA.

8.4 Marine Mammal Protection Act (MMPA)

NMFS has reviewed the impacts of FW1 and the Skate FMP on marine mammals and concluded that the specifications are consistent with the provisions of the MMPA and would not alter existing measures to protect the species likely to inhabit the management unit of the Skate FMP. For further information on the potential impacts of the proposed management action, see Section 7.4 of this document.

8.5 Coastal Zone Management Act (CZMA)

Section 307(c)(1) of the CZMA requires that all Federal activities which affect any coastal use or resource be consistent with approved state coastal zone management programs (CZMP) to the maximum extent practicable. NMFS has reviewed the relevant enforceable policies of each coastal state in the NE region for this action and has determined that this action is incremental and repetitive, without any cumulative effects, and is consistent to the maximum extent practicable with the enforceable policies of the CZMP of the following states: Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Delaware, Pennsylvania, Maryland, Virginia, and North Carolina. NMFS finds this action to be consistent with the enforceable policies to manage, preserve, and protect the coastal natural resources, including fish and wildlife, and to provide recreational opportunities through public access to waters off the coastal areas. Pursuant to the general consistency determination provision under Section 307 of the CZMA and codified at 15 CFR 930.36(c), NMFS sent a general consistency determination applying to Amendment 3 to the Skate FMP, and all routine Federal actions carried out in accordance with the FMP, to the following states: Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Delaware, Pennsylvania, Maryland, Virginia, and North Carolina on December 18, 2009. New Hampshire, Connecticut, Pennsylvania, New Jersey, Delaware, Virginia, and North Carolina have concurred with this determination. For the remaining states that have not responded, consistency has been inferred pursuant to the consistency letter.

8.6 Administrative Procedure Act

Section 553 of the APA establishes procedural requirements applicable to 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, no abridgement of the rulemaking process for this action is being requested.

8.7 Information Quality Act (IQA)

Pursuant to NOAA guidelines implementing Section 515 of Public Law 106-554 (the Information 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.

Utility

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.

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 NMFS to propose this action are the result of a multi-stage public process.

The *Federal Register* notice that implements the proposed revision to the skate catch limits would be made available in printed publication and on the NMFS NE Regional Office website. Instructions for obtaining a copy of this supplemental EA are included in the *Federal Register* notice.

Integrity

Prior to dissemination, information associated with this action, independent of the specific intended distribution mechanism, is safeguarded from improper access, modification, or destruction, to a degree commensurate with the risk and magnitude of harm that could result from the loss, misuse, or unauthorized access to or modification of such information. All electronic information disseminated by NMFS adheres to the standards set out in Appendix III, "Security of Automated Information Resources," of OMB Circular A-130; the Computer Security Act; and the Government Information Security Act. All confidential information (e.g., dealer purchase reports) is safeguarded pursuant to the Privacy Act; Titles

13, 15, and 22 of the United States Code (confidentiality of census, business, and financial information); the Confidentiality of Statistics provisions of the Magnuson-Stevens Act; and NOAA Administrative Order 216-100, Protection of Confidential Fisheries Statistics.

Objectivity

For the purposes of the Pre-Dissemination Review, this supplemental EA 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 EFH Guidelines; the National Standard Guidelines; and NOAA Administrative Order 216-6, Environmental Review Procedures for Implementing the NEPA.

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 the recommended ACL reported in this product are based on the results of the NEFSC bottom trawl survey and catch statistics reported to NMFS, and were subject to peer-review through the Council's Skate PDT and SSC. These methods were developed and peer-reviewed during the 2008 Northeast Data Poor Stocks Working Group stock assessment of the skate complex (NEFSC 2009). These reports are developed using an approved, scientifically valid sampling process. Original analyses in this supplemental EA build upon the analyses contained in Amendment 3 and the FW1 EA, and were prepared using data from accepted sources, and the analyses have been reviewed by NOAA.

Despite current data limitations, the measures proposed for this action were selected based upon the best scientific information available (NEFMC 2011). The principal author of this document is a professional fishery scientist employed by the Council, the chair of the Council's Skate Plan Development Team, and is familiar with the available data and information relevant to the state of the regulated fisheries under the FMP, fishing techniques in the NE Region, biology of skates, and the socioeconomic impacts of the fisheries on impacted communities.

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, or incorporated by reference, in Sections 6.0 and 7.0 of this supplemental EA. 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 supplemental EA involves the Northeast Fisheries Science Center, the Northeast Regional Office, and NMFS 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. 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 supplemental EA and clearance of any rules prepared to implement resulting regulations is conducted by staff at NMFS Headquarters, the Department of Commerce, and the United States Office of Management and Budget.

8.8 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 the proposed action. 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.

8.9 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 Amendment, 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.

8.10 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. PRA for data collections relating to the Skate FMP have been considered and evaluated under the original Skate FMP implemented in 2003, and approved by the Office of Management and Budget (OMB). This action relies upon the existing collections, including those approved by the OMB under the original FMP, and does not propose to modify any existing collections or to add any new collections. Therefore, no review under the PRA is necessary for this action.

8.11 Regulatory Impact Review

8.11.1 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 7.5 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.

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:

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

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

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

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

A more detailed discussion of economic impact is provided in Section 7.5. The discussion to follow provides a summary of those findings.

8.11.1.1 Objectives

The goals and objectives of Framework Adjustment 2 are the same as those detailed in the original Northeast Skate Complex FMP and are as follows:

> **Goal**: Consistent with the requirements of the Magnuson-Stevens Fishery Conservation and Management Act and other applicable laws, to develop a Fishery Management Plan to research and manage the Northeast Skate Complex at long-term sustainable levels
> **Objective 1**: Collect information critical for substantially improving knowledge of skate fisheries by species and for monitoring: (a) the status of skate fisheries, resources, and related markets and (b) the effectiveness of skate management approaches
> **Objective 2**: Implement measures to: protect the two currently overfished species of skates (barndoor and thorny) and increase their biomass to target levels, reduce fishing mortality on winter skate, and prevent overfishing of the other species in the Northeast skate complex – this may be accomplished through management measures in other FMPs (groundfish, monkfish, scallops), skate-specific management measures, or a combination of both as necessary.
> **Objective 3**: Develop a skate permit system, coordinate data collection with appropriate state agencies for vessels fishing for skates or catching skates as bycatch only in state waters, and work with the fishing industry to establish a catch reporting system consistent with industry capabilities, including the use of study fleets.

Objective 4: Minimize the bycatch and discard mortality rates for skates caught in both directed and on-directed fisheries through the promotion and encouragement of experimentation, conservation engineering, and gear development.
Objective 5: Promote and encourage research for critical biological, ecological, and fishery information based on the research needs identified in the Skate SAFE Report and scoping document, including the development and dissemination of a skate species identification guide.
Objective 6: Minimize, to the extent possible, the impacts of skate management approaches on fisheries for other species on which New England and Mid-Atlantic fishermen depend (for example, groundfish, monkfish, scallops, and fluke), recognizing the interconnected nature of skate and other fisheries in the Northeast Region.
Objective 7: To the extent possible, manage clearnose and rosette skates separately from the other five species in the skate complex, recognizing that these two species are distributed primarily in the Mid-Atlantic and South Atlantic regions.

8.11.1.2 Description

A description of the entities affected by this Framework Adjustment, specifically the stakeholders of the Northeast Skate Fishery, is provided in Section 6.5 of this document.

8.11.1.3 Problem Statement

The need and purpose of the actions proposed in this Framework Adjustment are set forth in Section 3.2 of this document and are incorporated herein by reference.

8.11.1.4 Analysis of Alternatives

This section provides an analysis of each proposed alternative of FW3 as mandated by EO 12866. The focus will be on the expected changes 1) in net benefits and costs to stakeholders of the Northeast Skate fishery, 2) changes to the distribution of benefits and costs within the industry, 3) changes in income and employment, 4) cumulative impacts of the regulation, and 5) changes in other social concerns. Much of this information is captured already in the detailed economic impacts and social impacts analyses of Sections 7.5 and 7.6 of this document. This RIR will summarize and highlight the major findings of the economic impacts analysis provided in Section 7.5 of this document, as mandated by EO 12866. For social impacts of each alternative, see Section 7.6.

8.11.1.4.1 Updates to Annual Catch Limits

A detailed description of this alternative can be found in Section 4.1 of this document.

8.11.1.4.1.1 Option 1: No Action

Under the no Action Alternative, no changes in ACL or TAL would occur. Although recent landings have been below the TAL, this alternative carries the distinct possibility of allowing landings to exceed the TAL based on revised data. In the long run, this option may lead to future declines in biomass and catch, more restrictive regulation and the failure to reach optimum yield, which would result in a negative and potentially significant economic impact to the fishery.

8.11.1.4.1.2 Option 2: Revised Annual Catch Limit Specifications (Preferred Alternative)

Under this alternative, the TAL would be reduced from 18,001 mt to 12,872 mt. Reductions in the ACL and TAL themselves do not necessarily necessitate changes in management measures, reductions in fishery effort, or changes in fishery profits. The Option 2 TAL (12,872 mt) is below the total catch by federally reporting vessels from FY 2014 (16,251 mt). Accountability Measures (AMs) are triggered when the skate wing fishery TAL or skate bait fishery TAL is determined to have been exceeded by more than 5% in any given year. In that event, the Regional Administrator will reduce the in-season possession limit trigger for that fishery in the next fishing year by 1% for each 1% of the TAL overage. If the ACL is exceeded in any given year, the percent buffer between the ACL and the ACT shall be increased by 1% for each 1% ACL overage. In-season adjustments may also be made to the possession limits when catch of skate wings reaches 85% of the wing TAL or 90% for the skate bait fishery, as established in FW1 and A3 to the FMP. For either fishery, a lower TAL increases the likelihood of triggering AMs and the incidental possession limits. While the long-run economic benefits of both skate fisheries depend on meeting, but not exceeding, the TAL, short-term negative economic impacts may accrue to the targeted skate fishery as a result of this alternative.

8.11.1.4.2 Skate Wing Possession Limit Alternatives

A detailed description of this alternative can be found in Section 4.2 of this document.

8.11.1.4.2.1 Option 1: No Action (Preferred Alternative)

When combined with Updates to ACL Alternative 2: Revised ACL Specifications, the wing possession limits associated with this alternative could potentially result in more frequent in-season adjustments to possession limits due to the triggering threshold remaining at 85% of TAL and a decreased TAL. The distribution and estimated magnitude of the economic impact of a lower TAL combined with status quo possession limits would be expected to trigger the incidental possession limit prior to the end of the fishing year based on a simulation analysis.

In most cases, this option would result in overall landings closer to TAL compared to Option 2, and would result in less frequent AM triggering compared to Option 3 and overall higher landings without exceeding the TAL. Therefore, Option 1: No Action represents the net-benefit maximizing alternative.

8.11.1.4.2.2 Option 2: Revised Skate Wing Possession Limit

Option 2 would reduce the wing possession limit for skates. It is not clear that changing the skate possession limit changes the level of fishing effort. If however, the reduction in the possession limit reduces directed fishing effort on skates, this reduction will occur during the summer months when interactions of skate gear with turtles tend to be higher in Southern New England and Georges Bank. Vessels may shift fishing effort to areas of lower skate density to reduce skate encounters that can be time consuming; there is no economic benefit to discarding skate.

Simulations performed in Section 7.5.2.2 indicate that this Skate Wing Possession Limit alternative would have resulted in a lower percentage of TAL achieved in FY2011 but would have fully achieved the TAL, while triggering the incidental possession limit approximately 4 months prior to the end of the fishing year in FY2014. If TAL is set at or near the optimum harvest point, any action that constrains harvest significantly below TAL represents an economic loss to the fishery.

8.11.1.4.2.3 Option 3: Revised Skate Wing Possession Limit

This alternative would eliminate the seasonal trip limits and replace them with a constant skate wing possession limit between the range of 2,500 to 3,000 lbs. The economic benefit of a constant possession limits depends upon the corresponding skate wing TAL. To estimate the likelihood of exceeding a proposed TAL, a counterfactual trip landing was generated for every trip in FY2013 and FY2014.

To simulate landings under a 2500 to 3000 lbs possession limit, the landings were set at either (1) the possession limit *if and only if* the actual trip landings were more than 100 live lbs below the actual possession limit (in live pounds), or (2) the actual trip landings *if* the actual trip landings was within 100 live lbs of the actual possession limit (in live pounds). Trips within 100 live lbs of the possession limit would be considered a "skate targeting / maximizing" trip, and would be assigned a counterfactual landing.

The counterfactual represents a likely upper-bound for landings. Based on the simulation analysis, under FY2014 conditions, the TAL would likely have been exceeded, except for the 2600 lbs possession limit (Table 39, options 423 a-f). FY2014 represented a high year for skate landings; in the FY2014 counterfactual, the incidental possession limit would have been triggered in January or December (April, March, or February for 2013 conditions), and the wing TAL would have been exceeded in the previous month (the way the analysis was run if 85% of the TAL was reach in month A the incidental possession limit was implemented in month B). Based on the simulation analysis, the result is lost revenue, ranging from 13.5% to 15.9% in 2013 and 19.1% to 23.4% in 2014 and lost landings, ranging from 1.8 to 2.3 million pounds in 2013, 4.6 to 5.6 in 2014. The TAL, however, would not be achieved in FY2013 and somewhat exceeded in FY2014 (except under the 2,600 lbs possession limit). On the other hand, the costs associated with changing the possession limit from thousands to 500 landed pounds may result in a large number of skate 'trips' not occurring during February through April (2013 conditions) and December through April (2014 conditions). Drastic changes in ex-vessel prices, although not measured, from the heavy to the light landing periods also are likely.

8.11.1.4.3 Bait Possession Limit Alternatives

A detailed description of this alternative can be found in Section 4.3 of this document.

8.11.1.4.3.1 Option 1 No Action (Preferred Alternative)

This action would keep the skate bait possession limit constant at 25,000 lbs. In FY2013, 9 trips landed within 1,000 lbs of the possession limit. In 2014, 15 out of the 1,766 federally-reported skate bait trips came within 1,000 lbs of the 25,000 lbs trip limit. However, the bait fishery operates largely to order and would be expected to adjust landings in order to not exceed the 90% in-season trigger or the TAL. Option 1 would be expected to have low negative impacts because of the reduction in the TAL combined with the status quo possession limits would result in a higher likelihood of triggering AMs.

8.11.1.4.3.2 Option 2: Revised Skate Bait Possession Limit

This action would lower the skate bait possession limit to 20,000 lbs. In FY2013, 47 trips out of 1,823 landed greater than the proposed possession limit. In FY2014, 46 out of 1,765 trips landed greater than the proposed possession limit. In FY2013 and FY2014, a total of 2,092,937 live lbs of skate bait were landed in excess of the proposed possession limits. This amount represents approximately 10% of all FY2013-FY2014 bait landings. Although vessels who reach the lower proposed possession limit can shift additional catch to other trips to offset potential losses, the impact of this proposed possession limit would be expected to result in an economic loss, assuming that TAL is not exceeded under either possession limit. A reduction in landings for a fishery that has not reached its TAL would represent a real, negative economic loss in comparison to Option 1: No Action. If the fishery adjusts landings as expected, the TAL is not likely to be exceeded, nor is the 90% AM trigger expected to be reached, under either possession limit. Therefore, no future benefits are gained through a reduction in catch and the proposed constraining possession limit constitutes an un-necessary economic loss for the skate fishery.

8.11.1.4.4 Wing Fishery Seasonal Management Alternatives

A detailed description of this alternative can be found in Section 4.4 of this document.

8.11.1.4.4.1 Option 1: No Action

The No Action alternative would maintain the seasonal structure established in Framework Adjustment 1 for skate wing possession limits. The fishing year would remain divided into two seasons: season 1 (May 1 to Aug 31) and season 2 (Sep 1 to Apr 30). This would maintain the current levels of fishing opportunities for vessels. When combined with Updates to ACL Alternative 2: Revised ACL Specifications, the wing possession limits associated with this alternative could potentially result in more frequent in-season adjustments to possession limits due to the triggering threshold remaining at 85% of TAL and a decreased TAL. The distribution and estimated magnitude of the economic impact of a lower TAL combined with status quo possession limits would be expected to trigger the incidental possession limit prior to the end of the fishing year based on a simulation analysis.

In most cases, this option would result in overall landings closer to TAL compared to Option 2, and would result in less frequent AM triggering compared to Option 3 and overall higher landings without exceeding the TAL. Therefore, Option 1: No Action represents the net-benefit maximizing alternative.

8.11.1.4.4.2 Option 2: Modification of Wing fishery Seasonal Management (Preferred Alternative)

This alternative would create seasonal TALs for the wing fishery consistent with the existing seasonal skate wing possession limits (2600 and 4100 landed pounds) and alternative limits (2000 and 3000 landed pounds). The first season would be allocated 57 % of the annual TAL (representing 10,756,684 live pounds in 2016 and 2017) for May 1 to August 31. The second season would be allocated 43% of the annual TAL (representing 8,114,692 live pounds in 2016 and 2017) for September 1 to April 30.

Based on the simulation analysis for status quo possession limits, under 2013-2014 conditions, revenues declined 3.5% and 15.2% respectively, while landings declined, by 851 and 3,719 thousand pounds. The truncated total landings would not achieve the TAL in FY2013, but would exceed it by 9.2% in 2014.This scenario would have the lowest negative short-term economic impacts, because the estimated revenue loss is less than that of Option 1 under both 2013 and 2014 conditions. The alternative skate wing possession limits of 2000/3000 landed pounds would result in revenue loss of 10.7% and 19.3% in FY2013 and FY2014, respectively; lost landings are 2.1 and 3.7 million live pounds. TAL is not achieved in 2013 by nearly 10%, and exceeded by 3.8% in 2014. Option 2 would have low short-term negative economic impacts because of estimated revenue losses associated.

8.11.1.4.4.3 Option 3: Revised Skate Wing Seasonal Structure

This alternative would create seasonal TALs for the wing fishery consistent with the existing seasonal skate wing possession limits, or for seasonal possession limits of 2000/3000. The first season would be allocated 57 % of the annual TAL (representing 10,756,684 live pounds in 2016 and 2017) for May 1 to July 31. Between August 1 and September 15, the incidental possession limit of 500 lbs would be implemented, regardless of whether the in-season trigger point had been reached. The second season would be allocated 43% of the annual TAL (representing 8,114,692 live pounds in 2016 and 2017) for September 1 to April 30, along with any shortfall from the first season.

The difference between Option 3 and Option 2 is the automatic imposition of the 500 pound wing weight possession limit in August. Based on the simulation analysis, possession limits of 2600/4100/500, results in an estimated 10.8% loss in revenue under FY2013 conditions (-19.3% estimated revenue loss in FY2014) and an estimated landings loss of 2.4 million pounds (-4.7 million lb estimated loss in FY2014). Simulation results indicated that possession limits 2000/3000/500, would result in an 18.6% estimated revenue loss under FY2013 conditions (-24.4% in 2014) and estimated lost landings of 3.8 million pounds (-6 million lb in FY2014). This would have negative short-term economic impacts on the fishery because of the loss in revenues.

8.11.1.5 Determination of Significance

The analysis included in this document shows that this action is not a “significant regulatory action” because it will not affect in a material way the economy or a sector of the economy. The preferred Update to Annual Catch Limits Alternative would adopt the TAL consistent with optimal yield in the long-run, maximizing economic benefits of the fishery. The preferred Skate Wing Possession Limit Alternative, though it would result in more frequent triggering of accountability measures (AMs), would reach the TAL associated with the optimum yield, maximizing long-run benefits. The preferred Bait Possession Limit Alternative (Option 1: No Action) would be most likely to harvest TAL without exceeding it, and would thus represent the long-run economic benefit-maximizing option. The preferred wing fishery seasonal management alternative would have the lowest negative short-term economic impact based on the estimated revenue losses expected from the combined changes in possession limits and proposed TAL.

8.11.2 **Initial Regulatory Flexibility Analysis (IRFA)**

8.11.2.1 Introduction

The Regulatory Flexibility Act (RFA) requires agencies to assess the impacts of their proposed regulations on small businesses. The Regulatory Flexibility Act Analysis (RFAA) determines whether the proposed action would have a significant economic impact on a substantial number of small entities. The Small Business Administration (SBA) size standards define whether a business entity is small and, thus, eligible for Government programs and preferences reserved for "small business" concerns. Size standards have been established for all for-profit economic activities or industries in the North American Industry Classification System (NAICS). The SBA defines a small business in the finfish fishing sector (NAICS code 114111) as a firm or affiliate group with gross revenue of $20.5 million; and the shellfish fishing sector (NAICS code 114112) as a firm or affiliate group with gross revenue of $5.5 million or more.

This section provides the Initial Regulatory Flexibility Analysis (IRFA) of the potential economic impacts of the proposed action, as required by the RFA. The IRFA identifies the number and types of businesses that would be regulated, indicates how many of these entities are small businesses, explains the expected economic impact of the regulation on these businesses and describes any feasible alternatives that would minimize negative economic impacts.

8.11.2.2 Description of the Reasons Why Action by Agency is Being Considered

The need and purpose of the actions are set forth in Section 3.2 of this document and are incorporated herein by reference.

8.11.2.3 Statement of the Objectives and Legal Basis for the Proposed Action

The need and purpose of the actions are set forth in Section 3.2 of this document and are incorporated herein by reference.

The goals and objectives of Framework Adjustment 3 are the same as those detailed in Amendment 3 and original Northeast Skate Complex FMP. In general, FW 3 is intended to modify catch limits and management measures to ensure that overfishing does not occur, while at the same time achieving optimal yield (OY).

8.11.2.4 Description and Estimate of the Number of Small Entities to which the Proposed Rule will apply

The proposed decrease in the Skate ACL and TALs would impact vessels that hold Federal open access commercial skate permits that participate in the skate fishery or affiliated groups that hold multiple open access commercial skate permits that participate in the skate fishery. Within the skate fishery, the majority of affiliate groups consist of a single permit-holder, or 248 vessels in fishing year 2014. The remaining 116 vessels belong to affiliate groups that hold two or more permits. Aggregate group records in the NOAA dealer database are removed from these numbers.

The economic analysis in Section Economic Analysis simulates impacts for the fishing years 2013 (low resource) and 2014 (higher resource) conditions, and is used to compare to the NOAA Affiliates database. The Affiliates data are assembled by NOAA, as of June 1st each year, for analysis required by the Regulatory Flexibility Act. Fishing vessels (permits) are linked together, an industry determination is made (finfish, shellfish, no revenue), and firms are classified as small or large based on SBA guidelines. Per SBA guidelines, a 3 year average is used to make the "small" determination, as well as measure affiliate group total revenues.

The Affiliates database indicates the maximum number of small fishing entities (as defined by the Small Business Administration (SBA)) that may be affected by this action is 597 and 629 entities, in 2013 and 2014 respectively (Table 42). However, 3 and 13 of these affiliates, respectively, are no revenue operations (party/charter boats) and are not affected by this action. During fishing years 2013 and 2014, only 441 and 433 affiliate groups, respectively, landed any amount of skate. At the permit level, every skate landing permit is defined as a small business according to SBA standards (the top five vessels have total revenues between 2 and 2.5 million dollars in 2014). At the affiliate group level, of these 364 entities, 3 (0.8%) are defined as large businesses based on 2014 landings

Table 42 - Skate fishery summary data for 2014 fishing year (Source: NMFS Dealer data), and affiliate groups for 2014 calendar year (Source: NOAA Affiliates database)

Number of individual permits landing skates	431
Number of vessels without affiliation	364
Number of vessels in affiliate groups	67
Total entities in Affiliates database	629

8.11.2.5 Reporting, Recordkeeping and Other Compliance Requirements

This action does not introduce any introduce any new reporting, recordkeeping, or other compliance requirements. This action does alter currently available reporting codes but does not create any additional reporting, record-keeping or other compliance requirements. This proposed action does not duplicate, overlap, or conflict with other Federal rules.

8.11.2.6 Description of Steps the Agency Has Taken to Minimize the Significant Economic Impact on Small Entities Consistent with the Stated Objectives of Applicable Statutes

During the development of FW3, NMFS and the Council considered ways to reduce the regulatory burden on and provide flexibility to the regulated community. The measures implemented by the FW3 final rule minimize the long-term economic impacts on small entities to the extent practicable. The proposed action decreases the total allowable landings (TAL), and the wing and bait possession limits are reduced in an effort to allow the fisheries to achieve the full available TAL at minimum economic impact. This is expected to allow the fishery to land the TAL with a moderate possibility of triggering the incidental trip limit. Based on FY2014 data, a most entities would see some decline in total landings revenue. Overall, long term impacts of FW3 rule, as well as the related actions of the Skate FMP, are minimized by ensuring that management measures and catch levels are sustainable and contribute to rebuilding stocks and, therefore, maximizing yield, as well as providing additional flexibility for fishing operations in the short term.

8.11.2.7 Economic Impacts on Small Entities Resulting from Proposed Action

The economic impact resulting from this action on these small entities is associated with the possession limit; the preferred alternative may be more likely, than No Action, to trigger the incidental trip limit under the lower ACL. Based on recent landing information the fishery is more likely to land close to the full amount of skates allowable under the quotas. The Preferred Alternative is certain to result in greater revenue from skate landings when compared to the other wing possession limit options that would lower possession limit or increase it to a level that was highly likely to trigger an AM (see Section Economic Analysis). Not enough is known about the economic status of this fishery to determine what level of revenue loss would result in small entities falling below break-even.

Under 2013 fishing conditions, a 3.5% revenue loss would have occurred in the skate fishery under the preferred alternative. Based on fishing year 2014 data and assuming no mitigating shifts in seasonal effort (a worst-case scenario), the preferred alternative is expected to result in a reduction from 5 to 10 percent of total landings revenue for 12 affiliate groups, from 10 to 15 percent for 12 affiliate groups, from 15 to 25 percent for 6 affiliate groups, and over 25 percent for 1 affiliate group. All 31 affiliate groups are considered "small" and represent 42.4% of all skate landings. Table 43 shows more detail about these impacts, from the Affiliate database:

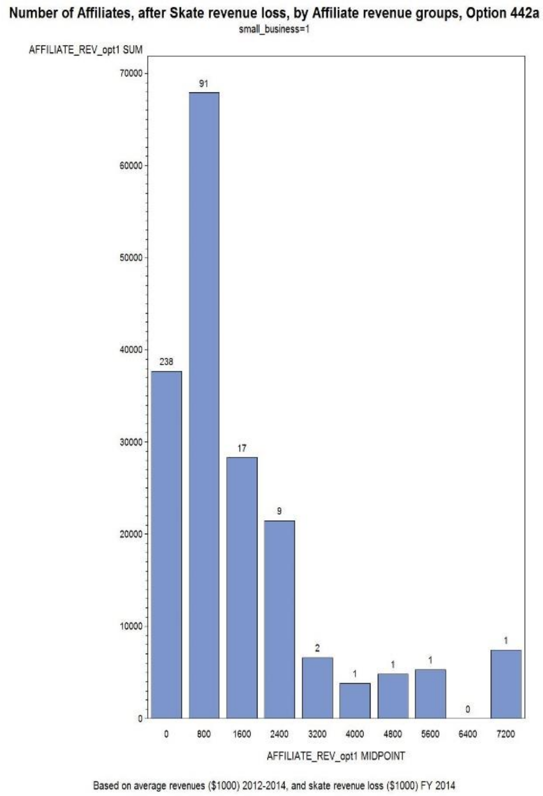
Table 43 - Summary of estimated revenue loss based on 2014 fishing conditions

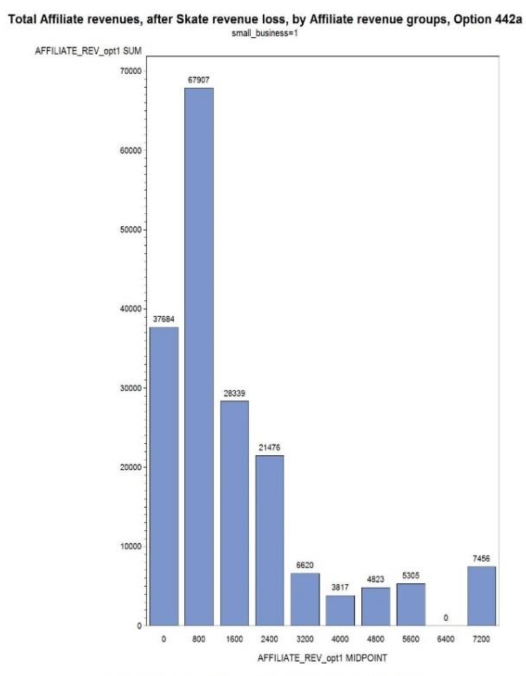
REVENUE LOSS:	**0%**	**0-1%**	**1-5%**	**5-10%**	**10-15%**	**Over 25%**
Number of Affiliates	211	99	23	12	12	7
Skate; $1000	1390	2208	506	1363	1169	488
% of total Skate $	19.5	31.0	7.1	19.1	16.4	6.9

Further analysis (Figure 28) shows the distribution of total revenues after the loss of skate revenue due to the preferred alternative, under 2014 conditions, for small businesses only. About 238 affiliate groups operate at a level below $400 thousand (average revenue, $158 thousand). Ninety-one affiliate groups operate at the next midpoint ($400-1200 thousand) and average $746 thousand. The 17 affiliate groups in the $1200-2000 midpoint average $1.667 million; 9 in the $2000-2800 midpoint average $2.386 million, and the remaining 6 affiliate groups average $4.670 million.

The impact from regulation could be mitigated by individual entities by shifting effort earlier into the season; and a greater impact would likely result from the selection of any other alternative. No economic impact is expected from the preferred Bait Possession Limits alternative or the preferred Skate VTR and Dealer Reporting Codes alternative.

Figure 28 - Distribution of total revenues after the loss of skate revenue due to preferred alternative, under 2014 conditions





9.0 Glossary

ABC – "Acceptable biological catch" means a level of a stock or stock complex's annual catch that accounts for the scientific uncertainty in the estimate of OFL.

ACL – "Annual catch limit" is the level of annual catch of a stock or stock complex that serves as the basis for invoking accountability measures (AMs).

ACT – "Annual catch target" is an amount of annual catch of a stock or stock complex that is the management target of the fishery.

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.

AMs – "Accountability measures" are management controls that prevents ACLs or sector ACLs from being exceeded, where possible, and correct or mitigate overages if they occur.

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

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

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

Biological Reference Points – specific values for the variables that describe the state of a fishery system which are used to evaluate its status. Reference points are most often specified in terms of fishing mortality rate and/or spawning stock biomass.

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.

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

B_{MSY} – the stock biomass that would produce maximum sustainable yield (MSY) when fished at a level equal to F_{MSY}. For most stocks, B_{MSY} is about ½ of the carrying capacity.

B_{target} – A desirable biomass to maintain fishery stocks. This is usually synonymous with BMSY or its proxy, and was set in the original Monkfish FMP as the median of the 3-yr. running average of the 1965-1981 autumn trawl survey biomass index.

$B_{threshold}$ – 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 Bthreshold. A determination of overfished triggers the SFA requirement for a rebuilding plan to achieve Btarget as soon as possible, usually not to exceed 10 years except certain requirements are met. For monkfish, Bthreshold was specified in Framework 2 as 1/2BTarget (see below).

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.

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

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

Council – New England Fishery Management Council (NEFMC).

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

DAS – A day-at-sea is an allocation of time that a vessel may be at-sea on a fishing trip. For vessels with VMS equipment, it is the cumulative time that a vessel is seaward of the VMS demarcation line. For vessels without VMS equipment, it is the cumulative time between when a fisherman calls in to leave port to the time that the fisherman calls in to report that the vessel has returned to port.

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.

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

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

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

Essential Fish Habitat (EFH) – Those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. The EFH designation for most managed species in this region is based on a legal text definition and geographical area that are described in the Habitat Omnibus Amendment (1998).

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

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

Exploitation Rate – the percentage of catchable fish killed by fishing every year. If a fish stock has 1,000,000 fish large enough to be caught by fishing gear and 550,000 are killed by fishing during the year, the annual 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 effort – the amount of time and fishing power used to harvest fish. Fishing power is a function of gear size, boat size and horsepower.

Fishing Mortality (F) – (see also exploitation rate) a measurement of the rate of removal of fish from a population by fishing. F is that rate at which fish are harvested at any given point in time. ("Exploitation rate" is an annual rate of removal, "F" is an instantaneous rate.)

$F_{0.1}$ – F at which the increase in yield-per-recruit in weight for an increase in a unit-of effort is only 10% of that produced in an unexploited stock; usually considered a conservative target fishing mortality rate.

F_{MSY} – a fishing mortality rate that would produce the maximum sustainable yield from a stock when the stock biomass is at a level capable of producing MSY on a continuing basis.

F_{MAX} – the fishing mortality rate that produces the maximum level of yield per recruit. This is the point beyond which growth overfishing begins.

F_{target} – the fishing mortality that management measures are designed to achieve.

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

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

$F_{threshold}$ – 1) The maximum fishing mortality rate allowed on a stock and used to define overfishing for status determination. 2) The maximum fishing mortality rate allowed for a given biomass as defined by a control rule.

Growth Overfishing – the situation existing when the rate of fishing mortality is above F_{MAX} and then the loss in fish weight due to mortality exceeds the gain in fish weight due to growth.

ICL – Interim catch limit is the maximum amount of skate catch, including landings and dead discards, that has been chosen to promote skate rebuilding. This limit has been calculated as the product of the median catch/biomass index for the time series and the latest 3 year moving average of the applicable survey biomass (spring survey for little skate; fall survey for all other managed skates).

Individual Fishing Quota (IFQ) – A 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

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

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

Limited Access – a management system that limits the number of participants in a fishery. Usually, qualification for this system is based on historic participation, and the participants remain constant over time (with the exception of attrition).

Limited-access permit – A permit issued to vessels that met certain qualification criteria by a specified date (the "control date").

LPUE – Landings per unit effort. This measure is the same as CPUE, but excludes discards.

Maximum Sustainable Yield (MSY) – the largest average catch that can be taken from a stock under existing environmental conditions.

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. L25 is the length where 25% of the fish encountered are retained by the mesh. L50 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 2,204.6 lbs. A thousand metric tons is equivalent to 2.204 million lbs.

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

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

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

Natural Mortality (M) – a measurement of the rate of fish deaths from all causes other than fishing such as predation, cannibalism, disease, starvation, and pollution; the rate of natural mortality may vary from species to species

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

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

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

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).

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.

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.

PDT (Plan Development Team) – a group of technical experts responsible for developing and analyzing management measures under the direction of the Council; the Council has a Skate PDT that meets to discuss the development of this FMP.

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

Rebuilding Plan – a plan designed to increase stock biomass to the B_{MSY} level within no more than ten years (or 10 years plus one mean generation period) when a stock has been declared overfished.

Recruitment overfishing – fishing at an exploitation rate that reduces the population biomass to a point where recruitment is substantially reduced.

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).

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 variable does not provide an estimate of the proportion of removals from the stock due to fishing, but allows for general statements about trends in exploitation.

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

Spawning stock biomass (SSB) – the total weight of fish in a stock that sexually mature, i.e., are old enough to reproduce.

Status Determination Criteria – objective and measurable criteria used to determine if overfishing is occurring or if a stock is in an overfished condition according to the National Standard Guidelines.

Stock assessment – An analysis for 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 – 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.

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 trends in stock biomass, biomass weighted fishing mortality rates, MSY, FMSY, BMSY, K, (maximum population biomass where stock growth and natural deaths are balanced) and r (intrinsic rate of increase).

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). BMSY is often defined as the biomass that maximizes surplus production rate.

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 is equivalent to the ICL.

TAL – Total allowable landings, which for skate management is equivalent to 75% of the TAC minus the dead discard rate.

Ten-minute- "squares" of latitude and longitude (TMS) – 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 at 40° of latitude. This is the spatial area that EFH designations, biomass data, and some of the effort data have been classified or grouped for analysis.

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)

Yearclass (or 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.

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.

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