

**2012-2013
Northeast Skate Complex Specifications
Environmental Assessment
Regulatory Impact Review
and
Initial Regulatory Flexibility Analysis**

**NORTHEAST SKATE
COMPLEX**



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Prepared by the
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in cooperation with the
National Marine Fisheries Service



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1.0 EXECUTIVE SUMMARY

The proposed action in this document would implement the first planned change in specifications based on updated data and research. These specifications include changes to the Skate Allowable Biological Catch (ABC), the Annual Catch Limit (ACL), the Annual Catch Target (ACT), and Total Allowable Landings (TAL) allocated to the skate wing and skate bait fisheries. The ACL is equal to the ABC and has been set at a risk adverse level, accounting for scientific uncertainty. The ACT is set at 75% of the ACL to account for management uncertainty. The TAL is allocated among the skate bait and wing fisheries, after accounting for expected discards and state water landings. This specification update is described in Section 4.1.1 and the analysis is described in Section 6.1.1.

The specification document also proposes to revise the skate wing and skate bait possession limits. The former is meant to balance the amount of daily landings with the wing TAL, so that the skate wing fishery is likely to stay open throughout the year, minimizing discards. Two possession limit alternatives are proposed, estimated by an equation fitted to new daily landings information through Aug 15, 2011. One alternative is estimated to land 100% of the TAL and the other alternative takes a risk adverse approach to land 85% of the TAL in case the estimated daily landings are lower than actually occur in 2012-2013. The alternative is described in Section 4.3 and the impact analysis is given in Section 6.1.3. Due to the higher daily landings observed in 2011, the skate wing possession limit alternative values are lower than the status quo, despite the TAL being higher. The specification document also proposes to raise the skate bait possession limit from 20,000 to 25,000 lbs., intended mainly to deter derby style fishing behavior if skate bait landing approach seasonal quotas (which would be raised with the proposed 2012-2013 specifications).

The description of alternatives is summarized in the table below and described in Sections 4.1 to 4.4. They include changes to the ACL specifications, revisions to the status determination specifications and clearnose skate overfishing definition to account for the new FSV Bigelow survey, and changes to the skate wing and skate bait possession limits for the 2012-2013 fishing years. Considered and rejected alternatives are described in Section 4.5 and rationale for their rejection is given. These rejected alternatives were discussed during the development of this specifications document and include raising the incidental skate possession limit, allowing vessels to fish for skates while on a Multispecies Category B DAS, allowing retention and landings of barndoor skate, and changes to monitoring that could align annual data with the fishing year. All other management changes are outside the scope of this action.

Table 1. Summary of management alternatives included and analyzed in this document.

Measure	Description	Biological analysis	Other impacts	Intended effect
ACL specifications	Section 4.1	Section 6.1.1	Sections 6.2 to 6.7	Respond to changes in skate biomass, achieve optimum yield, and prevent overfishing
Status determination specifications	Section 4.2	Section 6.1.2	Sections 6.2 to 6.7	Adjustments needed to accommodate changes in survey methods since 2009
Skate wing fishery possession limits	Section 4.3	Section 6.1.3	Sections 6.2 to 6.7	Limit landings so the directed fishery remains open year around, minimizing discards
Skate bait fishery possession limits	Section 4.4	Section 6.1.4	Sections 6.2 to 6.7	Allow fishermen to land the TAL without encouraging derby style fishing behavior in a quota-managed fishery

Updated or new data about the skate resource and fishery include 2008-2010 fall survey biomass indices (2009-2011 spring biomass indices for little skate). The survey biomass data collected using new trawl gear by the FSV Bigelow have been converted to the FSV Albatross IV units by applying peer reviewed calibration coefficients. And the entire survey biomass time series and biological reference points have been adjusted to be consistent with strata that are sampled by the new research vessel, FSV Bigelow (Section 5.1.3.2). These data were also used to determine whether skate stocks were overfished as of 2010 (spring 2011 for little skate) or if overfishing was occurring (see Section 5.1.3.2 for status summary).

Landings data (including newly discovered reports of transfers at sea) and discard estimates for 2008-2010 were also updated with new data (dealer reports and sea sampling data and discard mortality was estimated by applying new research information that indicates that discard mortality of little (0.20) and winter (0.12) skates were lower than previously assumed (0.50) based on the literature from other areas and gears. The lower discard rates were applied only to little and winter skate discards captured by trawls, based on specific skate discard mortality research on trawl vessels conducted since Amendment 3 approval. Skate discard mortality of other species or any skates discarded by non-trawl fishing gear was assumed to be 0.50, as before.

These discard mortality revisions had two effects – they changed the discard rate (discards ÷ total catch) for 2008-2010 (which is projected to remain constant in 2012-2013) and they changed the catch time series and required revision of the median catch/biomass exploitation ratio that Amendment 3 used as the basis for establishing ABC. The first change reduced the discard rate from 52.0 to 36.3% and increased the wing and bait fishery TALs as a proportion of the ACT. The second effect was to reduce the amount of catch in the time series and lower the median catch/biomass exploitation ratio for little and winter skates. This reduced the ABC, compared to what it would be using the Amendment 3 median catch/biomass exploitation ratios.

Finally, the increases in the TAL could allow a greater number of trips targeting skates, or a change in skate fishing effort to fish in areas with higher catch rates (these may be farther offshore, becoming economic with higher possession limits). Since thorny skate is overfished, smooth skate is in danger of becoming overfished (i.e. biomass near the threshold), and barndoor skate is in a rebuilding program, the analysis in this document (Section 5.1.3.2) evaluates the potential for interactions between vessels using trawls and gillnets to target skate wings and barndoor, smooth, and thorny skates. Due to distinct differences in the distribution of the skate wing fishery effort and the distributions of barndoor, smooth, and thorny skates, the impacts of raising the TALs is expected to be marginal and not impede recovery. There are however a few notable areas of overlap, possibly raising the possibility of seasonal interactions – primarily for barndoor skate in the spring gillnet fishery for monkfish in Southern New England.

The proposed action is needed to maintain the skate fisheries and achieve optimum yield while adequately minimizing the risk of overfishing the seven skate stocks.

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2.5 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
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
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
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 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) 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.

Amendment 3 catch limits for 2010-2011 were set using the 2006-2008 survey results. Since then new survey data have been collected, have been properly calibrated to consistent units¹ via a peer review conducted by the SSC, and applied to the ACL framework procedures established in Amendment 3. The Skate PDT analyzed the data and the Council's SSC recommended ABCs that use calibrated and updated survey data through 2010 (spring 2011 for little skate). In addition, the Skate PDT updated and the SSC reviewed the 2010 landings and discard data to set ACL-related management measures (TALs) that require such information. Included in these data are new estimates of discard mortality (see Section 5.1.4) for little and winter skates captured by vessels using trawls.

The need for this action is to set the annual catch limit specifications (ABC, ACL, ACT, and TALs) to maintain the skate fisheries while adequately minimizing the risk of overfishing the seven skate stocks. 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, two stocks (smooth and thorny skates) are currently overfished or the biomass is very close to the minimum threshold. Since it had been overfished, barndoor skate is in a rebuilding program but has not yet met the target. Annual catch limits (and associated in-season and post-season accountability measures) prevent fishing from increasing to unsustainable levels and enhance prospects for rebuilding of barndoor, smooth, and thorny skates (all landings of these species being prohibited).

This action also proposes to change the skate wing and bait fishery possession limits. In the wing fishery, the Council adopted in Amendment 3 a policy of setting possession limits that was intended to allow the directed skate wing fishery to remain open through the entire fishing year. Amendment 3 also included an in-season accountability measure to reduce the skate wing possession limit when the landings reached 80% of the TAL. Framework Adjustment 1 adjusted these limits, established a split season (May-Aug; Sep-Apr), and raised the TAL trigger to 85% in reaction to the early fishery closure that occurred in 2010. The proposed specifications in this document include an adjustment to the skate wing possession limits to be consistent with the updated ACL and with new estimates of daily landings rates under current fishery conditions (through July 2011).

The 20,000 lbs. skate bait fishery possession limit was intended as a precautionary measure to reduce the potential for derby style fishing behavior as landings approached the three seasonal quotas established by

¹ In 2009, NMFS began using a new survey vessel and modified gear to conduct shelf-wide surveys of benthic species, like skates. Due to catchability differences, selectivity differences, and modified survey procedures that dropped some survey strata, the data needed to be calibrated and adjusted to be applied to the historic catch/biomass ratios.

Amendment 3. Since the skate bait fishery TAL for 2012-2013 is substantially higher than the TAL for 2010-2011, the AP asked the Council to consider raising the skate bait fishery possession limit to 25,000 lbs., expanding the bait fishery's ability to land greater amounts of skates, but preserving the original intent to reduce the incentive to land very large volumes of skates before a pending closure of the bait fishery.

Lastly, the Skate PDT identified an additional source of landings that had not been taken into account in previous skate assessments and in Amendment 3 (2010-2011) specifications. Skates (and other species) may be transferred to other vessels at sea for use as bait (primarily for the lobster trap fishery). Skates are the largest component of these at-sea transfers and are reported in VTRs, but not reported by shoreside dealers, and the at-sea transfers of skates are a significant component of total skate catch (see Table 16). As proposed by this document, these at-sea transfers on VTR reports will count against the skate bait TAL. The exploitation ratio (and hence the ACL) has been increased to account for this additional source of previously unrecognized landings.

3.2 Management Background (EA, RFA)

3.2.1 Management Objectives

The management objectives of the FMP, as modified by Amendment 3 is to set annual catch limits and establish other measures that will end overfishing and promote rebuilding of overfished thorny skate to achieve the biomass target within the mandated rebuilding schedule, or earlier if possible, and to prevent overfishing of all managed skates. This objective is achieved by limiting discards and landings sufficiently to keep catches below the productive capacity of the stocks and thereby promote increases in skate biomass.

Amendment 3 addressed these objectives by implementing ACLs and AMs to comply with new MSA requirements, which are also consistent with National Standard 1 guidelines and account for both scientific and management uncertainty. It also established a process for evaluating the effects on the skate resource and on skate catches from new or pending regulations, alternatives under consideration in amendments or framework adjustments for other FMPs, and structural or economic changes in related fisheries that catch or land skates.

This document and the included Affected Environment section (SAFE Report) addresses these objectives by analyzing and incorporating new data and research that has become available since Amendment 3 implementation. These data and research results form the basis for the proposed changes in specifications described and analyzed herein.

3.2.2 Methods of Analysis

The basic approach adopted in this analysis is an assessment of various management measures to evaluate the potential and probable impacts on the environment. The alternatives are outlined in Table 1, and described in Sections 4.1 to 4.4 and analyzed in Section 6.0. A summary of impacts is given in Section 6.7.1.

This specification document serves a dual purpose, as it is a vehicle to convey the Council recommendations to the Regional Administrator. It also serves as a decision document for the Regional Administrator, who reviews the analysis of impacts of the various management alternatives presented here and determines which alternatives achieves the FMP objectives as well as the objectives and statutory requirements under MSA and other applicable law.

This environmental assessment (EA) examines the impacts of each proposed action (management alternative) on the affected environment. The aspects of the affected environment that are likely to be directly or indirectly affected by the actions proposed in this document are described as *valued ecosystem components* (VECs; Beanlands and Duinker 1984). These VECs comprise the affected environment and are specifically defined as the managed resources (skates) and any non-target species, habitat, including EFH for the managed resource and non-target species, endangered and protected resources, and any human communities (social and economic aspects of the environment). The impacts of the alternatives are evaluated with respect to these VECs.

All management alternatives under consideration for skates were analyzed for 2012-2013 only. A full description of each of these alternatives, including a discussion of a No Action Alternative is given in Section 4.0 of the EA.

The MSA requires each Council to establish an SSC to assist it by providing it with, among other things, ongoing scientific advice for fishery management decisions, including recommendations for ABC, preventing overfishing, and for achieving MSY. The FMP establishes a review process to be conducted by the Skate PDT and provide recommendations regarding annual skate specifications, considering a broad range of relevant information including but not limited to stock status updates from benchmark or update assessments, estimates of fishing mortality (or exploitation rates) and stock biomass, relevant research on skate biology and socio-economic fishery characteristics, landings and catch information, and impacts of specific commercial and recreational fishery regulations, including non-compliance rates for those regulations.

These Skate PDT recommendations are reviewed by the SSC, which provides a mechanism for peer review and provides the information the SSC needs to recommend ABC. A summary of this information with the SSC recommendations was presented to the NEFMC in June 2011, forming the basis of this specifications document. In this case, the SSC provided critical peer review of various survey calibration methods that properly related the catches of the FSV Bigelow to the catches of the FSV Albatross IV that the new vessel replaced (Appendix I of this document). The SSC also provided peer review for the Council to use new data on little and winter skate discard mortality for setting ABC and TALs (Appendix II of this document), pending publication in the literature.

Each Council must then develop ACLs that do not exceed the fishing level (ABC) recommendations of its SSC or its peer review process. The Council also receives advice about potential management alternatives and specifications from its Skate Advisory Panel, comprised of industry members and others knowledgeable about the skate resource and fishery. Based on SSC and Skate PDT recommendations, and advice from the Skate Advisory Panel, the Council makes a recommendation to the NMFS Northeast Regional Administrator. The Regional Administrator reviews the recommendation forwarded through this specifications document and may approve, disapprove, or partially disapprove the proposed action to meet the FMP objectives and statutory requirements.

3.2.3 Skate Fishery Management Plan

Table 2 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 2. Species description for skates in the management unit.

Species Common Name	Species Scientific Name	General Distribution	Size At Maturity	Other Common Names
Winter Skate	<i>Leucoraja ocellata</i>	Inshore and offshore GB and SNE with lesser amounts in GOM or MA	Large (> 100 cm)	<ul style="list-style-type: none"> • Big Skate • Spotted Skate • Eyed Skate
Barndoor Skate	<i>Dipturus laevis</i>	Offshore GOM (Canadian waters), offshore GB and SNE (very few inshore or in MA region)	Large (> 100 cm)	
Thorny Skate	<i>Amblyraja radiata</i>	Inshore and offshore GOM, along the 100 fm edge of GB (very few in SNE or MA)	Large (> 100 cm)	<ul style="list-style-type: none"> • Mud Skate • Starry Skate • Spanish Skate
Smooth Skate	<i>Malacoraja senta</i>	Inshore and offshore GOM, along the 100 fm edge of GB (very few in SNE or MA)	Small (< 100 cm)	<ul style="list-style-type: none"> • Smooth-tailed Skate • Prickly Skate
Little Skate	<i>Leucoraja erinacea</i>	Inshore and offshore GB, SNE, and MA (lower abundance in GOM)	Small (< 100 cm)	<ul style="list-style-type: none"> • Common Skate • Summer Skate • Hedgehog Skate • Tobacco Box Skate
Clearnose Skate	<i>Raja eglanteria</i>	Inshore and offshore MA	Small (< 100 cm)	<ul style="list-style-type: none"> • Brier Skate
Rosette Skate	<i>Leucoraja garmani</i>	Offshore MA	Small (< 100 cm)	<ul style="list-style-type: none"> • Leopard Skate

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

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). In the Northeast Region, the center of distribution for the little and winter skates is Georges Bank and Southern New England. The barndoor skate is most common in the Gulf of Maine, on Georges Bank, and in Southern New England. The thorny and smooth skates are commonly found in the Gulf of Maine. The clearnose and rosette skates have a more southern distribution, and are found primarily in Southern New England and the Chesapeake Bight. Skates are not known to undertake large-scale migrations, 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 the 2008 SAFE Report, Section 7.0 of Amendment 3 (NEFMC 2009).

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 are 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 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. A complete description of available information about these fisheries can be found in Section 5.4.1.

On January 15, 1999, NMFS requested information from the public on barndoor skate for possible inclusion on the list of candidate species under the Endangered Species Act (ESA). On March 4, 1999, NMFS received a petition from GreenWorld to list barndoor skate as endangered or threatened and to designate Georges Bank and other appropriate areas as critical habitat. The petitioners also requested that barndoor skate be listed immediately, as an emergency matter. On April 2, 1999, NMFS received a petition from the Center for Marine Conservation (now the Ocean Conservancy) to list barndoor skate as an endangered species. The second petition was considered by NMFS as a comment on the first petition submitted by GreenWorld. Both the petition and comment referenced a paper in the journal *Science*, which presents data on the decline of barndoor skates (Casey and Myers, 1998). These petitions provided the impetus to complete a benchmark stock assessment for the entire skate complex.

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. In March 2000, NMFS informed the Council of its decision to designate the NEFMC as the responsible body for the development and management of the seven species included in the Northeast Region’s skate complex. NMFS identified the need to develop an FMP to end overfishing and rebuild the resources based on the conclusions presented at SAW 30.

During the development of this FMP, the Skate PDT and the NMFS SAW assessment process (<http://www.nefsc.noaa.gov/nefsc/saw/>) have continued to update the status determinations for the skate species based on the biomass reference points used during SAW 30². At the time of the fall 2001 survey, only two species remain in an overfished condition: barndoor and thorny skates. The overfished status of these two species required the Council to develop management measures to end overfishing and rebuild these resources in accordance with the Magnuson-Stevens Fishery Conservation and Management Act.

On September 27, 2002, NMFS published its findings relative to the petitions to list barndoor skate as an endangered species. NMFS determined, after review of the best available scientific and commercial information that listing the barndoor skate was not warranted. The following factors all indicate a positive trend for barndoor skate populations: recent increases in abundance of barndoor skate observed during trawl surveys; the expansion of known areas where barndoor skate have been encountered; increases in size range; and the increase in the number of small barndoor skate that have been collected. These trends are not consistent with a species that is in danger of extinction throughout all or a significant

² These biological reference points have since been updated by Amendment 3 and revised to account for strata consistently sampled by the FSV Albatross IV and the newer FSV Henry B. Bigelow.

portion of its range or likely to become endangered within the foreseeable future throughout all or a significant portion of its range. NMFS retained the species on its candidate species list, however.

The development of the FMP in 2002 and a description of issues that the Council encountered is described in Section 3.2 of the Amendment 3 document (NEFMC 2009). Early problems included a lack of information about the biology of skates, population dynamics, and the fishery. 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.

Since the 2003 FMP implementation, information about skates has improved and biomass of many species has dramatically improved. The three year moving averages for skate biomass increased for barndoor skate and rosette skate, and but despite declining catch the survey biomass declined for the other five skate species. Barndoor skate is no longer overfished, but biomass has not yet rebuilt to the 1.62 kg/tow target. Thorny skate remained overfished and as of the 2007 survey is experiencing overfishing³.

As a result of these trends in the survey that changed the status of several skate species, NMFS notified the NEFMC on February 20, 2007 that winter skate had become overfished (Document 1 in Appendix I). At the time, the Magnuson-Stevens Act required the Council to develop a plan amendment to address the overfished condition and initiate rebuilding. In addition, the Skate PDT noted that smooth skate was approaching an overfished condition and that little skate biomass could decline enough that overfishing would be occurring.

3.2.4 Skate FMP Amendment 3

The Council began developing Amendment 3 in April 2007 and held scoping hearings on May 22-24, 2007. During 2007, the Council developed a framework of measures and alternatives to reduce skate catch and landings, particularly for the wing fishery which catches and lands predominantly winter skate. Poor data quality, however, has been a hindrance for developing management measures and predicting their effects throughout the existence of the Skate FMP. In addition to frequently unclassified species composition of landings and discards, the population dynamics of skates were poorly understood. Following the last benchmark skate assessment (NEFSC 2007a and NEFSC 2007b), recently acquired life history information about fecundity, survival, and growth allowed the PDT to estimate maximum rebuilding potential and mean generation times for smooth, thorny, and winter skates.

These rebuilding potential estimates were presented to the Council's Science and Statistical Committee (SSC) in November 2007, but while the SSC approved of the analysis, they advised the Council that these estimates could not be applied to current conditions to forecast rebuilding and set catch limits accordingly. It was unclear to the SSC whether current rates of exploitation were above or below F_{MSY} , much less whether a particular catch rate would cause rebuilding to occur. The SSC advised the Council that an MSY -based analytical assessment should be attempted, but the Council found that insufficient resources or time were available to begin a new assessment.

In response, the Council prepared a heuristic analysis of changes in skate biomass in response to historic exploitation rates to estimate probabilities of rebuilding biomass based on past history for all seven species. Positive relationships (i.e. increases in biomass with low exploitation rates) were found for

3. During SAW 44 (NEFSC 2007a), NMFS updated these survey results and status determinations with 2008 spring and fall survey data as the Council approved the final alternative and submitted the final Amendment 3 document. The new survey results and the updated biological reference points from the Data Poor Assessment Workshop changed the status determinations for smooth and winter skates.

smooth, thorny, and winter skates. This approach, developed by the Skate PDT, was approved by the SSC in April 2008 (Appendix I, Document 4 in Skate FMP Amendment 3; NEFMC 2009) and forms the basis for catch limits proposed by this specification document.

While Amendment 3 analysis was occurring, the 2007 survey results became available and NMFS evaluated the status of skates with respect to each species overfishing definition. Biomass of smooth skate declined from 0.19 kg/tow to 0.14 kg/tow, below the minimum biomass threshold of 0.16 kg/tow. Biomass of thorny skate declined from 0.55 kg/tow to 0.42 kg/tow, which is more than the maximum 20% decline that defines overfishing. Based on this new information, NMFS informed the Council on July 21, 2008 that smooth skate was considered to be overfished and that thorny skate was experiencing overfishing. Little skate biomass had also declined and was very close to the overfishing threshold (a 20% decline in the three year moving average for survey biomass), but preliminary spring trawl survey biomass had substantially increased (5.04 kg/tow) and overfishing is likely not occurring.

In summary, discards have remained stable to a slight increase and skate wing landings have increased since plan implementation in 2003. During this time skate biomass has declined for five of the seven skate species. Smooth and winter skates were classified as overfished because their biomass declined below the minimum biomass threshold. Thorny skate remains overfished and is now experiencing overfishing. And while little skate came very close to overfishing being declared, the preliminary 2008 data indicates that a change in little skate status may have been averted.

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. The amendment established a two-year specification cycle and set specifications for the 2010 and 2011 fishing years. After the 2010 fishing year is complete, the amendment tasks the Council and Skate PDT with analyzing the results, updating the indices, and recommending new specifications for the 2012 and 2013 fishing years. These 2012-2013 specifications would also include adjustments to account for prior overages, as accountability measures. This specification document addresses these issues using the process established by Amendment 3.

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 lb. 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.

The ACL specifications for the 2010 and 2011 fishing years were set using a three year (2006-2008) skate biomass average applied to the median exploitation ratio (the length of the time series varies by skate species) to set an ABC, reduced by 25% to an ACT that accounts for scientific and management uncertainty, reduces the ACT by the estimated discard rate in 2006-2008 (2009 discard estimates were not yet available), and allocates the remainder to allowable landings which were split 66.5/33.5% between the skate wing and bait fisheries, respectively. A small amount (3%) was set aside for skate landings by vessels fishing in state waters without a federal skate permit.

3.2.4.1 Fishery and Management Actions in 2010; Framework Adjustment 1

During 2010, the skate wing fishery landings quickly reached the 80% TAL trigger that Amendment 3 established to prevent landings from exceeding the TAL and to reduce the risk that catch would exceed the ACL, triggering AMs and potentially causing overfishing if action were not taken. Since it appeared that without taking action the skate wing fishery would exceed the TAL, the Regional Administrator took

action to reduce the skate wing possession limit to 500 lbs. from Sep 3, 2010 to Apr 30, 2011 in accordance with the in-season AM procedure established by Amendment 3.

This action stopped vessels from targeting larger skates for the wing market, but also caused considerable economic dislocation in the fishery. Some fishermen apparently began fishing in state waters by shelving all federal fishing permits for their vessel or began using vessels without federal permits to fish for skates in state waters. Nonetheless, final total skate catches in 2010 were 84% of the ACL, slightly above the 75% ACT, and triggered no AMs to be applied in future fishing years to account for overages of the ACL. The increases in state landings were absorbed by the 25% management buffer.

Due to the economic dislocation caused by the skate wing fishery closure, industry representatives asked the Council to take action to keep the fishery open year around. It was also known that the fall 2009 and spring 2010 survey data had indicated a higher winter and little skate biomass, respectively. These new survey data, however, could not be used to adjust the ABC until peer reviewed calibrations could be completed. The Council took two actions. It initiated Framework Adjustment 1 to change the skate wing possession limit to a level that would be more likely to keep the fishery open year around. It also directed the Skate PDT to evaluate calibration methods for skates and the SSC to peer review the results for the purposes of setting 2012-2013 ABCs.

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. Landings and discards for 2009 were however updated and included in the Framework Adjustment 1 analysis. New daily landings data for 2010 were also included to estimate an appropriate possession limit. The industry also advise that a lower limit in May-Aug would enhance economic value in Sep-Apr when prices and skate quality were better. And for various reasons, the skate wing landings in 2010 were higher than projected they would be with both a 20,000 lbs. possession limit before July 16, 2010 and a 5,000 lbs. possession limit after Amendment 3 implementation.

While the 20,000 lb. skate wing possession limit was effective before July 16, 2010 the skate wing landings nearly doubled compared to the same period in 2009. Furthermore, the daily landings of skate wings only declined by 19% when the 5,000 lb. skate wing possession limit was in effect from July 16 to September 3, 2010, compared to the same time period in 2009. Once the 500 lbs. incidental skate wing limit became effective on September 3, 2010 the daily wing landings dropped and it appears that the skate wing TAL will be exceeded only by a small amount, despite the high landings under the 20,000 lb. possession limit early in the fishing year. Discards on some trips have undoubtedly increased, but the reduced possession limit will prevent boats from making trips to target skates, the reduced mortality possibly offsetting most or all of this anticipated increase in discards on trips targeting non-skate species. Therefore the effect on total discards is unknown at this point.

At this time, it appears that skate bait landings have remained stable and slightly higher than in 2009, but not high enough to trigger a reduction in the skate possession limit for vessels with bait letters of authorization. Some vessels that target skates for the wing market may have applied for a bait letter of authorization to target skates, but the landings are limited only to skates less than 23 in, which yield wings that are too small to be generally marketable. This size limit protects the larger skates, such as winter, thorny, and barndoor skates, as Amendment 3 intended.

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 30, 2011 and a 4,100 lbs. skate wing possession limit from Sep 1, 2011 to Apr 30, 2012. Framework measures were implemented on May 17, 2011 (76 FR 29328).

During the end of the 2010 fishing year (Jan – Apr), the Skate PDT developed the analyses needed to update the ABCs 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.

3.2.4.2 Acceptable Biological Catch and Total Allowable Landings in 2011

These analyses were peer reviewed and indicated that the skate ABCs and ACL specifications could be raised for 2012-2013. And since there was no biological justification why the limits could not be raised to the same level in the 2011 fishing year, the Council requested in June 2011 that the Regional Administrator initiate Emergency Action to adjust the 2011 ACL specifications, based on the new analysis and calibrated survey data through spring 2011.

A final rule was published on October 28, 2011 (76 FR 76685); (<http://www.nero.noaa.gov/nero/nr/nrdoc/11/11SkateEmergencyActionPHL.pdf>) to raise the ACL specifications to the levels shown in the table below. These new limits which became effective on November 28, 2011, coupled with the Framework Adjustment 1 possession limits are expected to allow the skate wing fishery to remain open for most or all of the 2011 fishing year, ending on April 30, 2012.

Table 3. Revised skate specifications for the 2011 fishing year.

ABC	50,435 mt	Wing fishery possession limit	May-Aug: 2,600 lbs. skate wings Sep-Apr: 4,100 lbs. skate wings
ACT (75% of ABC)	37,826 mt	Wing fishery TAL trigger	85% of wing fishery TAL
TAL (assuming 36.3% discard rate)	21,561 mt	Bait fishery possession limit with a Letter of Authorization	20,000 lbs. whole weight
State waters catch	6.7%	Bait fishery TAL trigger	90% of bait fishery TAL
Wing fishery TAL	14,338 mt	Bait fishery quotas	
Bait fishery TAL	7,223 mt	May 1 – Jul 31	2,225 mt
		Aug 1 – Oct 31	2,680 mt
		Nov 1 – Apr 30	2,318 mt + any remaining from periods 1 & 2

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

Principally due to intractable 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 is to set catch limits which 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).

Due to changes in the median catch/biomass exploitation ratio, the value of MSY, originally estimated in the Amendment 3 FEIS (NEFMC 2009) had to be re-estimated. The estimated catch when skates are at the biomass target and landings of all skates are allowed is 46,192 mt (Table 4). This value should be considered as a provisional estimate of MSY and is probably conservative due to the historic underreporting of skate landings for data that were used to estimate the median exploitation ratio.

Using the 2008-2010 average fall biomass for barndoor, clearnose, rosette, smooth, thorny, and winter skates and the 2009-2011 average spring biomass for little skate, the current yield that does not exceed the median exploitation ratio is 50,435 mt and was approved in June 2011 by the Council’s SSC as the acceptable biological catch, or ABC. The Amendment 3 FEIS estimate using previous estimates of the median exploitation ratio and 2006-2008 biomass was 41,080 mt.

Table 4. Exploitation ratios and survey values for managed skates, with estimates of annual catch limits, catch targets, and allowable landings that take into account the 2008-2010 discard rate using DPWS catch data using the selectivity ogive method to assign species to catch⁴.

Species	Catch/biomass index (thousand mt catch/kg per tow)		Stratified mean survey weight (kg/tow)			
	Median	75% of median	2006-2008	2008-2010	MSY Target	Revised MSY target
Barndoor	2.94	2.20	1.02	1.11	1.62	1.57
Clearnose	5.91	4.43	1.04	0.93	0.77	0.66
Little	2.38	1.79	5.04	7.85	7.03	6.15
Rosette	3.62	2.72	0.05	0.04	0.03	0.03
Smooth	2.39	1.79	0.13	0.16	0.31	0.27
Thorny	2.30	1.73	0.42	0.25	4.41	4.13
Winter	2.26	1.69	5.23	9.68	6.46	5.66
Annual catch limit (ACL/ABC)			41,080	50,435	60,527	46,192
Annual catch target (ACT)			30,810	37,826	47,462	34,644
Total allowable landings (TAL)			14,780	24,088	19,469	22,079

For the reasons that 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 not 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 changed this circular logic and defined 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 34,644 mt. Accounting for the average discard rate in 2008-2010, a landed yield of 22,079 mt can be considered as a suitable amount of skate landings of achieve optimum yield.

At current skate biomass, the ACT will be set at 37,826 mt, allowing a 25% buffer to account for scientific and management uncertainty. Deducing the 2008-2010 discard rate to account for bycatch sets the aggregate TAL at 24,088 mt.

⁴ The survey biomass value for little skate is the arithmetic average of the 2006-2008 spring surveys.

3.4 ABC and ACL Specifications

ABC and ACL specifications are derived from the median catch/biomass exploitation ratio for time series up to 2007 and the three year average stratified mean biomass for skates, using the 2009-2011 spring survey data for little skate and the 2008-2010 fall survey data for other managed skate stocks. For skates, the Council set the ACL to be 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 be 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 (2008-2010), and that state landings will approximate 3% to the total landings.

The updated specifications are presented in Section 4.1.1 and the analysis of the data is presented in Section 6.0. 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 and winter skates captured by trawl gear and also include recently discovered information about transfers at sea for bait, reported on VTRs.

3.5 Stock Status

Stock status is described in more detail in Section 5.1.3.2. Based on survey data through spring 2011 and catch data through calendar year 2010, winter, little, and clearnose skate biomass are above the target, rosette skate biomass is between the threshold and target, smooth skate biomass is slightly above the threshold, and barndoor skate is rebuilding with biomass 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). Overfishing is not occurring on any stock.

3.6 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 DESCRIPTION OF MANAGEMENT ALTERNATIVES AND RATIONALE (EA, RFA)

The following sections describe the proposed adjustments to the skate specifications for the 2012-2013 fishing years. The Council intends for these specifications to become effective on May 1, 2012 and continue until altered by a future specification package or other management action, following the specification process established by Amendment 3 ([http://www.nefmc.org/skates/planamen/amend3/final/Skate Amendment 3 FEIS.pdf](http://www.nefmc.org/skates/planamen/amend3/final/Skate%20Amendment%203%20FEIS.pdf)) to the Northeast Skate FMP.

This specification process allows for adjustments to ACL limits and other management measures to respond to changes in skate biomass, indexed by the annual spring (little skate) and fall (all other skates) bottom trawl surveys. These are stratified random surveys and specific consistently stratified strata have been chosen to best represent the trends in skate biomass. These strata used to index skate biomass were revised to be consistent with the strata that are now surveyed by the FRV Bigelow, a larger vessel operated by NOAA that cannot survey in shallow depths that were accessible using the previous survey vessel, the FSV Albatross IV.

Even without consideration of this change in survey methodology, substantial increases in skate biomass had been observed in 2008-2010 compared with the 2006-2008 period used in Amendment 3 to set 2010-2011 specifications. In particular, the three year average biomass for little skate increased from 5.04 kg/tow (unadjusted strata) to 7.848 kg/tow and for winter skate from 5.230 kg/tow (unadjusted strata) to 9.684 kg/tow (see table below).

The Amendment 3 ACL framework allows the Council to set an aggregate skate ABC that is the product of a three year average stratified mean biomass and the median exploitation ratio (catch/biomass) through 2007. It is described in more detail in Section 3.4. The re-estimated discard rate also incorporates new discard mortality estimates for little (20%) and winter (12%) skates captured by trawls.

A comparison of the ACL limits in Amendment 3 (column A), changes due to modified survey biomass calculations (column B), and a revised discard rate estimate with a 3% set aside to account for state landings (column C) is shown in the table below. The new discard mortality rate affects the catch/biomass median values and hence the ABC because the estimated total catch (and proportion of catch from dead discards) changes the time series through 2007. It also raises the proportion of the ACT which may be allocated to TAL. The parameters and results in column C represent the updated specifications proposed for the 2012-2013 fishing years.

Table 5. Amendment 3 specifications for 2010-2011 fishing years (column A)⁵ and proposed (column C) ACL specifications.

	(A)	(B)	(C)
	Current specifications	Bigelow strata	3% state landings set aside
	2006-2008 survey, 2007-2009 discards	2008-2010 survey, 2007-2009 discards	2008-2010 survey, 2008-2010 discards
ACL specifications			
ABC (mt)	41,080	69,215	50,435
ACT (mt)	30,810	51,911	37,826
TAL (mt)	14,780	24,903	24,088
Assumed state landings	924	924	723
Federal TAL	13,856	23,979	23,365
Wing TAL	9,214	15,946	15,538
Percent change 2007	-27.5%	25.5%	23.6%
Bait TAL	4,642	8,033	7,827
Season 1	1,430	2,474	2,411
Season 2	1,722	2,980	2,904
Season 3	1,490	2,579	2,513
C/B medians			
Barndoor	3.230	3.222	2.938
Clearnose	2.440	2.695	5.910
Little	2.390	2.898	2.384
Rosette	2.190	2.090	3.622
Smooth	1.690	1.669	2.388
Thorny	3.140	3.117	2.300
Winter	4.120	4.067	2.256
Survey biomass (mean kg/tow)			
Barndoor	1.020	1.114	1.114
Clearnose	1.037	0.933	0.933
Little	5.040	7.848	7.848
Rosette	0.053	0.040	0.040
Smooth	0.133	0.161	0.161
Thorny	0.420	0.245	0.245
Winter	5.230	9.684	9.684
Discard rate	52.0%	52.0%	36.3%
Discard mortality	50.0%	50.0%	31.0%

4.1 ACL Alternatives

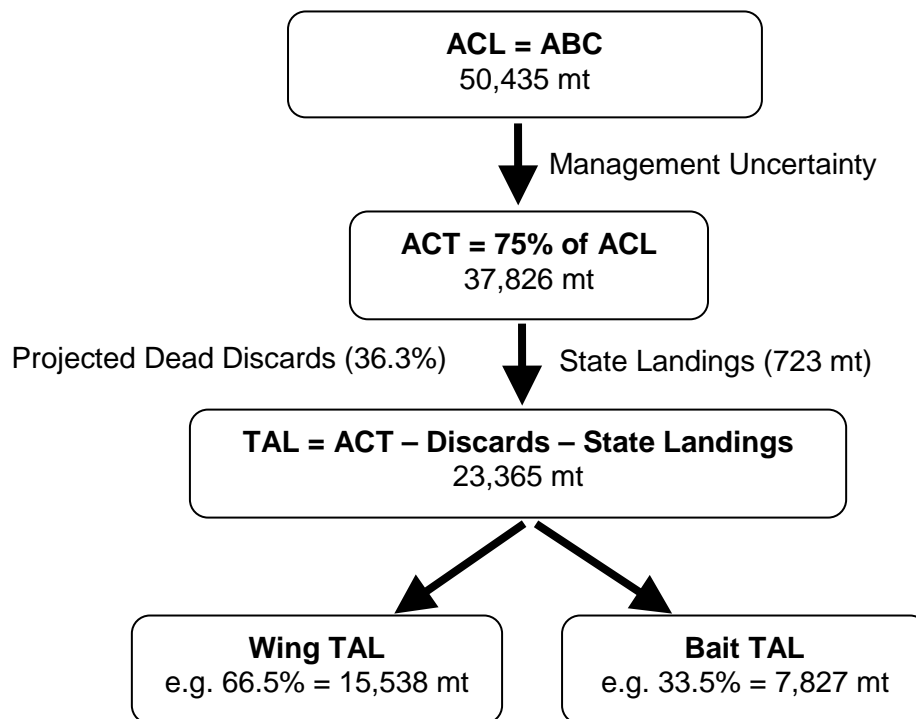
4.1.1 Updated ACL specifications (preferred)

The ABC and 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 and ACL would

⁵ Although labeled ‘current’ in the table and were in effect when the ABC analysis had been done, these specifications were replaced by Emergency Action on November 28, 2011; as discussed in Section 3.2.4.2.

increase from 41,080 to 50,435 mt. The ACL is a limit that would trigger AMs if catches exceed this amount. The ACT would likewise increase from 30,810 to 37,826 mt. It is used to set management measures to produce a target catch. And after deducting amounts for projected dead discards (based on the average 2008-2010 discard rate), the TAL would increase from 14,780 to 23,365 mt. It is used to set limits on landing skates. The TAL is proportionally a larger increase than the ABC and ACT, compared to the 2010-2011 specifications (see Section 4.1.2), because the proportion of dead discards in the catch declines from 52% to 36.3%, primarily due to the application of new science that indicates that discard mortality for little and winter skates captured by trawls is lower than had been assumed in Amendment 3 (see Section 8.3.1.3 in NEFMC 2009).

Although the skates landed from state waters by vessels without federal fishing permits were greater (12.6%) than had been anticipated (3%) in Amendment 3, the Council decided to continue the current 3% state waters TAL set aside, and instead asked the coastal states that have skate landings to consider regulations to bring skate landings in line with previous year's. If the current monitoring procedures had been applied to 2009 landings (before Amendment 3), the analysis would have showed that vessels without federal permits landed 6.7% of total skate landings.



Rationale for alternative: This alternative would make the specifications (catch and landings limits) consistent with the procedures approved in Amendment 3 and with new science that has been analyzed by the Skate PDT and peer reviewed by the SSC. And 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. Biomass of little and winter skates have increased considerably from the 2006-2008 period and contribute the majority of landings in the skate bait and skate wing fisheries, respectively. Since most of the skate fishing occurs in the waters of Georges Bank, Southern New England, and the Mid-Atlantic region, the higher ACL specifications will not have a minimal impact on thorny and smooth skate (which primarily occur in the Gulf of Maine), and on rebuilding barndoor skate (which occurs primarily on Georges Bank,

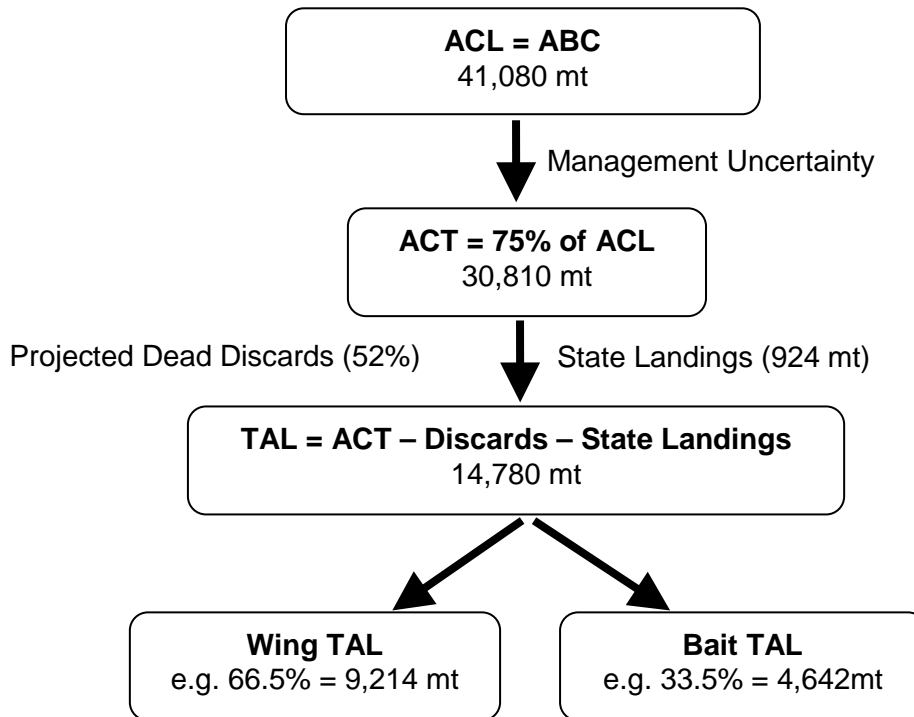
typically in deeper water than where winter skate occur). This alternative will also have a positive effect of reducing skate discards, compared to No Action, because the skate fishing season will remain open and a greater fraction of skate catches will be landed. It is expected that the higher landings will also increase fishery revenue and related shoreside employment.

The Council decided to continue the assumption that skate landings will be 3% of total state skate landings, because 1) the events that occurred in 2010 were probably transitory, caused by the closure of the directed fishery on Sep 3, 2010, and mitigated by the effects of Framework Adjustment 1 and this action. And even though a retrospective analysis of 2009 data indicated that the actual amount of state water skate landings was 6.7% rather than the 3% assumed by Amendment 3, the difference can easily be absorbed by the 25% management buffer between the ACL and the ACT. Moreover, in August 2011, the Council wrote a letter to coastal states asking them to evaluate the effect that their state water landings could have on the Skate FMP and consider rules to keep state water skate landings in check. If states take action, the proportion of skate landings derived from fishing in state-waters could decline.

4.1.2 No Action

The ACL parameters and limits would remain unchanged from the final ACL specifications for the 2010-2011 fishing years (see diagram below) in the final regulations for Amendment 3 (http://www.nefmc.org/skates/planamen/amend3/final/SkateA3_FinalRule_75FR34049.pdf) and would incorporate no new scientific data and information.

Although considered part of the No Action alternative, Framework Adjustment 1 changed the skate wing possession limit and made other regulatory adjustments, but did not change the ACL specifications as shown in the diagram below. Status quo however refers to adjusted ACL specifications that NMFS implemented via Emergency Action for the 2011 fishing year, responding to the new scientific information reviewed and approved by the Council's SSC in June 2011. Status quo however is not a viable alternative because the Emergency Action applies only to the 2011 fishing year ending on April 30, 2012 and cannot extend for more than 360 days.



Rationale for alternative: The No Action alternative would continue a lower ABC and ACL specifications than those derived from the specifications procedure described in Amendment 3. While it would be inconsistent with the FMP’s description of optimum yield, No Action would indirectly increase the buffer for scientific uncertainty that in Amendment 3 is expressed in terms of probability and amount of expected biomass increase (i.e. conservation). And while the yield on species whose biomass is near the target (little and winter skate, for example), the lower ACLs would reduce directed fishing activities and could enhance rebuilding prospects for overfished skates (thorny), skates near the minimum biomass threshold (smooth), and skates in a rebuilding program (barndoor). Possession of all three of the above species is prohibited, but less targeting of skates could reduce discards, depending on where fishing occurs.

Most importantly, No Action would be inconsistent with the Act, with the FMP’s optimum yield (Section 3.3), and with the Information Quality Act (Section 8.11). The No Action alternative would thus be illegal.

4.2 Status determination specifications

Adjustments to the skate overfishing definitions are proposed below to account for changes in NMFS trawl survey methods that have been in place since 2009, when NMFS began using the FSV Bigelow.

4.2.1 Revised status determination specifications and adjustments to overfishing definitions using consistent survey strata

The overfishing definition for clearnose skate would be revised as shown below to account for interannual variability in survey tow data collected from strata that are surveyed by the FSV Bigelow. Table 6 includes a revised list of survey strata used to define stock status..

Clearnose skate is in an overfished condition when the three-year moving average of the autumn survey mean weight per tow is less than one-half of the 75th percentile of the mean weight per tow observed in the autumn trawl survey from the selected reference time series. Overfishing occurs when the three-year moving average of the autumn survey mean weight per tow declines 40% or more, or when the autumn survey mean weight per tow declines for three consecutive years. The reference points and selected time series may be re-specified through a peer-reviewed process and/or as updated stock assessments are completed.

Table 6. Status determination criteria specifications for skates in the management unit.

Species/stock	Bottom Trawl Survey	Selected reference time series ⁶	Selected strata used for status determination and setting reference points
Winter	Autumn	1967-2007	1-30, 34-40, and 61-76
Little	Spring	1982-2008	1-30, 34-40, 61-76, and inshore strata 2,5,8,11,14, 17,20,23,26,29,32,35,38,41,44-46, 56, 59-61,64-66
Barndoor ⁷	Autumn	1963-1966	1-30 and 34-40
Thorny	Autumn	1963-2007	1-30 and 34-40
Smooth	Autumn	1963-2007	1-30 and 34-40
Clearnose	Autumn	1975-2007	61-76 and inshore strata 17,20,23,26,29,32,35,38,41,44
Rosette	Autumn	1967-2007	61-76

Rationale: The FSV Bigelow surveys fewer inshore strata due to depth considerations using the new vessel. The Skate PDT has examined the historic data and found that normal interannual variability is greater in the survey strata that are sampled only by the FSV Bigelow.

The SSC reviewed and approved the proposed changes to the overfishing definitions used for stock status determination. No changes to the overfishing definitions for other skates are needed, because the change in the survey methods did not affect the historic indices as much, but Table 6 revises the list of survey strata used to define stock status..

4.2.2 No Action

The existing skate overfishing definitions are listed below and the values for making a status determination are listed in Table 7.

Winter skate is in an overfished condition when the three-year moving average of the autumn survey mean weight per tow is less than one-half of the 75th percentile of the mean weight per tow observed in the autumn trawl survey from the selected reference time series. Overfishing occurs when the three-year

⁶ The beginning of the selected reference time series was chosen in the Skate FMP based on changes in geographical range of the survey and the seasonal distribution of the species/stock.

⁷ Unchanged.

*moving average of the autumn survey mean weight per tow declines **20% or more, or when the autumn survey mean weight per tow declines for three consecutive years.** The reference points and selected time series may be re-specified through a peer-reviewed process and/or as updated stock assessments are completed.*

*Little skate is in an overfished condition when the three-year moving average of the spring survey mean weight per tow is less than one-half of the 75th percentile of the mean weight per tow observed in the spring trawl survey from the selected reference time series. Overfishing occurs when the three-year moving average of the spring survey mean weight per tow declines **20% or more, or when the spring survey mean weight per tow declines for three consecutive years.** The reference points and selected time series may be re-specified through a peer-reviewed process and/or as updated stock assessments are completed.*

*Barndoor skate is in an overfished condition when the three-year moving average of the autumn survey mean weight per tow is less than one-half of the mean weight per tow observed in the autumn trawl survey from 1963-1966 (currently 0.81 kg/tow). Overfishing occurs when the three-year moving average of the autumn survey mean weight per tow declines **30% or more, or when the autumn survey mean weight per tow declines for three consecutive years.** The reference points and selected time series may be re-specified through a peer-reviewed process and/or as updated stock assessments are completed.*

*Thorny skate is in an overfished condition when the three-year moving average of the autumn survey mean weight per tow is less than one-half of the 75th percentile of the mean weight per tow observed in the autumn trawl survey from the selected reference time series. Overfishing occurs when the three-year moving average of the autumn survey mean weight per tow declines **20% or more, or when the autumn survey mean weight per tow declines for three consecutive years.** The reference points and selected time series may be re-specified through a peer-reviewed process and/or as updated stock assessments are completed.*

*Smooth skate is in an overfished condition when the three-year moving average of the autumn survey mean weight per tow is less than one-half of the 75th percentile of the mean weight per tow observed in the autumn trawl survey from the selected reference time series. Overfishing occurs when the three-year moving average of the autumn survey mean weight per tow declines **30% or more, or when the autumn survey mean weight per tow declines for three consecutive years.** The reference points and selected time series may be re-specified through a peer-reviewed process and/or as updated stock assessments are completed.*

*Clearnose skate is in an overfished condition when the three-year moving average of the autumn survey mean weight per tow is less than one-half of the 75th percentile of the mean weight per tow observed in the autumn trawl survey from the selected reference time series. Overfishing occurs when the three-year moving average of the autumn survey mean weight per tow declines **30% or more, or when the autumn survey mean weight per tow declines for three consecutive years.** The reference points and selected time series may be re-specified through a peer-reviewed process and/or as updated stock assessments are completed.*

*Rosette skate is in an overfished condition when the three-year moving average of the autumn survey mean weight per tow is less than one-half of the 75th percentile of the mean weight per tow observed in the autumn trawl survey from the selected reference time series. Overfishing occurs when the three-year moving average of the autumn survey mean weight per tow declines **60% or more, or when the autumn survey mean weight per tow declines for three consecutive years.** The reference points and selected time series may be re-specified through a peer-reviewed process and/or as updated stock assessments are completed.*

Table 7. Status determination criteria specifications for skates in the management unit.

Species/stock	Bottom Trawl Survey	Selected reference time series ⁸	Selected strata used for status determination and setting reference points
Winter	Fall	1967-2007	1-30, 33-40, and 61-76
Little	Spring	1982-2008	1-30, 33-40, 61-76, and inshore strata 1-66
Barndoor ⁹	Fall	1963-1966	1-30 and 33-40
Thorny	Fall	1963-2007	1-30 and 33-40
Smooth	Fall	1963-2007	1-30 and 33-40
Clearnose	Fall	1975-2007	61-76 and inshore strata 15-44
Rosette	Fall	1967-2007	61-76

4.3 Skate Wing Possession Limit Alternatives

The skate wing possession limits in Amendment 3 and in Framework Adjustment 1 were intended to strike a balance between the skate wing TAL and the amount of directed fishing for skates, so that the skate fishing season remains open for the entire year, or at least as long as possible. Responding to higher than anticipated landings rates and an early fishery closure in 2010, the Council approved in Framework Adjustment 1 a seasonal reduction in the skate wing possession limit. Initially at 5,000 lbs for the entire year, Framework Adjustment 1 lowered the skate wing possession limit to 2,600 lbs. from May 1 to Aug 31 and to 4,100 lbs. from Sep 1 to Apr 30.

The lower possession limit in the summer months was intended to discourage targeting skates for the wing market during a season when prices are typically lower to enhance the economic benefits to the industry. No conservation benefits, other than reducing the potential for skate discarding during a longer fishery closure, were ascribed to the new, lower skate wing possession limits.

The alternatives below follow the same procedure as approved in Framework Adjustment 1, maintaining approximately a 26:41 ratio between the summer and fall/winter skate wing possession limits. Both alternatives (Sections 4.3.1 and 4.3.2) are calculated to balance the updated ACL specifications (Section 4.1.1) with expected landings rates. Updated with new data from the fishery, the limits in the alternatives are estimated to keep the fishery open for the entire year, possibly reaching the 85% trigger toward the end of the fishing year, but not triggering a reduction to the incidental skate possession limit.

⁸ The beginning of the selected reference time series was chosen in the Skate FMP based on changes in geographical range of the survey and the seasonal distribution of the species/stock.

⁹ Unchanged.

The second alternative (Section 4.1.1) was calculated as a more conservative choice in case the analysis is biased low and actual landings exceed expectations. By definition, the analysis will indicate that the fishery will not reach the 85% TAL trigger until the end of the fishing year, but it would also mean that the fishery may not be able to land 100% of the TAL unless effort or targeting increase.

4.3.1 Possession limit adjustments to allow fishery to take 100% of TAL (preferred)

The seasonal skate wing possession limit for May 1 to Aug 31 would decrease from 2,600 lbs. to 2,300 lbs. Likewise, the seasonal skate wing possession limit for Sep 1 to Apr 30 would also decrease from 4,100 lbs. to 3,600 lbs.

Rationale for alternative: This alternative is calculated (see Section 6.1.3) to allow the fishery to land the TAL by the end of the fishing year, achieving optimum yield. As in Framework Adjustment 1, the split season is intended to encourage targeted skate fishing during the fall and winter seasons, when skate wing prices tend to be higher.

4.3.2 Possession limit adjustments to allow fishery to take 85% of TAL

The seasonal skate wing possession limit for May 1 to Aug 31 would decrease from 2,600 lbs. to 1,500 lbs. The seasonal skate wing possession limit for Sep 1 to Apr 30 would likewise decrease from 4,100 lbs. to 2,400 lbs.

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, even if the landings rate and fishing effort increases beyond those estimated here based on historical (2010 and 2011) data (Section 6.1.3). 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. Also, it has a greater chance (than the preferred alternative in Section 4.3.1) that the fishery will remain open through the spring, when fishermen using gillnets target a combined catch of skates and monkfish.

4.3.3 No Action

The No Action alternative would continue 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 will exceed the annual TAL.

Rationale for alternative: This is actually a less conservative limit than proposed in the two alternatives described above, due to the higher daily catch rates observed in 2011. On one hand, the status quo possession limit would be less disruptive to industry allowing vessels that could target skates with the current fishing limits to continue fishing as before. On the other hand, the analysis (Section 6.1.3) suggests that the status quo possession limits will not allow directed skate fishing to continue year around. Seasonal changes in prices, catch rates, and fishing opportunities may however induce different catch rates than have been projected in Section 6.1.3.

4.4 *Skate Bait Fishery Alternatives*

In Amendment 3, a skate bait possession limit of 20,000 lbs. was approved to discourage derby-style fishing behavior by vessels making trips and landing large amounts of skates when total landings approach the seasonal skate bait quotas. Unlike the skate wing possession limit, the bait possession limit

was not intended to balance the daily landings rate with the TAL. Nonetheless, industry advisors indicated that a modest increase in the skate bait possession limit would be consistent with the increase in the skate bait TAL from 4,642 to 7,827 mt.

Also, during the development and analysis of the 2012-2013 specifications, a previously unrecognized source of landings was discovered. Landings that result from transfers at sea for bait, but are not reported by shoreside dealers, are reported by fishermen on VTRs. Skates are the predominant species that are reported as transfers at sea for bait and are a significant fraction of the skate catch (see Table 16). The reported skate transfers at sea have been added to the catch series and raised the catch/biomass median values that are used to set the ACL specifications, but a management alternative to count them against the revised TALs is needed.

4.4.1 Raise the skate bait possession limit to 25,000 lbs. (preferred)

This alternative would raise the skate bait possession limit from 20,000 lbs. to 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 for alternative: Raising the skate bait possession limit will allow the larger vessels in the fleet to benefit from the higher TAL without increasing the number of trips taken, but without inviting derby style fishing behavior when skate landings approach the seasonal quotas. Most of the larger vessels targeting skates for the bait market work closely with dealers to ensure that the quotas are not exceeded and bait is available year around.

4.4.2 Include skate transfers at sea reported on VTRs in monitored landings and to count against the skate bait fishery TAL (preferred)

Skate landings reported on VTRs as being transferred at sea (signified by dealer code 000002) to another vessel for bait (or any other purpose) will be monitored and added to skate bait landings reported by shoreside dealers. These combined landings will be counted against the Skate Bait TAL for purposes of determining whether accountability measures will be initiated. When and if the skate bait landings reach the TAL trigger (currently 90% of the TAL or seasonal quota) and it appears that without taking action, the Regional Office will suspend the skate bait fishery possession limit. If suspended occurs, vessels will be able to retain skates up to the whole weight equivalent of the skate wing fishery or the incidental skate wing possession limit whichever is in effect for the remainder of the seasonal quota period.

Rationale for alternative: All skate catches should count against the ACL that is derived from an average exploitation ratio (catch/biomass) that includes transfers at sea reported on VTRs. Otherwise, not counting the landings against the skate bait TAL and aggregate skate ACL would increase the risk of exceeding the ACL and triggering accountability measures.

4.4.3 No Action

Only skate landings reported by dealers as destined for the bait market would count against the skate bait TAL and seasonal quotas. The skate bait possession limit would remain at 20,000 lbs.

Rationale for alternative: On one hand, the more conservative possession limit would inhibit expansion of fishing effort on small skates (primarily little skates), particularly by large vessels. It would reduce the risk that landings would trigger an in-season change in the skate bait possession limit. On the other hand,

not counting the VTR skate landings transferred at sea for bait would also increase the risk that total catches could exceed the ACL, triggering post-season accountability measures.

4.5 Considered and Rejected Alternatives

The following management issues arose during the development of this specifications package, but were not adopted as alternatives by the Council.

4.5.1 Raising the Incidental Skate Possession Limit

This alternative would raise the incidental skate possession limit from 500 lbs. of skate wings (1,137 lbs. of whole skates) to another higher level based on further analysis. The incidental skate possession limit applies when triggered by landings reaching the TAL triggers and applies to vessels that are not on a Multispecies Category A, Monkfish Category A or B, or Scallop Limited Access DAS.

Rationale for alternative rejection: This alternative was considered (and proposed) as part of Framework Adjustment 1, but was rejected by the Secretary of Commerce because it was estimated to allow landings to exceed the skate wing TAL. Instead of focusing on this measure, the Council chose to focus on setting the skate wing possession limit so that the fishery would remain open throughout the fishing year. As such, the incidental skate possession limit becomes superfluous, except to vessels that are not on a DAS and target species other than skates. The Council felt that the existing incidental skate possession limit is consistent with fishing for other species and would not increase discards, since skates are typically not landed on these trips even without a possession limit.

4.5.2 Allowing vessels to use Multispecies Category B DAS to fish for skates

Vessels must use Multispecies Category A, Monkfish Category A or B, or Scallop Limited Access DAS to fish for skates. This alternative would expand this requirement to include Multispecies Category B DAS when vessels use gillnets to fish for skates.

Rationale for alternative rejection: Before the 2010 fishing year and Amendment 3, vessels using gillnets were allowed to use Multispecies Category B DAS to fish for skates, which at the time were categorized as “healthy stocks”. When winter skate became overfished shortly before the Council developed Amendment 3 to implement ACLs and in response to a rapid increase in skate landings by the gillnet fishery, the Council added a measure to further limit the use of Category B DAS to target skates. Vessels using trawls were already subject to low skate possession limits to discourage skate fishing on a Multispecies Category B DAS, due to concerns about incidental catches of overfished groundfish stocks.

The Council rejected this alternative because it has the potential to substantially increase skate fishing effort by groundfish sector-enrolled vessels that no longer need DAS to fish for groundfish.

4.5.3 Allowing retention and landings of a limited amount of barndoor skate

Some fishermen and advisors have asked the Council to consider allowing fishermen to retain and land barndoor skate, because the stock biomass has increased, fishermen more frequently catch barndoor skate, and the prohibition on retention and landings causes fishermen to discard the skates.

Rationale for alternative rejection: Despite significant increases in biomass, barndoor skate have not yet met the biomass target and therefore are not considered fully rebuilt. The accuracy of the B_{msy} proxy (biomass target) is also uncertain, being chosen during a period of very low stock biomass based on a few

years of survey data when survey catches were higher. Since the 1990s, barndoor skate biomass has increased and more biological information could be analyzed. The Skate PDT recommended that the Council not consider allowing barndoor skate retention and landing until either the stock is fully rebuilt or a formal barndoor skate stock assessment which would re-evaluate MSY proxies can be completed. This re-analysis might also affect the established rebuilding timeline for barndoor skate.

4.5.4 Alignment of annual data with fishing year specification cycle

This alternative could include measures or actions that would allow application of discard estimates for the fishing year to be applied to future specifications. These actions could include one or more of the following: adjustments to data processing procedures to make data available on a fishing year rather than a calendar year basis, changes to the specification development cycle to align with data availability, and making the fishing year consistent with the calendar year.

Rationale for alternative rejection: Changes such as the ones identified above would have broad implications for New England fisheries management and should be developed in that context. Data processing is not under the Council's purview, although NMFS works with the Council to make necessary data available in a timely fashion. However the data needed to estimate discards is generated once a year on a calendar year basis after the input data for a calendar year has become final.

5.0 AFFECTED ENVIRONMENT (EA)

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.

The analyses of the biological environment were prepared using contributions from the Skate Plan Development Team (PDT). It presents available biological, physical, and socioeconomic information for the Northeast's region skate complex and its associated fisheries.

Table 8 and the sections that follow present a brief summary of 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. For more details, the reader is referred to the EIS for Amendment 3 (NEMFC 2009), the EA for Framework 1 (NEFMC 2011), and the SAW benchmark assessment (NEFMC 2007b).

5.1 *Biological Environment*

5.1.1 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.

Table 8. Skate species identification for Northeast Skate Complex

Species Common Name	Species Scientific Name	General Distribution	Size At Maturity Cm (TL)	Other Common Names
Winter Skate	<i>Leucoraja ocellata</i>	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	<i>Dipturus laevis</i>	Offshore GOM (Canadian waters), offshore GB and SNE (very few inshore or in MA region)	Males (GB): 108cm Females (GB): 116 cm	
Thorny Skate	<i>Amblyraja radiata</i>	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	<i>Malacoraja senta</i>	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	<i>Leucoraja erinacea</i>	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	<i>Raja eglanteria</i>	Inshore and offshore MA	61 cm	Brier Skate
Rosette Skate	<i>Leucoraja garmani</i>	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.

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).

5.1.2 Species Distribution

The general distribution and life history of each of the skates in the NE Skate Complex are described in Table 8. For detailed charts of the distribution of each species, refer to the 2008 SAFE Report (NEFMC 2009). More detailed descriptions of life history characteristics of each species are also provided in the 2008 SAFE Report (NEFMC 2009). Like other elasmobranch fishes, skates have relatively low productivity. They are slow-growing, long-lived, mature at a late age, and produce few offspring. This general life history strategy makes skate populations more sensitive to fishing mortality than other fishes.

5.1.3 Stock assessment and status

5.1.3.1 Prior assessments and status determination

The first benchmark assessment of the seven species in the managed skate complex was conducted in October 2006 and reviewed by the 44th Northeast Region Stock Assessment Workshop (NEFSC 2007a). Partly due to uncertainties about species identification in the commercial catch and a lack of aging and life history data, no analytical models were attempted. At that time, the status determination was based on the survey time series using biological reference points adopted by the Council when the Skate FMP was developed and approved.

Stratified mean biomass from the survey conducted with the FSV Albatross in the spring (for little skate) and in the fall (for other skates) was compared with the existing biomass threshold to determine overfishing and with a maximum rate of biomass decline to determine if overfishing was occurring. Using survey data through 2005, the SAW determined that thorny skate was overfished and overfishing was occurring for winter skate. Biomass of clearnose and rosette skate were above the biomass target. The next year the survey indices were updated and winter skate (one of the two primary target species landed by the fishery) was determined to be overfished because the three-year moving average had fallen below the biomass target.

Subsequently, a Data Poor Working Group (DPWG) was convened (NEFSC 2009a) to evaluate several stocks that had no analytical assessment and could therefore provide little information to enable the Council to set Acceptable Biological Catch levels and revise FMPs to comply with new Magnuson Act requirements. The seven managed skates were included in the assessed species. The Council and NMFS had hoped that the DPWG could resolve some of the difficulties in prior assessments, once the problems with catch identification had been resolved. Efforts were made to allocate mixed commercial catches of skates to individual species, but models using these data did not perform satisfactorily. The DPWG recommended updating the existing overfishing definitions using survey data through 2007. Using the updated survey indices and the revised overfishing definitions, the DPWG found that overfishing was not occurring on any skate species and only smooth and thorny skates were overfished, i.e. the three year survey biomass was below the minimum biomass threshold. Winter skate had not been overfished using the updated reference points produced by the DPWG, but the biomass was very near the threshold and was in danger of becoming overfished. Clearnose skate biomass was near the target and rosette skate biomass was above the target.

5.1.3.2 Updated assessment and status determination

In preparation for this specification package, the Council needed to update the survey time series and re-estimate ABCs for the skate complex. Since 2008, the annual spring and fall surveys have been conducted with a new vessel, the FSV Bigelow, using a newly designed trawl and shorter tow durations. Calibration procedures had been developed and peer reviewed (NEFSC 2009b), but the application of calibration coefficients to convert Bigelow catches into Albatross units (or vice versa) had been peer-reviewed during benchmark assessments by the SAW process. During these other assessments, relative catches of some stocks were related to fish size (i.e. the relative catches of small fish was higher on the FSV Bigelow than for large fish, or vice versa depending on the interaction of trawl gear with that fish). Only preliminary calibration analysis had been done for skates and its application had not been peer reviewed.

To address the issue, the Council augmented and used its Skate PDT to evaluate the application of various calibration models and to recommend one that performed best. This work (Document 1 in the appendix) was peer reviewed by the Council's SSC and allowed the Council to update the skate ABC. More importantly to status determination, it allowed the comparison of the FSV Bigelow biomass indices with the reference points. Some reference points needed minor adjustments to only use strata sampled by both vessels¹⁰.

Applying the calibrations to calculate mean biomass in FSV Albatross units for consistent survey strata allowed the NEFSC to determine status, using the 2009-2011 spring and 2008-2010 fall survey data. Using the new data, only thorny skate is overfished (0.25 kg/tow vs. a 2.065 kg/tow threshold) and overfishing is occurring on no skate stocks (Table 9).

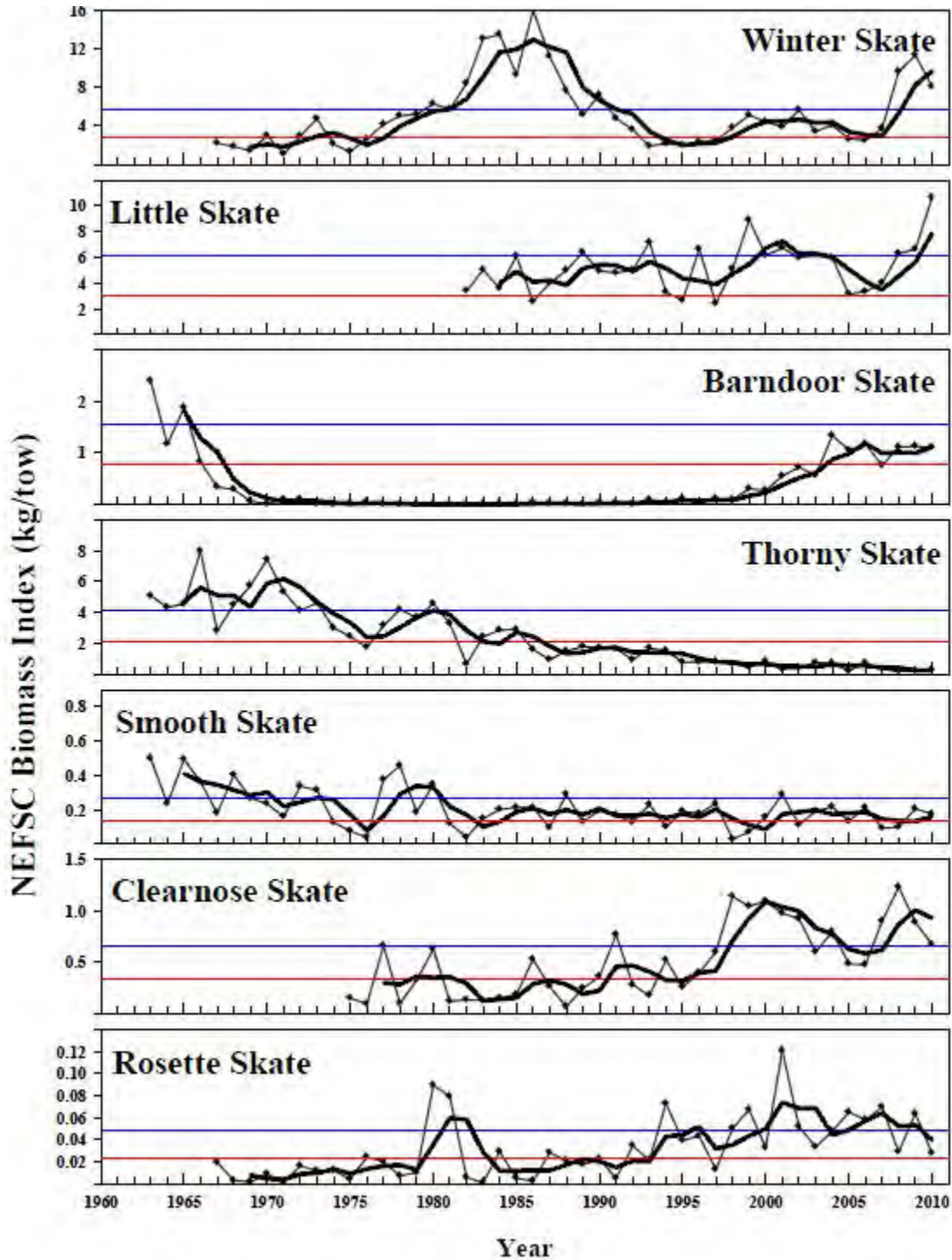
More importantly to setting the ABC, the biomass for little and winter skates has increased. Along with clearnose skate, the little and winter skate biomass is above the target (MSY proxy). Longer term trends in biomass are shown in Figure 1, relative to the respective targets and thresholds for each stock. All data have either been converted using appropriate calibration coefficients, or are converted to use consistent survey strata sampled by both vessels. Rosette skate which was above the target is now slightly below the target. Smooth skate is not overfished but the biomass is only slightly above the threshold and remains a concern. The barndoor skate biomass trend has leveled off (at 1.11 kg/tow) and has not reached the target (1.57 kg/tow), despite barndoor skate being in a rebuilding program with no retention allowed.

¹⁰ The FSV Bigelow is a larger vessel than the FSV Albatross, which could sample inshore strata in shallower water. This change in survey design to accommodate the larger vessel mainly affected the biological reference points for clearnose and little skates.

Table 9. Summary by species of recent survey indices, survey strata used and biomass reference points, updated through the 2010 spring and fall surveys. Green cells represent biomass that is above the B_{MSY} proxy (target). Red cells indicate stock biomass that is below the threshold and is (or was) considered overfished, or overfishing was occurring.

	BARNDOOR	CLEARNOSE	LITTLE	ROSETTE	SMOOTH	THORNY	WINTER
Survey (kg/tow) Time series basis Strata Set	Autumn 1963 – 1966 Offshore 1 – 30, 33-40	Autumn 1975-1998 Offshore 61-76, Inshore 15-44	Spring 1982-1999 Offshore 1-30, 33-40, 61-76, Inshore 1-66	Autumn 1967-1998 Offshore 61-76	Autumn 1963-1998 Offshore 1-30, 33-40	Autumn 1963-1998 Offshore 1-30, 33-40	Autumn 1967-1998 Offshore 1-30, 33-40, 61-76
1999	0.30	1.05	9.98	0.07	0.07	0.48	5.09
2000	0.29	1.03	8.60	0.03	0.15	0.83	4.38
2001	0.54	1.61	6.84	0.12	0.29	0.33	3.89
2002	0.78	0.89	6.44	0.05	0.11	0.44	5.60
2003	0.55	0.66	6.49	0.03	0.19	0.74	3.39
2004	1.30	0.71	7.22	0.05	0.21	0.71	4.03
2005	1.04	0.52	3.24	0.07	0.13	0.22	2.62
2006	1.17	0.53	3.32	0.06	0.21	0.73	2.48
2007	0.80	0.85	4.46	0.07	0.09	0.32	3.71
2008	1.09	1.73	7.34	0.03	0.10	0.21	9.50
2009 prelim	1.13	0.89	6.55	0.06	0.21	0.25	11.33
2010 prelim	1.10	0.68	10.56	0.03	0.18	0.28	8.09
2005-2007 3-year average	1.00	0.64	3.67	0.06	0.14	0.42	2.93
2006-2008 3-year average	1.02	1.04	5.04	0.05	0.13	0.42	5.23
2007-2009, prelim. 3-year average	1.01	1.16	6.12	0.05	0.13	0.26	8.18
2008-2010, prelim. 3-year average	1.11	1.10	8.15	0.04	0.16	0.25	9.64
Percent change 2006-2008 compared to 2005-2007	2	63	37	-19	-8	-1	78
Percent change 2007-2009 compared to 2006-2008, prelim.	-1	12	21	4	-1	-38	56
Percent change 2008-2010 compared to 2007-2009, prelim.	10	-5	33	-24	23	-5	18
Percent change for overfishing status determination in FMP	-30	-40	-20	-60	-30	-20	-20
Biomass Target	1.570	0.660	6.150	0.048	0.270	4.130	5.660
Biomass Threshold	0.785	0.330	3.075	0.024	0.135	2.065	2.830
CURRENT STATUS	<u>Not</u> Overfished; <u>Not</u> Rebuilt; Overfishing is <u>Not</u> Occurring	<u>Not</u> Overfished Overfishing is <u>Not</u> Occurring	<u>Not</u> Overfished Overfishing is <u>Not</u> Occurring	<u>Not</u> Overfished Overfishing is <u>Not</u> Occurring	<u>Not</u> Overfished; <u>Not</u> Rebuilt; Overfishing is <u>Not</u> Occurring	<u>Overfished</u> Overfishing is <u>Not</u> Occurring	<u>Not</u> Overfished Overfishing is <u>Not</u> Occurring

Figure 1. NEFSC survey biomass indices (stratified mean kg/tow in consistent survey strata) for seven managed skates, calibrated to FSV Albatross units for data collected by the new FSV Bigelow research vessel. Thin lines with symbols are annual indices, thick lines are three-year moving averages, and the thin horizontal lines are the minimum biomass thresholds that define an overfished status and biomass targets (MSY proxies).



5.1.4 Discards and discard mortality

Since the Council adopted a 50% discard mortality assumption for setting ABCs in Amendment 3, based on 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 trawl vessels in the Gulf of Maine. 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.

While data are still being collected and the research will not become final until 2012, the Council's SSC reviewed the methodology of the new discard mortality research and found the sample sizes, experimental design and analyses to be comparable or superior to the available published studies. And because these estimates were for species and areas covered in the FMP, the new discard mortality values for little skate (0.20) and winter skate (0.12) were estimated with sufficient precision to reject the previous literature values, the new research data were determined to be the best scientific information available to be 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 (see Appendix II) 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. The following discussion presents the information that was available for the SSC review in June 2011.

Data on immediate- and delayed (i.e. post-release) mortality rates of discarded skates and rays is extremely limited. Only five published studies have estimated discard mortality rates in these species (Table 10), and only one examined a skate from the Northeast Skate Complex (winter skate, Benoit 2006). Based largely upon the results of this study, which 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 ABC.

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. Therefore, the PDT reviewed the best available scientific information on skate discard mortality rates to determine if the 50% assumption is still appropriate. The review included summarizing old and new published data (Table 11), as well as receiving a report on the preliminary findings of a focused skate discard mortality study being carried out in the Gulf of Maine by Drs. John Mandelman (New England Aquarium) and James Sulikowski (University of New England). The preliminary results are summarized below, but more complete information and analysis will become available when the results are formally published.

Sample sizes for other skate species, i.e. smooth and thorny skates, were at the time thought to be insufficient to estimate discard mortality, but more data is being collected in 2011 to make reliable estimates for these species. There are probably differences in physiology that would make discard mortality for these skates to differ from those estimated for little and winter skates. By the same token, discard mortality may be less than the Council's 50% mortality assumption, which would make discarding less of a problem in the skate fishery than if the discard mortality were higher.

5.1.4.1 Literature review

Table 10 summarizes the results of the five studies on skate/ray discard mortality rates. The study locations, fisheries, species, and gears varied across these studies, however most used some type of trawl

gear. Only one study (Benoit 2010) estimated the skate discard mortality rate in scallop dredge gear (10% for winter skate). Discard mortality rates for skates have not been estimated in any other gear types (e.g., gillnet, hook gear). Due to the differences in study objectives, methods, and sample sizes across these investigations, it is difficult to directly compare these results, but they may inform the range of reasonable mortality rate assumptions for the Northeast Skate Complex.

Overall, discard mortality rates of skates and rays in trawl gears ranged from 10-100%. Mortality rates varied greatly between species. However, across this broad range of species, the mean discard mortality rate was approximately 50% (± 1 standard deviation = 24%). While there are some significant assumptions associated with applying this information to the Northeast Skate Complex, it appears that the current scientific literature supports the use of an assumed 50% discard mortality rate for skates in trawl gear. However, more research is clearly needed on this subject area.

Despite the Benoit (2010) estimate of winter skate discard mortality rates in scallop dredge gear (10%), the Skate PDT determined that this 10% discard mortality estimate is not applicable to the Northeast Skate Complex. The Benoit study was conducted in the Gulf of St. Lawrence using at-sea observer data, and the dredge gear (small bucket scallop dredges) are not considered comparable to the New Bedford style dredges used in the New England scallop fishery. Given the magnitude of skate discards by scallop dredge vessels (Table 6), research on discard mortality rates in this gear should be a high priority.

Table 10. Summary of published skate and ray discard mortality rate studies.

Source	Location	Gear Type	Skate/Ray Species	Discard Mortality Rate (%Dead)
Stobutzki et al. (2002)	N. Australia	Prawn Trawl	56 elasmo species	56% (range = 10-82%)
			All rays	61%
			Dasyatidae	59%
			Gymnuridae	41%
			Rhynchobatidae	10%
Laptikhovskiy (2004)	Falkland Islands	Squid Trawl	<i>Bathyraja albomaculata</i>	28.6%
			<i>B. brachiurops</i>	45.4%
			<i>B. griseocauda</i>	100%
			<i>B. macloviana</i>	100%
			<i>B. magellanica</i>	40%
			<i>Bathyraja sp.</i>	25%
			<i>Psammobatis sp.</i>	40%
Benoit (2006)	Gulf of St. Lawrence	Bottom Trawl	<i>Leucoraja ocellata</i>	50%
Enever et al. (2009)	Bristol Channel, UK	Bottom Trawl	4 skate species	mean = 45%
			<i>Leucoraja naevus</i>	67%
			<i>Raja microocellata</i>	49%
			<i>Raja brachyura</i>	45%
			<i>Raja clavata</i>	41%
Benoit (2010)	Gulf of St. Lawrence	Scallop Dredge	<i>Leucoraja ocellata</i>	10%
			MEAN TRAWL	50%

5.1.4.2 Skate discard mortality research in the Gulf of Maine

Drs. John Mandelman (New England Aquarium, Boston, MA) and James Sulikowski (University of New England, Portland and Biddeford, ME) received NOAA funding in 2009 (Saltonstall-Kennedy Grant Program) to investigate the immediate and short-term discard mortality rates of skates in the Gulf of Maine. Their study is investigating mortality rates of winter, little, thorny, and smooth skates captured by otter trawl gear. The research is ongoing, but preliminary data were presented to the PDT on discard mortality rates of little and winter skates, which dominate the skate catch in the region.

Since a variety of factors contribute to discard mortality rates (e.g., tow duration, temperature differentials, fish size and sex, tow weight, deck time and handling, etc.), the researchers are attempting to account for each of these variables. Trials were done with tow durations of 20-30 minutes (controls), 2 hours, and 3-4 hours, accounting for the range typical of industry practices in this region. The distribution of the estimated catch biomass load per tow in the study, a factor previously shown to positively correlate with the mortality of discarded finfish bycatch, was also reported as broad, and included heavily packed tows. Skates were sampled from the catch and given a standardized condition index of 1-3 based on the extent of visible injuries and general condition (i.e. energy levels). They were then placed in specially-designed cylindrical mesh cages (with sea lice resistant bottoms), and returned to the water for a period of 72 hours. The biomass of skates in each cage was kept relatively constant between trials. The cages were then retrieved and sampled for the numbers of dead and alive skates.

So far, over 650 individual skates have been sampled for immediate and delayed mortality, including 243 little skates (18-60 cm TL) and 203 winter skates (23-95 cm TL) on 37 tows (the number of specimens assessed for immediately mortality only exceeds 2000). Initial results indicate that immediate at-vessel mortality of trawl-caught skates (all species) is near zero. Excluding skates from the shorter control tows (to more closely approximate commercial tow durations), pooled mortality rates after the 72-hour cage trials were 20% for little skate and 12% for winter skate (see table below). Significant predictors of mortality included condition index (more injuries resulted in higher mortality) and sex (males had higher mortality than females). Other variables were not significant, however, but Drs. Mandelman and Sulikowski acknowledge that sample size is still relatively low at this time to detect significant differences in potential secondary factors.

Table 11. Preliminary estimates of Gulf of Maine little and winter skate delayed (72-h) discard mortality rates in trawl gear.

Tow Duration	2h			3-4 hr			Total		Pooled
	<i>N</i> tows	Dead	Alive	<i>N</i> tows	Dead	Alive	Dead	Alive	%Mortality
Little	6	18	61	4	17	79	35	140	20%
Winter	11	3	47	11	21	124	24	171	12%

Data collection is expected to be completed in 2011. Laboratory-based experiments on the physiological effects of aerial exposure stress on little and thorny skates are also ongoing. The final study results are anticipated to be finished in 2012, including mortality rate estimates for thorny and smooth skates, and a complete analysis of mortality predictor variables (which may help refine the discard mortality estimates and projections).

5.1.5 Observed discards by gear and area

Another way to evaluate the potential interactions between skate fishing and barndoor, smooth, and thorny skate distributions is to examine sea sampling data, which can be split into ‘fleets’ based on gear use and directivity using SBRM methods. Although these sea sampling data include only sub-sampled trips, they can be more informative about actual catches and interactions on trips than overlaps in effort and species distributions. Observed tows shown on the following maps are not however unbiased representations of the distribution of fishing effort, due to uneven sampling of the fishing fleets

The following maps show the distribution of skate discards to kept of all species (D/Kall) on observed trawl tows and gillnet hauls. Map 1 shows the distribution of skate discards to kept for large mesh trawls and for the Ruhle & Separator trawls, which are more selective and used to target certain groundfish.

Most of the higher levels of skate discarding occur on Georges Bank and on the continental shelf of Southern New England. Overall, median skate discards were about 1.1-1.2 pounds per pound of landings but half of the observed tows were less than 0.2 (Table 12). Discard rates did not change very much since 2010 when Amendment 3 was implemented.

On Georges Bank and in Southern New England fishing areas as well as the coastal areas of the Gulf of Maine, the discard rates were considerably above 1.0 (Map 1). These areas are where catches of little and winter skate are common. Discard rates appear to be much lower in the deeper portions of the Gulf of Maine, where smooth and thorny skates are more common. Smooth skate discard to kept ratios for observed tows were generally low throughout the range, except for the area north and northwest of Closed Area I (Map 2). Higher rates of thorny skate discard were more widely distributed than those for smooth skates, but were highest on the NE corner of Closed Area II, east and north of the Western Gulf of Maine closed area and on Jeffries Bank (Map 3).

Discard rates for vessels using Ruhle and separator trawls were not very different than those for vessels using standard large mesh trawls (Table 12), although the distribution of tows by vessels using these gears is different, mostly along the margins of Georges Bank and along the western side of Closed Area II (Map 1). The observer data do not suggest that the Ruhle and separator trawls are any more selective for barndoor, smooth, and thorny skates than the standard trawl. To do a proper comparison, however, would require the analysis to filter the large mesh trawls to exclude areas and seasons where Ruhle and separator trawl tows were not observed.

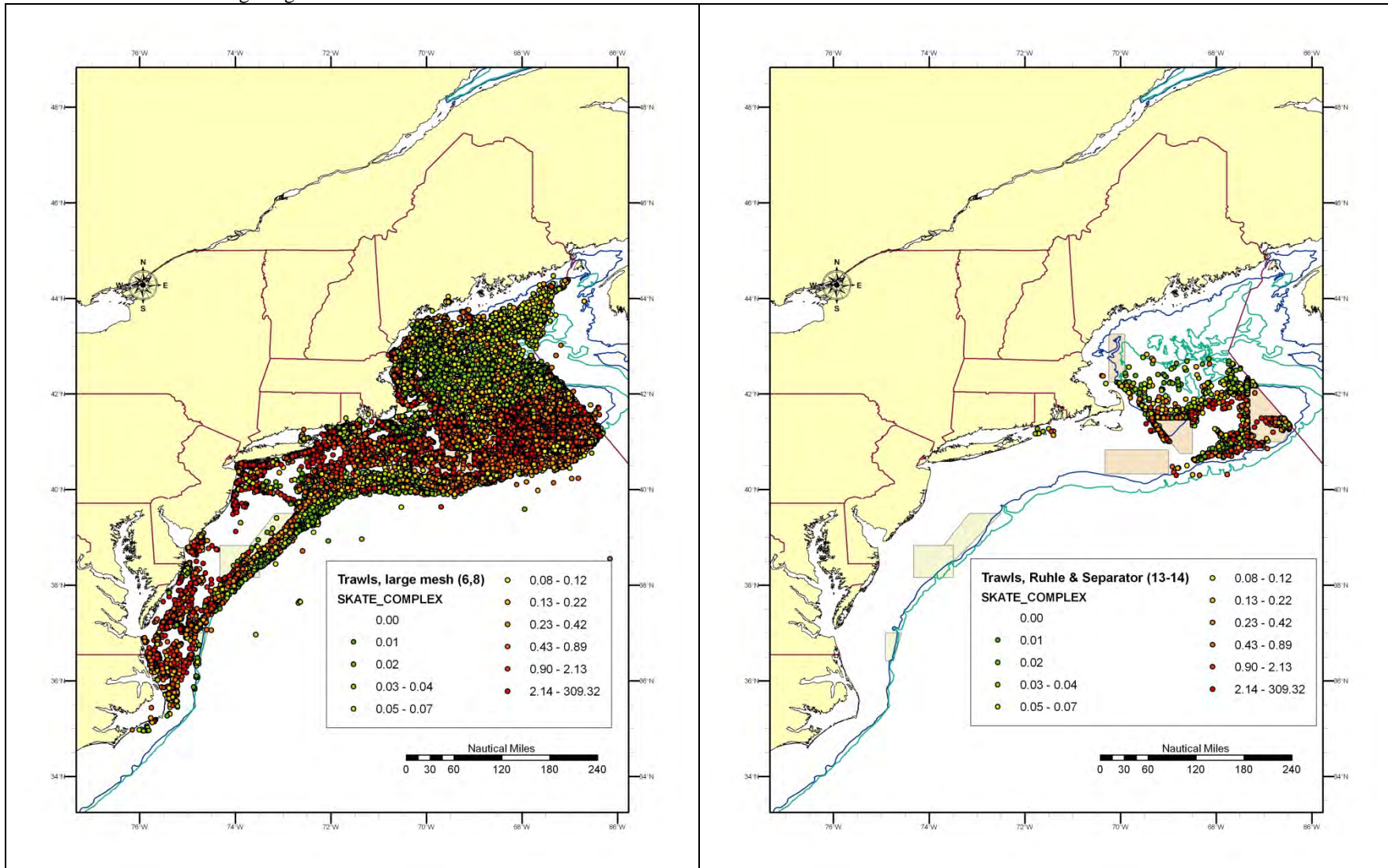
Sink gillnets are used to target skates, monkfish, and other species mostly in four areas: inshore Gulf of Maine, along outer Cape Cod, the Southern New England continental shelf, and along the coast of northern NJ (Map 4).

Discard rates were mostly lower than those for trawls, 0.12-0.46 (Table 12). Discards were highest off of Southern New England (Map 4) and discard rates were higher since 2010 when Amendment 3 was implemented. This increase in skate complex and barndoor skate discard rates is more related to the observed increases in barndoor and winter skate biomass than it is related to Amendment 3 measures. Except for an area along the SW corner of the Western Gulf of Maine area and Platts Bank (Map 5), discards of thorny skate by vessels using gillnets are rare. Smooth skate are rarely caught because gillnets are seldom used in the deeper portions of the Gulf of Maine.

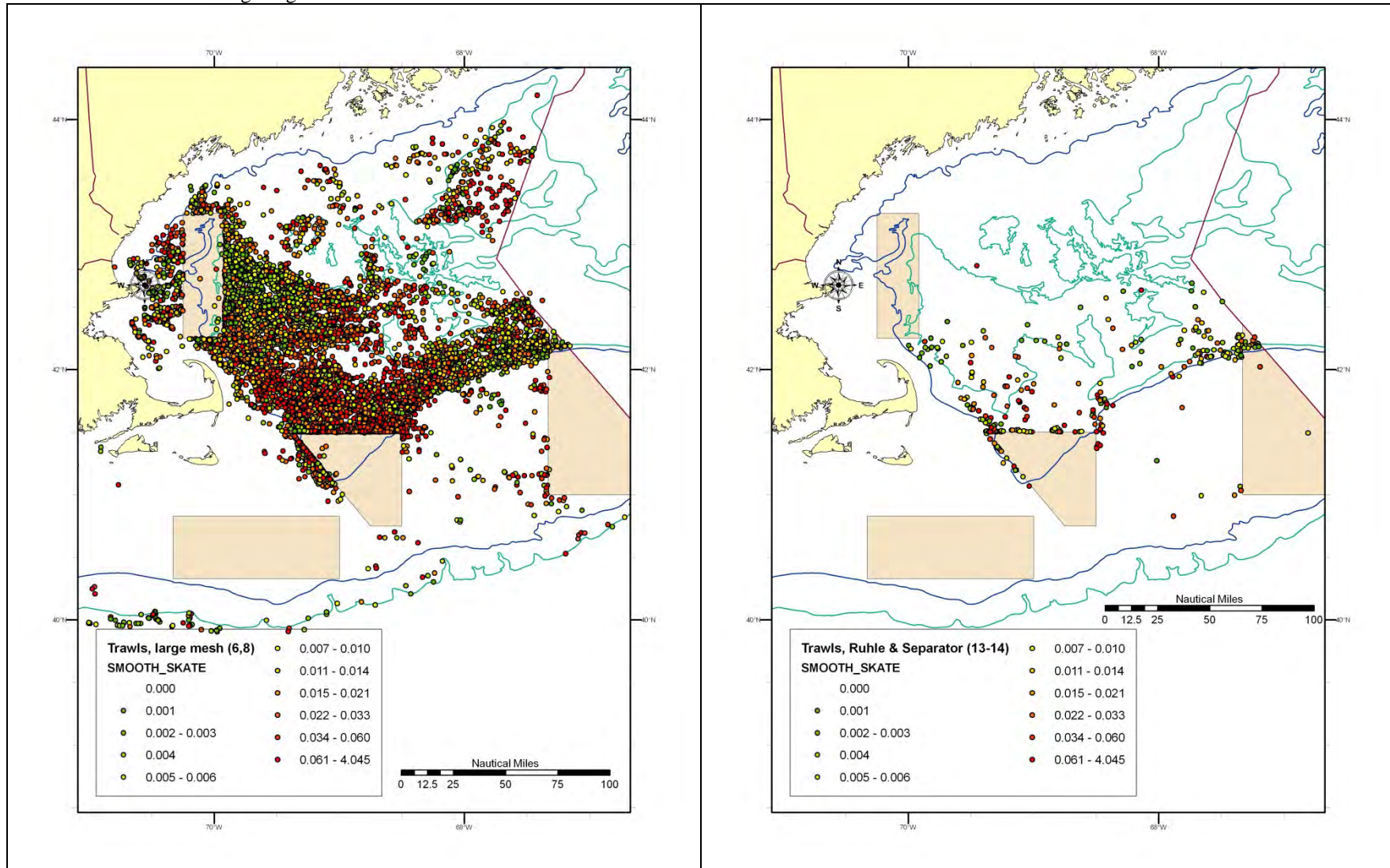
Table 12. Skate discard rates on observed tows for vessels using large mesh trawl, Ruhle & separator trawl, and gillnets. Source: Sea Sampling Observer Program data.

		1989-2009				2010-2011			
		Skate complex	Barndoor skate	Smooth skate	Thorny skate	Skate complex	Barndoor skate	Smooth skate	Thorny skate
Large mesh trawl (Fleets 6,8)	No. observed tows	N=79700 tows				N=29006 tows			
	Mean	1.084	0.028	0.006	0.012	1.194	0.054	0.010	0.020
	Median	0.215	0.031	0.016	0.026	0.115	0.025	0.009	0.016
	90 th percentile	2.313	0.236	0.108	0.163	2.185	0.226	0.062	0.132
Ruhle & Separator trawl (Fleets 13,14)	No. observed tows	N=2131				N=244			
	Mean	0.941	0.042	0.005	0.008	0.868	0.072	0.007	0.019
	Median	0.133	0.017	0.006	0.009	0.172	0.031	0.008	0.025
	90 th percentile	2.015	0.194	0.091	0.070	2.214	0.251	0.060	0.561
Sink gillnets (Fleets 21,24)	No. observed tows	N=8132				N=2344			
	Mean	0.118	0.016	0.000	0.006	0.459	0.091	0.000	0.009
	Median	0.037	0.029	0.010	0.028	0.062	0.054	0.010	0.025
	90 th percentile	0.249	0.215	0.051	0.135	0.941	0.547	0.043	0.149

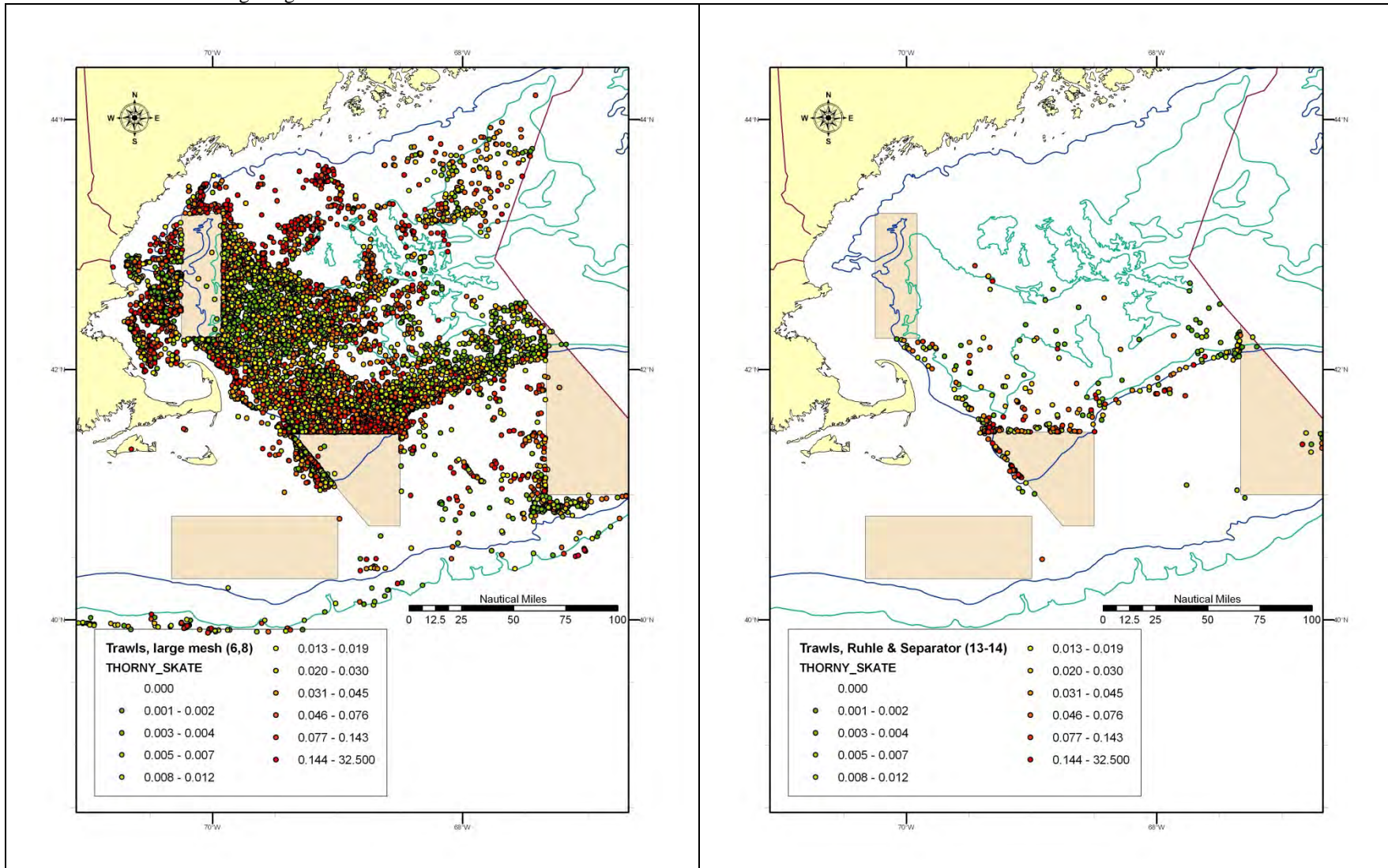
Map 1. 1989-2010 distribution of observed skate complex discards to kept_all for large mesh ($\geq 5.5''$) trawls (left) and separator trawls (right). Sea Sampling Observer and At-Sea Monitoring Programs data are included.



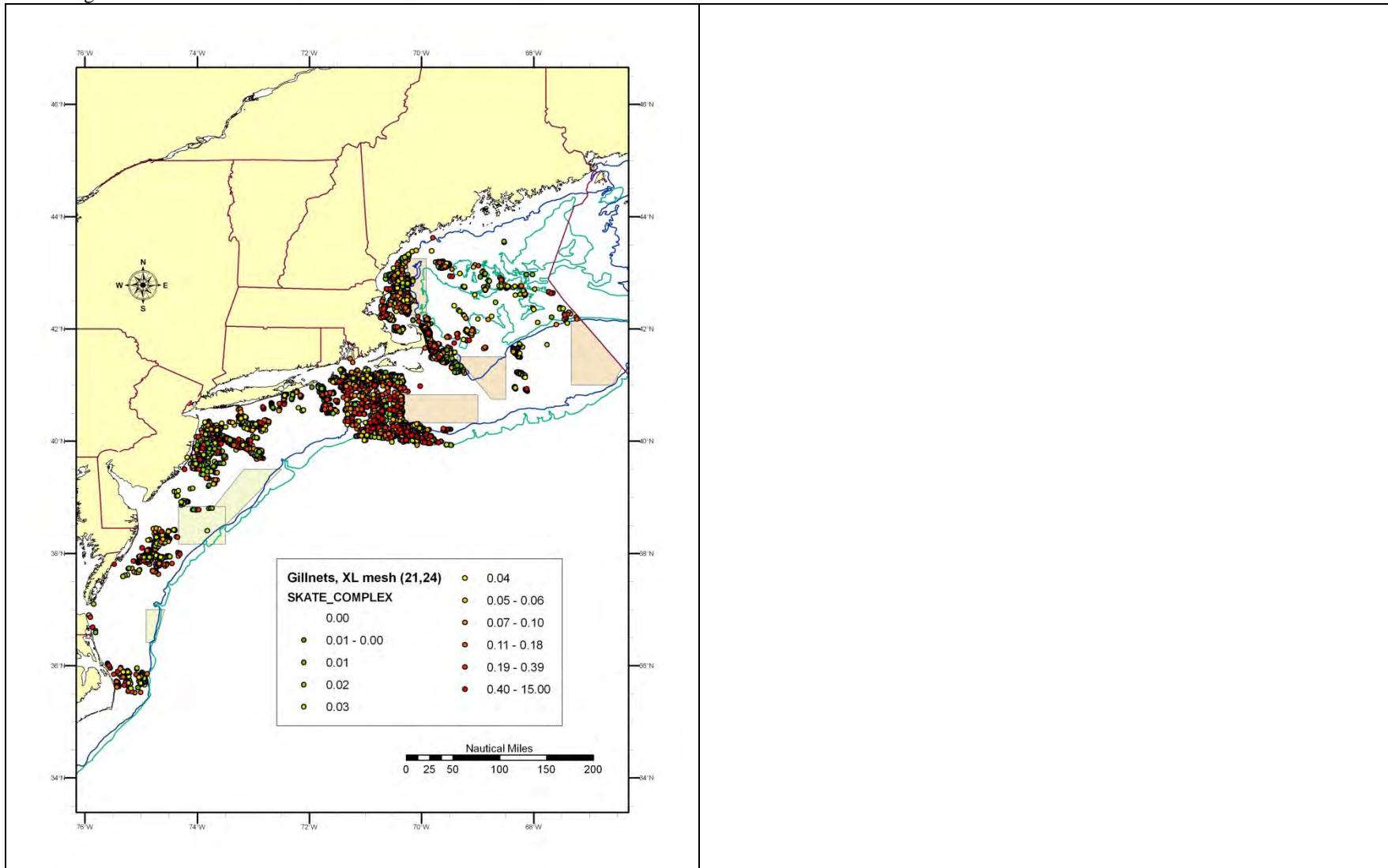
Map 2. 1995-2010 distribution of observed smooth skate discards to kept_all for large mesh ($\geq 5.5''$) trawls (left) and separator trawls (right). Sea Sampling Observer and At-Sea Monitoring Programs data are included.



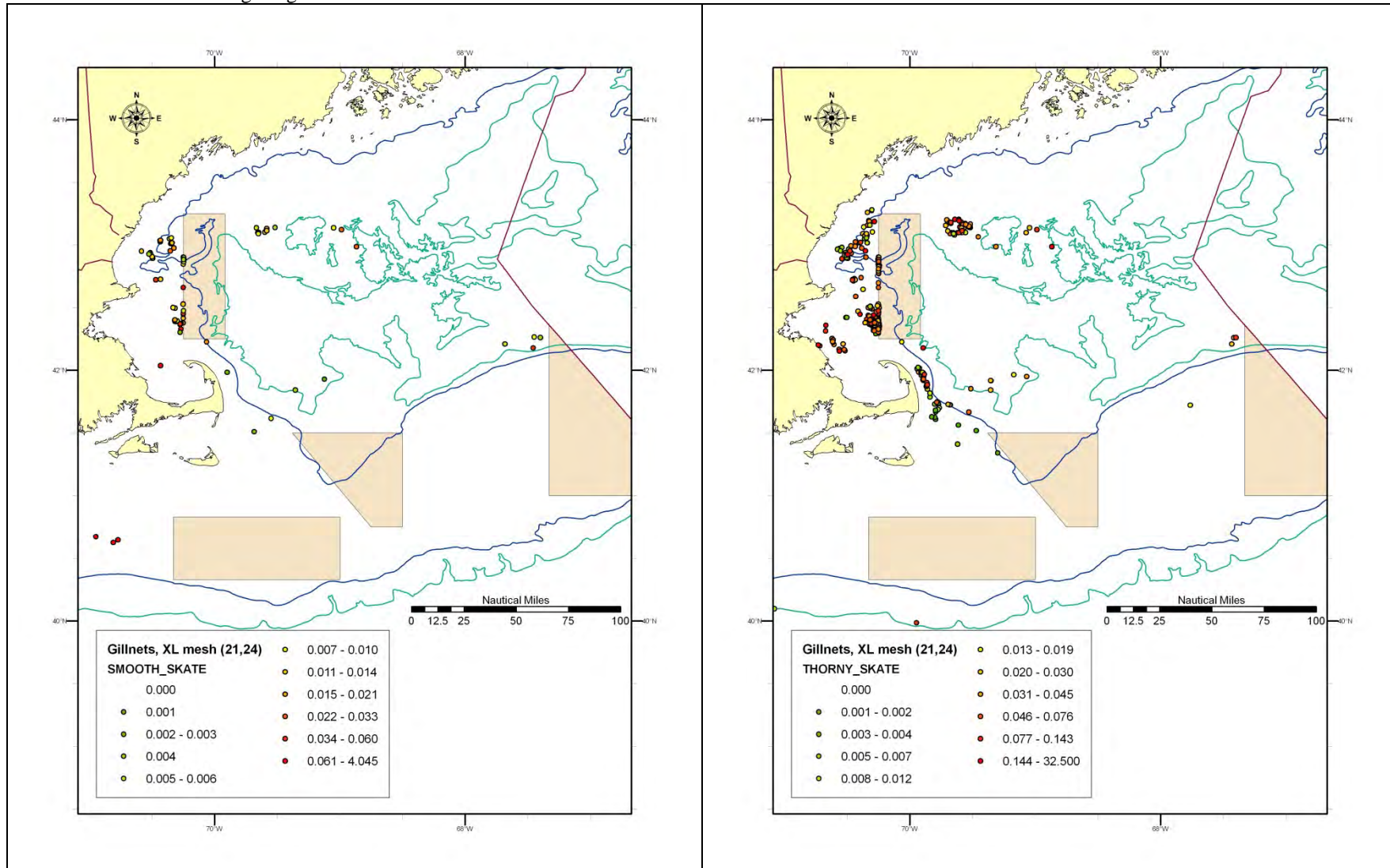
Map 3. 1995-2010 distribution of observed thorny skate discards to kept_all for large mesh ($\geq 5.5''$) trawls (left) and separator trawls (right). Sea Sampling Observer and At-Sea Monitoring Programs data are included.



Map 4. 1989-2010 distribution of observed skate complex discards to kept_all for extra large mesh ($\geq 8''$) gillnets (left). Sea Sampling Observer and At-Sea Monitoring Programs data are included.



Map 5. 1995-2010 distribution of observed smooth skate (left) and thorny skate (right) discards to kept_all for extra large mesh ($\geq 8''$) gillnets. Sea Sampling Observer and At-Sea Monitoring Programs data are included.



5.1.6 Marine Mammals and Protected Species

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

5.1.6.1 Species present in the area

Below are listed the species, protected either by the ESA, the MMPA, or both, that may be found in the environment that would be utilized by the fishery. The list below also includes three candidate fish species as identified under the ESA. Candidate species are those petitioned species that are actively being considered for listing as endangered or threatened under the ESA, as well as those species for which NMFS has initiated an ESA status review that it has announced in the Federal Register. Below are the species protected under the Endangered Species Act and Marine Mammal Protection Act that may occur in the operations area for the skate fishery¹¹:

Cetaceans

	<i>Status</i>
Northern right whale (<i>Eubalaena glacialis</i>)	Endangered
Humpback whale (<i>Megaptera novaeangliae</i>)	Endangered
Fin whale (<i>Balaenoptera physalus</i>)	Endangered
Blue whale (<i>Balaenoptera musculus</i>)	Endangered
Sei whale (<i>Balaenoptera borealis</i>)	Endangered
Sperm whale (<i>Physeter macrocephalus</i>)	Endangered
Minke whale (<i>Balaenoptera acutorostrata</i>)	Protected
Pilot whale (<i>Globicephala</i> spp.)	Protected
Risso's dolphin (<i>Grampus griseus</i>)	Protected
Atlantic white-sided dolphin (<i>Lagenorhynchus acutus</i>)	Protected
Common dolphin (<i>Delphinus delphis</i>)	Protected
Spotted dolphin (<i>Stenella frontalis</i>)	Protected
Bottlenose dolphin (<i>Tursiops truncatus</i>) ¹²	Protected
Harbor porpoise (<i>Phocoena phocoena</i>)	Protected

Sea Turtles

Leatherback sea turtle (<i>Dermochelys coriacea</i>)	Endangered
Kemp's ridley sea turtle (<i>Lepidochelys kempii</i>)	Endangered
Green sea turtle (<i>Chelonia mydas</i>)	Endangered ¹³

¹¹ MMPA-listed species occurring on this list are only those species that have a history of interaction with similar gear types within the action area of the skate fishery, as defined in the 2012 List of Fisheries.

¹² Bottlenose dolphin (*Tursiops truncatus*), Western North Atlantic coastal stock is listed as depleted.

¹³ Green turtles in U.S. waters are listed as threatened except for the Florida breeding population which is listed as endangered. Due to the inability to distinguish between these populations away from the nesting beach, green turtles are considered endangered wherever they occur in U.S. waters.

Loggerhead sea turtle (<i>Caretta caretta</i>)	Threatened
Hawksbill sea turtle (<i>Eretmochelys imbricate</i>)	Endangered

Fish

Shortnose sturgeon (<i>Acipenser brevirostrum</i>)	Endangered
Atlantic salmon (<i>Salmo salar</i>)	Endangered
Atlantic sturgeon (<i>Acipenser oxyrinchus</i>)	
Gulf of Maine DPS	Threatened
New York Bight DPS	Endangered
Chesapeake Bay DPS	Endangered
Carolina DPS	Endangered
South Atlantic DPS	Endangered
Cusk (<i>Brosme brosme</i>)	Candidate
Alewife (<i>Alosa pseudo harengus</i>)	Candidate
Blueback herring (<i>Alosa aestivalis</i>)	Candidate

Pinnipeds

Harbor seal (<i>Phoca vitulina</i>)	Protected
Gray seal (<i>Halichoerus grypus</i>)	Protected
Harp seal (<i>Phoca groenlandicus</i>)	Protected
Hooded seal (<i>Cystophora cristata</i>)	Protected

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

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

5.1.6.2 Species potentially affected

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

Waring et al. 1995---2011), and other publications (e.g., Clapham et al. 1999, Perry et al. 1999, Best et al. 2001, Perrin et al. 2002).

5.1.6.2.1 Sea turtles

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

On March 16, 2010, NMFS and USFWS published a proposed rule (75 FR 12598) to divide the worldwide population of loggerhead sea turtles into nine DPSs, as described in the 2009 Status Review. Two of the DPSs were proposed to be listed as threatened and seven of the DPSs, including the Northwest Atlantic Ocean DPS, were proposed to be listed as endangered. NMFS and the USFWS accepted comments on the proposed rule through September 13, 2010 (June 2, 2010, 75 FR 30769). On March 22, 2011 (76 FR 15932), NMFS and USFWS extended the date by which a final determination on the listing action will be made to no later than September 16, 2011. This action was taken to address the interpretation of the existing data on status and trends and its relevance to the assessment of risk of extinction for the Northwest Atlantic Ocean DPS, as well as the magnitude and immediacy of the fisheries bycatch threat and measures to reduce this threat. New information or analyses to help clarify these issues were requested by April 11, 2011.

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

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

This proposed action only occurs in the Atlantic Ocean. As noted in Conant et al. (2009), the range of the four DPSs occurring in the Atlantic Ocean are as follows: NWA DPS – north of the equator, south of 60°

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

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

5.1.6.2.2 Large cetaceans

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

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

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

during 2004 to 2008 (Waring et al. 2011). Of these, fishery interactions resulted in an average of 0.8 mortality or serious injury incidents per year.

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

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

5.1.6.2.3 Small cetaceans

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

5.1.6.2.4 Pinnipeds

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

5.1.6.2.5 Atlantic sturgeon

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

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

5.1.6.3 Species not likely to be affected

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

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

The wild populations of Atlantic salmon are listed as endangered under the ESA. Their freshwater range occurs in the watersheds from the Androscoggin River northward along the Maine coast to the Dennys River. Juvenile salmon in New England rivers typically migrate to sea in spring after a one- to three-year

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

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

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

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

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

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

5.1.6.4 Interactions between gear and protected resources

NMFS categorizes commercial fisheries based on a two-tiered, stock-specific fishery classification system that addresses both the total impact of all fisheries on each marine mammal stock as well as the impact of individual fisheries on each marine mammal stock. NMFS bases the system on the numbers of animals per year that incur incidental mortality or serious injury due to commercial fishing operations relative to a marine mammal stock's Potential Biological Removal (PBR) level. PBR is the maximum number of animals, not including natural mortalities, which may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population. Tier 1 takes into account the cumulative mortality and serious injury to marine mammals caused by commercial fisheries. Tier 2 considers marine mammal mortality and serious injury caused by the individual fisheries. This EA uses Tier 2 classifications to indicate how each type of gear proposed for use in the Proposed Action may affect marine mammals (NMFS 2009b). The table below identifies the classifications used in the final List of Fisheries for FY 2012 (76 FR 73912; November 29, 2011), which are broken down into Tier 2 Categories I, II, and III.

Table 13. Marine mammals impacts based on northeast skate fishing areas (based on 2010 list of fisheries)

Category	Category Description
Category I	A commercial fishery that has frequent incidental mortality and serious injury of marine mammals. This classification indicates that a commercial fishery is, by itself, responsible for the annual removal of 50 percent or more of any stock's PBR level.
Category II	A commercial fishery that has occasional incidental mortality and serious injury of marine mammals. This classification indicates that a commercial fishery is one that, collectively with other fisheries, is responsible for the annual removal of more than 10 percent of any marine mammal stock's PBR level and that is by itself responsible for the annual removal of between 1 percent and 50 percent, exclusive of any stock's PBR.
Category III	A commercial fishery that has a remote likelihood of, or no known incidental mortality and serious injury of marine mammals. This classification indicates that a commercial fishery is one that collectively with other fisheries is responsible for the annual removal of: <ol style="list-style-type: none"> <li data-bbox="456 726 1390 753">a. Less than 50 percent of any marine mammal stock's PBR level, or <li data-bbox="456 760 1390 1052">b. More than 1 percent of any marine mammal stock's PBR level, yet that fishery by itself is responsible for the annual removal of 1 percent or less of that stock's PBR level. In the absence of reliable information indicating the frequency of incidental mortality and serious injury of marine mammals by a commercial fishery, the Assistant Administrator would determine whether the incidental serious injury or mortality is "remote" by evaluating other factors such as fishing techniques, gear used, methods used to deter marine mammals, target species, seasons and areas fished, qualitative data from logbooks or fisher reports, stranding data, and the species and distribution of marine mammals in the area or at the discretion of the Assistant Administrator.

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

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

- Entanglement in mesh (gillnets and trawls)
- Entanglement in the float line (gillnets and trawls)
- Entanglement in the groundline (gillnets, trawls)
- Entanglement in anchor lines (gillnets), or
- Entanglement in the vertical lines that connect gear to the surface and surface systems (gillnets).

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

The table below lists the marine mammals known to have had interactions with gear used by the skate fishery. This gear includes sink gillnets and bottom trawls within the skate region, as excerpted from the List of Fisheries for FY 2012 ([76 FR 73912; November 29, 2011], also see Waring et al. 2009). Sink gillnets have the greatest potential for interaction with protected resources, followed by bottom trawls.

Table 14. Marine mammals impacts based on skate fishing areas (based on 2012 list of fisheries)

Fishery		Estimated Number of Vessels/Persons	Marine Mammal Species and Stocks Incidentally Killed or Injured
Category	Type		
Category I	MA gillnet	6,402	Bottlenose dolphin, Northern Migratory coastal ^a Bottlenose dolphin, Southern Migratory coastal ^a Bottlenose dolphin, Northern NC estuarine system ^a Bottlenose dolphin, Southern NC estuarine system ^a Bottlenose dolphin, WNA offshore Common dolphin, WNA Gray seal, WNA Harbor porpoise, GOM/Bay of Fundy Harbor seal, WNA Harp seal, WNA Humpback whale, Gulf of Maine Long-finned pilot whale, WNA Minke whale, Canadian east coast Short-finned pilot whale, WNA White-sided dolphin, WNA
	Northeast sink gillnet	3,828	Bottlenose dolphin, WNA, offshore Common dolphin, WNA Fin whale, WNA Gray seal, WNA Harbor porpoise, GOM/Bay of Fundy Harbor seal, WNA Harp seal, WNA Hooded seal, WNA Humpback whale, GOM Minke whale, Canadian east coast North Atlantic right whale, WNA Risso's dolphin, WNA White-sided dolphin, WNA
Category II	MA bottom trawl	1,388	Bottlenose dolphin, WNA offshore Common dolphin, WNA ^a Long-finned pilot whale, WNA ^a Short-finned pilot whale, WNA ^a White-sided dolphin, WNA Risso's dolphin, WNA

Fishery		Estimated	Marine Mammal Species and Stocks Incidentally
Category	Type	Number of Vessels/Persons	Killed or Injured
	Northeast bottom trawl	2,584	Bottlenose dolphin, WNA offshore Grey Seal, WNA Common dolphin, WNA Harbor porpoise, GOM/ Bay of Fundy Harbor seal, WNA Harp seal, WNA Long-finned pilot whale, WNA Short-finned pilot whale, WNA White-sided dolphin, WNA ^a
Category III	Long Island Sound inshore gillnet	unknown	None documented in most recent 5 years of data
	RI, southern MA (to Monomoy Island) and NY Bight (Raritan and Lower NY Bays inshore gillnet	unknown	None documented in most recent 5 years of data
	Atlantic shellfish bottom trawl	>86	None documented

Notes:

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

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

^c This fishery is classified by analogy.

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

seasonal area closures and the seasonal use of pingers (acoustic devices that emit a sound) to deter harbor porpoises from approaching the nets.

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

Atlantic sturgeon are known to be captured in sink gillnet, drift gillnet, and otter trawl gear (Stein et al. 2004a, ASMFC TC 2007). Of these gear types, sink gillnet gear poses the greatest known risk of mortality for sturgeon bycatch (ASMFC TC 2007). Sturgeon deaths were rarely reported in the otter trawl observer dataset (ASMFC TC 2007). However, the level of mortality after release from the gear is unknown (Stein et al. 2004a).

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

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

The preliminary analysis apportioned the sturgeon takes to specific fishery management plans. The analysis estimates that between 2006 and 2010, there were 2,250 to 3,862 encounters per year in gillnet and trawl fisheries (mean per year = 3,118). As noted previously, the vast majority of fishing effort for skates is tied to NE Multispecies and/or Monkfish DAS. Of the trips that landed any amount of skates, most fishing effort and sturgeon takes were attributed to these other fisheries. Therefore, only those sturgeon takes on skate fishing trips that could not be attributed to effort in another fishery would count as takes in the skate fishery. The results estimated that the average annual encounter rate in the skate fishery was 228, with an estimated 14 mortalities. A total of 20 encounters and 4 mortalities were attributed to the skate gillnet fishery, and 208 encounters and 10 mortalities were attributed to the skate trawl fishery. The estimated annual mortalities of Atlantic sturgeon in the skate fishery represent approximately 4% of the total commercial fishery-related mortalities.

The encounter rates and mortalities for Atlantic sturgeon that have been calculated as part of the preliminary analysis of NEFOP data include encounters and mortalities by all fisheries utilizing large-mesh sink gillnet and otter trawl gear, including the groundfish, monkfish, bluefish, spiny dogfish, and other fisheries. Based upon the above estimates, the rates of encounters and mortalities by the skate fishery are lower than the estimates in most of those fisheries.

These updated data and new analysis support the earlier conclusion that the skate fishery may interact with Atlantic sturgeon. Since the Atlantic sturgeon DPSs have been listed as endangered and threatened under the ESA, the ESA Section 7 consultation for the skate fishery will be reinitiated, and additional evaluation will be included in the resulting Biological Opinion to describe any impacts of the fisheries on Atlantic sturgeon and define any measures needed to mitigate those impacts, if necessary. It is anticipated that any measures, terms and conditions included in an updated Biological Opinion will further reduce impacts to the species.

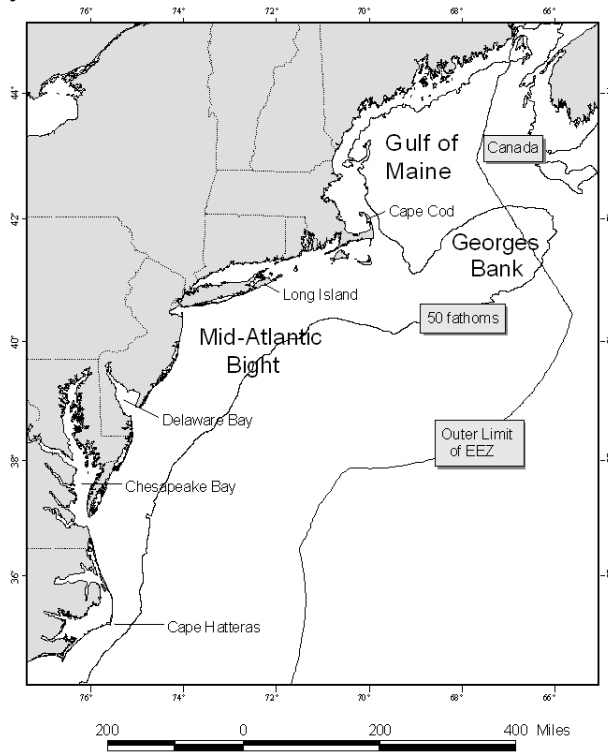
5.2 *Physical Environment*

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 6 and Map 7).

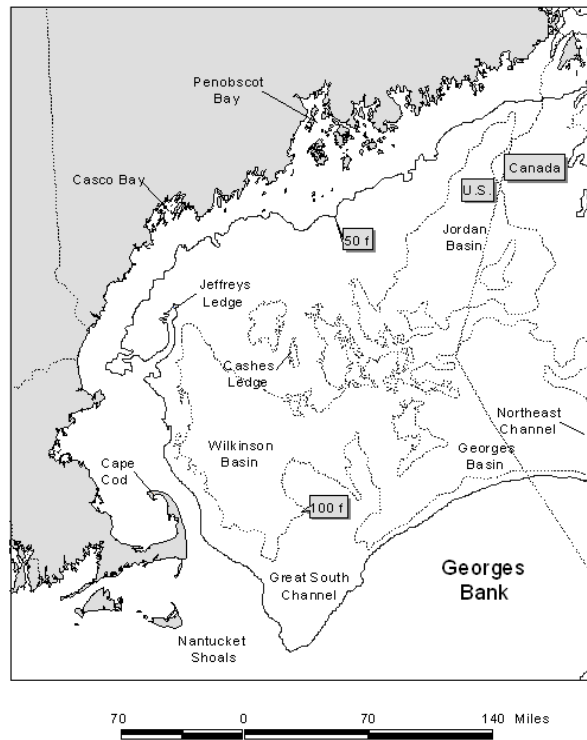
The Gulf of Maine is an enclosed coastal sea, characterized by relatively cold waters and deep basins, with a patchwork of various sediment types. Georges Bank is a relatively shallow coastal plateau that slopes gently from north to south and has steep submarine canyons on its eastern and southeastern 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 6. Northeast shelf ecosystem



Map 7. 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.

5.3 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.

5.4 Economic Environment

The purpose of this section is to describe and characterize the various fisheries in which skates are caught. It is meant to supplement and update sections of the 2000 Stock Assessment and Fishery Evaluation (SAFE) Report for the Northeast Skate Complex (NEFMC 2001), completed as part of the FEIS for the original Skate FMP (NEFMC 2003). Descriptive information on the fisheries is included, and where possible, quantitative commercial fishery and economic information is presented.

5.4.1 Description of Directed Skate Fisheries

5.4.1.1 The Skate Bait Fishery

One of the primary markets for skate products in the northeast U.S. is for bait. Small, whole skates are among the preferred baits for the regional American lobster (*Homarus americanus*) fishery. Most of the skate bait fishery occurs in southern New England waters, and is largely comprised of little skate (>90%), with a smaller percentage of winter skate occurring seasonally. The following sections describe the major ports and other aspects of the skate bait fishery.

5.4.1.1.1 Rhode Island Bait Fishery

Skates have been targeted commercially in Rhode Island for decades for utilization primarily as lobster bait. The majority of bait skates landed in Rhode Island are little skates, with a small percentage of winter skates. 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.

Detailed background about the skate bait fishery and its relationship to the American lobster fishery, particularly in Southern New England and the State of RI was provided in the Amendment 3 EIS (NEFMC 2009). The bait fishery has remained relatively unchanged since that analysis and fishery description was published. The fishery landings have remained below the seasonal quotas established by Amendment 3 and the participants in the fishery have not voiced any concerns about the 20,000 lbs. possession limit.

To exceed the skate wing allowance, fishermen must obtain a Skate Bait Letter of Authorization, and cannot land skates that exceed 23 cm, reducing the potential to target and land larger winter skates. It does not appear that this activity has increased, even though the PDT has reported to the Council that skate landings in state waters had doubled in 2010, probably as a response to the skate wing possession limit reduction on Sep 3, 2010. The increase in state water landings does not appear to have had any effect on the skate bait fishery, however.

Landings trends in the bait fishery have remained relatively constant since 2007, from 9,000 to 10,000 mt (see Section 5.4.1.3.2 and Table 16), but during the preparation for this specification package, the PDT identified an overlooked source of landings which were reported only on VTRs. These transfers at sea for bait have also been relatively constant since 2007, ranging from 4,200 to 6,300 mt. Through new regulations promulgated by Framework Adjustment 1, the transfers at sea for bait are monitored and count toward the skate bait TAL.

5.4.1.1.2 Regulatory issues for the bait fishery

Two existing and significant regulatory limitations on the directed bait skate fishery include lobster regulations which mandate a decrease in pot limits and groundfish DAS requirements. A majority of directed skate fishermen fish in federal waters, possess multispecies permits, and fish for skates with gear capable of catching multispecies. This, in turn, means that they must use a DAS when fishing for skates unless fishing in an exempted fishery. There are currently two exempted skate fisheries in the Southern New England Exemption Area; one gillnet fishery and one deepwater trawl fishery.

Effort in the skate fishery is reduced during the winter months because it becomes more difficult to budget DAS usage, especially for vessels that fish for groundfish either seasonally or year-round (in addition to directing on skates). Due to effort reductions in the multispecies fishery (e.g., Amendment 13, Framework 42), the majority of full-time skate vessels are presently limited to less than 50 DAS per fishing year.

Since the implementation of the Skate FMP in 2003, vessels fishing in the skate bait fishery that wish to be exempt from the skate possession limits must acquire a Letter of Authorization (LOA) from the Regional Administrator. A number of vessels remain under the mistaken impression that this LOA also exempts them from DAS requirements. However, these vessels must still be fishing in an exempted fishery to be exempt from DAS.

Since May 1, 2010, vessels with Multispecies permits may elect to fish in a sector without participating in the DAS program while fishing for regulated multispecies. Sectors are regulated with sector catch limits for regulated multispecies and accountability measures (reductions in future allocations) for overages that occur. Skates and monkfish are regulated via multispecies DAS limits for qualifying vessels, but are not included in the sector limits. To retain and land skates vessels must still be on a multispecies, monkfish, or scallop DAS. Since the sector vessels did not have to use a DAS to land regulated multispecies, the Council believed that some sector vessels would split their effort, using DAS to fish for skates, monkfish, and other species while not fishing for regulated multispecies.

This potential effect does not appear to have occurred in the skate bait fishery, however. Total skate bait landings by vessels enrolled in a 2010 sector did not increase compared with landings these sector vessels made in previous years (tab). In fact the opposite may have occurred: skate landings by non-sector vessel increased from 3.7 to 5.5 million pounds, contributing to a greater fraction of total skate bait landings. This increase might also have been caused by the incidental wing limit becoming effective on Sep 3,

2010, increasing fishing effort by non-sector vessels on skates for the bait market. Curiously, this increase is not evident for sector vessels.

Table 15. Skate bait landings (thousand lbs. live weight) by calendar year, categorized by whether the vessel was enrolled in a 2010 groundfish fishing sector. Source: NMFS SAFIS dealer data.

Year	Sector	Non-sector	Total
2003		892	892
2004	4,398	1,861	6,260
2005	4,956	2,789	7,745
2006	4,490	2,359	6,849
2007	5,944	2,560	8,504
2008	6,077	3,184	9,261
2009	4,917	3,656	8,573
2010	4,849	5,516	10,366

5.4.1.2 The skate wing fishery

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. 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 (Table 14).

Table 16. Skate wing fishery species composition¹⁴ (% total) in sampled landings. Source: Skate wing dockside sampling by port agents, NMFS Fisheries Statistics Office.

Species	Percent of Total						Mean/Year
	2005	2006	2007	2008	2009	2010	
Winter	84.11%	90.77%	97.97%	99.22%	99.12%	95.31%	94.41%
Thorny	5.99%	9.22%	1.54%	0.13%	0.43%	0.61%	2.99%
Barndoor	1.12%	0.00%	0.49%	0.00%	0.00%	0.00%	0.27%
Little*	8.62%	0.01%	0.00%	0.66%	0.45%	4.08%	2.30%
<i>N</i>	1784	7442	12640	11095	11444	15474	59879

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.

Notable is that 85% 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. It is also notable that only a

¹⁴ Some winter skates may have been mis-identified as little skates, or vessels catching skates for the wing market may land some large little skates incidentally.

little over 3 percent of landed skates were identified by port agents as a prohibited species. And this proportion declined with time, averaging around 0.5% since 2008.

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. Refer to Section 5.4.1.3.6 for a description of skate wing landings by port.

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).

5.4.1.2.1 Regulatory issues for the wing fishery

Two existing and significant regulatory limitations on the directed skate wing fishery groundfish DAS requirements and restrictions on fishing for skates using gillnets and trawls while fishing on a Multispecies Category B DAS.

Most directed skate fishermen fish in federal waters, possess multispecies permits, and fish for skates with gear capable of catching multispecies. This, in turn, means that they must use a DAS when fishing for skates unless fishing in an exempted fishery. Until Amendment 3 (NEFMC 2009) implementation in July 2010, vessels with multispecies permits could fish for skates on a Category B DAS while using gillnets, most of the time targeting winter skate for the wing market. Fishing for skates with trawls on a Category B day was prohibited to reduce fishing pressure on regulated multispecies which were often caught in tandem with skates. Before Amendment 3, the Council realized that fishing effort on a Category B DAS by gillnet vessels had rapidly increased, and since at the time the target winter skate species was believed to be overfished, the Council also prohibited gillnet vessels from using B DAS to target skates.

There are currently two exempted skate fisheries in the Southern New England Exemption Area; one gillnet fishery and one deepwater trawl fishery. Fishing for skates in all other areas requires a vessel to be fishing under a Multispecies, Monkfish, or Scallop DAS as a measure to limit fishing effort on skates.

Since May 1, 2010, however, vessels with Multispecies permits may elect to fish in a sector without participating in the DAS program while fishing for regulated multispecies. Sectors are regulated with sector catch limits for regulated multispecies and accountability measures (reductions in future allocations) for overages that occur. Skates and monkfish are regulated via multispecies DAS limits for qualifying vessels, but are not included in the sector limits. To retain and land skates vessels must still be on a multispecies, monkfish, or scallop DAS. Since the sector vessels did not have to use a DAS to land regulated multispecies, the Council believed that some sector vessels would split their effort, using DAS to fish for skates, monkfish, and other species while not fishing for regulated multispecies. This was especially expected in the skate wing fishery, which has considerable overlap with multispecies vessels fishing in the Gulf of Maine and Georges Bank.

Despite these expectations, skate landings by sector vessels did not increase. In fact, they declined (see table below), both in absolute numbers and especially in proportion to total landings. This may have resulted from the interaction between sector management and the early closure of the wing fishery on Sep

3, 2010, skates being of lower value per pound than most regulated multispecies. Landings by non-sector vessels (including dealer reports for vessels without federal permits landing skates from state waters) held steady.

Table 17. Skate wing landings (thousand lbs. live weight) by calendar year, categorized by whether the vessel was enrolled in a 2010 groundfish fishing sector. Source: NMFS SAFIS dealer data.

Year	Sector	Non-sector	Total
2003	16,646	15,660	32,306
2004	16,407	12,817	29,224
2005	14,400	8,940	23,339
2006	17,580	11,046	28,626
2007	23,139	10,544	33,683
2008	22,089	10,418	32,506
2009	20,006	11,627	31,634
2010	15,957	12,925	28,883

5.4.1.3 Commercial Fishery Landings

This section presents available commercial landings information for the northeast region skate complex from 2003-2010 (landings for 2011 were not yet complete at the time of this report). This includes total annual landings; landings by market category; landings by state, gear type, port, and area fished; Canadian skate landings; and recreational skate landings. For data previous to 2003, refer to the 2000 SAFE Report (NEFMC 2001) and the EIS for Amendment 10 (NEFMC 2009).

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).

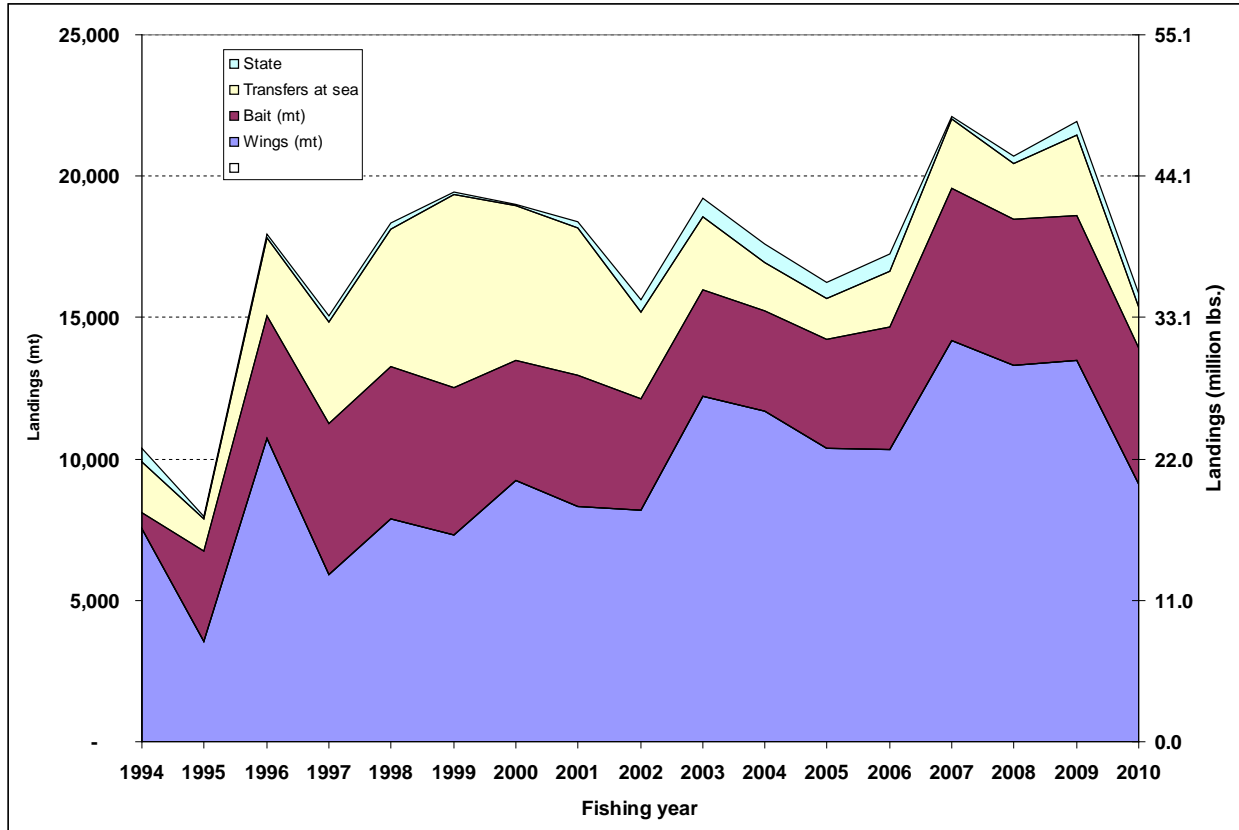
5.4.1.3.1 Total Commercial Landings

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. Skate landings reached 9,500 mt in 1969, but declined quickly during the 1970s, falling to 800 mt in 1981 (Figure 2). Landings have since increased substantially, partially in response to increased demand for lobster bait and the increased export market for skate wings. In 2007, skate landings were the highest ever recorded, exceeding 19,000 mt. The increased demand for skate products since the mid-1980s has concurrently resulted in declining discard rates for skates (Figure 2).

Amendment 3 was implemented on July 16, 2010, near the beginning of the 2010 fishing year. Landings from 2009 to 2010 decline by 28% to 15,836 mt, largely from reductions in the wing fishery. Skate transfers at sea for bait, reported on VTRs, also declined by 50% to 1,427 mt. State landings in the figure below include landings reports by dealers which have no or aggregate federal permit numbers, but for actual monitoring purposes, the NE Regional Office determines whether the vessel has a federal permit at

the time of landing. State landings in the figure below are henceforth underestimated, compared to TAL monitoring data.

Figure 2. Annual U.S. skate landings (mt), 1994 – 2010 fishing years. The Skate Complex FMP was implemented in 2003.



5.4.1.3.2 Landings by fishery

Federal permitted seafood dealers report skate landings by intended market, recorded with either a disposition or utility code. Although slight differences occur (and the disposition code began in 1996), nearly all of the skate landings are recorded as ‘bait’ or ‘food or unknown’ and the two codes agree in the vast majority of cases. In addition, vessel operators report landings and transfers at sea (dealer=000002) by vessel trip reports (VTR) since 1994.

Skate landings reported for the food market began at least as early as 1963, with 26,000 lbs. of landings (Table 16). Wing landings rose to 35 million pounds in 2003 and then varied between 24.5 and 32.5 million pounds since then, before declining to 22.2 million pounds in 2010. Over the period 1995-2006 (the period used in Amendment 3 to allocate landings to wing and bait fisheries), wing landings averaged 73.2% of total skate landings. From 1995-2009, before Amendment 3 implementation, wing landings averaged 72.5% of total landings.

Reported bait landings increased rapidly from the first reports in 1983 to 12.2 million pounds in 1992, before declining to relatively low levels from 1995-2003. During this time, it appeared that reported transfers at sea of skates for bait replaced the bait landings reported to dealers, peaking at 15 million pounds in 2000. Bait landings reported by dealers increase by about 10% to 10.0 million pounds during

fishing year 2010. Bait landings reported by dealers accounted for 6.7 of total skate landings during 1995-2006 and 9.8% of landings during 1995-2009. Transfers of sea of skates for bait averaged 20.1 % of total skate landings during 1995-2006 and 17.7% of total skate landings during 1995-2009. Taken together, the bait landings sold to dealers or transferred at sea averaged 26.8% of total skate landings during 1995-2006 and 27.5% during 1995-2009.

On a price per whole pound basis¹⁵, skate prices for wings were two to two and half times those paid by dealers for bait (Table 16). In 2010, however, bait prices increased to \$0.25 per pound, while prices for wings increased slightly to \$0.23 per whole pound (or \$0.52 for wings). It should be noted that in 2010, skate wing prices varied considerably as the supply of skate wings changed in response to skate possession limit changes.

¹⁵ Skate landings reported as wing landings are converted using an accepted ratio of 2.27.

Table 18. Fishing year landings (thousand pounds live weight) and price per live pound by fishery. Source NMFS dealer SAFIS and VTR files.

Fishing year	Bait			Transfers at sea		Wings			Total Landings, lbs live wt
	Landings, lbs live wt	Percent	Price per lb.	Landings, lbs live wt	Percent	Landings, lbs live wt	Percent	Price per lb.	
1963		0%				26	100%	\$0.04	26
1964		0%				89	100%	\$0.04	89
1965		0%				76	100%	\$0.04	76
1966		0%				127	100%	\$0.04	127
1967		0%				87	100%	\$0.04	87
1968		0%				84	100%	\$0.05	84
1969		0%				136	100%	\$0.05	136
1970		0%				132	100%	\$0.06	132
1971		0%				162	100%	\$0.07	162
1972		0%				180	100%	\$0.07	180
1973		0%				176	100%	\$0.08	176
1974		0%				223	100%	\$0.08	223
1975		0%				277	100%	\$0.10	277
1976		0%				291	100%	\$0.13	291
1977		0%				331	100%	\$0.12	331
1978		0%				821	100%	\$0.12	821
1979		0%				1,562	100%	\$0.14	1,562
1980		0%				854	100%	\$0.13	854
1981		0%				733	100%	\$0.14	733
1982		0%				1,506	100%	\$0.08	1,506
1983	92	4%	\$0.59			1,988	96%	\$0.06	2,080
1984	18	1%	\$0.06			1,801	99%	\$0.06	1,818
1985	114	7%	\$0.05			1,612	93%	\$0.07	1,725
1986	277	11%	\$0.05			2,221	89%	\$0.08	2,498
1987	81	2%	\$0.06			4,525	98%	\$0.08	4,606
1988	9,019	67%	\$0.05			4,343	33%	\$0.08	13,362
1989	9,105	57%	\$0.05			7,007	43%	\$0.10	16,112
1990	10,554	41%	\$0.05			15,421	59%	\$0.10	25,976
1991	12,195	46%	\$0.05			14,140	54%	\$0.09	26,335
1992	12,068	44%	\$0.06			15,182	56%	\$0.13	27,250
1993	1,923	11%	\$0.07			15,370	89%	\$0.16	17,293
1994	1,019	5%	\$0.06			17,864	95%	\$0.28	18,883
1995	3,883	20%	\$0.21	3,980	21%	11,197	59%	\$0.22	19,060
1996	23	0%	\$0.12	2,525	7%	33,451	93%	\$0.19	35,999
1997	97	0%	\$0.06	6,115	19%	25,255	80%	\$0.14	31,467
1998	654	2%	\$0.06	7,890	21%	29,033	77%	\$0.13	37,578
1999	145	0%	\$0.10	10,752	28%	27,716	72%	\$0.12	38,613
2000	50	0%	\$0.12	15,040	33%	29,832	66%	\$0.13	44,922
2001	1,184	3%	\$0.16	12,050	29%	27,832	68%	\$0.11	41,066
2002	665	2%	\$0.21	11,564	29%	27,091	69%	\$0.13	39,319
2003	865	2%	\$0.08	6,753	16%	35,736	82%	\$0.13	43,353
2004	7,417	18%	\$0.08	5,717	14%	27,616	68%	\$0.17	40,750
2005	8,086	22%	\$0.10	3,777	10%	24,546	67%	\$0.20	36,409
2006	6,870	19%	\$0.09	3,158	9%	26,711	73%	\$0.25	36,739
2007	9,247	19%	\$0.09	4,256	9%	33,979	72%	\$0.22	47,482
2008	9,130	20%	\$0.10	5,448	12%	30,739	68%	\$0.20	45,317
2009	9,050	20%	\$0.11	4,350	9%	32,486	71%	\$0.20	45,886
2010	10,012	26%	\$0.25	6,280	16%	22,247	58%	\$0.23	38,539
1995-2006		6.7%						73.2%	
1995-2009		9.8%						72.5%	

Nearly all skate bait landings are landed in whole form (Table 17). Some dealers have reported landings of wings for the bait market, but these reports may either be inaccurate or represent landings of wings that cannot be marketed for food. On the other hand, since 1995 a significant amount of landings for the skate wing market (reported as ‘food or unknown’ on dealer reports were landed in whole form, presumably cut shoreside with the carcasses either sold as bait or disposed as unmarketable. This practice (landing whole skates for the wing market) seemed to be more prevalent from 1995 to 2003, but it appears to coincide with a period of low landings reports by dealers. Thus some of these landings of whole skates for the wing market were probably really destined for the skate market and not reported or coded accurately on the dealer reports. It would be difficult to distinguish the difference in the dealer report data without making assumptions.

Table 19. Skate landings (thousand pounds live weight) by fishery and product form.

FISHING_YEAR	Bait		Bait Total	Food or unknown		Food or unknown Total
	Whole	Wings		Whole	Wings	
1963				26		26
1964				89		89
1965				76		76
1966				127		127
1967				87		87
1968				84		84
1969				136		136
1970				132		132
1971				162		162
1972				180		180
1973				176		176
1974				223		223
1975				277		277
1976				291		291
1977				331		331
1978				821		821
1979				1,562		1,562
1980				854		854
1981				733		733
1982				392	1,113	1,506
1983	92		92	242	1,746	1,988
1984	18		18	83	1,717	1,801
1985	114		114	177	1,435	1,612
1986	277		277	197	2,024	2,221
1987	81		81	86	4,439	4,525
1988	9,019		9,019	168	4,175	4,343
1989	9,102	3	9,105	674	6,333	7,007
1990	10,554		10,554	370	15,052	15,421
1991	12,061	134	12,195	657	13,483	14,140
1992	11,945	123	12,068	378	14,805	15,182
1993	1,906	17	1,923	684	14,686	15,370
1994	1,017	3	1,019	560	17,304	17,864
1995	3,843	40	3,883	3,172	8,025	11,197
1996	23		23	9,587	23,864	33,451
1997	97		97	11,812	13,443	25,255
1998	654	0	654	11,293	17,740	29,033
1999	113	32	145	11,504	16,213	27,716
2000	50		50	9,338	20,495	29,832
2001	1,183	1	1,184	9,159	18,673	27,832
2002	638	27	665	8,589	18,501	27,091
2003	865		865	8,345	27,391	35,736
2004	7,412	5	7,417	1,182	26,433	27,616
2005	8,003	84	8,086	1,222	23,324	24,546
2006	6,853	17	6,870	2,970	23,741	26,711
2007	9,246	0	9,247	2,603	31,376	33,979
2008	9,130		9,130	2,358	28,381	30,739
2009	9,050	0	9,050	2,590	29,897	32,486
2010	9,417	595	10,012	1,014	21,233	22,247

5.4.1.3.3 Landings by state

Table 18 presents commercial landings of skates by individual states from 2003 – 2010. Massachusetts and Rhode Island continue to dominate the skate fishery, averaging about 20 – 30 million lb annually across the time series. Skate landings from Massachusetts and Rhode Island comprised 80-94% of the total reported annual skate landings during this period. Rhode Island landings have remained fairly consistent but declined in 2009 and 2010, while Massachusetts landings have increased significantly since 2000, before dropping in 2010. New Jersey, New York, Connecticut, Maine, New Hampshire, and Virginia land relatively small amounts of skates. Reported skate landings from Maine and New Hampshire have decreased in recent years. Very few skates are landed in Maryland and North Carolina, and Delaware (no listed due to confidentiality) reported minimal skate landings for the time series.

From 2009 to 2010, bait landings increased by 7 percent, mostly from increases in RI where bait landings increased by 10%. Wing landings, on the other hand, declined by 33% to 22 million pounds, mostly in MA. Wing landings in RI were about the same as they were in 2009, but less than half of the amounts in 2003 to 2010. It may be that the utility code reported by dealers for landings in RI (where most bait landings occur) were misclassified before 2009. Skate wing landings in NJ and NY increased by 22 and 42 percent, respectively.

Table 20. U.S. skate landings (thousands pounds live weight) by state, 2003-2010. Source: NMFS Dealer reports.

Fishery	State	Fishing year								Change
		2003	2004	2005	2006	2007	2008	2009	2010	
Bait	CT	690	6	620	413	419			320	
	MA			1	32	129	592	2,043	1,603	-22%
	MD	45	0	5	10			0	8	4755%
	NJ	129	5	16			60	349	511	46%
	RI	0	17	33	57	301	1,943	6,594	7,246	10%
	VA	1	0	6		15	13	64	9	-85%
Bait Total		865	28	682	512	864	2,608	9,050	9,697	7%
Wing	CT	292	905	153	151	126	1,455	956	224	-77%
	MA	20,054	23,766	20,523	23,511	29,868	26,134	23,541	12,075	-49%
	MD	15	10	22	17	53	107	173	52	-70%
	ME	103	26	4	7	68	9	6	10	72%
	NC	1	1	0	0	1	11	4	17	366%
	NH	25	24	20	26	11	12	15	7	-50%
	NJ	855	776	794	963	1,326	1,579	2,174	2,661	22%
	NY	767	420	375	515	776	942	1,458	2,076	42%
	RI	13,582	9,003	10,024	8,036	10,111	8,323	4,349	4,341	0%
	VA	82	71	65	24	122	137	366	584	59%
Wing Total		35,776	35,003	31,981	33,251	42,461	38,708	33,041	22,048	-33%
Grand Total		36,640	35,031	32,663	33,763	43,325	41,316	42,090	31,745	-25%

5.4.1.3.4 Landings by market category

The Skate FMP implemented new reporting requirements for skates beginning in 2003. A list of the available skate codes in the dealer weighout database is included in Table 19. Federally permitted dealers report most of the skate wings they purchase by two separate market categories: unclassified wings (code 3651) or “big skate” (code 3671). They mostly report whole/bait skate landings as little skate (code 3660) or unclassified whole skates (code 3650). Landings reported as little skate are known to include amounts of juvenile winter skate. Although reporting of skate landings by species has been encouraged, species identification by vessels and dealers remains problematic, and most landings continue to be unclassified or misrepresented (Figure 3). This mis-identification in the landings declined in 2010 but still remains problematic.

While the landings by market category from the dealer weighout data may not be entirely complete, they can be examined to identify the general proportion of skate landings that are used for either the lobster

bait market or the seafood market. They can also be disaggregated into individual ports to characterize skate fishing activity in the port.

According to Table 20, more pounds of skates are caught for the wing market than for the bait market. For the time series, skate wing landings (*live weight*) accounted for 68-75% of the total landings. In general, the proportion of skate landings reported as wings has increased since 2000, which is also apparent in landings data for the state of Massachusetts, presented in Table 18, but declined in 2010 mostly from Amendment 3 regulations.

Revenues from wing landings are generated from *landed weight*. Wing landings receive a significantly higher ex-vessel price than bait landings, as fewer landed pounds of wings generated substantially higher revenues than the larger amounts of whole skates landed. Based on the data summarized in Table 20, the price for whole skates averaged \$0.07-0.12 per lb, and the price for skate wings averaged \$0.33-0.60 per lb. The price (unadjusted) for whole skates has remained relatively constant, whereas the price for skate wings has been increasing since 2001, but leveled off since 2006. Prices for wings in 2010 averaged \$0.52 and the wing landings were 68% of the total.

Table 21. List of skate species and market codes used in the dealer weighout database since 2003. Note: Big skate is an alternative common name for winter skate (*Leucoraja ocellata*), and does not indicate the Pacific big skate (*Raja binoculata*).

Species Code (NESPP4)	Common Name	Grade Description	Market Description
3650	SKATES	ROUND	MIXED OR UNSIZED
3650	SKATES	ROUND	UNKNOWN
3670	SKATE, BIG	ROUND	UNKNOWN
3720	SKATE, CLEARNOSE	ROUND	UNKNOWN
3660	SKATE,LITTLE	ROUND	UNKNOWN
3640	SKATE, ROSETTE	ROUND	UNKNOWN
3680	SKATE,BARNDOOR	ROUND	UNKNOWN
3670	SKATE, WINTER	ROUND	UNKNOWN
3700	SKATE, THORNY	ROUND	UNKNOWN
3690	SKATE, SMOOTH	ROUND	UNKNOWN
3651	SKATES	WINGS	MIXED OR UNSIZED
3651	SKATES	WINGS	UNKNOWN
3671	SKATE, BIG	WINGS	UNKNOWN
3721	SKATE, CLEARNOSE	WINGS	UNKNOWN
3661	SKATE,LITTLE	WINGS	UNKNOWN
3641	SKATE, ROSETTE	WINGS	UNKNOWN
3681	SKATE,BARNDOOR	WINGS	UNKNOWN
3671	SKATE, WINTER	WINGS	UNKNOWN
3701	SKATE, THORNY	WINGS	UNKNOWN
3691	SKATE, SMOOTH	WINGS	UNKNOWN

Figure 3. Total skate landings (thousand pounds live weight) by reported species code in the dealer SAFIS database, 2007 v 2010.

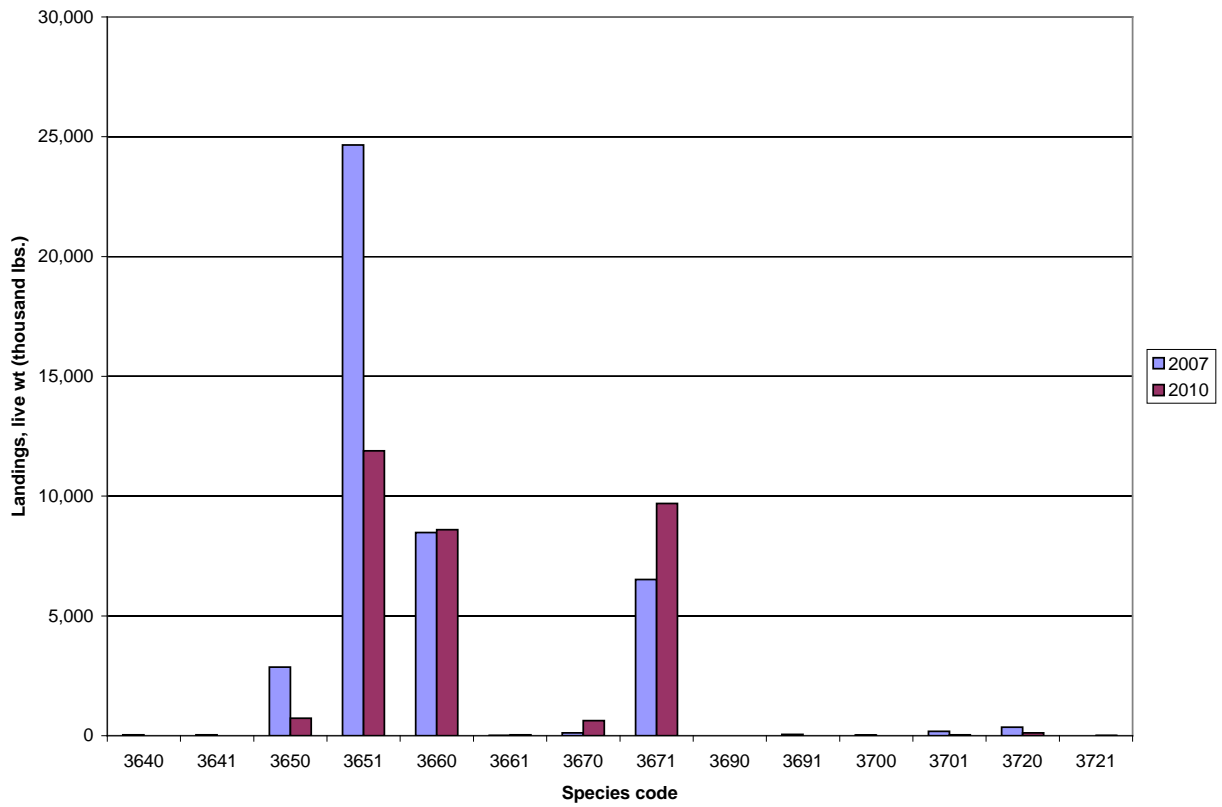


Table 22. Annual skate landings and revenue by landed form (2003-2010). *Source: Dealer SAFIS Database, NMFS*

Fishing year	Landed form	Landed weight (lb)	Live weight (lb)	Revenue (thousands)
2003	Whole	9,206,764	9,206,764	\$687
	Wings	12,085,113	27,433,455	\$3,928
2003 Total		21,291,877	36,640,219	\$4,615
2004	Whole	8,598,935	8,598,935	\$696
	Wings	11,643,823	26,431,730	\$4,602
2004 Total		20,242,758	35,030,665	\$5,298
2005	Whole	9,249,365	9,249,365	\$993
	Wings	10,314,129	23,413,404	\$4,793
2005 Total		19,563,494	32,662,769	\$5,786
2006	Whole	10,054,924	10,054,924	\$981
	Wings	10,444,049	23,708,338	\$6,258
2006 Total		20,498,973	33,763,262	\$7,240
2007	Whole	11,866,957	11,866,957	\$1,129
	Wings	13,858,174	31,458,515	\$7,230
2007 Total		25,725,131	43,325,472	\$8,360
2008	Whole	11,488,141	11,488,141	\$1,137
	Wings	13,139,784	29,827,729	\$6,013
2008 Total		24,627,925	41,315,870	\$7,150
2009	Whole	11,653,816	11,653,816	\$1,213
	Wings	13,408,047	30,436,670	\$6,305
2009 Total		25,061,863	42,090,486	\$7,518
2010	Whole	10,076,697	10,076,697	\$1,233
	Wings	9,545,274	21,668,234	\$4,926
2010 Total		19,621,971	31,744,931	\$6,159

5.4.1.3.5 Landings by gear

Table 21 presents annual skate landings (2003-2010) from the dealer SAFIS database by gear type and by market category as a percentage of the annual total. Otter trawl is the primary gear used to land skates. Approximately 43-73% of the total skate landings during this period were captured by trawl gear. About 25-30% of the skates caught with otter trawls are landed for the lobster bait market, with the other 70-75% landed for the wing market (Table 21). Almost all skates caught for the lobster bait fishery are caught with a trawl. Gillnets are the secondary gear used to land skates. Almost all skates that are caught with gillnets are landed as wings. Between 2003 and 2010, 95-98% of the total gillnet landings of skates were wings (Table 21). Gillnet landings of skates increased over the time series, representing 25% of the total landings in 2003, but up to 47% of the total in 2010.

Other gears in which skates are consistently caught include traps, hook gear (including longlines), and scallop dredges. The overall contribution of skate landings from gears other than trawl and gillnets is relatively insignificant.

Table 23. Annual (fishing year) skate landings (thousands pounds live weight) by gear type and market category as a percentage of total skate landings. Source: Dealer SAFIS Database, NMFS.

Gear type	Landed form	Data	2003	2004	2005	2006	2007	2008	2009	2010
Trawls	Whole	Landings live wt (thousand lbs)	8,799	8,341	8,547	9,674	11,389	10,719	10,506	9,191
		Percent	24%	24%	26%	29%	26%	26%	25%	29%
	Wings	Landings live wt (thousand lbs)	18,072	15,105	13,708	11,904	17,494	14,018	12,799	4,311
		Percent	49%	43%	42%	35%	40%	34%	31%	14%
Trawls Landings live wt (thousand lbs)			26,871	23,446	22,255	21,578	28,883	24,737	23,305	13,502
Trawls Percent			73%	67%	68%	64%	67%	60%	56%	43%
Gill nets	Whole	Landings live wt (thousand lbs)	406	163	371	293	310	582	903	837
		Percent	1%	0%	1%	1%	1%	1%	2%	3%
	Wings	Landings live wt (thousand lbs)	9,216	9,252	7,855	10,830	13,434	13,687	15,847	15,050
		Percent	25%	27%	24%	32%	31%	33%	38%	47%
Gill nets Landings live wt (thousand lbs)			9,622	9,416	8,226	11,124	13,744	14,269	16,749	15,887
Gill nets Percent			26%	27%	25%	33%	32%	35%	40%	50%
Unknown	Whole	Landings live wt (thousand lbs)	0	31	193	40	151	144	232	21
		Percent	0%	0%	1%	0%	0%	0%	1%	0%
	Wings	Landings live wt (thousand lbs)	6	665	760	466	440	1,997	1,597	2,221
		Percent	0%	2%	2%	1%	1%	5%	4%	7%
Unknown Landings live wt (thousand lbs)			7	696	953	506	592	2,141	1,829	2,242
Unknown Percent			0%	2%	3%	2%	1%	5%	4%	7%
Dredges	Whole	Landings live wt (thousand lbs)	0	22	124	28	13	8	1	1
		Percent	0%	0%	0%	0%	0%	0%	0%	0%
	Wings	Landings live wt (thousand lbs)	18	300	971	460	67	45	36	27
		Percent	0%	1%	3%	1%	0%	0%	0%	0%
Dredges Landings live wt (thousand lbs)			18	322	1,095	488	80	52	37	28
Dredges Percent			0%	1%	3%	1%	0%	0%	0%	0%
Other nets	Whole	Landings live wt (thousand lbs)	1	0	7	0		29	8	6
		Percent	0%	0%	0%	0%	0%	0%	0%	0%
	Wings	Landings live wt (thousand lbs)	8	613	25	1	1	0	1	0
		Percent	0%	2%	0%	0%	0%	0%	0%	0%
Other nets Landings live wt (thousand lbs)			9	613	32	1	1	29	10	7
Other nets Percent			0%	2%	0%	0%	0%	0%	0%	0%
Longlines	Whole	Landings live wt (thousand lbs)		0	1	2	3	3	2	4
		Percent	0%	0%	0%	0%	0%	0%	0%	0%
	Wings	Landings live wt (thousand lbs)	79	378	54	29	11	13	25	24
		Percent	0%	1%	0%	0%	0%	0%	0%	0%
Longlines Landings live wt (thousand lbs)			79	378	54	32	14	16	27	28
Longlines Percent			0%	1%	0%	0%	0%	0%	0%	0%

5.4.1.3.6 Landings by port

Table 22 present annual skate wing landings (from the dealer SAFIS database) by port for 2003-2010. The top 15 ports in 2003-2009 represented over 93% of the total skate landings in the region. In 2010, the top 15 ports contributed to only 88% of skate wing landings, suggesting that the top ports may have been impacted more by the Amendment 3 regulations than ports with lower skate wing landings. New Bedford suffered a 72% decline in reported landings for the skate wing market.

Table 24. Annual skate landings (thousands pounds live weight) for top 15 ports by market category and as a percentage of total skate landings (2003-2010). *Source: Dealer SAFIS Database, NEFSC*

Port	State		2003	2004	2005	2006	2007	2008	2009	2010	Change
NEW BEDFORD	MA	Landings live wt (thousand lbs)	13,611	16,001	14,583	15,025	20,406	16,948	15,207	4,193	-72%
		Percent	38%	46%	46%	45%	48%	44%	46%	19%	
CHATHAM	MA	Landings live wt (thousand lbs)	4,757	5,997	4,522	6,212	7,334	6,675	5,884	5,261	-11%
		Percent	13%	17%	14%	19%	17%	17%	18%	24%	
POINT JUDITH	RI	Landings live wt (thousand lbs)	10,111	5,779	5,540	5,100	5,663	4,864	2,140	2,694	26%
		Percent	28%	17%	17%	15%	13%	13%	6%	12%	
TIVERTON	RI	Landings live wt (thousand lbs)	2,381	2,383	2,884	1,658	2,540	995	120	121	1%
		Percent	7%	7%	9%	5%	6%	3%	0%	1%	
NEWPORT	RI	Landings live wt (thousand lbs)	299	319	1,078	1,022	1,597	1,488	694	624	-10%
		Percent	1%	1%	3%	3%	4%	4%	2%	3%	
BARNEGAT LIGHT/LONG BEACH	NJ	Landings live wt (thousand lbs)	383	313	375	244	489	536	1,258	1,639	30%
		Percent	1%	1%	1%	1%	1%	1%	4%	7%	
GLOUCESTER	MA	Landings live wt (thousand lbs)	534	360	326	347	455	561	772	1,859	141%
		Percent	1%	1%	1%	1%	1%	1%	2%	8%	
LITTLE COMPTON	RI	Landings live wt (thousand lbs)	752	510	258	221	302	798	1,241	713	-43%
		Percent	2%	1%	1%	1%	1%	2%	4%	3%	
BOSTON	MA	Landings live wt (thousand lbs)	441	680	538	709	781	697	525	344	-34%
		Percent	1%	2%	2%	2%	2%	2%	2%	2%	
HAMPTON BAYS	NY	Landings live wt (thousand lbs)	303	155	84	175	362	377	508	522	3%
		Percent	1%	0%	0%	1%	1%	1%	2%	2%	
POINT PLEASANT	NJ	Landings live wt (thousand lbs)	235	138	143	158	227	286	483	696	44%
		Percent	1%	0%	0%	0%	1%	1%	1%	3%	
OTHER CONNECTICUT	CT	Landings live wt (thousand lbs)		0			19	1,366	737	62	-92%
		Percent	0%	0%	0%	0%	0%	4%	2%	0%	
MONTAUK	NY	Landings live wt (thousand lbs)	169	103	102	150	234	202	541	644	19%
		Percent	0%	0%	0%	0%	1%	1%	2%	3%	
FALL RIVER	MA	Landings live wt (thousand lbs)	194	246	22	520	299	741	30	4	-87%
		Percent	1%	1%	0%	2%	1%	2%	0%	0%	
WESTPORT	MA	Landings live wt (thousand lbs)	209	172	182	84	111	190	463	44	-91%
		Percent	1%	0%	1%	0%	0%	0%	1%	0%	

Currently, the top ports landing whole skates for lobster bait are:

- | 2003-2009 | 2010 |
|-----------------|-----------------|
| 1. Point Judith | 1. Point Judith |
| 2. Tiverton | 2. Newport |
| 3. New Bedford | 3. Fall River |
| 4. Newport | 4. Chatham |
| 5. Stonington | 5. Belford |

Currently, the top ports landing skate wings are:

- | 2003-2009 | 2010 |
|-------------------|-------------------|
| 1. New Bedford | 1. Chatham |
| 2. Chatham | 2. New Bedford |
| 3. Point Judith | 3. Point Judith |
| 4. Boston | 4. Gloucester |
| 5. Barnegat Light | 5. Barnegat Light |

New Bedford, MA and Chatham still dominate skate landings, averaging over 43% of the total skate landings in 2010. New Bedford and Chatham dominate skate wing landings, and Point Judith dominates skate bait landings. Between 2003-2010, an average of 97% of New Bedford's skate landings were classified as wings. All of New Bedford's 2010 landings were classified as wings. An average of 78% of Point Judith's skate landings were classified as whole skates (Table 22). Wing landings as a percentage

in Point Judith increased to 33% in 2009 and 2010. Since 2000, skate wing landings in Provincetown, MA have declined, while landings in Chatham, MA have increased substantially.

5.4.1.3.7 Landings by day-at-sea program

This section has not been updated since the Amendment 3 FEIS (NEFMC 2009), due to difficulties using the revised DAS data and the implementation of NE Multispecies FMP sectors. The requirement, described below, for vessels to use a DAS remains as a deterrent to derby-style fishing behavior in the skate wing fishery and as an input control on vessel capacity. As of Amendment 3 implementation, vessels were limited to possession no more than 500 lbs./day whole weight per trip when on a Category B Multispecies DAS, so the amount of landings in this category is expected to have been much less in 2010.

Upon implementation of the Skate FMP in 2003, vessels were required to fish on a Multispecies, Monkfish, or Scallop Day-at-Sea (DAS) to possess skates, unless fishing in an exempted fishery. This management measure was an indirect method to control effort in the skate fishery, which has a great deal of overlap with these fisheries. Using DAS to limit skate fishing effort also reflects a Multispecies FMP requirement, since the primary gears fishermen use to target skates (trawl and gillnet) are also capable of catching regulated groundfish. Historically, most skate landings occur either indirectly when targeting regulated groundfish or on trips targeting skates. Some skates are caught and landed by vessels using gillnets to target monkfish and skates using gillnets. And although skates are frequently caught by vessels targeting scallops with dredges, few are landed on Scallop DAS.

Two changes have occurred since the implementation of Amendment 3 to make DAS use less important. In response to a rapid increase in the use of Multispecies Category B DAS to target winter skates using gillnets, Amendment 3 prohibited the practice because of concerns about fishing mortality on winter skate and the potential effect that catch share management in the multispecies fishery could have on skate effort, freeing up DAS to target skates. According to the analysis in Sections 5.4.1.2.1 and 5.4.1.1.2, increases in skate fishing effort on a Multispecies DAS by sector vessels apparently did not occur. A mixed monkfish/skate fishery exists in Southern New England and the Mid-Atlantic regions, in which skate catch is limited by monkfish DAS allocations.

Since 2007, monkfish DAS allocations for the southern management area (where the majority of skate fishing occurs) have remained constant. Monkfish DAS allocations for the 2011 fishing year increase from 23 to 28 DAS, but this minor change is not expected to have a significant direct effect on using monkfish DAS to target skates. There have been no reports or indications that vessels are using monkfish DAS to increase targeting of skates, particularly since the TALs and in-season accountability measures were implemented in 2010 by Amendment 3. In fact, the opposite probably occurred since the mixed monkfish/skate gillnet fishery primarily occurs in the spring. And since the incidental possession limits were effect in the spring of 2011 (fishing year 2010), fishermen may have focused their fishing effort in areas where they can catch more monkfish and avoid catching skates. Very few skates have been landed by vessels on a scallop DAS, because of the relatively low value of skates relative to scallops and the fully rebuilt status of the scallop resource. Scallop catch rates and prices are at historically high levels.

5.4.1.3.8 Fishing areas

Vessels landing skates for the wing market either target skates on Georges Bank, in the Great South Channel near Cape Cod, MA, or west of the Nantucket Lightship Area in Southern New England waters. Maps of effort distributions were presented in the Amendment 3 FEIS (NEFMC 2009), which analyzed the effect of skate management areas on skate fishing. Vessels using gillnets often target skates to supply the wing market by fishing east of Cape Cod, MA.

Other vessels land skates for the wing market while fishing for other species. Vessels fishing for groundfish and in particular flounders often land an incidental catch of skates. These vessels often fish in Massachusetts Bay and on Georges Bank. Some vessels fishing for scallops using dredges also land skates, but in particular scallop vessels with general category permits that fished in the Great South Channel often land skates. There is also a mixed monkfish/skate fishery that occurs west of the Nantucket Lightship Area and off Northern NJ, near Point Pleasant.

A skate fishery in RI and to a lesser extent in New Bedford supplies a lobster bait market, by landing whole skates while fishing inshore waters of Southern New England. Most of these vessels use trawls and often fish in an exempted fishery.

According to landings data, assigned to statistical fishing area with matching VTR reports, the majority of skate wing landings from vessels using trawls are caught on Georges Bank and landed in MA (Table 23). These wing landings fell off dramatically in 2010, much more than in other states or other areas, possibly related to new skate and groundfish rules. Nearly all of the skate wing landings decrease occurred in New Bedford by vessels using trawls, a pattern not reflected nearly as dramatically in other ports in MA or elsewhere.

Skate wing landings in MA by vessels using gillnets were more evenly split, 60% from Georges Bank and 30% from Southern New England (Table 23). And despite the reduced possession limit for vessels using a gillnet while using a Category B Multispecies DAS¹⁶ and the Amendment 3 skate possession limits, the landings by vessels using gillnets declined relatively little in 2010. In fact significant landings in RI and NY from Southern New England waters remained nearly steady and in NJ from the Mid-Atlantic waters actually increased in 2010.

Some whole skate landings in MA from the Gulf of Maine and RI from Southern New England waters were reported for vessels using gillnets (Table 24). These landings were either relatively stable in 2010 or increased by about 200,000 lbs and most of these landings were probably landed in whole form for the wing market, with carcasses being sold for bait. Most of the whole skate landings for the bait market come from Southern New England waters (Table 24) and are caught by vessels using trawls. MA landings primarily come from Southern New England waters and dropped by about 2/3rds in 2010. The majority of whole skate landings by trawl vessels occurred in RI from Southern New England waters and declined by about 15% from fishing year 2009 to 2010.

¹⁶ Amendment 3 reduced the possession limit for gillnet vessels on a Category B DAS from 20,000 lbs. to 220 lbs. of skate wings.

Table 26. skate landings (thousand pounds live weight for vessels using trawls and gillnets by fishing year, state, and area

STATE/ABB	REGION	Trawls								Trawls Total	Gill nets								Gill nets Total								
		2003	2004	2005	2006	2007	2008	2009	2010		2003	2004	2005	2006	2007	2008	2009	2010									
CT	Georges Bank			0	1	2			0	0	3																
	Mid-Atlantic				0						0																
	Southern New England		690	772	601	394	23			335	2,814	43	5	17	6	0										71	
	Unknown					11	379		0		2				18											18	
CT Total			690	772	602	407	401		0	337	3,210	43	5	17	6	18										89	
MA	Georges Bank		55	30	46	197	48	55	17		449	23	0	6	55	1			5	4	1					95	
	Gulf of Maine		7	6	53	66	8	29	44	3	216	1	0	6	2	28	240	262	566							1,104	
	Mid-Atlantic							4			4								3	0						3	
	Southern New England		1	226	24	2,172	2,258	2,749	3,178	701	11,308		2	97	82	59	84	9								332	
	Unknown			20	2	40	127	89	152	300	729		6	42	49	20	31	157	19							323	
MA Total			62	283	124	2,476	2,441	2,926	3,391	1,003	12,706	24	8	150	187	108	360	435	585							1,858	
MD	Mid-Atlantic		5	1	9	14	1			4	33	0	0	0	0											0	
	Unknown		45				19	22			1	86	0	0	0	1	3									4	
MD Total			50	1	9	14	19	22		4	119	0	0	0	0	1	3									4	
ME	Gulf of Maine																									0	
	Unknown																									0	
ME Total												0	0													0	
NC	Unknown									2	2															1	
NC Total										2	2															1	
NH	Gulf of Maine												0										0	0		0	
	Unknown																						0	0		0	
NH Total																							0	0		0	
NJ	Georges Bank					3					3															0	
	Mid-Atlantic		163	233	67	423	455	650	616	496	3,104	0	0	13	1											14	
	Southern New England		0		3		2	1	0	0	7																
	Unknown		129	0						103	233															0	
NJ Total			293	234	70	427	457	651	616	599	3,347	0	0	13	1											15	
NY	Georges Bank			0					1	0	1													2		2	
	Gulf of Maine										0					0										0	
	Mid-Atlantic			0		1	1	2	1	0	6					5	0	3								16	
	Southern New England		3	5	31	34	26	13	12	23	147	4	11	53	32	38	19	7	5							168	
	Unknown				0	1	0	19		6	26		31			2	0	1								34	
NY Total			3	6	31	35	28	16	33	29	180	4	42	60	32	44	21	10	6							220	
RI	Georges Bank		131	15	57	124	16	22	142	0	506																17
	Gulf of Maine									4	4																
	Mid-Atlantic					6	4		37	11	57																
	Southern New England		7,560	7,023	7,651	6,172	8,007	7,054	6,183	5,280	54,929	317	104	130	68	136	197	433	224							1,609	
	Unknown			0		2	7	16	33	1,916	1,974				2		20	22								47	
RI Total			7,691	7,038	7,708	6,303	8,034	7,091	6,394	7,211	57,470	334	107	130	68	139	197	452	246							1,673	
VA	Mid-Atlantic		10	8	2	13	9	13	72	6	132															6	
	Unknown		1								1															1	
VA Total			10	8	2	13	9	13	72	6	133															6	
DE	Mid-Atlantic												0													0	
DE Total													0													0	

5.4.1.4 Canadian skate landings

Historical information on Canadian skate fisheries and management was described in the 2000 SAFE Report and in the Amendment 3 FEIS (NEFMC 2009). Historic details can also be found in Swain et al. (2006) and Kulka et al. (2007). Prior to 1994, skates were only caught incidentally in Canadian fisheries like those for groundfish. However, a Canadian directed skate fishery was initiated in 1994 as a response to closures in the traditional Canadian groundfish fishery and an increasing international market for skate wings. Canadian skate catches have declined from 4200 mt in 1994, to 1100 mt in 2006 (Kulka et al. 2007).

Since 2006, Canadian landings of skates have held nearly constant between 995 and 1,278 mt (see table below). Nearly all of the landings originate in the Newfoundland and Labrador provinces (see map below), and therefore have less effect on skates in the Gulf of Maine and on Georges Bank. Closer to US waters, landings from the New Brunswick province (northern Gulf of Maine and western Scotian Shelf) increased to 254 mt in 2007, but then declined to 64 mt in 2008 and 36 mt in 2009. Landings data from 2010 were not yet available when this report was written. Recent skate landings in the New Brunswick province (Scotian Shelf) have remained at zero.

Table 27. Canadian skate landings (mt, whole) by calendar year, province, and region. Source: Canada Dept. of Fisheries and Oceans: <http://www.dfo-mpo.gc.ca/stats/commercial/sea-maritimes-eng.htm>.

	NS			NB			PE	QC	NL	Atlantic
	S-F	Gulf	Total	S-F	Gulf	Total	Total	Total	Total	Total
1990	112	1	113	-	-	-	-	1	12	125
1991	1,109	3	1,112	-	-	-	-	1	22	1,135
1992	377	1	378	0	-	0	0	1	117	496
1993	238	-	238	-	1	1	8	0	76	323
1994	2,704	29	2,733	-	1	1	14	15	3,630	6,393
1995	1,797	0	1,797	0	1	1	27	4	4,419	6,249
1996	2,090	0	2,090	0	0	0	19	14	1,777	3,901
1997	1,497	0	1,497	0	-	0	5	10	2,862	4,373
1998	678	0	678	0	0	0	0	11	2,297	2,986
1999	765	0	765	0	0	0	4	8	2,325	3,101
2000	479	0	479	0	0	0	0	6	1,580	2,065
2001	453	0	453	0	0	0	0	4	2,171	2,628
2002	490	0	490	0	0	0	0	6	2,488	2,984
2003	380	0	380	0	0	0	0	11	2,210	2,601
2004	503	0	503	0	0	0	0	26	1,402	1,931
2005	257	0	257	0	0	0	0	22	1,510	1,789
2006	105	0	106	0	0	0	0	6	1,162	1,274
2007	254	0	254	0	0	0	0	5	1,278	1,538
2008	64	0	64	0	0	0	0	4	995	1,063
2009	36	0	37	0	0	0	0	8	1,085	1,129
2010	Not yet available									

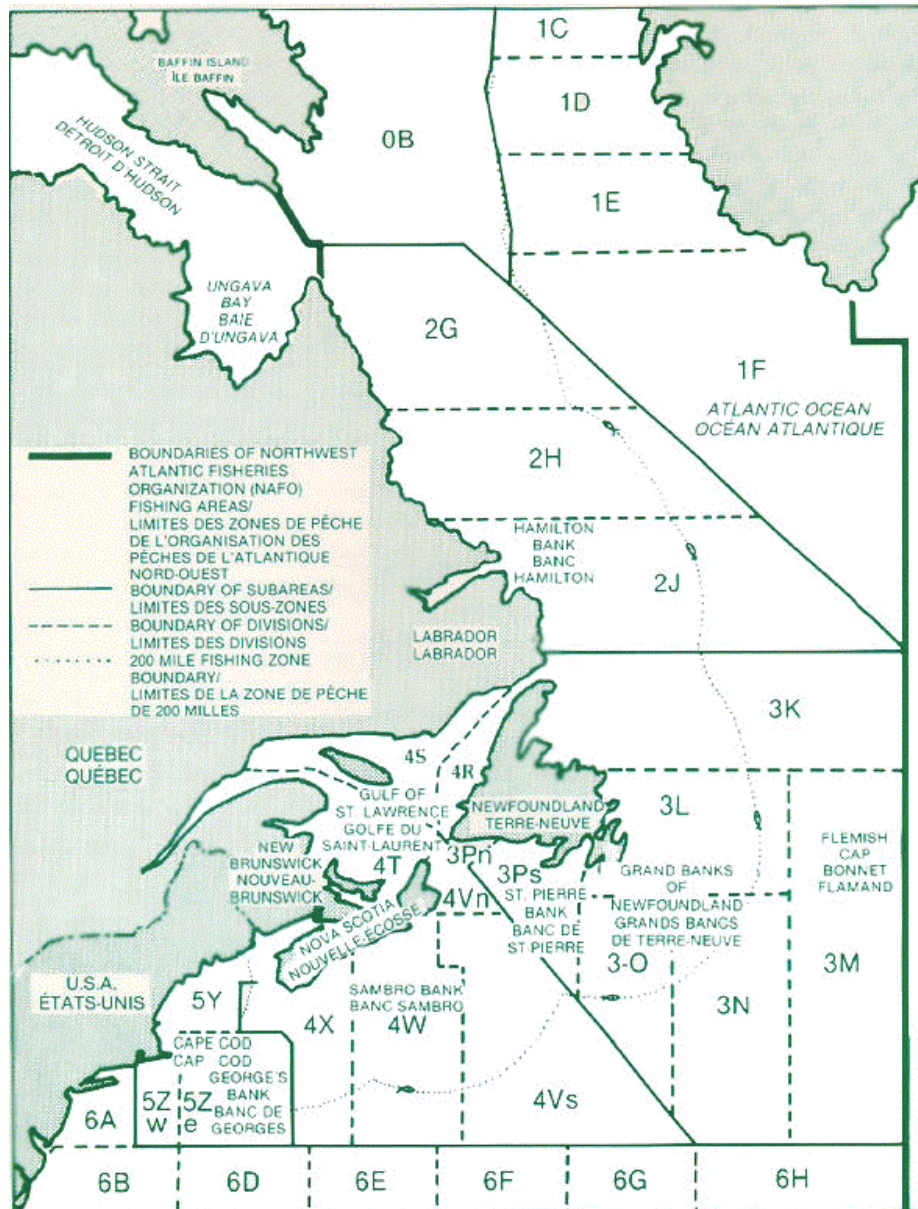
Provinces

NS = Nova Scotia
 NB = New Brunswick
 PE = Prince Edward
 QC = Quebec
 NL = Newfoundland and Labrador

Regions

S-F = Scotia-Fundy
 Gulf = Gulf of St. Lawrence

Map 8. Northwest Atlantic Fishing Organization (NAFO) fishing areas



Map Source: Nova Scotia Department of Fisheries and Aquaculture, <http://www.gov.ns.ca/fish/>

5.4.1.5 Recreational skate catches

In general, skates have little to no recreational value and are not intentionally pursued in any recreational fisheries. Catch information for Atlantic coast skates from the Marine Recreational Fishery Statistics Survey (MRFSS) is presented in Table 26 and Table 29. Recreational skate catches between 2000 and 2009 ranged from 1.4 million fish in 2001 to 3.3 million fish in 2003 (Table 26). Recreational skate catch estimates have declined since 2006 to 1.8 million fish.

Recreational *harvest* of skates (MRFSS A+B1 data), where skates were retained and/or killed by the angler, represent only 0.4 – 3.0% of the estimated total catch during this time period Table 28. The vast

majority of skates caught by recreational anglers are therefore considered released alive, but do not account for post-release mortality caused by hooking and handling.

New Jersey, New York, North Carolina, Massachusetts, and Virginia reported the largest recreational skate catches over the time series, but the annual catch estimates for each of those states appear to be rather inconsistent and do not illustrate any clear trends. Recreational fishers in Maine did not report catching any skates in 2004, 2006 to 2009. Catch estimates from Delaware, Maryland, Virginia, and North Carolina suggest that some of the skates caught recreationally are either clearnose or rosette skate, or other species of skates that are not included in the northeast complex (Table 29).

Reliability of skate recreational catch estimates from MRFSS is a concern. Many summaries given in the table below include estimates with a proportional standard error (PSE) of 0.2 or more, indicating that they are not well estimated. In particular, this applies to landings and dead discards (A+B1), even for coastwide annual summaries. PSEs provide a measure of precision and represent another way to express error associated with a point estimate. Estimates with a PSE of 0.2 or less are considered to be more reliable than those with higher PSEs, and generally, PSEs of 0.2 or less are considered acceptable for fisheries data. 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 28. Recreational skate (Family Rajidae) catch (A+B1+B2; thousand fish) on Atlantic Coast, 1981-2009. Type A catch is fish that are landed in a form that can be identified by trained interviewers. Type B1 catch is fish that are used for bait, released dead, or filleted - they are killed, but identification is by individual anglers rather than trained interviewers. Type B2 catch are fish that are released alive. Source NMFS Marine Recreational Fisheries Statistics (MRFSS): http://www.st.nmfs.noaa.gov/pls/webpls/MR_HELP.SPECIES. Estimates with proportional standard error (PSE) of 0.20 or less (available via the above website) are considered more reliable than those with higher PSEs.

Year	PRIVATE/RENTAL	SHORE	BEACH/BANK	MAN MADE	PARTY/CHARTER	CHARTER	PARTY	Grand Total
1981	150	0	24	39	15	0	0	229
1982	193	0	17	24	46	0	0	279
1983	359	0	153	26	17	0	0	555
1984	316	0	24	32	32	0	0	404
1985	883	0	11	34	12	0	0	940
1986	331	222	0	0	18	0	0	572
1987	738	39	42	3	14	0	0	837
1988	604	90	9	4	20	0	0	726
1989	266	58	51	3	29	0	0	407
1990	521	115	2	5	33	0	0	675
1991	494	58	3	7	35	0	0	597
1992	344	96	10	31	43	0	0	524
1993	642	190	20	40	39	0	0	931
1994	902	190	77	144	43	0	0	1,355
1995	481	116	62	48	59	0	0	767
1996	625	235	75	76	14	0	0	1,025
1997	804	181	88	98	46	0	0	1,217
1998	451	120	36	67	31	0	0	705
1999	344	112	181	69	7	0	0	712
2000	977	114	207	323	20	0	0	1,641
2001	937	193	126	121	45	0	0	1,422
2002	1,408	287	104	117	50	0	0	1,965
2003	2,267	507	150	242	99	0	0	3,265
2004	1,693	379	370	116	65	0	0	2,624
2005	1,557	652	173	252	0	74	24	2,732
2006	2,067	385	92	141	0	149	31	2,864
2007	1,616	427	111	84	0	48	17	2,303
2008	1,402	281	65	70	0	50	12	1,881
2009	1,268	294	215	48	0	56	4	1,886
Grand Total	24,640	5,342	2,498	2,262	832	378	87	36,039

Table 29. Recreational catch (A+B1+B2; thousand fish) by state, 2003-2009.

STATE	2003	2004	2005	2006	2007	2008	2009	Grand Total
CONNECTICUT	125	39	35	70	57	182	45	553
DELAWARE	137	150	160	166	78	116	86	893
EAST FLORIDA	1	1	5	4	2	3	2	17
GEORGIA	3	0	3	0	1	1	2	10
MAINE	1	0	3	0	0	0	0	3
MARYLAND	65	25	27	56	20	55	32	279
MASSACHUSETTS	175	347	126	149	162	146	214	1,319
NEW HAMPSHIRE	12	15	19	13	82	8	0	150
NEW JERSEY	1,482	761	731	1,032	677	651	782	6,117
NEW YORK	629	442	613	806	708	352	292	3,843
NORTH CAROLINA	440	566	528	287	235	164	288	2,508
RHODE ISLAND	53	86	66	67	112	156	51	591
SOUTH CAROLINA	28	20	4	5	18	3	5	84
VIRGINIA	115	172	413	207	151	44	85	1,186
Grand Total	3,265	2,624	2,732	2,864	2,303	1,881	1,886	17,554

Table 30. Recreational catch (total, 2007-2009) by species, mode, and distance from shore. Type A catch is fish that are landed in a form that can be identified by trained interviewers. Type B1 catch is fish that are used for bait, released dead, or filleted - they are killed, but identification is by individual anglers rather than trained interviewers. Type B2 catch are fish that are released alive.

STATE	A+B1	B2	A+B1	B2	A+B1	B2	A+B1	B2	A+B1	B2
CONNECTICUT		6	278	284	0	0	0	0	0	284
DELAWARE		1	151	152	0	99	99	0	30	280
EAST FLORIDA		0	5	5	0	2	2	0	0	7
GEORGIA		0	3	3	0	1	1	0	0	4
MARYLAND		0	68	68	4	31	35	0	5	107
MASSACHUSETTS		31	277	308	2	189	191	0	23	522
NEW HAMPSHIRE		0	1	1	0	90	90	0	0	91
NEW JERSEY		2	710	712	0	1,134	1,134	0	264	2,110
NEW YORK		27	419	447	0	789	789	0	118	1,353
NORTH CAROLINA		0	75	75	0	608	608	0	4	687
RHODE ISLAND		10	98	108	4	199	204	0	7	319
SOUTH CAROLINA		1	14	15	0	12	12	0	0	27
VIRGINIA		3	236	239	2	38	40	0	1	280
Grand Total		81	2,334	2,415	13	3,192	3,204	0	451	6,070

Table 31. Recreational catch (A+B1+B2; thousand fish) by species, mode, and distance from shore. The “All” category includes catches identified by species.

STATE	Clearnose	Little	Smooth	Thorny	Winter	All	Grand Total
CONNECTICUT		0	0	0	0	0	284
DELAWARE		171	0	0	0	0	280
EAST FLORIDA		32	0	0	0	0	7
GEORGIA		0	0	0	0	0	4
MARYLAND		97	0	0	0	0	107
MASSACHUSETTS		0	60	0	0	0	522
NEW HAMPSHIRE		0	5	0	0	2	91
NEW JERSEY		1,005	312	0	0	27	2,110
NEW YORK		60	106	48	0	41	1,353
NORTH CAROLINA		5	0	0	0	0	687
RHODE ISLAND		0	14	0	0	1	319
SOUTH CAROLINA		3	0	0	0	0	27
VIRGINIA		392	0	0	0	0	280
Grand Total		1,764	497	48	0	71	6,070

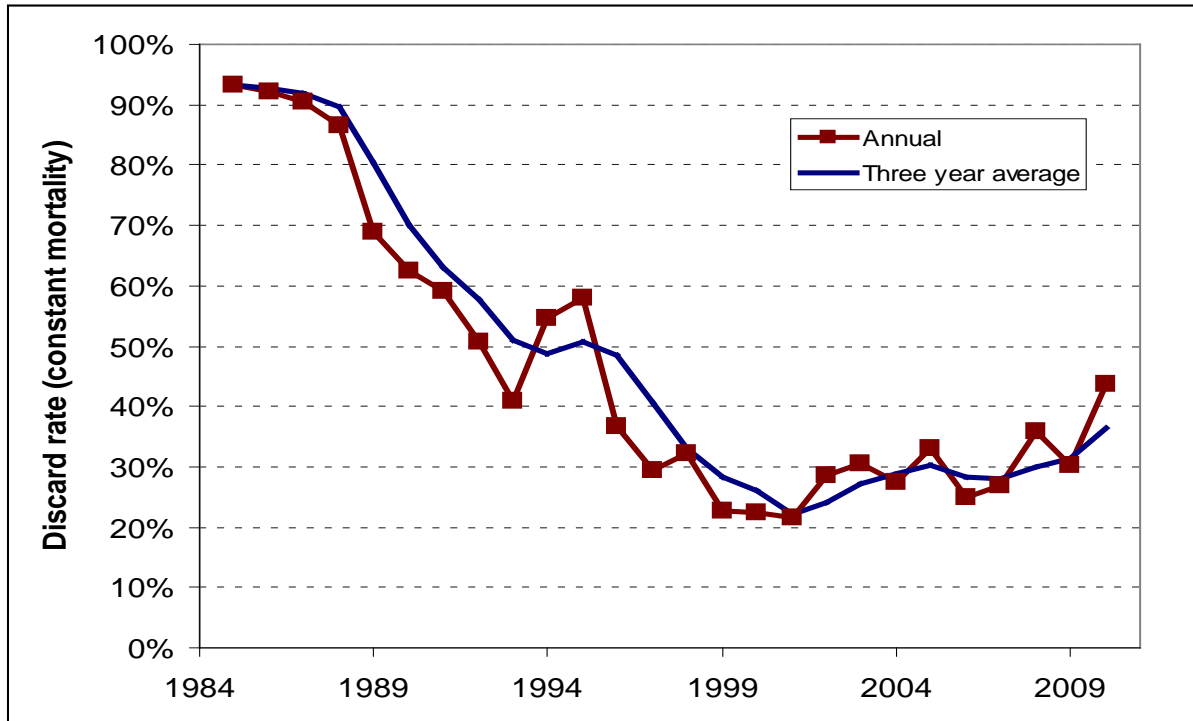
5.4.1.6 Discards

Skate discards were estimated to reconstruct the time series, estimate the median catch/biomass exploitation ratio, and analyze alternative ABCs. This work was largely required by new research data indicating that little and winter skate discard mortality (see Section 5.1.4) was less than had been assumed in the Amendment 3 FEIS.

Discards are estimated from sea sampling data based on the fraction of discarded skates to total kept (landed). This D/Kall ratio is stratified by gear, region, and half year, then applied to dealer-reported landings to estimate total skate discards. Mortality is assumed to be 50% of discards for all skates and gears, except for little (0.20) and winter (0.12) skates captured by vessels using trawls. Details about these estimates are given in Appendix II of this document.

Discard proportions declined from 1985 to 2001 (Figure 4) as landings of skates increased in response to demand. Since 2001, the discard proportion has increased from 21% to over 40% in 2010. The 2008-2010 average discard rate is used to set the Federal TAL. The reasons for discarding are varied, but discards in 2010 can be explained by increasing skate biomass and by possession limit restrictions. In particular, the skate wing fishery closed on Sep 3, 2010 when the Regional Administrator reduced the skate possession limit to 500 lbs. of wings. This action to keep catches below the ACL undoubtedly contributed to higher discards and lower skate landings, although discards are estimated on a calendar year basis. The lower skate wing fishery possession limits implemented by Framework Adjustment 1 are expected to reduce discards in the 2011 fishing year because the skate wing fishery is expected to remain open through most of the fishing year. Vessels that land skates as an incidental or targeted catch will therefore be less likely to discard skates.

Figure 4. Trend in calendar year skate discard rate with updated discard estimates and discard mortality=0.20 for little skate and 0.12 for winter skate caught by vessels using trawls.



5.4.2 Description of the skate processing sector

Whole skates are most often landed to supply the lobster fishery with bait, particularly in Southern New England. Some whole skates are also landed for the wing (mainly export food market) and processed at shoreside dealers. Wings are cut and sold for the export food market and the remaining racks are salted and sold for lobster fishery bait. Changes to regulations in Framework Adjustment 1 clarified that this practice was not prohibited and made changes so that the weight of the racks would not be counted twice against the wing and bait TALS. A significant amount of skate landings for bait do not go through any shoreside processing and are simply transferred at sea to lobster boats (Table 16).

Most skates sold for the wing (food) market are processed (cut) on board the fishing vessels, with the remainder of the skate body discarded. Some vessels retain the skate bodies in salted barrels to sell as bait through other market channels. Skate wings are offloaded shoreside, iced and boxed, and shipped to wholesalers to enter the domestic and international markets.

A more detailed description of processing is provided in the Amendment 3 FEIS (NEFMC 2009). Data of annual production of processed and exported skate products is sparse. Limited trade data was collected by NOAA/NMFS for the New England Fisheries Development Program in 1975. Reports from an international seafood trade expert at the Seafood Institute indicate that skate export poundage was tracked through “Euro Stat Data” until 1995 or 1996, then abandoned. Customs does not track the exports, and no census data exists specific to skate exports.

5.4.3 Domestic and international skate markets

No new information about domestic and international skate markets has been developed and a description of these markets is available in the Amendment 3 FEIS (NEFMC 2009). Changes in regulations since Amendment 3 do not appear to have appreciably changed the available markets for skates. Disruptions in supply from the incidental skate wing possession limit that became effective from Sep 3, 2010 to Apr 30, 2011 may have lost some market share as international buyers probably sought a new source of worldwide supply. At the same time, shipping and fuel prices have increased making it more expensive to supply international markets, but this effect may have been offset to some extent by the declining value of the US dollar.

5.4.4 Economic information

This section presents available economic information on the skate fishery. This includes a brief summary of the economic frameworks (supply and demand) for both the lobster bait market and the wing market; information about dockside prices for skates; trends in revenues from skate landings; and information about skate vessels, dealers, processors, and trade.

5.4.4.1 Dockside skate price

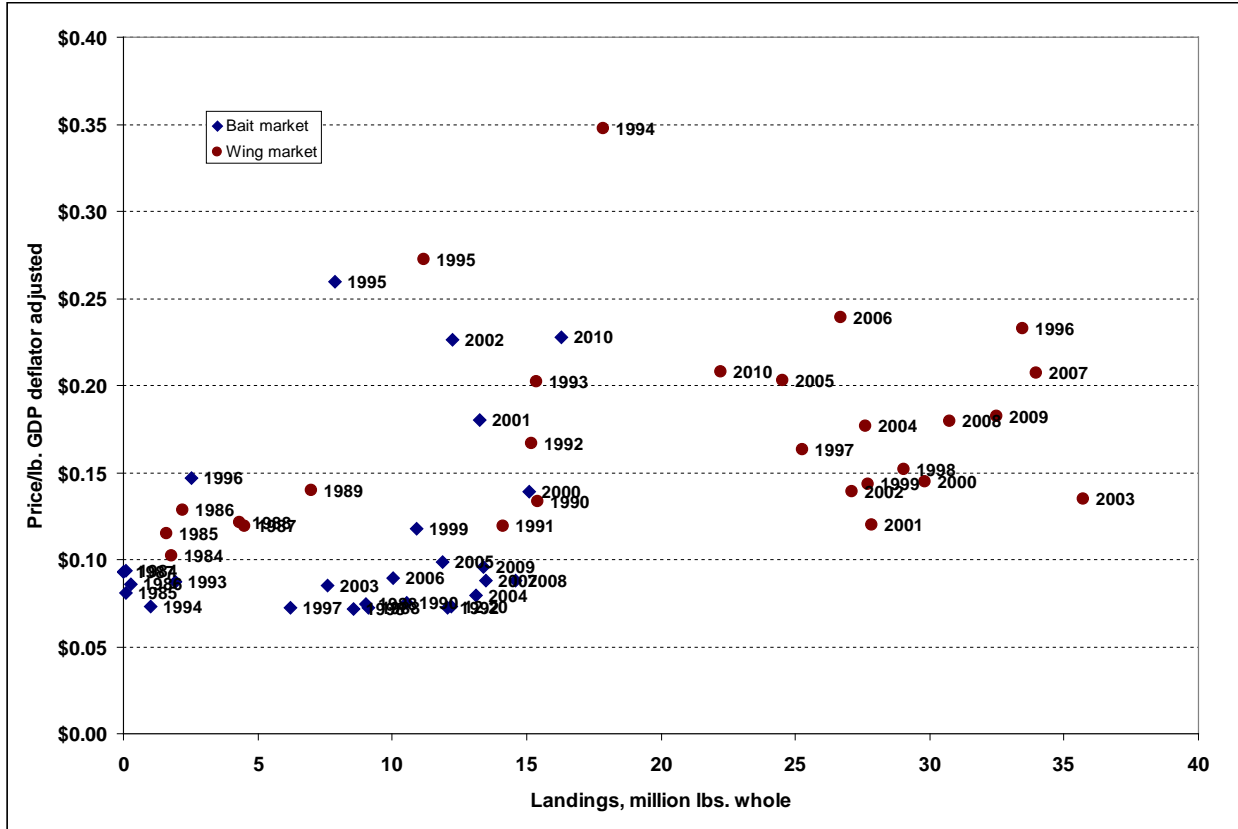
Prices reveal important information about the economic benefits and costs of fishery regulations. More recently and until 2010, PPI-adjusted prices for skate wings have risen (Figure 5) and landings have risen, partially as a result of the higher prices but also because vessels with DAS allocations have been subject to greater groundfish fishing restrictions. Generally, the prices paid for skate wings has been higher than those paid for whole skates (presumably product quality is better for a food market) and since 2004, prices have been above \$0.17 per pound.¹⁷ Average skate wing prices in 2007 rose to nearly \$0.21 per pound and the 2007 skate wing landings were the 2nd highest on record. Quantities of skate wing landings and prices in 2008 and 2009 were nearly the same as in 2007. But in 2010, the quantity of skate wings declined, but inflation adjusted prices increased to near \$0.21 per pound, from \$0.18 to \$0.19 per pound in 2008-2009. And although there were seasonal price spikes related to short-term supply and changes in skate possession limits, the ex-vessel price was not very responsive to decreases in supply. Most of the skate wing landings are sent to foreign markets where the US product competes with other sources and substitute goods. With respect to skate wing prices, the US may be more of a price-taker for a foreign market whose prices is determined by other seafood supply.

PPI-adjusted prices for whole skates, most of which are landed to supply bait to the lobster fishery, have been relatively stable, except for 1995, 2001, and 2002. Except for three years¹⁸, whole skate prices have been generally less than \$0.15 per pound and annual landings in recent years have been around 10-15 million lbs. Including transfers at sea (for all years since 1994), skate bait landings in 2010 increase to a record 16.3 million pounds. Inflation adjusted prices however was the second highest on record, nearly \$0.23 per pound. And unlike previous years, the price per whole pound of skates was actually higher for skates destined for the bait market than for skates destined for the wing market, whereas the ratio since 2004 has been about 2:1 in favor of wing prices.

¹⁷ Prices for skate wings are actually higher by a factor of 2.27, but these wing prices have been converted to a whole-weight equivalent to be on the same metric as prices for whole skate landings.

¹⁸ The higher prices in 1995 and 1996 may have been influenced by mis-reported (or erroneously recorded) landings of skate wings.

Figure 5. GDP deflator adjusted annual prices for skate wing and bait landings compared to quantity landed (whole weight).

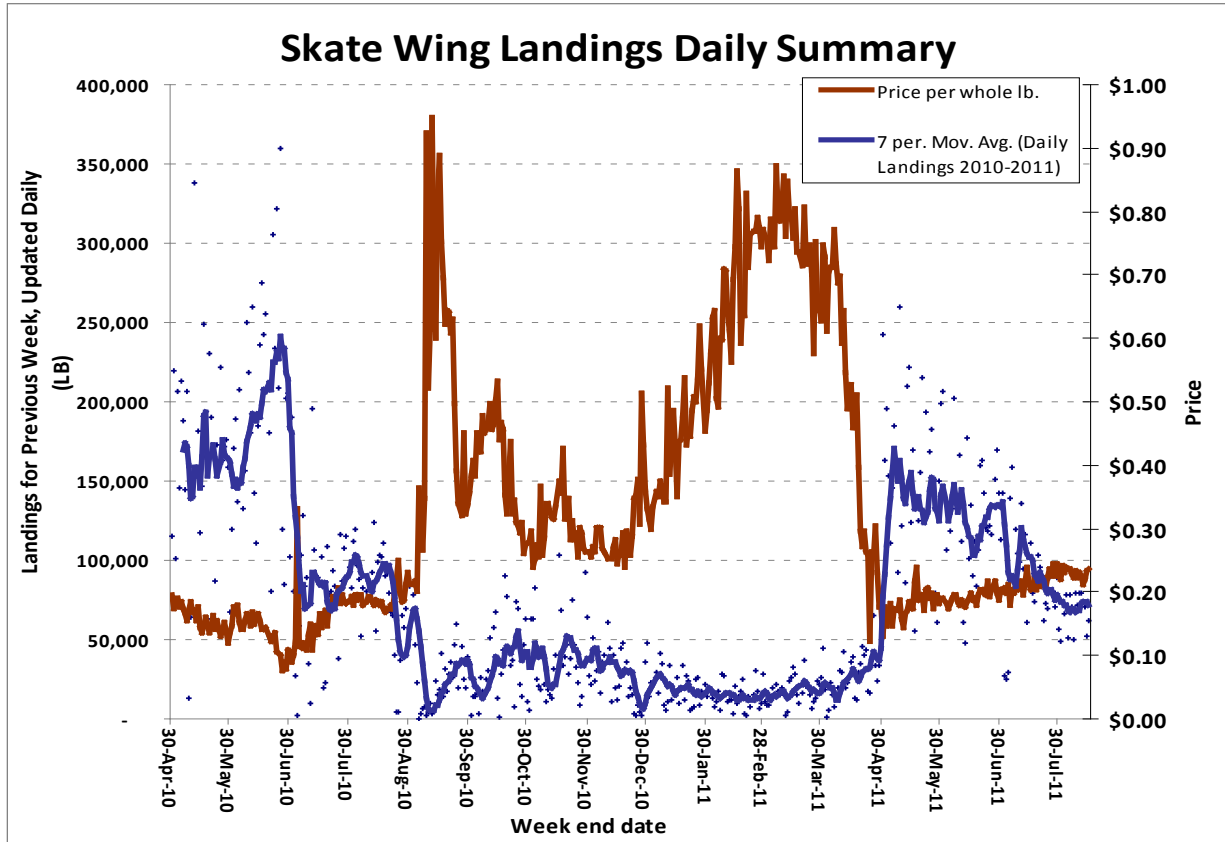


5.4.4.2 Skate prices

Section 8.7 of the Amendment 3 FEIS provides an analysis of trends in skate prices in relationship to market supply and demand. These analyses were used to estimate producer and consumer surplus expected from the various Amendment 3 alternatives. In general, skate prices in the bait market are set domestically depending on supply of bait and there are alternative sources, such as herring. The wing market is primarily an export market, which competes with other sources worldwide, although US skate wings are often preferred. Prices during 2010 responded to changes in supply which was highly influenced by the skate wing possession limit.

Prices started out the 2010 fishing year around \$0.17/lb and declined through the end of June, responding to high landings when the possession limit was 20,000 lbs. of wings. After Amendment 3 implementation, landings dropped to under 100,000 lbs./day and prices began rising to near \$0.20/lb. Wing prices spiked to over \$0.90/lb. (near \$3/lb. of wings) after the possession limit was reduced to 500 lbs. on Sep 3, 2010. Prices declined through most of the winter to about \$0.30, and then increase to nearly \$0.90/lb. in the spring. Prices dropped at the end of the 2010 fishing year in anticipation to new supply when the 5,000 lbs. possession limit became effective on May 1, 2011, then gradually increased to over \$0.20/lb. through Jul and Aug 2011. During this period, there is an obvious inverse relationship between domestic supply of wings and price, as would be expected with an elastic supply and demand response.

Figure 6. Relationship between skate wing prices and landings since May 1, 2010. Prices for skate wings were 2.27 times the converted whole skate prices shown in the figure.



5.4.4.3 Revenues from Skate Landings

Fishermen in the northeast region earned \$7.0 million from skate landings in 2009 and although landings declined, the revenue in 2010 increased to \$7.7 million (see table below). Seventy-nine percent of landings and eighty-seven percent of revenue in 2009 was derived from landings skate wings for the food market. In 2010, the contribution of the wing landings for the food market declined to 74 and 85 percent, respectively. While skate landings for bait increased in 2010, the skate wing landings declined on directed fishing trips, which landed more than the incidental skate possession limit (1137 lbs. whole; 500 lbs. wing weight). Skate wing landings for the food market conversely increased on trips landing less than this amount of skates, probably due to increases in prices (see Section above).

Table 32. Total annual landings and revenue by market and skate trip type (directed = skate landings > 1137 lbs.; incidental 1 – 1137 lbs. whole weight equivalent). Source NMFS SAFIS dealer data.

Row Labels	2009		2009 Total	2010		2010 Total	Grand Total
	Bait	Food or unknown		Bait	Food or unknown		
Directed							
Landings	8,458,618	30,059,107	38,517,725	10,055,362	26,160,322	36,215,684	74,733,409
Landings (%)	98.7%	93.2%	94.4%	97.0%	87.2%	89.7%	92.1%
Revenue	\$883,271	\$5,685,919	\$6,569,190	\$1,085,249	\$5,352,241	\$6,437,490	\$13,006,680
Revenue (%)	98.0%	93.0%	93.6%	97.4%	81.5%	83.8%	88.5%
Incidental							
Landings	114,769	2,189,375	2,304,144	310,171	3,826,185	4,136,356	6,440,500
Landings (%)	1.3%	6.8%	5.6%	3.0%	12.8%	10.3%	7.9%
Revenue	\$18,401	\$430,241	\$448,642	\$29,193	\$1,211,811	\$1,241,004	\$1,689,646
Revenue (%)	2.0%	7.0%	6.4%	2.6%	18.5%	16.2%	11.5%
Total Landings	8,573,387	32,248,482	40,821,869	10,365,533	29,986,507	40,352,040	81,173,909
Total Revenue	\$901,672	\$6,116,160	\$7,017,832	\$1,114,442	\$6,564,052	\$7,678,494	\$14,696,326

Revenues from skate landings are reported by state in Figure 7. Rhode Island was the leading skate bait state where fishermen grossed \$575 thousand for skate bait in 2009 and \$775 thousand in 2010, more than all other states combined. Fishermen from Connecticut and New Jersey received an order of magnitude less revenue from skate bait landings – \$10 thousand and \$54 thousand in 2010, respectively. Skate landings for bait increased in MA from \$0 in 2009 to \$281 thousand in 2010, primarily in New Bedford. Some of these new landings may be skate wings for the food market mis-coded as being destined for the bait market.

Skate bait revenues were less than \$8 thousand in all other states. In contrast, Massachusetts lead all states in skate wings dockside revenues with more than \$4.5 million in 2009 and \$4.0 million in 2010, followed distantly by RI (\$711 thousand and \$1.1 million), NJ (\$275 and \$516 thousand), NY (\$229 and \$488 thousand), and VA (\$37 and \$79 thousand) (Figure 7).

Figure 7 also reports the relative contribution of skate dockside revenues to total state fishery revenues in 2010. In Rhode Island, the leading skate bait state, total skate revenues (bait and wings) was not quite one percent of total fisheries earnings, but was over 66% of the total 2009 fisheries earnings by vessels landing skates for bait, nearly 80% in 2010. In Massachusetts, the leading skate wings state, total skate returns were 1.2 percent of total 2009 dockside revenues, 0.9% in 2010.

Figure 8 reports the contribution of skate landings to total dockside revenues during 2009 and 2010 by gear type. Otter trawl fishermen received \$3.4 million from skate wings and bait landings – 50 percent of total skate revenues in the region – which amounted to 1.8 percent of total gross revenue from all species. In 2010, otter trawl revenue from skate landings declined to 2.8 million, or 1.3% of total gross revenue from all species and only 38% of total skate revenue. Sink gillnet fishermen were paid \$2.4 million for

2009 skate landings – 35 percent of total skate revenues – which amounted to five percent of the gear’s total earnings in the region. In 2010, skate landings by vessels using sink gillnets increased to \$3.4 million, 46% of total skate revenue (switching with landings by trawls as the top spot) and accounting for 8.7% of revenue from all species by vessels using sink gill nets. It is notable that these sink gill net skate landings are considerably higher than those analyzed in the Amendment 3 FEIS (NEFMC 2009).

The state and gear data were cross-tabulated to more closely examine dependence on skate earnings. Figure 9 shows results for combinations of states and gear types with at least 0.5 percent dependence on skates. Sink gillnet fishermen in New Jersey received 4 percent of their total annual revenues from skate landings in 2009 and 11% in 2010, followed by line trawl fishermen with 3.9 percent. Gill net revenues from skates by vessels using gill nets increase in all major states, increasing from 4 to 11% in NY, 6 to 18% in CT, 12 to 14% in MA and 16 to 20% in RI. In comparison, the percent of revenue from skates by trawls and other gears were below 4% of the total annual revenue from all landings, across the board.

Finally, skate dockside revenues were also investigated by port (Figure 10). New Bedford was the top port for skate landings in 2009 (\$2.9 million) and 2010 (\$2.1 million), followed by Chatham MA (\$1.1 and 1.4 million), and Point Judith, RI (\$0.7 and 1.1 million). The list of top ports by revenue has some notable changes from those listed as top ports in the Amendment 3 FEIS (Provincetown, MA), Tiverton, RI; Point Judith, RI; and New Bedford, MA; reflecting the higher fishing activity by vessels using gill nets to target skates for the wing market. In terms of dependence on skate revenue, the top ports were Moriches, NY (57%); Waretown, NJ (22%); and East Lime, CT (20%).

Figure 7 Contribution of skate landings to total state fisheries revenue, 2009 (top) and 2010 (bottom).
 Source: NMFS SAFIS dealer reports.



Figure 8 Contribution of skate landings to total gear revenue, 2009 (top) and 2010 (bottom). Source: NMFS SAFIS dealer reports.

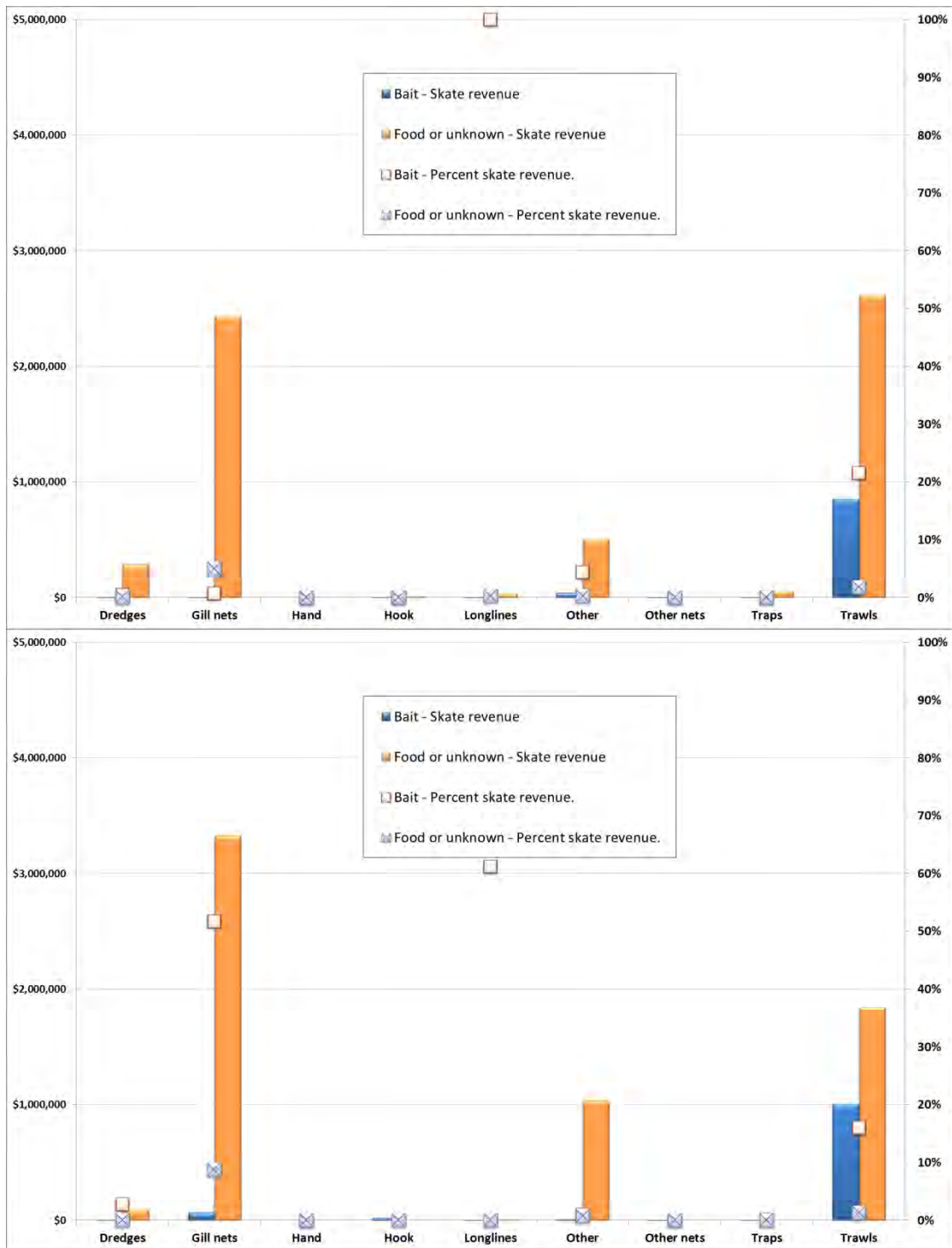


Figure 9 Contribution of Skate Revenues (0.5% or more) to combinations of gear and state, 2009 and 2010. Source: NMFS SAFIS dealer reports.

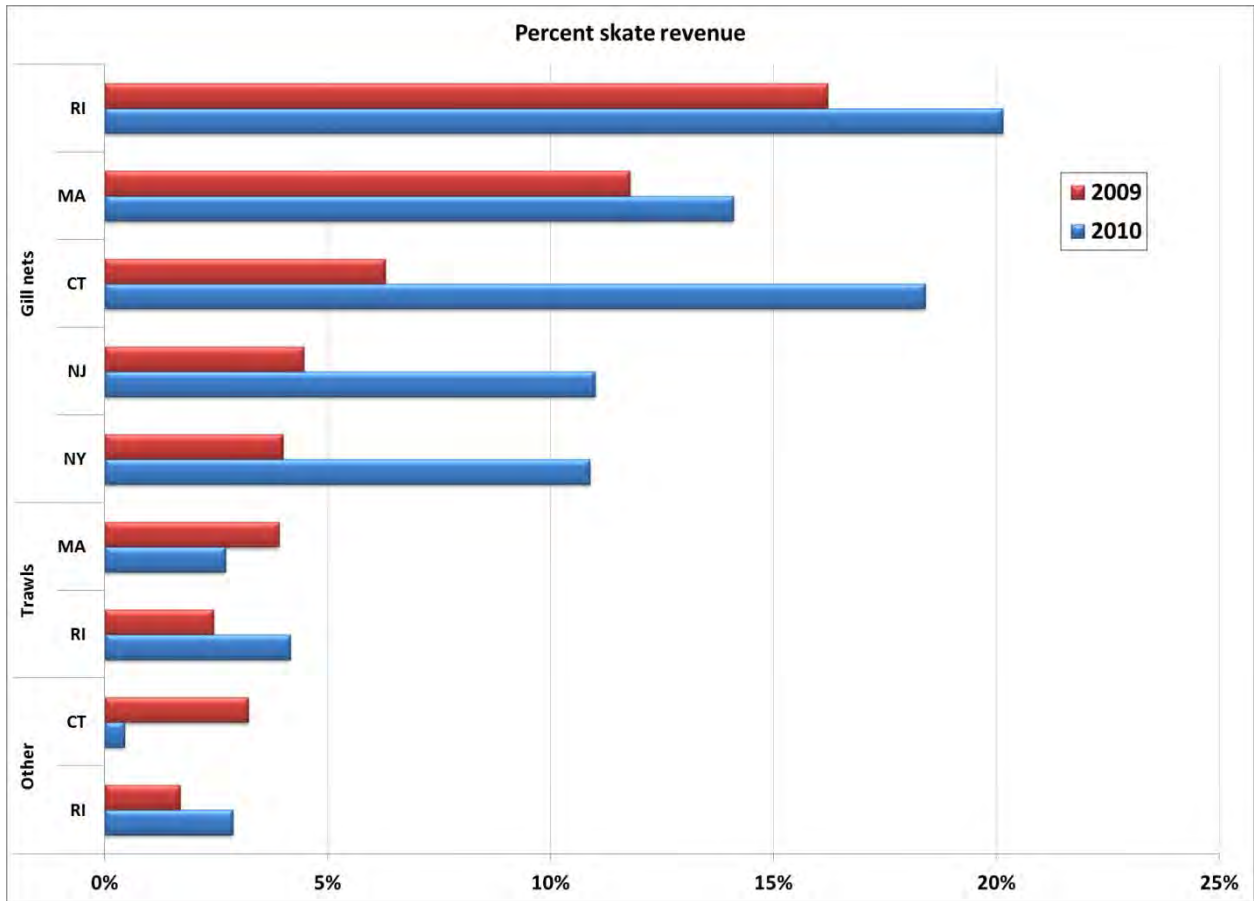
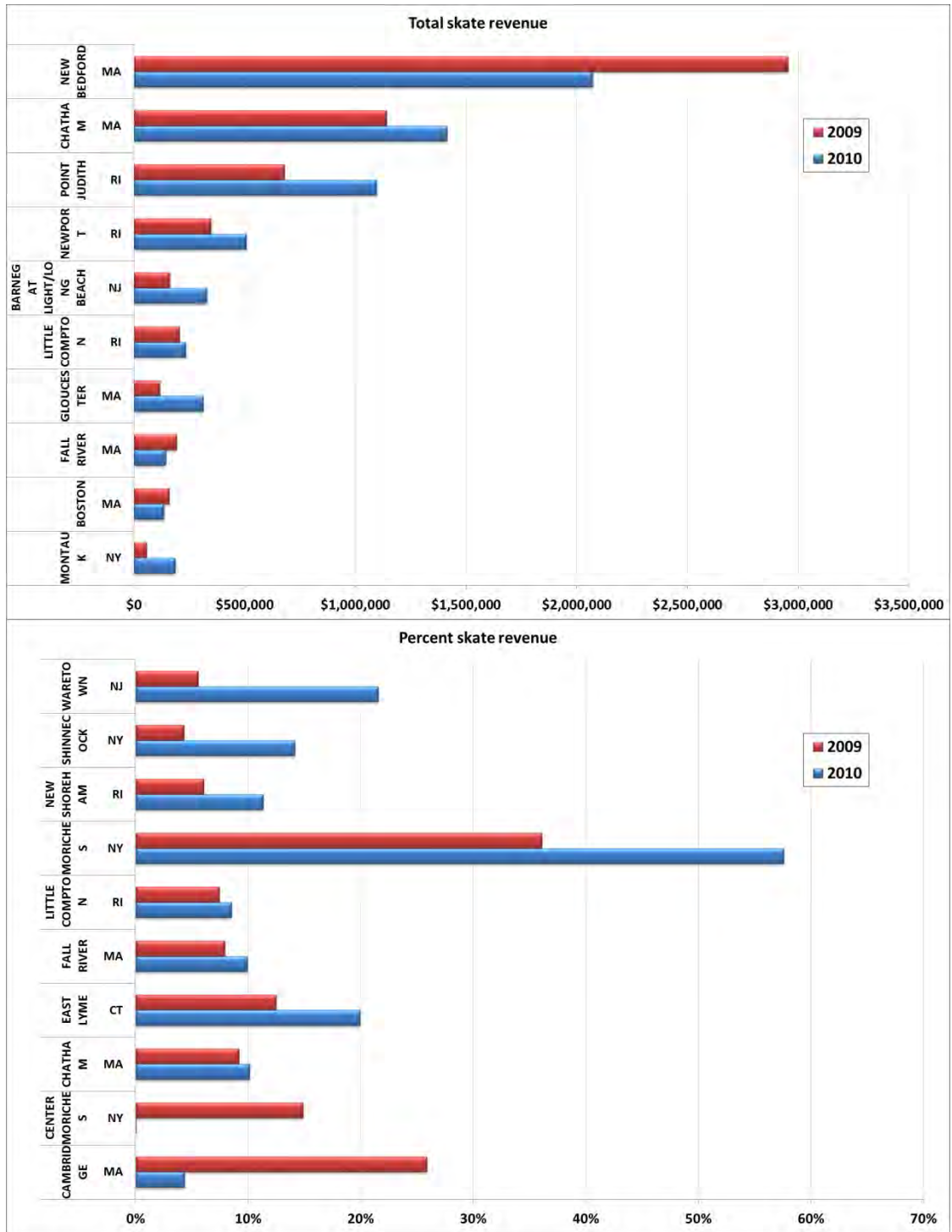


Figure 10 Contribution of skate revenues (0.5% or more) to ports by total revenue (top) and percent of total revenue (bottom), 2009-2010. Source: NMFS SAFIS dealer reports.



5.4.5 Skate Vessels

The discussion in this section summarizes the changes in economic activity by vessels landing more than the incidental skate possession limit (1137 lbs. whole weight equivalent). A comparison between 2009 and 2010 by skate fishery and vessel size (ton class in Table 31) and by trip length (duration between the sailing and landing dates reported on matching VTRs in Table 32) is presented. These represent calendar years before and after implementation of Amendment 3 and similar data for earlier years was given in the FEIS (NEFMC 2009).

5.4.5.1 Landings of skate to be marked as bait

For the bait fishery, Amendment 3 had negligible effects. The 20,000 lbs. possession limit affected few trips (intentionally) and the fishery stayed within the seasonal quotas during 2010. Amendment 3 rules were implemented in July 2010. The number of trips increased by 48% to 1,220 trips, made by 84 vessels (a 38% increase over 2009) (Table 31). About half of the vessels were in ton class 3 (51-150 gross tons), and skate revenue by ton class 3 vessels were over half of the total skate revenue in both years.

Bait skate landings reported by dealers increased from 8.3 to 10.0 million pounds, while revenue also rose from \$872 thousand in 2009 to \$1.1 million in 2010. On trips landing bait skates, revenue from landings of other species were negligible (< 1%). The average number of crew per trip was about the same in both years, averaging about 2 per trip for smaller vessels and 3 per trip for the larger vessels. Revenue per trips from bait skate landings \$690 to \$1,562 per trip, about 50% higher for ton class 3 vessels than for ton class 2 vessels.

Vessels that landed bait skates however participated in other fisheries, including the skate wing fishery, when they were not fishing for skates. In both 2009 and 2010, bait skate landings for ton class 2 and 3 vessels were only about 9 to 12 percent of their total annual income from fishing. In 2009, however, there were ton class 1 vessels that derived more than half of their annual income from bait skate landings.

A frequency distribution of this dependence is summarized in Figure 11, with most vessels deriving less than one percent of annual income from bait skates. More vessels in 2010 derived between 1 and 20 percent of annual income from bait skate landings, possibly due to the directed skate wing fishery closing on Sep 3, 2010. Just five vessels derived more than 20% of annual income from bait skate landings during both 2009 and 2010. Total revenue from landing bait skates was of course highest for the vessels that derived the most income from landing skates, increasing from \$556 thousand in 2009 to \$723 thousand in 2010.

Of the trips that could be matched to VTR data, about ¾ths of trips, landings and revenue from bait skates were of shore duration trips, less than a day (Table 32). Trips taken, skate landings, and total skate revenue increase the most on these short trips, whereas these statistics declined on long trips. The number of trips per vessel, however remained nearly the same in all categories, implying greater participation by more vessels on short trips targeting skates for the bait market. Crew size on longer trips were consistently higher than on trips less than a day in duration, but average gross tons was nearly equal with a smaller increase in horsepower with trip length. This implies that vessels did not vary much in size with trip duration, but had a little more horsepower and generally carried one or two more crewmembers than did vessels taking shorter trips.

5.4.5.2 Landings of skate wings to be marked as bait

For the wing fishery, however, there were notable effects from Amendment 3 in 2010, as discussed in more detail in the above section on skate prices. Although the skate landings limit (TAL) became effective on May 1, the new lower skate wing possession limit did not take effect until July 16, 2010 and then was reduced to the incidental skate wing possession limit (1137 lbs.) on Sep 3, 2010 when skate wing landings reached 90% of the TAL. As a result of these actions, total landings spiked between May 1 and Jun 16, 2010 and then dropped to low levels after Sep 3. This had substantial effects on skate fishing activity and vessel participation.

The total number of trips landing skates for the wing (i.e. food) market increased to 7,273, a two percent increase from 2009 (Table 31). Total skate wing landings declined from 28.5 million pounds (whole weight equivalent) to 25.3 million pounds (an 11% decrease), while revenue from skate wing landings decreased by 6% to \$5.2 million. Percent revenue from skate wings on trips landing skates actually increased from 16.1% in 2009 to 20.0% in 2010. Many trips landed predominately skate wings, but this analysis includes many more trips that landed skate wings incidentally to other species being targeted, but still landing more than 500 lbs. of skate wings (the incidental possession limit).

Trips landing skate wings per vessel increased by about 30-50% for ton class 1 and 2 vessels and declined considerably for larger vessels. Vessel participation and trips landing skates were distributed fairly evenly between ton class categories, but about $\frac{2}{3}$ of skate wing landings and revenue were made by ton class 2 and 3 vessels. The proportion of skate revenue per trip, however, decreased with vessel size, averaging more than 40% for ton class 1 and 2 vessels and only 6 to 14% for ton class 3 and 4 vessels. This is probably the effect of the contribution of smaller gill net vessels targeting skates for the wing market on shorter trips. Likewise, skates contributed about seven to nine percent of total annual revenue on ton class 1 and 2 vessels, but only one to two percent of total annual revenue for ton class 3 and 4 vessels in 2010. Crew size and vessel horsepower were higher on larger vessels landing skate wings, probably correlated with trip length.

The number of vessels that derived less than 20 percent of total annual fishing income declined from 2009 to 2010 (Figure 11). Between 120 and 130 vessels derived less than one percent of total annual fishing income from skate wing landings, yet landed one or more trips having greater than 500 lbs. of skate wings. These are mainly vessels that typically target other species, like regulated groundfish. About 175 vessels derived one to twenty percent of income from landing skate wings in 2009, declining to 159 vessels in 2010. Total skate revenue for vessels deriving one to five percent of total annual income skate landings was nearly the same in both years, but declined substantially for vessels that derived between 5 and 20 percent of total annual fishing income from skate landings. Conversely, more vessels derived a higher proportion (>20% of annual revenue) from skate landings in 2010 than they did in 2009, implying greater specialization. The number of vessels deriving more than 20% of annual income from skates increased from 24 to 36, and revenue from skates increased by 23% to \$2.3 million.

For trips with matching VTR data, trips landing skates were distributed fairly evenly by trip duration (Table 32). Skate landings and revenue were higher with increasing trip duration, increasing from about \$470 per trip on trips shorter than one day to about \$900 per trip for trips between 1 and 4 days, and to about \$1,250 per trip for longer trips. This statistic as well as the number of trips per vessel landing more than 500 lbs. of skate wings was fairly similar between 2009 and 2010. Average crew number, vessel horsepower, and gross tonnage tended to increase with trip length in both years, with a slight decline in all statistics in 2010 across the board, implying that smaller vessels were being used on trips landing skate wings. This result might have arisen from the effect of more vessels using gill nets to target skates for the wing market.

Table 33 Vessel counts, trip counts, and measures of economic importance for vessels making trips landing more than 1137 lbs. whole (500 lbs. wing weight) categorized by ton class¹⁹. Source NMFS SAFIS dealer data, excluding non-federal vessels and aggregate reports. Skate bait landings and revenue data for ton class 4 vessels was redacted to preserve confidentiality.

Market	Ton class	1		2		3		4	
	Year	2009	2010	2009	2010	2009	2010	2009	2010
B a i t	Number of vessels	5	7	12	17	27	44	17	16
	Trips landing skates	56	115	289	464	480	639	1	2
	Trips per vessel	11	16	24	27	18	15	0	0
	Skate landings (lbs)	202,200	679,287	2,103,494	3,777,220	6,021,849	5,577,855		
	Landings per trip (lbs)	3,611	5,907	7,279	8,141	12,546	8,729		
	Dockside skate revenue	\$87,468	\$112,087	\$199,404	\$346,515	\$584,694	\$624,741		
	Skate revenue per trip	\$1,562	\$975	\$690	\$747	\$1,218	\$978		
	Total revenue on skate trips	\$87,468	\$112,087	\$199,404	\$346,650	\$584,694	\$625,116		
	Percent skate revenue	100.0%	100.0%	100.0%	100.0%	100.0%	99.9%		
	Skate vessel's total annual revenue	\$147,704	\$952,713	\$1,968,601	\$3,080,920	\$6,460,703	\$5,076,690		
	Percent skate revenue, annual	59.2%	11.8%	10.1%	11.2%	9.1%	12.3%		
	Skate trip revenues (% of annual)	59.2%	11.8%	10.1%	11.3%	9.1%	12.3%		
	Average crew per trip	2.0	2.1	2.2	2.2	3.2	3.0	0.0	3.0
	Average horsepower	517	382	348	323	423	409	670	670
Average GRT	11	11	33	33	98	94	158	158	
F o o d / w i n g s	Number of vessels	68	67	135	121	121	242	110	107
	Trips landing skates	1,573	1,882	2,798	3,593	2,077	1,364	695	434
	Trips per vessel	23	28	21	30	17	6	6	4
	Skate landings (lbs)	5,562,701	6,395,687	7,796,207	11,180,210	11,689,944	5,993,267	3,494,108	1,707,661
	Landings per trip (lbs)	3,536	3,398	2,786	3,112	5,628	4,394	5,027	3,935
	Dockside skate revenue	\$977,939	\$1,115,764	\$1,482,816	\$2,157,991	\$2,163,447	\$1,452,373	\$821,003	\$426,912
	Skate revenue per trip	\$622	\$593	\$530	\$601	\$1,042	\$1,065	\$1,181	\$984
	Total revenue on skate trips	\$2,232,557	\$2,785,785	\$4,149,308	\$5,205,043	\$16,219,061	\$10,443,188	\$11,286,985	\$7,338,253
	Percent skate revenue	43.8%	40.1%	35.7%	41.5%	13.3%	13.9%	7.3%	5.8%
	Skate vessel's total annual revenue	\$10,986,550	\$12,239,041	\$21,941,890	\$26,576,009	\$57,335,574	\$63,541,454	\$33,086,443	\$40,484,252
	Percent skate revenue, annual	8.9%	9.1%	6.8%	8.1%	3.8%	2.3%	2.5%	1.1%
	Skate trip revenues (% of annual)	20.3%	22.8%	18.9%	19.6%	28.3%	16.4%	34.1%	18.1%
	Average crew per trip	2.6	2.9	2.7	2.7	3.3	3.2	4.3	4.3
	Average horsepower	359	380	367	369	442	443	806	824
Average GRT	19	19	28	28	101	93	164	174	

¹⁹ 1 = 1 - 4 tons;
2 = 5 - 50 tons;
3 = 51 - 150 tons;
4 = 151 - 500 tons;

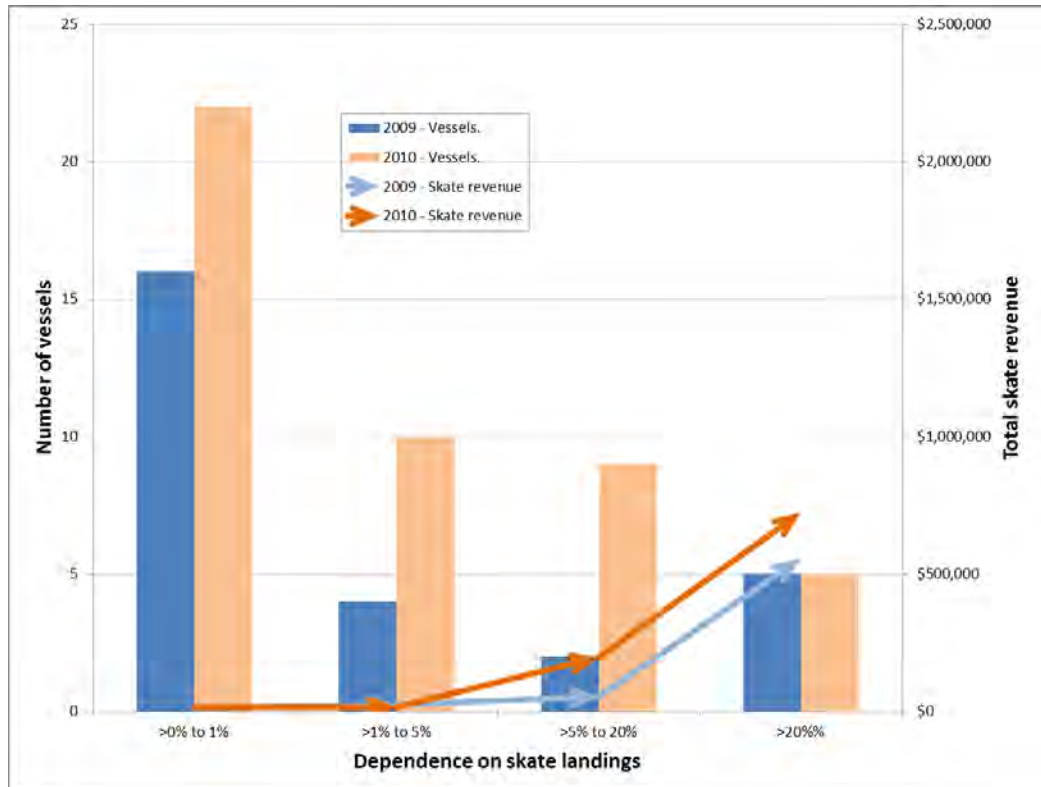
Table 34 Vessel counts, trip counts, and measures of economic importance for vessels making trips landing more than 1137 lbs. whole (500 lbs. wing weight) categorized by trip length²⁰. Source NMFS SAFIS dealer and VTR data, excluding non-federal vessels and aggregate reports. Trips with unknown trip length did not match to a VTR report.

Market	Trip length	< 1		1 - 4		> 4		Unknown	
	Year	2009	2010	2009	2010	2009	2010	2009	2010
B a i t	Number of vessels	17	38	16	18	3	1	26	24
	Trips landing skates	428	916	117	81	5	1	276	222
	Trips per vessel	25	24	7	5	2	1	11	9
	Skate landings (lbs)	4,019,781	7,408,193	2,088,872	759,130	46,400	15,000	2,176,490	1,866,289
	Landings per trip (lbs)	9,392	8,088	17,854	9,372	9,280	15,000	7,886	8,407
	Dockside skate revenue	\$391,190	\$811,969	\$208,748	\$76,388	\$4,773	\$1,500	\$267,175	\$194,769
	Skate revenue per trip	\$914	\$886	\$1,784	\$943	\$955	\$1,500	\$968	\$877
	Total revenue on skate trips	\$ 391,190	\$ 812,104	\$ 208,748	\$ 76,763	\$ 4,773	\$ 1,500	\$ 267,175	\$ 194,769
	Percent skate revenue	100.0%	100.0%	100.0%	99.5%	100.0%	100.0%	100.0%	100.0%
	Average crew per trip	2.6	2.5	3.0	2.9	4.3	4.0	2.3	2.6
Average horsepower	407	377	422	402	444	400	407	377	
Average GRT	70	57	86	82	95	70	81	68	
F o o d / w i n g s	Number of vessels	191	185	175	161	115	103	161	150
	Trips landing skates	3,169	3,833	1,547	1,594	1,384	803	1,121	1,043
	Trips per vessel	17	21	9	10	12	8	7	7
	Skate landings (lbs)	9,657,499	11,037,247	6,506,390	6,220,195	8,284,112	4,181,405	4,903,539	3,837,978
	Landings per trip (lbs)	3,047	2,880	4,206	3,902	5,986	5,207	4,374	3,680
	Dockside skate revenue	\$1,482,491	\$1,805,001	\$1,352,870	\$1,525,486	\$1,773,959	\$992,942	\$939,791	\$829,611
	Skate revenue per trip	\$468	\$471	\$875	\$957	\$1,282	\$1,237	\$838	\$795
	Total revenue on skate trips	\$9,657,499	\$11,037,247	\$6,506,390	\$ 6,220,195	\$8,284,112	\$4,181,405	\$ 4,903,539	\$3,837,978
	Percent skate revenue	15.4%	16.4%	20.8%	24.5%	21.4%	23.7%	19.2%	21.6%
	Average crew per trip	2.6	2.5	3.0	2.9	4.3	4.0	2.3	2.6
Average horsepower	407	377	422	402	444	400	407	377	
Average GRT	70	57	86	82	95	70	81	68	

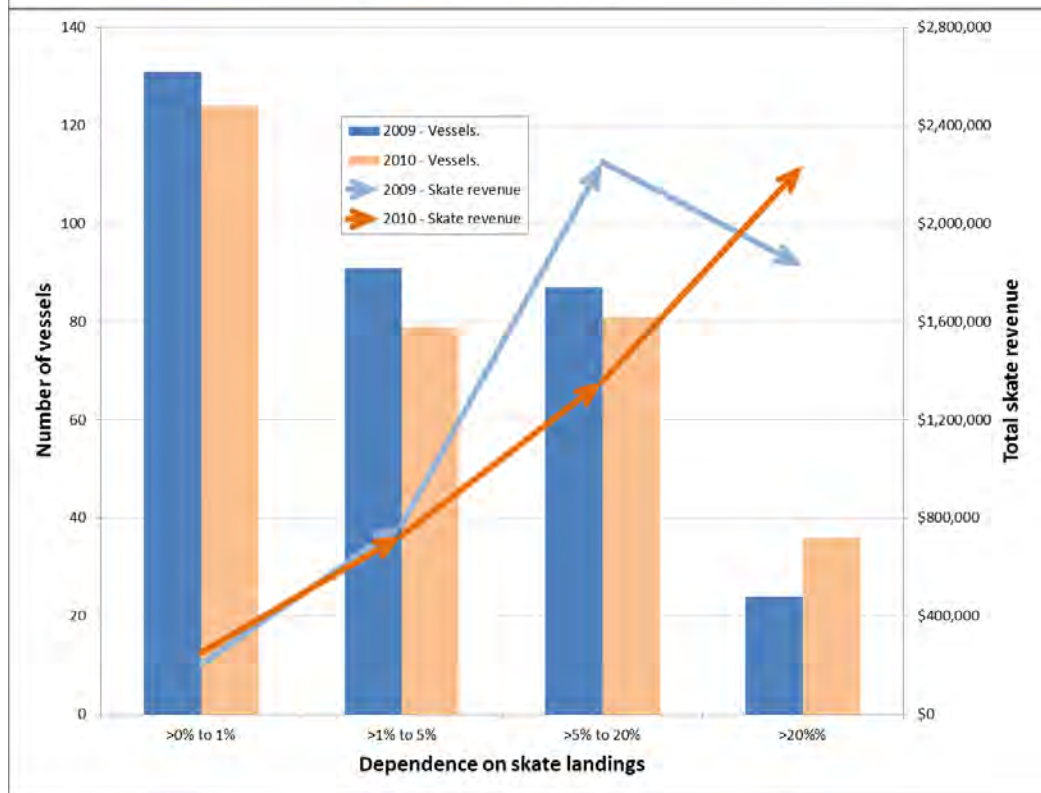
²⁰ 1 = 1 - 4 tons;
2 = 5 - 50 tons;
3 = 51 - 150 tons;
4 = 151 - 500 tons;

Figure 11 Dependence of individual vessels [n=27 bait (upper); 333 food/wing (lower)] on skate revenues in 2009 vs. 2010: percent of total annual revenues. Data include vessels with trips landing more than 1,137 lbs. (500 lbs. wing equivalent). Source: NMFS SAFIS dealer data.

Bait fishery



Wing fishery



Other species harvested while on presumed skate trips are summarized in Table 33. In this case, a targeted trip (vis-à-vis vessels that target skates during the year as addressed above) was defined as above, including any trip that landed more than the incidental possession limit of skates (1137 lbs. whole weight equivalent).

Skate revenue contributed to nearly all the revenue on trips landing skates for the bait market in both years, as noted in the above discussion and presented in the table below. And while there were many trips targeting skates for the wing market and landing predominately skates, there were also many trips that target other species and land skate wings as an incidental catch. Mostly these trips are targeting regulated multispecies (52.2% of total revenue in 2010) and monkfish (21.3% of total revenue in 2010). It is notable that regulated groundfish revenue on trips landing skate wings declined by about 50% in 2010, related to the new rules under Multispecies Amendment 16 and sector implementation, while revenue from skates and monkfish stayed relatively flat.

Table 35 Revenue by species group on trips landing skates, 2009 and 2010. Source NMFS SAFIS dealer data.

Data	MARKET		YEAR	
	Bait		Food or unknown	
	2009	2010	2009	2010
Skate landings	8,458,618	10,055,362	30,059,107	26,160,322
Skate revenue	\$883,271	\$1,085,249	\$5,685,919	\$5,352,241
Groundfish (10 large mesh species)	\$0	\$0	\$21,205,576	\$13,475,671
Monkfish.	\$0	\$0	\$5,317,470	\$5,496,811
Lobsters	\$0	\$0	\$787,371	\$417,900
Summer flounder	\$0	\$0	\$666,282	\$673,146
Groundfish (3 small mesh species)	\$0	\$0	\$11,806	\$120,858
Scallops	\$0	\$0	\$180,723	\$24,166
Scup & black sea bass	\$0	\$120	\$55,678	\$68,613
Squid, mackerel, & butterfish	\$0	\$30	\$10,053	\$45,373
Spiny dogfish	\$0	\$0	\$67,425	\$157,922
Other fish and shellfish	\$68	\$84	\$924	\$913

5.4.6 Skate Dealers and Processors

Summaries of the number of dealers and processors dependent on revenue from skate landings were presented in the FEIS for Amendment 3 (NEFMC 2009). The numbers and distribution of dealers do not appear to have markedly changed during recent years, are updated in the following four tables.

The number of dealers dependent on skate revenue by state during 2009 and compared to 2010 is given in Table 34 and Table 35, respectively. Most dealers handling skate landings are in MA, NY, and RI, with a few dealers in all three states deriving handling more than 50% of the total annual landings by value from skates. This was true in both 2009 and 2010 and there wasn't a noticeable change in the distribution of dealers handling skates or their dependence therein.

A relatively few dealers handled a high value of skates, e.g. > \$50,000, and these dealers were located in MA, RI and NJ (Table 36 and Table 37). These dealers, however, handled a high fraction of total revenue from skates. In MA, for example, the top 11 dealers handling skates contributed to 89% of total skate revenue during 2010, while the top seven RI dealers handled 79% of total 2010 skate revenue, a pattern that did not appreciably change since 2009.

Table 36. Number of Federally permitted dealers by dependence and percent of skate revenue in 2009.

Row Labels	CT	MA	MD	ME	NC	NH	NJ	NY	RI	VA	Grand Total	
Dealers.												
0-5%		8	39	4	1	2	10	21	51	29	6	171
5-10%		1	4					3	7	6	1	22
10-15%		1	3							2		6
15-20%			3								1	4
20-25%			3				1	1		1		6
25-30%			2					1	1			3
30-35%								1	1			1
35-40%			1				1					2
40-45%			2					1	2			5
50-55%			1									1
60-65%			3									3
65-70%									1			1
70-75%			1									1
80-85%			1							1		2
90-95%										2		2
Skate revenue												
0-5%		82.9%	52.7%	100.0%	100.0%	100.0%	100.0%	94.5%	55.0%	34.7%	90.7%	52.3%
5-10%		5.5%	1.9%	0.0%	0.0%	0.0%	0.0%	4.4%	26.5%	4.9%	8.0%	3.5%
10-15%		11.6%	12.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	11.2%	0.0%	11.1%
15-20%		0.0%	4.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%	3.4%
20-25%		0.0%	0.6%	0.0%	0.0%	0.0%	0.0%	0.4%	0.4%	0.0%	0.8%	0.5%
25-30%		0.0%	3.6%	0.0%	0.0%	0.0%	0.0%	0.0%	2.3%	0.0%	0.0%	2.7%
30-35%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.4%	0.0%	0.0%	0.1%
35-40%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.7%	0.0%	0.0%	0.0%	0.1%
40-45%		0.0%	10.4%	0.0%	0.0%	0.0%	0.0%	0.0%	13.4%	8.8%	0.0%	9.5%
50-55%		0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%
60-65%		0.0%	4.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.0%
65-70%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%
70-75%		0.0%	8.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	6.4%
80-85%		0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.3%	0.0%	0.5%
90-95%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	39.1%	0.0%	6.9%
Total Dealers.		10	63	4	1	2	10	26	63	42	9	230

Table 37. Number of Federally permitted dealers by dependence and percent of skate revenue in 2010.

Row Labels	CT	MA	MD	ME	NC	NH	NJ	NY	RI	VA	Grand Total	
Dealers.												
0-5%		6	41	3	5	3	6	22	50	20	8	164
5-10%		1	3					2	6	5		17
10-15%		3	5						2	1		11
15-20%		2	1							2		5
20-25%		3	1					1	1	1		7
25-30%									1	1		2
30-35%			2							1		3
40-45%			1					1	1	1		4
50-55%		1	1									2
55-60%									1			1
65-70%										1		1
70-75%			1									1
85-90%										1		1
90-95%										1		1
95-100%										1		1
Skate revenue												
0-5%		31.5%	46.4%	100.0%	100.0%	100.0%	100.0%	78.9%	35.4%	35.4%	100.0%	46.0%
5-10%		1.5%	1.5%	0.0%	0.0%	0.0%	0.0%	13.7%	28.9%	7.4%	0.0%	5.6%
10-15%		3.0%	26.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%	15.8%
15-20%		3.2%	2.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	9.8%	0.0%	4.1%
20-25%		47.6%	1.7%	0.0%	0.0%	0.0%	0.0%	4.4%	17.1%	0.5%	0.0%	3.1%
25-30%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	6.8%	0.0%	1.6%
30-35%		0.0%	1.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.8%	0.0%	2.0%
40-45%		0.0%	9.4%	0.0%	0.0%	0.0%	0.0%	2.9%	0.2%	0.0%	0.0%	5.8%
50-55%		13.2%	3.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.0%
55-60%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	18.4%	0.0%	0.0%	1.2%
65-70%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
70-75%		0.0%	6.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.9%
85-90%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.4%	0.0%	0.3%
90-95%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	22.9%	0.0%	5.5%
95-100%		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	11.7%	0.0%	2.8%
Total Dealers.		16	56	3	5	3	6	26	62	36	8	221

Table 38. Number of Federally permitted dealers by revenue category and percent of skate revenue in 2009.

Row Labels	CT	MA	MD	ME	NC	NH	NJ	NY	RI	VA	Grand Total
Dealers.											
\$1-10			2				2	2	4		10
\$10-100		2	6				6	12	7	1	34
\$100-1000		3	19	1	1	1	6	2	22	6	66
\$1,000-10,000		3	10	2		1	2	13	19	9	61
\$10k-50k		1	13	1				4	8	12	40
\$50k-100k		1	7					2		2	12
\$100k-500k			5							4	9
\$500k-1m			2								2
\$1m-5m			1								1
Skate revenue											
\$1-10		0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%
\$10-100		0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.2%	0.0%	0.1%
\$100-1000		1.0%	0.1%	0.9%	100.0%	23.9%	44.8%	0.3%	3.5%	0.2%	4.1%
\$1,000-10,000		15.6%	0.8%	19.2%	0.0%	76.1%	54.9%	10.2%	30.2%	3.2%	10.5%
\$10k-50k		11.6%	6.0%	80.0%	0.0%	0.0%	0.0%	39.9%	66.1%	24.3%	85.2%
\$50k-100k		71.8%	11.3%	0.0%	0.0%	0.0%	0.0%	49.5%	0.0%	11.5%	0.0%
\$100k-500k		0.0%	28.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	60.8%	0.0%
\$500k-1m		0.0%	23.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	16.7%
\$1m-5m		0.0%	30.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	21.3%
Total Dealers.		10	65	4	1	2	10	27	63	44	9
											235

Table 39. Number of Federally permitted dealers by revenue category and percent of skate revenue in 2010.

Row Labels	CT	MA	MD	ME	NC	NH	NJ	NY	RI	VA	Grand Total
Dealers.											
\$1-10			2		2		1		4	2	11
\$10-100		1	9		1		1	3	14	7	37
\$100-1000		5	10	2		3	4	11	17	4	60
\$1,000-10,000		6	15	2	2			4	16	6	53
\$10k-50k		4	7					7	8	8	34
\$50k-100k			3					2	3	3	12
\$100k-500k			8					1		7	16
\$500k-1m			3								3
Skate revenue											
\$1-10		0.0%	0.0%	0.0%	0.4%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%
\$10-100		0.0%	0.0%	0.0%	0.5%	0.0%	4.0%	0.0%	0.1%	0.0%	0.0%
\$100-1000		3.5%	0.1%	12.5%	0.0%	100.0%	95.8%	0.8%	1.4%	0.1%	1.6%
\$1,000-10,000		10.9%	1.6%	87.5%	99.1%	0.0%	0.0%	2.4%	13.8%	1.8%	3.8%
\$10k-50k		85.5%	4.4%	0.0%	0.0%	0.0%	0.0%	26.8%	37.8%	9.5%	0.0%
\$50k-100k		0.0%	5.1%	0.0%	0.0%	0.0%	0.0%	24.1%	46.9%	9.9%	94.6%
\$100k-500k		0.0%	42.2%	0.0%	0.0%	0.0%	0.0%	45.9%	0.0%	78.6%	0.0%
\$500k-1m		0.0%	46.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	27.3%
Total Dealers.		16	57	4	5	3	6	28	62	37	8
											226

5.5 Social Environment

5.5.1 Vessels by Homeport and Owner's Residence

Permitting of vessels in 2007 that fish for skates was summarized in the EIS for Amendment 3 (NEFMC 2009). The top five home ports of vessels holding skate permits were New Bedford, MA; Gloucester, MA; Cape May, NJ; Point Judith, RI; and Montauk, NY (ranked order). These five ports contributed to 32.6% of total skate permits.

While there have been some significant changes in fisheries regulations since 2007 when these data were compiled, including implementation of groundfish sectors, these ports are likely to represent the majority of current skate permits. These data will be updated when a new EIS is prepared.

5.5.2 Other Permits Held by Skate Permit Holders

Due to significant overlaps with other fisheries, the majority of vessels with skate permits also hold multispecies, monkfish, dogfish, bluefish, and squid/mackerel/butterfish permits. A more detailed analysis is given in the FEIS for Amendment 3 (NEFMC 2009), but there have been no major re-allocations of permits since that time that would have impacted fishing for skates. Many Multispecies FMP permit holders, however, began participating in sectors during 2010.

5.5.3 Commercial Ports of Landing

In 2010, there were 75 ports (out of a total of 539 ports with seafood landings from NC to ME) that landed skates. This was a decline from 78 ports that landed skates in 2009, and 88 ports in 2007. Of these, 45 ports had skate landings from trips that exceeded the 1137 lbs. (whole weight equivalent) incidental skate possession limit, down from 53 ports in 2009, indicating some contraction in the number of ports landing skates. This contraction may be due to economic conditions, sector management for regulated groundfish, or the incidental skate wing possession limit that was implemented on Sep 3, 2010, or other factors, singly or in combination. The total number of trips with skate landings at these ports, however, increased from 20,630 in 2009 to 25,410 in 2010. ‘Directed’ skate trips landing more than 1137 lbs. whole weight equivalent of skates totaled 7,373 in 2009, increasing to 7,935 in 2010.

Ports landings skates were located in all states in the Northeast plus North Carolina. The table below summarizes the revenue from skate landings and economic dependence on skate landings at the top ten ports in each state.

Table 40. All ports landing skates in 2009-2010. Data were redacted to maintain confidentiality. Source: NMFS SAFIS dealer data.

State	Port	Skate revenue		Economic dependence on skate revenue	
		2009	2010	2009	2010
CT	Other Connecticut	\$92,661	\$36,498	4.4%	29.4%
	Stonington				
	East Lyme				
	Waterford				
	New London				
	Old Lyme				
	Niantic				
CT Total		\$123,133	\$87,700	0.8%	0.6%
MA	New Bedford	\$3,044,832	\$2,085,251	1.2%	0.7%
	Chatham	\$1,161,190	\$1,505,755	9.2%	10.2%
	Gloucester	\$116,025	\$328,495	0.2%	0.6%
	Fall River	\$192,215	\$142,922	7.9%	9.9%
	Boston	\$169,170	\$141,164	1.4%	0.9%
	Westport	\$68,139	\$120,937	4.2%	6.5%
	Provincetown	\$108,011	\$40,750	2.9%	0.7%

State	Port	Skate revenue		Economic dependence on skate revenue	
MA Total	Scituate	\$71,732	\$63,520	1.7%	1.7%
	Woods Hole				
	Plymouth				
	Other Plymouth				
	Cambridge				
	Fairhaven				
	Marblehead				
	Marshfield				
	Newburyport				
	Other Barnstable				
	Rockport				
	Falmouth				
	Harwichport				
	Manchester				
	Gay Head (Aquinnah)				
	Swampscott				
	Chilmark				
	MA Total		\$4,980,737	\$4,486,210	1.2%
MD	Other Maryland				
	Ocean City				
MD Total		\$21,380	\$8,792	0.0%	0.1%
ME	Cape Elizabeth				
	Portland				
	Boothbay Harbor				
	Kennebunkport				
ME Total		\$205	\$3,010	0.0%	0.0%
NC	Wanchese				
NH	Portsmouth				
	Seabrook				
	New Hampshire(State Of)				
	Hampton				
	Rye				
NH Total		\$5,178	\$1,995	0.0%	0.0%
NJ	Barnegat Light/Long Beach	\$161,975	\$351,545	0.7%	1.4%
	Point Pleasant	\$64,067	\$125,733	0.3%	0.5%
	Belford	\$34,775	\$39,480	1.5%	1.6%
	Sea Isle City	\$37,305	\$25,746	4.4%	2.6%
	Waretown				
	Cape May				
	Barnegat				
	Avalon				
	Belmar				
	Atlantic City				
	Wildwood				
NJ Total		\$317,957	\$594,267	0.2%	0.4%
NY	Montauk	\$59,943	\$186,255	0.4%	1.0%

State	Port	Skate revenue		Economic dependence on skate revenue	
NY	Hampton Bays	\$90,747	\$106,301	1.9%	2.3%
	Moriches	\$31,219	\$91,050	37.6%	57.9%
	Shinnecock	\$23,097	\$86,120	4.1%	14.6%
	Islip				
	Brooklyn				
	Other Suffolk				
	Center Moriches				
	Mattituck				
	Point Lookout				
	East Hampton				
	Amagansett				
	Mount Sinai				
	Riverhead				
	Wainscott				
	Freeport				
	Greenport				
	NY Total		\$232,959	\$489,901	0.5%
RI	Point Judith	\$677,623	\$1,094,738	2.1%	3.5%
	Newport	\$347,824	\$510,714	4.8%	7.6%
	Little Compton	\$211,247	\$261,028	7.6%	9.3%
	Tiverton				
	New Shoreham				
	Other Newport				
	Other R.I.				
	South Kingstown				
	North Kingstown				
	Westerley				
RI Total		\$1,293,561	\$1,923,977	2.2%	3.3%
VA	Chincoteague	\$38,525	\$77,022	1.2%	2.2%
	Other Northampton				
	Greenbackville				
	Hampton				
	Accomac				
	Newport News				
	Norfolk(County)				
	Cape Charles				
	Wachapreague				
VA Total		\$44,549	\$81,446	0.0%	0.1%

There are several ways to present landings data to show different kinds of importance of skate to communities. Three tables below illustrate importance due to total levels of revenue and landings versus importance due to percent of skate revenue and landings relative to all commercial revenue and landings by port.

Only 31 ports (32 if you include the port of “Other Suffolk, NY”) receive at least \$10,000 per year from skate; only 9 ports receive at least \$100,000 per year. In descending order of revenue received these are:

New Bedford, MA; Chatham, MA; Point Judith, RI; Boston, MA; Tiverton, RI; Newport, RI; Barnegat Light/Long Beach, NJ; Gloucester, MA and Provincetown, MA (in bold).

There are 34 ports (37 if you include the three “Other something” ports) that landed at least 10,000lbs of skate; 15 ports landed at least 100,000lbs. In descending order of pounds landed they are: New Bedford, MA; Point Judith, RI; Chatham, MA; Tiverton, RI; Newport, RI; Boston, MA; Stonington, CT; Sea Isle City, NJ; Barnegat Light/Long Beach, NJ; Gloucester, MA; Hampton Bays, NY; Provincetown, MA; Fall River, MA; Belford, NJ and Montauk, NY (in italics).

Table 41. Top skate ports by skate wing revenue sorted by economic dependence from total skate landings. Ports with at least \$45,000 and 50 trips in 2009-10. Source: NMFS SAFIS dealer, VTR, and permit data.

Port	Trips		Average crew/trip		Average horsepower		Average gross tons		Skate revenue		Dependence	
	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010
Moriches, NY	60	89							\$ 28,858	\$ 86,515	37.6%	57.9%
Other Connecticut, CT	17	33	3.0	3.1	234	389	14	33	\$ 91,345	\$ 31,670	4.4%	29.4%
Waretown, NJ	32	84	3.0	2.8	411	514	15	17	\$ 10,991	\$ 35,420	6.1%	22.7%
Shinnecock, NY	53	118	2.3	2.2	365	331	26	20	\$ 17,120	\$ 70,214	4.1%	14.6%
Chatham, MA	1037	1304	3.1	3.3	326	341	23	22	\$ 1,135,173	\$ 1,199,409	9.2%	10.2%
Little Compton, RI	405	355	2.9	2.7	311	295	26	20	\$ 198,254	\$ 192,185	7.6%	9.3%
Newport, RI	176	247	3.3	3.8	368	324	24	17	\$ 117,176	\$ 182,025	4.8%	7.6%
Westport, MA	81	91	3.0	3.0	282	384	21	16	\$ 67,320	\$ 114,790	4.2%	6.5%
Point Judith, RI	505	473	2.7	2.9	470	469	68	66	\$ 269,637	\$ 492,121	2.1%	3.5%
Hampton Bays, NY	225	114	2.0	2.3	339	342	31	26	\$ 38,355	\$ 27,997	1.9%	2.3%
Chincoteague, VA	182	189	2.8	2.7	321	320	36	31	\$ 33,978	\$ 75,304	1.2%	2.2%
Scituate, MA	103	47	3.4	3.1	436	448	64	64	\$ 62,088	\$ 17,283	1.7%	1.7%
Barneгат Light/Long Beach, NJ	455	616	2.1	2.3	342	389	25	32	\$ 132,976	\$ 257,192	0.7%	1.4%
Montauk, NY	101	377	2.6	2.7	374	433	22	33	\$ 24,743	\$ 101,012	0.4%	1.0%
Boston, MA	193	155	3.5	3.6	633	608	113	115	\$ 148,805	\$ 91,023	1.4%	0.9%
New Bedford, MA	2226	1260	3.5	3.7	475	488	94	98	\$ 3,006,087	\$ 1,914,837	1.2%	0.7%
Gloucester, MA	232	566	3.3	3.3	565	467	91	74	\$ 83,677	\$ 228,643	0.2%	0.6%
Point Pleasant, NJ	137	169	2.7	3.1	505	398	36	37	\$ 42,701	\$ 69,486	0.3%	0.5%

Table 42. Top skate ports by skate bait revenue sorted by economic dependence from total skate landings. Ports with at least \$45,000 and 50 trips in 2009-10. Source: NMFS SAFIS dealer, VTR, and permit data.

Port	Trips		Average crew/trip		Average horsepower		Average gross tons		Skate revenue		Dependence		
	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	
Chatham, MA		51		2.7		322		18		\$ 112,521		9.2%	10.2%
Fall River, MA	130	166	3.0	3.0	460	460	99	99	\$ 190,315	\$ 141,022		7.9%	9.9%
Newport, RI	141	178	3.3	3.1	371	361	85	87	\$ 227,266	\$ 315,104		4.8%	7.6%
Point Judith, RI	218	371	2.5	2.4	437	438	75	62	\$ 332,754	\$ 434,177		2.1%	3.5%
Sea Isle City, NJ	59	55	1.1	1.0	180	180	29	29	\$ 35,670	\$ 22,590		4.4%	2.6%

5.5.4 Census Data for Top Skate Ports

Census data for communities that derive income from skate landings were summarized in the FEIS for Amendment 3 (NEFMC 2009), including detailed social information through 2007 in the Amendment 3 appendix for Boston, New Bedford, Gloucester, Provincetown, Chatham and Fall River, MA; Stonington, CT; Tiverton, Point Judith, Little Compton and Newport, RI; Montauk and Hampton Bays/Shinnecock, NY; Belford/Middleton, Barnegat Light/Long Beach, Sea Isle City, Cape May, and Point Pleasant/Point Pleasant Beach, NJ and Portland, ME. These data will be updated when a new EIS is prepared.

5.5.5 Skate Dealers

There were 55 ports where dealers bought skate (57 if you count the “Other something” ports). Of these only 4 had 10 or more dealers: Hampton Bays/Shinnecock, NY (20), Montauk, NY (17), Point Judith, RI (15), and New Bedford, MA (12). An additional 7 had at least 5 dealers: Chatham, Provincetown and Gloucester, MA; Little Compton and Newport, RI (6 each), Scituate, MA and Mattituck, NY (5 each). Here the total number of dealers may exceed 195, as some dealers buy in multiple ports. One factor to note in regard to the large number of dealers in Montauk is that many individual vessel owners have acquired dealers permits in order to sell skate as bait to local lobster and whelk fishermen²¹.

²¹ Pers. Comm.. from Victor Vecchio, NMFS Port Agent in East Hampton, NY.

Table 43. Federally permitted dealer dependence on skate in 2009 compared to 2010 – by ports with 3 or more dealers having skate landings. Source: NMFS SAFIS dealer data.

Row Labels	<= 0-5%	5-10%	10-15%	35-40%	15-20%	20-25%	25-30%	30-35%	40-45%	50-55%	55-60%	65-70%	70-75%	60-65%	80-85%	85-90%	90-95%	95-100%	Grand Total
CT	6	1			1	1													9
2009	3																		3
NEW LONDON, CT	3																		3
2010	3	1			1	1													6
NEW LONDON, CT	3	1			1	1													6
MA	60	5	6		4	4	2	2	3	1				2	1	1			91
2009	29	3	2		3	3	2		2	1				1	1	1			48
NEW BEDFORD, MA	6	1	1		1	1	1		1							1			13
GLOUCESTER, MA	7	1																	8
PROVINCETOWN, MA	5																		7
SCHUATE, MA	5					1	1								1				6
WESTPORT, MA	2																		6
CHATHAM, MA	1		1		1	1			1	1				1					4
BOSTON, MA	3	1																	4
2010	31	2	4		1	1		2	1					1					43
NEW BEDFORD, MA	12		1						1	1									15
GLOUCESTER, MA	6	1																	7
SCHUATE, MA	5																		5
CHATHAM, MA	1		2		1									1					5
PROVINCETOWN, MA	3		1																4
BOSTON, MA	3	1																	4
WESTPORT, MA	1						1	1											3
MID	6																		6
2009	3																		3
OCEAN CITY, MD	3																		3
2010	3																		3
OCEAN CITY, MD	3																		3
NC	3																		3
2010	3																		3
WANHESE, NC	3																		3
NH	8																		8
2009	5																		5
PORTSMOUTH, NH	5																		5
2010	3																		3
PORTSMOUTH, NH	3																		3
NJ	30	4					1												35
2009	16	2					1												19
POINT PLEASANT, NJ	10						1												11
BARNEGAT LIGHT/LONG BEACH, NJ	4	1																	5
BELFORD, NJ	2	1																	3
2010	14	2																	16
POINT PLEASANT, NJ	9	1																	10
BARNEGAT LIGHT/LONG BEACH, NJ	5	1																	6
NY	85	11	2				2		1	2		1	1						105
2009	43	6					1		1	1				1					53
MONTAUK, NY	16	1																	17
HAMPTON BAYS, NY	9	1																	10
MATTITUCK, NY	7																		7
SHINNECOCK, NY	3	3																	6
OTHER SUFFOLK, NY	4																		4
AMAGANSETT, NY	3																		3
CENTER MORICHES, NY							1		1					1					3
MORICHES, NY	1	1								1									3
2010	42	5	2				1			1		1							52
MONTAUK, NY	15	3																	18
HAMPTON BAYS, NY	11	1																	12
MATTITUCK, NY	5	1																	6
SHINNECOCK, NY	4						1												5
AMAGANSETT, NY	5																		5
MORICHES, NY										1		1							3
POINT LOOKOUT, NY	2	1																	3
RI	43	8	3			1	1	1	3				1			1	1	3	67
2009	25	3	2						2					1		1	2		35
POINT JUDITH, RI	16	1													1		1		19
NEWPORT, RI	4	1	1						1								1		7
LITTLE COMPTON, RI	4		1							1									6
TIVERTON, RI	1	2																	3
2010	18	5	1			1	1	1	1				1			1	1	1	32
POINT JUDITH, RI	11	2											1						16
LITTLE COMPTON, RI	4	1				1			1							1	1		7
NEWPORT, RI	1	1	1				1											1	5
TIVERTON, RI	2	1							1										4
Grand Total	241	28	12		6	8	3	4	8	1	1	2	2	1	2	1	3	1	324

5.5.6 Skate Processors

Skate processors include: AML International (about 90 employees), Bergie’s Seafood (about 35 employees), Sea Trade (about 75 employees), and the Whaling City Auction (about 30 employees) in New Bedford, MA; Sea Fresh in Portland, ME and Point Judith, RI (about 50 employees total); Zeus Packing (about 200 employees) in Gloucester, MA; Ideal Seafood in Boston, MA; Agger Company in Brooklyn, NY. These data were collected for 2007, during the development of the Amendment 3 FEIS (NEMFC 2009). It is not believed that changes in skate landings have affected these processing characteristics, but they may have been effected by the NE Multispecies Amendment 16 and sector implementation, which will be summarized in updated NE Multispecies monitoring reports (see <http://www.nemfc.org/nemulti/index.html> for more information).

5.5.7 Skate Fishing Areas

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. 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.

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

5.5.8 Data on Lobster Fishing in Top Skate Ports

Compared to data presented in the Amendment 3 FEIS (NEFMC 2009), skate revenue in RI ports landing lobster declined in importance and skate landings in MA ports increase, particularly in New Bedford and Chatham. Nonetheless, skate landings in Southern New England remain an important source of bait for the lobster trap fishery. The relative ranking of dealer reported skate landings in ports landing lobster is somewhat misleading, because a significant portion of skates are transferred at sea to be used for bait (see Table 16) and skates are often transferred by truck between ports. Furthermore, some of the skates landed for the wing/food market are processed ashore and the ‘racks’ are sold for lobster bait, after the wings have been removed. Some vessels targeting larger skates for the wing market may also retain racks to be sold to other vessels as bait.

By order of dependence on lobster landings, the top five lobster ports where skate is also landed are Marblehead, MA (4.1% in 2010); Boston, MA (2.8%); New Bedford, MA (1.5%); Gloucester, MA (1.2%), and Chatham, MA (1.0%). It should be noted, however, that lobstermen in the Gulf of Maine do not frequently use skate for bait. By total value of lobster landings, the top lobster ports where skate are also landed are: New Bedford, MA ; Chatham, MA; Point Judith, RI; and Belford, NJ (see table below).

Table 44. Lobster landings and value in top ports landing skates for bait. Skate landings do not include transfers at sea, which are port-less and reported on VTRs. Source: NMFS SAFIS dealer data. Data for some ports have been redacted to preserve confidentiality required by law.

Port	Skate revenue		Lobster revenue	
	2009	2010	2009	2010
NEW BEDFORD, MA	\$3,044,832	\$2,085,251	\$294,089	\$157,030
CHATHAM, MA	\$1,161,190	\$1,505,755	\$75,825	\$25,719
POINT JUDITH, RI	\$677,623	\$1,094,738		
BELFORD, NJ			\$0	
TIVERTON, RI			\$0	\$0
STONINGTON, CT			\$0	\$0
SEA ISLE CITY, NJ			\$0	\$0
PROVINCETOWN, MA	\$108,011	\$40,750	\$0	\$0
ISLIP, NY			\$0	\$0
FALL RIVER, MA	\$192,215	\$142,922	\$0	\$0
CHINCOTEAGUE, VA			\$0	\$0
NEWPORT, RI	\$347,824	\$510,714	\$0	\$0

6.0 ENVIRONMENTAL CONSEQUENCES (EA)

6.1 *Biological Impacts on Skates*

6.1.1 ACL alternatives

No Action

No Action will keep the ABC/ACL the same as in the 2010 fishing year, at 41,080 mt instead of 50,435 mt under the preferred alternative. The no action alternative was appropriate for managing the skate resource when biomass indicators were at a lower level and before there was an improved understanding of skate discard mortality rates, but is not appropriate as a result of these changes.

This alternative would have three main impacts on the skate resource: 1) It would maintain skate biomass at a negligibly higher but unknown amount than would the preferred alternative; 2) Because the underlying skate biomass has increased according to survey data, the resulting biomass would be larger than needed to achieve optimum yield; the status quo ABC/ACL would reduce the overall long-term yield from the skate resource; 3) The higher biomass level could also result in a higher proportion of discards to total landings because due to the higher catch rates under the current possession limit.

Preferred alternative

ACL alternatives are described in Section 4.1 and include increases in the ABC, in the aggregate skate ACL, and in the skate bait and skate wing fishery TALs. These changes are needed in response to increases in skate biomass measured by the NMFS trawl surveys, particularly for little and winter skates which are targeted by the bait and wing fisheries, respectively. The revised ABC was calculated using the same reference point (median catch/biomass exploitation ratio) that was approved in Amendment 3 for setting ABCs. Because the preferred alternative would increase the ACL and TALs from 41,080 mt to 50,435 mt, it will decrease the biomass of the skate resource by a 41,080 mt instead of 50,435 mt amount compared to the no action alternative and therefore have small negative impact on the skate resource in terms of the resulting size of the skate biomass compared to the no action alternative; however, the proposed alternative is necessary to achieve OY as defined under the MSRA.

In Amendment 3, the Council took a risk-adverse approach for setting a Skate Complex ABC. Although overfishing not defined by mortality or catch per se (see Section 6.1.1), analyses prepared for Amendment 3 found that catches at or below the median catch/biomass exploitation ratio tended to increase biomass more frequently and by a greater amount than catches that were above the median exploitation ratio [see Appendix 1 of the Amendment 3 FEIS (NEFMC 2009)]. These catch and survey biomass data were re-analyzed using peer reviewed methods approved by the SSC to take account of changes in the survey data required because of the new survey methodology (see Appendix I of this document) and to take into account the effects of new discard mortality data presented to the Skate PDT and peer reviewed by the SSC (Appendix II of this document).

The effect of changes in gear and survey sampling procedures were taken into account by calibrating the FSV Bigelow data collected in 2009-2011 to FSV Albatross IV units and adjusting the stratified mean biomass calculations to include survey strata that were consistently sampled from 1963-2008 and 2009-2011. Most of the change in the median catch/biomass exploitation ratio (C/B medians in the table below) was for clearnose and little skates which frequently occur in inshore strata that are not surveyed by the FSV Bigelow due to depth considerations. The C/B medians were also affected by the changes in the

assumed discard mortality for little²² and winter skates. The combined effects of these two changes are given in the table below and in more detail in Appendix II of this document. Even with the calibration and adjustments, most of the change in the survey biomass is attributable to increases in little and winter skate survey catches in 2008-2010 compared to the low biomass average for 2006-2008 surveys.

Applying the approved Amendment 3 ACL formula for skate specifications to the new data, the aggregate ABC is the sum product of survey biomass and the median exploitation ratio in thousands of metric tons, or 50,435 mt. The FMP sets the ACL equal to the ABC and applies a 25% buffer between the ABC and ACT to account for management uncertainty. The remainder is then allocated between projected discard mortality (assumed to be 36.3%, the average estimated 2008-2010 discard mortality), state landings (projected to be 3%), the wing fishery (66.5% after deducting state landings), and the bait fishery (33.5% after deducting state landings).

The biological impacts of the ABC and allocations to discards and catch result mainly from preventing overfishing and keeping catches below a level that has been shown in Amendment 3 to produce larger and more frequent increases in skate biomass²³. Variations in landings and discards may cause catch to exceed the ACT and any overages of the risk-adverse ACT will be absorbed by the 25% management uncertainty buffer. Any overages of the ACL will trigger accountability measures. Thus it is highly unlikely that skate catches will exceed the ABC, which was chosen to account for scientific uncertainty and keep mortality below a level that would be more likely to cause declines in skate biomass. A more detailed review of this analysis is given in Appendix 1, Document 4 of Amendment 3 (NEFMC 2009).

Although calculated for individual stocks using estimated catch and stratified mean survey biomass, the ABC was aggregated due to difficulties in monitoring skate catches by species. Although many skates can be readily distinguished from one another, some species, notably immature little and small winter skates are difficult to identify, even for biologists. There has also been some confusion about skate names which leads to rare cases of mis-reporting by dealers and fishermen. Skates that are prohibited due to their being overfished, at risk of becoming overfished, or in a rebuilding program are pretty easy to distinguish in whole form at sea however. Species identification of landed wings is more difficult. Therefore, lacking better identification methods and accurate reporting, the Council chose to monitor the TALs by (wing and bait) fishery and the ACL in the aggregate.

Because of the added management uncertainty using an aggregate ABC, the analysis below characterizes the potential interactions with and marginal changes in catch between the trawl and sink gill net fisheries (fisheries that contribute to the vast majority of landings) and the distribution of barndoor, smooth, and thorny skates. These fisheries target mainly little skate for the bait fishery (which mainly occurs near shore in Southern New England and has little interaction with barndoor, smooth, and thorny skates) and winter skate for the wing fishery (targeting this species mainly due to landings prohibitions for barndoor and thorny skates that are otherwise suitable for cutting and marketing wings). The analysis therefore focuses on the wing fishery which is more likely to interact with barndoor, smooth, and thorny skates.

²² The new discard mortality rate partially offset the change in the C/B ratio caused by the new survey methodology.

²³ Projections based on analytical models are not available however because the attempted analytical stock assessment models have not been reliable for management (NEFSC 2007a).

Table 45. **No Action (labeled “Current”)** and proposed 2012-2013 specifications including changes in input parameters: C/B exploitation medians, updated stratified mean biomass in FSV Albatross IV units, and a average mean discard mortality rate weighted by estimated discards by species and fishing gear.

	Current specifications 2006-2008 survey, 2007- 2009 discards	Proposed 2012- 2013 specifications 2008-2010 survey, 2008- 2010 discards
ACL specifications		
ABC (mt)	41,080	50,435
ACT (mt)	30,810	37,826
TAL (mt)	14,780	24,088
Assumed state landings	924	723
Federal TAL	13,856	23,365
Wing TAL	9,214	15,538
Bait TAL	4,642	7,827
Season 1	1,430	2,411
Season 2	1,722	2,904
Season 3	1,490	2,513
C/B medians		
Barndoor	3.230	2.938
Clearnose	2.440	5.910
Little	2.390	2.384
Rosette	2.190	3.622
Smooth	1.690	2.388
Thorny	3.140	2.300
Winter	4.120	2.256
Survey biomass (mean kg/tow)		
Barndoor	1.020	1.114
Clearnose	1.037	0.933
Little	5.040	7.848
Rosette	0.053	0.040
Smooth	0.133	0.161
Thorny	0.420	0.245
Winter	5.230	9.684
Discard rate	52.0%	36.3%
Discard mortality	50.0%	31.0%

There are three ways that vessels may respond to the higher TALs and new possession limits, depending on the situation. Vessels that target skates may take longer trips to catch the possession limit, may fish in more productive areas that might be further from port, or take more trips targeting skates because the fishery is open longer, or a little of all three. Vessels in other fisheries may also begin targeting skates due to the greater fishing opportunity offered by the higher skate TALs (this may be mitigated somewhat

by the potential of lower skate prices). And finally, vessels targeting other species and catching an incidental amount of skates may land more skates rather than discard them²⁴.

In the spring, barndoor skate are mainly distributed along the southern edge of Georges Bank and along the shelf edge down to NJ (see Map 9). Some barndoor skate also occur in shallower water from the western part of the Nantucket Lightship Area west to the eastern end of Long Island, NY. In the fall, barndoor skate are distributed in the same areas, but move into shallower waters of Southern New England and Georges Bank. Catches in the Gulf of Maine in both seasons are rare.

In contrast, the survey catches smooth skate mainly in the deeper water of the Gulf of Maine and off the northern edge of Georges Bank (see Map 10). The distribution of smooth skate is similar in the spring and fall, but there appears to be some shoreward migration of smooth skate in the Gulf of Maine during the spring, particularly in the area of Jefferies Ledge. It should be noted that a large proportion of smooth skate abundance has been observed in the Western Gulf of Maine closed area, offering protection from fishing. In the fall, there appears to be some offshore migration, particularly in the area of Cashes and Fippennies Ledges. It also should be noted that the area around Cashes Ledge are also closed to fishing (not shown; see <http://www.nero.noaa.gov/nero/regs/infodocs/MultsClosedAreas.pdf> for more details), offering protection from fishing.

Thorny skate are also caught by the survey in the Gulf of Maine (see Map 11), but in somewhat shallower areas than for smooth skate. During the spring, thorny skate were observed in more abundance on Jeffries Ledge, Stellwagen Bank, and Tillies Bank, off of MA, along the outer portion of Cape Cod, and in the northern part of Closed Area I. In the fall, thorny skate are observed in somewhat deeper water, but generally have the same distribution as they exhibit in the spring. A few survey catches of thorny skate occurred along the southern edge of Georges Bank in the spring, but not in the fall. It should be noted that the Western Gulf of Maine, Closed Area I, and the Cashes Ledge closed area afford thorny skate a significant amount of protection from fishing, although a relatively high proportion of thorny skates occur on Stellwagen Bank and the outer portion of Cape Cod, both areas being open to fishing.

²⁴ The skate wing possession limit was reduced to only 500 lbs. of skate wings (1137 lbs. whole) on September 3, 2010 to accommodate some incidental landings, but may have caused vessels on some trips to discard excess skates.

6.1.1.1 Potential interactions with the skate wing fishery effort distribution for vessels using trawls

6.1.1.1.1 Directed skate fishing effort

Fishing effort by vessels using trawls to target (or partially targeting) skate wings is shown in Map 9 to Map 11. Most of the fishing effort occurs along and just north of the northern edge of Georges Bank, to the SW of Closed Area II, and in the spring on the SE part of Georges Bank. Some effort also occurs along the shelf break off Southern New England and in the Hudson Canyon area, but these trips are probably targeting other species. The fishing effort that appears near Block Island Sound, south of RI, is probably targeting skates for the bait market, but these boats do not have Skate Bait Letters of Authorization²⁵ and it is impossible to determine in vessel trip reports whether the vessel was landing skates for bait or wings²⁶.

Except for one area, the distribution of directed skate wing fishing effort does not overlap the distribution of barndoor skate (Map 9). Few barndoor skate have been caught by the survey where the fishing effort is most intense, along the northern edge of Georges Bank. And the fishing effort on the SW edge of Closed Area II is too shallow to catch many barndoor skate. One area that does stand out is the skate trawl fishing effort along on the SE part of Georges Bank, in the spring. Fishing for skates in this area during the spring would be expected to have a relatively high proportion of barndoor skate in the catch.

There is even less overlap between directed skate wing fishing effort and the distribution of smooth (Map 10) and thorny (Map 11) skates. The main exception appears to be around the NE corner of Closed Area I in the spring, where the survey has had significant catches of smooth and thorny skates.

Since the new specifications will increase the landings and catch limits, it would be reasonable that fishing effort distribution may be more likely to be similar to 2009 effort than 2010 effort. And it is also reasonable that the increase is more likely to benefit and attract fishing effort for vessels that target skates, rather than land skates incidentally to fishing for other species. For the former group of vessels and trips, the higher limits may allow the vessels to take more trips and/or travel further from port. In contrast, the latter group of vessels and trips are targeting other species and if the possession limits are higher in 2012-2014 than they were in 2010, then the fishing effort is unlikely to change, but vessel may land more skates rather than discard them.

6.1.1.1.2 Potential changes in directed skate wing fishing effort

To analyze the potential changes in directed skate wing fishing effort, a comparison is made between skate fishing effort one year before July 16, 2010 (implementation of Amendment 3) and one year after this date. These differences are shown in Map 12 to Map 14, comparing the potential changes to the seasonal distributions of barndoor, smooth, and thorny skates. Areas with blue cells represent increases in effort during 2010. Conversely, warmer colors (yellow, orange, red) represent areas where effort was

²⁵ Vessels only need a Skate Bait Letter of Authorization if they exceed the skate wing possession limit. The Skate Bait Letter of Authorization, however, specifically restricts vessels to landing only skates smaller than 23 cm in length, prohibiting possession of larger skates including barndoor, smooth, and thorny skates, which are usually larger than this limit.

²⁶ For monitoring purposes, the NMFS uses dealer reports which report the market for the skate landings. Vessel trip reports were used here for more information about the fishing trip and vessel characteristics. Fishermen can report whole skate or skate wing landings on vessel trip reports, but often whole skate reports are destined for the wing market and are only reported in whole form on the vessel trip reports.

higher (in some cases much higher) than directed skate wing fishing effort in 2010. It is the latter areas where increases in effort might be expected in 2012-2014 due to higher limits, all other factors held constant.

The analysis shows that increases in directed skate wing fishing effort can be expected mostly on the northern edge of Georges Bank and to a lesser extent in the area SW of Closed Area II. These areas are generally more shallow than where barndoor skate occur (Map 12) and are outside the distribution of smooth (Map 13) and thorny (Map 14) skates.

6.1.1.1.3 Non-target fishing effort

Skate fishing effort on trips where any amount of skates were landed are shown in Map 15 to Map 17 and are generally more widely distributed than directed skate wing fishing effort (Map 9 to Map 11). In particular, more fishing effort occurs on these trips in shallower water of Georges Bank, and in the spring, to the east of the Western Gulf of Maine closed area, on Stellwagen Bank, and along the Southern New England and Mid-Atlantic shelf edge. These are mixed species fisheries of various sorts (often groundfish, monkfish, and squid fisheries), that land an incidental amount of skates.

In these other fisheries that land skates, there is a greater amount of overlap with the distribution of barndoor skate in the spring along the Southern New England and Mid-Atlantic shelf edge (Map 15). There is also a greater amount of overlap with the distribution of smooth skate between the Western Gulf of Maine closed area and Closed Area II (Map 16).

Most of the fishing effort on trawl trips that land an incidental amount of skates does not overlap the distribution of thorny skate, except for fishing effort on Stellwagen and Tillies Banks in the spring and along the NW edges of Closed Area II (Map 17).

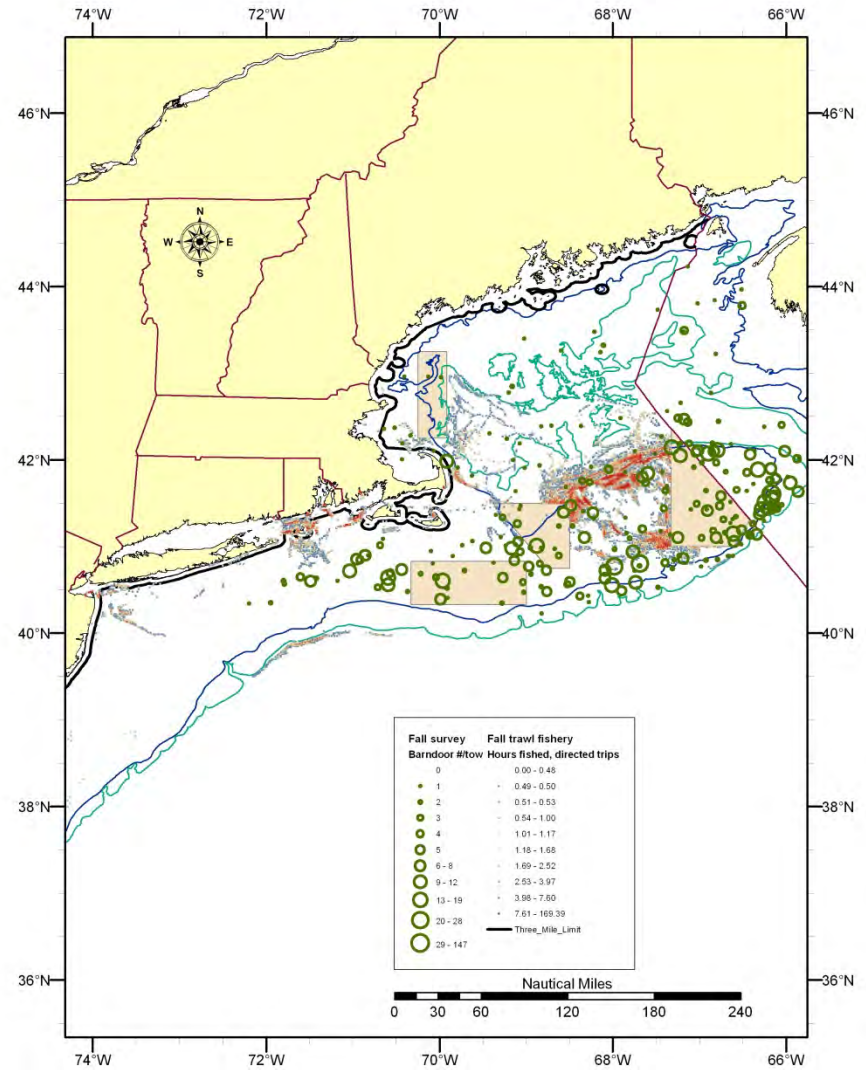
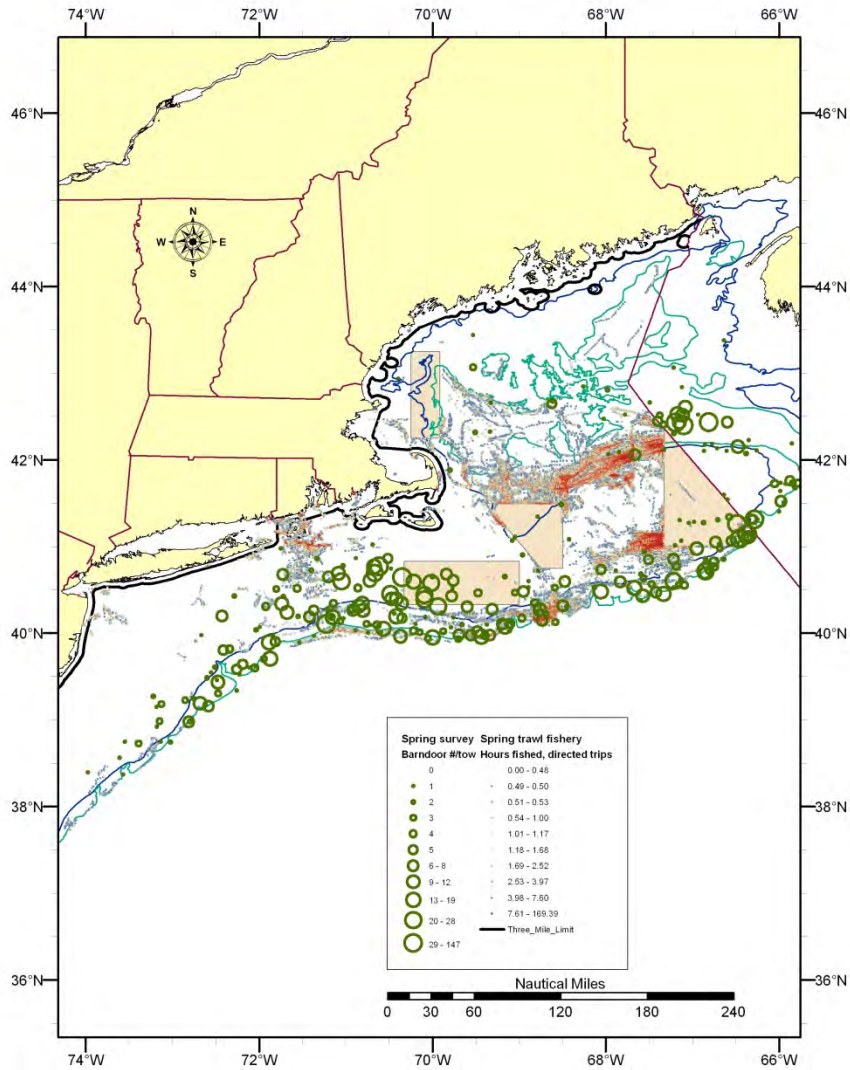
6.1.1.1.4 Conclusion

Overlaps in the distribution of trawl effort on trips targeting or landing an incidental amount of skates and the distributions of barndoor, smooth, and thorny skates on surveys is at best marginal. There are a few areas that the overlap suggests that catches of barndoor, smooth, and thorny skates might be problematic (see discussion above), but in general the analysis indicates that increases in the ABC and the skate wing TAL is not going to significantly impact the catches of barndoor, smooth, and thorny skates.

Map 9. Distribution of 2006-2010 barndoor skate abundance (#/tow) compared to distribution of 2009-2011 directed skate trawl fishing effort (hot colors, like red, represent more intense fishing effort). Directed effort includes trips landing more than 500 lbs. of skate wings and with skates contributing more than 30% of total landings by vessels without Skate Bait Letters of Authorization that reported using trawls.

Spring (Jan-Jun effort)

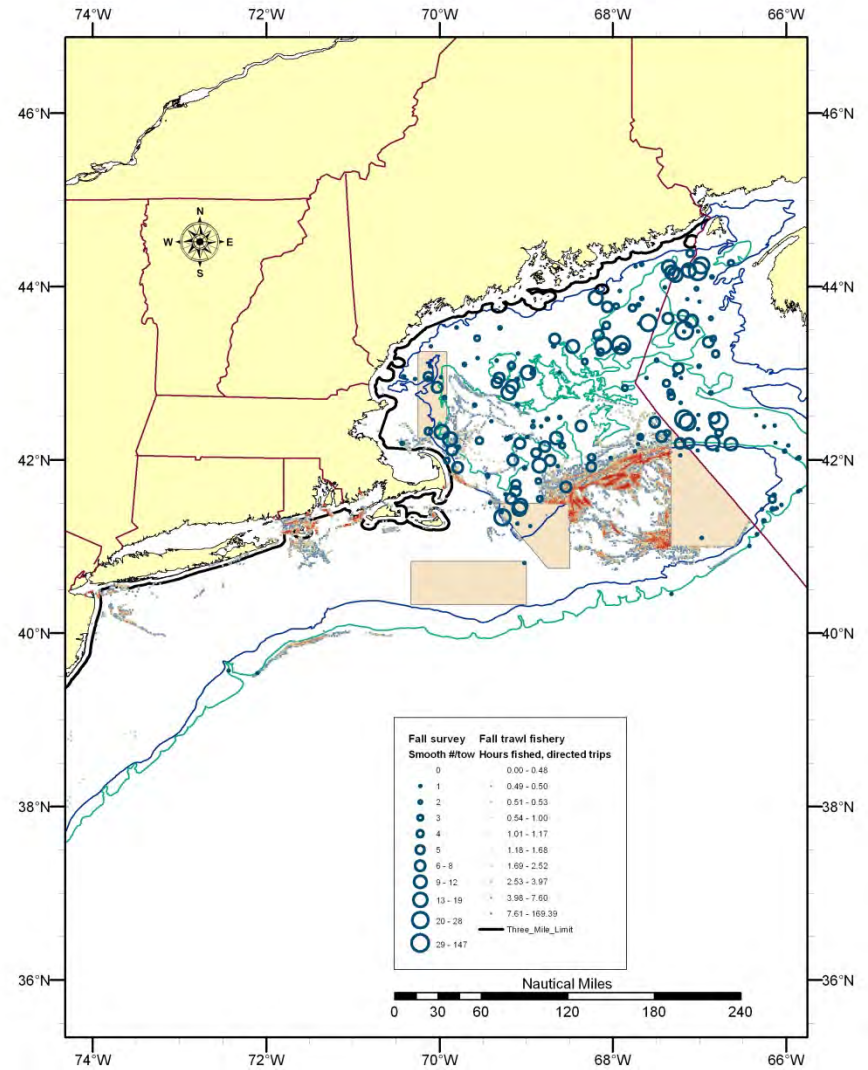
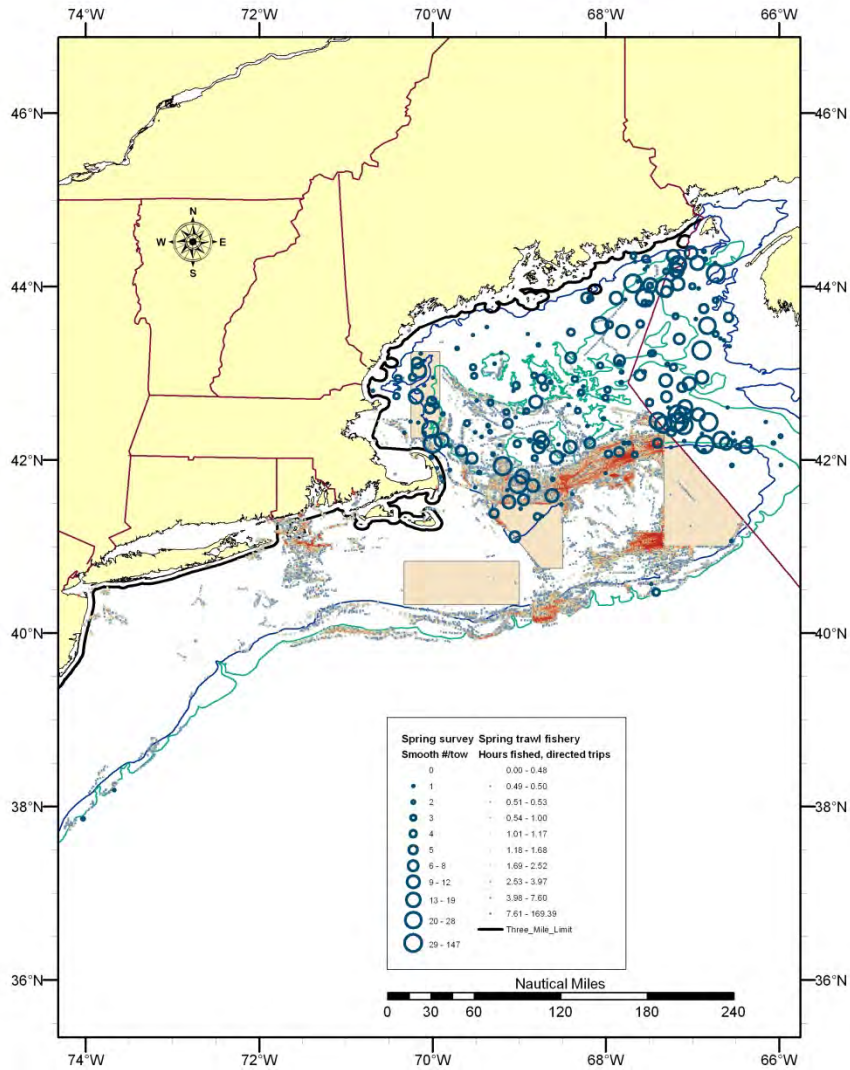
Fall (Jul-Dec effort)



Map 10. Distribution of 2006-2010 smooth skate abundance (#/tow) compared to distribution of 2009-2011 directed skate trawl fishing effort (hot colors, like red, represent more intense fishing effort). Directed effort includes trips landing more than 500 lbs. of skate wings and with skates contributing more than 30% of total landings by vessels without Skate Bait Letters of Authorization that reported using trawls.

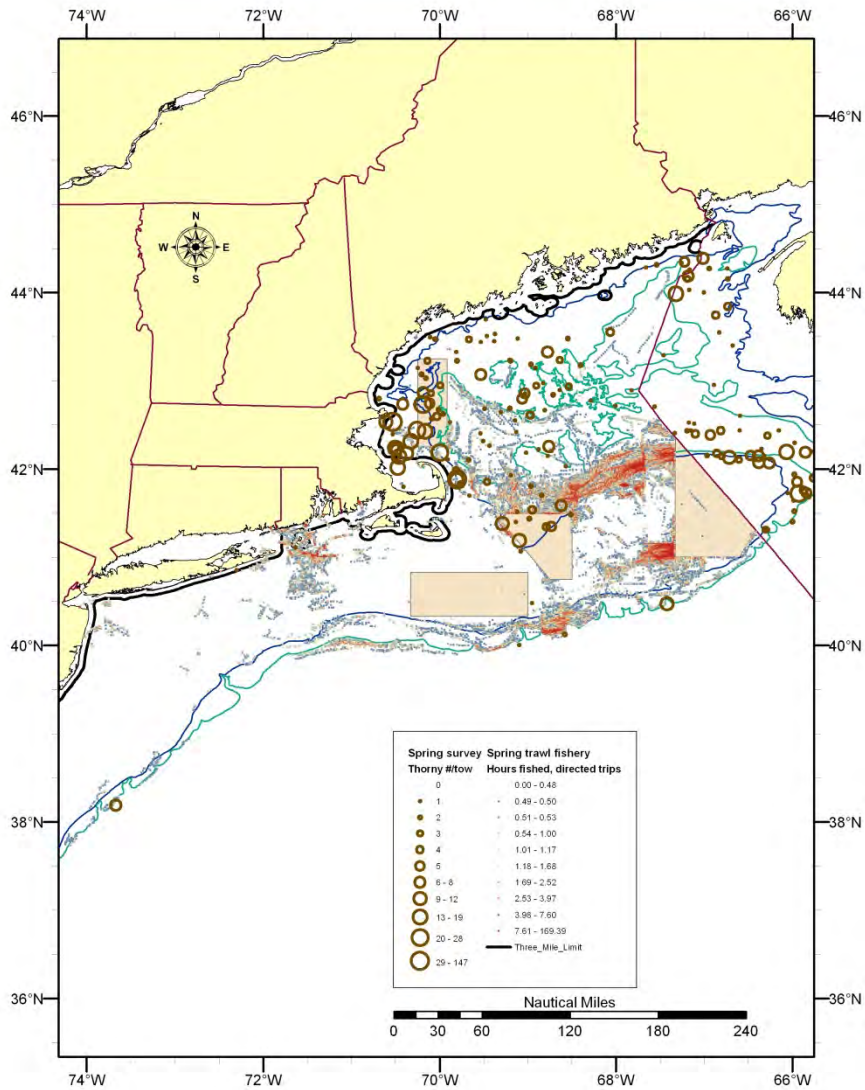
Spring (Jan-Jun effort)

Fall (Jul-Dec effort)

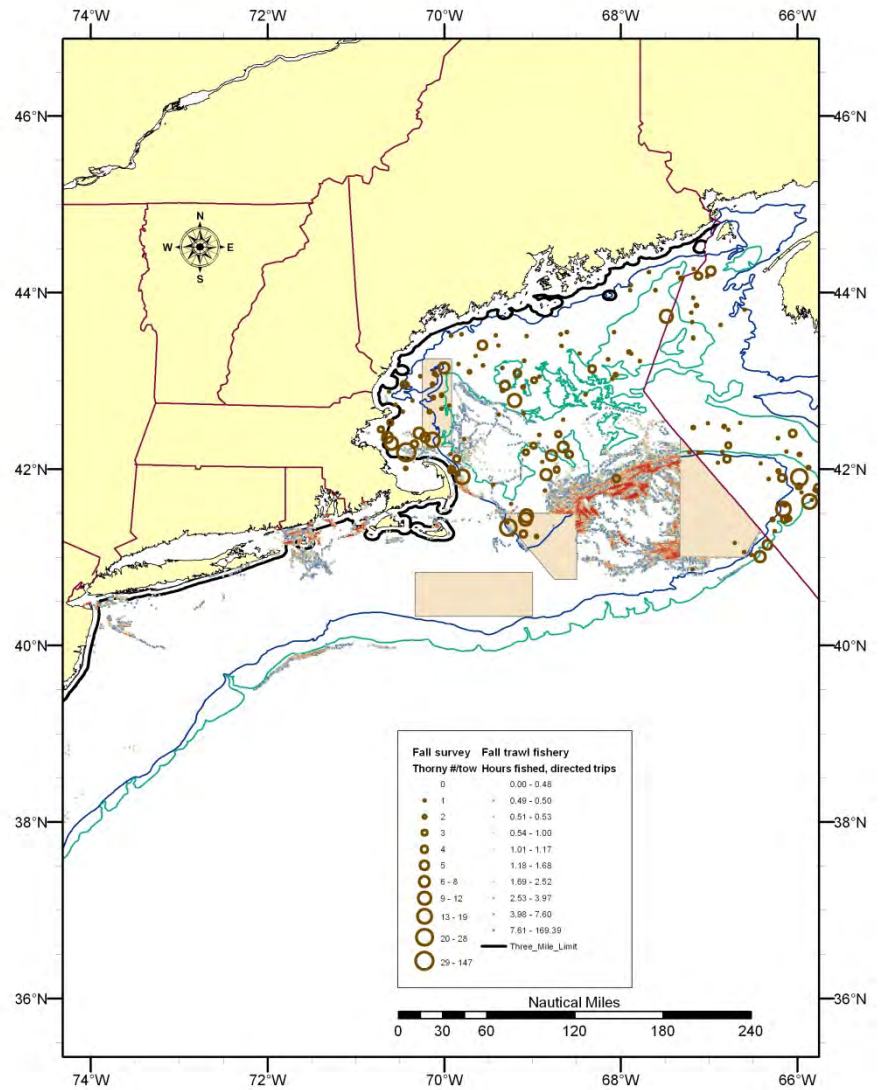


Map 11. Distribution of 2006-2010 thorny skate abundance (#/tow) compared to distribution of 2009-2011 directed skate trawl fishing effort (hot colors, like red, represent more intense fishing effort). Directed effort includes trips landing more than 500 lbs. of skate wings and with skates contributing more than 30% of total landings by vessels without Skate Bait Letters of Authorization that reported using trawls.

Spring (Jan-Jun effort)



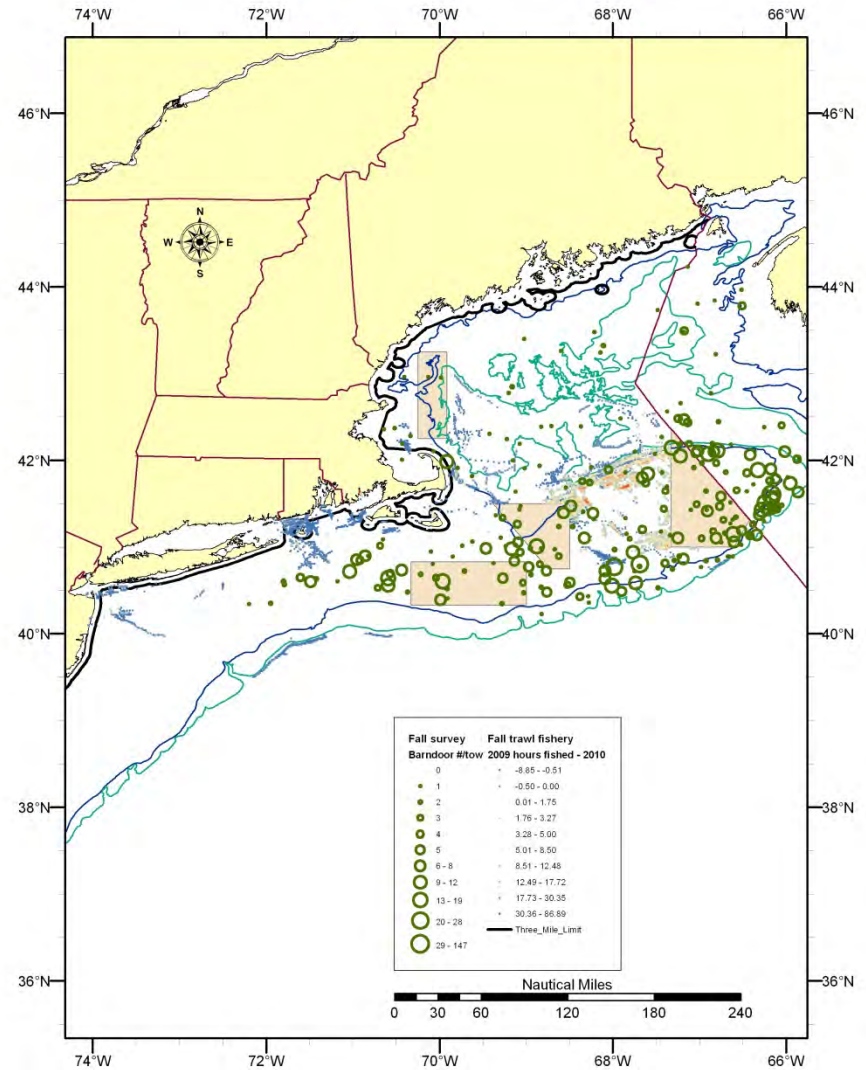
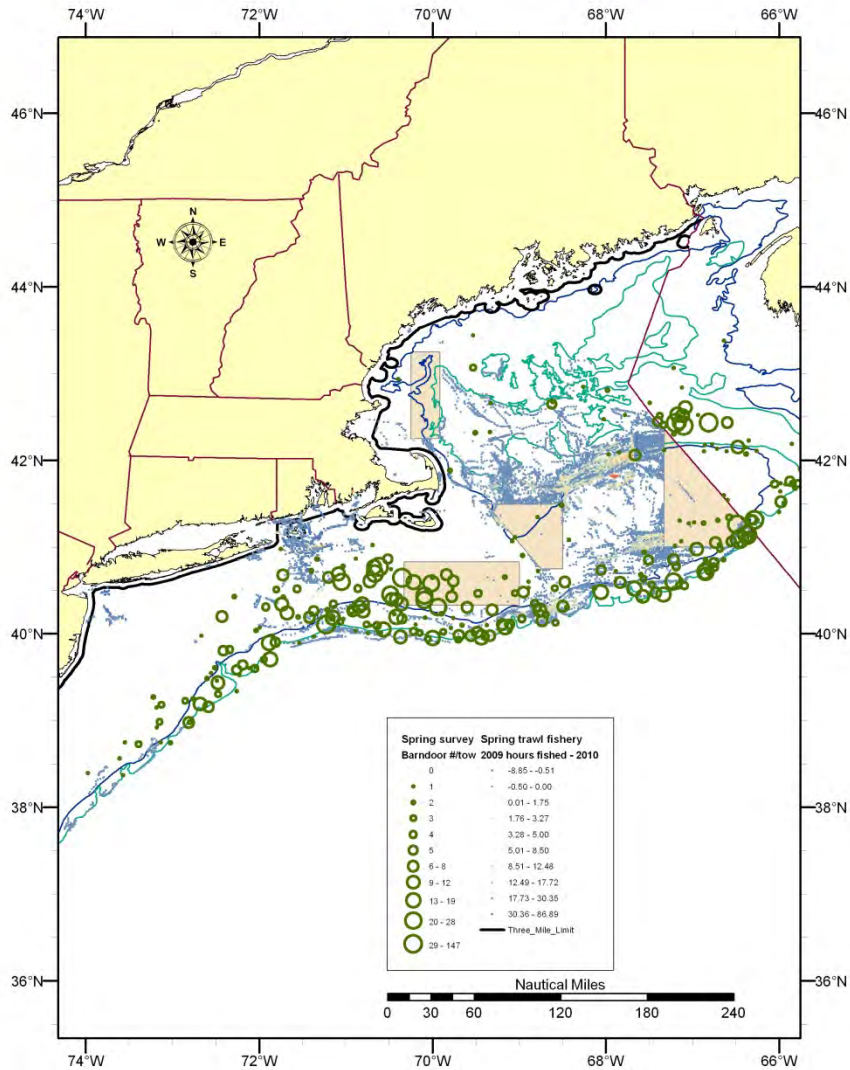
Fall (Jul-Dec effort)



Map 12. Distribution of 2006-2010 barndoor skate abundance (#/tow) compared to distribution of 2009-2010 change in directed skate trawl fishing effort (Hot colors, like red, represent less fishing effort in 2010 after implementation of ACLs. Cool colors, like blue represent more fishing effort in 2010). Directed effort includes trips landing more than 500 lbs. of skate wings and with skates contributing more than 30% of total landings by vessels without Skate Bait Letters of Authorization that reported using trawls.

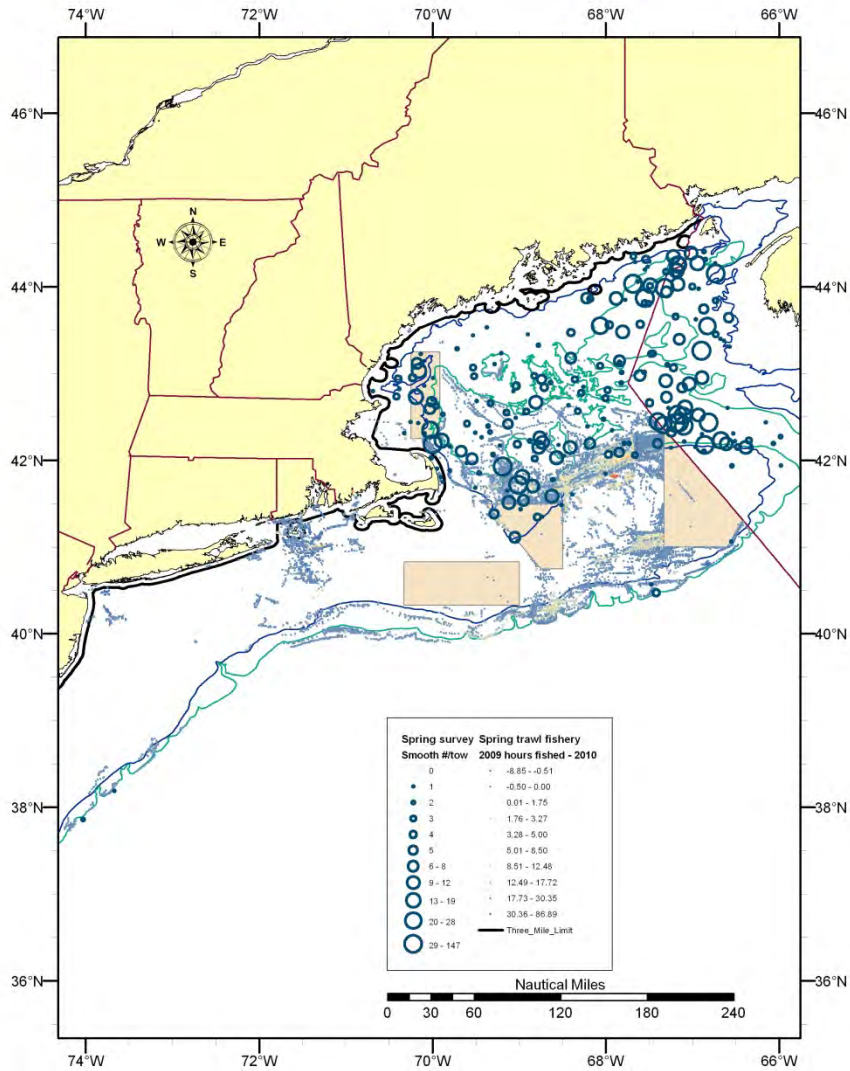
Spring (Jan-Jun effort)

Fall (Jul-Dec effort)

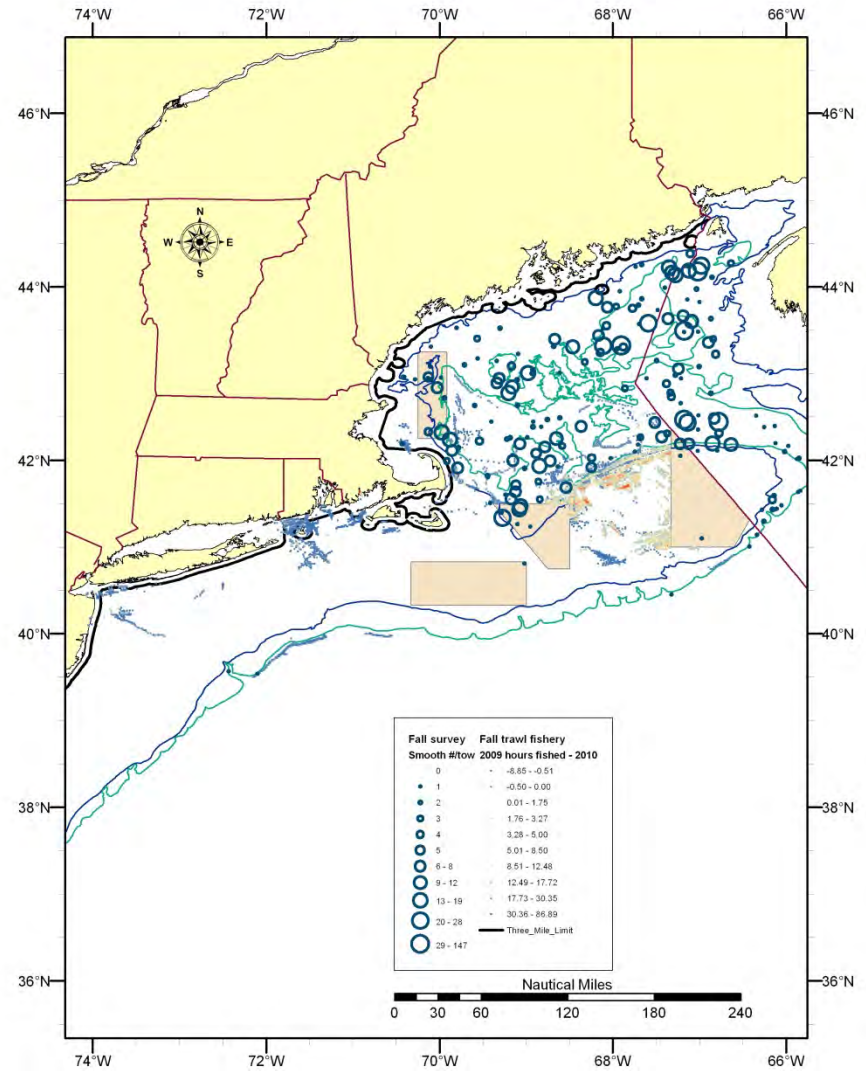


Map 13. Distribution of 2006-2010 smooth skate abundance (#/tow) compared to distribution of 2009-2010 change in directed skate trawl fishing effort (Hot colors, like red, represent less fishing effort in 2010 after implementation of ACLs. Cool colors, like blue represent more fishing effort in 2010). Directed effort includes trips landing more than 500 lbs. of skate wings and with skates contributing more than 30% of total landings by vessels without Skate Bait Letters of Authorization that reported using trawls.

Spring (Jan-Jun effort)

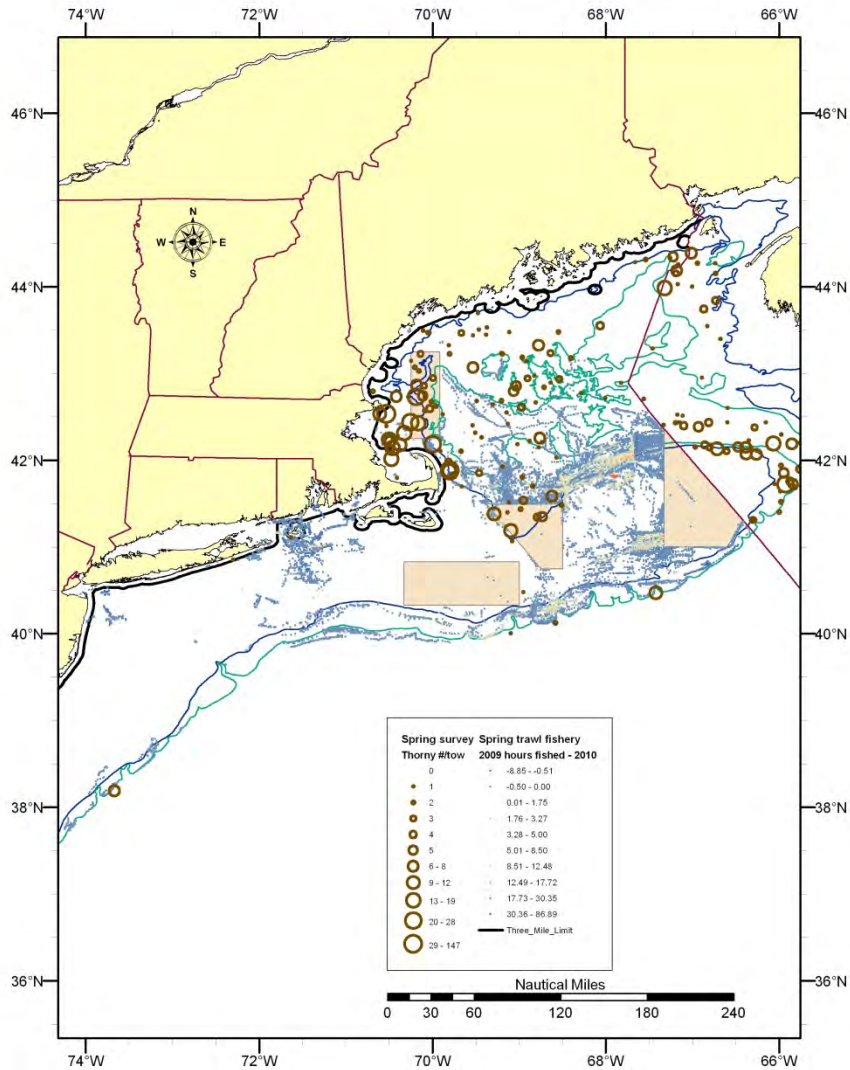


Fall (Jul-Dec effort)

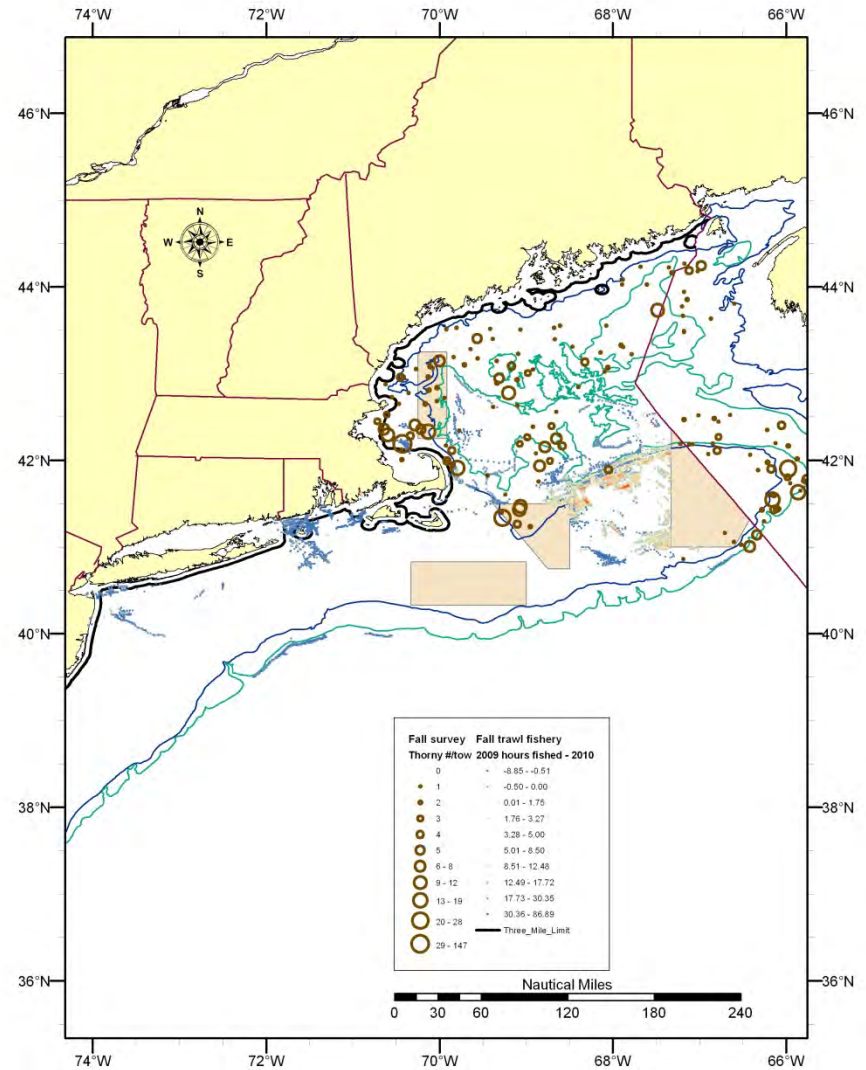


Map 14. Distribution of 2006-2010 thorny skate abundance (#/tow) compared to distribution of 2009-2010 change in directed skate trawl fishing effort (Hot colors, like red, represent less fishing effort in 2010 after implementation of ACLs. Cool colors, like blue represent more fishing effort in 2010). Directed effort includes trips landing more than 500 lbs. of skate wings and with skates contributing more than 30% of total landings by vessels without Skate Bait Letters of Authorization that reported using trawls.

Spring (Jan-Jun effort)



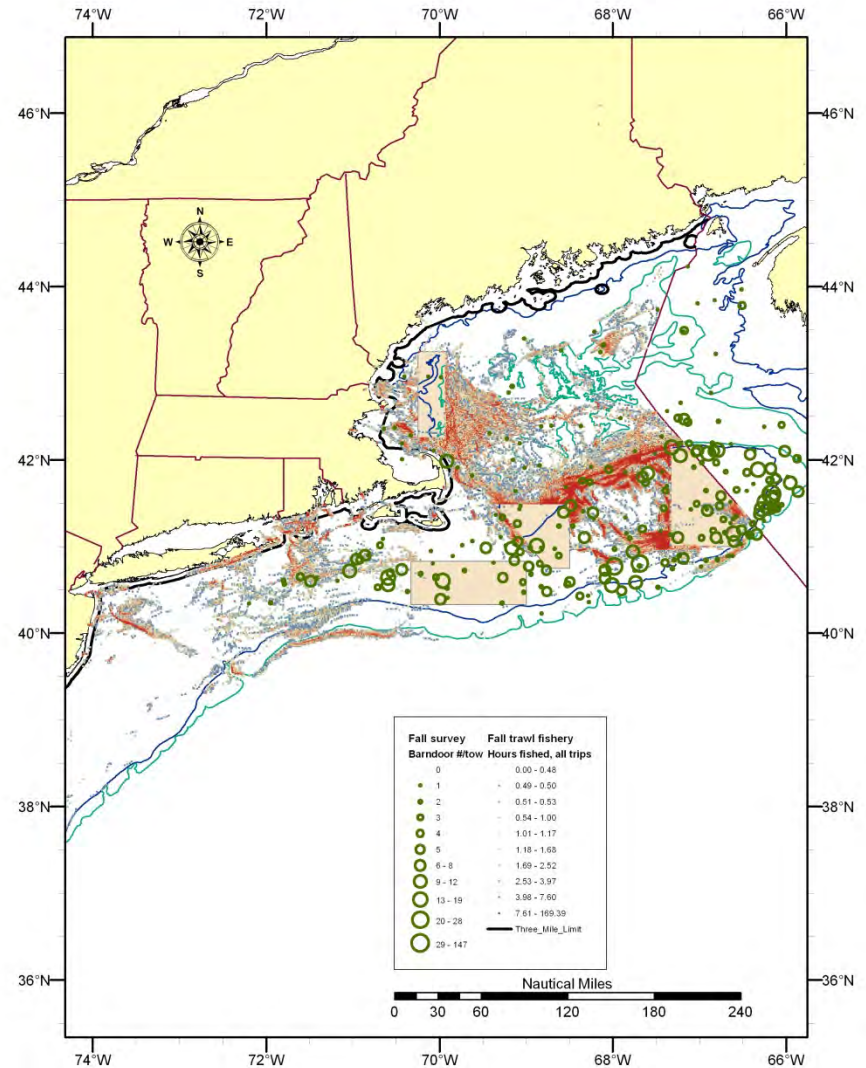
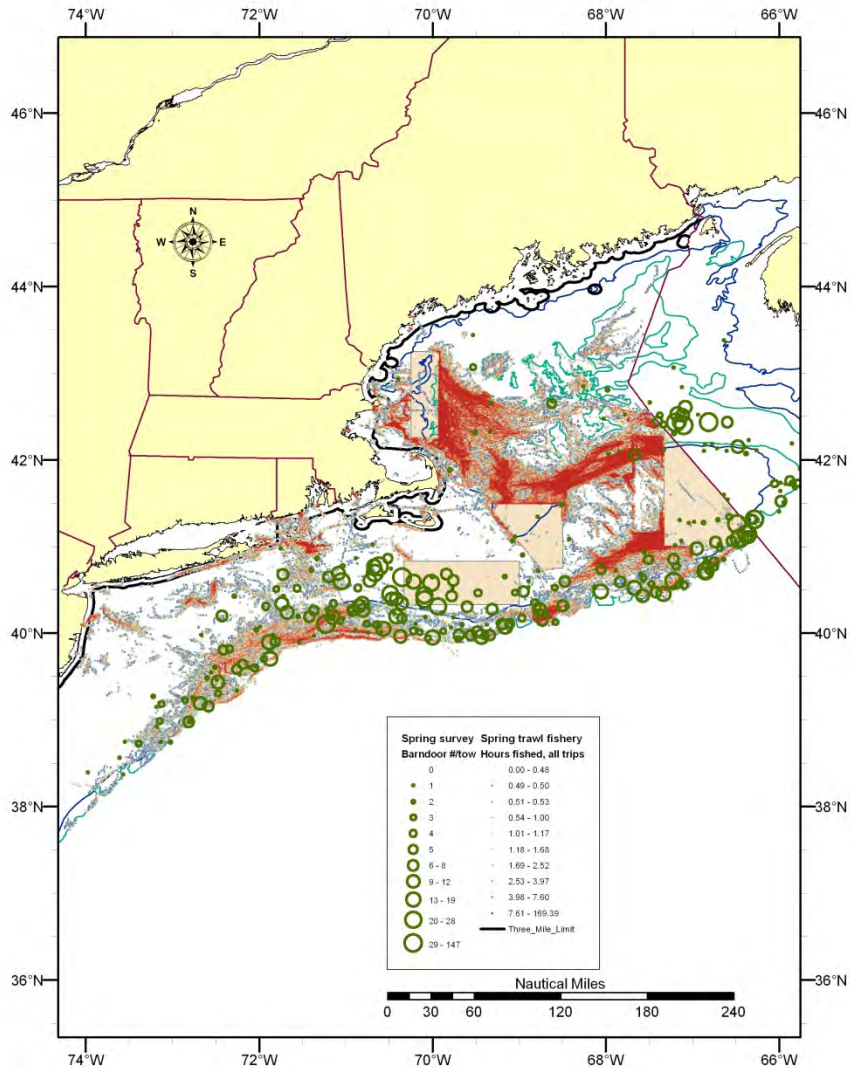
Fall (Jul-Dec effort)



Map 15. Distribution of 2006-2010 barndoor skate abundance (#/tow) compared to distribution of 2009-2010 target and non-target skate trawl fishing effort (Hot colors, like red, represent less fishing effort in 2010 after implementation of ACLs. Cool colors, like blue represent more fishing effort in 2010). The effort data include all trips landing more than 500 lbs. of skate wings by vessels without Skate Bait Letters of Authorization that reported using trawls.

Spring (Jan-Jun effort)

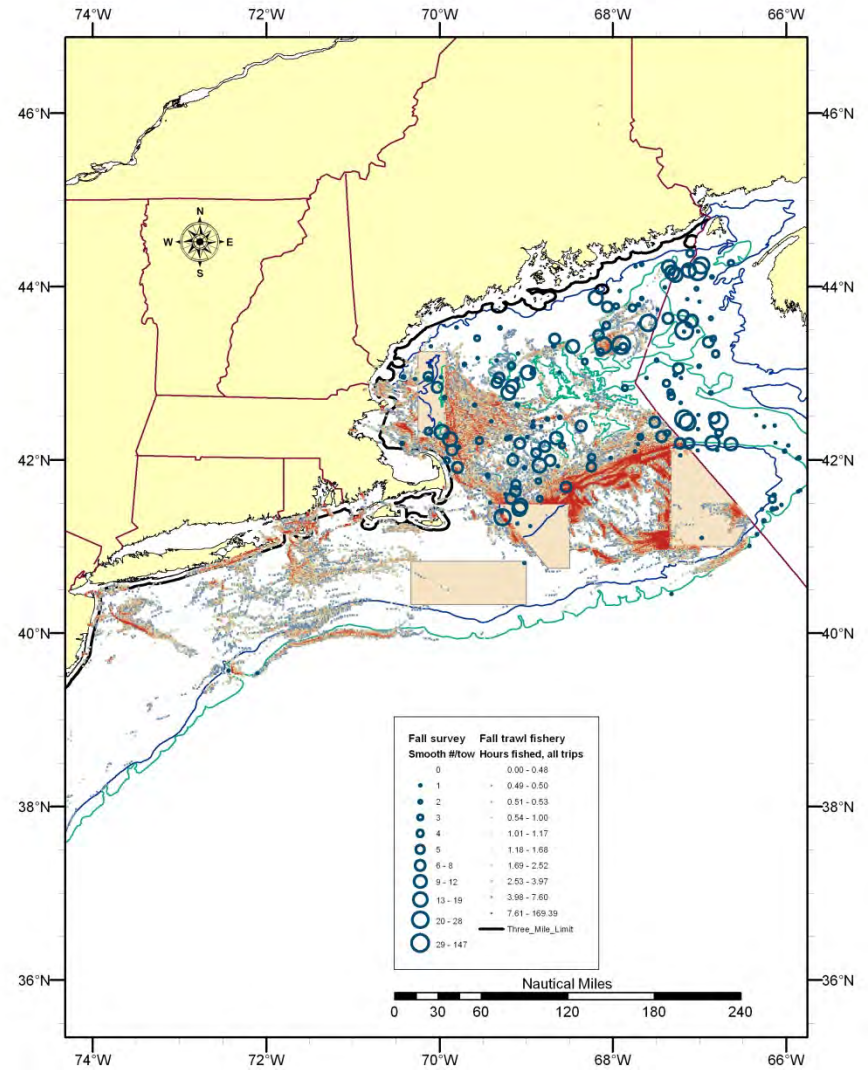
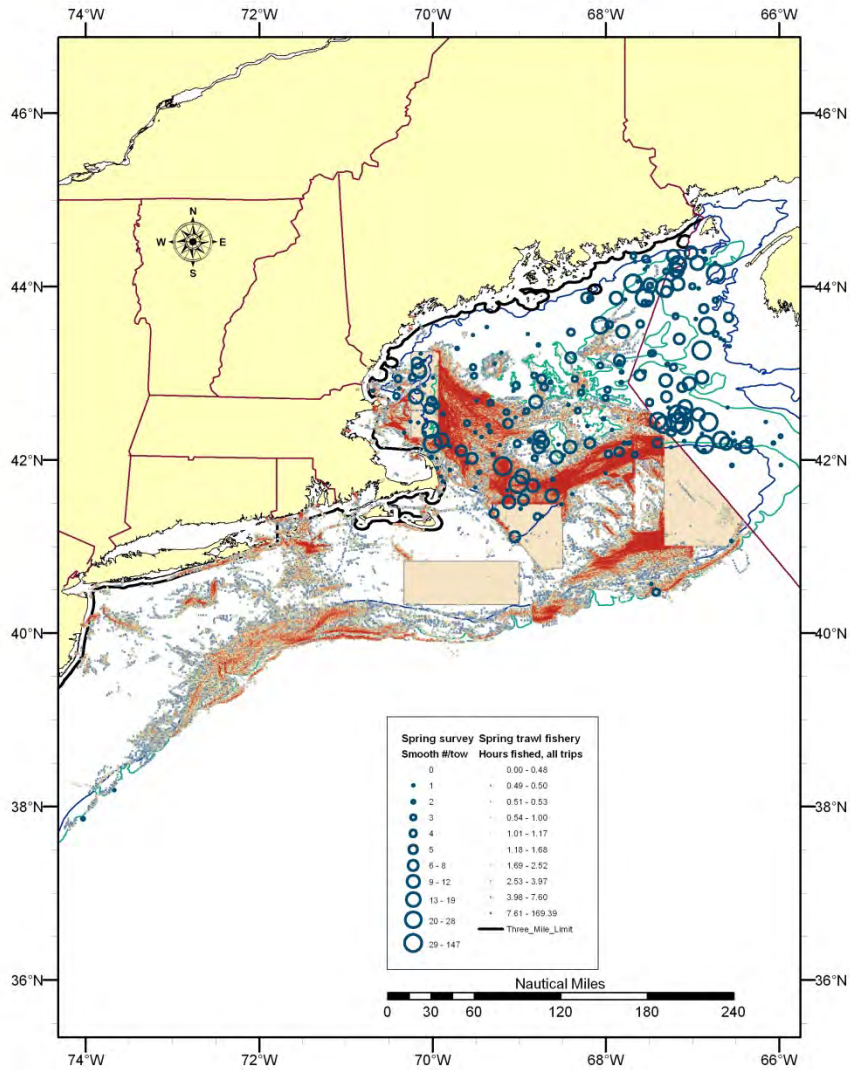
Fall (Jul-Dec effort)



Map 16. Distribution of 2006-2010 smooth skate abundance (#/tow) compared to distribution of 2009-2010 target and non-target skate trawl fishing effort (Hot colors, like red, represent less fishing effort in 2010 after implementation of ACLs. Cool colors, like blue represent more fishing effort in 2010). The effort data include all trips landing more than 500 lbs. of skate wings by vessels without Skate Bait Letters of Authorization that reported using trawls.

Spring (Jan-Jun effort)

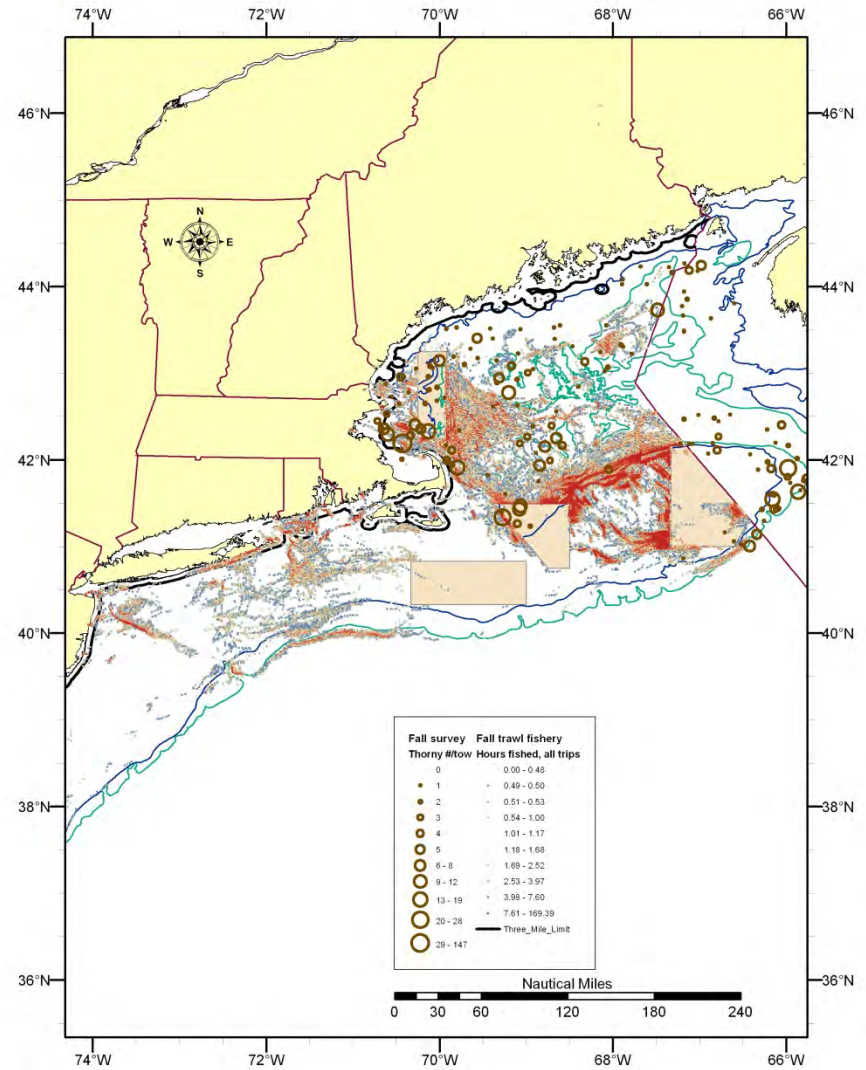
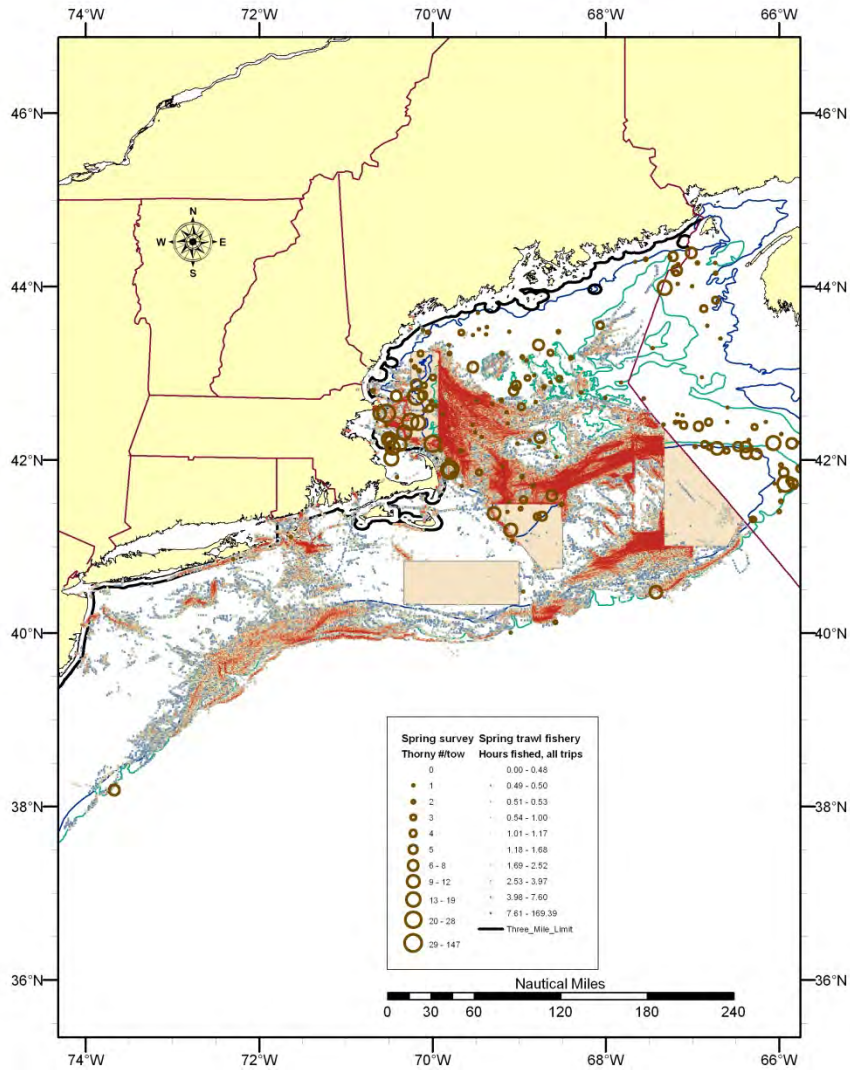
Fall (Jul-Dec effort)



Map 17. Distribution of 2006-2010 thorny skate abundance (#/tow) compared to distribution of 2009-2010 target and non-target skate trawl fishing effort (Hot colors, like red, represent less fishing effort in 2010 after implementation of ACLs. Cool colors, like blue represent more fishing effort in 2010). The effort data include all trips landing more than 500 lbs. of skate wings by vessels without Skate Bait Letters of Authorization that reported using trawls.

Spring (Jan-Jun effort)

Fall (Jul-Dec effort)



6.1.1.2 Potential interactions with the skate wing fishery effort distribution for vessels using gillnets

6.1.1.2.1 Directed skate fishing effort

As in the analysis above for trawl fishing effort, the distribution of fishing effort on trips using sink gillnets to target or land incidental amounts of skates can be compared with the distribution of barndoor, smooth, and thorny skates observed in surveys. The species distributions are of course the same as those used in the above trawl analysis, but the gillnet fishing effort distribution is different than it is for the trawl fishery evaluated in the previous section. Most of the gillnet fishing for skates lands skates for the wing market, which is plotted in the following maps. Nonetheless, vessels that held Skate Bait Letters of Authorization were excluded from the analysis, because they would be targeting little skate which mostly occur in shallow waters that have little overlap with the distributions of barndoor, smooth, and thorny skates.

In contrast to trawl fishing effort, the directed gill net fishing effort is concentrated in three areas: Southern New England from SW of the Nantucket Lightship Area to the eastern part of Long Island, NY, from the SE tip of Cape Cod, MA to the NW part of Closed Area I, and along the SW edge of the Western Gulf of Maine closed area (Map 18 to Map 20).

There is a considerable amount of overlap in directed skate gillnet effort and barndoor skate distribution in the spring to the south and west of the Nantucket Lightship Area (Map 18). This is a fishery that targets both skates and monkfish, and therefore is expected to have a significant amount of barndoor skate, if they do not evade capture by gillnet gear. Given that skates are captured by gillnets and the gillnets are designed to capture large monkfish, this evasion is unlikely.

There is almost no overlap in directed gillnet fishing effort and smooth skate distribution (Map 19). And although the directed gillnet fishing effort has little in common with the thorny skate distribution (Map 20), the gillnet effort on the SW edge of the Western Gulf of Maine closed area appears to have a year round interaction with thorny skates.

6.1.1.2.2 Potential changes in directed skate wing fishing effort

The areas of a high degree of overlap identified in the previous section can be examined for potential increases in fishing effort due to the higher ABC and skate wing TAL, by comparing the 2009 effort to 2010 when more restrictive limits were implemented by Amendment 3, similar to the analysis for directed trawl effort above. In the area that directed gillnet fishing effort overlaps the barndoor skate distribution, effort was actually higher in 2010 than it was in 2009 (indicated by the blue cells in Map 21). This is an area where vessels target monkfish using gillnets, so the differences between 2009 and 2010 effort may have had more to do with monkfish fishing than skate fishing. As a result, the 500 lbs. incidental skate possession limit probably caused a considerable amount of discarding in this area where vessels target monkfish with gillnets. In the area SW of the Western Gulf of Maine closed area that overlaps the thorny skate distribution (Map 23), there was little change in the amount of effort in 2010 compared to 2009 and therefore increases in the skate limits would not be expected to change the effort distribution there and the catches of thorny skate.

6.1.1.2.3 Non-target fishing effort

The distribution of gillnet fishing effort on all trips landings skates (Map 24 to Map 26) is of course more widely distributed than it is for trips targeting skates (Map 18 to Map 20). The additional effort is located around Hudson Canyon in the Mid-Atlantic and on the various banks in the central Gulf of Maine. The Hudson Canyon gillnet fishing effort is unlikely to have any interaction with barndoor, smooth, and thorny skates. On the other hand, the gillnet trips targeting non-skate species in the central Gulf of Maine are likely to have interactions with smooth skates (Map 25) and to a somewhat lesser extent with thorny skate (Map 26).

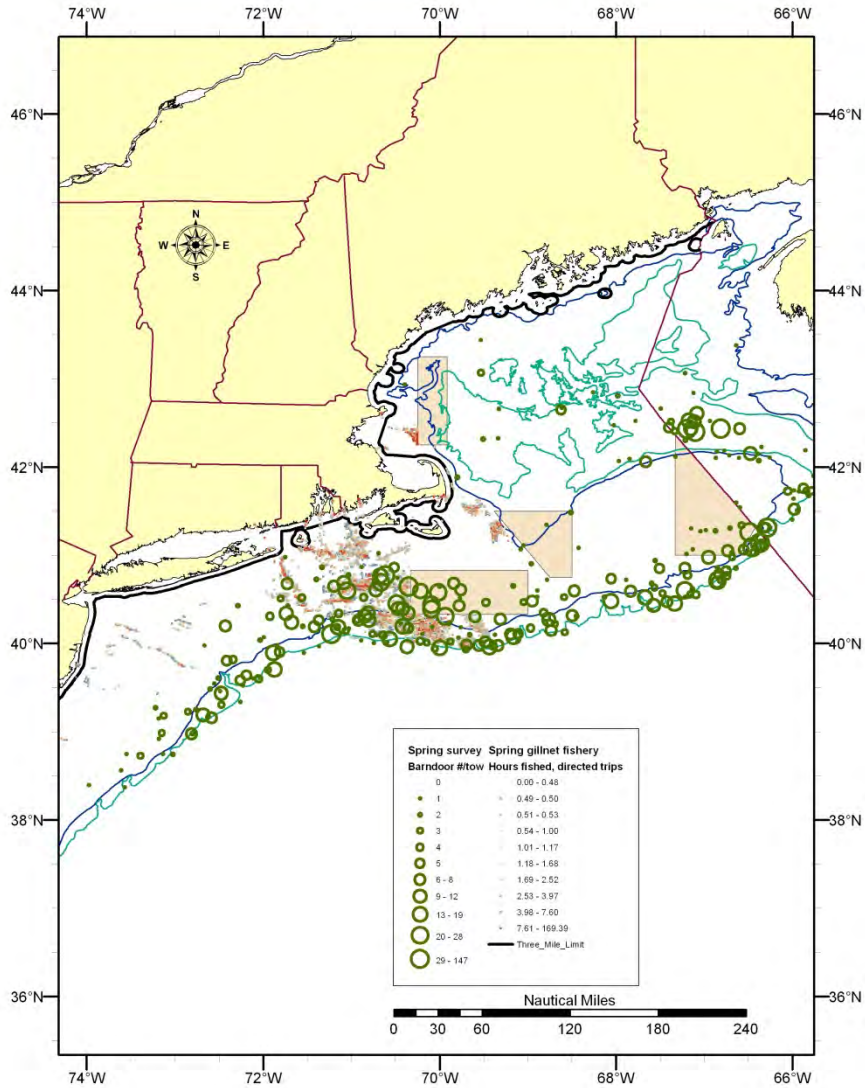
6.1.1.2.4 Conclusion

Except for gillnet trips targeting or landing incidental amounts of skates to the south and west of the Nantucket Lightship Area and to a much lesser extent the trips fishing SW of the Western Gulf of Maine closed area, gillnets do not overlap the distribution of barndoor, smooth, and thorny skates very much and increases in the skate ABC and skate wing TAL are unlikely to have much effect on the biomass of these species. The gillnet fishing effort south and west of the Nantucket Lightship Area however overlaps a considerable amount of the spring distribution of barndoor skate. Gillnet fishing in this area could have a meaningful impact on the biomass of barndoor skate, although discard survival may be better than the 50% level assumed by the Council²⁷. But it should also be noted that barndoor biomass skate has increased considerably in the last decade despite this interaction and could soon reach the rebuilding target.

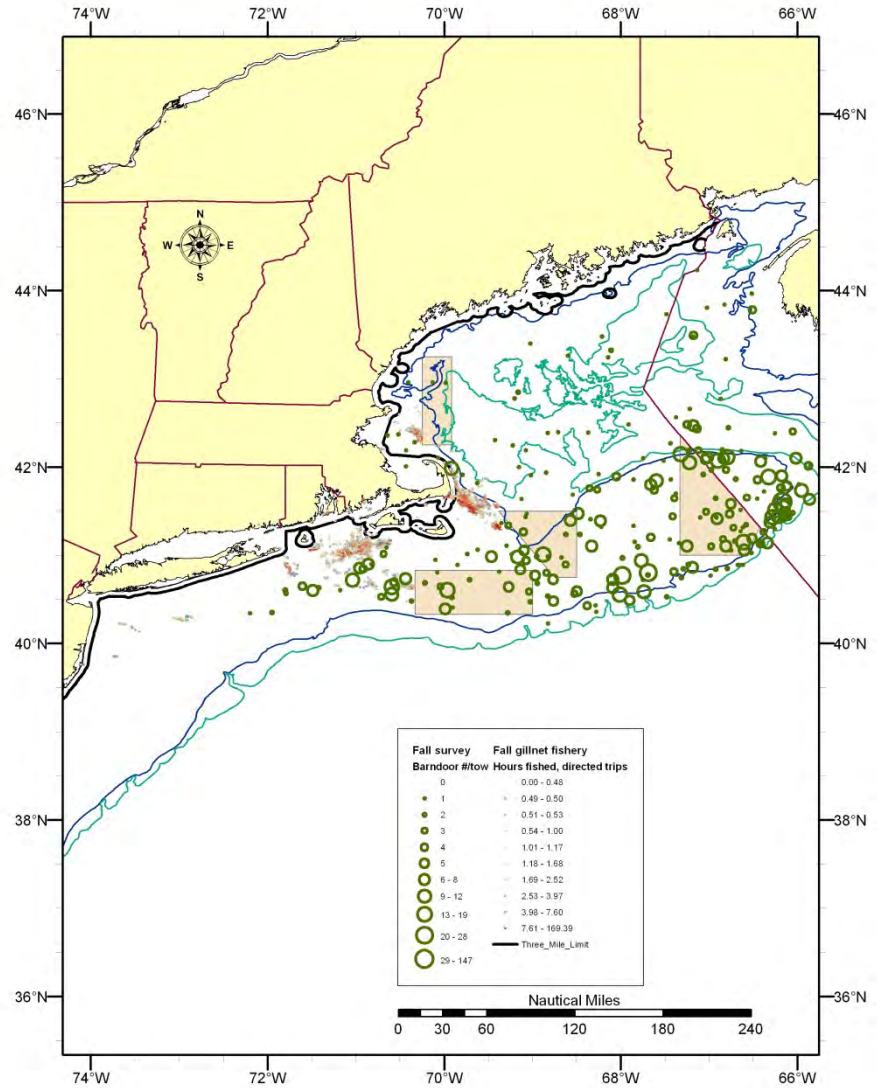
²⁷ There are no data on discard survival of skates when captured by gillnets in US waters.

Map 18. Distribution of 2006-2010 barndoor skate abundance (#/tow) compared to distribution of 2009-2011 directed skate sink gillnet fishing effort (hot colors, like red, represent more intense fishing effort). Directed effort includes trips landing more than 500 lbs. of skate wings and with skates contributing more than 30% of total landings by vessels without Skate Bait Letters of Authorization that reported using sink gillnets.

Spring (Jan-Jun effort)



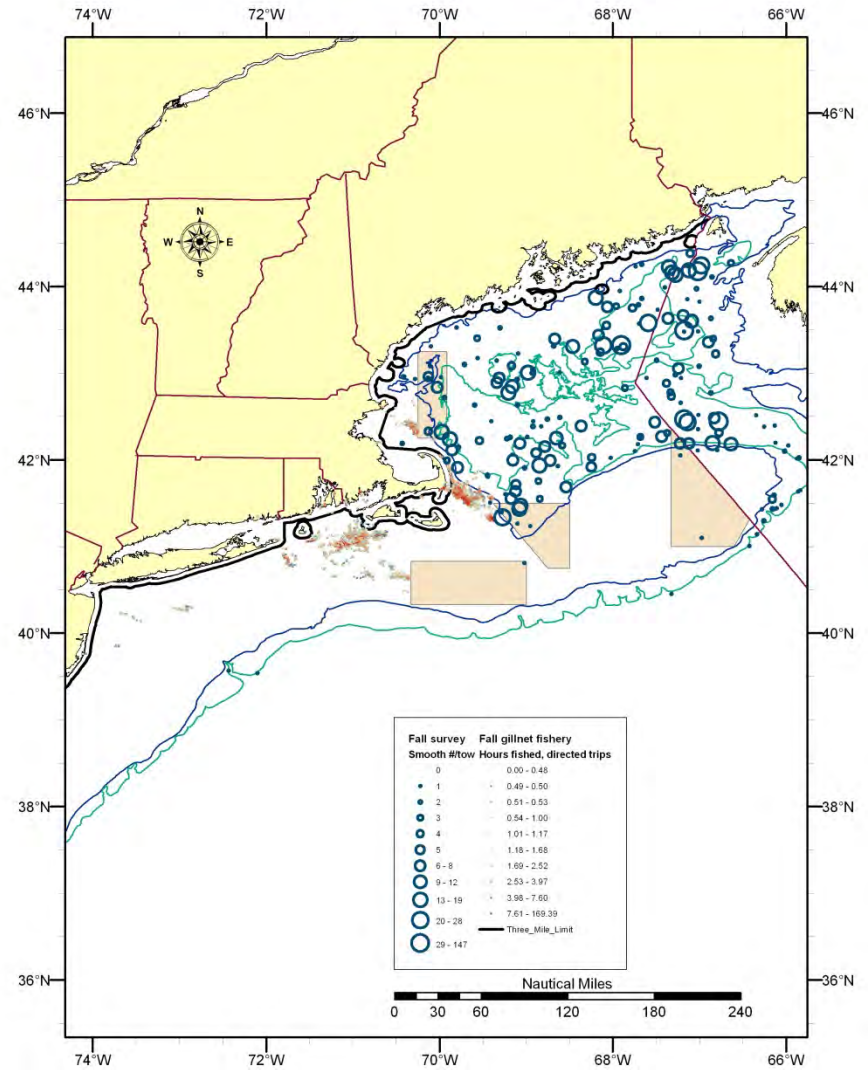
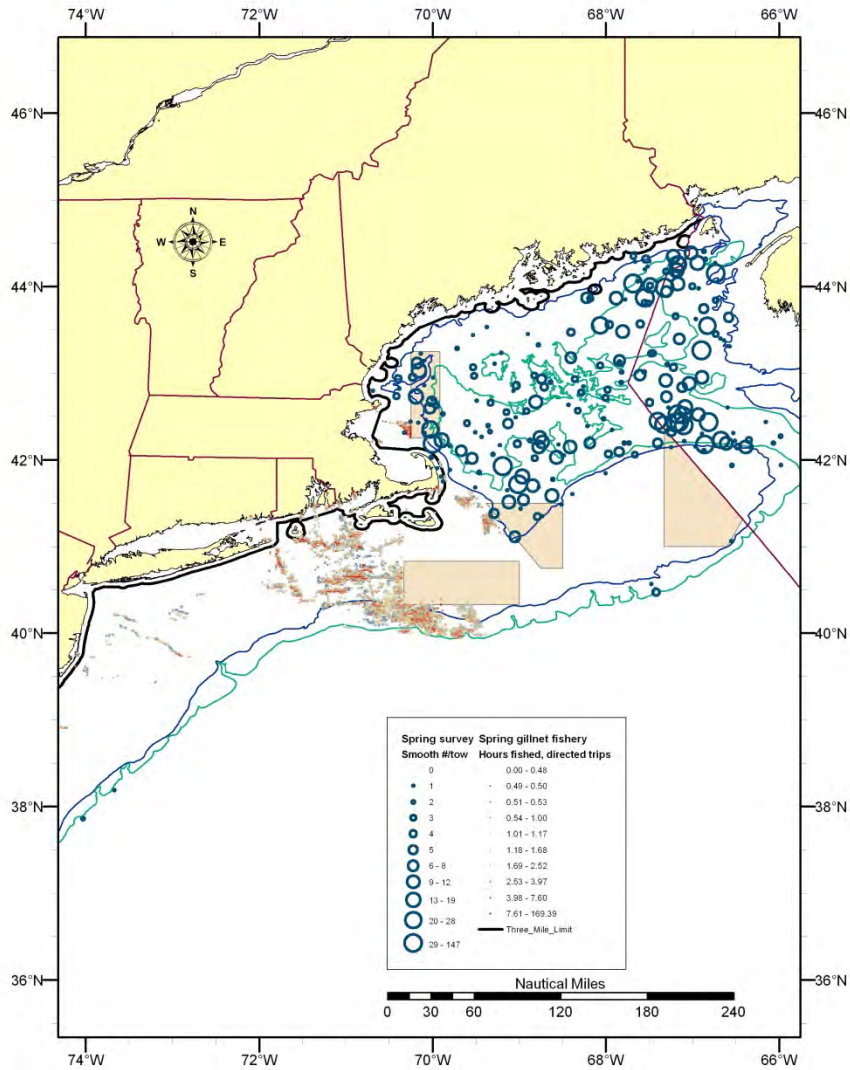
Fall (Jul-Dec effort)



Map 19. Distribution of 2006-2010 smooth skate abundance (#/tow) compared to distribution of 2009-2011 directed skate sink gillnet fishing effort (hot colors, like red, represent more intense fishing effort). Directed effort includes trips landing more than 500 lbs. of skate wings and with skates contributing more than 30% of total landings by vessels without Skate Bait Letters of Authorization that reported using sink gillnets.

Spring (Jan-Jun effort)

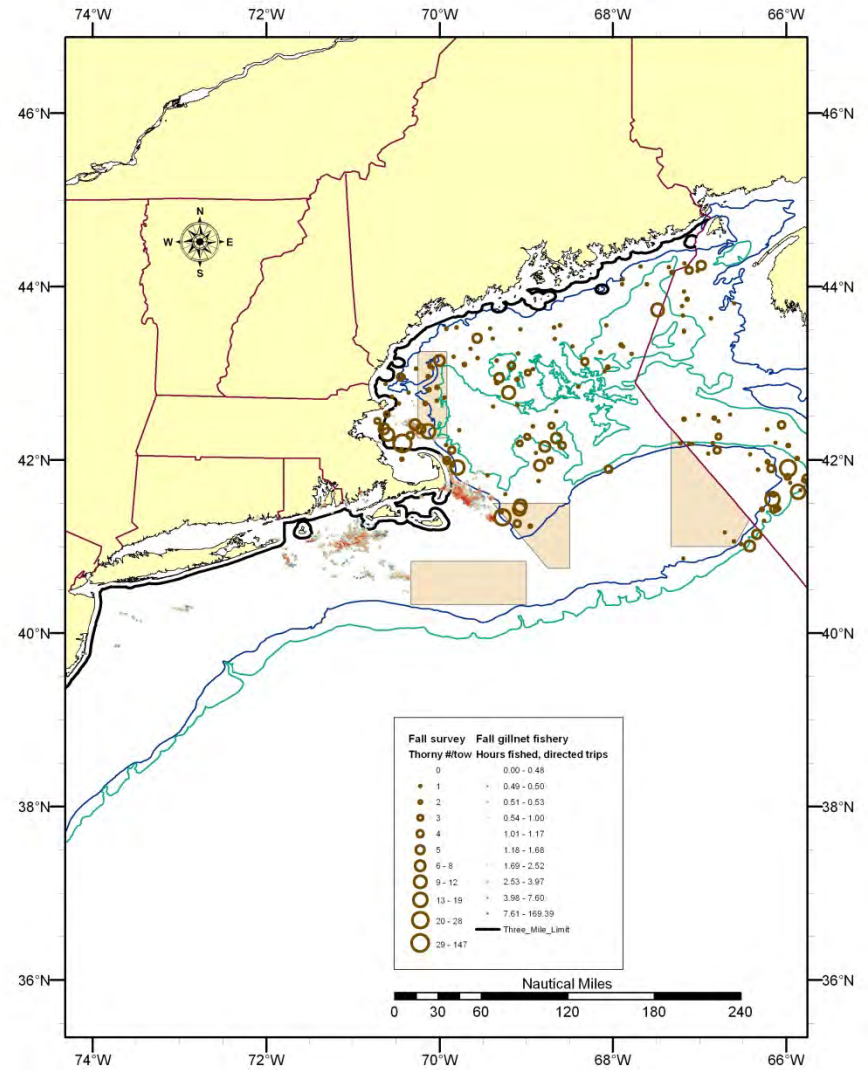
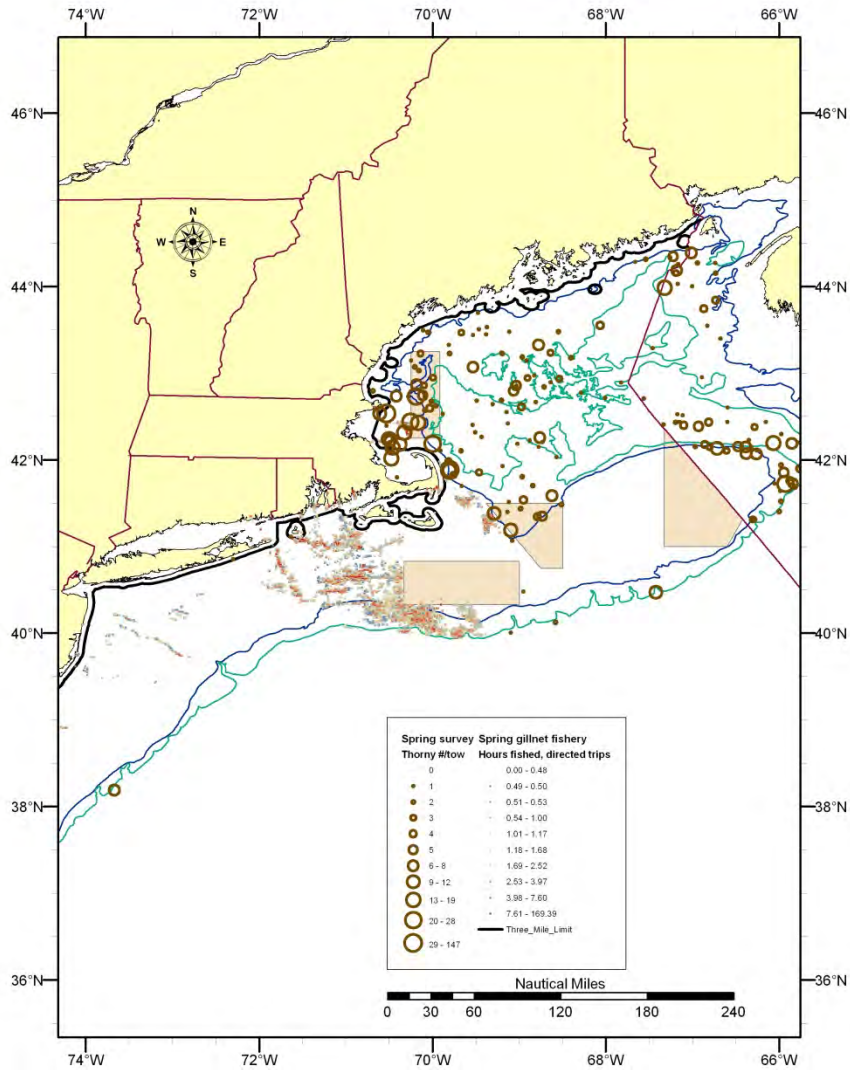
Fall (Jul-Dec effort)



Map 20. Distribution of 2006-2010 thorny skate abundance (#/tow) compared to distribution of 2009-2011 directed skate sink gillnet fishing effort (hot colors, like red, represent more intense fishing effort). Directed effort includes trips landing more than 500 lbs. of skate wings and with skates contributing more than 30% of total landings by vessels without Skate Bait Letters of Authorization that reported using sink gillnets.

Spring (Jan-Jun effort)

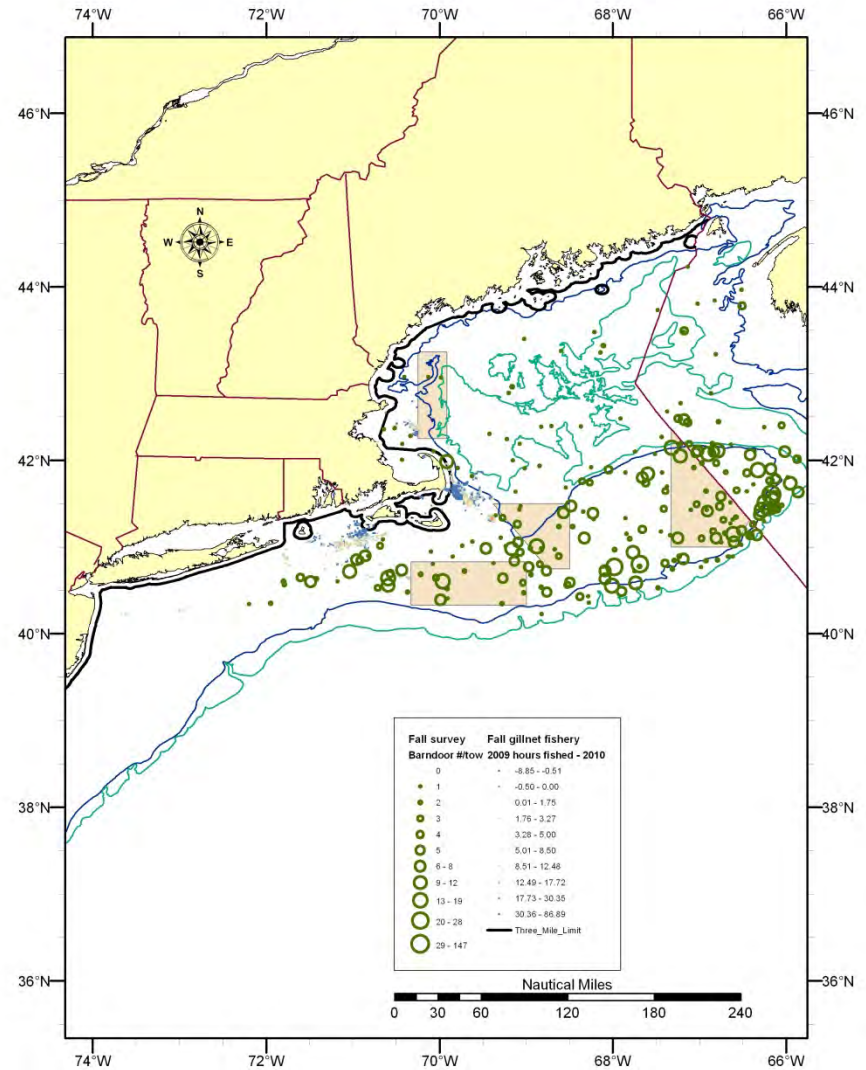
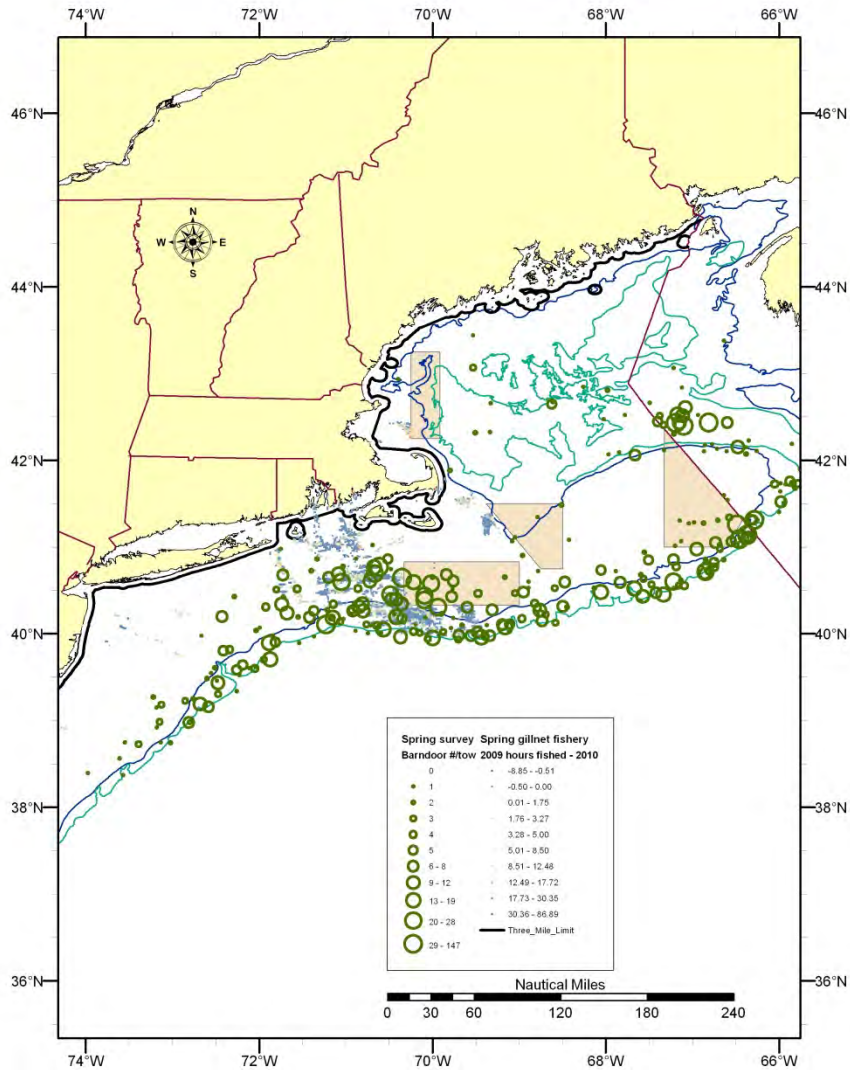
Fall (Jul-Dec effort)



Map 21. Distribution of 2006-2010 barndoor skate abundance (#/tow) compared to distribution of 2009-2010 change in directed skate sink gillnet fishing effort (Hot colors, like red, represent less fishing effort in 2010 after implementation of ACLs. Cool colors, like blue represent more fishing effort in 2010). Directed effort includes trips landing more than 500 lbs. of skate wings and with skates contributing more than 30% of total landings by vessels without Skate Bait Letters of Authorization that reported using sink gillnets.

Spring (Jan-Jun effort)

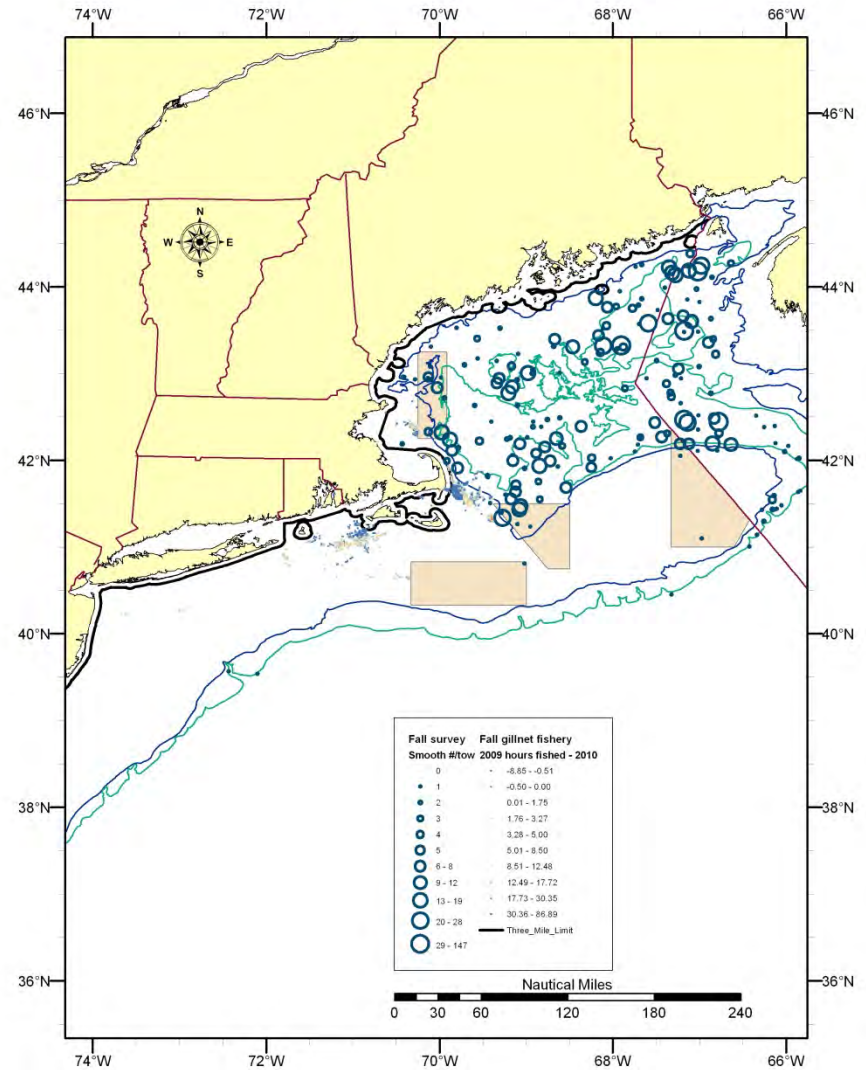
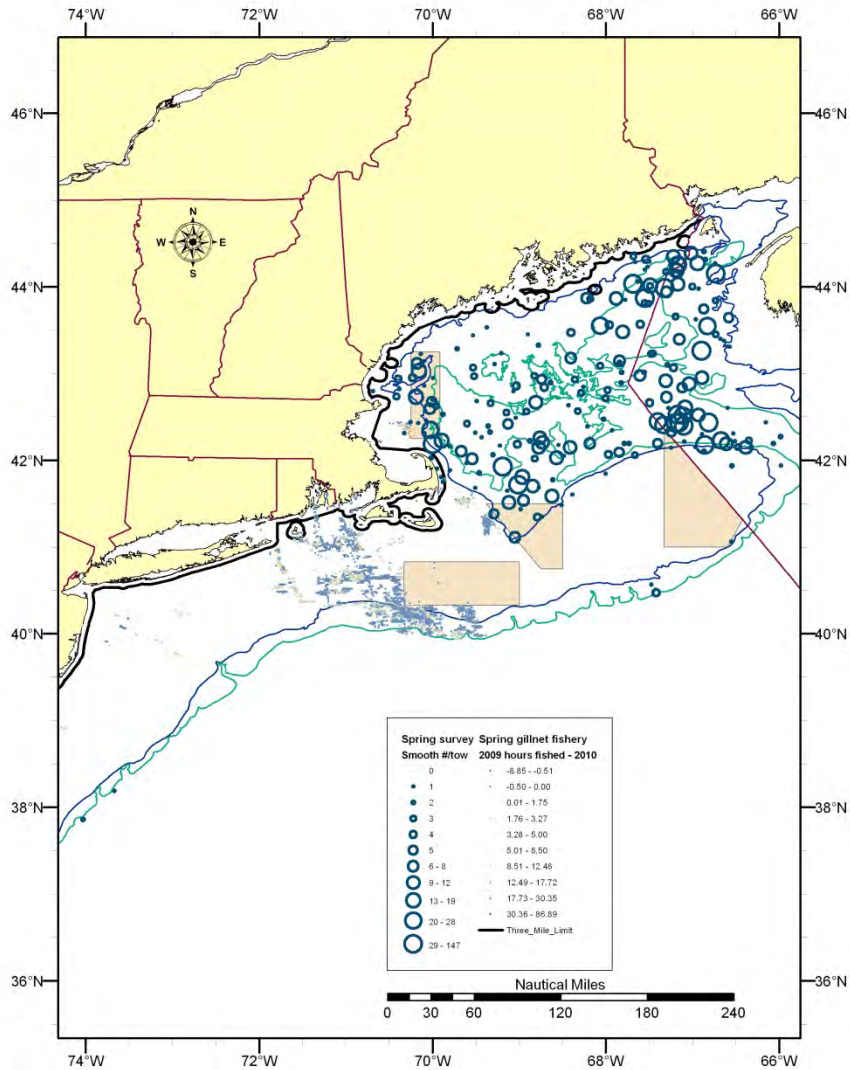
Fall (Jul-Dec effort)



Map 22. Distribution of 2006-2010 smooth skate abundance (#/tow) compared to distribution of 2009-2010 change in directed skate sink gillnet fishing effort (Hot colors, like red, represent less fishing effort in 2010 after implementation of ACLs. Cool colors, like blue represent more fishing effort in 2010). Directed effort includes trips landing more than 500 lbs. of skate wings and with skates contributing more than 30% of total landings by vessels without Skate Bait Letters of Authorization that reported using sink gillnets.

Spring (Jan-Jun effort)

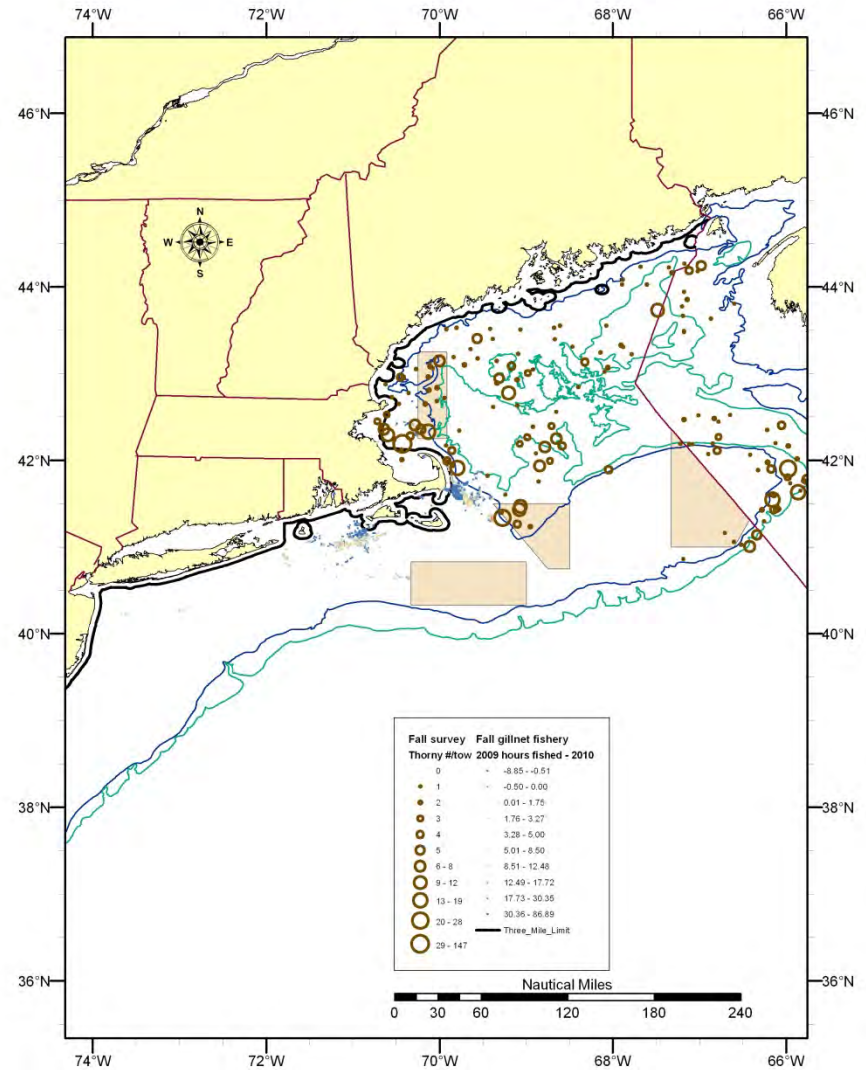
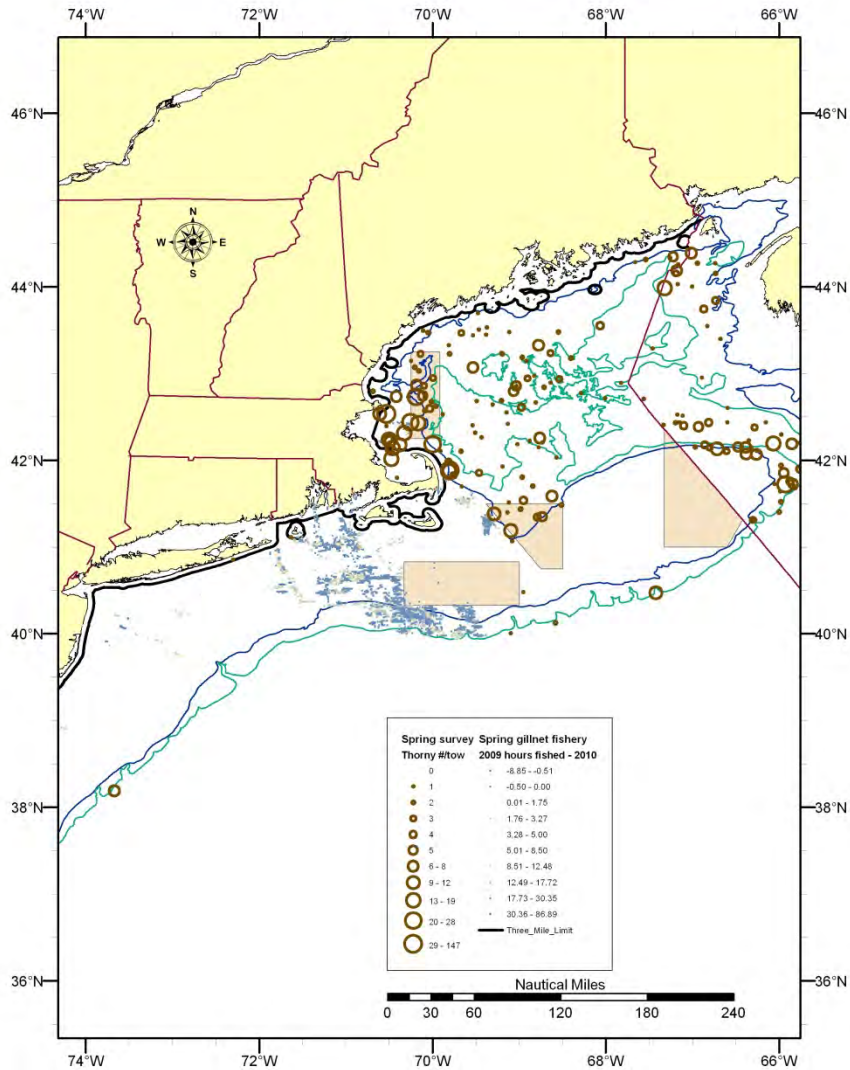
Fall (Jul-Dec effort)



Map 23. Distribution of 2006-2010 thorny skate abundance (#/tow) compared to distribution of 2009-2010 change in directed skate sink gillnet fishing effort (Hot colors, like red, represent less fishing effort in 2010 after implementation of ACLs. Cool colors, like blue represent more fishing effort in 2010). Directed effort includes trips landing more than 500 lbs. of skate wings and with skates contributing more than 30% of total landings by vessels without Skate Bait Letters of Authorization that reported using sink gillnets.

Spring (Jan-Jun effort)

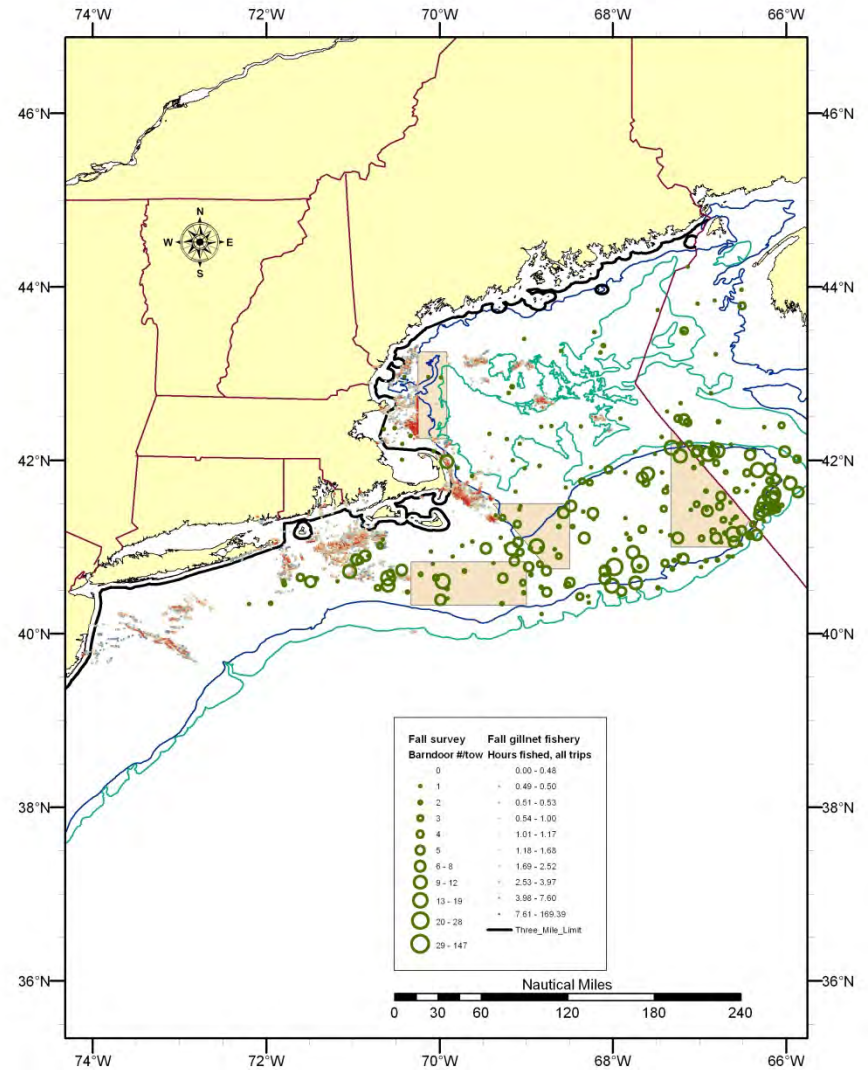
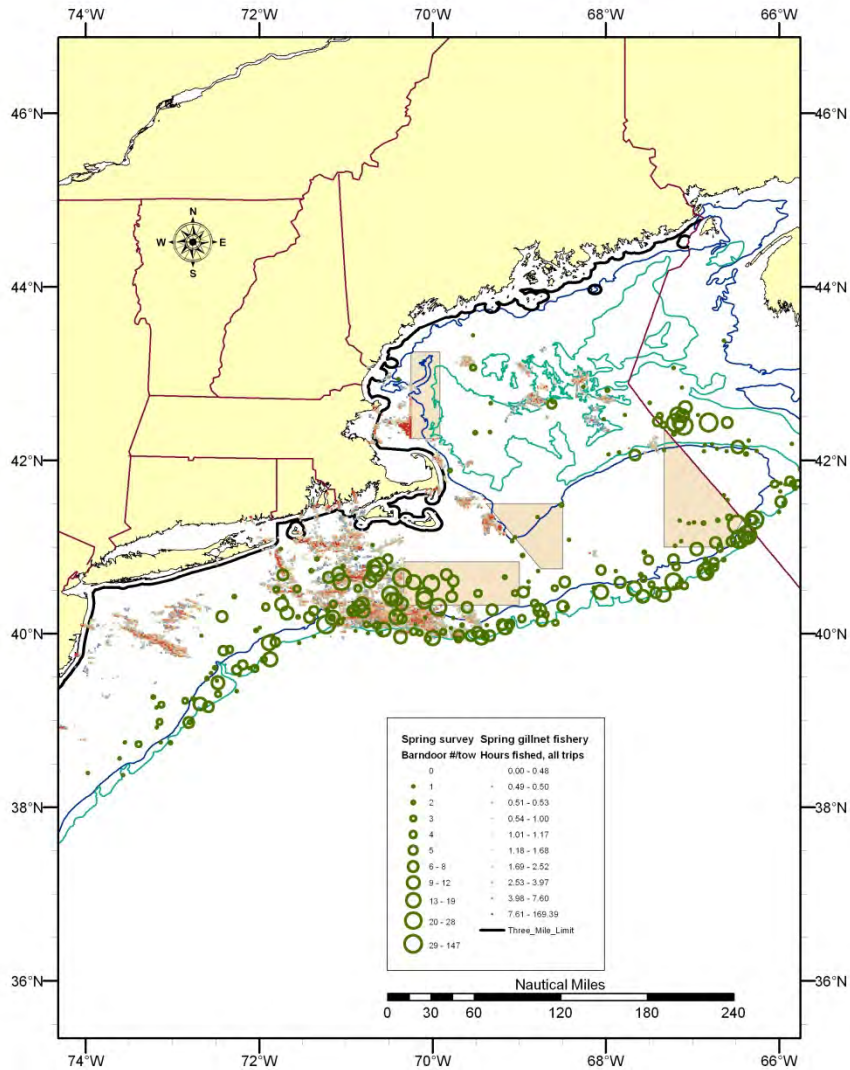
Fall (Jul-Dec effort)



Map 24. Distribution of 2006-2010 barndoor skate abundance (#/tow) compared to distribution of 2009-2010 target and non-target skate sink gillnet fishing effort (Hot colors, like red, represent less fishing effort in 2010 after implementation of ACLs. Cool colors, like blue represent more fishing effort in 2010). The effort data include all trips landing more than 500 lbs. of skate wings by vessels without Skate Bait Letters of Authorization that reported using sink gillnets.

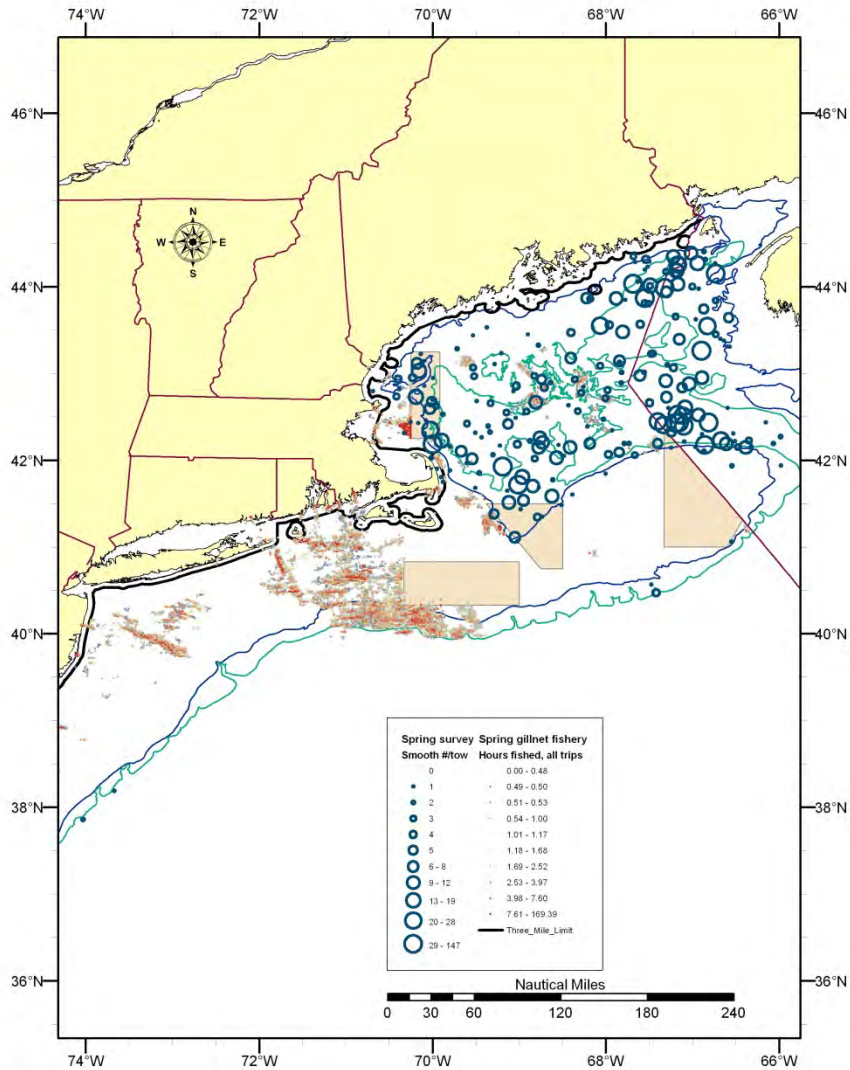
Spring (Jan-Jun effort)

Fall (Jul-Dec effort)

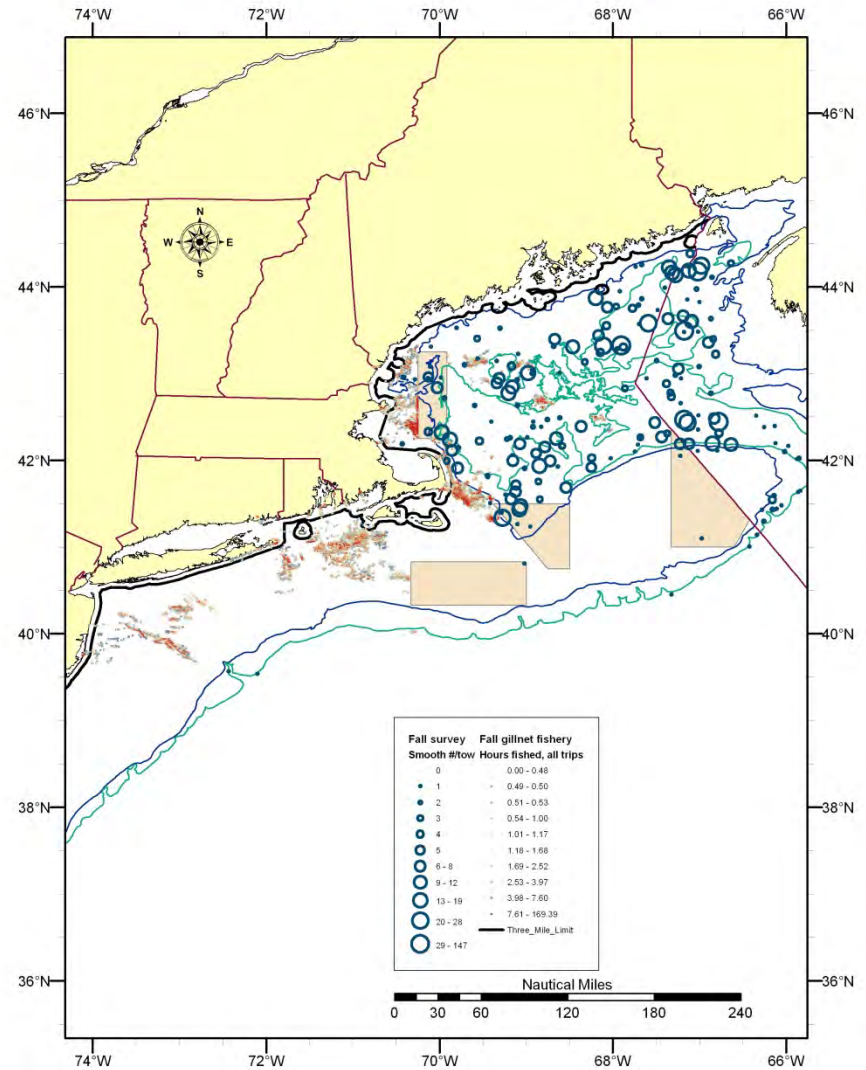


Map 25. Distribution of 2006-2010 smooth skate abundance (#/tow) compared to distribution of 2009-2010 target and non-target skate sink gillnet fishing effort (Hot colors, like red, represent less fishing effort in 2010 after implementation of ACLs. Cool colors, like blue represent more fishing effort in 2010). The effort data include all trips landing more than 500 lbs. of skate wings by vessels without Skate Bait Letters of Authorization that reported using sink gillnets.

Spring (Jan-Jun effort)

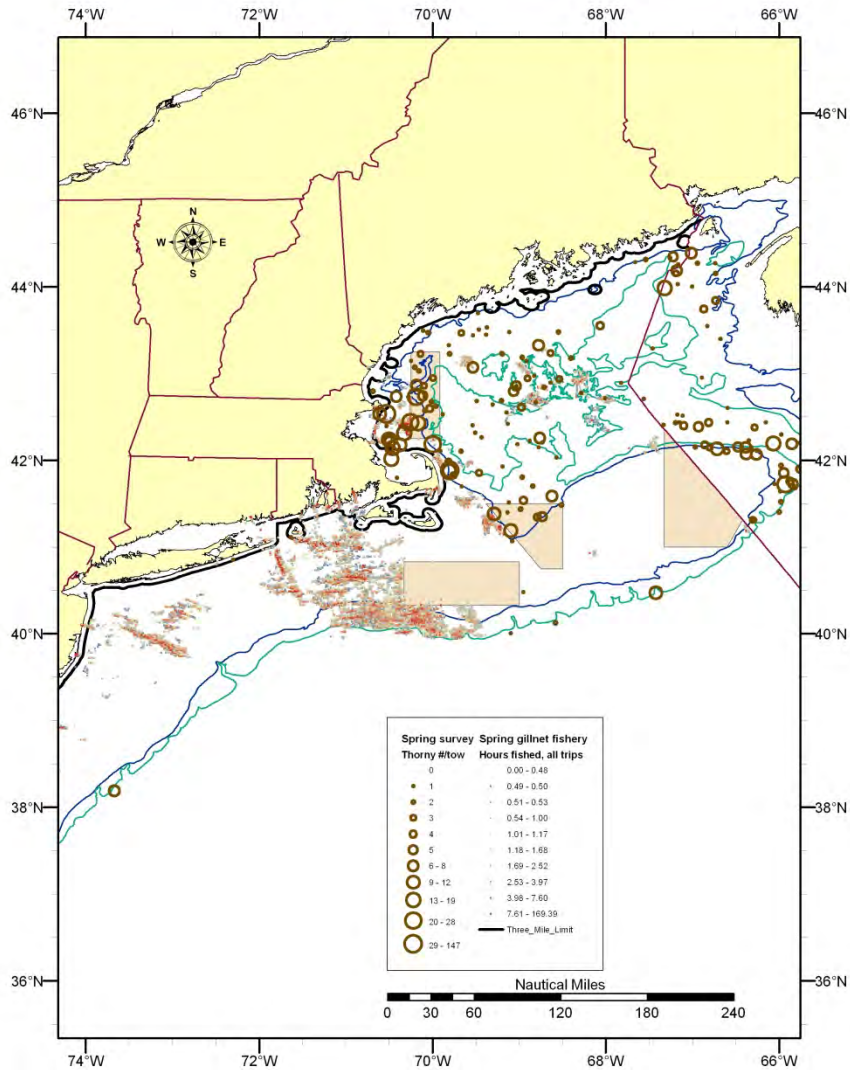


Fall (Jul-Dec effort)

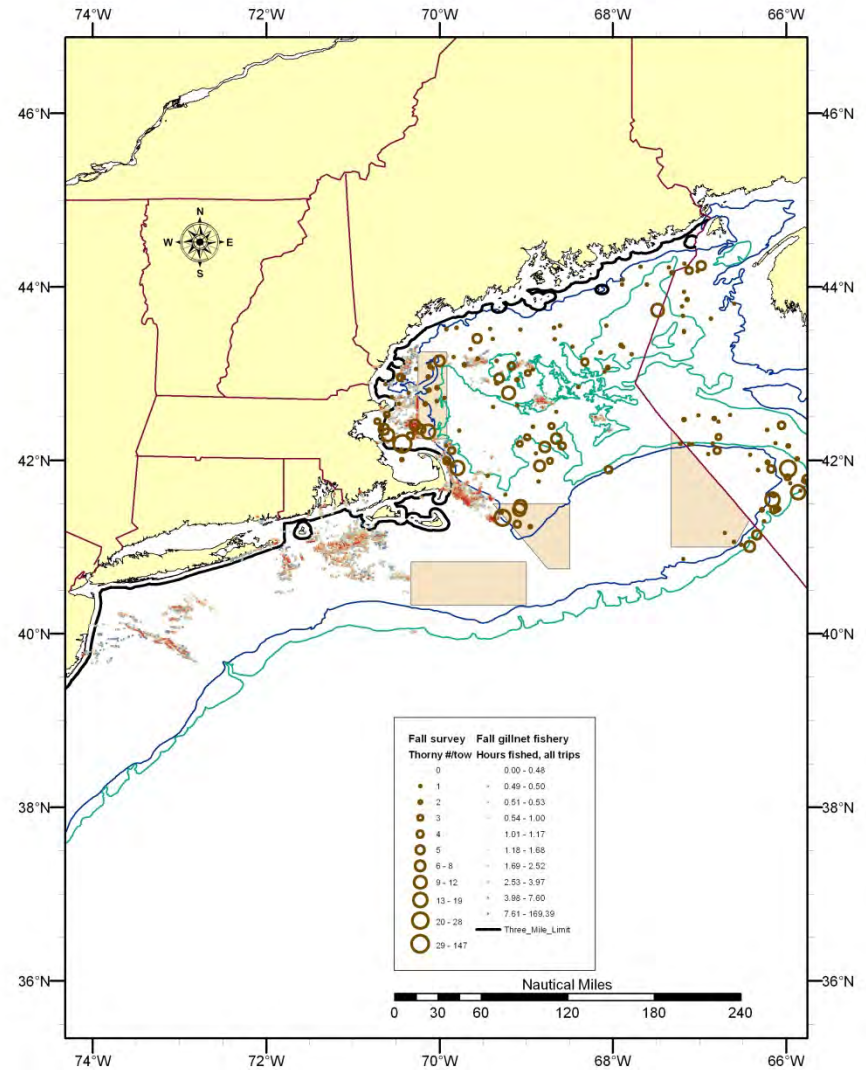


Map 26. Distribution of 2006-2010 thorny skate abundance (#/tow) compared to distribution of 2009-2010 target and non-target skate sink gillnet fishing effort (Hot colors, like red, represent less fishing effort in 2010 after implementation of ACLs. Cool colors, like blue represent more fishing effort in 2010). The effort data include all trips landing more than 500 lbs. of skate wings by vessels without Skate Bait Letters of Authorization that reported using sink gillnets.

Spring (Jan-Jun effort)



Fall (Jul-Dec effort)



6.1.2 Status Determination Specifications

The adjustments to status determination specifications are necessary to properly respond to changes in survey methods (see Appendix I of this document), but have minor biological consequences. No changes in status are indicated by the proposed change in specifications and clearnose skate overfishing definition.

No Action

The no action alternative would have small but negative indirect impact on the skate resource because status determinations would be less certain than under the preferred alternative and may decrease the potential for appropriate management responses to changes in resource conditions.

Preferred Alternative

The determination of status will be more certain under the proposed alternative because it is consistent with the NMFS survey conducted with the new FSV Bigelow, and therefore the proposed alternative will have a small, but positive indirect impact on the skate resource because it potentially enables more precise management. And any uncertainty about the reference points has been accommodated in the analysis and allowance for scientific uncertainty, taken into account when setting the skate ABCs (see Appendix II of this document).

6.1.3 Skate Wing Possession Limit Alternatives

Although possession limits generally cause regulatory discards, total discards are controlled by how the TAL is set relative to the ACL and taking into account discard mortality/survival rates. As long as the ACL and TAL effectively control mortality and the TAL trigger is appropriately set, different possession limits will have no impact on fishing mortality and therefore no impact on the skate resource.

No Action

The No Action alternative would keep the current possession limits the same as those set by Framework Adjustment 1. A more detailed comparison is given in the analysis below, but the No Action alternative possession limits would close the directed skate wing fishery possibly as early as mid-February when landings reach 85% of the TAL. If this occurs, the analysis below indicates that the fishery would not achieve the TAL by the end of the fishing year, probably resulting in more skate discards while the fishery is closed from February through April. For the reason stated above, that different possession limits will have no impact on fishing mortality in the skate fishery, the No Action alternative has no positive or negative impacts on the skate resource.

Preferred alternative and non-preferred alternative

Skate wing possession limit alternatives are described in Section 4.3 and include changes in the seasonal wing possession limits, estimated to allow the wing fishery to remain open throughout the year without triggering in-season accountability measures. The May 1 to Aug 31 possession limit is held constant at a 26:41 ratio to the Sep 1 to Apr 30 possession limit to discourage targeting skates during the summer months when prices are typically depressed compared to other parts of the year, not for biological conservation reasons. For the reason stated above, that different possession limits will have no impact on fishing mortality in the skate fishery, the No Action alternative has no positive or negative impacts on the skate resource.

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 2010) and skates will be discarded on trips that target other species and whose catch exceeds the 500 lbs. incidental skate wing limit²⁸. 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.

For the above reason, the Council believes that it is in the best interest of the fishery and it will minimize the biological impacts on skates and other species if the skate wing possession limit is 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.

Two analyses of skate wing possession limits were performed, updating the approach used in Framework Adjustment 1 (NEFMC 2011) with new data. It is apparent that daily 2011 skate wing landings were considerably higher than in previous periods since May 1, 2010 given that the possession limit was only 2,600 lbs. as of May 17, 2011 when NMFS implemented Framework Adjustment 1. When the 2,600 lbs. skate wing possession limit was effective from May 17 to Aug 15²⁹, the daily skate wing landings averaged $105,084 \pm 43,670$ lbs., which is considerably higher than that landed in fishing year 2010 while the skate wing possession limit was 5,000 lbs. ($78,663 \pm 28,993$ lbs.). Also, during 2011 when the 5,000 lbs. skate wing possession limit was effective, daily landings averaged $158,925 \pm 57,900$ lbs, much higher than it had been during 2010.

Although the outcome of these analyses depends on the estimated regression parameters and the regressions fit the data relatively well, it is important to understand the causes of the higher daily landings in 2011. The new TAL of 15,538 mt is equivalent to 93,850 lbs./day, less than the daily landings rate while the 2,600 lbs. skate wing possession limit was in effect. Under normal circumstances, average daily landings during May 1 to Aug 31 with a 2,600 lbs. possession limit should be lower than it will be with a 4,100 lbs. possession limit after Sep 1, especially since prices in the fall and winter are expected to be higher than they are in the summer.

This seasonality in the fishery has more economic than biological implications, except for impacts from delayed mortality that result from net changes in growth (growth less natural mortality). If the net changes in growth are positive, then for a given TAL the fishery will remove fewer skates and fishing mortality will be lower if catches (and by implication trips targeting skates for the wing market) are postponed from the summer to the following fall and winter.

Examining the relationship between landings and price may shed some light on the behavior of the fishery. According to dealer reports, the average daily landed price of skate wings during May to Aug 2010 was \$0.10 to 0.18 per lb. of skates³⁰. In comparison, skate wing prices began the 2011 fishing year

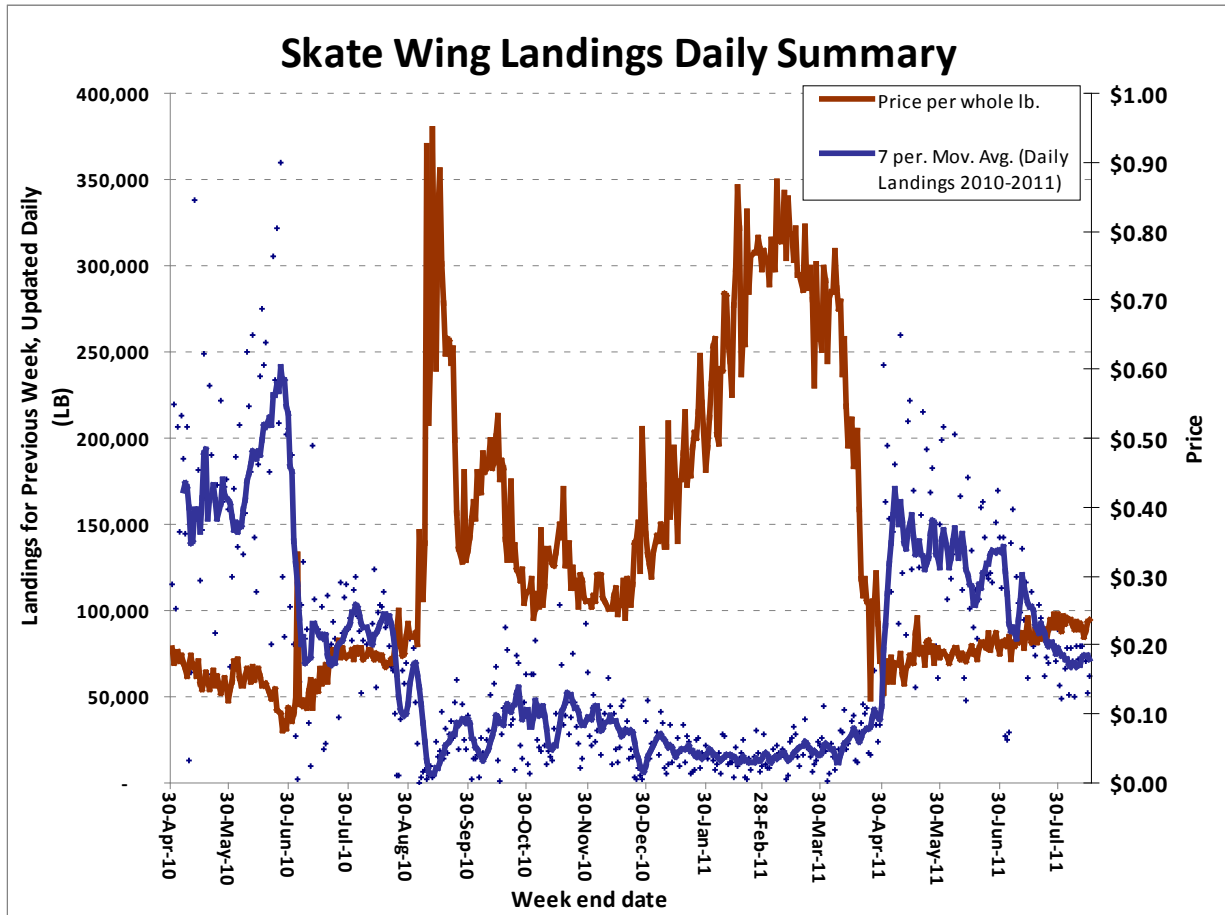
²⁸ Framework Adjustment 1 (NEMFC 2011) considered and proposed raising the incidental skate possession limit from 500 to 1,250 lbs. to reduce discards but this measure was disapproved by NMFS.

²⁹ This is the latest date that landings could be analyzed. The 2,600 lbs. skate wing possession limit will continue through Aug 31, when it will increase to 4,100 lbs.

³⁰ This value is for a equivalent pound of whole skates. To get the actual average skate wing price, multiply by 2.27 to convert the amount to a price per pound of wings.

about \$0.15 and then gradually increased in price to \$0.24 per lb. (Figure 12). During this same time period in 2011, daily landings rose to over 150,000 lbs./day when the skate possession limit increased from 500 to 5,000 lbs. on May 1, 2011. Since, there has been a gradual decline in daily landings to about 75,000 lbs./day in early Aug 2011. Landings are expected to increase after Sep 1 when the skate wing possession limit increases to 4,100 lbs.

Figure 12. Trend in daily skate wing landings and price from May 1, 2010 to August 15, 2011.

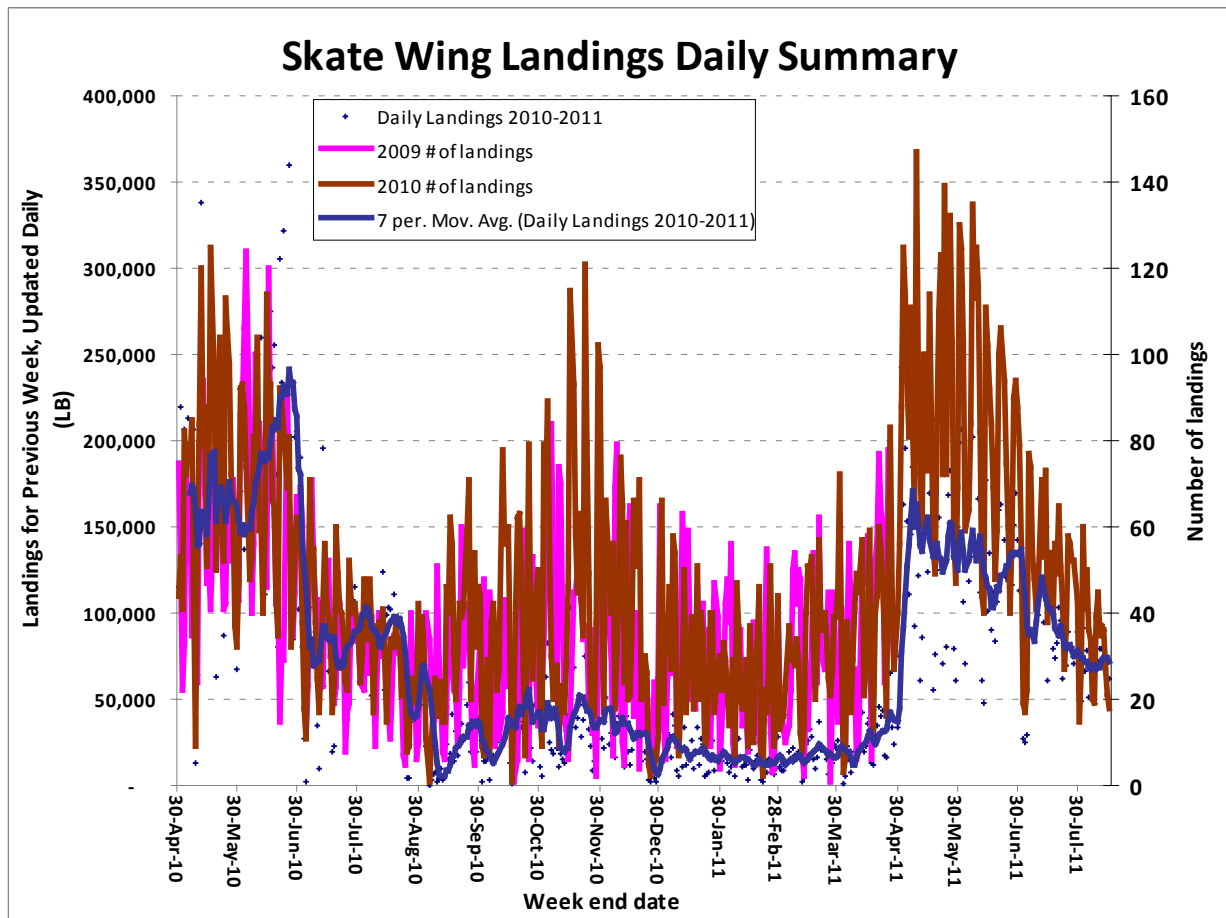


There are three ways that the fishery can land more skates per day: either more vessels land skates, existing vessels in the skate fishery take more trips, or vessels land more of their skate catch when targeting other species. The only changes in impacts caused by the first two responses above are economic. 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 fewer would as a result survive when the discard mortality is less than 100%).

In any case, during 2011 the skate fleet made 80 to 120 landings per day, much higher than at any time in 2010 (Figure 13). Therefore the higher daily landings rate appears to result from more trips landing skate, either by existing or new vessels in the fishery. Since the beginning of the fishing year, the number of landings per day has declined to 20-40 in late July and early August. This response is not caused by a decline in skate wing price (Figure 12), so it is possible that some vessels have reduced skate fishing activity in anticipation of a higher skate wing possession limit on Sep 1, or when it became more apparent

that the 2011 TAL would be increased through Secretarial Emergency Action and it would be less likely that NMFS would have to shut down the directed skate wing fishery during the year.

Figure 13. Trend in number of trips landing skate wings and the daily landings rate, compared year over year with 2009 skate wing trips.



As in Framework Adjustment 1, a logarithmic model (Figure 14 and Figure 15) has been fitted to the data to estimate the potential response of the fishery and average amount of daily landings at various possession limits. The new 2011 data indicate that the daily landings rate would be higher than it had been in previous estimates for Framework Adjustment 1 (NEFMC 2011) using only 2010 data. There are indications however that the daily landings rate has declined during July and August, but may reach a different equilibrium when the possession limit increases to 4,100 lbs. on Sep 1, 2011. These latter data are not yet available.

Logarithmic equations have been fitted to the daily landings data with (Figure 14) and without (Figure 15) the landings before Amendment 3 implementation (20,000 lb. possession limit). The equations fit the data with $R^2 > 0.5$ and are better than other types of equations with two or more parameters. The estimated parameters for the two equations are fairly similar and the expected values at various possession limits (Figure 16) have little differences.

Figure 14. Fitted logarithmic relationship between daily skate wing landings and possession limit since May 1, 2010.

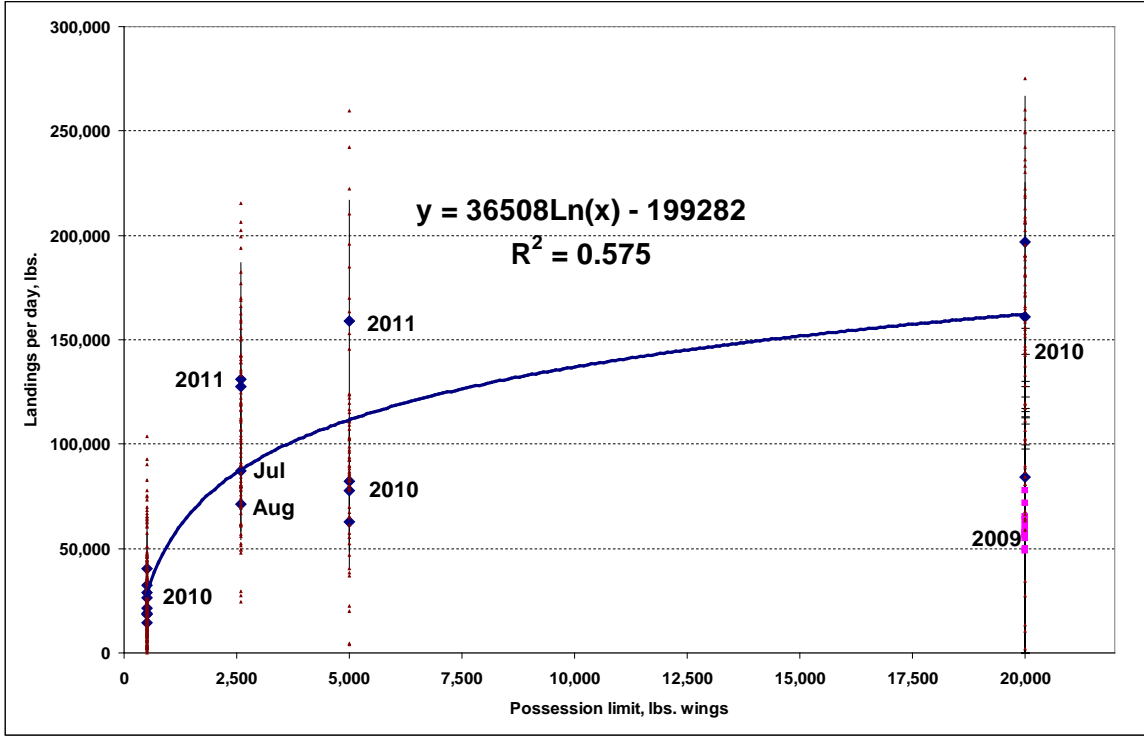


Figure 15. Fitted logarithmic relationship between daily skate wing landings and possession limit since Amendment 3 implementation on July 16, 2010. Daily landings while a 20,000 lbs. possession limit was in effect are shown simply for comparative purposes, but are not included in the fitted logarithmic equation.

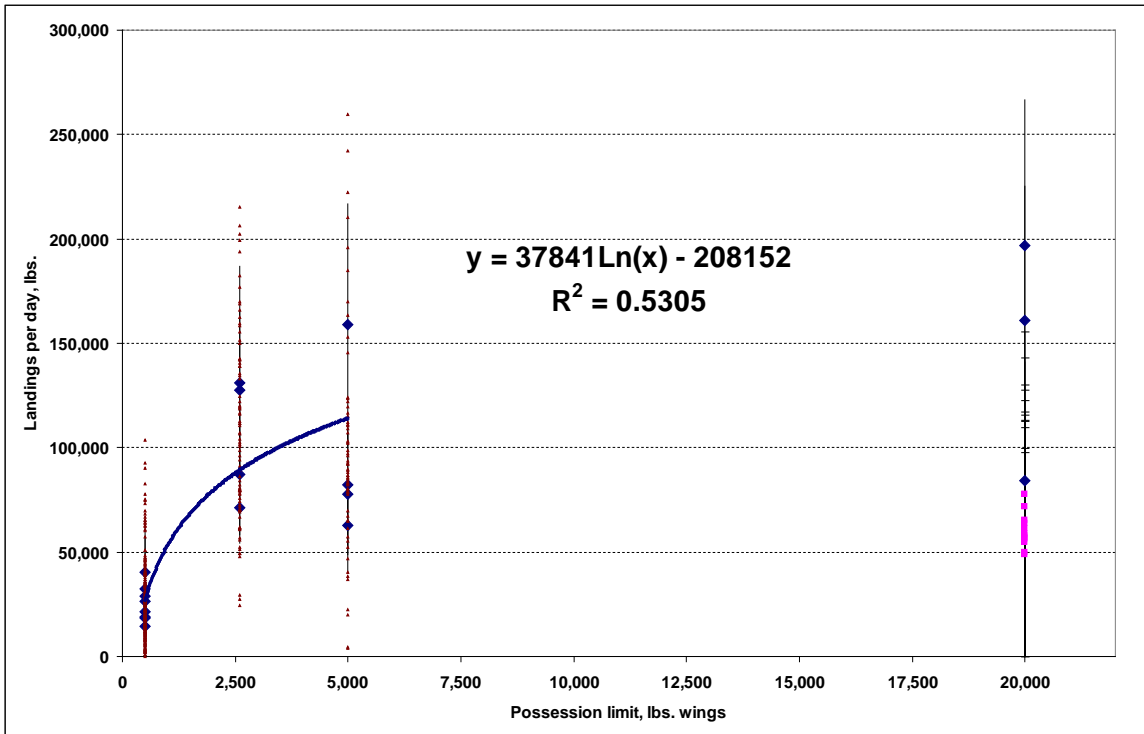
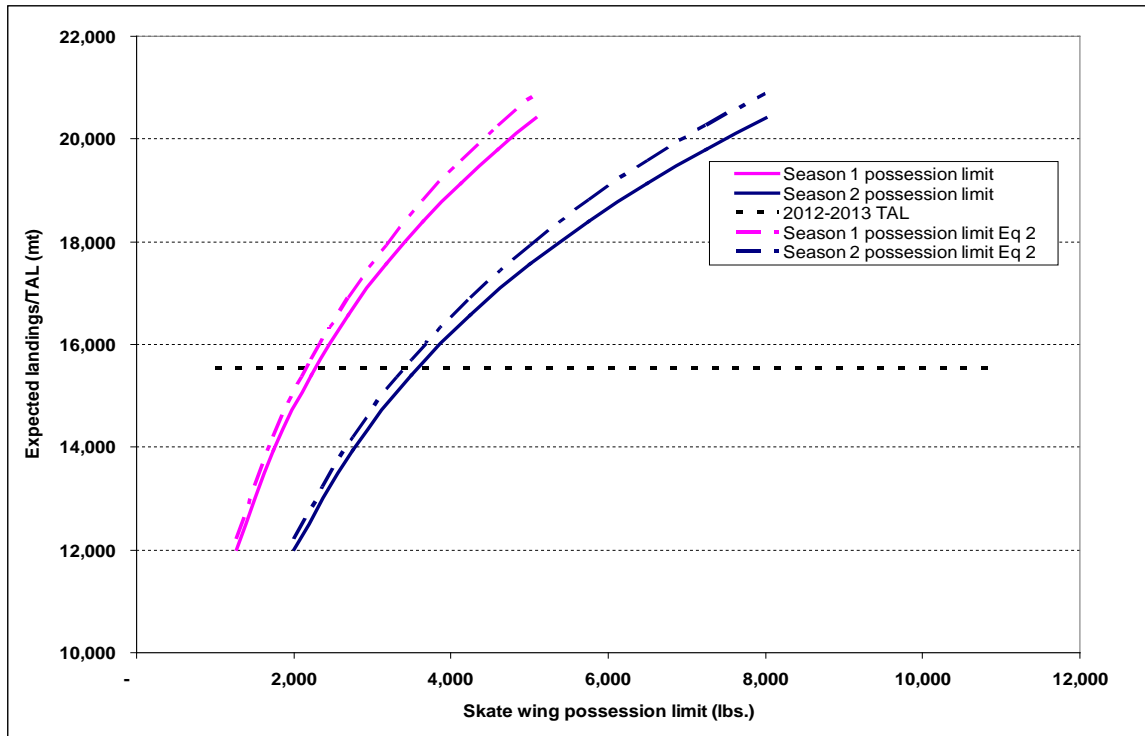


Figure 16. Total expected fishing year landings over a range of skate wing possession limits which retain a 26/41 ratio between the May – Aug 31 skate wing possession limit and the Sep 1 to Apr 30 skate wing possession limit. Solid lines are fitted to all data since May 1, 2010 and the dashed lines are fitted to all data since Amendment 3 implementation on July 16, 2010.



The results for Alternatives 1 and 2 (4.3.1 and 4.3.2) are given in the table below, using the two sets of parameters shown in Figure 14 and Figure 15. Calculated to take 100% of the TAL without closing the directed fishery (Alternative 1, Section 4.3.1), the updated analysis indicates that the May 1 to Aug 31 possession limit should be between 2,100-2,300 lbs. followed by an increase in the skate wing possession limit to 3,400-3,600 lbs. on Sep 1 (rows 1 and 3 in the table below). Under both cases, the skate wing fishery would reach the 85% TAL trigger between March 8 and March 11, but keeping the directed fishery open through the end of the fishing year would not cause the skate wing landings to exceed the 15,538 mt TAL.

In Alternative 2 (Section 4.3.2), the Council would set a more conservative skate wing possession limit, calculated to take 85% of the TAL by the end of the fishing year (rows 2 and 4 in the table below). This approach is appropriate to keep the directed fishery open year around if the current data underestimate the actual daily landings rate during the fishing year. In this case, the analysis indicates that the May 1 to Aug 31 possession limit should be 1,500 lbs., increasing to 2,400 lbs. on Sep 1. By definition, the projections indicate that the fishery would not exceed the 85% TAL trigger by the end of the fishing year.

It should be noted that due to the higher daily landings rates in the analysis above, these skate wing possession limit alternatives have lower values than the status quo, despite the significant increase in the TAL to 15,538 mt. Applying the same parameters to the status quo possession limits, the analysis indicates that the fishery would reach the 85% TAL trigger between Feb 22 and Feb 22 (lines 5 and 6 in the table below). But due to the low 500 lbs. incidental skate wing limit, the fishery would take only between 90 and 91 percent of the TAL despite reaching the 85% trigger in Feb.

The biological impacts of various skate wing possession limits arise primarily from when and at what size the skates are caught and the amount of discards that result from the skate wing possession limit alternatives. More of the impacts will be economic, rather than biological since (at least according to the analysis) the fishery would only take 90-91 percent of the TAL, probably resulting in more discards than either alternative.

Table 46. Possession limits estimated to achieve 85 and 100% of the TAL without closing the directed skate wing fishery, plus estimate of TAL trigger data and projected landings with the status quo, applying a 500 lbs. possession limit after the 85% trigger is reached.

Specifications	Season 1	Season 2	Wing TAL trigger	Incidental wing limit	Projected TAL trigger date	Projected percent TAL landed	Parameters	
	possession limit	possession limit					Alpha	Beta
100%TAL all data	2,300	3,600	85%	500	3/8/2013	100%	-199282	36508
85% TAL all data	1,500	2,400	85%	500	NA	84%	-199282	36508
100% TAL A3 data	2,100	3,400	85%	500	3/11/2013	100%	-208152	37841
85% TAL A3 data	1,500	2,400	85%	500	4/27/2013	86%	-208152	37841
Status quo, all data	2,600	4,100	85%	500	2/22/2013	90%	-199282	36508
Status quo, A3 data	2,600	4,100	85%	500	2/16/2013	91%	-208152	37841

6.1.4 Skate Bait Fishery Alternatives

As explained under the analysis of impacts for the skate wing possession limit alternatives, different possession limits will have no impact on fishing mortality in the skate fishery and therefore on the skate resource.

Preferred alternatives

Management alternatives for the skate bait fishery are described in Section 4.4 and include raising the skate bait fishery possession limit and counting against the TAL the reported landings from skates transferred at sea for bait. The bait possession limit was not chosen in Amendment 3 (NEFMC 2009) to keep the fishery open, but rather as a brake or cap to prevent derby style fishing behavior to develop when the landings began approaching the seasonal quotas. Doing so would prevent abrupt price declines as vessels landed larger volumes in a short time period. Thus there are few biological effects of the skate bait possession limit alternatives, except as a means to prevent greater discards if the fishery develops a derby style behavior. For the reason stated above, that different possession limits will have no impact on fishing mortality in the skate fishery, the preferred alternatives have no positive or negative impacts on the skate resource.

No Action

The No Action alternative would keep the skate bait fishery possession limit at 20,000 lbs. Due to the higher catch rates expected from higher little skate biomass (the primary target of the skate bait fishery), the seasonal skate bait quotas may be reached early and a lower possession limit may promote some derby-style fishing behavior, with potentially negative impacts on skate discarding (making sure the trip lands exactly 20,000 lbs.), product quality, and price. The No Action skate bait limit might also prevent the fishery from landing the TAL and achieving optimum yield. For the reason stated above, that different possession limits will have no impact on fishing mortality in the skate fishery, the No Action alternative has no positive or negative impacts on the skate resource.

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

Preferred alternatives

The Skate FMP requires that all vessels landing skates be fishing under a monkfish, multispecies, or scallop DAS. As such, fishing effort in the wing and bait fishery is constrained by the effort controls in place in those other fisheries. And while a considerable portion of skates is landed while targeting other species, some vessels may target skates more frequently with the higher proposed limits.

However, the added effort targeting skates is unlikely to represent new fishing effort, but more likely will result from diverting effort from other fisheries, some of them requiring DAS use. Catch of other species on trips landing skates are controlled by the DAS limits or sector rules in other FMPs. Furthermore, 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. However, because the overall fishing mortality of these other species are managed under other FMPs, the preferred alternative will have negligible negative or positive impacts on non-target species.

No Action

The No Action alternatives would result in less fishing for skates and possibly more fishing for other species, particularly monkfish relative to the preferred alternatives, to make up the lower amounts of skate landings and revenue under no action than under the preferred alternatives. However, because the major non-target species are managed under other FMPs, the no action alternative will have negligible negative or positive impacts on non-target species.

6.3 Essential Fish Habitat (EFH) Impacts

This section describes the potential impacts of the alternatives in this specifications package on Essential Fish Habitat (EFH). The magnitude of the adverse effects to EFH that results from the skate fishery as a whole depends on: (1) the mix of gears used to harvest the skates, (2) the amount of time that gear contacts the seabed, and (3) the locations fished.

Skate landings come mostly from bottom otter trawl and sink gillnet fisheries: little skate are targeted near shore in Southern New England for the bait market, and winter skate are targeted for the wing market. In general, adverse effects resulting from mobile gear (i.e. bottom otter trawl) fishing are greater than those from fixed gear (i.e. sink gillnet fishing). Analyses developed for the EFH Omnibus Amendment indicate that this conclusion applies on an amount of seabed swept/contacted basis (i.e. the quality of the impact from mobile vs. fixed gears varies), and on an adverse effect generated per amount of skates (or other species) landed basis (i.e. for a given amount of habitat impact, more skates can be landed with a gillnet than with a trawl).

Although the exact relationship between the amount of seabed contacted/seabed area swept and the magnitude of adverse effects is not known, if area swept increases, it is expected that adverse effects will increase. (Analyses developed for the EFH Omnibus Amendment assume a 1:1 relationship between amount of area swept by fishing gear and habitat impacts.) Seabed area swept can increase if there is more fishing, or if catches overall remain similar but catch rates decline.

Finally, some locations are more vulnerable to the effects of fishing gears than others. Thus, if the spatial distribution of fishing effort changes, even if total seabed area swept remains constant, adverse effects to EFH could increase or decrease.

The specifications document includes alternatives related to (1) annual catch limits (ACLs), (2) skate wing possession limits, and (3) bait fishery possession limits and reporting. It is difficult to predict how fishing behavior and thus adverse effects to EFH might change as a result of the alternative ACL specifications and possession limits proposed in this framework. The biological impacts section notes that vessels targeting skates could respond in a variety of ways: (1) take longer trips to catch the bait possession limit, (2) fish in more productive areas further from port, and/or (3) take more trips targeting skates. Vessels targeting other species may begin targeting skates due to the opportunity afforded by the higher TALs, and vessels that have incidental catches of skates may land more skates. The sections below discuss potential changes in EFH impacts that may result from adoption of the three different types of alternatives.

6.3.1 ACL alternatives

The alternative and no action ACL allocations for all skate species combined (the skate complex) are described in Section 4.1. The preferred alternative raises ACL/ABC, ACT, overall TAL, and the wing and bait TALs as follows.

Specification	Updated ACL specifications (preferred)	No Action*
ACL = ABC	50,435 mt	41,080 mt
ACT = 75% ACL	37,826 mt	30,810 mt
TAL = ACT – discards – state landings	23,365 mt	14,780 mt
Wing TAL	15,538,mt	9,214 mt
Bait TAL	7,827 mt	4,642 mt

* Note that no action is different from status quo because the status quo specifications were implemented via an emergency action which will expire on April 30, 2012.

No Action Alternative

Under the no-action alternative fishing effort and impacts on EFH would not change. Amendment 3 and Framework 1 concluded that under the current FMP, adverse EFH impacts were minimized to the extent practicable based on the analysis in the Omnibus habitat amendment. There would be no change in the impacts of the skate fishery on EFH from no action and therefore impacts would be negligible, negative or positive.

Preferred Alternative

Since the ratio between the wing and bait TALs remains constant, the relative contribution of trawl vs. gillnet gear is not likely to change and thus the magnitude of adverse effects is not expected to change substantially. (If the gillnet component of the fishery was expected to increase substantially relative to the trawl component, for example, adverse effects would be expected to decline.)

To the extent that total area swept/fishing time by trawl and gillnet gear increases, adverse effects to EFH would be expected to increase. It is likely that total area swept will increase in response to TAL increases so there are likely to be small, negative impacts on EFH.

Recent years with different TALs can be compared in order to estimate whether the location of directed skate fishing effort would be expected to shift to more or less vulnerable habitats. If fishing is expected to

shift into more vulnerable habitats, adverse effects would be likely to increase. Maps 1-3 in the biological impacts section show where directed trawl fishing effort was located between 2009 and 2011. Maps 4-6 in the biological impacts section show the difference between fishing year 2009, which had higher TAL limits, and fishing year 2010, which had lower TAL limits. The areas with the most concentrated fishing effort during 2009-2010 are the same areas where 2009 hours fished is much higher than 2010 hours fished. In other words, under higher 2009 limits, fishing effort increased at the core of the general effort distribution, not at the margins. It could be expected, therefore, that an increase in fishing effort as a result of the proposed specifications would not shift fishing effort into new locations/habitats, but rather, would increase effort in locations that are already heavily fished.

In summary the preferred alternative is not expected to change the relative effort of trawl gear compared to gillnet; is expected to increase total area swept as a result of TAL increases; and is not expected to shift fishing effort into new locations/habitats, but rather, would increase effort in locations that are already heavily fished. Therefore this alternative is expected to small but negative impacts habitat including EFH.

6.3.2 Skate Wing Possession Limit Alternatives

Skate wing possession limit alternatives are summarized below (see Section 4.3 for details).

	No Action	Alternative 1	Alternative 2
May 1-Aug 31	2,600 lbs.	2,200 lbs.	1,500 lbs.
Sep 1-Apr 30	4,100 lbs.	3,600 lbs.	2,400 lbs.
Goal of alternative	-	Take 100% of TAL without triggering in season AMs	Take 85% of TAL without triggering in season AMs

No Action

Under the no-action alternative, swept area would not change and therefore there would be no impacts on EFH.

Preferred Alternative

The biological impacts section of the document notes that the differences in impacts between the two alternatives and no action are primarily economic, not biological, although the higher possession limits could lead to increased discards later in the season if the TAL trigger is reached early and the incidental catch limit of 500 lbs. is applied. It is difficult to estimate the differences in adverse effects to EFH that would result from Alternative 1 vs. Alternative 2 vs. no action. However, changes in the relative contributions of different gear types to total skate landings and differences in the locations fished seem unlikely.

Differences in the amount of area swept, and thus differences in EFH impacts, could result from differences in discard rates among the three sets of possession limits, but the magnitude and direction of change in these area swept estimates cannot be estimated. Therefore impacts from the preferred alternative on EFH are expected to be negligible but are not possible to determine.

6.3.3 Skate Bait Fishery Alternatives

Possession limit alternatives for whole skates (bait possession limits) alternatives are described in detail in Section 4.4. The purpose of the possession limit is to avoid a derby style fishing by distributing catch/landings throughout the fishing year and this bait possession limit is not intended to achieve the TAL by limiting the daily landings rate. Also, because alternative possession limits are not expected to change catch rates, they would not affect the total amount of fishing effort needed to achieve a particular TAL as long as they do not change the relative distribution of landings by different types of fishing gear. Differences in the amount of area swept, and thus differences in EFH impacts, could result from differences in discard rates among the two possession limits if they caused a changes in the distribution of catch and landings among different gear types. However, under the all the possession limit alternatives, changes in the relative contributions of different gear types to total skate landings and differences in the locations fished seem unlikely because the alternatives do not changes incentives for using different gear types. As result, no change in the overall level of habitat impacts from gill net or mobile gear used in the directed or incidental skate fisheries are expected under any alternative.

Preferred Alternatives

Increase in the possession limit from 20,000 lbs. to 25,000 lbs. per trip

This bait possession limit is not intended to balance the daily landings rate with the TAL. For the reasons explained no habitat impacts are expected under this alternative.

As above, the biological impacts section of the document notes that the differences in impacts between the alternative and no action bait fishery possession limit are primarily economic, not biological, as the possession limit was intended to prevent a derby-style fishery as the seasonal catch limits were approached. As above, it is difficult to estimate the differences in adverse effects to EFH that would result from the alternative possession limit vs. no action. However, changes in the relative contributions of different gear types to total skate landings and differences in the locations fished seem unlikely.

The reported landings from skates transferred at sea for bait would be counted against the bait TAL.

These landings would then be combined with shore side dealer bait landings to determine if and when accountability measures should be triggered to prevent ACL overage. It will simply provide for a better accounting of landings between the wing and whole/bait landings categories and therefore is not expected to have any impact on EFH.

No Action

The no action alternative would keep the possession limit for whole skates (bait possession limit) at 20,000 lbs. per trip. For the reasons explained no habitat impacts are expected under the No Action alternative.

6.4 Impact on Stellwagen Bank National Marine Sanctuary (SBNMS)

6.4.1 ACL alternatives

ACL alternatives are described in Section 4.1 and include increases in the ABC, in the aggregate skate ACL, and in the skate bait and skate wing fishery TALs. Since comparatively little fishing for skates occurs within the SBNMS, increasing the ACL specifications is unlikely to have anything than a marginal impact. Therefore the no action alternative and the updated ACL specifications alternative are expected to have no impact on the SBNMS.

6.4.2 Status determination specifications

The proposed changes in status determination specifications and the clearnose skate overfishing definition is described in Section 4.2. These changes are administrative in nature and therefore, although these changes may require a future action if one or more of the skates become overfished or experience overfishing, there are no direct or indirect impacts of this change in specifications on the SBNMS. Similarly because status determination specifications also are administrative provisions, no impacts on the SBNMS are expected under the no action alternative.

6.4.3 Skate Wing Possession Limit Alternatives

Skate wing possession limit alternatives are described in Section 4.3 and include changes in the seasonal wing possession limits, estimated to allow the wing fishery to remain open throughout the year without triggering in-season accountability measures. The May 1 to Aug 31 possession limit is set at a 26:41 ratio to the Sep 1 to Apr 30 possession limit to discourage targeting skates during the summer months when prices are typically depressed compared to other parts of the year, not for biological conservation reasons.

It is unlikely that changing the skate wing possession limit will have more than a marginal impact on fishing within the SBNMS. In fact, if the skate wing possession limits increase, vessels may venture farther from shore to target skates in areas where winter skates are more abundant. Conversely decreasing the skate wing possession limit may cause vessels to fish more frequent trips, closer to port. This could marginally increase skate fishing effort within the SBNMS, but the main target species of winter skate is less abundant there than elsewhere.

6.4.4 Skate Bait Fishery Alternatives

Management alternatives for the skate bait fishery are described in Section 4.4 and include raising the skate bait fishery possession limit and counting against the TAL the reported landings from skates transferred at sea for bait.

The skate bait fishery does not occur within the SBNMS, so changes to the skate bait possession limit will not have an effect on fishing within the SBNMS.

6.5 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 5.1.6.2.

6.5.1 No Action

Under the No Action Alternative, the skate catch limits would be those proposed by Amendment 3 and FW1 (Section 4.1). No additional impacts on protected resources beyond those already analyzed in Amendment 3 and FW1 (refer to Section 6.0 of the FW1 EA) are expected. FW1 concluded that the management measures currently in place (same as the No Action alternative) would have negligible positive or negative impacts on protected resources. There are no new reasons for changing this conclusion; however, for the status determination specifications measure there would be no direct or indirect impacts on protected resources.

6.5.2 Preferred Alternative

6.5.2.1 ACL alternatives

ACL alternatives are described in Section 4.1 and include increases in the ABC, in the aggregate skate ACL, and in the skate bait and skate wing fishery TALs. These increases in the aggregate ACL, and in the bait and wing TALs are not expected to increase fishing effort for skates because they typically are caught on trips targeting groundfish, monkfish, or scallops. The catch of these species is controlled by DAS and/or sector catch allocations. Since the possession of skates mostly requires vessels to be fishing on a NE Multispecies, Scallop, or Monkfish DAS, fishing effort on skates and potential protected species interactions are largely constrained by other FMPs. As noted in FW1, the action is also not likely to result in any spatial or temporal shifts in fishing effort that might increase the risk of interaction with protected species. Therefore this alternative is expected to have negligible negative or positive impacts on protected resources.

6.5.2.2 Status determination specifications

The proposed changes in status determination specifications and the clearnose skate overfishing definition is described in Section 4.2 overfished or experience overfishing. Because this alternative only improves the accuracy or precision of status determinations for skates, there are no direct or indirect impacts of this change in specifications on protected resources. For these same reasons, the No Action alternative for this measure also does not have any direct or indirect impacts on protected resources, as concluded in FW1.

6.5.2.3 Skate possession limit alternatives

Skate wing possession limit alternatives are described in Section 4.3 and include changes in the seasonal wing possession limits, estimated to allow the wing fishery to remain open throughout the year without triggering in-season accountability measures. The preferred alternative would decrease the May 1 to Aug 31 wing possession limit from 2,600 lbs. to 2,200 lbs. and increase the Sep 1 to Apr 30 possession limit from 4,100 lbs. to 3,600 lbs. 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.

The increase in the bait (whole) skate possession limit from 20,000 to 25,000 lbs., described in Section 4.4, is not expected to increase the overall level of fishing effort for skates because, as explained above, effort is largely constrained under the NE Multispecies, Scallop, or Monkfish FMPs. Also this increase in the bait (whole) skate possession limit is not likely to cause any spatial or temporal shifts in fishing effort that might increase the risk of interaction with protected species. Therefore this alternative is expected to have negligible negative or positive impacts on protected resources.

The No Action alternatives for skate possession limits also has no or negligible impacts on protected resources for the same reasons.

6.5.3 Impacts on Atlantic sturgeon

Formal consultation on the skate fishery was reinitiated on February 9, 2012. NMFS has determined that there will not be any irreversible or irretrievable commitment of resources under Section 7(d) of the ESA during the consultation period that would have the effect of foreclosing the formulation or implementation of any reasonable and prudent alternative measures. NMFS has also determined that the continued

authorization of the skate fishery during the consultation period, including the authorization of the fishery to operate under the measures proposed in this action, is not likely to jeopardize the continued existence of ESA-listed species or result in the destructive or adverse modification of critical habitat.

On February 6, 2012, NMFS listed the Gulf of Maine distinct population segment of Atlantic sturgeon as threatened, and listed the New York Bight, Chesapeake Bay, Carolina, and South Atlantic DPSs of Atlantic sturgeon as endangered (77 FR 5880 and 75 FR 5914). This action considered whether the skate fishery, including implementation of the proposed action, is likely to jeopardize Atlantic sturgeon DPSs, as they were proposed to be listed, and concluded that is not. While it is possible there may be interactions between Atlantic sturgeon and gear used in the skate fishery, the number of interactions that will occur during the duration of this action is not likely to cause an appreciable reduction in survival and recovery. This is supported by updated bycatch estimates based upon NEFOP data (2006-2010).

Atlantic sturgeon are known to be captured in sink gillnet, drift gillnet, and otter trawl gear. Of these gear types, sink gillnet gear poses the greatest known risk of mortality for bycaught sturgeon. Sturgeon deaths were rarely reported in the otter trawl observer dataset. However, the level of mortality after release from the gear is unknown. A summary of interactions of Atlantic sturgeon with gears used in the skate fishery and preliminary estimates of Atlantic sturgeon takes is summarized in Section 5.1.6.4.

Despite the proposed increase in skate catch limits and quotas under this action, skate fishing effort is not expected to increase significantly relative to no action. The proposed action will effectively allow the retention of skates that would have to be discarded under the no action alternative, without a measurable change in effort. Finally, this EA evaluates a temporary action, one that is only in place for FY 2012-2013. Therefore, impacts resulting from the approval of the skate fishery specifications are not likely to be significant.

NMFS will implement any appropriate measures outlined in the formal consultation's Biological Opinion to mitigate harm to Atlantic sturgeon. Given the limited scope of this action and the overall low contribution of the skate fishery to Atlantic sturgeon mortality, the magnitude of interactions during the 2012 and 2013 fishing years are not likely to result in jeopardy to the species based on current assessments of each DPS. Since Atlantic sturgeon DPSs have been listed, formal consultations were reinitiated as required for the skate fishery, as well as the related NE Multispecies and Monkfish fisheries, and additional evaluation will be included to describe any impacts of the fisheries on Atlantic sturgeon and define any measures needed to mitigate those impacts, if necessary. It is anticipated that any measures, terms and conditions included in an updated Biological Opinion will further reduce impacts to the species. It is expected that the completion of the Biological Opinion will occur near the beginning of the 2012 skate fishing year on May 1, 2012.

6.6 Human Communities/Economic/Social Environment

6.6.1 ACL alternatives

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

No Action

Under the No Action Alternative, the skate catch limits would be those implemented by Amendment 3 and FW1 (Section 4.1). No additional impacts on human communities beyond those already analyzed in Amendment 3 and FW1 (refer to Section 6.0 of the FW1 EA) are expected. The FW1 EA determined that the action would have positive economic and social benefits, mainly by reducing the risk of closing the directed skate wing fishery early in the fishing year. This was expected to prolong the fishing season, stabilize skate wing markets and revenue, maintain processing jobs, and reduce the incentives for derby-style fishing behavior. The two seasonal skate wing possession limits implemented by FW1 (2,600 lb for May 1 through August 31, and 4,100 lb 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.

Preferred Alternative

Economic Impacts

Under the Preferred Alternative, skate catch limits would be higher than those implemented by Amendment 3 and FW1 (No Action Alternative) and therefore, are expected to result in greater revenue. Assuming the skate wing fishery lands its entire TAL, which is 56% higher relative to the No Action Alternative, the fishery could potentially increase its revenue proportionally. A comparison of the potential revenue from the proposed skate wing and bait fishery TALs compared with the No Action Alternative is presented below in Table 47. Since the proposed action does not change skate possession limits, the trip-level revenue would be similar to that expected under the No Action Alternative. However, under the Preferred Alternative, more trips could land skates under the FW1 possession limits, rather than being constrained by the incidental limit triggered at 85-90% of the TAL. Despite the expected positive economic impacts of the Preferred Alternative, skates only represent approximately 4% of the total fishing related revenue of participating vessels (Section 8.7 of the FW1 EA). Most skate fishing vessels derive the vast majority of their revenue from other species, including groundfish and monkfish.

Table 47. Estimate of potential FY 2011 skate landing revenues between the No Action and Preferred alternatives, assuming an average bait price of \$0.11 per lb and an average wing price of \$0.23 per lb (whole wt.).

	No Action		Preferred		
	TAL (lb)	Revenue	TAL (lb)	Revenue	Percent change
Bait fishery	10,233,753	\$1,125,713	17,255,404	\$1,898,094	68.6%
Wing Fishery	20,313,184	\$4,672,032	34,255,075	\$7,878,667	68.6%
Total	30,546,937	5,797,745	51,510,479	9,776,761	68.6%

Social Impacts

Preferred Alternative

The Preferred Alternative may contribute marginally to improved attitudes towards the Federal fishery management process. Many vessel owners, operators, and crew are currently impacted by the relatively low annual catch limits for many stocks. Therefore, when the actions of the Federal government result in additional economic opportunity, there may be a small amount of positive attitude and relief generated.

Second, the ability of fishing businesses to plan is enhanced with the knowledge that the revised skate fishery TALs make it less likely that the fishery will be constrained by closures early in the fishing season. Relative to No Action, the higher TALs proposed in the Preferred Alternative are likely to stabilize employment for vessel operators, crew, and processors, which provides positive social benefits to affected communities. The proposed action should enhance the positive social impacts anticipated from FW1.

No Action

The preferred alternative would result in tangible economic benefits that in turn would have positive community and social impacts, therefore failure to realize these benefits would increase frustration with the Federal fisheries management system. As result, no action in response to additional information about the skate stock status and higher survivability of discards would have negative social impacts.

6.6.2 Status determination specifications

Preferred Alternative

The proposed changes in status determination specifications and the clearnose skate overfishing definition is described in Section 4.2. Although these changes may require a future action if one or more of the skates become overfished or experience overfishing, there are no direct impacts of this change in specifications on human communities or the socio-economic environment.

Indirectly, the impacts on human communities or the socio-economic environment should be positive because status determinations will be more consistent with trends in stock conditions, indexed by data collected by the FSV Bigelow. Since the stock specifications are more consistent with the data being collected, management measures are more likely to respond better to overfishing or overfished conditions.

No Action

Failure to take action under the preferred alternative would result in sub-optimal use of scientific information to make status determinations. As a result, the no action alternative would tend to reduce the credibility of and increase frustration with the Federal fishery management system and therefore have small but negative social impacts.

6.6.3 Skate Wing Possession Limit Alternatives

Preferred alternative

Skate wing possession limit alternatives are described in Section 4.3 and include changes in the seasonal wing possession limits, estimated to allow the wing fishery to remain open throughout the year without triggering in-season accountability measures. The May 1 to Aug 31 possession limit is set at a 26:41 ratio to the Sep 1 to Apr 30 possession limit to discourage targeting skates during the summer months when prices are typically depressed compared to other parts of the year, and hence create opportunities for better catch and economic benefits during winter/spring season when the prices are higher.

No Action

When timely adjustments to management measures are expected to result in improvements to Federal management restrictions, taking no action will increase frustration with current restrictions and therefore have negative social impacts in terms of negative perceptions about the management system.

6.6.4 Skate Bait Fishery Alternatives

Preferred alternatives

Preferred alternatives for the skate bait fishery are described in Section 4.4 include raising the skate bait fishery possession limit and counting against the TAL the reported landings from skates transferred at sea for bait. Higher possession limit in combination with high TAL would have a positive economic impact on the vessels fishing for baits, since they would be able to retain more bait without increasing the number of trips or engaging in derby style fishing activity. Moreover, accounting for at-sea transfers of skate landing against the skate bait TAL and aggregate skate ACL would help avoid the in-season trigger of accountability measures. Both of these measures will potentially have a positive impact on the bait fishery by ensuring year round supply of baits and creating price stability. This may also have positive impact on the other fisheries that significantly depend on skate for their supply of bait.

No Action

As stated above, when timely adjustments to management measures are expected to result in improvements to Federal management restrictions, taking no action will increase frustration with current restrictions and therefore have negative social impacts in terms of negative perceptions about the management system.

Summary of Impacts on Human Communities

As explained above, the preferred alternatives will have positive economic and social impacts while the No Action alternative will have small negative impacts on human communities.

6.7 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. The CEA baseline in this case consists of the combined effects of Amendment 3, FW1, and the past, present, and reasonably foreseeable future fishing and non-fishing actions which are described below.

This CEA assesses the combined impact of the direct and indirect effects of the proposed skate specifications for 2012-2013 with the impact from the past, present, and reasonably foreseeable future fishing actions, as well as factors external to the skate fishery that affect the physical, biological, and socioeconomic resource components of the skate environment. This analysis is focused on the VECs (see below) and because this action is supplementing Amendment 3 and FW1, it relies heavily on the analysis contained in the Amendment 3 EIS (NEMFC 2009; Section 8.1) and in the FW1 EA (NEMFC 2011; Section 6.6).

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, 2012 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.

The temporal range considered for endangered and other protected species begins in the 1990s when NMFS began generating stock assessments for marine mammals and developed recovery plans for sea turtles that inhabit waters of the U.S. EEZ. In terms of future actions, the analysis examines the period of approval for this action through May 1, 2012, which is the beginning of the subsequent fishing year when new management measures will be implemented. 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 5.0 (Affected Environment) of the FW1 EA. Similarly, the range of each endangered and protected species as presented in Section 5.4 of FW1 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.

6.7.1 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 6 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

In this table, negligible means “little or none”. Impacts to the physical and biological environment from the proposed action were assessed and found to be either none, not able to be determined or small negative. In general, the larger allowable amounts of skate catch and landings are not likely to result in considerable additional 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 2012-2013 is likely to be similar to that in FY 2010 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.

Table 48. Summary of direct and indirect effects of the alternatives

Alternative	Valued Ecosystem Components				
	Physical Environment including habitat	Regulated Stocks (skate complex)	Non-Target Species and Bycatch	Protected Resources	Human Communities
ACL alternatives described in Section 4.1					
No-Action Alternative	None	Small, positive	Negligible negative or positive	Negligible negative or positive	Small negative
Proposed Alternative	Not able to be determined	Small, negative	Negligible negative or positive	Negligible negative or positive	Positive
Status specification alternatives described in Section 4.2					
No-Action Alternative	Negligible negative or positive	Small, indirect, negative	Negligible negative or positive	None	Small negative
Proposed Alternative	Small, negative	Small, indirect, positive	Negligible negative or positive	None	Positive
Skate wing fishery possession limit alternatives described in Section 4.3					
No-Action Alternative	None	None	Negligible negative or positive	Negligible negative or positive	Small negative
Proposed Alternative 1	Negligible negative or positive	None	Negligible negative or positive	Negligible negative or positive	Positive
Proposed Alternative 2	Negligible negative or positive	None	Negligible negative or positive	Negligible negative or positive	Positive
Skate bait fishery possession limit alternatives described in Section 4.4					
No-Action Alternative	None	None	Negligible negative or positive	Negligible negative or positive	Small negative
Proposed Alternative	None	None	Negligible negative or positive	Negligible negative or positive	Positive

6.7.2 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. The Regional Administrator has also published a proposed rule to implement an Emergency Action to raise the 2011 specifications, with an ABC of 50,435 mt.

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.

Monkfish. Monkfish Amendment 5 implemented ACL and AMs for the monkfish fishery, and updated the biological reference points for monkfish stocks. FW 7 has proposed a new ACT for the monkfish Northern Fishery Management Area, increasing the allocated DAS from 31 to 40 days per vessel, and adjustment of some possession limits.

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. 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.

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 lb in 2010; 20 million lb in 2011) and a 3,000-lb trip limit. Fishing effort is largely constrained by NE Multispecies and Monkfish DAS.

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. A proposed rule for these actions is under development at this time.

Atlantic Herring. The impacts of the herring fishery on skates catch is considered negligible. However, the 2010-2012 herring specifications reduced the ABC by 45% to 106,000 mt. Herring are often used as lobster bait in the Gulf of Maine and the Area 1A TAC declined by 41% to 26,546 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 the 2012-2013 fishing years would replace the management measures implemented by Amendment 3, Framework Adjustment 1, and the pending Emergency Action. Without approval of the proposed action in this specifications document, the Emergency Action would expire during the 2012 fishing year and the ACL specifications would revert back to ones set by Amendment 3 for the 2010-2011 fishing years. No other skate actions are currently planned, but the Council may consider initiating a future action when it considers priorities for 2012. The industry has asked the Council to consider limiting access to the skate bait fishery and NMFS set a control date in 2010 at the request of the Council.

NMFS has received two petitions to list certain skates as endangered or threatened species under authority of the Endangered Species Act. NMFS has 90 days to respond whether it should consider listing one or more of the species identified in the two petitions. One petition was submitted by the Animal Welfare Institute on Aug 11, 2011, and requests the US Department of Commerce to list the Northwest Atlantic or the US District Population Segment of thorny skate as an endangered or threatened species. The other petition submitted on Aug 22, 2011, requests the US Secretary of Commerce to list thorny, barndoor, winter, and smooth skates as endangered or threatened species. NMFS will respond to the petitions by mid-November as to whether these species will be considered as candidate species. Therefore, it would be speculative to predict future actions that might arise from these petitions at this time, and no further consideration of this is made in this document.

The Council has asked coastal states to examine their state water fisheries for skates and determine whether they need to take action to prevent state water fisheries from undermining the conservation goals of the Skate Complex FMP. During the review of 2010 data for this document, state landings had jumped from an assumed 3% of total landings (6.7% in 2009) to 12%, possibly in response to tighter fishing

regulations in Federal waters and an early closure of the directed skate wing fishery on Sep 3, 2010. States may as a result of this Council letter take action to bring state fishing rules in line with those that apply to Federal waters. As of this time, MA and RI are evaluating their fisheries to determine whether action is necessary. Action by states may improve monitoring and reduce management uncertainty.

NE Multispecies. FW 46, if approved by NMFS, would increase the amount of haddock allowed to be caught by the herring fishery (“haddock catch-cap”) from its current level of 0.2 percent of the ABC, to 1% of the ABC, and make separate allocations for the Georges Bank and Gulf of Maine stocks. The Council is expected to initiate FW 47 in June 2011 to set specifications (OFLs, ABCs, and ACLs) for 20 groundfish stocks for FYs 2012-2013 (beginning May 1, 2012). Framework 47 would also refine AMs for ocean pout, windowpane flounder, Atlantic halibut, Atlantic wolffish, and SNE/MA winter flounder, consider eliminating the scallop access area yellowtail flounder caps, and consider additional allocation of yellowtail flounder to the scallop fishery based on estimated catch.

Atlantic Sea Scallops. The Council is currently developing FW 23 to the Scallop FMP. The action is expected to consider scallop dredge gear modifications and measures to reduce bycatch of sea turtles and yellowtail flounder.

Essential Fish Habitat. Reasonably foreseeable future actions that will likely affect habitat include the EFH Omnibus Amendment (under development 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). Final listing determinations for the Atlantic sturgeon distinct population segments (DPSs) are expected by October 2011. Serious injuries and mortalities of Atlantic sturgeon in commercial fishing gear are a likely concern for the long-term persistence and recovery of the DPSs, and a primary reason cited for the proposals to list the DPSs under the ESA. If the species is listed under the ESA, re-initiation of formal consultations on FMPs, and the effects of fisheries on the five DPSs would be fully examined. The formal consultation process may result in conservation recommendations and, if pertinent, reasonable and prudent measures or reasonable and prudent alternatives, which would be actions deemed appropriate or necessary to minimize the impact of take of Atlantic sturgeon.

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.

6.7.3 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.

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 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.

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 ABC, 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 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 and Section 6.1.1.1 of this document). 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 effects by reducing injuries and deaths. Future positive impacts are likely.

The proposed action is not expected to increase the potential for gear interactions with protected species. This action would likely have negligible 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.

NMFS will implement any appropriate measures outlined in the BO to mitigate harm to Atlantic sturgeon. Further, the encounter rates and mortalities for Atlantic sturgeon that have been calculated as part of the preliminary analysis of NEFOP data (as discussed in Section 5.1.6.4) include encounters and mortalities by all fisheries utilizing gillnets, large-mesh otter trawl gear, including the skate fishery. Thus, it is likely that rates of encounters and mortalities by skate fishery would be lower than those estimates. Finally, this EA evaluates an action that is primarily administrative in nature and the biological impacts are primarily indirect. Therefore, impacts resulting from the approval of this specification package are not likely to be significant.

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.

The proposed action will have positive impacts on human communities due to large increases in allowable landings of skates. The positive impacts from the proposed action would provide some mitigation of the negative economic impacts of recent actions in the NE Multispecies fishery. Therefore, the proposed action when taken into consideration with past, present, and reasonably foreseeable future actions is not expected to have significant cumulative impacts. The table below summarizes the cumulative effects resulting from implementation of the proposed action and CEA baseline.

Table 49. **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	Positive
	Cumulative Effects Summary of Effects from implementation of Proposed Action and Cumulative Effect Baseline	Negligible	Negligible	Negligible	Negligible	Low positive

7.0 COMPLIANCE WITH THE MAGNUSON-STEVENSON 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 ABC, did not contain an analysis of the revised ABC 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.

8.0 COMPLIANCE WITH OTHER APPLICABLE LAW

8.1 *National Environmental Policy Act (NEPA)*

8.1.1 Finding of No Significant Impacts (FONSI)

This EA updates the Finding of No Significant Impacts (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 for the EA would not jeopardize the sustainability of any of the target species (primarily winter and little skates) affected by the action, because the biomass of these species has increased to levels significantly above their B_{msy} targets and would be harvested at a sustainable, conservative rate (see Appendix 1, Document 4 of Amendment 3, NEFMC 2009). The action is expected to reduce the discards of these species and to increase landings within sustainable levels. The indirect impacts affecting other stocks are expected to be negligible. The biological impacts of the Proposed Action on the allocated target species are analyzed in Section 6.1.

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

Response: The Proposed Action for the EA is not expected to jeopardize the sustainability of any non-target species. As described in Section 6.2, 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 for the EA 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 (Section 6.1.1), but may intensify effort in areas where vessels target skates while reducing effort elsewhere. Most of the effort in areas targeting skates are not in sensitive EFH areas (Section 6.3)

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

Response: The Proposed Action for the EA is not expected to have a substantial adverse impact on public health and safety. The additional amount of allowable skate landings will likely prolong the fishing season and enable additional flexibility regarding when fishing trips can be planned. Safety could be enhanced if such flexibility enables vessels to fish during more optimal weather conditions.

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

Response: The Proposed Action is not expected to have an adverse impact on endangered or threatened species, marine mammals, or critical habitat of these species. Impacts to cetaceans and pinnipeds from the use of gillnets would be minimized by use of the Take Reduction Plans, as discussed in Section 6.5. Trawl gear is generally considered to have low impacts on most protected resources. Effort controls and sectors in the NE Multispecies and Monkfish FMPs effectively limit fishing effort for skates, and therefore also limit potential interactions with protected species and their critical habitats.

For the reasons described in Sections 6.5.3, NMFS has determined that the continued operation of the Skate FMP during the reinitiation period is not likely to jeopardize the continued existence of any Atlantic sturgeon DPS. This is based on the short time period encompassed by the reinitiation period and

consequently, the scale of any interactions with Atlantic sturgeon that may occur during this period. NMFS will implement any appropriate measures outlined in the BO to mitigate harm to Atlantic sturgeon. Further, the encounter rates and mortalities for Atlantic sturgeon that have been calculated as part of the preliminary analysis of NEFOP data include encounters and mortalities by all fisheries utilizing large-mesh sink gillnet and otter trawl gear, including the groundfish, monkfish, bluefish, spiny dogfish, and other fisheries. Based upon the above estimates, the rates of encounters and mortalities by the skate fishery are lower than the estimates in most of those fisheries. Finally, this EA evaluates a temporary action, one that is only in place for FY 2012-2013. Therefore, impacts resulting from the approval of the skate fishery specifications are not likely to be significant.

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

Response: The Proposed Action for the EA 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. 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 for the EA that are interrelated with natural or physical environmental effects. The proposed action would provide additional skate landings and is likely to enable the skate fishery to remain open year around. Within the context of the region and the fishery as a whole, these benefits would continue to be insignificant as determined under criteria of the Regulatory Flexibility Act (see Section 8.7). While the 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 for the EA on the quality of human environment are not considered to be to be highly controversial. The action only modifies the ACL and TALs in response to increases in skate biomass survey indices, incorporates new peer-reviewed science bearing on discard mortality assumptions, and makes adjustments to possession limits to be consistent with existing fishery conditions. The Proposed Action incorporates the best available science and is not expected to negatively impact habitat, allocated target species, non-allocated target species and bycatch, or protected resources as described in Sections 6.1 through 6.5.

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: The Proposed Action cannot be reasonably expected to result in substantial impacts to unique areas or ecological critical areas. There are no known parkland, prime farmlands, wetlands, or wild scenic rivers in the affected area. Vessel operations around the unique historical and cultural resources encompassed by the Stellwagen Bank National Marine Sanctuary would not likely be altered by this action (see Section 6.1.1). The skate fishery is mainly prosecuted by trawl and gillnet gear, and this action does not propose alterations in the spatial extent of the fishery. As a result, no substantial impacts are expected from this action.

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

Response: The effects of the Proposed Action for the EA 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 as those conditions existing currently. Approval of the revised catch limits would provide additional revenue to the fishery at a time when some other groundfish catch levels have been reduced and the overall economic environment is difficult for small businesses, while at the same time meeting the conservation requirements of the Skate FMP. 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 6.7 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. Since none of the cumulative impacts of the original Proposed Action or the Proposed Action are considered significant, Section 6.7 concluded there are no significant cumulative impacts among these related actions. Further, the Proposed Action would not have any significant impacts when considered individually or in conjunction with any of the other actions presented in Section 6.7 (fishing related and non-fishing related).

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

Response: The fishing operations would take place on ocean waters and would not affect any human communities on the adjacent shorelines. There are no known districts, sites, or highways in the area of the Proposed Action. The Proposed Action is unlikely to affect objects listed in the National Register of Historic Places or cause significant impact to scientific, cultural, or historical resources. The only objects in the fishery area that are listed in the National Register of Historic Places are various ship wrecks. However, vessels typically avoid fishing near wrecks to avoid tangling gear on the wreck. Therefore, this action would not result in any adverse effects to the wrecks.

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 ABC 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 6.7, impact on resources encompassing skates, groundfish, and other stocks is expected to be minimal.

DETERMINATION

In view of the information presented in this document, 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.

Regional Administrator Northeast Region, NMFS

Date

8.1.2 List of preparers; point of contact

The information contained in this document was prepared through 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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8.1.3 Agencies consulted

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

8.1.4 Opportunity for public comment

The proposed action in this specifications document was prepared by the New England Fishery Management Council during a series of public meetings, including SSC and Skate Oversight Committee meetings, a Council meeting on June 19-21 2011, and a review of the final proposed specifications at the Sep 26-29, 2011. NMFS will publish the new specifications as a proposed rule following submission of this document to the Secretary of Commerce, which will provide an additional opportunity for public comment.

8.2 *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 October 29, 2010, 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.

8.3 *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 6.5.

8.4 *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.

8.5 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.

8.6 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.

8.7 Initial Regulatory Flexibility Analysis (IRFA) – Determination of Significance

Introduction

The RFA requires agencies to assess the impacts of their proposed regulations on small entities. 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 commercial fishing and recreational fishing sector, as a firm with receipts (gross revenues) of up to \$4 million.

This section provides an assessment and discussion of the potential economic impacts of the proposed action, as required of the RFA. The objective of the RFA is to require consideration of the capacity of those affected by regulations to bear the direct and indirect costs of regulation. The Final Regulatory Flexibility Analysis (FRFA) must identify the number and types of businesses that would be regulated,

indicate how many of these entities are small businesses, explain the expected economic impact of the regulation on small businesses, and describe any feasible alternatives that would minimize the economic impacts.

Description of the Reasons Why Action by Agency is Being Considered

The purpose for this action is to implement revised catch limits for skates for FY 2011, in order to achieve a better balance of the conservation and economic objectives of the MSA. This action is needed due to the change in circumstances caused by the availability of new scientific information and resulting recommendations to increase the ABC for the skate complex. For more information refer to Sections 3.1 and 4.0 of this EA.

The Objectives and Legal Basis for the Proposed Action

As stated above, the purpose for this action is to implement a revised ABC and catch limits for skates for FY 2011. The legal basis for the action is the Magnuson-Stevens Fishery Conservation and Management Act.

Summary of the Significant Issues Raised by Public Comments in Response to the IRFA. A Summary of the Assessment of the Agency of Such Issues, and a Statement of Any Changes Made from the Proposed Rule as a Result of Such Comments

The public has not yet had an opportunity to comment on the IRFA and proposed rule for this action. Seven comments were received on the proposed rule to implement FW1, and responses to those comments were addressed in the final rule (76 FR 28328).

Estimate of the Number of Small Entities

The proposed increase in the Skate ACL and TALs would impact vessels that hold Federal open access commercial skate permits that participate in the skate fishery. In practice, although some firms own more than one vessel, available data make it difficult to reliably identify ownership control over more than one vessel. For this reason, the number of permitted vessels is considered to be a proxy for the number of small business entities. For the purposes of this analysis, each permitted vessel is treated as a single small entity and is determined to be a small entity under the RFA.

As of December 31, 2010, the maximum number of small fishing entities (as defined by the Small Business Administration (SBA)) that may be affected by this action is 2,607 entities (numbers of skate permit holders). (For the purposes of this analysis, 2010 data provide a reasonable estimate of the number of small business entities expected to be operating in 2013-2014.) However, during fishing year 2010, only 601 vessels landed any amount of skate. As can be seen from Table 43 below, average revenue from skate or all species taken together is much lower than \$4 million. Therefore, all the vessels participating in skate fishery can be considered as small business.

Table 50. Skate fishery summary data for 2010 fishing year (Source: NMFS VTR/Dealer data)

Number of vessels	601
Total annual revenue from Skate	\$ 10,242,290
Average revenue from Skate	\$ 17,042
Total revenue from all trips of the vessels landing any Skate	\$ 140,867,728
Average revenue from all trips of the vessels landing any Skate	\$ 234,389

Reporting, Recordkeeping and Other Compliance Requirements

This action does not introduce any new reporting, recordkeeping, or other compliance requirements. This proposed action does not duplicate, overlap, or conflict with other Federal rules.

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

This action is expected to result in positive economic impacts on small business entities; therefore, no steps are needed to minimize significant negative impacts.

Economic Impacts on Small Entities Resulting from Proposed Action

The economic impact resulting from this action on these small entities would be positive since the action would provide additional fishing opportunity for vessels participating in the skate fishery for FY 2012 and FY 2013. The Preferred Alternative is expected to result in greater revenue from skate landings. Based on recent landing information, the skate fishery is able to land close to the full amount of skates allowable under the quotas. The estimated potential revenue from the sale of skates under the proposed catch limits is approximately \$9.8 million, compared with \$5.8 million if this action were not implemented (Table 47).

Due to the implications of closing the directed skate fisheries early in the fishing year, the larger catch limits associated with the Preferred Alternative, compared with the No Action Alternative will result in additional revenue, if fishing is prolonged. Although the proposed changes will likely have a significant positive impact on skate revenues, this is less likely to significantly impact the overall revenue of a vessel, since vessels that participate in the skate fishery derive most (an average of 96%) of their revenues from other fisheries (e.g. groundfish, monkfish and scallops). Therefore, relative to total fishing revenues, catch limits of other species would be expected to have more significant economic impacts than revenues derived from skates alone.

8.8 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.

8.9 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.

8.10 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.” Sections 6.6 and 8.7 represent the RIR, which includes an assessment of the benefits of the Proposed Action, in accordance with the guidelines established by E.O. 12866. The analysis included in the RIR shows that this action is a not “significant regulatory action” because it will not affect in a material way the economy or a sector of the economy.

E.O. 12866 requires a review of proposed regulations to determine whether or not the expected effects would be significant, where a significant action is any regulatory action that may

- Have an annual effect on the economy of \$100 million or more, or adversely affect in a material way the economy, a sector of the economy, productivity, jobs, the environment, public health or safety, or State, local, or tribal governments or communities;
- Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;
- Materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or
- Raise novel legal or policy issues arising out of legal mandates, the President’s priorities, of the principles set forth in the Executive Order.

The proposed action will not 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. The proposed action is expected to result in small but positive gains to skate fishermen and processors and have positive impacts on fishing communities. It is not expected to result any measurable economic benefits to the U.S. consumer because the markets for skate wings are mostly foreign. The proposed action is clearly not expected to have an annual economic effect on the economy of \$100 million or more. The total ex-vessel value of the skate

wing fishery in 2010 was \$14.696 million (Table 30) and the action is expected to increase revenues roughly in proportion to the 69% increase in allowable landings or by about \$10 million. Although, total direct and indirect economic impacts would exceed the increase in the value of landings, they are expected to be less than \$20 million.

The proposed action also will not create a serious inconsistency or otherwise interfere with an action taken or planned by another agency. Analysis of compliance with other applicable laws also is described in this section (Section 8.0).

The proposed action will not materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof. No entitlements, grants, user fees, or loan programs are affected by proposed action.

The proposed action will not raise novel legal or policy issues arising out of legal mandates, the President's priorities, of the principles set forth in the Executive Order. (See discussion below.)

Executive Order 12886 of 1993 is intended to limit the promulgation of regulations to those that are required by law, or are made compelling public need. In the latter category are the failure of private markets to protect and improve the health and safety of the public, the environment or the well-being of the American people. Selection of the ways and means of regulation is to require, where practical, an assessment of all costs and benefits of available regulatory alternatives including the alternative of not regulating. In choosing among alternatives, agencies are instructed to select approaches that maximize net benefits, unless a statute requires another regulatory approach. Net benefits are to include potential economic, environmental, public health and safety, and other advantages such as distributive and equity impacts. The Regulatory Principles state a dozen Principles to which agencies should adhere. They are:

- (1) Each agency shall identify in writing the specific market failure (such as externalities, market power, lack of information) or other specific problem that it intends to address (including, where applicable, the failures of public institutions) that warrant new agency action, as well as assess the significance of that problem, to enable assessment of whether any new regulation is warranted.
- (2) Each agency shall examine whether existing regulations (or other law) have created, or contributed to, the problem that a new regulation is intended to correct and whether those regulations (or other law) should be modified to achieve the intended goal of regulation more effectively.
- (3) Each agency shall identify and assess available alternatives to direct regulation, including providing economic incentives to encourage the desired behavior, such as user fees or marketable permits, or providing information upon which choices can be made by the public.
- (4) In setting regulatory priorities, each agency shall consider, to the extent reasonable, the degree and nature of the risks posed by various substances or activities within its jurisdiction.
- (5) When an agency determines that a regulation is the best available method of achieving the regulatory objective, it shall design its regulations in the most cost-effective manner to achieve the regulatory objective. In doing so, each agency shall consider incentives for innovation, consistency, predictability, the costs of enforcement and compliance (to the government, regulated entities, and the public), flexibility, distributive impacts, and equity.
- (6) Each agency shall assess both the costs and the benefits of the intended regulation and,

recognizing that some costs and benefits are difficult to quantify, propose or adopt a regulation only upon a reasoned determination that the benefits of the intended regulation justify its costs.

- (7) Each agency shall base its decisions on the best reasonably obtainable scientific, technical, economic, and other information concerning the need for, and consequences of, the intended regulation or guidance document.
- (8) Each agency shall identify and assess alternative forms of regulation and shall, to the extent feasible, specify performance objectives, rather than specifying the behavior or manner of compliance that regulated entities must adopt.
- (9) Wherever feasible, agencies shall seek views of appropriate State, local, and tribal officials before imposing regulatory requirements that might significantly or uniquely affect those governmental entities. Each agency shall assess the effects of Federal regulations on State, local, and tribal governments, including specifically the availability of resources to carry out those mandates, and seek to minimize those burdens that uniquely or significantly affect such governmental entities, consistent with achieving regulatory objectives. In addition, as appropriate, agencies shall seek to harmonize Federal regulatory actions with related State, local, and tribal regulatory and other governmental functions.
- (10) Each agency shall avoid regulations and guidance documents that are inconsistent, incompatible, or duplicative with its other regulations and guidance documents or those of other Federal agencies.
- (11) Each agency shall tailor its regulations and guidance documents to impose the least burden on society, including individuals, businesses of differing sizes, and other entities (including small communities and governmental entities), consistent with obtaining the regulatory objectives, taking into account, among other things, and to the extent practicable, the costs of cumulative regulations.
- (12) Each agency shall draft its regulations and guidance documents to be simple and easy to understand, with the goal of minimizing the potential for uncertainty and litigation arising from such uncertainty.

Principle 1: Problems addressed

This Principle requires that, “*Each agency shall identify in writing the specific market failure (such as externalities, market power, lack of information) or other specific problem that it intends to address (including, where applicable, the failures of public institutions) that warrant new agency action, as well as assess the significance of that problem, to enable assessment of whether any new regulation is warranted.*”

In the context of fish harvesting, market failures have been a problem five decades. The basis of the failure is biological (a finite, renewable resource), and institutional; however, the reason for proposed action is based on the biological need to periodically adjust catch levels to meet the requirements of the Magnuson-Stevens Fishery Management and Conservation Act. In this case the action is warranted to increase catch levels in response to new information about changes in skate species abundance.

Principle 2: Existing regulations: Existing regulations have not contributed to the problem the action is intended to correct. The purpose of the action is to allow fishermen to take advantage of naturally occurring increases in skate species abundance.

Principle 3: Alternatives: The Council identified several possession limit alternatives for skate (Section 4.0) to allow the fishery to maximize the total allowable landings of skates.

Principle 4: Risks: No significant change in risks is expected.

Principle 5: Cost effectiveness: The proposed action is expected to result in positive economic benefits with no changes in administrative or enforcement costs.

Principle 6: Benefits and Costs

The proposed action is expected to result in positive economic benefits with no changes in administrative or enforcement costs. It may increase fishing costs because fishermen will have to take more trips to land the same amount of skates under the proposed lower possession limits; however, fishermen and processors have stated in public meeting that extending the duration of the directed wing fishery was more important than the costs of the lower possession limit. Also, lower discards anticipated under the proposed action are expected to possibly result in a higher proportion of the ABC being allocated to the fishery instead of to discards in the future.

Principle 7: Best Available Information: The FMP is based on the best available scientific information. See Section 8.11.

Principle 8: Performance Objectives: The performance objective is an extend duration for the wing fishery and a more stable supply of wings to various markets.

Principle 9: Views of Appropriate State, Local and Tribal Officials: See Section 8.1.4, list of agencies consulted. State fisheries agencies have formal representation as members of the New England Fishery Management Council.

Principle 10: Avoidance of Regulations that are Inconsistent, Incompatible or Duplicative

Avoidance of inconsistent regulations is attained through the processes of the Council and its advisory committees and the public review and comment process. In particular, the Skate FMP relies on regulations in other FMPs to the extent practicable to achieve its goals, because nearly all skate fishing must occur on a multispecies, monkfish, or scallop fishing trips. Thus, the Skate FMP avoids duplicate or incompatible regulations which apply to vessels permitted in these fisheries.

Principle 11: Least Burden on Society: The action adjusts the Skate Fishery Management Plan without adding new types of restrictions and therefore minimizes the burden on society to the extent possible.

Principle 12: Simplicity: The options proposed are simple and familiar, by example, to fishermen and regulators and should minimize uncertainty and litigation.

Summary and Conclusions

The proposed regulations would result in positive gains to the harvesting and processor sectors. The impacts on U.S. consumers which are a very small part of the global market for skates cannot be determined but they are expected to be positive.

8.11 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 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 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 ABC 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 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 5.0 and 6.0 of this 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 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 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.

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 $\frac{1}{2}$ of the carrying capacity.

B_{target} – A desirable biomass to maintain fishery stocks. This is usually synonymous with B_{MSY} 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 $B_{threshold}$. A determination of overfished triggers the SFA requirement for a rebuilding plan to achieve B_{target} as soon as possible, usually not to exceed 10 years except certain requirements are met. For monkfish, $B_{threshold}$ was specified in Framework 2 as $\frac{1}{2}B_{Target}$ (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 condition 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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