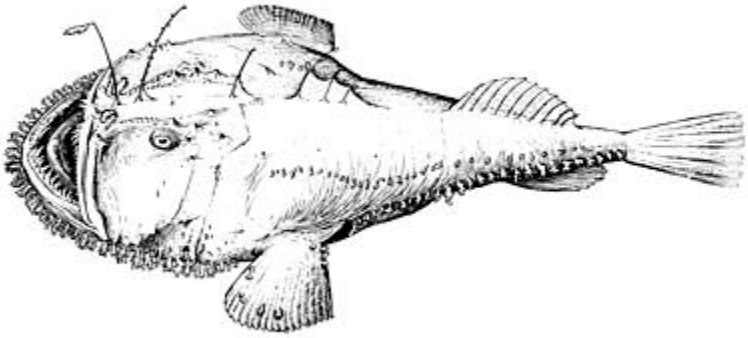
DRAFT

Monkfish Fishery Management Plan
Framework Adjustment 10 including
Specifications for Fishing Years 2017 - 2019

Incorporating Stock Assessment and Fishery Evaluation (SAFE) Report
For the 2015 Fishing Year
and the Environmental Assessment



Prepared by
New England Fishery Management Council
and Mid-Atlantic Fishery Management Council

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1.0 Executive Summary

The monkfish fishery in the EEZ is jointly managed under the Monkfish Fishery Management Plan (FMP) by the New England Fishery Management Council (NEFMC) and the Mid-Atlantic Fishery Management Council (MAFMC), with the NEFMC having the administrative lead. The fishery extends from Maine to North Carolina out to the continental shelf margin. The fishery is managed as two separate stocks; the Northern Fishery Management Area (NFMA) covers the Gulf of Maine (GOM) and northern part of Georges Bank (GB), and the Southern Fishery Management Area (SFMA) extends from the southern flank of GB through the Mid-Atlantic Bight to North Carolina (Figure 1). The fishery is primarily managed by landing limits in conjunction with a yearly allocation of days-at-sea (DAS). Specifications follow the hierarchy of an annual catch limit (ACL), an annual catch target (ACT), and total allowable landings (TAL), which are set to reduce the likelihood of the ACL being exceeded.

This action is needed to update fishery specifications for the monkfish FMP for the years 2017-2019 using the most recent scientific advice and monkfish stock assessment. The purpose of this action is to establish DAS and landing limits for the NFMA and SFMA, as well as to modify discard rates and uncertainty buffers based upon the updated fishery information. This action is also needed to allow fishery participants to more effectively harvest OY and achieve the annual TAL in each management area.

Proposed Action

Under the provision of the Magnuson-Stevens Fishery Conservation and Management Act (M-S Act), the NEFMC and MAFMC Councils submit proposed management actions to the Secretary of Commerce for review. The Secretary of Commerce can approve, disapprove, or partially approve the action proposed by the NEFMC and MAFMC. In the following alternative descriptions, measures identified as Preferred Alternatives constitute the NEFMC and MAFMC proposed management action.

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

The Preferred Alternatives include:

- *Updates to Annual Catch Limits*
    - *Revised Annual Catch limits.* The preferred alternatives would set the ABC/ACL, reduce the management uncertainty buffer to 3%, and update the calculated discard rate for both fishery management areas.

- *Modifications to Monkfish Effort Controls*
    - *Northern Fishery Management Area DAS Allocation and Monkfish Possession Limit*. The preferred alternative would increase the incidental monkfish possession limit when on a NE multispecies DAS.

    - *Southern Fishery Management Area DAS Allocations and Monkfish Possession Limits* The preferred alternative would increase the monkfish DAS allocation and trip limit when on a monkfish DAS.

Summary of Environmental Consequences

The environmental impacts of all of the alternatives under consideration are described in Section 7.0. Biological impacts are described in Section 7.1, impacts on essential fish habitat are described in Section 7.2, impacts on endangered and other protected species are described in Section 7.3, the economic impacts are described in Section 7.4, and social impacts are described in Section 7.5. Summaries of the impacts of the Preferred Alternatives are provided in the following paragraphs. As required by NEPA, the Preferred Alternatives are compared to the No Action alternative.

Biological Impacts
The preferred alternatives to set specifications in the NFMA and SFMA would have negligible, because it would not increase the ABC, to low negative impacts on the monkfish stock because it would not incorporate the updated calculated discard rate from the 2016 operational assessment. Increasing the incidental monkfish trip limit in the NFMA would have negligible impacts on the monkfish stock because it would not be expected to help the fishery better achieve, the TAL, which has been under-harvested in recent years. Increasing the DAS allocation and trip limits in the SFMA would have negligible biological impacts on the monkfish stock. The moderate increases in DAS allocation and trip limits would be expected to help the fishery better achieve, but not exceed, the TAL, which has been under-harvested in recent years

Essential Fish Habitat (EFH) Impacts
The preferred alternatives to set specifications in the NFMA and SFMA would have negligible impacts on EFH because they would not be expected to increase the ability of vessels to catch monkfish or lead to additional fishing effort. The TAL has been under-harvested for the last five years.

Impacts on Endangered and Other Protected Species
The preferred alternatives to set specifications in the NFMA and SFMA, to increase the incidental monkfish trip limit in the NFMA, and to increase the DAS allocation and trip limit in the SFMA would have low negative impacts because, despite interactions with protected resources occurring, these alternatives would not be expected to increase fishing levels above and beyond those that have been experienced in the monkfish broad stock areas to date that has been previously determined not likely to jeopardize the continued existence of protected resources.

Economic Impacts
The preferred alternatives to set specifications in the NFMA and SFMA would be expected to have neutral to possibly low positive economic impacts. The existing TALs have not been constraining landings in recent fishing years and therefore we would not expect substantial increases in landings from the specifications alternatives. Increasing the incidental monkfish trip limit in the NFMA would have neutral to possibly slightly low positive because this decreased administrative burden would not be expected to greatly increase landings and ex-vessel price. Increasing the DAS allocation and trip limits in the SFMA would have low positive to positive because landings and efficiency would be expected to increase. However, increased monkfish landings by the limited access fleet in the SFMA could have the effect of lowering average ex-vessel price.

Social Impacts
The preferred alternatives to set specifications in the NFMA and SFMA would be expected to have neutral to possibly low positive social impacts. The preferred alternatives for modifying current monkfish effort controls would have neutral to slightly low positive impacts because of increased flexibility and potential to increase landings.

Alternatives to the Proposed Action

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

- *Updates to Annual Catch Limits*
  - *Revised Annual Catch limits.* The alternatives to the proposed action would not adjust the management uncertainty buffer and/or the revised calculated discard rate.

- *Modifications to Monkfish Effort Controls*
  - *Northern Fishery Management Area DAS Allocation and Monkfish Possession Limit*. The alternative to the proposed action would not increase the incidental monkfish possession limit while on a NE multispecies DAS in the NFMA.

  - *Southern Fishery Management Area DAS Allocations and Monkfish Possession Limits* The alternative to the proposed action would not increase the DAS allocation or trip limits in the SFMA.

Impacts of Alternatives to the Proposed Action

Biological Impacts
The No Action alternative, maintaining the specification set in Framework 8, would not incorporate the updated calculated discard mortality rate or reduce the management uncertainty buffer. Impacts on the monkfish stock would be negligible because it would only slightly increase the likelihood that an insufficient amount of discards would be accounted for in the specifications. Option 2, that would modify the discard rate only for northern and southern fishery management areas, would be expected to have low positive impacts on the monkfish resource because it applies the most recent scientific advice and would result in a slight decrease in the TAL providing a greater buffer to the monkfish stock. The No Action alternative that would maintain the existing DAS Allocations and incidental trip limits in the NFMA would have negligible to low positive biological impacts on monkfish because it would not increase the ability to land monkfish, reducing the likelihood of the TAL being achieved. The No Action alternative that would maintain the existing trip limits and DAS allocations in the SFMA would have neutral to low positive biological impacts because it would not increase the ability to land monkfish, reducing the likelihood of the TAL being achieved.

Essential Fish Habitat (EFH) Impacts
The No Action alternative, maintaining the specifications set in Framework 8, would have negligible impacts on EFH because this alternative would not modify the expected interactions of monkfish or groundfish gear with EFH from current conditions. Option 2, which would update the discard rate for northern and southern fishery management areas, would have negligible impacts on EFH because no impact on monkfish fishing effort was expected despite the lower TALs under this option. The no action alterative that would not change the DAS allocation or trip limits in the NFMA would have negligible impacts on EFH because it would not be expected to change fishing effort in the NFMA. The No Action alternative, which would not adjust the DAS allocation or trip limits in the SFMA would be expected to have negligible impacts because no change in fishing effort would be expected and therefore no additional impact on EFH would result from this alternative.

Impacts on Endangered and Other Protected Species
The No Action alternative, maintaining the specifications set in Framework 8, would not result in changes in fishing effort or behavior above and beyond that which has been considered since 2010 and therefore

no new risks or additional takes to ESA listed species that has not already been considered would occur. Option 2, which would update the discard rate for northern and southern fishery management areas, would not be expected to result in any significant changes in fishing behavior in either area, therefore impacts would not be expected to go above and beyond that which has been considered in the fishery to date. The No Action alternative, which would not adjust the DAS allocation or trip limits in the NFMA, would have low negative to neutral impacts because it would not be expected to introduce any new risks to protected resources that have not already been considered and/or authorized by NMFS to date. The No Action alternative that would not adjust the DAS allocation nor trip limits in the SFMA, would have low negative impacts because it would not be expected to introduce any new risks to protected species that have not already been considered and/or authorized by NMFS to date.

Economic Impacts

The No Action alternative, maintaining the specification set in Framework 8, would not incorporate the updated calculated discard mortality rate or reduce the management uncertainty buffer. Economic impacts of the No Action alternative, while difficult to predict, would likely not affect fishing operations and the TAL would not be expected to be achieved, and therefore would be negligible. Option 2, that would modify the discard rate only for northern and southern fishery management areas, would be expected to have low negative, but likely neutral, economic impacts because it is unlikely that TAL reductions for either management area would adversely affect monkfish revenues. The No Action alternative that would maintain the existing DAS Allocations and incidental trip limits in the NFMA would have neutral economic impacts because it would likely not affect fishing operations and the TAL would not be expected to be achieved. The No Action alternative that would maintain the existing trip limits and DAS allocations in the SFMA would have neutral economic impacts because it would not affect fishing operations, reducing the likelihood of the TAL being achieved.

Social Impacts

The No Action alternative, maintaining the specifications set in Framework 8, would not incorporate the updated calculated discard mortality rate or reduce the management uncertainty buffer. The social impacts would likely be neutral but possibly slightly low negative. Option 2, that would modify the discard rate only for northern and southern fishery management areas, would be expected to have neutral to possibly slightly low negative social impacts. The No action alternative that would maintain the existing DAS allocations and incidental trip limits in the NFM would have neutral social impacts as no economic changes would be expected. The No Action alternative that would maintain the existing trip limits and DAS allocations in the SFMA would have likely neutral to possibly slightly low negative impacts.

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2.5 List of Acronyms

ABC	Acceptable 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
CPUE	catch per unit of effort
DAM	Dynamic Area Management
DAS	days-at-sea
DPS	Distinct Population Segments
DPWG	Data Poor Working Group
DSEIS	Draft Supplemental Environmental Impact Statement
EA	Environmental Assessment
EEZ	exclusive economic zone
EFH	essential fish habitat
EIS	Environmental Impact Statement
ESA	Endangered Species Act
F	Fishing mortality rate
FEIS	Final Environmental Impact Statement
FMP	fishery management plan
FW	framework
FY	fishing year
GB	Georges Bank
GOM	Gulf of Maine
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
LOA	letter of authorization
MA	Mid-Atlantic
MAFAC	Marine Fisheries Advisory Committee
MAFMC	Mid-Atlantic Fishery Management Council
MMPA	Marine Mammal Protection Act
MPA	Marine Protected Area
MSFCMA	Magnuson-Stevens Fishery Conservation and Management Act
MSRA	Magnuson-Stevens Reauthorization Act of 2007
MSY	maximum sustainable yield
NEFMC	New England Fishery Management Council

NEFSC	Northeast Fisheries Science Center
NEPA	National Environmental Policy Act
GARFO	Greater Atlantic Regional Fisheries Office
NFMA	Northern Fishery Management Area (Monkfish)
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
OLE	Office for Law Enforcement (NMFS)
OY	optimum yield
PBR	Potential Biological Removal
PDT	Plan Development Team
PRA	Paperwork Reduction Act
PREE	Preliminary Regulatory Economic Evaluation
RFA	Regulatory Flexibility Act
RMA	Regulated Mesh Area
RPA	Reasonable and Prudent Alternatives
SA	Statistical Area
SAFE	Stock Assessment and Fishery Evaluation
SARC	Stock Assessment Review Committee
SAW	Stock Assessment Workshop
SBNMS	Stellwagen Bank National Marine Sanctuary
SEIS	Supplemental Environmental Impact Statement
SFA	Sustainable Fisheries Act
SIA	Social Impact Assessment
SFMA	Southern Fishery Management Area (monkfish)
SNE	southern New England
SSB	spawning stock biomass
SSC	Scientific and Statistical Committee
TAC	total allowable catch
TED	turtle excluder device
TTAC	Target Total Allowable Catch
TTAL	Target Total Allowable Landings
VEC	Valued Ecosystem Component
VMS	vessel monitoring system
VPA	virtual population analysis
VTR	vessel trip report
WGOM	Western Gulf of Maine
YPR	yield per recruit

3.0 Background, Purpose and Need

3.1 Background and Introduction

3.1.1 History and Summary of the Fishery Management Plan

The Monkfish FMP was initially implemented in 1999, and has been modified several times, most recently in 2011 with the implementation of Amendment 5 and FW 9 in 2016. The documents pertaining to previous management actions are available on the NEFMC website, www.nefmc.org.

For management purposes, the monkfish fishery is divided into two areas; the Northern Fishery Management Area (NFMA) and the Southern Fishery Management Area (SFMA; see Figure 1). While scientific evidence for two biological stocks is uncertain, and additional research, including archival tagging, is ongoing, fisheries in the two areas are clearly distinct. As a result, stock assessments are completed for the two areas separately to be able to support the management plan. The NFMA monkfish fishery is closely integrated with the multispecies fishery, and is primarily a trawl fishery, while the SFMA fishery is primarily a gillnet fishery targeting monkfish almost exclusively. These differences have resulted in some differences in management measures, such as landing limits and DAS allocations, between the two areas.

The monkfish fishery is managed primarily with a days-at-sea (DAS) management system with corresponding trip limits per DAS. The monkfish fishery is jointly managed by the New England and Mid-Atlantic Fishery Management Councils. The fishing year extends from May 1 to April 30. The range for the monkfish fishery is the EEZ north of the North Carolina/South Carolina border. However, there are two separate management areas, the Northern (NFMA) and Southern (SFMA) Fishery Management Areas based on different fishing activity between the two areas. The boundary between the NFMA and SFMA runs south along the 70° W longitude line from the south-facing shoreline of Cape Cod, MA, to 41° N latitude, then eastward to the U.S.-Canada maritime boundary. For commercial vessels, these management areas have different possession limits and regulatory requirements. There are seven categories of monkfish permits (A, B, C, D, E, F, and H); trip limits can vary with permit types as outlined at https://www.greateratlantic.fisheries.noaa.gov/sustainable/species/monkfish/index.html.

The Monkfish FMP requires the annual catch limit (ACL), annual catch target (ACT), total allowable landings (TAL), and effort controls (DAS and trip limits) to be specified every three years. The overfishing limit was set above the ACL. The ACL was set equal to the acceptable biological catch (ABC). The ACT is defined as the ACL minus the management uncertainty buffer. The TAL is the ACT minus calculated discards. If the ACL is determined to have been exceeded in any given year, the amount of the ACL overage will be deducted from the ACT for the corresponding monkfish stock on a pound-for-pound basis. Adjustments to the DAS and trip limits may also be made if the Accountability Measure is triggered. The 2007 Northeast Data Poor Stocks Working Group and the 2013 operational assessment used the SCALE model (Statistical Catch-at-Length Analysis) to estimate fishing mortality, recruitment, and stock biomass.

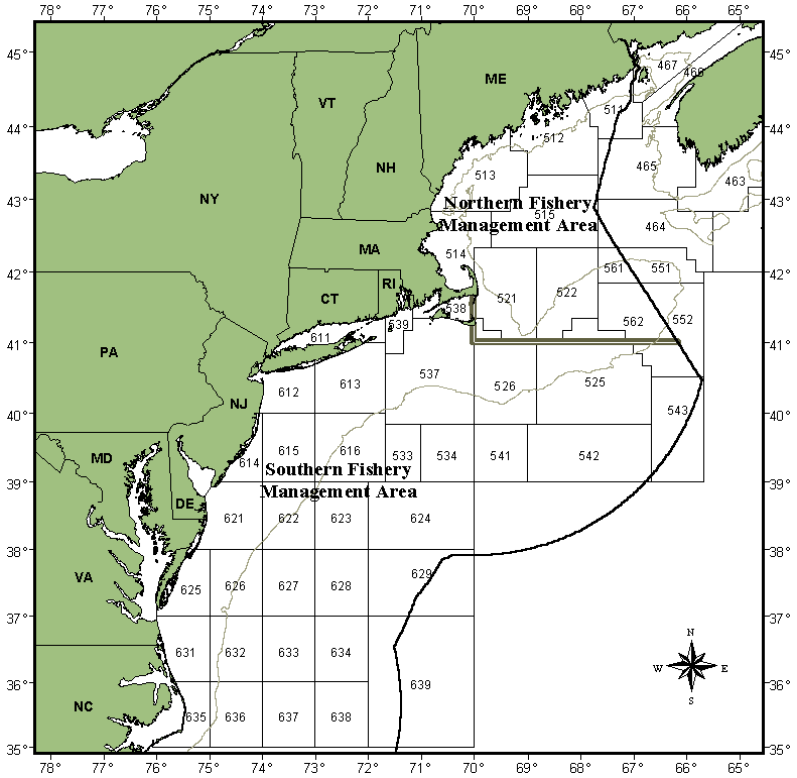


Figure 1 – Monkfish fishery management areas and statistical areas.

3.1.2 Other Fishery Management Plans Affecting the Monkfish Fishery

A majority of monkfish limited access vessels also hold limited access permits in either the Northeast Multispecies (groundfish) or Atlantic Sea Scallop fisheries. Both of those fisheries continue to undergo changes in their respective management programs, which have direct and indirect effects on the monkfish fishery. Many vessels with groundfish permits catch and land monkfish while targeting groundfish. Several management measures "link" the fisheries by allowing vessels to simultaneously utilize a groundfish and monkfish day-at-sea (DAS). For these reasons, groundfish effort has a substantial impact on monkfish effort and landings, particularly in the NFMA. While some NE multispecies stocks have responded positively to management actions (e.g., haddock and redfish) others remain overfished and in need of rebuilding. Consequently, the Multispecies FMP continues to constrain fishing effort and has been subject to major changes, most notably the adoption of catch shares through the allocation of quota to sectors (NEFMC, 2009).

Similarly, scallop and monkfish DAS could also be linked. However, in large part due to the success of the Scallop FMP and the profitability of the fishery, scallop vessels that also have monkfish limited access permits use their allocated effort to target scallops rather than monkfish; they would be required to use a scallop DAS to target monkfish, and be prohibited from using a dredge on those trips. As a result, a substantial portion of the allocated monkfish effort (DAS) is not used.

3.1.2.1 Groundfish Exemption Areas

Exempted fisheries allow fishing vessels to fish for specific species without being subject to certain NE multispecies regulations including DAS, provided the bycatch of regulated species is minimized. The

GOM/GB monkfish gillnet exemption area restricts vessels fishing under the exemption to gillnets with minimum mesh size of 10 inches (diamond) throughout the net between July 1 through September 14; only monkfish and lobster can be landed. The SNE monkfish and skate trawl exemption restricts vessels fishing under the exemption to a minimum mesh size of 10 inch square or 12 inch diamond mesh. Landings are restricted to monkfish, incidentally caught species allowed in the SNE Regulated Mesh Area, and skates. Currently, the SNE monkfish and skate gillnet exempted fishery restricts vessels fishing under the exemption to gillnet gear with a minimum mesh size of 10 inches with only monkfish, some incidentally caught species, and skate allowed to be retained. Currently the Mid-Atlantic Exemption Area exempts vessels fishing in the exemption area from the 5-percent bycatch criteria specifications and may, therefore, fish in a fishery outside of a NE multispecies DAS, provided that the vessel does not possess or land regulated multispecies finfish. Further information on possession limit restrictions can be found at https://www.greateratlantic.fisheries.noaa.gov/regs/infodocs/large_mesh_exemption.pdf.

3.1.2.2 Northeast Skate Complex FMP

The final rule for Amendment 3 to the Northeast Skate Complex FMP was published on June 16, 2010 (NEFMC, 2009b). This amendment establishes ACLs, AMs, seasonal bait fishery quotas, and skate wing, bait, and incidental skate landing limits to address the following issues:

- Overfished status of thorny skate
- Overfishing of thorny skate
- Implementation of ACLs and AMs, as mandated by the reauthorized MSA, and
- A baseline review process that has become obsolete and less meaningful.

The final action established an incidental skate landing limit of 500 lb of wing weight (1,135 lb whole weight), established a 20,000 lb whole weight landing limit for vessels with a Skate Bait Letter of Authorization, reduced the skate wing landing limit to 5,000 lb wing weight (11,350 lb whole weight), and adopted a three-season annual quota system for the skate bait fishery. In-season AMs will reduce allowable skate landing landings to the incidental limit (500 lb of skate wing weight, 1,135 lb whole weight) when landings approach 80-90% of allowable levels.

An annual monitoring report and a bi-annual specification process replaced the obsolete baseline review procedures. The report describes the expected impacts of recent regulations and pending management alternatives in other fisheries that impact the skate resource. The first annual monitoring report was published in June 2010 and is available at:
http://www.nefmc.org/skates/annual_reviews/2010%20Annual%20Monitoring%20Report%20Final.pdf.

A number of Framework Adjustments have been made to the Skate FMP. The most recently, FW 3, became effective August 17, 2016. This framework established specifications for FY2016 and 2017, in addition, to a seasonal structure for the wing fishery that splits the wing TAL into two seasons based on a three year moving average of landings. Skate possession limits were unchanged.

3.1.2.3 Spiny Dogfish FMP

Amendment 3 to the Spiny Dogfish FMP was implemented on August 14, 2014 to address four issues in the management of the spiny dogfish fishery (MAFMC, 2014). This action implemented a research set-aside funding program for spiny dogfish, updated spiny dogfish essential fish habitat definitions, allowed rollover of management measures from one year to the next until replaced via rulemaking, and eliminated the seasonal allocation of the commercial quota to improve alignment of management measures with

those of the Atlantic States Marine Fisheries Commission's (ASMFC) interstate management plan for spiny dogfish.

The specifications setting process for FY2016-2018 resulted in a decrease in the ABC to 23,617 mt in 2016, 23,045 mt in 2017 and 22,635 mt in 2018. For FY2016, the commercial quota was reduced to 18,307 mt. The federal spiny dogfish trip limit was increased to 6,000 lb.

3.2 Purpose and Need

This action is needed to update fishery specifications for the monkfish FMP for the years 2017-2019 using the most recent scientific advice and monkfish stock assessment. The propose of this action is to establish DAS and landing limits for the NFMA and SFMA, as well as to modify discard rates and uncertainty buffers based upon the updated fishery information.

This action is also needed to allow fishery participants to more effectively harvest OY and achieve the annual TAL in each management area. As described in section 7.1.1.1, fishery participants have been unable to obtain the TAL in recent years, and need flexibility with which to do so. The additional purpose of this action is to explore management measures that would allow for operational flexibility and increased participant access to the monkfish TAL.

3.3 Goals and Objectives

The original FMP specified the following management objectives:

1. To end and prevent overfishing; rebuilding and maintaining a healthy spawning stock;
2. To optimize yield and maximize economic benefits to the various fishing sectors;
3. To prevent increased fishing on immature fish;
4. To allow the traditional incidental catch of monkfish to occur.

The goals and objectives for this framework supplement the basic FMP objectives. As discussed in the Purpose and Need Section above, this framework is intended to address identified needs consistent with these FMP objectives.

4.0 Alternatives under Consideration

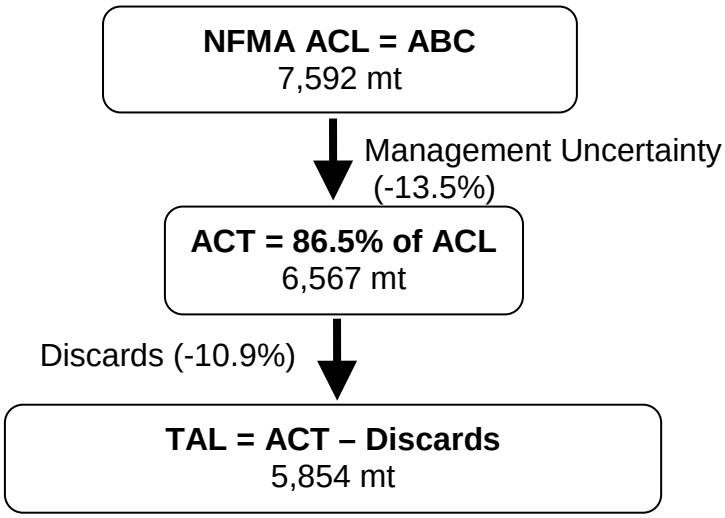
4.1 Updates to Annual Catch Limits

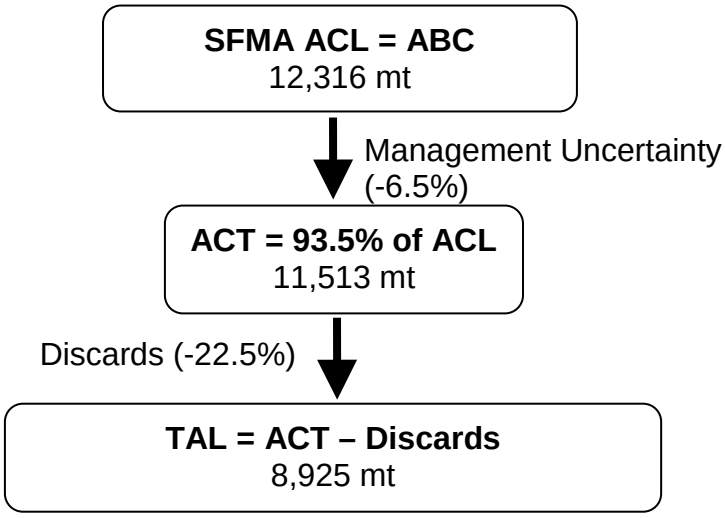
4.1.1 Revised Annual Catch Limits

The 2016 operational assessment did not include an update to the population model (SCALE) used in previous assessments but instead provided a plan to update catch advice (Richards, 2016). The SCALE model could not be updated because of uncertainty about the ageing methodology currently used to estimate monkfish growth. As a result, components of the biological reference points, such as $F_{THRESHOLD}$, could not be updated resulting in no updates to the OFL. The OFL is defined as the product of $F_{threshold}$ and current exploitable biomass ($B_{current}$) and was last calculated using the SCALE model updated in the 2013 operational assessment (NEFSC, 2013). The 2016 operational assessment did not vacate the benchmark assessment. The 2016 assessment did update several indicators including commercial fishery statistics, fishery-independent survey indices, and fishery performance indices. Based on the observed trends, the SSC recommended status quo OFLs and ABCs for both management areas for FYs 2017 - 2019.

4.1.1.1 Option 1: No Action

This option would maintain the specifications (ABC, ACT, and TAL) for both the NFMA and SFMA as set in Framework 8 (NEFMC, 2014). This option would not take into account the updated discard rate information from the 2016 operational assessment. The OFL would be maintained as 17,805 mt and 23,204 mt for the NFMA and SFMA, respectively, and the ABC, ACT and TAL calculated as in FW8:

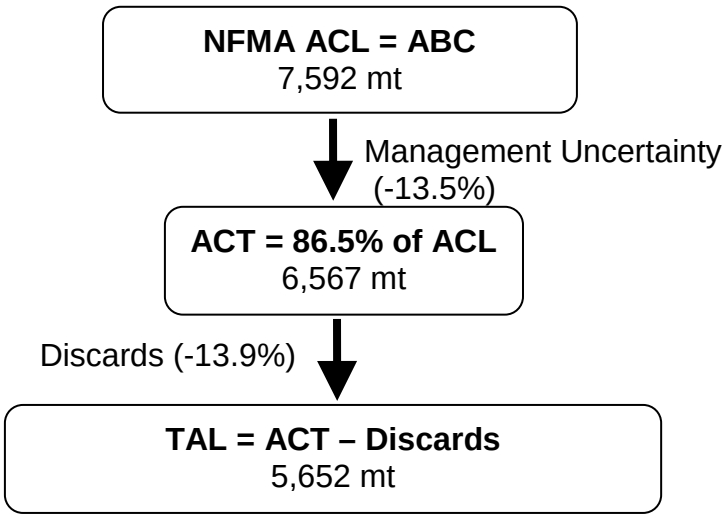


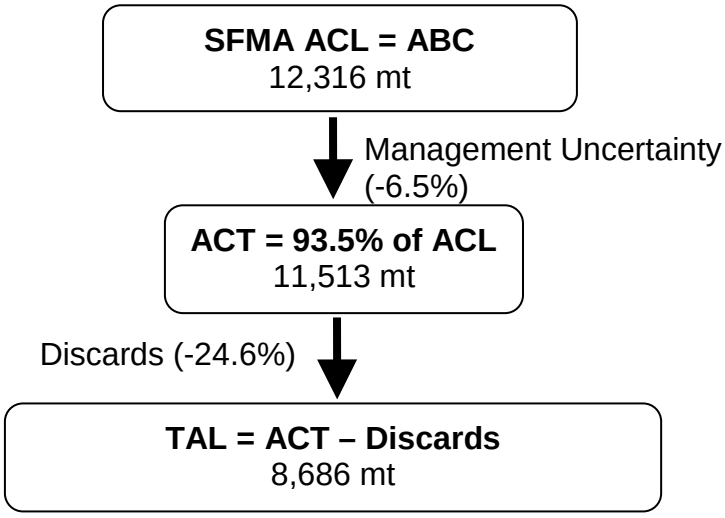


Rationale: The 2016 operational assessment provided a plan for setting catch advice. The status quo TAL would continue to use the 2007 Data Poor Working Group Assessment discard estimates that do not include updates in data and estimation methodology. The discard rate is calculated as the ratio of discards to catch, and under status quo, the years used to calculate the discard rate would be 2004-2006.

4.1.1.2 Option 2: Updated Discard Rate for Northern and Southern Fishery Management Areas

This option would maintain the specifications (ACL and ACT) for both the NFMA and SFMA as set in Framework 8 (NEFMC, 2014) but would update the discard rate for both management areas based on the 2016 operational assessment.

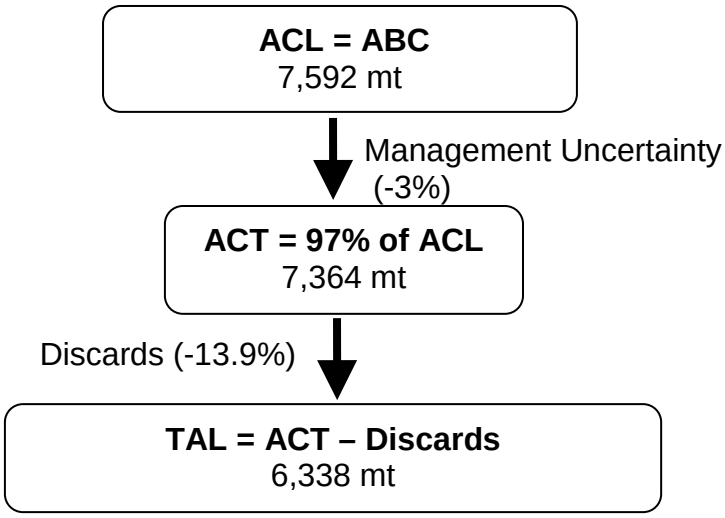




Rationale: The discard rate is calculated from the ratio between the same 3 years of discards and catch. Under Option 2, the years used to calculate the discard rate were 2013-2015.

4.1.1.3 Option 3: Reduce the Management Uncertainty Buffer to 3% in the Northern Fishery Management Area (***Preferred Alternative***)

Option 3 would reduce the management uncertainty buffer in the NFMA to 3%. The ACL would not be affected by that reduction but the ACT would increase. The revised specifications would also update the years used to calculate the discard rate from 2004-2006 to 2013-2015 (as outlined in Option 2 [Section 1.1.1.2] above). The overfishing limit (OFL) would be maintained as 17,805 mt.

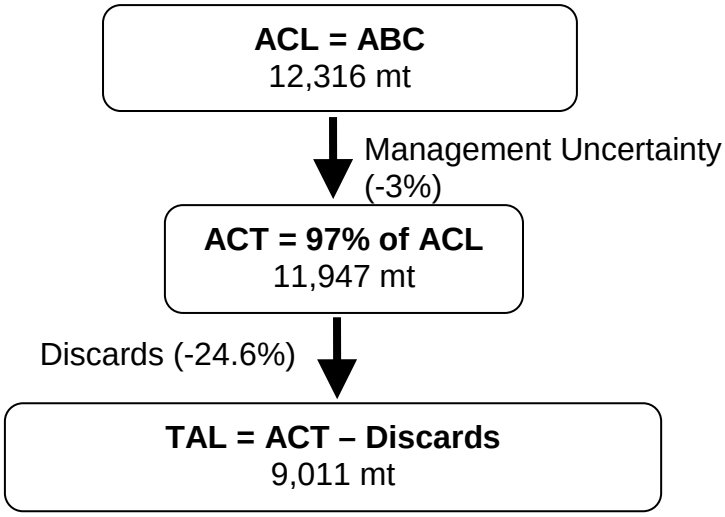


Rationale: The methodology used to calculate discards has performed well by setting aside an adequate amount of poundage to reduce the likelihood of the ACL being exceeded. This could justify reducing the management uncertainty buffer. The ACT was established as a proactive Accountability Measure (AM) that was set sufficiently below the ACL to prevent the ACL from being exceeded in consideration of all

sources of management uncertainty. Sources of management uncertainty included number of permits (active limited access permits, open access permits), DAS/trip limits (DAS usage rate, DAS usage pattern, catch rates), incidental catch fisheries (participants, catch rates), annual participation in each management area, gear used, enforcement, and regulations in other FMPs. Less than 62% of the ACL was achieved in FY2015, indicating that the risk of exceeding the ACL is low. The discard rate is calculated from the ratio between the same 3 years of discards and catch. Under Option 3, the years used to calculate the discard rate were 2013-2015.

4.1.1.4 Option 4: Reduce the Management Uncertainty Buffer to 3% in the Southern Fishery Management Area (***Preferred Alternative***)

Option 4 would reduce the management uncertainty buffer in the SFMA to 3%. The ACL would not be affected by that reduction but the ACT would increase. The OFL would be maintained as 23,304 mt. The revised specifications would also update the years used to calculate the discard rate from 2004-2006 to 2013-2015 (as outlined in Option 2 [Section 1.1.1.2] above).



Rationale: The performance of the methodology used to calculate discards has performed well by setting aside an adequate amount of poundage to reduce the likelihood of the ACL being exceeded. This could justify reducing the management uncertainty buffer. The ACT was established as a proactive Accountability Measure (AM) that was set sufficiently below the ACL to prevent the ACL from being exceeded in consideration of all sources of management uncertainty. Sources of management uncertainty included number of permits (active limited access permits, open access permits), DAS/trip limits (DAS usage rate, DAS usage pattern, catch rates), incidental catch fisheries (participants, catch rates), annual participation in each management area, gear used, enforcement, and regulations in other FMPs. Less than 48% of the ACL was achieved in FY2015, indicating that the risk of exceeding the ACL is low. The discard rate is calculated from the ratio between the same 3 years of discards and catch. Under Option 4, the years used to calculate the discard rate were 2013-2015.

4.2 Modifications to Current Monkfish Effort Controls

In order to land more than incidental amounts of monkfish, vessels must be fishing under one or a combination of the following: a monkfish DAS, a Northeast (NE) multispecies day-at-sea (DAS), an Atlantic sea scallop DAS. Monkfish Permit Category C and D vessels (i.e., those also issued a limited access NE multispecies DAS permit) can declare a monkfish DAS while at sea in the NFMA if they are fishing on a NE multispecies DAS and declare the "monkfish option" prior to leaving port at the start of its trip. Permit Category C and D vessels fishing in the NFMA on both a NE multispecies and monkfish DAS do not have a monkfish trip limit.

As part of the specifications setting process, adjustments to DAS allocations and trip limits can be necessary to ensure that the fishery achieves, but does not exceed, the catch limits set in this action.

4.2.1 Modify the DAS allocation and/or trip limits in the NFMA

4.2.1.1 Option 1: No Action

No action would maintain the existing DAS allocations and trip limits in the NFMA. Trip limits would remain as outlined in Table 1 when fishing on a monkfish DAS. DAS allocations would be kept at 45 DAS.

Table 1 - Landing limits while on a monkfish DAS in the NFMA

NFMA				
Permit Category	A	B	C	D
Landing limit (tail weight per DAS)	1,250 lb	600 lb	Unlimited (when also on a NE multispecies DAS)	Unlimited (when also on a NE multispecies DAS)

Rationale: The no action alternative would continue the stability and consistency that allows participants to maintain their business plans and reduce the likelihood of overfishing. The NFMA fishery is not limited by DAS allocations or the daily landing limit. The number of DAS used in the NFMA is low (Hermsen, 2016 [Appendix I]). The number of permit holders using their full allocation is low in the NFMA.

4.2.1.2 Option 2: Increase the incidental trip limits in the NFMA (***Preferred Alternative***)

Option 2 would maintain the status quo DAS allocations and the status quo trip limits when fishing on a monkfish DAS in the NFMA, but would increase the incidental landing limits when on a NE multispecies DAS. The incidental landing limits would increase to 900 lb tail weight/DAS for category C vessels and 750 lb tail weight/DAS for category D vessels. Incidental landing limits would remain at 25% of landings onboard, not to exceed 300 lb for permit category E, F, or H, when fishing on a NE multispecies DAS.

Rationale: This alternative increases incidental trip limits on a NE multispecies DAS, which will help decrease the administrative burden on vessels in the NFMA and may help reduce regulatory discards of monkfish in the event that the incidental limit has previously limited fishing effort. The majority of fishing effort and monkfish landings in the NFMA occurs in association with groundfish trips. It is possible that increasing the incidental landing limit could result in additional operational flexibility, catch, and monkfish landings for some vessels.

4.2.2 **Modify the DAS allocation and trip limits in the SFMA**

4.2.2.1 Option 1: No Action

No action would maintain the existing DAS allocations and trip limits in the SFMA. Trip limits would remain as outlined in Table 2 when fishing on a monkfish DAS. DAS allocations would be kept at 32 DAS.

Table 2 - Trip limits in the SFMA when on a monkfish DAS

SFMA			
Permit Category	A, C, or G	B, D, or H	F
Landing limit (tail weight per DAS)	610 lb	500 lb	1,600 lb

Rationale: The no action alternative would continue the stability and consistency that allows participants to maintain their business plans. This would also maintain fishing effort at a level not shown to result in overfishing in previous assessments. However, the 2016 operational assessment indicated a decrease in exploitable biomass.

4.2.2.2 Option 2: Increase the DAS Allocation and Trip Limits in the SFMA (***Preferred Alternative***)

Option 2 would increase the DAS allocation in the SFMA by 15%. DAS would increase from 32 to 37. It would also increase the SFMA DAS trip limits by 15%. Trip limits for permit categories A and C would increase to 700 lb tail weight per DAS, for permit category B and D vessels and 575 lb tail weight per DAS.

Incidental landing limits would remain 50 lb for category E or H permits and non-trawl category C, D, or F permits, and at 300 lb for trawl category C, D, or F permits. Incidental landing limits would remain at 50 lb for category E or H permits and non-trawl category C, D, or F permits, and at 300 lb for trawl category C, D, or F permits.

Rationale: Because the SFMA TAL was not achieved in FYs 2014 and 2015, this alternative increases DAS allocation and trip limits in order to increase landings in the directed fishery. The majority of landings in the SFMA come from directed trips. Because more directed trips occur in the south, the southern fishery is restricted by DAS allocations and trip limits. Some vessels in the SFMA are using their entire DAS allocations (Figure 2, Hermsen, 2016 [Appendix I]). Therefore we would expect to see a larger impact on landings in the SFMA rather than the NFMA if the DAS allocations or daily landings limits were increased.

5.0 Considered but Rejected

5.1.1 Modify the DAS allocation and/or trip limits in the NFMA

5.1.1.1 Option 1: Increase the DAS allocation in the Northern Fishery Management Area

Option 1 would have increased the NFMA DAS allocation from 45 to up to 74 or 87 DAS depending on the management uncertainty buffer. Incidental landing limits would remain at 25% of landings onboard, not to exceed 300 lb for permit category E, F, or H, 600 lb for category C permits, and 500 lb for category D permits when fishing on a NE multispecies DAS.

This option was not pursued because it would not meet the need to increase landings and was seen as unnecessary to improve operational flexibility in the NFMA.

5.1.1.2 Option 2: Increase the DAS allocation in the SFMA

Option 2 would maintain the status quo possession limits in the SFMA (Table 2) but would increase the SFMA DAS allocation by 15%. DAS would increase from 32 to *37*. Incidental landing limits would remain 50 lb for category E or H permits and non-trawl category C, D, or F permits, and at 300 lb for trawl category C, D, or F permits.

This option was not pursued because the Council intended to increase both DAS allocations and trip limits in the SFMA. This option only increased DAS allocation.

5.1.1.3 Option 3: Increase the trip limits in the SFMA

Option 3 would maintain the status quo DAS allocations in the SFMA, but would increase the SFMA DAS trip limits by 15%. Trip limits for permit categories A and C would increase to 700 lb tail weight per DAS, for permit category B and D vessels and 575 lb tail weight per DAS. Incidental landing limits would remain at 50 lb for category E or H permits and non-trawl category C, D, or F permits, and at 300 lb for trawl category C, D, or F permits.

This option was not pursued because the Council intended to increase both DAS allocations and trip limits in the SFMA. This option only increased trip limits.

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6.0 Affected Environment (SAFE Report for 2014)

6.1 Biological Environment and Stock Status

6.1.1 Monkfish Life History

Information about monkfish life history is incomplete, although ongoing cooperative research projects continue to improve the understanding of the species biology and population dynamics. Richards et al. (2008) examined data from resource surveys spanning the period 1948-2007, and noted that "monkfish exhibited seasonal onshore-offshore shifts in distribution, migrated out of the southern MAB in mid-spring, and re-appeared there in autumn". This observation is reflected in the seasonal pattern of fishing activity, particularly in the SFMA. The authors also observed that "sex ratios at length for fish 40-65 cm long were skewed toward males in the southern Mid-Atlantic Bight (MAB), but approximated unity elsewhere, suggesting that a portion of the population resides outside sampled areas. Growth was linear at 9.9 cm per year, and did not differ by region or sex. Maximum observed size was 138 cm for females and 85 cm for males. Length at 50% maturity for males was 35.6 cm (4.1 yrs. old) in the north and 37.9 cm (4.3 yrs. old) in the south. Length at 50% maturity for females was 38.8 cm (4.6 yrs. old) in the north and 43.8 cm (4.9 yrs. old) in the south. Ripe females were found in shallow (<50 m) and deep (>200 m) water in the south, and in shallow (<50 m) water in the north." However, recent research has called the validity of the growth curves used in the assessment into question. The current method used in the U.S. estimates the age of monkfish by counting rings in the vertebrae, each ring is assumed to represent one year. An age validation study indicated that the vertebra does not provide a consistent estimate of the presumed annual rings (Bank, 2016).

6.1.2 Monkfish Stock Status

NMFS conducted an operational assessment for monkfish in 2016 (Richards, 2016) but because of the uncertainty of the growth rates the SCALE model not updated in this assessment. An alternative method to advise catch limits was developed that was based on calculating the proportional rate of change in smoothed survey indices over the most recent 3 years and using those rates to revise catch limits. The survey trend adjustment factor suggested an increase in the NFMA of 2% and a decrease in the SFMA of 13%. Because the SCALE model was not used in the 2016 operational assessment the reference points and stock status could not be updated from the 2013 operational assessment numbers (Table 3). The 2013 assessment indicates that monkfish are not overfished in the NFMA or the SFMA (Figure 2 and Figure 3), however there are high levels of uncertainty regarding Biological Reference Points (BRPs) due to gaps in the input data and a persistent retrospective pattern that underestimates F and overestimates B in each area.

Table 3- Monkfish reference points and stock status from the 2013 Monkfish Operational Assessment

	North	South	Comment
$F_{threshold}$	0.44	0.37	F_{MSY} proxy based on F_{max}
$F_{current}$ (2011)	0.08	0.11	Overfishing Not Occurring
B_{target}	46,074 mt	71,667 mt	B_{msy} proxy
$B_{threshold}$	23,037 mt	35,834 mt	$0.5*B_{target}$
$B_{current}$ (2011)	60,500 mt	111,100 mt	Not Overfished

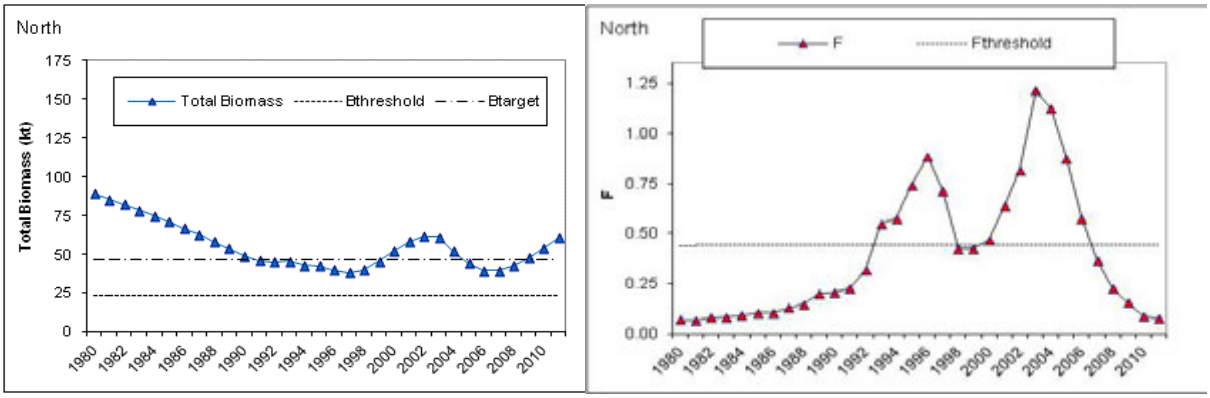


Figure 2 - Northern monkfish biomass and fishing mortality estimated from the 2013 Monkfish Operational Assessment

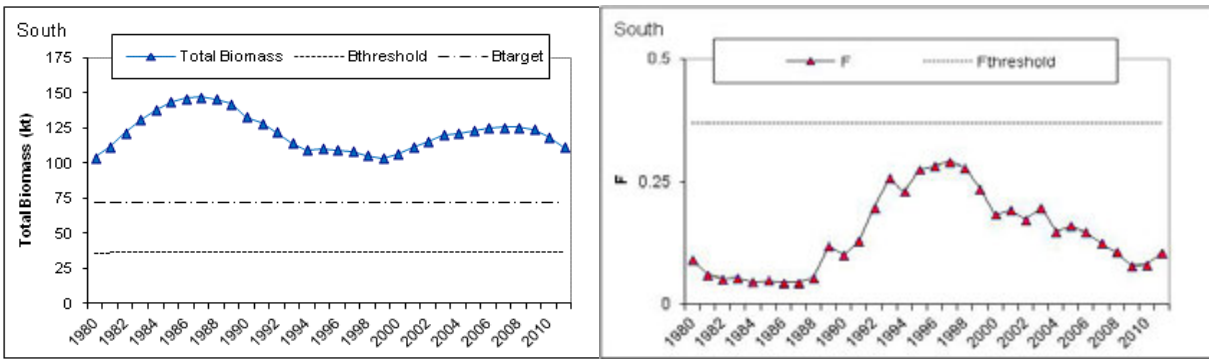


Figure 3 - Southern monkfish biomass and fishing mortality estimated from the 2013 Monkfish Operational Assessment

6.1.3 Bycatch of Non-target Species in the Fishery

The monkfish fishery is closely associated with the catch of several species managed by other FMPs, specifically groundfish, skate, and spiny dogfish fisheries. Particularly in the NFMA, monkfish can be targeted or caught as incidental bycatch during trips in which groundfish are also caught, depending on the focus of a trip. Further, skates and spiny dogfish are often caught when targeting monkfish in both areas, particularly in the SFMA.

The status of all managed groundfish stocks were most recently updated in 2015. Updated assessments occurred in 2015. These assessments are summarized in recent management actions under the Northeast Multispecies FMP, including FW 48 (NEFMC 2013a), FW 50 (NEFMC 2013b), FW 51 (NEFMC 2014b), FW 53 (NEFMC, 2015c), and FW55. Several groundfish stocks are overfished, while others are subject to overfishing (Table 4).

Table 4 - Current status of groundfish stocks for fishing year 2015 managed under the Northeast Multispecies FMP (GB = Georges Bank

	2015 Assessments	
Stock	Overfishing?	Overfished?
Georges Bank Cod	Unknown	Yes
Gulf of Maine Cod	Yes	Yes
Georges Bank Haddock	No	No
Gulf of Maine Haddock	No	No
Georges Bank Yellowtail Flounder	Unknown	Unknown
Southern New England/Mid-Atlantic Yellowtail Flounder	Yes	Yes
Cape Cod/Gulf of Maine Yellowtail Flounder	Yes	Yes
American Plaice	No	No
Witch Flounder	Yes	Yes
Georges Bank Winter Flounder	Yes	Yes
Gulf of Maine Winter Flounder	No	Unknown
Southern New England/Mid-Atlantic Winter Flounder	No	Yes
Acadian Redfish	No	No
White Hake	No	No
Pollock	No	No
Northern Windowpane Flounder	No	Yes
Southern Windowpane Flounder	No	No
Ocean Pout	No	Yes
Atlantic Halibut	Unknown	Yes
Atlantic Wolffish	No	Yes

Source: NEFSC 2015

6.1 Protected Resources

6.1.1 Species Present in the Area

Numerous protected species inhabit the environment within the monkfish FMP management unit (Table 5). These species are under NMFS jurisdiction and are afforded protection under the Endangered Species Act (ESA) of 1973 and/or the Marine Mammal Protection Act (MMPA) of 1972.

Table 5 - Species protected under the ESA and/or MMPA that may occur in the affected environment of the monkfish fishery. Marine mammal species (cetaceans and pinnipeds) italicized and in bold are considered MMPA strategic stocks.

Species	Status[2]	Potentially affected by this action?
Cetaceans		
North Atlantic right whale (Eubalaena glacialis)	***Endangered***	***Yes***
Humpback whale, West Indies DPS (Megaptera novaeangliae)[3]	***Protected (MMPA)***	***Yes***
Fin whale (Balaenoptera physalus)	***Endangered***	***Yes***
Sei whale (Balaenoptera borealis)	***Endangered***	***Yes***
Blue whale (Balaenoptera musculus)	***Endangered***	***No***
Sperm whale (Physeter microcephalus)	***Endangered***	***No***
Minke whale (*Balaenoptera acutorostrata*)	Protected (MMPA)	Yes
Pilot whale (*Globicephala spp.*)[4]	Protected (MMPA)	Yes
Risso's dolphin (*Grampus griseus*)	Protected (MMPA)	Yes
Atlantic white-sided dolphin (*Lagenorhynchus acutus*)	Protected (MMPA)	Yes
Short Beaked Common dolphin (*Delphinus delphis*)[5]	Protected (MMPA)	Yes
Spotted dolphin (*Stenella frontalis*)	Protected (MMPA)	No
Bottlenose dolphin (Tursiops truncatus)[6]	***Protected (MMPA)***	***Yes***
Harbor porpoise (Phocoena phocoena)	***Protected (MMPA)***	***Yes***
Sea Turtles		
Leatherback sea turtle (*Dermochelys coriacea*)	Endangered	Yes
Kemp's ridley sea turtle (*Lepidochelys kempii*)	Endangered	Yes
Green sea turtle, North Atlantic DPS (*Chelonia mydas*)[7]	Threatened	Yes
Loggerhead sea turtle (*Caretta caretta*), Northwest Atlantic Ocean DPS	Threatened	Yes
Hawksbill sea turtle (*Eretmochelys imbricate*)	Endangered	No
Fish		
Shortnose sturgeon (*Acipenser brevirostrum*)	Endangered	No
Atlantic salmon (*Salmo salar*)	Endangered	Yes
Atlantic sturgeon *(Acipenser oxyrinchus)*		
Gulf of Maine DPS	Threatened	Yes
New York Bight DPS, Chesapeake Bay DPS, Carolina DPS & South Atlantic DPS	Endangered	Yes
Cusk (*Brosme brosme)*	Candidate	Yes
Thorny skate (*Amblyraja radiata*)	Candidate	Yes
Pinnipeds		

Harbor seal (*Phoca vitulina*)	Protected (MMPA)	Yes
Gray seal (*Halichoerus grypus*)	Protected (MMPA)	Yes
Harp seal (*Phoca groenlandicus*)	Protected (MMPA)	Yes
Hooded seal (*Cystophora cristata*)	Protected (MMPA)	Yes
Critical Habitat		
North Atlantic Right Whale[8]	ESA (Protected)	No
Northwest Atlantic DPS of Loggerhead Sea Turtle	ESA (Protected)	No

Notes:
[1] A strategic stock is defined under the MMPA as a marine mammal stock for which: (1) the level of direct human-caused mortality exceeds the potential biological removal level; (2) based on the best available scientific information, is declining and is likely to be listed as a threatened species under the ESA within the foreseeable future; and/or (3) is listed as a threatened or endangered species under the ESA, or is designated as depleted under the MMPA (Section 3 of the MMPA of 1972).
[2] The status of the species is defined by whether the species is listed under the ESA as endangered (species are at risk of extinction) or threatened (species at risk of endangerment), or protected under the MMPA. Note, marine mammals listed under the ESA are also protected under the MMPA. Candidate species are those species in which ESA listing may be warranted.
[3] On September 8, 2016, a final rule was issued revising the ESA listing status of humpback whales (81 FR 62259). Fourteen DPSs were designated: one as threatened, four as endangered, and nine as not warranting listing. The DPS found in U.S. Atlantic waters, the West Indies DPS, is delisted under the ESA; however, this DPS is still protected under the MMPA.
[4] There are two species of pilot whales: short finned (*G. melas melas*) and long finned (*G. macrorhynchus*). Due to the difficulties in identifying the species at sea, they are often just referred to as *Globicephala spp*.
[5] Prior to 2008, this species was called "common dolphin."
[6] This includes the following Stocks of Bottlenose Dolphins: Western North Atlantic Offshore, Northern Migratory Coastal (strategic stock), and Southern Migratory Coastal (strategic stock).
[7] On April 6, 2016, a final rule was issued removing the current range-wide listing of green sea turtles and, in its place, listing eight green sea turtle DPSs as threatened and three DPSs as endangered (81 FR 20057). The green sea turtle DPS located in the Northwest Atlantic is the North Atlantic DPS of green sea turtles; this DPS is considered threatened under the ESA.
[8] Originally designated June 3, 1994 (59 FR 28805); Expanded on January 27, 2016 (81 FR 4837).

Cusk and thorny skate are NMFS "candidate species" under the ESA. Candidate species are those petitioned species for which NMFS has determined that listing may be warranted under the ESA and those species for which NMFS has initiated an ESA status review through an announcement in the Federal Register. If a species is proposed for listing the conference provisions under Section 7 of the ESA apply (see 50 CFR 402.10); however, candidate species receive no substantive or procedural protection under the ESA. As a result these species will not be discussed further in this and the following sections; however, NMFS recommends that project proponents consider implementing conservation actions to limit the potential for adverse effects on candidate species from any proposed action. Additional information on cusk and thorny skate can be found at http://www.nmfs.noaa.gov/pr/species/esa/candidate.htm.

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

Based on available information, it has been determined that this action is not likely to affect multiple ESA listed and/or marine mammal protected species or any designated critical habitat (see Table 5). This determination has been made because either the occurrence of the species is not known to overlap with

the area primarily affected by the action and/or there have never been documented interactions between the species and the primary gear type (i.e., gillnet and bottom trawl) used to prosecute the monkfish fishery (see Waring *et al*. 2014a, 2015, 2016; NMFS NEFSC FSB 2015; http://www.nefsc.noaa.gov/fsb/take_reports/nefop.html; NMFS 2013). In the case of critical habitat, this determination has been made because the action will not affect the essential physical and biological features of North Atlantic right whale or loggerhead (NWA DPS) critical habitat and therefore, will not result in the destruction or adverse modification of any species critical habitat (NMFS 2013; NMFS 2014a; NMFS 2015a,b).

6.1.3 **Species Potentially Affected by the Proposed Action**

Table 5 provides a list of sea turtle, marine mammal, and fish species present in the affected environment of the monkfish fishery, and that may also be affected by the operation of this fishery. Of primary concern is the potential for the fishery to interact (e.g., bycatch, entanglement) with these species. To understand the potential risk of an interaction, it is necessary to consider (1) species occurrence in the affected environment of the fishery and how the fishery will overlap in time and space with this occurrence; and (2) data and observed records of protected species interaction with particular fishing gear types. Information on species occurrence in the affected environment of the monkfish fishery is provided in this section, while information on protected species interactions with specific fishery gear is provided in Section 1.1.7.

6.1.3.1 Sea Turtles

Green (North Atlantic DPS), Kemp's ridley, leatherback, and loggerhead (Northwest Atlantic Ocean DPS) sea turtle are the four ESA listed species of sea turtles that occur in the area of operation for the 13 GAR fisheries (see Table 5). Three of the four species are considered hard-shelled turtles (i.e., green, loggerhead, and Kemp's ridley). Additional background information on the range-wide status of the other four species, as well as a description and life history of the species, can be found in a number of published documents, including sea turtle status reviews and biological reports (NMFS and USFWS 1995; Turtle Expert Working Group [TEWG] 1998, 2000, 2007, 2009; Conant *et al*. 2009; NMFS and USFWS 2013; NMFS and USFWS 2015; Seminoff *et al*. 2015), and recovery plans for the loggerhead sea turtle (Northwest Atlantic DPS; NMFS and USFWS 2008), leatherback sea turtle (NMFS and USFWS 1992), Kemp's ridley sea turtle (NMFS *et al.* 2011), and green sea turtle (NMFS and USFWS 1991).

Hard-shelled sea turtles

Distribution

In U.S. Northwest Atlantic waters, hard-shelled turtles commonly occur throughout the continental shelf from Florida (FL) to Cape Cod, Massachusetts (MA), although their presence varies with the seasons due to changes in water temperature (Shoop and Kenney 1992; Epperly *et al.* 1995a, 1995b; Braun and Epperly 1996; Mitchell *et al.* 2003; Braun-McNeill *et al.* 2008; TEWG 2009). While hard-shelled turtles are most common south of Cape Cod, MA, they are known to occur in the Gulf of Maine (GOM). Loggerheads, the most common hard-shelled sea turtle in the GAR, feed as far north as southern Canada. Loggerheads have been observed in waters with surface temperatures of 7 °C to 30 °C, but water temperatures ≥11 °C are most favorable (Shoop and Kenney 1992; Epperly *et al.* 1995b). Sea turtle presence in U.S. Atlantic waters is also influenced by water depth. While hard-shelled turtles occur in waters from the beach to beyond the continental shelf, they are most commonly found in neritic waters of the inner continental shelf (Mitchell *et al.* 2003; Braun-McNeill and Epperly 2002; Morreale and

Standora 2005; Blumenthal *et al.* 2006; Hawkes *et al.* 2006; McClellan and Read 2007; Mansfield *et al.* 2009; Hawkes *et al.* 2011; Griffin *et al.* 2013).

Seasonality

Hard-shelled sea turtles occur year-round in waters off Cape Hatteras, North Carolina (NC) and south. As coastal water temperatures warm in the spring, loggerheads begin to migrate to inshore waters of the southeast United States and also move up the Atlantic Coast (Epperly *et al.* 1995a, 1995b, 1995c; Braun-McNeill and Epperly 2002; Morreale and Standora 2005; Griffin *et al.* 2013), occurring in Virginia (VA) foraging areas as early as late April and on the most northern foraging grounds in the GOM in June (Shoop and Kenney 1992). The trend is reversed in the fall as water temperatures cool. The large majority leave the GOM by September, but some remain in Mid-Atlantic and Northeast areas until late fall. By December, sea turtles have migrated south to waters offshore of NC, particularly south of Cape Hatteras, and further south (Shoop and Kenney 1992; Epperly *et al.* 1995b; Hawkes *et al.* 2011; Griffin *et al.* 2013).

Leatherback sea turtles

Leatherback sea turtles also engage in routine migrations between northern temperate and tropical waters (NMFS and USFWS 1992; James *et al*. 2005; James *et al*. 2006; Dodge *et al*. 2014). Leatherbacks, a pelagic species, are known to use coastal waters of the U.S. continental shelf (James *et al*. 2005; Eckert *et al*. 2006; Murphy *et al*. 2006; Dodge *et al*. 2014). They have a greater tolerance for colder water than hard-shelled sea turtles (NMFS and USFWS 2013). They are also found in more northern waters later in the year, with most leaving the Northwest Atlantic shelves by mid-November (James *et al*. 2005; James *et al*. 2006; Dodge *et al*. 2014).

6.1.3.2 Marine Mammals

6.1.3.2.1 Large Whales

As provided in Table 5, as North Atlantic right, humpback, fin, sei, and minke whales are found throughout the waters of the Northwest Atlantic Ocean, these species will occur in the affected environment of the monkfish fishery. In general, these species follow an annual pattern of migration between low latitude (south of 35°N) wintering/calving grounds and high latitude spring/summer foraging grounds (primarily north of 41°N; Waring *et al*. 2014a; Waring *et al*. 2015; Waring *et al*. 2016; NMFS 1991, 2005, 2010, 2011, 2012). This, however, is a simplification of whale movements, particularly as it relates to winter movements. It remains unknown if all individuals of a population migrate to low latitudes in the winter, although, increasing evidence suggests that for some species (e.g., right and humpback whales), some portion of the population remains in higher latitudes throughout the winter (Waring *et al*. 2014a; Waring *et al*. 2015; Waring *et al*. 2016; Khan *et al*. 2009, 2010, 2011, 2012; Brown *et al*. 2002; NOAA 2008; Cole *et al*. 2013; Clapham *et al*. 1993; Swingle *et al*. 1993; Vu *et al*. 2012). Although further research is needed to provide a clearer understanding of large whale movements and distribution in the winter, the distribution and movements of large whales to foraging grounds in the spring/summer is well understood. Movements of whales into higher latitudes coincide with peak productivity in these waters. As a result, the distribution of large whales in higher latitudes is strongly governed by prey availability and distribution, with large numbers of whales coinciding with dense patches of preferred forage (Mayo and Marx 1990; Kenney *et al*. 1986, 1995; Baumgartner *et al*. 2003; Baumgartner and Mate 2003; Payne *et al*.1986, 1990; Brown *et al.* 2002; Kenney and Hartley 2001; Schilling *et al.* 1992). For additional information on the biology, status, and range wide distribution of each whale species please refer to: Waring *et al*. 2014a; Waring *et al*. 2015; Waring *et al*. 2016; NMFS 1991, 2005, 2010, 2011, 2012.

To further assist in understanding how the monkfish fishery may overlaps in time and space with the occurrence of large whales, a general overview on species occurrence and distribution in the area of operation for the monkfish fishery is provided in the following table (Table 6).

Table 6 - Large whale occurrence in the area of operation for the monkfish fishery.

Species	Prevalence and Approximate Months of Occurrence
North Atlantic Right Whale	• Distributed throughout all continental shelf waters from the GOM to the South Atlantic Bight (SAB) throughout the year. • New England waters (GOM and GB regions) = **Foraging Grounds**. Important foraging grounds include (Late winter (January) through summer (July)): › Massachusetts and Cape Cod Bays; › Great South Channel; › GOM (e.g., Jordan Basin; Wilkinson Basin; Cashes Ledge, Platts Bank, Georges Basin); and › northern edge of GB; • Mid-Atlantic waters: Migratory pathway to/from northern (high latitude) foraging and southern calving grounds. • SAB (Coastal waters from Cape Fear, North Carolina (NC), to 28°N (northeastern Florida (FL)) = **Calving and Nursing Grounds** (mid- November-early April). • Increasing evidence of wintering areas (approximately November – January) in: › Cape Cod Bay; › Jeffreys and Cashes Ledges; › Jordan Basin; and › Massachusetts Bay (e.g., Stellwagen Bank).
Humpback	• Distributed throughout all continental shelf waters of the Mid-Atlantic (SNE included), GOM, and GB throughout the year. • New England waters (GOM and GB regions) = **Foraging Grounds** (March-November). • Mid-Atlantic waters: Migratory pathway to/from northern (high latitude) foraging and southern (West Indies) calving grounds. • Increasing evidence of wintering areas (for juveniles) in Mid-Atlantic (e.g., waters in the vicinity of Chesapeake and Delaware Bays; peak presence approximately January through March) and Southeastern coastal waters.
Fin	• Distributed throughout all continental shelf waters of the Mid-Atlantic (SNE included), GOM, and GB throughout the year.

Species	Prevalence and Approximate Months of Occurrence
	• Mid-Atlantic waters: › Migratory pathway to/from northern (high latitude) foraging and southern (low latitude) calving grounds; and › Possible offshore calving area (October-January). • New England(GOM and GB)/SNE waters = **Foraging Grounds** (greatest densities March-August; lower densities September-November).Important foraging grounds include: > Massachusetts Bay (esp. Stellwagen Bank); > Great South Channel; > Waters off Cape Cod (~40-50 meter contour); > GOM; > Perimeter (primarily eastern) of GB; and > Mid-shelf area off the east end of Long Island. • Evidence of wintering areas in mid-shelf areas east of New Jersey (NJ), Stellwagen Bank; and eastern perimeter of GB.
Sei	• Uncommon in shallow, inshore waters of the Mid-Atlantic (SNE included), GB, and GOM; however, occasional incursions during peak prey availability and abundance. • Primarily found in deep waters along the shelf edge, shelf break, and ocean basins between banks. • Spring through summer, found in greatest densities in offshore waters of the GOM and GB; sightings concentrated along the northern, eastern (into Northeast Channel) and southwestern (in the area of Hydrographer Canyon) edge of GB.
Minke	• Widely distributed throughout continental shelf waters of the Mid-Atlantic (SNE included), GOM, and GB from spring through fall. • Generally occupy continental shelf waters (<100 meters)

***Sources*:** NMFS 1991, 2005, 2010, 2011, 2012; Hain *et al.* 1992; Payne *et al*. 1984; Good 2008; McLellan *et al*. 2004; Hamilton and Mayo 1990; Schevill *et al*. 1986; Watkins and Schevill 1982; Payne *et al*.1990; Winn *et al.* 1986; Kenney et al. 1986, 1995; Khan *et al*. 2009, 2010, 2011, 2012; Brown *et al*. 2002; NOAA 2008; 50 CFR 224.105; CETAP 1982; Clapham *et al*. 1993; Swingle *et al*. 1993; Vu *et al*. 2012; Baumgartner *et al*. 2011; Cole *et al*. 2013; Risch *et al*. 2013; Waring *et al*. 2014a; Waring *et al*. 2015; Waring *et al*. 2016; 81 FR 4837(January 27, 2016); NMFS 2015b.

6.1.3.2.2 Small Cetacean

As provided in Table 5, as Atlantic white sided dolphins, short and long finned pilot whales, Risso's dolphins, short beaked common dolphins, harbor porpoise, and several stocks of bottlenose dolphins are found throughout the year in the Northwest Atlantic Ocean, these species will occur in the affected environment of the monkfish fishery (Waring *et al*. 2014a; Waring *et al*. 2015; Waring *et al*. 2016). Within this range; however, there are seasonal shifts in species distribution and abundance. To further assist in understanding how fisheries may overlap in time and space with the occurrence of small cetaceans, a general overview of species occurrence and distribution in the area of operation for the monkfish fishery is provided in the following table (Table 7). For additional information on the biology, status, and range wide distribution of each species please refer to Waring *et al*. (2014a), Waring *et al.* (2015), and Waring *et al*. (2016).

Table 7 - Small cetacean occurrence in the area of operation of the monkfish fishery

Species	Prevalence and Approximate Months of Occurrence
Atlantic White Sided Dolphin	• Distributed throughout the continental shelf waters (primarily to 100 meter isobath) of the Mid-Atlantic (north of 35°N), SNE, GB, and GOM ; however, most common in continental shelf waters from Hudson Canyon (~ 39°N) to GB, and into the GOM. • **January-May**: low densities found from GB to Jeffreys Ledge. • **June-September**: Large densities found from GB, through the GOM. • **October-December**: intermediate densities found from southern GB to southern GOM. • South of GB (SNE and Mid-Atlantic), low densities found year round, with waters off Virginia (VA) and NC representing southern extent of species range during winter months.
Short Beaked Common Dolphin	• Regularly found throughout the continental shelf-edge-slope waters (primarily between the 100-2,000 meter isobaths) of the Mid-Atlantic, SNE, and GB (esp. in Oceanographer, Hydrographer, Block, and Hudson Canyons). • Less common south of Cape Hatteras, NC, although schools have been reported as far south as the Georgia (GA)/South Carolina (SC) border. • **January-May**: occur from waters off Cape Hatteras, NC, to GB (35° to 42°N).

Species	Prevalence and Approximate Months of Occurrence
	• **Mid-summer-autumn**: Occur primarily on GB with small numbers present in the GOM; *Peak abundance* found on GB in the autumn.
Risso's Dolphin	• **Spring through fall**: Distributed along the continental shelf edge from Cape Hatteras, NC, to GB. • **Winter**: distributed in the Mid-Atlantic Bight, extending into oceanic waters. • Rarely seen in the GOM; primarily a Mid-Atlantic continental shelf edge species.
Harbor Porpoise	• Distributed throughout the continental shelf waters of the Mid-Atlantic (north of 35°N), SNE, GB, and GOM. • **July-September**: Concentrated in the northern GOM (waters < 150 meters); low numbers can be found on GB. • **October-December**: widely dispersed in waters from NJ to Maine (ME); seen from the coastline to deep waters (>1,800 meters). • **January-March**: intermediate densities in waters off NJ to NC; low densities found in waters off New York (NY) to GOM. • **April-June**: widely dispersed from NJ to ME; seen from the coastline to deep waters (>1,800 meters).
Bottlenose Dolphin	**Western North Atlantic Offshore Stock** • Distributed primarily along the outer continental shelf and continental slope in the Northwest Atlantic from GB to FL. • Depths of occurrence: ≥40 meters **Western North Atlantic Northern Migratory Coastal Stock** • Warm water months (e.g., July-August): distributed from the coastal waters from the shoreline to approximately the 25-meter isobaths between the Chesapeake Bay mouth and Long Island, NY. • Cold water months (e.g., January-March): stock occupies coastal waters from Cape Lookout, NC, to the NC/VA border. **Western North Atlantic Southern Migratory Coastal Stock**

Species	Prevalence and Approximate Months of Occurrence
	• **October-December**: stock occupies waters of southern NC (south of Cape Lookout) • **January-March**: stock moves as far south as northern FL. • **April-June**: stock moves north to waters of NC. • **July-August**: stock is presumed to occupy coastal waters north of Cape Lookout, NC, to the eastern shore of VA.
Pilot Whales: *Short- and Long-Finned*	**Short- Finned Pilot Whales** • Except for area of overlap (see below), primarily occur south of 40ºN (Mid-Atl and SNE waters); although low numbers have been found along the southern flank of GB, but no further than 41ºN. • May through December (approximately): distributed primarily near the continental shelf break of the Mid-Atlantic and SNE; individuals begin shifting to southern waters (i.e., 35ºN and south) beginning in the fall. **Long-Finned Pilot Whales** • Except for area of overlap (see below), primarily occur from 42ºN to 44ºN • Winter to early spring (November through April): primarily distributed along the continental shelf edge-slope of the Mid-Atlantic, SNE, and GB. • Late spring through fall (May through October): movements and distribution shift onto/within GB, the Great South Channel, and the GOM. **Area of Species Overlap:** between approximately 38ºN and 41ºN.

Notes : [1]
Information presented in table is representative of small cetacean occurrence in the Northwest Atlantic continental shelf waters out to the 2,000 meter isobath.

***Sources*:** Waring *et al*. 1992, 2007**,** 2014a, 2015, 2016**;** Payne and Heinemann 1993; Payne *et al.* 1984; Jefferson *et al*. 2009.

6.1.3.2.3 Pinnipeds

As provided in Table 5, harbor, gray, harp, and hooded seals will occur in the affected environment of the monkfish fishery. Specifically, pinnipeds are found in the nearshore, coastal waters of the Northwest Atlantic Ocean. They are primarily found throughout the year or seasonally from New Jersey to Maine; however, increasing evidence indicates that some species (e.g., harbor seals) may be extending their range seasonally into waters as far south as Cape Hatteras, North Carolina (35ºN) (Waring *et al*. 2007, 2014a, 2015, 2016). To further assist in understanding how the monkfish fishery may overlap in time and space with the occurrence of pinnipeds, a general overview of species occurrence and distribution in the area of operation of the monkfish fishery is provided in the following table (Table 8). For additional information on the biology, status, and range wide distribution of each species of pinniped please refer to Waring *et al*. (2007), Waring *et al*. (2014a), Waring *et al*. (2015), Waring *et al*. (2016).

Table 8 - Pinniped occurrence in the area of operation of the monkfish fishery.

Species	Prevalence
Harbor Seal	• Primarily distributed in waters from NJ to ME; however, increasing evidence indicates that their range is extending into waters as far south as Cape Hatteras, NC (35ºN). • **Year Round**: Waters of ME • **September-May**: Waters from New England to NJ.
Gray Seal	• Distributed in waters from NJ to ME. • **Year Round**: Waters from ME to MA. • **September-May**: Waters from Rhode Island to NJ.
Harp Seal	• Winter-Spring (approximately January-May): Waters from ME to NJ.
Hooded Seal	• Winter-Spring (approximately January-May): Waters of New England.

***Sources*:** Waring *et al*. 2007 (for hooded seals); Waring *et al*. 2014a; Waring *et al*. 2015;Waring *et al*. 2016.

6.1.3.3 Atlantic Sturgeon

Table 5 lists the 5 DPSs of Atlantic sturgeon that occur in the affected environment of the monkfish fishery and that may be affected by the operation of this fishery. The marine range of U.S. Atlantic sturgeon extends from Labrador, Canada, to Cape Canaveral, Florida. All five DPSs of Atlantic sturgeon have the potential to be located anywhere in this marine range; in fact, results from genetic studies show that, regardless of location, multiple DPSs can be found at any one location along the Northwest Atlantic coast (ASSRT 2007; Dovel and Berggren 1983; Dadswell *et al*. 1984; Kynard *et al*. 2000; Stein *et al*. 2004a; Dadswell 2006; Laney *et al*. 2007; Dunton *et al*. 2010; Dunton *et al*. 2012; Dunton *et al*. 2015; Erickson *et al*. 2011; Wirgin *et al*. 2012; O'Leary *et al*. 2014; Waldman *et al.* 2013; Wirgin *et al*. 2015).

Based on fishery- independent and dependent data, as well as data collected from tracking and tagging studies, in the marine environment, Atlantic sturgeon appear to primarily occur inshore of the 50 meter

depth contour (Stein *et al*. 2004 a,b; Erickson *et al*. 2011; Dunton *et al*. 2010); however, Atlantic sturgeon are not restricted to these depths, as excursions into deeper continental shelf waters have been documented (Timoshkin 1968; Collins and Smith 1997; Stein *et al*. 2004a,b; Dunton *et al*. 2010; Erickson *et al*. 2011). Data from fishery-independent surveys and tagging and tracking studies also indicate that some Atlantic sturgeon may undertake seasonal movements along the coast (Erickson *et al.* 2011; Dunton *et al*. 2010; Wipplehauser 2012). For instance, tagging and tracking studies found that satellite-tagged adult sturgeon from the Hudson River concentrated in the southern part of the Mid-Atlantic Bight, at depths greater than 20 meters, during winter and spring, while in the summer and fall, Atlantic sturgeon concentrations shifted to the northern portion of the Mid-Atlantic Bight at depths less than 20 meters (Erickson *et al.* 2011).

Within the marine range of Atlantic sturgeon, several marine aggregation areas have been identified adjacent to estuaries and/or coastal features formed by bay mouths and inlets along the U.S. eastern seaboard (i.e., waters off North Carolina, Chesapeake Bay, and Delaware Bay; New York Bight; Massachusetts Bay; Long Island Sound; and Connecticut and Kennebec River Estuaries); depths in these areas are generally no greater than 25 meters (Bain *et al.* 2000; Savoy and Pacileo 2003; Stein *et al*. 2004a; Laney *et al*. 2007; Dunton *et al*. 2010; Erickson *et al*. 2011; Oliver *et al*. 2013; Waldman *et al.* 2013; O'Leary *et al*. 2014). Although additional studies are still needed to clarify why these particular sites are chosen by Atlantic sturgeon, there is some indication that they may serve as thermal refuge, wintering sites, or marine foraging areas (Stein *et al*. 2004a; Dunton *et al*. 2010; Erickson *et al*. 2011).

6.1.3.4 Atlantic Salmon (Gulf of Maine DPS)

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

6.1.4 Interactions Between Gear and Protected Resources

Protected species are vulnerable to interactions with various types of fishing gear, with interaction risks associated with gear type, quantity, and soak or tow time. Available information on gear interactions with a given species (or species group) is provided in the sections below. These sections are not a comprehensive review of all fishing gear types known to interact with a given species; emphasis is only being placed on the primary gear types used to prosecute the monkfish fishery (i.e., sink gillnet and bottom trawl gear).

6.1.4.1 Marine Mammals

Depending on species, marine mammals have been observed seriously injured or killed in bottom trawl and/or sink gillnet gear. Pursuant to the MMPA, NMFS publishes a List of Fisheries (LOF) annually,

classifying U.S. commercial fisheries into one of three categories based on the relative frequency of incidental serious injuries and/or mortalities of marine mammals in each fishery (i.e., Category I=frequent; Category II=occasional; Category III=remote likelihood or no known interactions). In the Northwest Atlantic, the 2016 LOF (81 FR 20550 (April 8, 2016)) categorizes commercial gillnet fisheries (Northeast or Mid-Atlantic) as Category I fisheries and commercial bottom trawl fisheries (Northeast or Mid-Atlantic) as Category II fisheries.

6.1.4.1.1 Large Cetaceans

Bottom Trawl Gear

With the exception of minke whales, there have been no observed interactions with large whales and bottom trawl gear. In bottom trawl gear, to date, interactions have only been observed in the northeast bottom trawl fisheries. From the period of 2008-2012, the estimated annual mortality attributed to this fishery was 7.8 minke whales for 2008, and zero minke whales from 2009-2012; no serious injuries were reported during this time (Waring *et al*. 2015). Based on this information, from 2008-2012, the estimated annual average minke whale mortality and serious injury attributed to the northeast bottom trawl fishery was 1.6 (CV=0.69) whales (Waring *et al*. 2015). Lyssikatos (2015) estimated that from 2008-2013, mean annual serious injuries and mortalities from the northeast bottom trawl fishery were 1.40 (CV=0.58) minke whales. Based on this information, bottom trawl gear is likely to pose a low interaction risk to any large whale species and therefore, is expected to be a low source of serious injury or mortality to any large whale.

Fixed Fishing Gear (e.g., Sink Gillnet Gear)

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

The effects of entanglement to large whales range from no injury to death (NMFS 2014b; Johnson *et al*. 2005; Angliss and Demaster 1998; Moore and Van der Hoop 2012). The risk of injury or death in the event of an entanglement may depend on the characteristics of the whale involved (species, size, age, health, etc.), the nature of the gear (e.g., whether the gear incorporates weak links designed to help a whale free itself), human intervention (e.g., the feasibility or success of disentanglement efforts), or other variables (NMFS 2014b). Although the interrelationships among these factors are not fully understood,

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

and the data needed to provide a more complete characterization of risk are not available, to date, available data indicates that entanglement in fishing gear is a significant source of serious injury or mortality for Atlantic large whales (Table 9; Henry *et al*. 2016; Waring *et al*. 2016).

Table 9 summarizes confirmed human-caused injury and mortality to humpback, fin, sei, minke, and North Atlantic right whales along the Gulf of Mexico Coast, U.S. East Coast, and Atlantic Canadian Provinces from 2010 to 2014 (Henry *et al.* 2016); the data provided in Table 9 is specific to confirmed injury or mortality to whales from entanglement in fishing gear. As many entanglement events go unobserved, and because the gear type, fishery, and/or country of origin for reported entanglement events are often not traceable, it is important to recognize that the information presented in Table 9 likely underestimates the rate of large whale serious injury and mortality due to entanglement. Further studies looking at scar rates for right whales and humpbacks suggests that entanglements may be occurring more frequently than the observed incidences indicate (NMFS 2014b; Robbins 2009; Knowlton *et al.* 2012).

Table 9 - Summary of confirmed human-caused injury or mortality to fin, minke, humpback, sei, and North Atlantic right whales from 2010-2014 due to entanglement in fishing gear.[1]

Species	Total Confirmed Entanglement: Serious Injury[2]	Total Confirmed Entanglement: Non-Serious Injury	Total Confirmed Entanglement: Mortality	Entanglement Events: Total Average Annual Injury and Mortality Rate (US waters/Canadian waters/unassigned waters)
North Atlantic Right Whale	16	31	8	4.65 (0.4/0/4.25)
Humpback Whale	30	53	8	6.85 (1.55/0/5.3)
Fin Whale	6	1	4	1.8 (0.2/0.8/0.8)
Sei Whale	0	0	0	0
Minke Whale	20	11	16	6.4 (1.7/2.45/2.25)

Notes:
[1]Information presented in Table 9 is based on confirmed human-caused injury and mortality events along the Gulf of Mexico Coast, US East Coast, and Atlantic Canadian Provinces; it is not specific to US waters only.
[2] NMFS defines a serious injury as an injury that is more likely than not to result in mortality (for additional details see: http://www.nmfs.noaa.gov/pr/pdfs/serious_injury_procedure.pdf)

***Source*:** Henry *et al.* 2016

As noted in section 6.1.4.1, pursuant to the MMPA, NMFS publishes a LOF annually, classifying U.S. commercial fisheries into one of three categories based on the relative frequency of incidental serious injurious and mortalities of marine mammals in each fishery. Large whales, in particular, humpback, fin, minke, and North Atlantic right whales, are known to interact with Category I and II fisheries in the (Northwest) Atlantic Ocean. As humpback, fin, and North Atlantic right whales are listed as endangered under the ESA, these species are considered strategic stocks under the MMPA (see Table 5). Section 118(f)(1) of the MMPA requires the preparation and implementation of a Take Reduction Plan (TRP) for

any strategic marine mammal stock that interacts with Category I or II fisheries. In response to its obligations under the MMPA, in 1996, NMFS established the Atlantic Large Whale Take Reduction Team (ALWTRT) to develop a plan (Atlantic Large Whale Take Reduction Plan (ALWTRP or Plan)) to reduce serious injury to, or mortality of large whales, specifically, humpback, fin, and North Atlantic right whales, due to incidental entanglement in U.S. commercial fishing gear.[2] In 1997, the ALWTRP was implemented; however, since 1997, the Plan has been modified; recent adjustments include the Sinking Groundline Rule and Vertical Line Rules (72 FR 57104, October 5, 2007; 79 FR 36586, June 27, 2014; 79 FR 73848, December 12, 2014; 80 FR 14345, March 19, 2015; 80 FR 30367, May 28, 2015).

The Plan consists of regulatory (e.g., universal gear requirements, modifications, and requirements; area- and season- specific gear modification requirements and restrictions; time/area closures) and non-regulatory measures (e.g., gear research and development, disentanglement, education and outreach) that, in combination, seek to assist in the recovery of North Atlantic right, humpback, and fin whales by addressing and mitigating the risk of entanglement in gear employed by commercial fisheries, specifically trap/pot and gillnet fisheries (http://www.greateratlantic.fisheries.noaa.gov/Protected/whaletrp/; 73 FR 51228; 79 FR 36586; 79 FR 73848; 80 FR 14345; 80 FR 30367). The Plan recognizes trap/pot and gillnet Management Areas in Northeast, Mid-Atlantic, and Southeast regions of the U.S, and identifies gear modification requirements and restrictions for Category I and II gillnet and trap/pot fisheries in these regions; these Category I and II fisheries must comply with all regulations of the Plan.[3] For further details on the ALWTRP please see: http://www.greateratlantic.fisheries.noaa.gov/Protected/whaletrp/.

6.1.4.1.2 Small Cetaceans and Pinnipeds

Sink Gillnet and Bottom Trawl Gear

Small cetaceans and pinnipeds are vulnerable to interactions with sink gillnet and bottom trawl gear. Species that have been observed incidentally injured and/or killed by MMPA LOF Category I (frequent interactions) and/or II (occasional interactions) gillnet or trawl fisheries that operate in the affected environment of Greater Atlantic Region (GAR) fisheries are provided in Table 10 (Waring *et al*. 2014a,b; Waring *et al*. 2015; Waring *et al*. 2016; 81 FR 20550 (April 8, 2016)).[4] Of the species provided in Table 10, gray seals, followed by harbor seals, harbor porpoises, short beaked common dolphins, harps seals, and Atlantic white sided dolphins are the most frequently bycaught small cetacean and pinnipeds in sink gillnet gear in the GAR (Hatch and Orphanides 2014, 2015, 2016). In terms of bottom trawl gear, short-beaked common dolphins and Atlantic white-sided dolphins are the most frequently observed bycaught marine mammal species in the GAR, followed by gray seals, long-finned pilot whales, and risso's dolphins (Lyssikatos 2015). Incidental bycatch of these latter species, as well as those provided in Table 10, have been observed in the monkfish fishery (Hatch and Orphanides 2014, 2015, 2016; Lyssikatos 2015; http://www.nefsc.noaa.gov/fsb/take_reports/nefop.html), which is comprised of Category I Northeast and Mid-Atlantic sink gillnet and Category II Northeast and Mid-Atlantic bottom trawl

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

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

[4] "GAR Fisheries" are in reference to the 13 fisheries in the Greater Atlantic Region (GAR) (i.e., Northeast multispecies (including the whiting/small mesh multispecies complex); monkfish; spiny dogfish; Atlantic bluefish; northeast skate complex; mackerel/squid/butterfish; summer flounder/scup/black sea bass; American lobster; Atlantic herring; Atlantic sea scallop; red crab; surfclam/ocean quahog; and golden tilefish) in which fishery management plans (FMPs) have been developed and authorized; the NMFS-Greater Atlantic Regional Fisheries Office, in association with the New England and Mid-Atlantic Fisheries Management Councils (FMCs), is charged with conserving and managing these FMPs.

fisheries (81 FR 20550 (April 8, 2016). Specifically, observed bycatch in sink gillnet hauls targeting monkfish has shown that interactions primarily occur in sink gillnet gear with mesh sizes between 10-12 inches, and with soak duration ≥ 100 hours (Hatch and Orphanides 2014, 2015, 2016); in regards to bottom trawl hauls targeting monnkfish, general tow time and net mesh size associated with observed bycatch of small cetaceans and pinnipeds are not available (Lyssikatos 2015).

Based on the best available information provided in Table 10, Waring *et al*. (2014a,b), Waring *et al*. (2015), Waring *et al*. (2016), and the April 8, 2016, LOF (81 FR 20550), of the gear types primarily used to prosecute fisheries in the GAR (i.e., bottom trawl; mid-water trawl; gillnets (sink); scallop dredge; trap/pot; bottom longline; hydraulic clam dredge; purse seine; and hook and line), Northeast and Mid-Atlantic gillnet fisheries, followed by the Northeast and Mid-Atlantic bottom trawl fisheries (Category I and II fisheries, respectively) pose the greatest risks of serious injury and mortality to small cetaceans and pinnipeds (i.e., approximately 81.0% of the estimated total mean annual mortality to marine mammals (small cetaceans + seals, large whales excluded) is attributed to gillnet fisheries, 18.0% attributed to bottom trawl, 0.23% attributed to mid-water trawl; 0.15% attributed to pot/trap (bottlenose dolphin stocks only); and 0.11% attributed to hook and line (bottlenose dolphin stocks only; Figure 4).[5]

Table 10 - Small cetacean and pinniped species observed seriously injured and/or killed by Category I and II gillnet or trawl fisheries in the affected environment of GAR fisheries.

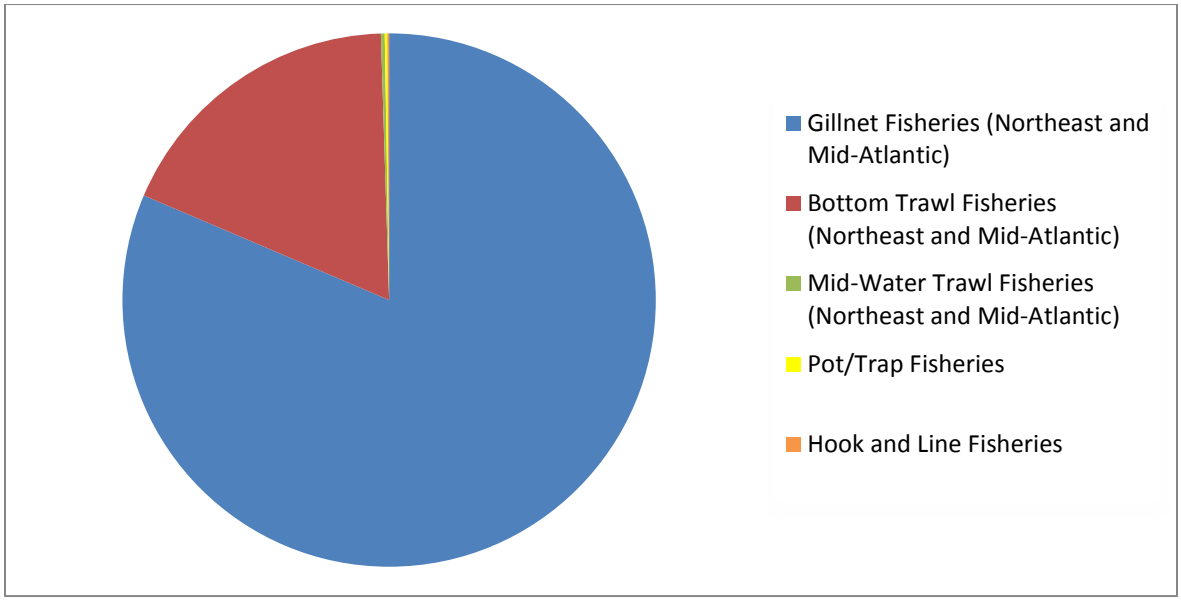
Fishery	Category	Species Observed or reported Injured/Killed
Northeast Sink Gillnet	I	Bottlenose dolphin (offshore)
		Harbor porpoise
		Atlantic white sided dolphin
		Short-beaked common dolphin
		Risso's dolphin
		Pilot whales (spp)
		Harbor seal
		Hooded seal
		Gray seal
		Harp seal
Mid-Atlantic Gillnet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

[5] Northeast anchored float gillnet fisheries were not included in the analysis as mean annual mortality estimates have not been provided for the species affected by these fisheries (Waring *et al*. 2014a; Waring *et al*. 2015; Waring *et al*. 2016). In addition, as there are no known small cetaceans or pinniped interactions with bottom longlines, hydraulic clam dredges, or sea scallop dredges, these fishing gear types were also not included in the assessment.

		Harp seal
		Gray seal
Mid-Atlantic Mid-Water Trawl-Including Pair Trawl	II	Risso's dolphin
		White-sided dolphin
		Harbor seal
		Pilot whales (spp)
		Gray seal
Northeast Mid-Water Trawl-Including Pair Trawl	II	Short-beaked common dolphin
		Pilot whales (spp)
		Gray seal
		Harbor seal
Northeast Bottom Trawl	II	Harp seal
		Harbor seal
		Gray seal
		Pilot whales (spp)
		Short-beaked common dolphin
		White-sided dolphin
		Harbor porpoise
		Bottlenose dolphin (offshore)
		Risso's dolphin
Mid-Atlantic Bottom Trawl	II	White-sided dolphin
		Pilot whales (spp)
		Short-beaked common dolphin
		Risso's dolphin
		Bottlenose dolphin (offshore)
		Gray seal
		Harbor seal
Northeast Anchored Float Gillnet	II	Harbor seal
		White-sided dolphin

Sources: Waring *et al*. 2014a,b; Waring *et al*. 2015; Waring *et al*. 2016; LOF 81 FR 20550 (April 8, 2016).

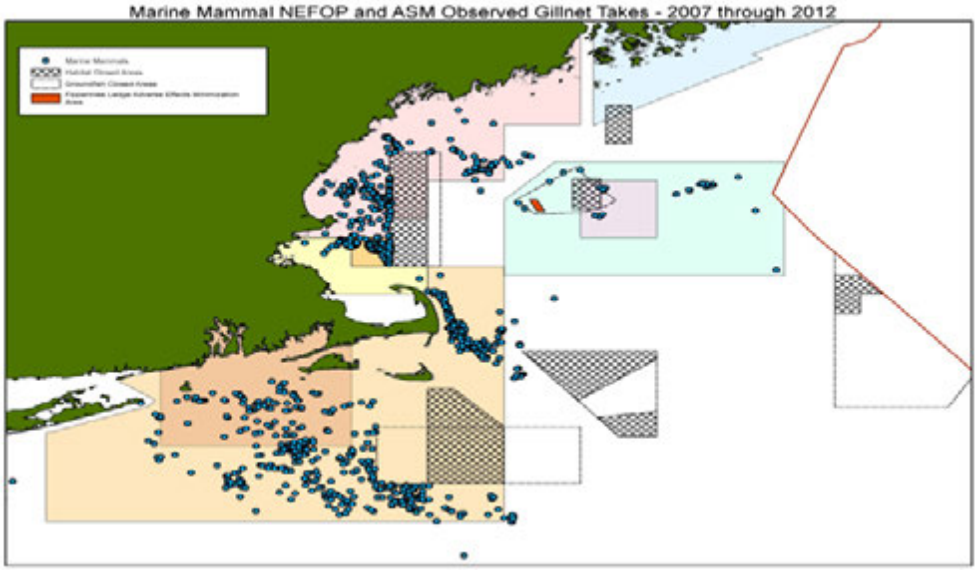
Figure 4 - Estimated total mean annual mortality of small cetaceans and pinnipeds by GAR fisheries from 2009-2013 (*source* Waring *et al*. 2014a, b; Waring *et al*. 2015; Waring *et al*. 2016).



Although there are multiple Category I and II fisheries that have the potential to result in the serious injury and morality of small cetaceans and pinnipeds in the GAR, the risk of an interaction with a specific fishery is affected by multiple factors, including where and when fishing effort is focused, the type of gear being used, and how effort overlaps in time and space with specific species in the affected area. For instance, the following figures (Figures 5 and 6) depict observed marine mammal takes (large whales excluded) in gillnet and trawl gear in waters of the GOM, GB, and SNE from 2007-2012 or 2007-2011, respectively.[6] As depicted in Figure 5 and Figure 6, over the last 5 years, there appears to be particular areas in the GOM, GB, and SNE where fishing effort is overlapping in time and space with small cetacean or pinniped occurrence. Although uncertainties, such as shifting fishing effort patterns and data on true density (or even presence/absence) for some species remain, the available observer data, as depicted in Figure 5 and Figure 6, does provide some insight into areas in the ocean where the likelihood of interacting with a particular species is high and therefore, provides a means to consider potential impacts of future shifts or changes in fishing effort on small cetaceans and pinnipeds. For additional maps depicting observed small cetacean and pinniped interactions with Northeast or Mid-Atlantic bottom trawl or gillnet gear, please see Appendix III in Waring *et al*. (2014a,b), Waring *et al*. (2015), and Waring *et al*. (2016).

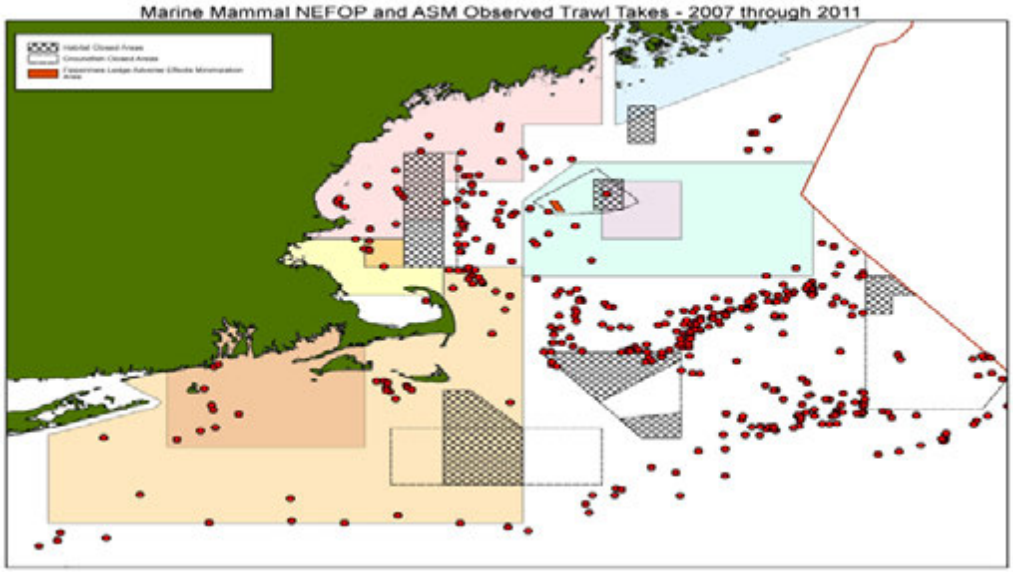
[6] Additional maps of marine mammal takes in various fishing gear can be found in Waring *et al*. 2014a, Waring *et al*. 2015, and Waring *et al*. 2016.

Figure 5 - Map of marine mammal bycatch in gillnet gear in the New England region (excluding large whales) observed by Northeast Fisheries Observer Program (NEFOP) and At Sea Monitoring (ASM) program between 2007 and 2012.



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

Figure 6 - Map of marine mammal bycatch in trawl gear in the New England region (excluding large whales) observed by the Northeast Fisheries Observer Program (NEFOP) and At Sea Monitoring (ASM) program between 2007 and 2011.



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

Habitat/Groundfish closed area: White-sided dolphins, and some pilot whales and harbor seals.

As noted above, numerous species of small cetaceans and pinnipeds interact with Category I and II fisheries in the GAR; however, several species in Table 10 have experienced such great losses to their populations as a result of interactions with Category I and/or II fisheries that they are now considered strategic stocks under the MMPA (see Table 5). These species include several stocks of bottlenose dolphins, and until recently, the harbor porpoise.[7] Section 118(f)(1) of the MMPA requires the preparation and implementation of a TRP for any strategic marine mammal stock that interacts with Category I or II fisheries. As a result, the Harbor Porpoise TRP (HPTRP) and the Bottlenose Dolphin TRP (BDTRP) were developed and implemented for these species.[8] In addition, due to the incidental mortality and serious injury of small cetaceans incidental to bottom and mid-water trawl fisheries operating in both the Northeast and Mid-Atlantic regions, the Atlantic Trawl Gear Take Reduction Strategy (ATGTRS) was implemented. The following provides a brief overview and summary for each HPTRP, BDTRP, and ATGTRS; however, additional information on each TRP can be found at:
http://www.greateratlantic.fisheries.noaa.gov/protected/porptrp/ or
http://www.nmfs.noaa.gov/pr/interactions/trt/bdtrp.htm
http://www.greateratlantic.fisheries.noaa.gov/Protected/mmp/atgtrp/

Harbor Porpoise Take Reduction Plan (HPTRP)

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

- **New England Region**: The New England component of the HPTRP pertains to all fishing with sink gillnets and other gillnets capable of catching multispecies in New England waters from Maine through Rhode Island. It includes five management areas and three closure areas. Per specified periods of time, fishing with sink gillnets is restricted in closed areas. In management areas, depending on location, seasonal restrictions include complete closure to sink gillnet fishing to closures to sink gillnet fishing unless pingers are used in the manner prescribed in the TRP regulations.

- **Mid-Atlantic Region:** The Mid-Atlantic portion of the HPTRP pertains to the Mid-Atlantic shoreline from the southern shoreline of Long Island, New York to the North Carolina/South Carolina border. It includes four management areas, each with time and area closures to sink gillnet fishing unless the gear meets certain specifications (e.g., floatline length, twine size, tie downs, net size, net number, nets in a string). Additionally, during regulated periods, sink gillnet fishing in each management area of the Mid-Atlantic is regulated differently for small mesh (> 5 inches to < 7 inches) and large (7-18 inches) mesh gear. The Plan also includes some time and area closures in which sink gillnet fishing is prohibited regardless of the gear specifications.

[7] In the most recent U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessment (Waring *et al*. 2016); harbor porpoise are no longer designated as a strategic stock.
[8] Although the most recent U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessment (Waring *et al.* 2016) no longer designates harbor porpoise as a strategic stock, HPTRP regulations are still in place per the mandates provided in Section 118(f)(1).

Bottlenose Take Reduction Plan (BDTRP)

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

Atlantic Trawl Gear Take Reduction Strategy (ATGTRS)

In addition to the HPTRP and the BDTRP, in 2006, the Atlantic Trawl Gear Take Reduction Team (ATGTRT) was convened to address the incidental mortality and serious injury of long-finned pilot whales (*Globicephala melas*), short-finned pilot whales (*Globicephala macrorhynchus*), common dolphins (*Delphinus delphis*), and white sided dolphins (*Lagenorhynchus acutus*) incidental to bottom and mid-water trawl fisheries operating in both the Northeast and Mid-Atlantic regions. Because none of the marine mammal stocks of concern to the ATGTRT are classified as a "strategic stock," nor do they currently interact with a Category I fishery, it was determined at the time that development of a take reduction plan was not necessary.[10]

In lieu of a take reduction plan, the ATGTRT agreed to develop an ATGTRS. The ATGTRS identifies informational and research tasks, as well as education and outreach needs the ATGTRT believes are necessary, to provide the basis for decreasing mortalities and serious injuries of marine mammals to insignificant levels approaching zero mortality and serious injury rates. The ATGTRS also identifies several potential voluntary measures that can be adopted by certain trawl fishing sectors to potentially reduce the incidental capture of marine mammals.

6.1.4.2 Sea Turtles

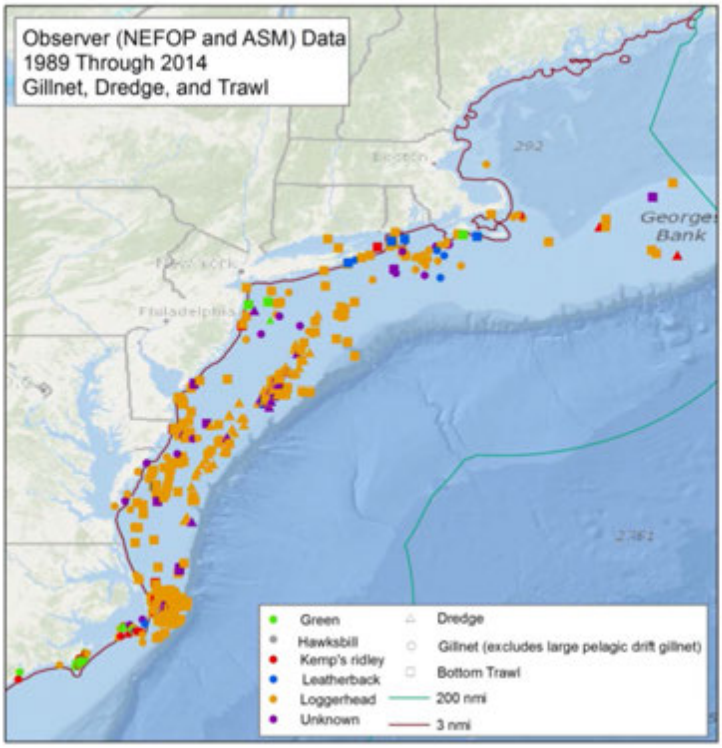
As provided in Figure 7, sea turtle interactions with gillnet, bottom trawl, and other bottom tending gear have been observed in the GOM, GB, and the Mid-Atlantic; however, most of the observed interactions have occurred in the Mid-Atlantic (see Warden 2011a,b; Murray 2013; Murray 2015). As few sea turtle interactions have been observed in the GOM and GB regions of the Northwest Atlantic, there is insufficient data available to conduct a robust model-based analysis on sea turtle interactions with gillnet or bottom trawl gear in these regions and therefore, produce a bycatch estimate for these regions. As a result, the bycatch estimates and the discussion below are based on observed sea turtle interactions in

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

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

gillnet or bottom trawl gear in the Mid-Atlantic.

Figure 7 - Observed locations of turtle interactions in bottom tending gears in the GAR from 1989-2014.



Bottom Trawl Gear

Green, Kemp's ridley, leatherback, loggerhead, and unidentified sea turtles have been documented interacting with bottom trawl gear. However, estimates are available only for loggerhead sea turtles. Warden (2011a,b) estimated that from 2005-2008, the average annual loggerhead interactions in bottom trawl gear in the Mid-Atlantic was 292 (CV=0.13, 95% CI=221-369), with an additional 61 loggerheads (CV=0.17, 95% CI=41-83) interacting with trawls, but released through a Turtle Excluder Device (TED).[11] Of the 292 average annual observable loggerhead interactions, approximately 44 of those were adult equivalents (Warden 2011a,b). Most recently, Murray (2015) estimated that from 2009-2013, the total average annual loggerhead interactions in bottom trawl gear in the Mid-Atlantic was 231 (CV=0.13, 95% CI=182-298). Of the 231 total average annual loggerhead interactions, approximately 33 of those were adult equivalents (Murray 2015). Bycatch estimates provided in Warden (2011a) and Murray (2015b) are a decrease from the average annual loggerhead bycatch in bottom otter trawls during 1996-2004, which Murray (2008) estimated at 616 sea turtles (CV=0.23, 95% CI over the nine-year period: 367-890). This decrease is likely due to decreased fishing effort in high-interaction areas (Warden 2011a,b).

[11] TEDs allow sea turtles to escape the trawl net, reducing injury and mortality resulting from capture in the net. Approved TEDs are required in the shrimp and summer trawl fishery. For further information on TEDs see 50 CFR 223.206 and 68 FR 8456 (February 21, 2003).

Sink Gillnet Gear

Murray (2013) conducted an assessment of loggerhead and unidentified hard-shell turtle interactions in Mid-Atlantic gillnet gear from 2007-2011. Based on Northeast Fisheries Observer Program data from 2007-2011, interactions between loggerhead and hard-shelled sea turtles (loggerheads plus unidentified hard-shelled) and commercial gillnet gear in the Mid-Atlantic averaged 95 hard-shelled turtles and 89 loggerheads (equivalent to 9 adults) annually (Murray 2013).[12] However, average estimated interactions in large mesh gear in warm, southern Mid-Atlantic waters have declined relative to those from 1996-2006 (Murray 2009), as did the total commercial effort (Murray 2013). Murray (2013) also estimated interactions by managed species landed in gillnet gear from 2007-2011. An estimate was not made for the monkfish fishery; but, takes have been observed in sink gillnet fisheries targeting other species. One of these was documented by an observer north of 42° N. Leatherback, Kemp's ridley, and green sea turtles have also been documented in Mid-Atlantic gillnet gear by observers (NMFS NEFSC FSB 2015), with observed takes of Kemp's ridley and leatherback sea turtles in overlapping areas with the monkfish fishery.

6.1.4.3 Atlantic Sturgeon

Sink Gillnet and Bottom Trawl Gear

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

- Setting gillnet gear at depths <40 m;
- Using gillnet gear with mesh sizes >10 in;
- Setting gillnet gear during spring, fall, and winter months;
- Long soak times (i.e., >24 h); and
- Setting gear during warmer water temperatures

Although Atlantic sturgeon deaths have rarely been reported in otter trawl gear (ASMFC 2007), it is important to recognize that effects of an interaction may occur long after the interaction. Based on physiological data obtained from Atlantic sturgeon captured in otter trawls, Beardsall *et al*. (2013) suggests that factors such as longer tow times (i.e., >60 min), prolonged handling of sturgeon (>10 min on deck), and the type of trawl gear/equipment used, may increase the risk of physiological disruption or impairment (e.g., elevated cortisol levels, immune suppression, impaired osmoregulation, exhaustion) to

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

Atlantic sturgeon captured in otter trawls and therefore, may result in an increased risk of post-release mortality. Although additional studies are needed to clearly identify the "after" effects of a trawl interaction, based on the available information, trawls should not be completely discounted as a form of gear that poses a mortality risk to Atlantic sturgeon.

6.1.4.4 Atlantic Salmon

Sink Gillnet and Bottom Trawl Gear

According to the Biological Opinion issued by NMFS Greater Atlantic Regional Fisheries Office on December 16, 2013, NMFS Northeast Fisheries Science Center's (NEFSC) Northeast Fisheries Observer and At-Sea Monitoring Programs documented a total of 15 individual salmon incidentally caught on over 60,000 observed commercial fishing trips from 1989 through August 2013 (NMFS 2013; Kocik *et al*. 2014). Specifically, Atlantic salmon were observed bycaught in gillnet (11/15) and bottom otter trawl gear (4/15), with 10 of the incidentally caught salmon listed as "discarded" and five reported as mortalities (Kocik (NEFSC), pers. comm (February 11, 2013) in NMFS 2013).[13] The very low number of observed Atlantic salmon interactions in gillnet and trawl gear reported in the Northeast Fisheries Observer Program's database suggests that interactions with Atlantic salmon are rare events (NMFS 2013; Kocik *et al*. 2014); however, it is important to recognize that observer program coverage is not 100 percent. As a result, it is likely that some interactions with Atlantic salmon have occurred, but have not been observed or reported.

6.2 Physical and Biological Environment

The Northeast U.S. Shelf Ecosystem has been described as including the area from the GOM 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 (Sherman et al. 1996). The continental slope includes the area east of the shelf, out to a depth of 2,000 m. Four distinct sub-regions comprise the NOAA Fisheries Greater Atlantic Region: the Gulf of Maine, Georges Bank, the Mid-Atlantic Bight, and the continental slope. Occasionally another sub-region, Southern New England, is described; however, we incorporated discussions of any distinctive features of this area into the sections describing Georges Bank and the Mid-Atlantic Bight.

The Gulf of Maine is an enclosed coastal sea, characterized by relatively cold waters and deep basins, with a patchwork of various sediment types. Georges 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 and biological characteristics of each of these sub-regions are described in the Physical and Biological Environment section of Amendment 5 (Section 4.2), along with a short description of the physical features of coastal environments. Monkfish habitats are described in Section 4.4.1 of Amendment 5 and summarized below. Information on the affected physical and biological environments included in Amendment 5 was extracted from Stevenson et al. (2004).

[13] The genetic identity of the 15 captured salmon is unknown; however, the NMFS 2013 Biological Opinion considers all 15 fish to be part of the GOM Distinct Population Segment, although some may have originated from the Connecticut River restocking program (i.e., those caught south of Cape Cod, Massachusetts).

6.2.1 **Fishing Effects on EFH**

A detailed discussion of monkfish fishing on EFH is contained in the Affected Environment Section of Amendment 5. Since monkfish EFH has been determined to not be vulnerable to any fishing gear (Stevenson, et al. 2004), the discussion focuses on gears used in the directed monkfish fishery (trawls and gillnets) that potentially could impact EFH of other fisheries. The discussion in Amendment 5 cites several important peer-reviewed studies in describing the potential biological and physical effects of fishing on various substrates (mud, sand, gravel and rocky substrates). With regard to the gears used in the monkfish fishery, the discussion focuses on trawling, since gillnets are stationary or static, and have been determined to not have an adverse effect on EFH. Since vessels are prohibited from using a dredge while on a monkfish DAS, discussion of the effects of dredges is not pertinent. Generally, trawling reduces habitat complexity and productivity by removing or altering physical (boulders, sand waves or cobble piles) and biological (structure forming invertebrates) habitat components and mixing sediments (ICES 2000). These impacts are more discernable with repeated trawl use and in low energy environments (NRC 2002).

6.2.2 **Essential Fish Habitat**

Section 4.4 of Amendment 5 contains a detailed description of monkfish EFH, EFH of other species vulnerable to bottom trawl gear, the effect of the monkfish fishery on EFH (monkfish and other species, all life stages), and measures to minimize adverse effects of the monkfish fishery on EFH. The document describes habitat protection measures taken in the monkfish FMP, as well as the Atlantic Sea Scallop and NE Multispecies FMPs (namely habitat closed areas).

In summary, the discussion notes that monkfish EFH has been determined to only be minimally vulnerable to bottom-tending mobile gear (bottom trawls and dredges) and bottom gillnets. Therefore, the effects of the monkfish fishery and other fisheries on monkfish EFH do not require any management action. However, the monkfish trawl fishery does have more than a minimal and temporary impact on EFH for a number of other demersal species in the region. Adverse impacts that were more than minimal and not temporary in nature were identified for the following species and life stages, based on an evaluation of species life history and habitat requirements and the spatial distributions and impacts of bottom otter trawls in the region (Stevenson et al., 2004):

Species and life stages with EFH more than minimally vulnerable to otter trawl gear:

> American plaice (Juvenile (J), Adult (A)), Atlantic cod (J, A), Atlantic halibut (J, A), haddock (J, A), pollock (A), ocean pout (Egg (E), J, A), red hake (J, A), redfish (J, A), white hake (J), silver hake (J), winter flounder (A), witch flounder (J, A), yellowtail flounder (J, A), black sea bass (J, A), scup (J), tilefish (J, A), barndoor skate (J, A), clearnose skate (J, A), little skate (J, A), rosette skate (J, A), smooth skate (J, A), thorny skate (J, A), and winter skate (J, A).

There are no species or life stages for which EFH is more than minimally vulnerable to bottom gillnets (Stevenson et al., 2004). Table 11 identifies the species, life stages and geographic area of their EFH, for those species whose EFH is vulnerable to bottom trawling.

Table 11 - EFH descriptions for all benthic life stages of federally-managed species in the U.S. Northeast Shelf Ecosystem with EFH vulnerable to bottom tending gear (Stevenson *et al*. 2004) [GOM = Gulf of Maine, GB = Georges Bank, SNE = Southern New England]

Species	Life Stage	Geographic Area of EFH	Depth (meters)	EFH Description
American plaice	juvenile	GOM and estuaries from Passamaquoddy Bay to Saco Bay, ME and from Mass. Bay to Cape Cod Bay, MA	45 - 150	Bottom habitats with fine grained sediments or a substrate of sand or gravel
American plaice	adult	GOM and estuaries from Passamaquoddy Bay to Saco Bay, ME and from Mass. Bay to Cape Cod Bay, MA	45 - 175	Bottom habitats with fine grained sediments or a substrate of sand or gravel
Atlantic cod	juvenile	GOM, GB, eastern portion of continental shelf off SNE and following estuaries: Passamaquoddy Bay to Saco Bay; Mass. Bay, Boston Harbor, Cape Cod Bay, Buzzards Bay	25 - 75	Bottom habitats with a substrate of cobble or gravel
Atlantic cod	adult	GOM, GB, eastern portion of continental shelf off SNE and following estuaries: Passamaquoddy Bay to Saco Bay; Mass. Bay, Boston Harbor, Cape Cod Bay, Buzzards Bay	10 - 150	Bottom habitats with a substrate of rocks, pebbles, or gravel
Atlantic halibut	juvenile	GOM, GB	20 - 60	Bottom habitats with a substrate of sand, gravel, or clay
Atlantic halibut	adult	GOM, GB	100 - 700	Bottom habitats with a substrate of sand, gravel, or clay
Atlantic herring	eggs	GOM, GB and following estuaries: Englishman/Machias Bay, Casco Bay, and Cape Cod Bay	20 – 80	Bottom habitats attached to gravel, sand, cobble or shell fragments, also on macrophytes
Atlantic sea scallop	juvenile	GOM, GB, SNE and middle Atlantic south to Virginia-North Carolina border and following estuaries: Passamaquoddy Bay to Sheepscot R.; Casco Bay, Great Bay, Mass Bay, and Cape Cod Bay	18 - 110	Bottom habitats with a substrate of cobble, shells, and silt
Atlantic sea scallop	adult	GOM, GB, SNE and middle Atlantic south to Virginia-North Carolina border and following estuaries: Passamaquoddy Bay to Sheepscot R.; Casco Bay, Great Bay, Mass Bay, and Cape Cod Bay	18 - 110	Bottom habitats with a substrate of cobble, shells, coarse/gravelly sand, and sand
Haddock	juvenile	GB, GOM, middle Atlantic south to Delaware Bay	35 - 100	Bottom habitats with a substrate of pebble and gravel
Haddock	adult	GB and eastern side of Nantucket Shoals, throughout GOME, *additional area of Nantucket Shoals, and Great South Channel	40 - 150	Bottom habitats with a substrate of broken ground, pebbles, smooth hard sand, and smooth areas between rocky patches
Monkfish	juvenile	Outer continental shelf in the middle Atlantic, mid-shelf off southern NE, all areas of GOME	25 - 200	Bottom habitats with substrates of a sandshell mix, algae covered rocks, hard sand, pebbly gravel, or mud

Species	Life Stage	Geographic Area of EFH	Depth (meters)	EFH Description
Monkfish	adult	Outer continental shelf in the middle Atlantic, mid-shelf off southern NE, outer perimeter of GB, all areas of GOME	25 - 200	Bottom habitats with substrates of a sandshell mix, algae covered rocks, hard sand, pebbly gravel, or mud
Ocean pout	eggs	GOM, GB, SNE, and middle Atlantic south to Delaware Bay, and the following estuaries: Passamaquoddy Bay to Saco Bay, Massachusetts and Cape Cod Bay	<50	Bottom habitats, generally in hard bottom sheltered nests, holes, or crevices
Ocean pout	juvenile	GOM, GB, SNE, middle Atlantic south to Delaware Bay and the following estuaries: Passamaquoddy Bay to Saco Bay; Mass. Bay, and Cape Cod Bay	< 50	Bottom habitats in close proximity to hard bottom nesting areas
Ocean pout	adult	GOM, GB, SNE, middle Atlantic south to Delaware Bay and the following estuaries: Passamaquoddy Bay to Saco Bay; Mass. Bay, Boston Harbor, and Cape Cod Bay	< 80	Bottom habitats, often smooth bottom near rocks or algae
Offshore hake	juvenile	Outer continental shelf of GB and SNE south to Cape Hatteras, NC	170 - 350	Bottom habitats
Offshore hake	adult	Outer continental shelf of GB and SNE south to Cape Hatteras, NC	150 - 380	Bottom habitats
Pollock	juvenile	GOM, GB, and the following estuaries: Passamaquoddy Bay to Saco Bay; Great Bay to Waquoit Bay; Long Island Sound, Great South Bay	0 – 250	Bottom habitats with aquatic vegetation or a substrate of sand, mud, or rocks
Pollock	adult	GOM, GB, SNE, and middle Atlantic south to New Jersey and the following estuaries: Passamaquoddy Bay, Damariscotta R., Mass Bay, Cape Cod Bay, Long Island Sound	15 – 365	Hard bottom habitats including artificial reefs
Red hake	juvenile	GOM, GB, continental shelf off SNE, and middle Atlantic south to Cape Hatteras and the following estuaries: Passamaquoddy Bay to Saco Bay; Great Bay, Mass. Bay to Cape Cod Bay; Buzzards Bay to Conn. R.; Hudson R./ Raritan Bay, and Chesapeake Bay	< 100	Bottom habitats with substrate of shell fragments, including areas with an abundance of live scallops
Red hake	adult	GOM, GB, continental shelf off SNE, and middle Atlantic south to Cape Hatteras and the following estuaries: Passamaquoddy Bay to Saco Bay; Great Bay, Mass. Bay to Cape Cod Bay; Buzzards Bay to Conn. R.; Hudson R./ Raritan Bay, Delaware Bay, and Chesapeake Bay	10 - 130	Bottom habitats in depressions with a substrate of sand and mud
Redfish	juvenile	GOM, southern edge of GB	25 - 400	Bottom habitats with a substrate of silt, mud, or hard bottom
Redfish	adult	GOM, southern edge of GB	50 - 350	Bottom habitats with a substrate of silt, mud, or hard bottom
Silver hake	juvenile	GOM, GB, continental shelf off SNE, middle Atlantic south to Cape Hatteras and the following estuaries: Passamaquoddy Bay to Casco Bay, Mass. Bay to Cape Cod Bay	20 – 270	Bottom habitats of all substrate types

Species	Life Stage	Geographic Area of EFH	Depth (meters)	EFH Description
Winter flounder	adult	GB, inshore areas of GOME, SNE, middle Atlantic south to Delaware Bay and the following estuaries: Passamaquoddy Bay to Chincoteague Bay	1 - 100	Bottom habitats including estuaries with substrates of mud, sand and gravel
Witch flounder	juvenile	GOM, outer continental shelf from GB south to Cape Hatteras	50 - 450 to 1500	Bottom habitats with fine grained substrate
Witch flounder	adult	GOM, outer continental shelf from GB south to Chesapeake Bay	25 - 300	Bottom habitats with fine grained substrate
Yellowtail flounder	adult	GB, GOM, SNE continental shelf south to Delaware Bay and the following estuaries: Sheepscot R., Casco Bay, Mass. Bay to Cape Cod Bay	20 - 50	Bottom habitats with substrate of sand or sand and mud
Black sea bass	juvenile	Demersal waters over continental shelf from GOM to Cape Hatteras, NC, also includes estuaries from Buzzards Bay to Long Island Sound; Gardiners Bay, Barnegat Bay to Chesapeake Bay; Tangier/ Pocomoke Sound, and James River	1 - 38	Rough bottom, shellfish and eelgrass beds, manmade structures in sandy-shelly areas, offshore clam beds, and shell patches may be used during wintering
Black sea bass	adult	Demersal waters over continental shelf from GOM to Cape Hatteras, NC, also includes estuaries: Buzzards Bay, Narragansett Bay, Gardiners Bay, Great South Bay, Barnegat Bay to Chesapeake Bay; Tangier/ Pocomoke Sound, and James River	20 - 50	Structured habitats (natural and manmade), sand and shell substrates preferred
Scup	juvenile	Continental shelf from GOM to Cape Hatteras, NC includes the following estuaries: Mass. Bay, Cape Cod Bay to Long Island Sound; Gardiners Bay to Delaware Inland Bays; and Chesapeake Bay	(0 - 38)	Demersal waters north of Cape Hatteras and inshore on various sands, mud, mussel, and eelgrass bed type substrates
Tilefish	juvenile	US/Canadian boundary to VA/NC boundary (shelf break, submarine canyon walls, and flanks: GB to Cape Hatteras)	76 - 365	Rough bottom, small burrows, and sheltered areas; substrate rocky, stiff clay, human debris
Tilefish	adult	US/Canadian boundary to VA/NC boundary (shelf break, submarine canyon walls, and flanks: GB to Cape Hatteras)	76 - 365	Rough bottom, small burrows, and sheltered areas; substrate rocky, stiff clay, human debris
Barndoor skate	juvenile	Eastern GOM, GB, SNE, Mid-Atlantic Bight to Hudson Canyon	l0 - 750, mostly < 150	Bottom habitats with mud, gravel, and sand substrates
Barndoor skate	adult	Eastern GOM, GB, SNE, Mid-Atlantic Bight to Hudson Canyon	l0 - 750, mostly < 150	Bottom habitats with mud, gravel, and sand substrates
Clearnose skate	juvenile	GOM, along shelf to Cape Hatteras, NC; includes the estuaries from Hudson River/Raritan Bay south to the Chesapeake Bay mainstem	0 – 500, mostly < 111	Bottom habitats with substrate of soft bottom along continental shelf and rocky or gravelly bottom
Clearnose skate	adult	GOM, along shelf to Cape Hatteras, NC; includes the estuaries from Hudson River/Raritan Bay south to the Chesapeake Bay mainstem	0 – 500, mostly < 111	Bottom habitats with substrate of soft bottom along continental shelf and rocky or gravelly bottom

Species	Life Stage	Geographic Area of EFH	Depth (meters)	EFH Description
Little skate	juvenile	GB through Mid-Atlantic Bight to Cape Hatteras, NC; includes the estuaries from Buzzards Bay south to the Chesapeake Bay mainstem	0 - 137, mostly 73 - 91	Bottom habitats with sandy or gravelly substrate or mud
Little skate	adult	GB through Mid-Atlantic Bight to Cape Hatteras, NC; includes the estuaries from Buzzards Bay south to the Chesapeake Bay mainstem	0 - 137, mostly 73 - 91	Bottom habitats with sandy or gravelly substrate or mud
Rosette skate	juvenile	Nantucket shoals and southern edge of GB to Cape Hatteras, NC	33 - 530, mostly 74 - 274	Bottom habitats with soft substrate, including sand/mud bottoms, mud with echinoid and ophiuroid fragments, and shell and pteropod ooze
Rosette skate	adult	Nantucket shoals and southern edge of GB to Cape Hatteras, NC	33 - 530, mostly 74 - 274	Bottom habitats with soft substrate, including sand/mud bottoms, mud with echinoid and ophiuroid fragments, and shell and pteropod ooze
Smooth skate	juvenile	Offshore banks of GOM	31 – 874, mostly 110 - 457	Bottom habitats with a substrate of soft mud (silt and clay), sand, broken shells, gravel and pebbles
Smooth skate	adult	Offshore banks of GOM	31 – 874, mostly 110 - 457	Bottom habitats with a substrate of soft mud (silt and clay), sand, broken shells, gravel and pebbles
Thorny skate	juvenile	GOM and GB	18 - 2000, mostly 111 - 366	Bottom habitats with a substrate of sand, gravel, broken shell, pebbles, and soft mud
Thorny skate	adult	GOM and GB	18 - 2000, mostly 111 - 366	Bottom habitats with a substrate of sand, gravel, broken shell, pebbles, and soft mud
Winter skate	juvenile	Cape Cod Bay, GB, SNE shelf through Mid-Atlantic Bight to North Carolina; includes the estuaries from Buzzards Bay south to the Chesapeake Bay mainstem	0 - 371, mostly < 111	Bottom habitats with substrate of sand and gravel or mud
Winter skate	adult	Cape Cod Bay, GB, SNE shelf through Mid-Atlantic Bight to North Carolina; includes the estuaries from Buzzards Bay south to the Chesapeake Bay mainstem	0 - 371, mostly < 111	Bottom habitats with substrate of sand and gravel or mud
White hake	juvenile	GOM, southern edge of GB, SNE to middle Atlantic and the following estuaries: Passamaquoddy Bay to Great Bay; Mass. Bay to Cape Cod Bay	5 - 225	Pelagic stage - pelagic waters; demersal stage - bottom habitat with seagrass beds or substrate of mud or fine grained sand

6.3 Human Environment, Vessels, Ports and Communities

This section updates information provided in the annual SAFE Report for the Monkfish FMP, adding data for FY2015.

6.3.1 **Vessels and Fishery Sectors**

The following sections show the distribution of effort and landings by permit category, area and gear type.

6.3.1.1 Permits

In 2015, there were 600 monkfish limited access permits, of which 268 were Category C permits holding limited access permits in either the multispecies (51%) or scallop (55%) fisheries, and 242 were Category D permits, primarily (98%) holding limited access multispecies permits (Table 12). Overall, 65.5% of monkfish limited access permit holders also hold multispecies limited access permits. Vessels in all monkfish permit categories also hold limited access permits in a number of New England and Mid-Atlantic fisheries. The number and percent of monkfish vessels has decreased slightly from the 2014 SAFE Report (NEFMC, 2015). There were eight Category H limited access permits for vessels fishing within the SFMA (Table 12).

Table 12 - Number and percent of monkfish limited access vessels also issued a limited access permit in other fisheries in 2015, by permit category

MONKFISH PERMIT CATEGORY	NUMBER OF MONKFISH PERMITS	NUMBER OF MONKFISH VESSELS ALSO ISSUED A LIMITED ACCESS PERMIT FOR:										
		BLACK SEA BASS	SUMMER FLOUNDER	HERRING	LAGC IFQ SCALLOP	LOBSTER	MULTI-SPECIES	OCEAN QUAHOG	RED CRAB	SCALLOP	SCUP	SQUID/ MACKEREL/ BUTTERFISH
A	22	13	10		4	14	2				12	1
B	43	19	8		4	22	3				10	4
C	268	97	211	15	147	218	136			161	103	88
D	242	94	150	22	111	217	237			19	116	78
F	17	16	17	8	9	17	15			2	17	17
H	8	2	1		1							
TOTAL	600	241	397	45	276	488	393	0	0	182	258	188

MONKFISH PERMIT CATEGORY	NUMBER OF MONKFISH PERMITS	PERCENT OF MONKFISH VESSELS ALSO ISSUED A LIMITED ACCESS PERMIT FOR:										
		BLACK SEA BASS	SUMMER FLOUNDER	HERRING	LAGC IFQ SCALLOP	LOBSTER	MULTI-SPECIES	OCEAN QUAHOG	RED CRAB	SCALLOP	SCUP	SQUID/ MACKEREL/ BUTTERFISH
A	22	59%	45%	0%	18%	64%	9%	0%	0%	0%	55%	5%
B	43	44%	19%	0%	9%	51%	7%	0%	0%	0%	23%	9%
C	268	36%	79%	6%	55%	81%	51%	0%	0%	60%	38%	33%
D	242	39%	62%	9%	46%	90%	98%	0%	0%	8%	48%	32%
F	17	94%	100%	47%	53%	100%	88%	0%	0%	12%	100%	100%
H	8	25%	13%	0%	13%	0%	0%	0%	0%	0%	0%	0%
TOTAL	600	40%	66%	8%	46%	81%	66%	0%	0%	30%	43%	31%

Source: NMFS-GARFO Analysis and Program Support Division, vessel permit database, accessed July, 2016.

The FMP also provides an open-access permit (Category E) for vessels that did not qualify for a limited access permit so those vessels can land monkfish caught incidentally in other fisheries. Table 13 shows an increase in the number of category E permits during the first few years of the FMP, followed by a decline since the peak in 2005, from 2,379 permits to 1,595 permits in 2015.

Table 13 - Monkfish open-access (Category E) permits issued each year since implementation of the FMP since 1999.

Fishing Year	Number of permits
1999	1,466
2000	1,882
2001	1,991
2002	2,142
2003	2,120
2004	2,256
2005	2,379
2006	2,310
2007	2,265
2008	2,163
2009	2,066
2010	1,998
2011	1,827
2012	1,763
2013	1,713
2014	1,644
2015	1,595

Source: NMFS-GARFO Analysis and Program Support Division, vessel permit database, accessed July, 2016.

6.3.1.2 Landings and Revenues

Table 14 shows monthly landings for FY2015 by area and gear, as well as total monthly landings for the fishing year. Landings in both areas combined peaked in FY 2003 but have since declined to reach a relatively stable level between FY2011 – 2014 (Table 15). FY 2015 landings showed a slight increase in landings in the NFMA and a slight decrease in the SFMA, however, it is not clear yet whether this represents a new trend. Monkfish landings increased between FY 2002 and FY 2003, principally due to the increased trip limits in the SFMA, then declined in FY 2004 as trip limits and DAS allocations were reduced in that area. In FY 2005 total landings increased by 1,272 mt, ~ 7%, due to an increase in SFMA landings as a result of increased trip limits and DAS allocations, despite a decline of 20% in NFMA landings from the previous year (Figure 8). NFMA landings declined between FY 2001 and FY2010, although trip limits were only established in FY 2007, and in FY 2008 were about 24% of what they were at the peak. The 2013 Emergency Action removed the NFMA possession limit but did not appear to significantly increase landings on previous fishing years. The NFMA harvest was below the target TAL for FY 2015 (30%); the SFMA harvest was also below the target TAL for FY 2014 (47%).

Table 16 shows monthly landings by gear from the dealer reports for FY 2015, both as reported (landed weight) and converted to live weight. The lower landed weights reflect the fact that monkfish are landed as tails only, and as whole, gutted fish. The lower ratio of landed weight to live weight for otter trawls (0.35), compared to gillnets (0.80), is the result of a greater proportion of tails being landed by otter trawls, while gillnet vessels land mostly whole fish. Table 16 includes all landings in the dealer database,

while other tables reporting landed weights are filtered by permit category, and, therefore, may not include some dealer landings for which there is no permit number associated.

Table 17 is based on fishing year and landed weights, and indicates that the trend in revenues and landings has stabilized in recent years. Figure 9 shows the long-term trend in landings and revenues based on a fishing year. While landings have declined since the pre-FMP peak in 1997, nominal revenues have declined to a lesser degree since that time. According to Table 17, the monkfish market fluctuates annually with periods of increasing and decreasing landings leading to both revenue increases and decreases.

Table 14 - Monkfish landings by area, gear and month for FY2014 (converted to live weight)

	May 2015	Jun 2015	Jul 2015	Aug 2015	Sep 2015	Oct 2015	Nov 2015	Dec 2015	Jan 2016	Feb 2016	Mar 2016	Apr 2016	May 2015 - Apr 2016		2015*	
															May - Apr FY '15 as a % of Target TAL	Target TAL
													Metric Tons	Percent of Area		Metric Tons
Northern	**226**	**215**	**258**	**332**	**325**	**284**	**322**	**379**	**299**	**501**	**548**	**391**	**4,808**	**46%**	**70%**	**5,854**
Otter Trawl	181	156	150	154	192	173	251	350	295	499	545	384	3,330	38%	57%	
Gillnet	39	38	86	148	126	104	64	29	4	2	1	6	647	7%	11%	
Dredge	6	17	20	29	6	7	7	0		0	0	1	93	1%	2%	
Other Gears	0	4	2	1	1	0	0	0			2	0	10	0%	0%	
Southern	**1,030**	**748**	**332**	**99**	**64**	**198**	**256**	**469**	**295**	**254**	**444**	**544**	**4,733**	**54%**	**53%**	**8,925**
Otter Trawl	53	15	20	15	19	97	33	99	46	88	111	87	683	8%	8%	
Gillnet	811	582	189	9	10	81	209	356	238	153	308	403	3,349	38%	38%	
Dredge	142	117	95	68	32	10	9	11	10	12	15	29	550	6%	6%	
Other Gears	24	34	28	7	3	10	5	3	1	1	10	25	151	2%	2%	
All Areas	**1,256**	**963**	**590**	**431**	**389**	**482**	**578**	**848**	**594**	**755**	**992**	**935**	**8,813**	**100%**		
Otter Trawl	234	171	170	169	211	270	284	449	341	587	656	471	4,013	46%		
Gillnet	850	620	275	157	136	185	273	385	242	155	309	409	3,996	45%		
Dredge	148	134	115	97	38	17	16	11	10	12	15	30	643	7%		
Other Gears	24	38	30	8	4	10	5	3	1	1	12	25	161	2%		

Table 15- Monkfish landings by management area FY1999 - 2015

Year	NFMA (metric tons)	SFMA (metric tons)
1999	9,720	14,311
2000	11,859	7,960
2001	14,853	11,069
2002	14,491	7,478
2003	14,155	12,198
2004	11,750	6,193
2005	9,533	9,656
2006	6,677	5,909
2007	5,050	7,180
2008	3,528	6,751
2009	3,344	4,800
2010	2,834	4,484
2011	3,699	5,801
2012	3,920	5,184
2013	3,596	5,088
2014	3,403	5,415
2015	4,080	4,733

Source: NMFS-GARFO Analysis and Program Support Division, cfders dealer weighout and vessel trip report databases.

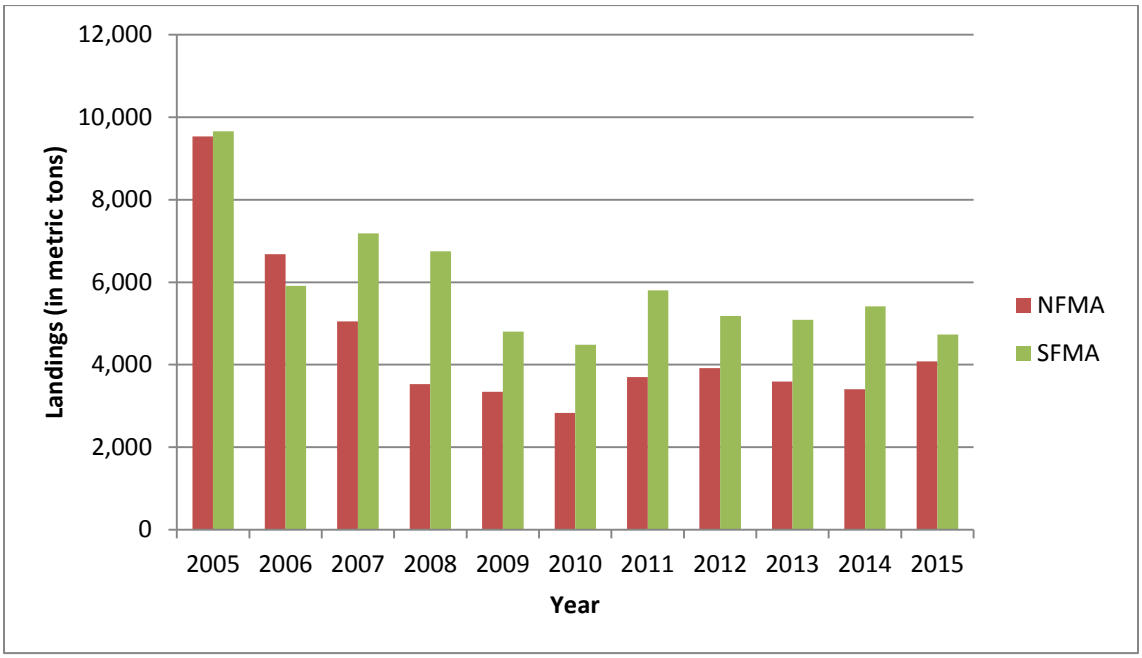


Figure 8 - NFMA and SFMA monkfish landings, FY 2004-2014

Table 16 - FY2014 monkfish landings from dealer reports, showing live weight (top) and landed weights (bottom)

Live Weight for FY 2014

Month	Otter Trawl	Scallop Dredge	Gillnet	Hook	Other	Total Pounds
May	443,818	123,599	1,713,867	1,318	386,286	2,668,888
June	291,482	100,856	1,251,977	103	379,418	2,023,836
July	261,786	95,033	537,999	277	319,356	1,214,451
August	243,864	45,982	301,761	955	312,853	905,415
September	261,490	29,053	287,767	15	257,375	835,700
October	359,718	10,106	370,008	173	281,707	1,021,712
November	352,958	10,890	527,983	3	351,385	1,243,219
December	538,518	5,377	760,759		555,093	1,859,747
January	612,785	4,648	497,712		148,173	1,263,318
February	1,047,768	4,926	284,518	312	325,250	1,662,774
March	1,222,555	4,128	575,796	50	330,178	2,132,707
April	913,456	12,196	817,689	1,481	251,576	1,996,398
TOTAL	**6,550,198**	**446,794**	**7,927,836**	**4,687**	**3,898,650**	**18,828,165**

Landed Weight for FY2014

Month	Otter Trawl	Scallop Dredge	Gillnet	Hook	Other	Total Pounds
May	173,735	37,597	1,373,708	1,150	136,729	1,722,919
June	99,181	30,380	1,003,355	68	134,309	1,267,293
July	84,992	28,627	391,199	104	114,181	619,103
August	84,904	13,886	153,553	526	98,897	351,766
September	85,073	8,948	152,077	13	79,436	325,547
October	121,735	3,084	227,164	52	95,189	447,224
November	121,237	3,409	388,660	1	124,696	638,003
December	194,408	1,631	629,609		205,393	1,031,041
January	219,320	1,442	418,752		49,702	689,216
February	352,072	1,485	233,619	94	115,042	702,312
March	436,397	1,242	478,143	15	123,265	1,039,062
April	362,890	3,673	652,699	1,356	94,766	1,115,384
TOTAL	**2,335,944**	**135,404**	**6,102,538**	**3,379**	**1,371,605**	**9,948,870**

Source: NMFS-GARFO Analysis and Program Support Division, cfders dealer weighout database, accessed July, 2015.

Note: Table does not include landings in the dealer database for which there is no permit number associated, while other tables reporting landed weights are not filtered by permit category, and, therefore, include all dealer landings.

Table 17 - Total monkfish landings (landed weight) and revenues, 1995-2014

Fishing Year	Landings*	Revenues*
(May 1 - April 30)	**(1,000 lbs. landed wt.)**	**($1,000)**
1995	18,416	$24,759
1996	20,733	$26,188
1997	21,774	$30,127
1998	24,156	$34,682
1999	26,077	$48,714
2000	23,423	$46,123
2001	30,520	$42,354
2002	25,312	$35,256
2003	29,321	$37,471
2004	18,377	$30,945
2005	22,818	$42,640
2006	14,747	$28,548
2007	14,225	$29,145
2008	11,714	$23,307
2009	9,652	$18,599
2010	8,728	$20,375
2011	11,350	$28,856
2012	9,937	$21,409
2013	9,489	$18,209
2014	10,189	$19,483
2015	9,949	$19,046

Source: NMFS-GARFO Analysis and Program Support Division, cfders dealer weighout database, accessed July, 2016

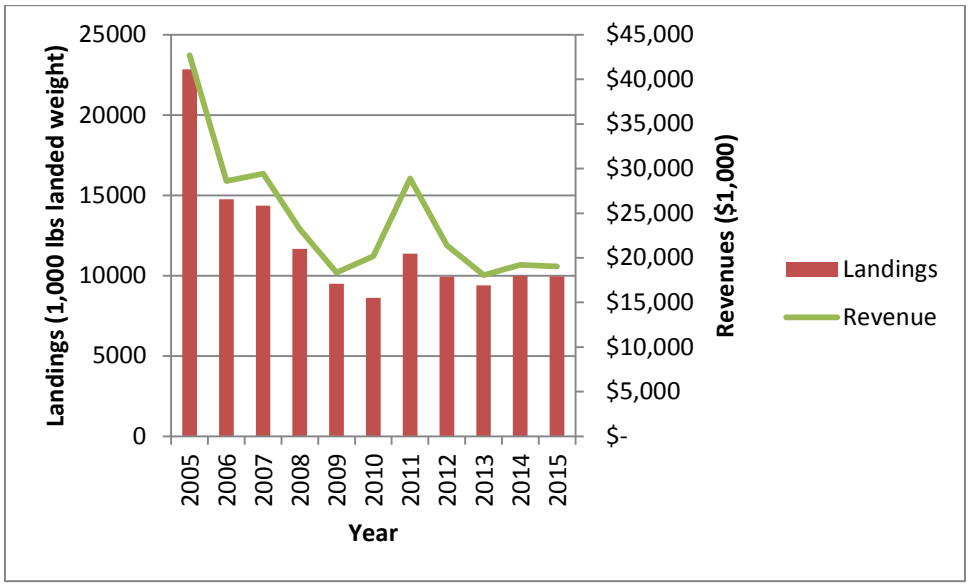


Figure 9 - Monkfish landings and revenue, 2005 - 2015

Figure 10 illustrates the seasonal pattern of monkfish landings in FY 2015 by month and gear type. The predominant gears are gillnet, landing approximately 1.7 million lb in May, and otter trawl landing approximately 1.2 million lb in March. A small proportion of landings occur during the winter months, but a much larger proportion during the spring/early summer months when fish are migrating from deeper water.

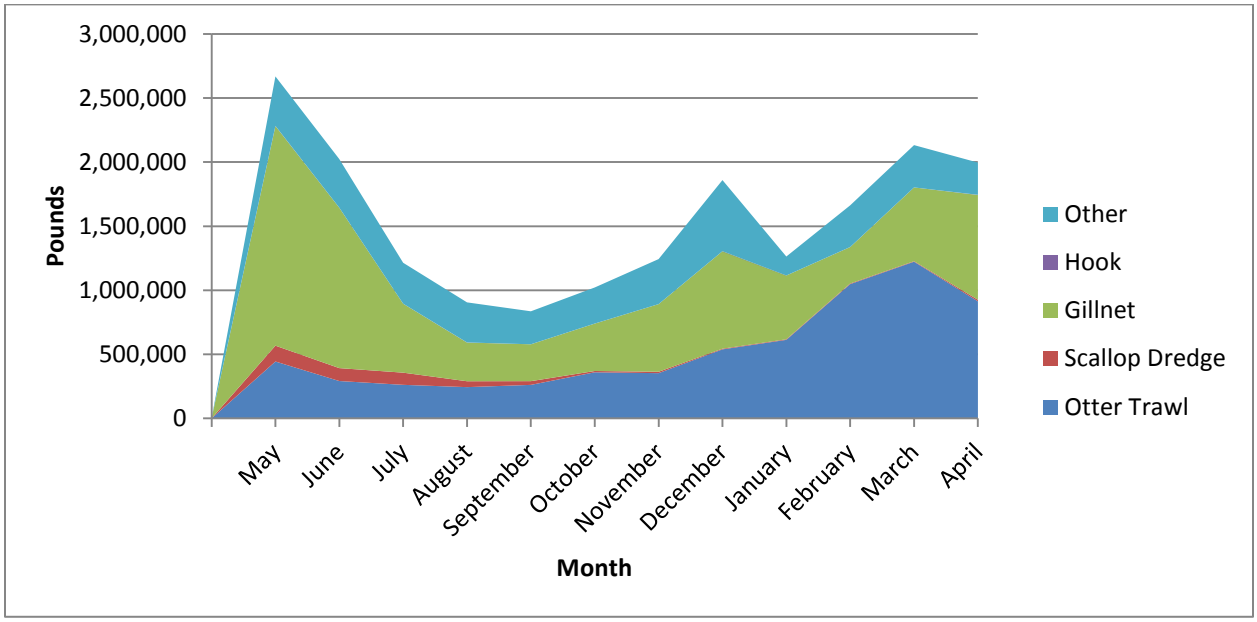


Figure 10 - Monkfish landings by gear and month (FY2015) in pounds (live weight)

While Massachusetts continues to account for the greatest proportion of all monkfish landings, all states have seen an overall decline in monkfish landings (Table 18) in recent years. FY2015 remains an outlier with some states seeing an increase in landings, however, it is not clear whether this constitutes a new trend.

Table 19 and Table 20 show monkfish landings and revenues as a percentage of total landings and revenues by permit categories for FY 2006-2014 (data for earlier years are available in the FW7 document). Data for Connecticut is shown separately to facilitate comparison with earlier landings data summarized in previous monkfish management actions that account for different ways that Connecticut reported state landings to NMFS.

Table 18 - Total monkfish landings (landed weight), 2009-2015, by state

STATE	Thousands of Pounds of Monkfish									
	′ 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
CT	318	406	244	253	305	457	547	724	380	464
MA	7,254	6,134	4,850	4,181	3,812	4,972	4,303	4,227	4,581	5,067
MD	106	158	132	48	83	98	69	86	78	36
ME	987	526	303	178	115	257	345	243	178	219

NC	112	58	31	27	10	3	38	47	56	99
NH	200	157	125	86	74	38	50	68	123	442
NJ	3,021	2,670	1,637	1,418	1,676	1,389	1,351	1,740	1,250	2,524
NY	1,150	841	807	766	1,059	1,183	773	748	827	739
RI	2,100	1,891	1,732	1,598	2,122	1,495	1,488	1,819	1,648	1,830
VA	560	524	502	402	638	567	413	352	259	464
TOTAL	**14,367**	**11,672**	**9,494**	**8,612**	**11,365**	**9,940**	**9,394**	**9,992**	**9,949**	**14,764**

Source: NMFS-GARFO Analysis and Program Support Division, cfders dealer weighout database, accessed July, 2016.

* CT data may include landings from vessels without a 2006-2012 Monkfish permit

Category A and B vessels continue to show a proportionally higher dependence on monkfish than Category C and D vessels, which also hold limited access permits in either scallops or multispecies. Category C vessels, of which 59% also hold scallop limited access permits, have seen their dependence on monkfish revenues decline steadily as revenues from scallops have increased.

Table 19 - Monkfish landings, 2006-2015, as a percentage of total landings by permit category

Monkfish Permit Category	1,000 pounds, landed weight									
	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
A	629	932	993	730	773	957	932	871	906	831
% of Total A Landings	9.8%	8.3%	8.7%	9.1%	10.1%	7.3%	14.7%	31.4%	25.5%	31.5%
B	1,206	1,628	1,558	1,117	1,210	1,579	1,429	1,251	1,446	1,154
% of Total B Landings	37.4%	42.3%	46.8%	27.0%	27.3%	28.3%	29.1%	28.5%	30.9%	21.1%
C	5,563	5,000	3,787	3,273	2,984	3,804	3,275	3,020	3,313	3,461
% of Total C Landings	6.1%	5.2%	3.8%	3.3%	3.0%	3.9%	3.9%	4.0%	4.9%	4.9%
D	5,842	5,384	4,503	3,734	3,199	4,288	3,531	3,509	3,674	3,901
% of Total D Landings	7.9%	7.1%	5.6%	4.3%	4.6%	4.7%	4.2%	4.3%	5.2%	6.0%
H	242	223	228	217	142	297	231	161	177	159
% of Total H Landings	19.4%	17.2%	14.8%	21.8%	12.0%	19.7%	18.7%	14.9%	15.5%	13.4%
E (Open Access)	987	937	605	424	282	342	417	526	378	344
% of Total E Landings	0.3%	0.3%	0.2%	0.1%	0.1%	0.1%	0.1%	0.2%	0.1%	0.1%
F					23	98	125	58	98	100
% of Total F Landings					0.7%	0.8%	0.8%	0.2%	0.3%	0.3%
CT	294	263								

% of Total CT Landings	2.8%	2.9%								
TOTAL MONK LANDED	14,764	14,367	11,672	9,494	8,612	11,365	9,940	9,395	9,992	9,949

Source: NMFS-GARFO Analysis and Program Support Division, cfders dealer weighout database, accessed July, 2016.
** CT data may include landings from vessels without a 2006-2007 Monkfish permit*
If necessary, Category F landings have been allocated to prior permit categories to protect confidentiality

Table 20 - Monkfish revenues, 2006-2015, as a percentage of total revenues by permit category

Monkfish Permit Category	$1,000, nominal (not discounted)									
	FY 2006	**FY 2007**	**FY 2008**	**FY 2009**	**FY 2010**	**FY 2011**	**FY 2012**	**FY 2013**	**FY 2014**	**FY 2015**
A	$1,002	$1,296	$1,406	$993	$1,341	$1,915	$1,637	$1,297	$1,407	$1,276
% of Total A Revenues	36.6%	40.6%	33.2%	35.0%	27.6%	31.2%	34.1%	31.2%	30.2%	30.9%
B	$1,788	$2,278	$2,091	$1,564	$2,191	$3,237	$2,593	$1,794	$2,176	$1,839
% of Total B Revenues	41.8%	44.9%	50.6%	35.4%	38.0%	40.3%	34.6%	30.7%	34.6%	30.3%
C	$11,769	$12,360	$9,012	$7,678	$8,462	$11,270	$7,908	$6,618	$7,146	$7,309
% of Total C Revenues	4.6%	4.8%	3.7%	3.2%	2.6%	3.1%	2.4%	2.3%	2.9%	2.6%
D	$11,265	$10,404	$8,859	$6,855	$7,091	$10,640	$7,475	$6,762	$6,947	$7,286
% of Total D Revenues	12.1%	11.4%	9.4%	7.9%	8.0%	9.3%	7.4%	7.8%	8.3%	8.3%
H	$338	$270	$251	$228	$181	$515	$401	$268	$305	$273
% of Total H Revenues	38.1%	27.1%	20.8%	32.9%	22.1%	36.5%	39.7%	35.5%	33.8%	41.5%
E (Open Access)	$2,101	$2,393	$1,610	$1,045	$833	$1,061	$1,141	$1,186	$951	$811
% of Total E Revenues	0.7%	0.7%	0.5%	0.3%	0.2%	0.2%	0.3%	0.3%	0.3%	0.2%
F					$73	$248	$246	$140	$279	$252
% of Total F Revenues					2.4%	2.6%	1.7%	0.8%	1.4%	1.1%
CT	$334	$425								
% of Total CT Revenues	0.9%	1.1%								19.6%
TOTAL MONK REVENUE	$28,598	$29,426	$23,228	$18,364	$20,173	$28,885	$21,400	$18,065	$19,210	$19,046

Source: NMFS-GARFO Analysis and Program Support Division, cfders dealer weighout database, accessed July, 2016.
** CT data may include landings from vessels without a 2006-2007 Monkfish permit*
If necessary, Category F landings have been allocated to prior permit categories to protect confidentiality

Vessel length category data (Table 21 and Table 22) indicate a decreased reliance on monkfish for all size classes except for 30-49 ft vessels, which shows consistent reliance on monkfish (data for earlier years are available in the FW7 document).

Table 21 - Monkfish landings, 2006-2015, as a percentage of total landings by vessel length

Vessel Length Category	1,000 pounds, landed weight									
	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
0-29 Feet	1	2	7	3	1	1	0	0	0	1
% of Total 0-29 Landings	0.1%	0.4%	1.3%	0.5%	0.2%	0.1%	0.1%	0.1%	0.0%	0.1%
30-49 Feet	7,562	8,366	7,166	5,869	5,160	6,730	5,657	5,451	6,020	5,840
% of Total 30-49 Landings	14.3%	14.3%	10.9%	8.7%	7.6%	10.0%	9.1%	10.6%	10.7%	8.7%
50-69 Feet	2,255	2,092	1,674	1,439	1,414	1,849	1,438	1,288	1,367	1,383
% of Total 50-69 Landings	3.7%	3.5%	2.5%	1.9%	2.0%	2.4%	1.4%	1.6%	1.6%	1.7%
70-89 Feet	4,256	3,139	2,502	1,925	1,838	2,508	2,539	2,557	2,497	2,626
% of Total 70-89 Landings	2.2%	1.6%	1.3%	1.1%	1.0%	1.2%	1.4%	1.5%	1.5%	1.6%
90+ Feet	396	505	324	259	198	278	306	99	109	99
% of Total 90+ Landings	0.2%	0.2%	0.1%	0.1%	0.1%	0.1%	0.2%	0.1%	0.1%	0.1%
CT	294	263								
% of Total CT Landings	2.8%	2.9%								
TOTAL MONK LANDED	14,764	14,367	11,672	9,494	8,612	11,365	9,940	9,395	9,992	9,949

Source: NMFS-GARFO Analysis and Program Support Division, cfders dealer weighout database, accessed July, 2016.
** CT data may include landings from vessels without a 2006-2007 Monkfish permit*

Table 22 - Monkfish revenues, 2006-2015, as a percentage of total revenues by vessel length

Vessel Length Category	$1,000, nominal (not discounted)									
	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
0-29 Feet	$2	$6	$18	$8	$2	$2	$1	$1	$0	$2
% of Total 0-29 Revenues	0.1%	0.4%	1.4%	0.7%	0.2%	0.1%	0.1%	0.1%	0.0%	0.1%
30-49 Feet	$12,082	$12,489	$11,026	$8,794	$9,354	$13,740	$10,554	$8,296	$9,556	$9,456
% of Total 30-49 Revenues	14.1%	13.6%	11.3%	10.1%	10.2%	12.7%	11.1%	9.8%	10.3%	10.2%
50-69 Feet	$5,143	$5,446	$4,080	$3,482	$3,878	$5,439	$3,336	$2,833	$2,872	$2,902
% of Total 50-69 Revenues	5.2%	5.5%	4.0%	3.7%	3.5%	4.1%	2.8%	2.7%	2.8%	2.6%
70-89 Feet	$10,022	$9,538	$7,214	$5,408	$6,297	$8,762	$6,733	$6,706	$6,522	$6,451

% of Total 70-89 Revenues	2.7%	2.4%	2.0%	1.5%	1.4%	1.6%	1.4%	1.5%	1.6%	1.3%
90+ Feet	$1,015	$1,521	$891	$673	$643	$943	$775	$229	$260	$235
% of Total 90+ Revenues	1.0%	1.4%	0.8%	0.6%	0.5%	0.6%	0.5%	0.2%	0.2%	0.2%
CT	$334	$425								
% of Total CT Revenues	0.9%	1.1%								
TOTAL MONK REVENUE	$28,598	$29,426	$23,228	$18,364	$20,173	$28,885	$21,400	$18,065	$19,210	$19,046

Source: NMFS-GARFO Analysis and Program Support Division, cfders dealer weighout database, accessed July, 2016.
** CT data may include landings from vessels without a 2006-2007 Monkfish permit*

When viewed in aggregate, vessels that hold a monkfish permit are not significantly reliant on monkfish, as monkfish has accounted for less than 3% of total landings since FY 2006 (Table 23) and less than 4.1% of total revenues in the same time period (Table 24). The proportion of monkfish in both landings and revenue has decreased between FY2006 and FY2015, the slight increase seen in FY2014 did not continue in FY2015.

Table 23 - Landings of monkfish and other species, 2006-2015, as a percent of total landings

Species Category	1,000 pounds, landed weight									
	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015
Dogfish	4,482	3,171	4,689	9,166	10,495	13,967	17,868	10,529	16,213	16,288
Dogfish % of Total Landings	0.9%	0.6%	0.8%	1.7%	2.1%	2.4%	3.3%	2.1%	3.3%	3.7%
Fluke	10,481	9,297	8,385	9,865	13,967	12,298	11,613	9,805	9,323	8,231
Fluke % of Total Landings	2.0%	1.7%	1.5%	1.8%	2.8%	2.1%	2.2%	2.0%	1.9%	1.9%
Monkfish	14,764	14,367	11,672	9,494	8,612	11,365	9,940	9,395	9,992	9,949
Monkfish % of Total Landings	2.9%	2.7%	2.0%	1.7%	1.7%	2.0%	1.9%	1.9%	2.0%	2.3%
Multispecies	48,711	59,165	66,647	64,420	57,683	61,758	48,874	44,832	45,267	42,146
Multispecies % of Total Landings	9.4%	11.1%	11.7%	11.8%	11.6%	10.8%	9.1%	9.0%	9.2%	9.7%
Scallops	59,644	59,792	51,774	54,247	54,524	57,743	51,989	37,434	29,839	36,228
Scallops % of Total Landings	11.5%	11.2%	9.1%	9.9%	11.0%	10.1%	9.7%	7.5%	6.1%	8.3%
Skates	15,874	21,042	19,576	19,832	13,102	15,765	15,751	16,566	11,715	10,478

Skates % of Total Landings	3.1%	4.0%	3.4%	3.6%	2.6%	2.8%	2.9%	3.3%	2.4%	2.4%
Other	363,654	365,809	408,763	380,806	338,531	399,535	380,679	368,401	368,703	312,950
Other % of Total Landings	70.3%	68.7%	71.5%	69.5%	68.1%	69.8%	70.9%	74.1%	75.1%	71.7%
TOTAL LBS. LANDED	517,610	532,644	571,508	547,830	496,914	572,432	536,716	496,963	491,052	436,269

Source: NMFS-GARFO Analysis and Program Support Division, cfders dealer weighout database, accessed July, 2016.
** CT data may include landings from vessels without a 2006-2007 Monkfish permit*

Table 24 - Revenues of monkfish and other species, 2006-2015, as a percent of total revenues

Species Category	$1,000, nominal (not discounted)									
	FY 2006	**FY 2007**	**FY 2008**	**FY 2009**	**FY 2010**	**FY 2011**	**FY 2012**	**FY 2013**	**FY 2014**	**FY 2015**
Dogfish	$ 1,172	$ 1,122	$ 1,500	$ 2,552	$ 2,902	$ 3,564	$ 4,313	$ 2,187	$ 3,564	$ 3,215
Dogfish % of Total Revenues	0.2%	0.2%	0.2%	0.4%	0.4%	0.4%	0.5%	0.3%	0.5%	0.4%
Fluke	$ 22,658	$ 21,790	$ 16,214	$ 18,571	$ 24,077	$ 25,862	$ 26,374	$ 24,282	$ 26,384	$ 25,242
Fluke % of Total Revenues	3.2%	3.0%	2.4%	2.9%	3.0%	2.7%	3.1%	3.2%	3.7%	3.2%
Monkfish	$ 28,598	$ 29,426	$ 23,228	$ 18,364	$ 20,173	$ 28,885	$ 21,400	$ 18,065	$ 19,210	$ 19,046
Monkfish % of Total Revenues	4.1%	4.0%	3.4%	2.8%	2.5%	3.1%	2.5%	2.4%	2.7%	2.4%
Multispecies	$ 74,579	$ 81,679	$ 82,625	$ 77,246	$ 81,948	$ 89,964	$ 72,149	$ 60,465	$ 60,971	$ 55,679
Multispecies % of Total Revenues	10.7%	11.1%	12.2%	12.0%	10.4%	9.5%	8.4%	7.9%	8.5%	7.0%
Scallops	$ 381,478	$ 394,486	$ 354,265	$ 355,337	$ 470,980	$ 576,076	$ 521,292	$ 437,760	$ 372,015	$ 445,872
Scallops % of Total Revenues	54.5%	53.7%	52.4%	55.1%	59.5%	60.9%	60.7%	57.5%	51.8%	56.4%
Skates	$ 5,466	$ 6,516	$ 5,206	$ 5,577	$ 3,137	$ 4,624	$ 4,563	$ 5,213	$ 2,697	$ 1,351
Skates % of Total Revenues	0.8%	0.9%	0.8%	0.9%	0.4%	0.5%	0.5%	0.7%	0.4%	0.2%
Other	$ 186,254	$ 200,207	$ 193,383	$ 167,415	$ 187,953	$ 216,500	$ 208,978	$ 213,464	$ 233,809	$ 239,492
Other % of Total Revenues	26.6%	27.2%	28.6%	26.0%	23.8%	22.9%	24.3%	28.0%	32.5%	30.3%
TOTAL REVENUE	$700,204	$735,227	$676,421	$645,064	$791,170	$945,476	$859,068	$761,437	$718,649	$789,897

Source: NMFS-GARFO Analysis and Program Support Division, cfders dealer weighout database, accessed July, 2016.

** CT data may include landings from vessels without a 2006-2007 Monkfish permit*

6.3.1.3 Days-at-Sea (DAS)

Starting in Year 2 of the FMP (May, 2000-April, 2001) limited access monkfish vessels (Categories A, B, C, and D) were allocated 40 monkfish DAS. By definition, Category A and B vessels do not qualify for limited access multispecies or scallop permits, and Category C and D vessels must use either a multispecies or scallop DAS while on a monkfish DAS. Beginning in FY 2005 seven vessels qualified for a permit Category H fishery under the provisions adopted in Amendment 2, for vessels fishing exclusively in the southernmost area of the fishery.

Until FW 4 which took effect in FY 2007, vessels were not required to use a monkfish DAS in the NFMA, as there were no monkfish landing limits when a limited access vessel was on a multispecies DAS. Therefore, DAS usage was well below the total DAS allocated, and primarily reflected monkfish fishing activity in the SFMA. Starting in FY 2007, vessels in both areas were required to use a monkfish DAS when exceeding the applicable incidental limit. The effect of this requirement shows the total DAS has remained reasonably the same from FY 2009-2015, with FY 2015 indicating a slight decrease in DAS used compared to FY2014. DAS used by permit category since 2009 is shown in Figure 11.

As shown in Table 25, only a portion of the limited access vessels used at least one monkfish DAS in FY 2015, and the total DAS used by limited access (permit category C and D) vessels was only about 10% of the total allocated. This represents a substantial amount of latent effort in the fishery. Even among active vessels (those that used at least one monkfish DAS), not all allocated DAS are used. Only about 43% of allocated DAS were used by active vessels across all permit categories, this is a decrease on FY2014. Part of this latent effort can be explained by the fact that nearly one-half of the permit category C vessels, 161 vessels, are limited access scallop vessels who choose not to use a scallop DAS to target monkfish under the monkfish DAS usage requirements because of the greater profitability of using scallop DAS to target scallops (Table 12 and Table 26).

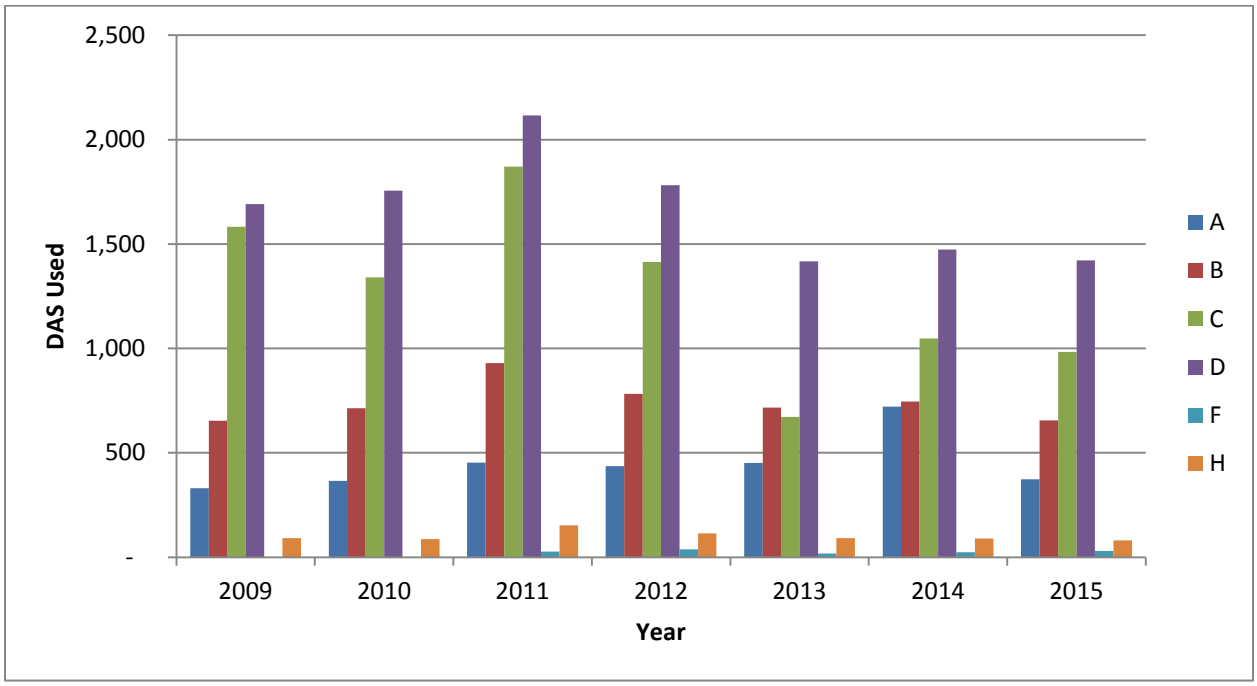


Figure 11 - DAS used by permit category, FY 2009-2012

A second reason for the unused DAS, even among active vessels, appears to be the result of the low monkfish DAS usage rate by vessels fishing in the NFMA. For active vessels, (i.e., those that used at least one DAS) in FY 2014, the DAS usage rate is distinctly different between the two management areas. Of the 49 active vessels in the NFMA, most were not constrained by the allocation of 40 DAS, plus four carryover DAS, and the average number of DAS used in the NFMA was 15 DAS (Table 26). In contrast, among the 132 active vessels in the SFMA the average number of DAS used was 21.3 of their 32 available DAS, (28 plus four carryover) (Table 26). The usage rate decreased in the SFMA from an average of 24 DAS during FY 2014. The usage rate for the NFMA also increased from an average number of DAS used of 12 in the previous year.

Table 25 - Monkfish DAS usage, FY 2015

Permit Category	All Vessels			Active Vessels*		
	Total Number of Permits	DAS Allocated	DAS Used	Number of Active Vessels	DAS Allocated	DAS Used
A	22	1,082	374	14	689	374
B	43	2,116	655	28	1,378	655
C	268	13,186	984	46	2,263	984
D	242	11,906	1,421	71	3,493	1421
F	17	249	30	3	34	30
H	8	394	81	7	344	81
TOTAL	**600**	**28,933**	**3,545**	**169**	**8,201**	**3,545**

Source: NMFS Vessel Permits and Allocation Management System (AMS) databases, accessed July, 2016.

** Active = vessels that used >0 monkfish DAS*

Permit Category A active vessel NMA DAS used not included due to confidentiality.

Table 26 - Monkfish-only, monkfish/multispecies and monkfish/scallop DAS usage by active vessels by area, FY 2015

Permit Category	Area	Number of Active Vessels	Monkfish	Monkfish/ Multispecies	Monkfish / Scallop	DAS Used	Average DAS Usage
A	NMA	0	0	0	0	0	0.0
B	NMA	1	2	0	0	2	2.0
C	NMA	23	0	377	0	377	16.4
D	NMA	25	0	349	0	349	14.0
Total		**49**	**2**	**726**	**0**	**728**	**15**
A	SMA	14	374	0	0	374	26.7
B	SMA	28	653	0	0	653	23.3
C	SMA	29	0	606	0	606	20.9
D	SMA	51	0	1,071	0	1,071	21.0
F	SMA	3	0	30	0	30	10.0
H	SMA	7	0	81	0	81	11.6
Total		**132**	**1,027**	**1,788**	**0**	**2,815**	**21.3**

Source: NMFS Vessel Permits and Allocation Management System (AMS) databases, accessed July, 2016.

** Active = vessels that used >0 monkfish DAS*

6.3.2 Ports and communities

This section updates information contained in the EA for Framework 9. Framework 9 also contains the most recent analysis of monkfish engagement by community and social vulnerability to high monkfish engagement (NEFMC, 2016).

Table 27 shows the distribution of monkfish permit holders by homeport and monkfish permit category for the five primary, 15 secondary, and "other" monkfish ports for FY 2015. Table 18 shows monkfish landings by state by federally-permitted vessels between 2006 and 2015.

Table 27 - Monkfish permits by port, FY 2015

HOMEPORT		FY 2015 by Category							
		A	B	C	D	E	F	H	TOTAL
PRIMARY PORTS		9	24	147	86	307	12	0	585
NEW BEDFORD	MA	2	0	105	33	68	0	0	208
GLOUCESTER	MA	0	0	19	27	101	0	0	147
NARRAGANSETT/POINT JUDITH	RI	1	0	12	17	46	7	0	83
MONTAUK	NY	0	4	2	6	75	5	0	92
BARNEGAT LIGHT/LONG BEACH	NJ	6	20	9	3	17	0	0	55
SECONDARY PORTS		5	6	84	82	357	5	4	543
HAMPTON BAYS/SHINNECOCK	NY	0	1	1	2	26	0	0	30
POINT PLEASANT	NJ	0	4	4	4	46	0	0	58
CHATHAM	MA	0	0	0	18	59	0	0	77
BOSTON	MA	1	27	10	29	1	1	0	68
CAPE MAY	NJ	0	0	21	8	87	3	0	119
NEW LONDON	CT	0	1	4	6	4	1	0	16
LITTLE COMPTON	RI	3	0	2	0	1	0	0	6
PORTLAND	ME	0	0	6	15	14	0	0	35
CHINCOTEAGUE	VA	0	0	0	0	6	0	1	7
WESTPORT	MA	1	0	1	1	11	0	0	14
SCITUATE	MA	0	0	1	4	15	0	0	20
PORTSMOUTH	NH	0	0	0	4	17	0	0	21
WANCHESE	NC	0	0	4	6	12	0	3	25
OCEAN CITY	MD	0	0	0	1	16	0	0	17
NEWPORT NEWS	VA	0	0	13	3	14	0	0	30
OTHER PORTS		8	13	37	74	925	0	4	1,061
TOTAL		**22**	**43**	**268**	**242**	**1,589**	**17**	**8**	**2,189**

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7.0 Environmental Consequences of the Alternatives

7.1 Biological Impacts of Alternatives on Monkfish and Non-Target Species

The impact of past and current management of the monkfish resource has generally been positive. Overfishing is not occurring, and the stock is not overfished. Both scientific and management uncertainty are accounted for in the structure established for specifications that includes a large buffer between the overfishing limit and the ACL, and a management uncertainty buffer between the ACL and the ACT. Moreover, accountability measures (AMs) would be triggered if the ACL is exceeded, further reducing the risk of overfishing and adverse impacts to the stock.

7.1.1 Updates to Annual Catch Limits

7.1.1.1 Revised Annual Catch Limits

7.1.1.1.1 Option 1: No Action

Impacts on monkfish

Under Option 1, the specifications (ABC, ACT, and TAL) for both the NFMA and SFMA would stay as set in Framework 8. Option 1 would not incorporate the results of the 2016 operational assessment, primarily the revised calculated discard rate.

Monkfish landings in the NFMA have fluctuated between FY 2005 and 2015 but had stabilized between FYs 2011 – 2014 (Table 28). An increase in landings occurred in FW2015 but it is not clear yet whether this upward trend will continue in FY 2016. FW 8 increased monkfish DAS allocations from 40 to 45 in the NFMA beginning in FY 2014. This did not have an apparent effect on landings in FY 2014. Monthly landings in FY2015 were higher than those in FY2014 for most months (Table 29 and Figure 12).

Table 28 - NFMA target monkfish TALs, trip limits, DAS allocations, and landings (FY 2005 - 2015)

		Trip Limits (lb)*				
Fishing Year	**Target TAL (mt)**	**Cat. A & C**	**Cat. B & D**	**DAS Restrictions****	**Landings (mt)**	**Percent of TAL**
2005	13,160	n/a	n/a	40	9,533	72%
2006	7,737	n/a	n/a	40	6,677	86%
2007	5,000	1,250	470	31	5,050	101%
2008	5,000	1,250	470	31	3,528	71%
2009	5,000	1,250	470	31	3,344	67%
2010	5,000	1,250	470	31	2,834	57%
2011	5,854	1,250	600	40	3,699	63%
2012	5,854	1,250	600	40	3,920	67%
2013	5,854	1,250	600	40	3,596	61%
2014	5,854	1,250	600	45	3,444	59%
2015	5,854	1,250	600	45	4,138	71%

* Trip limits in pounds tail weight per DAS
** Excluding up to 10 DAS carryover, became 4 DAS carryover in FY 2007

Table 29 - NFMA monkfish total landings in FY 2015 (May - March 2015)

NFMA Landings	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Through Apr
2015	226	215	258	332	325	284	322	379	299	501	548	391	4,138
2014	187	206	186	220	253	232	170	294	330	244	556	561	3,444
% increase/decrease compared to 2014	21	4	39	51	28	22	89	29	-9	105	-1	-30	20

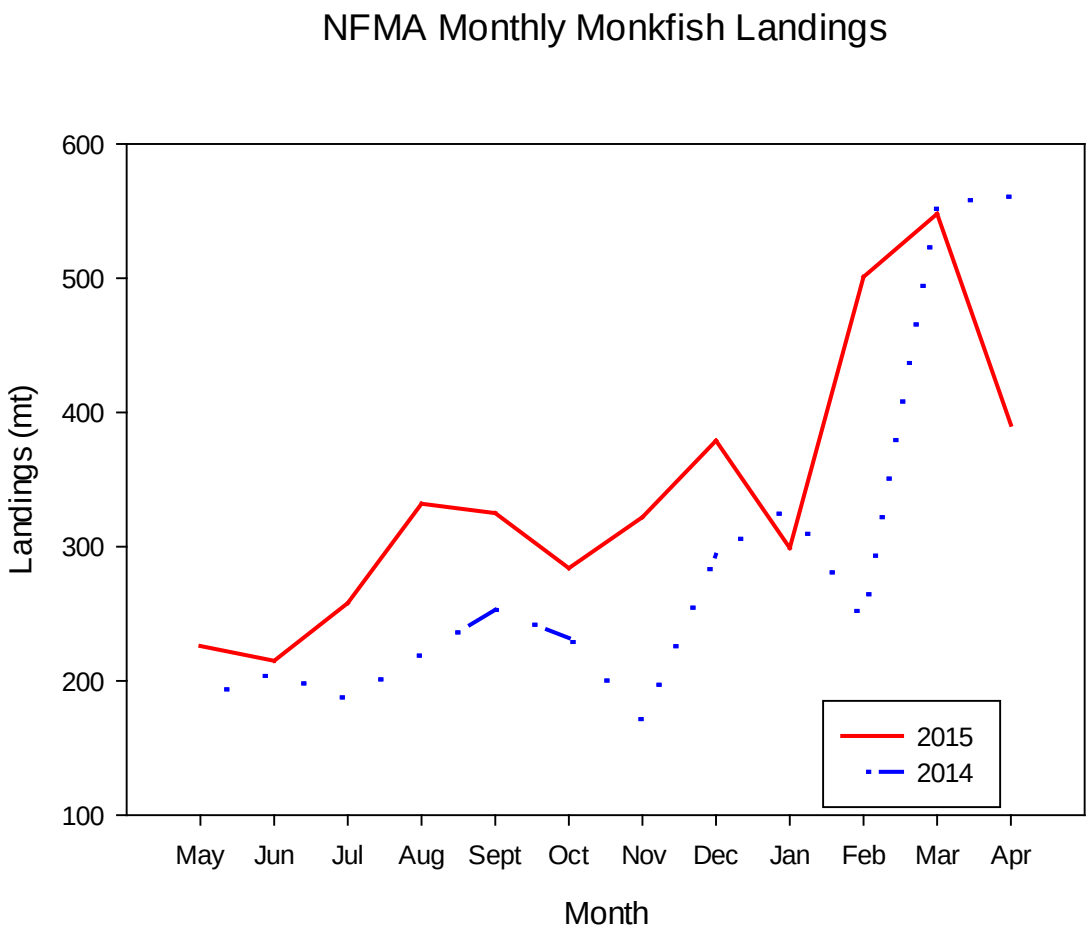


Figure 12 - NFMA monthly monkfish landings for FY 2014 and 2015

Recent DAS usage patterns suggest that monkfish vessels operating in the NFMA have not used many of their allocated DAS in this region (Table 30). The 2013 Emergency Action temporarily removed the

NFMA possession limit and may have reduced the number of DAS used in this region in FY2013. However, the Emergency Action did not appear to significantly increase landings on previous fishing years (Table 30). FW9 permanently removed the NFMA possession limit for category C and D permits when fishing on both a monkfish and NE multispecies DAS. The effect, if any, the removal of the NFMA possession limit has on landings won't be known until FY2016 is complete.

Table 30 - NFMA DAS usage between FY2009 and FY 2015

Fishing year	NFMA DAS Used	% Total DAS Used in NFMA	% Total DAS allocated Used in NFMA
2009	1097	25%	4%
2010	1109	26%	5%
2011	1157	21%	4%
2012	1164	26%	4%
2013	360	11%	1%
2014	651	16%	2%
2015	728	21%	3%
Average 2009 - 2015	923	21%	3%

Option 1 would have negligible, because it would not increase the ABC, to low negative impacts on the monkfish stock because it would not incorporate the updated calculated discard rate from the 2016 operational assessment. This very slightly increases the likelihood that an insufficient amount of discards (713 mt) would be accounted for in the specifications. However, considering the low difference in percentage between the old rates and new calculated discard rates the likelihood of this is very low.

Based on performance of the fishery over the last 5 years, it is not expected that the established TAL will be attained in the NFMA. If catch remains below the NFMA TAL, it is likely that biomass will continue to increase above Biomass target (B_{target}). The NFMA stock is not overfished, and overfishing is not occurring. Should this continue, it is likely that Option 1 would have negligible to low positive impacts on the monkfish resource. The status of the stock would continue to be not overfished, and no overfishing occurring.

There is little to no difference in expected impacts to the monkfish stock when comparing Option 1 to Options 2, 3, and 4. Despite any modifications to discard rates or uncertainty buffers, expected impacts to the monkfish resource are expected to be positive by maintaining the monkfish resource in a condition of not overfished and no overfishing occurring. The risk of exceeding the TAL would be less if the most recent scientifically approved discard rate is used (Option 2), however, the adjustment in calculated discard rates is minimal (~2%).

Monkfish landings in the SFMA have fluctuated between FY 2004 and 2015 but have stabilized over the last 4 fishing years (Table 31). FW 8 increased monkfish DAS allocations from 28 to 32 in the SFMA for FY 2014. Data for FY 2015 shows that landings in the SFMA decreased slightly to achieve 53% of the SFMA TAL (down from 61% in FY2013; Table 14). Monthly monkfish landings in the SFMA in FY 2015 have followed similar patterns to those in FY2014, despite total SFMA monkfish landings down 12% in FY2015 compared to FY2014 (Table 32 and Figure 13).

Table 31 - SFMA target monkfish TALs, trip limits, DAS allocations and landings (FY 2000-2015)

Fishing Year	Target TAL (mt)	Trip Limits (lb)*		DAS Restrictions **	Landings (mt)	Percent of SFMA TAL
		Cat. A & C	Cat. B & D			
2004	6,772	550	450	28	6,223	92%
2005	9,673	700	600	39.3	9,656	100%
2006	3,667	550	450	12	5,909	161%
2007	5,100	550	450	23	7,180	141%
2008	5,100	550	450	23	6,751	132%
2009	5,100	550	450	23	4,800	94%
2010	5,100	550	450	23	4,484	88%
2011	8,925	550	450	28	5,801	65%
2012	8,925	550	450	28	5,184	58%
2013	8,925	550	450	28	5,088	59%
2014	8,925	610	500	32	5,478	61%
2015	8,925	610	500	32	4,739	53%

* Trip limits in pounds tail weight per DAS
** Excluding up to 10 DAS carryover, became 4 DAS carryover in FY 2007

Table 32 – Monthly SFMA monkfish total landings in FY 2015 compared to FY2014

NFMA Landings	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Through Apr
2015	1,030	748	332	99	64	198	256	469	295	254	444	544	4,733
2014	1,126	943	267	195	105	232	484	609	496	161	232	565	5,415
% Difference compared to 2014	-9	-21	24	-49	-39	-15	-47	-23	-41	58	91	-4	-13

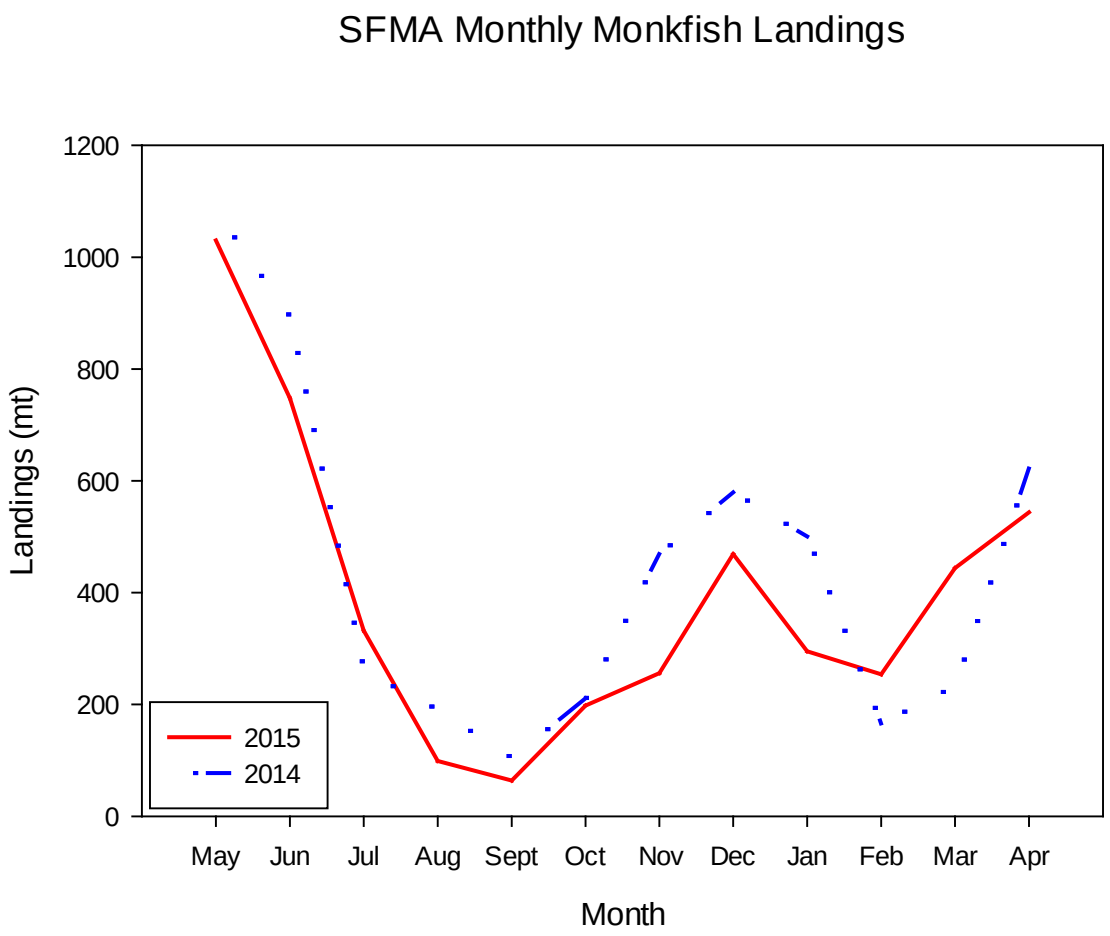


Figure 13 - Comparison of FY 2014 and FY2015 SFMA monthly monkfish landings

Recent DAS usage patterns suggest that monkfish vessels operating in the SFMA used 10% of total allocated DAS in this region (Table 33). The FY2013 emergency action reduced the need to use a monkfish DAS in the NFMA. This increased the potential for these unused NFMA monkfish DAS to be used in the SFMA. The total number of DAS used in the SFMA decreased in FY2015 when compared to FY2014 (Table 33). The percentage of total DAS used in the SFMA has decreased since FY2013, which suggests that an effort shift from the NFMA to the SFMA has not been taking place in recent years. An increased number of DAS used in the NFMA in FY2015 was not sufficient to balance out the decrease in SFMA DAS used. The total number of DAS used in the SFMA was still higher than those used in the NFMA. There was a decrease of approximately 5% in DAS used in the SFMA in FY2015 when compared to FY2014 (Table 33). It is not possible to distinguish between the effect of FW8, or FW9, and any shift in effort from the NFMA to the SFMA.

Table 33 - SFMA Monkfish DAS usage between FY 2009 and FY 2014

Fishing year	SFMA DAS Used	% Total DAS Used in SFMA	% Total DAS allocated Used in SFMA
2009	3252	75%	13%
2010	3151	74%	13%
2011	4389	79%	14%
2012	3284	74%	10%
2013	3038	89%	10%
2014	3463	84%	10%
2015	2,815	79%	10%
Average 2009 – 2015	3,342	79%	11%

To further prevent and mitigate overages, an Accountability Measure (AM) was implemented in Amendment 5. While an overage of the TAL under Option 1 would be unlikely, the AM is an adequate measure to mitigate the impacts of any potential overage and to prevent future overages from occurring.

Impacts on non-target species

FW3 to the NE Skate Complex FMP reduced the skate ABC reflecting the recent decrease in skate survey indices. This decrease in survey indices implies a decrease in skate biomass which may reduce interactions and therefore discards from the monkfish fishery. FW3 also modified the seasonal management of the wing fishery by apportioning a percentage of the TAL between the two seasons (May 1 – Aug 31 and Sept 1 – Apr 30). An incidental skate wing possession limit may be implemented if the in-season trigger is reached, which may reduce fishing for other species if high interactions with skate impede operations. Option 1 would have negligible to low negative impacts on the NE skate complex because no increase or decrease in the current trend in skate landings and discards would be expected, unless modifications are made under the NE Skate Complex FMP. Skate are frequently caught in conjunction with monkfish. As Option 1, would not decrease the ABC or result in any change in fishing patterns, no expected change in interactions with skate would be expected, resulting in low negative impacts on skate.

The spiny dogfish stock is not overfished, overfishing is not occurring, and stock size has been above the biomass target since 2007 (MAFMC, 2014). The MAFMC recently implemented specifications for FY2016-2018, which reduced the ABC based on updated survey indices and the application of a Kalman filter. The trip limit was increased from 5,000 lb to 6,000 lb. Option 1 would have neutral impacts on the dogfish stock because no increase or decrease in fishing effort on dogfish would be expected as a result of Option 1. Fishing for dogfish can occur concurrently with monkfish fishing effort, however, effort on dogfish is restricted by regulations controlled by the dogfish FMP and biomass remains relatively high, resulting in no change in the current trend in dogfish landings and discards.

Because groundfish landings and discards are tightly controlled under the Northeast Multispecies FMP, Option 1 is likely to have negligible impacts on groundfish stocks as these restrictive groundfish regulations affect the ability to fish for monkfish. Existing groundfish measures, including ACLs and AMs established for each stock, along with sector and common pool effort controls are expected to ensure that overfishing does not occur and overfished stocks are rebuilt. The number of active NE multispecies vessels further declined in FY2014 (https://www.greateratlantic.fisheries.noaa.gov/aps/monitoring/nemultispecies.html; Figure 14). Accordingly, effort on NE multispecies trips also declined in FY2014 (Figure 14). The number of active

monkfish vessels has also decreased over the same time period, although the number of monkfish DAS used in FY2014 showed a slight increase (Figure 15). This could suggest that monkfish effort is linked to groundfish effort, which would further indicate that impacts on groundfish would be neutral as directed monkfish effort is unlikely to increase under decreasing groundfish effort.

Overall, there is little to no difference when comparing impacts on non-target species from Option 1 to Options 2, 3, and 4. This is because Option 1 is not expected to increase or decrease fishing effort on monkfish, and therefore, on any of the non-target species. In addition, each of the non-target species are highly regulated under their own individual FMPs adding further protection.

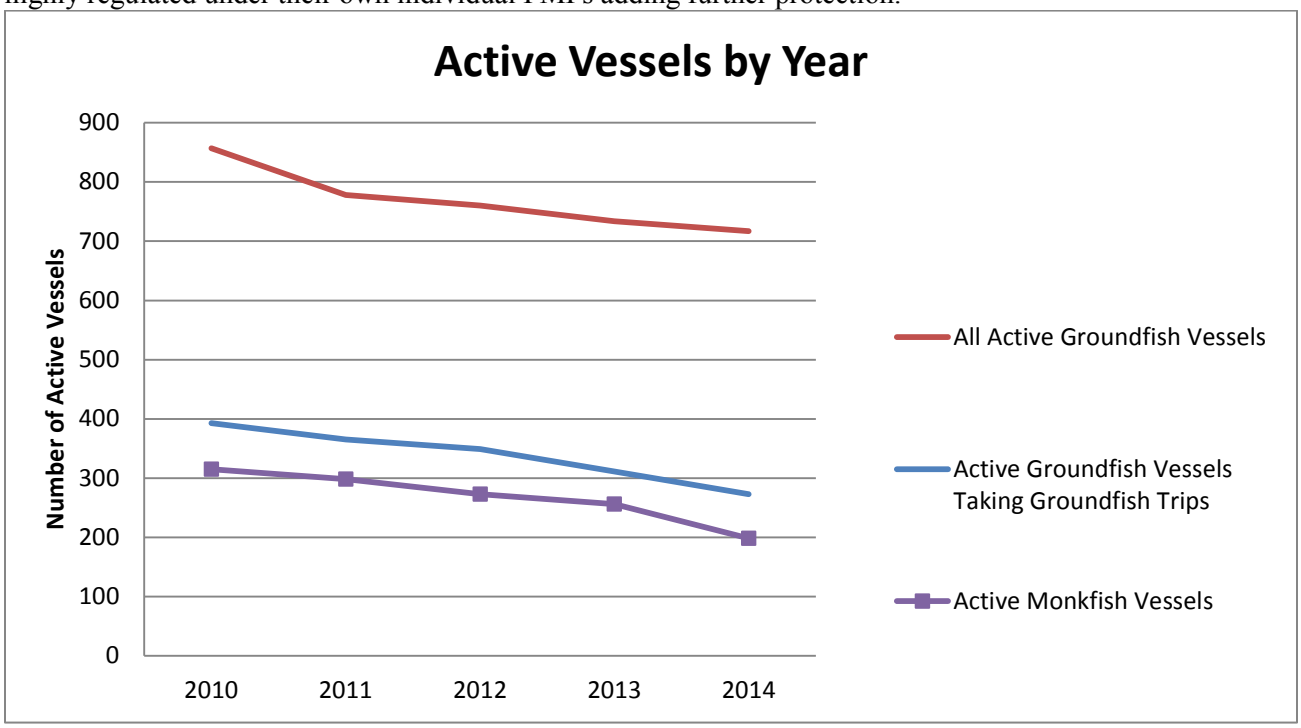


Figure 14 - Active groundfish vessels between Fishing Years 2010 and 2014. Active is defined as vessels that received revenue from any species on any trip while fishing under a federal limited access groundfish permit.

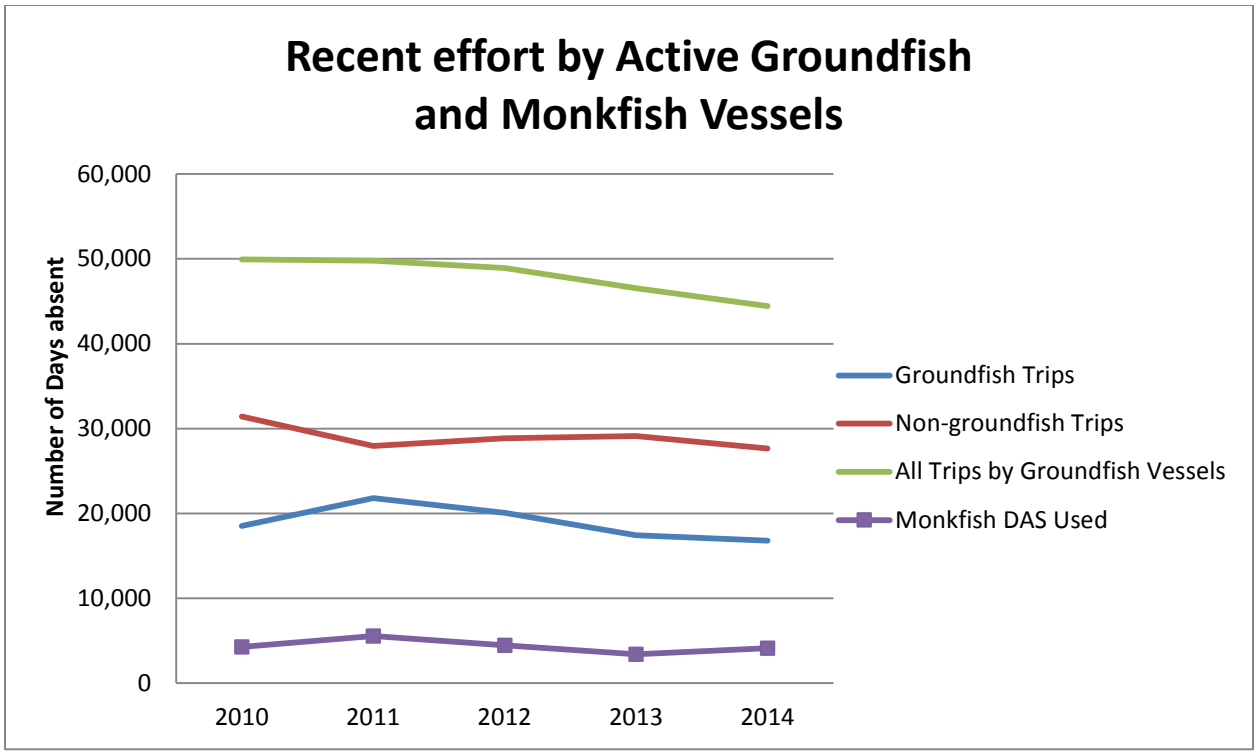


Figure 15 - Recent effort by active NE multispecies and monkfish vessels between Fishing Years 2010 and 2014. Active groundfish vessel is defined as vessels that received revenue from any species on any trip while fishing under a federal limited access groundfish permit. An active monkfish vessel is defined as any that used more than zero monkfish DAS.

7.1.1.1.2 Option 2: Modified Discard Rate for Northern and Southern Fishery Management Areas

Option 2 would maintain the ACL and ACT for monkfish as set in FW8 but would modify the calculated discard rate applied to the ACT. The calculated discard rate would be updated based on the 2016 operational assessment, using the 2013-2015 time period (NFMA = 13.9%; SFMA = 24.6%). Option 2 would be expected to have low positive impacts on the monkfish resource. The status of the stock would be maintained. The modified discard rate applies the most recent scientific advice, and would result in a slight decrease in the TAL from the updated calculated discard rate, providing a greater buffer to the monkfish stock. Since the NFMA and SFMA have not achieved their TAL in a number of years, this may have a greater positive biological impact on the stock, i.e. under-harvesting acts as an additional positive buffer for the stock.

There is no difference in the region-specific ABC for Options 1, 2, 3, and 4. There is a small difference in the TAL compared to Option 1, 3, and 4 as a result of the difference in region-specific discard rates and management uncertainty buffers. The small difference in TAL would not be expected to negatively impact the monkfish resource. Based on performance of the fishery over the last 5 years, it is not expected that the established TAL will be attained in the NFMA or the SFMA.

Impacts on non-target species

Impacts on non-target species resulting from Option 2 are expected to be negligible as described in Section 7.1.1.1.1.

7.1.1.1.3 Option 3: Reduce the Management Uncertainty Buffer to 3% in the Northern Fishery Management Area (*Preferred Alternative*)

Option 3 would reduce the management uncertainty buffer in the NFMA to 3%. The ACL would not be modified in this alternative. No adjustment in the scientific uncertainty buffer between the OFL and ACL would be made. If a sufficient level of discards are accounted for, and if the under-harvest of the TAL continues, a decrease in the management uncertainty buffer is suitable. This would have negligible to low negative biological impacts on the monkfish stock. The alternative is not expected to increase landings or the ability to catch monkfish. It would increase the amount of monkfish available for the TAL but does not increase the likelihood of exceeding the TAL. However, if the management uncertainty buffer is reduced there is a low risk of the ACL being exceeded if catch dramatically increased or discards increased, unexpectedly. Option 3 would have similar impacts ranging from negligible to low negative biological impacts when compared to Option 1 but more negative impacts than Option 2. It is not reasonable to compare Option 3 to Option 4 because they would be implemented in different management areas.

Impacts on non-target species

Impacts on non-target species resulting from Option 3 are expected to be negligible as described in Section 7.1.1.1.1.

7.1.1.1.4 Option 4: Revised Management Uncertainty Buffer for the Southern Fishery Management Area (*Preferred Alternative*)

Option 4 would reduce the management uncertainty buffer in the SFMA to 3%. The ACL would not be modified in this alternative. No adjustment in the scientific uncertainty buffer between the OFL and ACL would be made. If a sufficient level of discards are accounted for, and if the under-harvest of the TAL continues, a decrease in the management uncertainty buffer is suitable. This would have negligible biological impact on the monkfish stock. The alternative is not expected to increase landings or the ability to catch monkfish. It would increase the amount of monkfish available for the TAL but does not increase the likelihood of exceeding the TAL. Option 4 would have similar impacts ranging from negligible to low negative biological impacts when compared to Options 1 and 2 because it would not increase effort on monkfish. It is not reasonable to compare Option 3 to Option 4 because they would be implemented in different management areas.

Impacts on non-target species

Impacts on non-target species resulting from Option 3 are expected to be negligible as described in Section 7.1.1.1.1.

7.1.1.2 Modify the DAS allocation and/or trip limits in the NFMA

7.1.1.2.1 Option 1: No Action

Impacts on monkfish

The No Action alternative would maintain the existing DAS allocations (45 DAS) and trip limits (see Table 1) in the NFMA. Option 1 would have negligible to low positive biological impacts on monkfish

because it would not increase the ability to land monkfish, reducing the likelihood of the TAL being achieved. This alternative would continue the measures that have resulted in no overfishing and the stock not being overfished, resulting in the expectation that stock status would not change under Option 1.

Based on performance of the fishery over the last 5 years, it is not expected that the established TAL will be attained in the NFMA. If catch remains below the NFMA TAL, it is likely that biomass will continue to increase above Biomass target (B_{target}). The NFMA stock is not overfished, and overfishing is not occurring. Should this continue, it is likely that Option 1 would have negligible to low positive impacts on the monkfish resource. The status of the stock would continue to be not overfished, and no overfishing occurring.

Option 1 would have negligible to low positive impacts on the monkfish stock because it would not increase the ability of the fishery to achieve its TAL, leaving a portion of the TAL unharvested (or potentially discarded). There is a low probability that expected catch under Option 1 would exceed the NFMA TAL. Option 1 would have similar neutral impacts compared to Option 2 because Option 1 would not be expected to achieve the TAL and therefore the ACL could not be exceeded.

Impacts on non-target species

Option 1 would not modify the DAS allocation and trip limits in the NFMA and, therefore, would not be expected to result in an increase or decrease in effort within the NFMA. The number of NFMA DAS used in the NFMA did increase in FY2014 and FY 2015 although landings did not increase greatly. As the TAL is not expected to be exceeded it is unlikely that Option 1 would result in any negative biological impacts not already accounted for in existing measures and analyzed by previous actions under their respective FMPs. Impacts on non-target species resulting from Option 1 are expected to be negligible as described below.

The number of active monkfish vessels has fluctuated in both management areas (Figure 16). The number of active vessels in the NFMA area increased briefly in FY 2014 before decreasing in FY 2015, while landings showed the opposite pattern. In recent years, the number of active vessels has decreased in the NFMA despite DAS usage showing a slight increase in FY2015 (Figure 17).

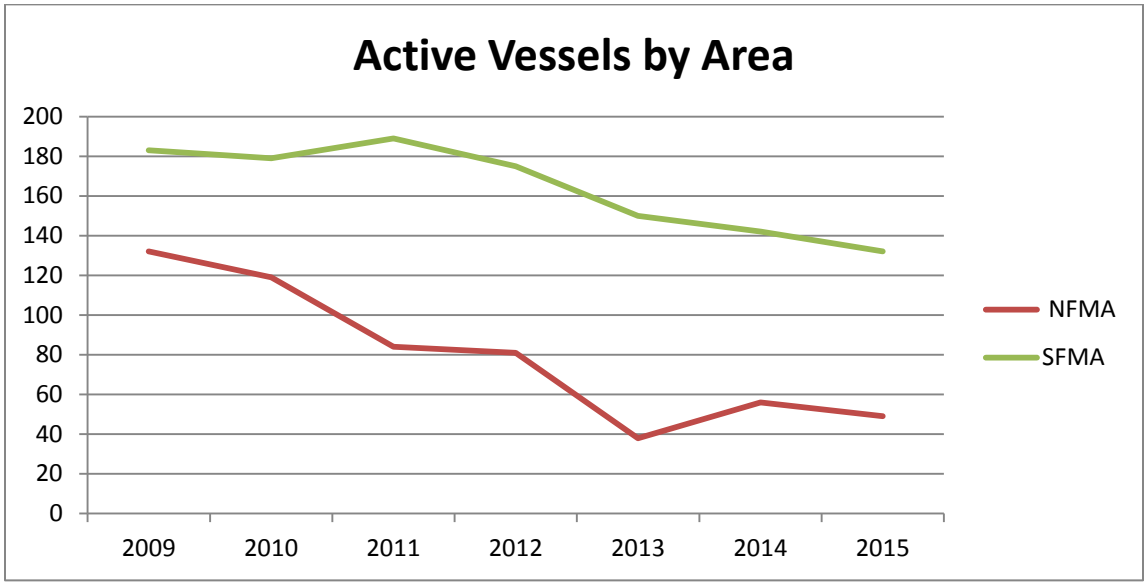


Figure 16 - Active Monkfish Vessels by Area. Active is defined as any vessel that used more than 0 monkfish DAS.

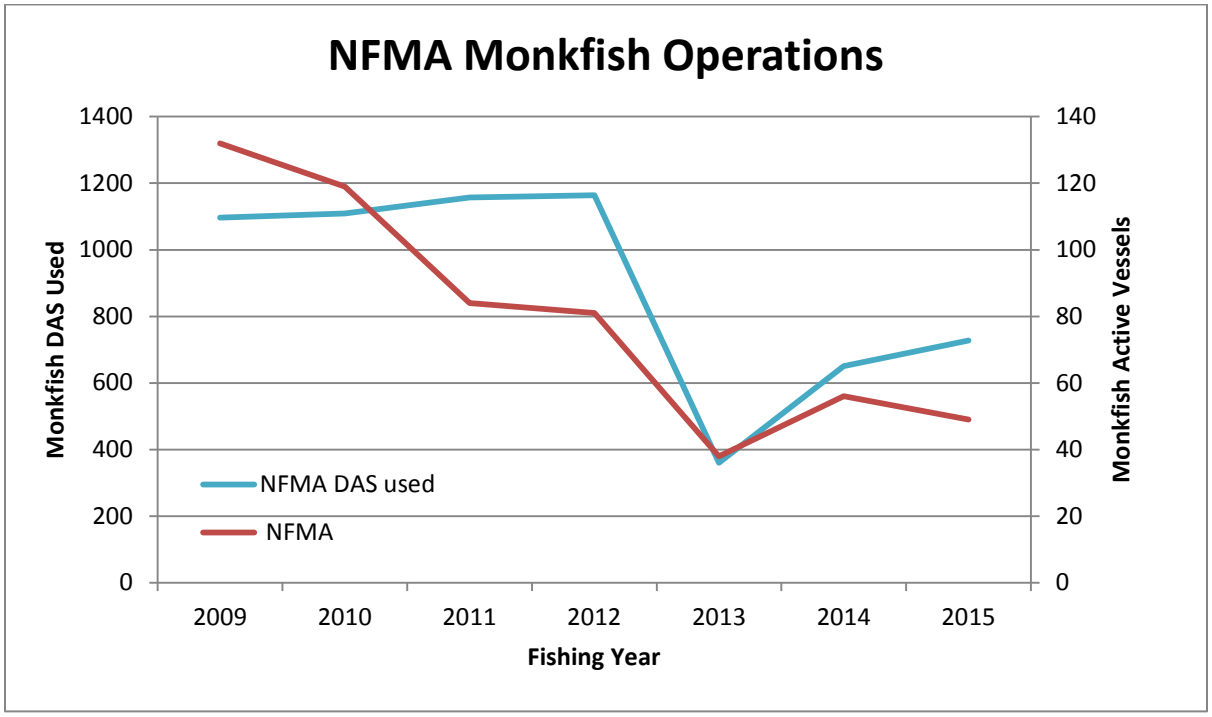


Figure 17 - NFMA monkfish Operations. Active is defined as any vessel that used more than 0 monkfish DAS.

FW3 to the NE Skate Complex FMP reduced the skate ABC reflecting the recent decrease in skate survey indices. This decrease in survey indices implies a decrease in skate biomass which may reduce interactions and therefore discards from the monkfish fishery. The skate ABC is largely driven by little and winter skate biomass, neither of which are overfished. Overfishing was occurring on winter skate in 2013 and 2014, however, the winter skate biomass proxy remained above the winter skate biomass target. FW3 also implemented a seasonal quota for the wing fishery. The skate FMP regulates the skate fishery using TALs, seasonal possession limits, seasonal quotas, and AMs. Option 1 would have negligible impacts on the NE skate complex because no change in the current trend in skate landings and discards would be expected.

The spiny dogfish stock is not overfished, overfishing is not occurring, and stock size has been above the biomass target since 2007 (MAFMC, 2014). Option 1 would have negligible impacts on the dogfish stock. The status would remain unchanged with continuation of this level of effort, resulting in no change in the current trend in dogfish landings and discards.

Because groundfish landings and discards are tightly controlled under the Northeast Multispecies FMP, Option 1 is likely to have neutral impacts on groundfish stocks. Existing groundfish measures, including ACLs and AMs established for each stock, along with sector and common pool effort controls are expected to ensure that overfishing does not occur and overfished stocks are rebuilt. The number of active NE multispecies vessels further declined in FY2013 (https://www.greateratlantic.fisheries.noaa.gov/aps/monitoring/nemultispecies.html; Figure 14). Accordingly, effort on NE multispecies trips also declined in FY2013 (Figure 14). The number of monkfish DAS used has also decreased over the same time period. This could suggest that monkfish effort is linked to groundfish effort, which would further indicate that negligible impacts on groundfish stocks would be expected as directed monkfish effort is unlikely to increase under decreasing groundfish

effort. Option 1 would similarly have negligible impacts on non-target species when compared to Option 2.

7.1.1.2.2 Option 2: Increase the incidental trip limit in the NFMA (*Preferred Alternative*)

Incidental trip limits on a NE multispecies DAS would increase to 900 and 750 lb tail weight/DAS for Category C and D vessels respectively.

Option 2 would have negligible impacts on the monkfish stock because it would not be expected to help the fishery better achieve, the TAL, which has been under-harvested in recent years. Based on the DAS and trip limit analysis, increasing the incidental trip limits in the NFMA would not increase expected landings (Hermsen, 2016 [Appendix I]). The TAL, specified in this document for FYs 2017 - 2019, would account for both scientific and management uncertainty, thus minimizing the risk of negative biological impacts. There is a very low probability that expected catch under Option 2 would exceed the NFMA TAL. Considering how the NFMA fishery operates, on a few trips where the incidental limit was limiting, this alternative could convert regulatory discards to landings.

The 2016 operational assessment (Richards, 2016) identified a strong 2015 year class in the survey data. It is unclear at this time what impact this year class could have on landings or fishing behavior. If the 2015 recruits to the fishery in FY2016 it may increase the availability of monkfish, which could increase landings. However, as Options 2 and 3 are not expected to significantly increase landings on their own then the 2015 year class would not be expected to result in the TAL being exceeded. However, given the lack of growth data for monkfish, it is not possible to predict when or if this year class will recruit to the fishery.

To further prevent and mitigate overages, an Accountability Measure (AM) was implemented in Amendment 5. While an overage of the TAL under Option 2 would be unlikely, the AM is an adequate measure to mitigate the impacts of any potential overage and to prevent future overages from occurring. Option 2 would have similar negligible impacts on the monkfish stock when compared to Option 1. Neither the No Action alternative or increasing the incidental monkfish trip limits were expected to increase landings (Hermsen, 2016 [Appendix I]) based on current fishing patterns. It is not reasonable to predict what might happen if the current fishing pattern were to change since it is impossible to know how it would change.

Impacts on non-target species

Option 2 would not be expected to increase or decrease overall fishing effort because it would not be expected to increase directed fishing in the NFMA. DAS usage in the NFMA is currently low. The majority of trips landing monkfish in the NFMA are fishing on a NE multispecies DAS as the number of DAS used in the NFMA remains low. However, if permit category C and D vessels want to have no monkfish possession limit they can fish on both a NE multispecies and monkfish DAS, this may increase the number of monkfish DAS used in the NFMA. Therefore, interactions with and discards of non-target species would not be expected to change.

Even though these trips might be targeting monkfish they are also interacting with dogfish or skate, which are restricted by ABCs and TALs. If an overage occurs in the skate fishery during the fishing year, the possession limit for the wing fishery would be reduced to the incidental limit of 500 lbs. If the overage is greater than 5% in any given year, the in-season possession limit trigger would be reduced 1% for every 1% of TAL overage, also, if the ACL is exceeded the buffer between the ACL and ACT would be increased from the current 25% in 1% increments for each 1% overage in ACL. Existing skate regulations ensure that overfishing does not occur and any overfished stocks continue to rebuild.

FW3 to the NE Skate Complex FMP reduced the skate ABC reflecting the recent decrease in skate survey indices. This decrease in survey indices implies a decrease in skate biomass which may reduce interactions and therefore discards from the monkfish fishery. The skate ABC is largely driven by little and winter skate biomass, neither of which are overfished. Overfishing was occurring on winter skate in 2013 and 2014, however, the winter skate biomass proxy remained above the winter skate biomass target. FW3 also implemented a seasonal quota for the wing fishery. The skate FMP regulates the skate fishery using TALs, seasonal possession limits, seasonal quotas, and AMs. Option 1 would have negligible impacts on the NE skate complex because no change in the current trend in skate landings and discards would be expected.

The spiny dogfish stock is not overfished, overfishing is not occurring, and stock size has been above the biomass target since 2007 (MAFMC, 2014). Option 1 would have negligible impacts on the dogfish stock. The status would remain unchanged with continuation of this level of effort, resulting in no change in the current trend in dogfish landings and discards.

Because groundfish landings and discards are tightly controlled under the Northeast Multispecies FMP, Option 2 is likely to have negligible impacts on groundfish stocks. Existing groundfish measures, including ACLs and AMs established for each stock, along with sector and common pool effort controls are expected to ensure that overfishing does not occur and overfished stocks are rebuilt. The number of active NE multispecies vessels further declined in FY2013 (https://www.greateratlantic.fisheries.noaa.gov/aps/monitoring/nemultispecies.html; Figure 14). Accordingly, effort on NE multispecies trips also declined in FY2013 (Figure 14). The number of monkfish DAS used has also decreased over the same time period. This could suggest that monkfish effort is linked to groundfish effort, which would further indicate that negligible impacts on groundfish stocks would be expected as directed monkfish effort is unlikely to increase under decreasing groundfish effort. Option 2 would similarly have negligible impacts on non-target species when compared to Option 1.

7.1.1.3 Modify DAS allocation and/or trip limits in the SFMA

7.1.1.3.1 Option 1: No Action

Option 1 would maintain the current trip limits and DAS allocations in the SFMA. Option 1 would have neutral to low positive biological impacts on monkfish because it would not increase the ability to land monkfish, reducing the likelihood of the TAL being achieved. Effort in the SFMA is largely executed on directed trips. A decrease in the usage of DAS in the SFMA would be expected to decrease landings, as was seen in FY2015 (Figure 18).

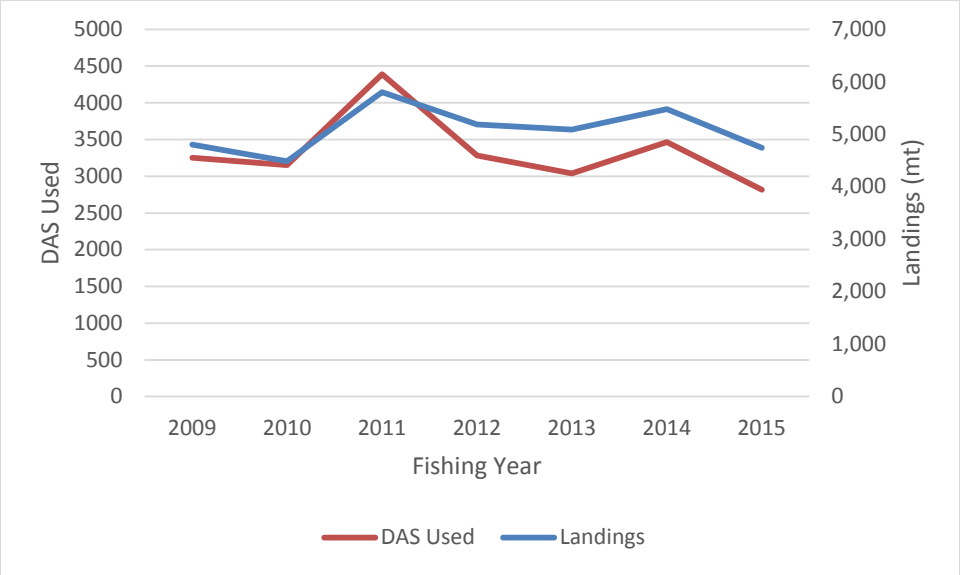


Figure 18 - Comparison of DAS used and landings (mt) in the SFMA between FYs 2009 and 2015

Based on performance of the fishery over the last 5 years, it is not expected that the established TAL will be attained in the SFMA. If catch remains below the SFMA TAL, it is likely that biomass will continue to increase above Biomass target (B_{target}). The SFMA stock is not overfished, and overfishing is not occurring. Should this continue, it is likely that Option 1 would have negligible to low positive impacts on the monkfish resource. The status of the stock would continue to be not overfished, and no overfishing occurring.

Option 1 would have negligible to low positive impacts on the monkfish stock because it would not increase the ability of the fishery to achieve its TAL, leaving a portion of the TAL unharvested (or potentially discarded). There is a low probability that expected catch under Option 1 would exceed the SFMA TAL. Option 1 would have similar neutral impacts compared to Option 2 because Option 1 would not be expected to achieve the TAL and therefore the ACL could not be exceeded.

Impacts on non-target species

Option 1 would not be expected to increase or decrease overall fishing effort. Therefore, interactions with and discards of non-target species would not be expected to change. As noted above in Section 7.1.1.1 Option 1, the current stock status of the NE skate complex and dogfish combined with no expected increase in effort in the monkfish fishery, Option 1 would not be expected to have any negative impacts on these stocks.

Existing groundfish measures, including ACLs and AMs established for each stock, along with sector and common pool effort controls are expected to ensure that overfishing does not occur and overfished stocks are rebuilt. Based on the analysis provided in Section 7.1.1.1 Option 1, Option 1 is also not expected to result in increased effort over the approved monkfish specifications. Therefore, Option 1 would have neutral impacts on non-target species, similar to Option 2.

7.1.1.3.2 Option 2: Increase the DAS Allocation and Trip Limits in the SFMA (*Preferred Alternative*)

Option 2 would increase the SFMA DAS allocation by 15% to 37 DAS. It would also increase trip limits in the SFMA by 15% to 700 lb and 575 lb tail weight/DAS for Category A and C, and Category B and D permits, respectively. Option 2 would have negligible biological impacts on the monkfish stock. The moderate increases in DAS allocation and trip limits would be expected to help the fishery better achieve, but not exceed, the TAL, which has been under-harvested in recent years (Hermsen, 2016 [Appendix I]). The TAL, specified in this document for FYs 2017 - 2019, would account for both scientific and management uncertainty, thus minimizing the risk of negative biological impacts. Therefore, Option 2 would also not be expected to result in the ACL being exceeded.

The 2016 operational assessment (Richards, 2016) identified a strong 2015 year class in the survey data. It is unclear at this time what impact this year class could have on landings or fishing behavior. If the 2015 recruits to the fishery in FY2016 it may increase the availability of monkfish, which could increase landings. However, as Options 2 and 3 are expected to moderately increase landings on their own then the 2015 year class would not be expected to result in the TAL being exceeded. However, given the lack of growth data for monkfish, it is not possible to predict when or if this year class will recruit to the fishery.

To further prevent and mitigate overages, an Accountability Measure (AM) was implemented in Amendment 5. While an overage of the TAL under Option 2 would be unlikely, the AM is an adequate measure to mitigate the impacts of any potential overage and to prevent future overages from occurring. Option 2 would have similar neutral impacts on monkfish when compared to Option 1.

Impacts on non-target species

Option 2 would likely result in a moderate increase in fishing effort because the monkfish fishery in the SFMA is a directed fishery. Increasing a DAS allocation in a directed fishery would allow for more landings. Therefore, interactions with and discards of non-target species would not be expected to change.

Even though these trips might be targeting monkfish they are also interacting with dogfish or skate, which are restricted by ABCs and TALs. If an overage occurs in the skate fishery during the fishing year, the possession limit for the wing fishery would be reduced to the incidental limit of 500 lbs. If the overage is greater than 5% in any given year, the in-season possession limit trigger would be reduced 1% for every 1% of TAL overage, also, if the ACL is exceeded the buffer between the ACL and ACT would be increased from the current 25% in 1% increments for each 1% overage in ACL. Existing skate regulations ensure that overfishing does not occur and any overfished stocks continue to rebuild.

The dogfish stock is not overfished nor experiencing overfishing. Similar to the skate complex, the dogfish fishery has an established ABC and commercial quota. If an ACL overage occurs the exact amount in pounds by which the ACL was exceeded would be deducted, as soon as possible, from the subsequent single fishing year ACL.

Option 2 would have neutral impacts on non-target species, similar to Option 1.

7.2 Essential Fish Habitat Impacts

7.2.1 Updates to Annual Catch Limits

Catch limits in the monkfish fishery include an Annual Biological Catch (ABC) equal to the Annual Catch Limit (ACL). The ABC/ACL is reduced to account for management uncertainty, resulting in the Annual Catch Target (ACT). The ACT is reduced to account for discards, resulting in the Total Allowable Landings (TAL). These values are set for the northern and southern management areas separately, and the management uncertainty and discard percentages vary by area. Status quo ABCs were recommended by the SSC, given the results of the 2016 operational assessment. However, this action considers adjustments to the management uncertainty buffers and discard percentages for both the northern and southern areas.

7.2.1.1 Revised Annual Catch Limits

7.2.1.1.1 Option 1: No Action

Under Option 1/No Action, there would be no change in specifications for FYs 2017 - 2019. Therefore, no change in fishing effort would be expected under Option 1, and the impacts on EFH would be the same as those identified in the EA developed for FW8, which set the current specifications. The analysis in FW8 concluded that under these specifications there would not be an adverse impact to EFH because the monkfish and NE multispecies DAS catch limits were not revised, which serve as a restraint on fishing effort in the monkfish fishery. In addition, because vessels operating in the NFMA are predominantly groundfish vessels, monkfish fishing effort would likely be largely constrained by NE multispecies DAS or ACE allocations rather than monkfish DAS allocations. Vessels in the SFMA are restricted by effort controls (DAS and trip limits), which are set conservatively so as to prevent the ACL from being exceeded. The Accountability Measures also account for any overage of ACLs and prevent future fishing operations from compromising the conservation objectives of the fishery. Thus the No Action alternative would not modify the expected interactions of monkfish or groundfish gear with EFH from current conditions; there would be no additional impact on EFH as a result of this alternative. Compared to Options 2, 3, and 4, Option 1 would have similar negligible impacts on EFH.

7.2.1.1.2 Option 2: Updated Discard Rate for Northern and Southern Fishery Management Areas

Option 2 would maintain the same ABCs and ACTs as in FW8, but would increase the discard rates applied to the ACT for both the NFMA and SFMA. These purpose of these increases is to allow for a sufficient amount of discards in the fishery, to further reduce the likelihood of the ACL being exceeded. The higher Option 1/No Action TALs are not limiting, however, so monkfish fishing effort is not likely to be reduced despite the lower TALs under this option. Thus, impacts to EFH are expected to be negligible relative to Option 1/No Action. Compared to Options 3 and 4, Option 2 would have similar negligible impacts on EFH (see discussion below).

7.2.1.1.3 Option 3: Revised Annual Catch Limit for the Northern Fishery Management Area

Option 3 would maintain the same NFMA ABC and ACT as in FW8, but would reduce the management uncertainty buffer and update the discard rate applied to the ACT. Combining both adjustments, this results in a larger NFMA TAL as compared to Options 1 and 2. Neither adjustment would affect the ability of vessels to catch monkfish, and the increase in the TAL is not expected to lead to additional fishing effort or landings, as the current TAL is under-harvested and not limiting to the fishery. Given that the magnitude of fishing effort in the NFMA is not expected to change, Option 3 would have similar negligible impacts on EFH compared to Options 1 and 2.

7.2.1.1.4 Option 4: Revised Annual Catch Limit for the Southern Fishery Management Area

Option 4 would maintain the same SFMA ABC and ACT as in FW8, but would reduce the management uncertainty buffer and update the discard rate applied to the ACT. Combining both adjustments, this results in a larger SFMA TAL as compared to Options 1 and 2. Neither adjustment would affect the ability of vessels to catch monkfish, and the increase in the TAL is not expected to lead to additional fishing effort or landings, as the current TAL is under-harvested and not limiting to the fishery. Given that the magnitude of fishing effort in the SFMA is not expected to change, Option 3 would have similar negligible impacts on EFH compared to Options 1 and 2.

7.2.2 Modifications to Current Monkfish Effort Controls

Days-at-sea allocations and trip limits specific to the various permit categories influence patterns of effort in the monkfish fishery. These allocations and limits are set separately for the northern and southern areas. Other factors influence patterns of effort in the fishery as well. In the NFMA, the fishery is predominantly incidental and therefore effort is mainly restricted by regulations in the groundfish fishery. The monkfish fishery in the SFMA is primarily directed, and is generally prosecuted using gillnet gear. In the SFMA, some vessels are using nearly all their allocated DAS (Hermsen 2016 [Appendix I], Figure 2). Monkfish DAS use is required when fishing under the higher, directed fishery trip limits, and Monkfish DAS use is not required when fishing under lower incidental trip limits (a NE multispecies DAS would be required). Thus, increasing incidental trip limits may have the effect of reducing Monkfish DAS usage if the higher incidental trip limits prove sufficient. This flexibility is possible because vessels can declare a DAS while at sea, rather than before leaving the dock. The following sections discuss how adjustments to DAS and trip limits may influence patterns of effort and thus fishery impacts to EFH.

7.2.2.1 Modify the DAS allocation and/or trip limits in the NFMA

This action is considering an increase to the NFMA incidental trip limits.

7.2.2.1.1 Option 1: No Action

Under Option 1, there would be no change in the DAS allocation or trip limits in the NFMA. No change in fishing effort would be expected under Option 1, therefore the current trend of not achieving the monkfish TAL would be expected to continue. The Accountability Measures also account for any overage of ACLs and prevent future fishing operations from compromising the conservation objectives of the fishery. Compared to Option 2, Option 1 would have similar negligible impacts on EFH.

7.2.2.1.2 Option 2: Increase the trip limits in the NFMA (Preferred Alternative)

Option 2 would increase the incidental trip limits when on a NE multispecies DAS. This change might reduce DAS usage in the NFMA if the higher incidental trip limits prove sufficient for more trips. However, since DAS are not limiting in the NMFA, with only a small number of vessels approaching the monkfish DAS limit (7.4.1.2.1), shifts between directed and incidental fishing are not expected to influence the overall magnitude of effort in the NFMA. Thus, impacts to EFH will likely be negligible as compared to Option 1/No Action. Fishing effort would continue to be restricted by the TAL, along with AMs that account for any overage of the ACL.

7.2.2.2 Modify the DAS allocation and/or trip limits in the SFMA

This action is considering changes to both DAS allocations and trip limits in the SFMA.

7.2.2.2.1 Option 1: No Action

Under Option 1, there would be no change in the DAS allocation or trip limits in the SFMA. Therefore, combined with a status quo ACL, no change in fishing effort would be expected under Option 1. In addition, the monkfish fishery in the SFMA is predominantly executed using gillnet gear, which has low impacts on EFH in general relative to bottom trawls. Compared to Option 2, Option 1 would have similar negligible impacts on EFH.

7.2.2.2.2 Option 2: Increase the DAS Allocation and Trip Limits in the SFMA

Option 2 would increase the SFMA DAS allocation and trip limits when on a monkfish DAS in the SFMA. Although an increase in DAS allocation would be expected to moderately increase effort, the SFMA fishery is mainly executed with gillnet gear which has limited impacts on EFH. Fishing effort would be restricted by the specifications set in this FW (as approved in FW8), along with AMs that account for any overage of ACLs and prevent future fishing operations from compromising the conservation objectives of the fishery. Increasing trip limits could increase efficiency for vessels if they are able to land more monkfish on fewer trips. Compared to Option 1, Option 2 would have similar negligible impacts on EFH.

7.3 Impacts on Endangered and Other Protected Species

7.3.1 Updates to Annual Catch Limits

7.3.1.1 Revised Annual Catch Limits

7.3.1.1.1 Option 1: No Action

Under Option 1, specifications set in FW8 for both the NFMA and SMFA including the ABC, ACT, and TAL would be maintained. The specifications are not limiting to fishing effort in either management area as the TAL has not been achieved over the last five years. This would be expected to maintain the current levels of fishing opportunities for vessels. Therefore, a change in effort pattern would not be expected.

Based on the above information, specifications under Option 1 are consistent with those authorized over the last several years, and therefore, significant changes in effort (e.g., gear quantity, soak/tow time, area fished) are not expected under this Option. As a result, as noted above, fishing behavior is expected to remain similar to current operating conditions. Understanding expected fishing behavior/effort in a fishery informs potential interaction risks with protected species. Specifically, interaction risks with protected species are strongly associated with amount, time, and location of gear in the water; vulnerability of an interaction increases with increases, relative to respective fisheries current operating conditions, of any or all of these factors. Taking into consideration the latter, as well as fishing behavior/effort under the No Action (Option 1), impacts of the No Action to protected species are provided below.

MMPA Protected Species Impacts

Impacts of Option 1 on marine mammals (i.e., species of cetaceans and pinnipeds) are somewhat uncertain as quantitative analysis has not been performed. However, we have considered, to the best of our ability, available information on marine mammal interactions with commercial fisheries over the last 5 or more years (Waring et al. 2014; Waring et al. 2015; Waring et al. 2016; http://www.nefsc.noaa.gov/fsb/take_reports/nefop.html; www.nefsc.noaa.gov/fsb/take_reports/asm.html). Aside from several large whale species (e.g., North Atlantic right, humpback, and fin), harbor porpoise, and several stocks of bottlenose dolphin, there has been no indication that takes of any other marine mammal species in commercial fisheries has exceeded potential biological removal (PBR) thresholds, and therefore, gone above and beyond levels which would result in the inability of each species population to sustain itself (Waring et al. 2014, 2015, 2016). Although, as noted above, several species of large whales, harbor porpoise and several stocks of bottlenose dolphin have experienced levels of take that have resulted in the exceedance of each species PBR threshold, take reduction plans have been implemented to reduce bycatch in the fisheries affecting these species (Atlantic Large Whale Take Reduction Plan, Harbor Porpoise Take Reduction Plan, and the Bottlenose Dolphin Take Reduction Plan; see Section 6.1 for details); these plans are still in place and are continuing to assist in decreasing bycatch levels for these species. Although the information presented in Waring et al. (2014, 2015, 2016) is a collective representation of commercial fishery interactions with marine mammals, and does not address the effects of any FMP specifically, the information does demonstrate that fishery operations over the last 5 or more years have not resulted in a collective level of take that threatens the continued existence of marine mammal populations (aside from those species noted above).

In conjunction with the above, additional analysis on the impacts of the operation of fisheries in the northeast region have also been conducted by NMFS, pursuant to section 7 of the ESA, for ESA-listed species of marine mammals. Specifically, NMFS issued a Biological Opinion in 2013, concluding that the

operation of the groundfish FMP, in addition to six other FMPs, may adversely affect, but is not likely to jeopardize the continued existence of any ESA listed species of marine mammals. Since issuance of this Opinion, there has been no indication that these fisheries have changed in any significant manner (e.g., increases in gear quantity and soak/tow time, new areas fished) such that there are new interactions risks to listed marine mammal species that have not already been considered by NMFS to date. As a result, we do not expect interactions with listed marine mammal species to go above and beyond that which has already been considered by NMFS to date (NMFS 2013; Waring et al. 2014; Waring et al. 2015; Waring et al. 2016). Based on this, Option 1, and the resultant fishing behavior under this Alternative, is not, as concluded by NMFS, expected to result in interaction levels that are likely to jeopardize the continued existence of ESA listed species of marine mammals.

Based on the above information, and the fact that the monkfish fishery must comply with specific take reduction plans (i.e., HPTRP, the BDTRP, ALWTRP), Option 1 is expected to have low negative impacts on marine mammal species.

ESA Listed Species

Although the impacts to ESA listed species from the No Action alternative are somewhat uncertain, as quantitative analysis has not been performed, we have considered, to the best of our ability, how the fishery has operated in regards to listed species from 2011, when substantial changes to the FMP had been experienced from the recent adoption of Amendment 5 on May 25, 2011, to the present. During this time, NMFS issued a biological opinion (Opinion) on the monkfish fishery in 2010 (NMFS 2010), with a subsequent replacement of this Opinion in 2013 (NMFS 2013). The Opinion issued on October 29, 2010, concluded that the fishery may affect, but would not jeopardize the continued existence of any ESA listed species of sea turtles or whales. An incidental take statement authorizing the take of specific numbers of ESA listed species of sea turtles was included in the 2010 Opinion. Until December 16, 2013, when NMFS issued a new biological opinion on the operation of seven commercial fisheries, including the monkfish fishery, the monkfish fishery had been covered by the incidental take statement authorized and issued with the 2010 Opinion. It should be noted that the 2010 biological opinion did not authorize the incidental take of ESA listed:

- Atlantic salmon: take of Atlantic salmon in the monkfish fishery was not expected; however, analysis of information since the 2010 Opinion was completed changed this determination and as a result, in NMFS most recent batched biological opinion issued on December 16, 2013, incidental take of Atlantic salmon is authorized (see NMFS 2013);
- Atlantic sturgeon: Atlantic sturgeon was not listed at the time the 2010 biological opinion was written. As a result, this species was not considered in the 2010 Opinion; however, since this species listing in 2012 (77 FR 5880 and 77 FR 5914, February 6, 2012), it has been included in the 2013 Opinion; and
- North Atlantic right, humpback, fin, and sei whales: NMFS could not include an incidental take authorization for large whales because (1) an incidental take statement cannot be lawfully issued under the ESA for a marine mammal unless incidental take authorization exists for that marine mammal under the MMPA (see 16 U.S.C. § 1536(b)(4)(C)), and (2) the incidental take of ESA- listed whales by the monkfish fishery has not been authorized under section 101(a)(5) of the MMPA. Because no ITS was included in either the 2010 Opinion, no incidental take by the monkfish fishery is authorized under the ESA.

As noted above, NMFS issued a new Opinion on the operation of seven commercial fisheries, including the monkfish FMP on December 16, 2013 (NMFS 2013). The 2013 Opinion concluded that the seven fisheries, including the monkfish fishery, may affect, but would not jeopardize the continued existence of any ESA listed species of sea turtles, whales, or fish (NMFS 2013). An incidental take statement

authorizing the take of specific numbers of ESA listed species of sea turtles, Atlantic salmon, and Atlantic sturgeon was included in the 2013 Opinion; for reasons described above, take of ESA listed species of whales is not authorized. To date, the monkfish FMP is covered by the incidental take statement authorized in NMFS 2013 Opinion.

The No Action would retain status quo operating conditions in the monkfish FMP and therefore, changes in fishing effort or behavior above and beyond that which has been considered since 2010 would not be expected. As a result, the No Action is not expected to result in the introduction of any new risks or additional takes to ESA listed species that have not already been considered and authorized by NMFS to date (NMFS 2013). Further, the monkfish FMP has not resulted in the exceedance of NMFS authorized take of any ESA listed species from 2010 to the present. The No Action Alternative, therefore, is not, as concluded in the NMFS 2013 Opinion, expected to result in levels of take that would jeopardize the continued existence of ESA listed species. For these reasons, and due to the fact that this alternative would still require compliance with the ALWTRP and sea turtle resuscitation guidelines, the No Action is expected to have low negative impacts on ESA-listed species.

Overall Impacts to Protected Species
As provided above, effort is not expected to increase to levels above and beyond those that have been experienced in the monkfish broadstock areas to date. As a result, interaction risks to protected species in these broadstock areas are not expected to change significantly from what has been observed to date in these regions (Waring et al. 2014; Waring et al. 2015; Waring et al. 2016; NMFS 2013; http://www.nefsc.noaa.gov/fsb/take_reports/nefop.html; www.nefsc.noaa.gov/fsb/take_reports/asm.html; NMFS NEFSC FSB 2015). Specifically, as fishing behavior and effort are not expected to change significantly from status quo conditions, the presence, quantity, or degree of gillnet, bottom trawl or other gear types used in these areas are also not expected to change significantly. As interactions risks with protected species are strongly associated with amount, time, and location of gear in the water, continuation of "status quo" groundfish fishing behavior/effort is not expected to change any of these operating conditions and therefore, is not expected to introduce any new interaction risks to protected species that would result in elevated levels of interactions above and beyond that which has been observed and considered by NMFS to date (Waring *et al*. 2014; Waring *et al*. 2015; Waring et al. 2016; NMFS 2013; NMFS; http://www.nefsc.noaa.gov/fsb/take_reports/nefop.html; www.nefsc.noaa.gov/fsb/take_reports/asm.html).

7.3.1.1.2 Option 2: Updated Discard Rate for Northern and Southern Fishery Management Areas

Option 2 would maintain the ABC and ACT as set in FW8. It would modify the discard rate applied to the ACT to calculate the TAL. Specifically, relative to Option 1 (No Action), the resultant TAL would be lower in the NFMA and SFMA. The specifications are not limiting to fishing effort in either management area as the TAL has not been achieved over the last five years. As a result, the resultant TAL under Option 2 is expected to result in current levels of fishing opportunities for vessels to be maintained. Therefore, based on fishing behavior in the fishery over the last 5 years, which set TALs at or above those under Option 2, a change in effort (e.g., gear quantity, gear soak/tow time, area fished, and number of vessels) is not expected.

As Option 2 is not expected to result in any significant changes in fishing behavior in the NFMA or the SFMA, the potential for protected species interactions with gillnet or trawl gear and therefore, serious injury or mortality, are not expected to go above and beyond that which has been considered in the fishery to date (NMFS 2013, Waring et al. 2014). Specifically, since the adoption of Amendment 5 on May 25, 2011, to the present, the monkfish fishery has not resulted in the exceedance of NMFS authorized take of any ESA listed species or resulted in levels of take of MMPA protected species that jeopardize the

continued existence of marine mammal populations (i.e., resulted in exceedance of PBR),we do not expect Option 2 to introduce any new risks or additional takes to protected species that have not already been considered and/or authorized by NMFS to date (NMFS 2013; Waring *et al.* 2014; Waring *et al.* 2015). For these, and the reasons provided in Section 7.3.1.1.1 (Option 1), we expect impacts of Option 2 on protected species (ESA listed and MMPA protected species) to be similar to those described in Section 7.3.1.1.1 (i.e., low negative). Relative to Option 1, Option 2 would have neutral impacts on protected resources for the reasons provided in Section 7.3.1.1.1.
Relative to option 3 and 4, we would expect Option 2 to have similar low negative impacts to protected species.

7.3.1.1.3 Option 3: Revised Annual Catch Limit for the Northern Fishery Management Area (*Preferred Alternative*)

Option 3 would maintain the NFMA ABC as set in FW8. It would reduce the management uncertainty buffer from 13.5% to 3% in the NFMA, which would increase the ACT and TAL. It would also update the discard rate applied to the ACT. Although Option 3 would result in an increase in ACT and TAL, based on fishing behavior over the last 5 years, specifically, the fact that TAL has not been achieved over the last five years, fishing opportunities for vessels are expected to remain similar to current levels. Based on this, we do not expect the increase in ACT or TAL to provide any incentive to vessels to significantly change fishing behavior relative to current operating conditions. As a result, a change in effort (e.g., gear quantity, gear soak/tow time, area fished, number of vessels), relative to current conditions, is not expected. Based on this, fishing behavior and the resultant effects to protected resources are expected to be similar to those described in Option 2 (see Section 7.3.1.1.2). Relative to options 1, 2, and 4, we would expect Option 3 to have similar low negative impacts to protected species.

7.3.1.1.4 Option 4: Revised Annual Catch Limit for the Southern Fishery Management Area (*Preferred Alternative*)

Option 4 would maintain the SFMA ABC as set in FW8. It would reduce the management uncertainty buffer from 6.5% to 3% in the SFMA, which would increase the ACT and TAL. It would also update the discard rate applied to the ACT. Although Option 3 would result in an increase in ACT and TAL, based on fishing behavior over the last 5 years, specifically, the fact that TAL has not been achieved over the last five years, fishing opportunities for vessels are expected to remain similar to current levels. Based on this, we do not expect the increase in ACT or TAL to provide any incentive to vessels to significantly change fishing behavior relative to current operating conditions. As a result, a change in effort (e.g., gear quantity, gear soak/tow time, area fished, number of vessels), relative to current conditions, is not expected. Based on this, fishing behavior and the resultant effects to protected resources are expected to be similar to those described in Option 2 (see Section 7.3.1.1.2). Relative to options 1, 2, and 3, we would expect Option 4 to have similar low negative to neutral impacts to protected species.

7.3.2 Modifications to Current Monkfish Days-at-Sea and Trip Limits

7.3.2.1 Modification the DAS allocation and/or trip limits in the NFMA

7.3.2.1.1 Option 1: No Action

Option 1 would maintain status quo conditions and therefore, would not increase the trip limit or the DAS allocation in the NFMA. Therefore, no change in fishing effort would be expected under Option 1. Based on this, we do not expect Option 1 (status quo conditions) to introduce any new risks to protected species that have not already been considered and/or authorized by NMFS to date (NMFS 2013; Waring et al. 2014) and expect impacts of Option 1 on protected resources (ESA listed and marine mammal protected species) to be similar to those described in Section 7.3.1.1.1 (i.e., low negative impacts).

7.3.2.1.2 Option 2: Increase the incidental trip limit in the NFMA (*Preferred Alternative*)

The monkfish fishery in the NFMA is predominately an incidental fishery. Option 2 would increase the incidental possession limit of monkfish on a NE multispecies DAS. Based on FW9's assessment of the monkfish fishery in the NFMA, this would be expected to convert regulatory discards to landings as opposed to incentivizing increased fishing effort. Specifically, in FW9, analysis of the removal of the possession limit when on a monkfish and NE multispecies DAS showed that the majority of trips occurring in the NFMA are catching less than 90% of the monkfish incidental possession limit for a NE multispecies DAS. Further, over the past 5 years the number of monkfish DAS used in the NFMA has remained low, and in fact, has never been fully used over this timeframe. Based on this, and the relative persistence of this trend over the last 5 years, we do not expect the increase in trip limits in the NFMA under Option 2 to provide any incentive to the fleet to significantly change fishing behavior or effort relative to current operating conditions. As a result, a change in effort, (e.g., gear quantity, gear soak/tow time, area fished, number of vessels), relative to current conditions, is not expected

Based on the information above, fishing effort and distribution is not expected to significantly change from how the fishery currently operates. As Option 2 is not expected to result in any significant changes in fishing behavior in the NFMA, the potential for protected species interactions with gillnet or trawl gear and therefore, serious injury or mortality, are not expected to go above and beyond that which has been considered in the fishery to date (NMFS 2013; Waring *et al.* 2014; Waring *et al*. 2015; Waring *et al*. 2016). Specifically, since the adoption of Amendment 5 on May 25, 2011, to the present, the monkfish fishery has not resulted in the exceedance of NMFS authorized take of any ESA listed species or resulted in levels of take of MMPA protected species that jeopardize the continued existence of marine mammal populations (i.e., resulted in exceedance of PBR),we do not expect Option 2 to introduce any new risks or additional takes to protected species that have not already been considered and/or authorized by NMFS to date (NMFS 2013; Waring *et al.* 2014; Waring *et al*. 2015; Waring *et al*. 2016). For these, and the reasons provided in section 7.3.1.1.1 (Option 1), we expect impacts of Option 2 on protected species (ESA listed and MMPA protected species) to be similar to those described in Section 7.3.1.1.1 (i.e., low negative). Relative to Option 1, Option 2 would have neutral impacts on protected resources for the reasons provided in section 7.3.1.1.1.

7.3.2.2 Modification the DAS allocation and/or trip limits in the SFMA

7.3.2.2.1 Option 1: No Action

Option 1 would maintain status quo conditions and therefore, would not increase the trip limit or the DAS allocation in the NFMA. Therefore, no change in fishing effort would be expected under Option 1. Based on this, we do not expect Option 1 (status quo conditions) to introduce any new risks to protected species that have not already been considered and/or authorized by NMFS to date (NMFS 2013; Waring *et al.* 2014; Waring *et al*. 2015; Waring *et al*. 2016) and expect impacts of Option 1 on protected species to be similar to those described in Section 7.3.1.1.1 (i.e., low negative). Compared to Option 2, Option 1 would have neutral impacts on protected resources (see below for details).

7.3.2.2.2 Option 2: Increase DAS Allocation and Trip Limits in the SFMA (*Preferred Alternative*)

Option 2 would increase the DAS allocation and trip limits on a monkfish DAS in the SFMA. Option 2 has the opportunity to increase monkfish landings, however, it is a moderate increase in both effort controls and would not be sufficient to cause a substantial change in fishing behavior patterns in the SFMA. The increase in DAS allocation (i.e., from 32 days to 37 days) would increase the amount of

opportunities for permit holders in the SFMA to land monkfish. Across permit categories, there were 169 active vessels in the SFMA in FY 2015 (Table 25). The monkfish fishery in the SFMA is a directed fishery, however, the number of vessels limited by the DAS allocation is relatively low (Hermsen, 2016 [Appendix I]). This implies that the incentive for all vessels fishing in the SFMA to take advantage of the increased DAS allocation could be lower than expected. Further, even with an increase in DAS over recent years, effort has remained lower than expected in recent years, with the number of used DAS being consistently lower than that allocated in the SFMA (Table 33). Specifically, only 3,545 DAS were used in the SFMA out of the 8,201 DAS allocated to vessels categorized as active (Table 25). In addition, landings over recent years have been consistently below the TAL. Based on this, it is unlikely that the entire fleet in the SFMA will respond to an increase in DAS by increasing effort above and beyond levels previously observed in the SFMA.

In regards to trip limits, for some vessels operating in the SFMA, trip limits, not allocated DAS, have been limiting (Hermsen, 2016 [Appendix I]). Increasing the trip limit in the SFMA could benefit these vessels by reducing regulatory discards and increasing efficiency by potentially decreasing the time on the water (e.g., TAL could be attained sooner). However, as an increase in trip limit will not necessarily benefit the entire fleet in the SFMA, any changes in fishing behavior when considered under the context of the entire fleet, will likely be insignificant. As a result, any response to an increase in trip limits will not be fleet wide, significant changes in overall effort or fishing behavior in the SFMA is not expected.

Based on the information above, fishing effort and distribution is not expected to significantly change from how the fishery currently operates. As Option 2 is not expected to result in any significant changes in fishing behavior in the SFMA, the potential for protected species interactions with gillnet gear and therefore, serious injury or mortality, are not expected to go above and beyond that which has been considered in the fishery to date (NMFS 2013; Waring *et al.* 2014; Waring *et al*. 2015; Waring *et al*. 2016). Specifically, since the adoption of Amendment 5 on May 25, 2011, to the present, the monkfish fishery has not resulted in the exceedance of NMFS authorized take of any ESA listed species or resulted in levels of take of MMPA protected species that jeopardize the continued existence of marine mammal populations (i.e., resulted in exceedance of PBR),we do not expect Option 2 to introduce any new risks or additional takes to protected species that have not already been considered and/or authorized by NMFS to date (NMFS 2013; Waring *et al.* 2014; Waring *et al*. 2015; Waring *et al*. 2016). For these reasons, we expect impacts of Option 2 on protected species (ESA listed and MMPA protected species) to be similar to those described in Section 7.3.1.1.1 (i.e., low negative). Relative to Option 1, Option 2 would have neutral impacts on protected resources.

7.4 Economic Impacts

The realized economic impacts of this action will depend upon actual monkfish landings, changes in ex-vessel price for monkfish and any changes in the costs associated with harvesting monkfish during the FY2017-FY2019 time period. Landings of other stocks, including groundfish, dogfish and skate, along with associated ex-vessel prices, will also factor into realized impacts. The value of monkfish landings realized will depend upon the market category landed, due to price variation among market categories, and the volume of monkfish in the market at the time of landing. Table 34 presents average ex-vessel prices for monkfish (in terms of both average monkfish price per live pound and average monkfish price per landed pound) across all monkfish market categories during FY2010-FY2015. Average ex-vessel prices across all monkfish market categories are presented in nominal terms (average dollar price during the year the sale took place) and in real terms (using 2015 constant dollars). The GDP Implicit Price Deflator was used to adjust nominal average monkfish prices for inflation, with 2015 as the base time period (US Bureau of Economic Analysis, 2016). Table 35 presents data by trip state and trip port on the number of permits landing monkfish in the trip port, monkfish revenue, monkfish landings and average ex-vessel price of monkfish per live pound for monkfish landed in the port.

The economic impacts analysis below presents, where possible, the projected monkfish landings from each alternative (including the No Action Alternatives for each measure) and where landings are expected to change from what they were in FY2015, a range of associated projected monkfish revenues for each alternative. Projected revenues for each alternative are a function of projected ex-vessel prices for monkfish, as well as estimated monkfish landings. Because it is uncertain how ex-vessel prices may change in response to changes in monkfish landings, the analysis presents a range of projected revenues. The analysis explores two possibilities with respect to how average ex-vessel price for monkfish may change in response to changes in monkfish landings: 1) changes in aggregate monkfish landings of the magnitude that the alternatives may result in are not substantial enough to affect average ex-vessel price for monkfish or 2) changes in aggregate monkfish landings may affect average ex-vessel price for monkfish. Ranges for projected monkfish average prices yield lower and upper bound estimates for projected revenues for alternatives under which monkfish landings are expected to change and where the expected change in monkfish landings can be estimated.

In the development of alternatives for the proposed action, monkfish industry advisors expressed that preserving the stability of the monkfish market is a primary concern. Industry advisors stated a desire to maintain ex-vessel price stability, to avoid gluts in the monkfish market, and to provide a continuous and predictable supply of monkfish to dealers. Monkfish industry advisors also expressed consensus that the monkfish market can absorb the limited increases in monkfish landings likely to occur from modest increases in daily landings limits and/or DAS allocations, without impacts on ex-vessel price. Therefore, one possibility explored in this economic analysis is that increased landings that may result from the action alternatives will not affect ex-vessel average price for monkfish. The analysis also considers the possibility that changes in aggregate monkfish landings may affect monkfish ex-vessel price. Lee and Thunberg (2013) estimated the price flexibility for monkfish to be -0.41, which means that ex-vessel price declines -0.41% for every 1% increase in monkfish landings. This analysis projects ex-vessel prices for monkfish using this price flexibility estimate for alternatives where monkfish landings are expected to change and the change in monkfish landings can estimated.

This economic impacts analysis must be viewed with several caveats in mind. Monkfish is sold both domestically and exported, which means that average ex-vessel price in the U.S. Northeast region and, therefore, economic impacts of the proposed action, may be affected by monkfish landings outside of the U.S. The analysis assumes that all other factors that could affect demand (e.g. domestic and international consumer preferences, availability and prices of substitute products) remain constant. In addition, it is

assumed that factors which could affect monkfish supply, such as costs and technological change, are constant.

Table 34 - Monkfish revenue, landings, and average price per pound, FY2010-2015

Fishing Year	Revenue (nominal $)	Landings (live lbs.)	Average Nominal Price per live lb.	Average Real Price per live lb. ($2015)	Landings (landed lbs.)	Average Nominal Price per landed lb.	Average Real Price per landed lb. ($2015)
2010	$19,022,755	16,287,912	$1.17	$1.27	8,341,731	$2.28	$2.48
2011	$28,174,654	21,136,204	$1.33	$1.42	10,940,022	$2.58	$2.74
2012	$20,704,503	19,522,544	$1.06	$1.11	9,795,933	$2.11	$2.21
2013	$16,794,581	19,133,321	$0.88	$0.90	8,921,533	$1.88	$1.94
2014	$18,106,583	19,018,714	$0.95	$0.96	9,365,699	$1.93	$1.95
2015	$18,451,604	19,213,089	$0.96	$0.96	9,353,152	$1.97	$1.97

Notes:
[1] Based on dealer data, for date reported through October 27, 2016.
[2] This summary table assumed the average ex-vessel price for monkfish does not differ between the NFMA and SFMA.

Table 35 - Monkfish revenue, landings, and average price per live pound, by trip state and trip port, directed and incidental trips, FY2015

Trip State	Trip Port	Number of Permits landing monkfish in FY2015	Revenue from monkfish ($2015)	Monkfish landings (live lbs.)	Average ex-vessel price of monkfish per live lb. ($2015)
CONNECTICUT			**$675,953**	**605,847**	**$1.12**
	EAST HAVEN	5	$3,843	4,337	$0.89
	MYSTIC	4	$4,325	5,848	$0.74
	NEW LONDON	14	$632,047	553,601	$1.14
	STONINGTON	19	$32,517	38,110	$0.85
	OTHER CONNECTICUT	3	$3,221	3,951	$0.82
MAINE			**$593,944**	**686,449**	**$0.87**
	BOOTHBAY HARBOR	ND	ND	ND	ND
	CUNDYS HARBOR	ND	ND	ND	ND
	ELIOT	ND	ND	ND	ND
	PORT CLYDE	3	$24,365	29,622	$0.82
	PORTLAND	28	$559,969	644,505	$0.87
MARYLAND			**$60,406**	**55,958**	**$1.08**
	OCEAN CITY	12	$59,939	55,246	$1.08
	OTHER WORCESTER	4	$467	**712**	$0.66

Trip State	Trip Port	Number of Permits landing monkfish in FY2015	Revenue from monkfish ($2015)	Monkfish landings (live lbs.)	Average ex-vessel price of monkfish per live lb. ($2015)
MASSACHUSETTS			**$10,716,397**	**11,571,215**	**$0.93**
	BARNSTABLE	ND	ND	ND	ND
	BOSTON	21	$1,730,844	2,001,780	$0.86
	BOURNE	ND	ND	ND	ND
	CHATHAM	21	$776,780	711,196	$1.09
	CHILMARK	ND	ND	ND	ND
	DENNIS	ND	ND	ND	ND
	EDGARTOWN	ND	ND	ND	ND
	FAIRHAVEN	11	$33,441	49,953	$0.67
	GLOUCESTER	68	$2,699,346	2,944,917	$0.92
	HARWICHPORT	8	$348,033	319,389	$1.09
	MARBLEHEAD	ND	ND	ND	ND
	MARSHFIELD	ND	ND	ND	ND
	MENEMSHA	6	$15,386	15,687	$0.98
	NANTUCKET	ND	ND	ND	ND
	NEW BEDFORD	230	$4,646,062	5,118,202	$0.91
	NEWBURYPORT	ND	ND	ND	ND
	OTHER BARNSTABLE	ND	ND	ND	ND
	OTHER PLYMOUTH	ND	ND	ND	ND
	PLYMOUTH	3	$2,242	1,882	$1.19
	PROVINCETOWN	9	$15,799	14,886	$1.06
	SANDWICH	4	$1,580	1,780	$0.89
	SCITUATE	8	$209,731	197,101	$1.06
	WELLFLEET	ND	ND	ND	ND
	WESTPORT	ND	ND	ND	ND
	WOODS HOLE	11	$8,677	7,030	$1.23

Trip State	Trip Port	Number of Permits landing monkfish in FY2015	Revenue from monkfish ($2015)	Monkfish landings (live lbs.)	Average ex-vessel price of monkfish per live lb. ($2015)
NEW HAMPSHIRE			**$352,037**	**314,855**	**$1.12**
	PORTSMOUTH	4	$201,497	181,008	$1.11
	SEABROOK	9	$150,540	133,847	$1.12
NEW JERSEY			**$2,149,958**	**1,706,826**	**$1.26**
	ATLANTIC CITY	7	$6,604	7,053	$0.94
	BARNEGAT	ND	ND	ND	ND
	BARNEGAT LIGHT/LONG BEACH	45	$1,555,349	1,163,677	$1.34
	BELFORD	20	$10,561	12,393	$0.85
	CAPE MAY	72	$64,437	90,333	$0.71
	OCEAN CITY	ND	ND	ND	ND
	OTHER ATLANTIC	6	$3,883	6,059	$0.64
	OTHER NJ	ND	ND	ND	ND
	POINT PLEASANT	60	$454,872	385,230	$1.18
	SEA ISLE CITY	3	$213	216	$0.99
	WARETOWN	ND	ND	ND	ND
	WILDWOOD	6	$5,362	8,852	$0.61

Trip State	Trip Port	Number of Permits landing monkfish in FY2015	Revenue from monkfish ($2015)	Monkfish landings (live lbs.)	Average ex-vessel price of monkfish per live lb. ($2015)
NEW YORK			**$1,345,707**	**1,099,348**	**$1.22**
	AMAGANSETT	ND	ND	ND	ND
	EAST HAMPTON	ND	ND	ND	ND
	FREEPORT	ND	ND	ND	ND
	HAMPTON BAYS	27	$612,561	501,862	$1.22
	MATTITUCK	ND	ND	ND	ND
	MONTAUK	38	$549,650	444,184	$1.24
	MORICHES	ND	ND	ND	ND
	POINT LOOKOUT	ND	ND	ND	ND
	RIVERHEAD	ND	ND	ND	ND
	SHINNECOCK	9	$31,170	29,228	$1.07
NORTH CAROLINA			**$123,793**	**143,644**	**$0.86**
	BEAUFORT	45	$97,019	117,435	$0.83
	ENGELHARD	11	$3,239	3,473	$0.93
	HATTERAS	ND	ND	ND	ND
	HOBUCKEN	10	$2,973	3,957	$0.75
	ORIENTAL	5	$1,124	1,113	$1.01
	SWAN QUARTER	ND	ND	ND	ND
	WANCHESE	30	$18,989	17,143	$1.11

Trip State	Trip Port	Number of Permits landing monkfish in FY2015	Revenue from monkfish ($2015)	Monkfish landings (live lbs.)	Average ex-vessel price of monkfish per live lb. ($2015)
RHODE ISLAND			**$2,780,972**	**2,534,469**	**$1.10**
	JAMESTOWN	ND	ND	ND	ND
	LITTLE COMPTON	12	$630,924	531,895	$1.19
	NEWPORT	8	$293,642	218,404	$1.34
	OTHER NEWPORT	ND	ND	ND	ND
	POINT JUDITH	111	$1,803,601	1,744,785	$1.03
	TIVERTON	ND	ND	ND	ND
VIRGINIA			**$480,057**	**422,217**	**$1.14**
	CHINCOTEAGUE	21	$363,984	254,162	$1.43
	GREENBACKVILLE	ND	ND	ND	ND
	HAMPTON	51	$86,254	128,482	$0.67
	HAMPTON(COUNTY)	ND	ND	ND	ND
	NEWPORT NEWS	29	$25,716	32,747	$0.79
	OTHER CITY OF CHESAPEAKE	ND	ND	ND	ND
	SEAFORD	5	$2,248	5,026	$0.45
GRAND TOTAL			**$19,279,223**	**19,140,828**	**$1.01**

Notes:
[1] Trip port is assigned by the DMIS database in order of availability from dealer port (dealer port where the vessel sold the catch), VTR port (first port landed on the Vessel Trip Report), and principal port listed in the permit data (main vessel landings location).
[2] Trip state is assigned by the DMIS database in order of availability from dealer state (dealer port state where the vessel sold the catch), VTR state (first state landed on the Vessel Trip Report), and principal port state from the permit data (state in which the principal port is located).
[3] "ND" within a cell for a port indicates that the data were suppressed due to confidentiality issues.

7.4.1 Updates to Annual Catch Limits

7.4.1.1 Revised Annual Catch Limits

7.4.1.1.1 Option 1: No Action

The No Action Alternative would keep the existing monkfish DAS allocations and landing limits in place, as implemented in FW8 (NEFMC, 2014). In the NFMA, daily landings limits would continue to be 1,250 pounds tail weight per DAS for monkfish permit Category A and C vessels and 600 pounds tail weight per DAS for Category B and D vessels. Allocated DAS (excluding the 4 DAS carryover) would continue to be 45 DAS, as in FY2014-FY2016. Total monkfish landings in the NFMA for FY2015 were 9.1 million live pounds, or approximately 71% of the overall TAL for the NFMA. In the SFMA, daily landing limits would continue to be 610 pounds tail weight per DAS for monkfish permit Category A and C vessels and 500 pounds tail weight per DAS for Category B and D vessels. Allocated DAS in the SFMA would continue to be 32 DAS (excluding the 4 DAS carryover) in FY2017-FY2019, as they were in FY2014-FY2016. Total monkfish landings in the SFMA for FY2015 were approximately 10.4 million live pounds, or 53% of the overall TAL.

Table 36 presents estimated monkfish landings and revenues for both management areas for FY2017 under the No Action Alternative. These estimates should be interpreted with caution, as they rest on several assumptions. The first is the effort and landings remained identical to what they were in FY2015; this assumption applies to both monkfish landings in each fishery management area and monkfish landings by port. The second is that the average price per live lb. for monkfish, $0.96 per live lb., will remain constant in FY2017, which implies that both supply and demand for monkfish remain constant. For Option 1, we do not need to account for the possibility that ex-vessel price may change as a result of a change in monkfish landings, since monkfish landings are expected to remain the same during FY2017-FY2019 under the No Action Alternative. The No Action Alternative is expected to result in about 9.1 million live lb. of monkfish landings from the NFMA in FY2017, based on FY2015 NFMA landings. Assuming that the average monkfish prices observed in FY2015 continue into FY2017 ($0.96 per live pound), this would result revenues of nearly $8.8 million from monkfish landed in the NFMA during FY2017. The projected total revenue from monkfish for the NFMA includes revenue from all monkfish landings in the NFMA from all permit categories. Similarly, assuming that landings and effort levels remained unchanged from FY2015 in the SFMA, the No Action Alternative can be expected to result in about 10.4 million live lb. of monkfish landings from the SFMA in FY2017. If the average monkfish prices observed in FY2015 continue into FY2017 ($0.96 per live pound), this would result in monkfish revenues of about $10.0 million during FY 2017. We cannot estimate monkfish landings and monkfish revenues at the trip port level for FY2017, but given the assumption that effort and landings are not expected to change in FY2017 from their FY2015 levels, we would expect port level monkfish landing and revenues to be similar to those presented in Table 35 for FY2015.

Table 36 - Projected total monkfish landings and total monkfish revenues for the NFMA and SFMA for FY2017 under the No Action Alternative, all monkfish permit categories, directed and incidental landings

Management Area	Projected Monkfish Fishery Landings (live lbs.)	Projected Price per Pound ($2015 per live lb.)	Projected Revenue ($2015)
NFMA	9,121,088	$0.96	$8,756,244
SFMA	10,447,707	$0.96	$10,029,799
Total	**19,568,795**	$0.96	**$18,786,043**

Table 37 breaks down the projected landings and revenue for vessels holding a limited access monkfish permit type. The projected revenue estimates are based on the assumption that average ex-vessel price for monkfish remains at $0.96 per live pound. For the No Action Alternative for FY2017, monkfish landings are assumed to be what they were in FY2015 and other factors are held constant.

Table 37 - Projected monkfish landings and monkfish revenues for FY2017 for vessels holding a limited access monkfish permit, by permit category and management area, under the No Action Alternative

Management Area	Landings Type	Cat A/C	Cat B /D/ H	All LA MF Permits
NFMA	Directed	1,093,479 $1,049,740	657,654 $631,348	1,751,133 $1,681,088
	Incidental	4,009,656 $3,849,270	2,793,127 $2,681,402	6,802,783 $6,530,672
Sub-total NFMA	**NFMA LA D&I**	**5,103,135** **$4,899,010**	**3,450,781** **$3,312,750**	**8,553,916** **$8,211,759**
SFMA	Directed	3,040,534 $2,918,913	4,825,055 $4,632,053	7,865,589 $7,550,965
	Incidental	897,236 $861,347	430,837 $413,604	1,328,073 $1,274,950
Sub-total SFMA	**SFMA LA D&I**	**3,937,770** **$3,780,259**	**5,255,892** **$5,045,656**	**9,193,662** **$8,825,916**
Total (NFMA & SFMA)	**Total MF Landings by LA Fleet**	**9,040,905** **$8,679,269**	**8,706,673** **$8,358,406**	**17,747,578** **$17,037,675**

Notes:
[1] Monkfish landings are in live pounds.
[2] Monkfish revenues are in real 2015 dollars.
[3] Projected monkfish revenues are based on a projected average monkfish price of $0.96 per live pound in real 2015 dollars.

Table 38 presents projected monkfish landings and monkfish revenue for vessels that hold either a Category E (open access or incidental catch monkfish permit) or are state-permitted vessels only. Monkfish landings by these vessels are expected to remain what they were in FY2015 for FY2017.

Table 38 - Projected monkfish landings and monkfish revenues for FY2017 for vessels with a Category E monkfish permit or a state-permit only, by management area

Management Area	Cat E & State
NFMA	459,219 $440,850
SFMA	878,730 $843,581
Total (NFMA & SFMA)	**1,337,949** **$1,284,431**

Notes:
[1] Monkfish landings are in live pounds.
[2] Monkfish revenues are in real 2015 dollars.
[3] Projected monkfish revenues are based on a projected average monkfish price of $0.96 per live pound in real 2015 dollars.

Table 39 summarizes projected total monkfish revenue from all monkfish landings for the entire FY2017-FY2019 period (the total over 3 years) under the No Action Alternative. Again, these projections assume that monkfish landings in each management area for each year in the FY2017-FY2019 period remain what they were in FY2015, and that the average price of monkfish per pound remains what it was in FY2015. Since landings are not expected to change during FY2017-FY2019 under the No Action Alternative and the analysis holds all other factors constant, we do not expect ex-vessel average price for monkfish to change from what it was in FY2015.

Table 39 - Projected total monkfish landings and total monkfish revenues for the NFMA and SFMA over FY2017-2019 under the No Action Alternative, assuming no price change

Management Area	Projected Total Monkfish Landings (live lbs.), FY2017-FY2019	Projected Average Price per lb. for monkfish ($2015 per live lb.)	Total Projected Monkfish Revenue ($2015), FY2017-FY2019
NFMA	27,363,264	$0.96	$26,268,733
SFMA	31,343,121	$0.96	$30,089,396
Total	**58,706,385**		**$56,358,130**

As noted earlier, the realized impacts of the No Action Alternative are difficult to predict, and may differ between the various segments of the monkfish fishery. Overall, it is likely that the No Action Alternative itself will not affect fishing operations; other factors including the availability of fishing opportunities in other fisheries will more directly affect fishing operations and, therefore, resulting monkfish landings. In particular, the capacity of groundfish vessels to catch available groundfish without exceeding their groundfish ACE (for sectors) or trimester (for non-sectors) for any stock before the end of the fishing year will most directly affect resulting monkfish landings in the NFMA. If groundfish vessels can avoid exceeding their ACE or trimester TACs, then monkfish landings may increase towards the FY2017-

FY2019 NFMA monkfish TAL, possibly resulting in greater monkfish revenues for vessels that primarily target groundfish.

7.4.1.1.2 Option 2: Updated Discard Rate for Northern and Southern Fishery Management Areas

Option 2 would maintain the ACL, the management uncertainty buffer and ACT for both management areas as set in FW8 (NEFMC, 2014), but would use the information from the 2016 operational assessment to update the discard rate for both management areas. As a result, the TALs for both the NFMA and SFMA would decrease under Option 2. In the NFMA, Option 2 would change the discard rate from -10.9% to -13.9%. Total allowable landings would decrease from 5,854mt to 5,652mt (-202mt or -445,318 live pounds) for the NFMA. In the SFMA, Option 2 would change the discard rate from -22.5% to -24.6%. Total allowable landings in the SFMA would decrease from 8,925mt to 8,686mt (-239mt or -526,882 live pounds).

The economic impacts of Option 2 relative to the No Action Alternative are possibly slightly low negative, but likely neutral. For both the NFMA and the SFMA, the decrease in the TAL is modest. TALs for each area under the No Action Alternative do not appear to be constraining landings in either the NFMA or SFMA; total landings of monkfish are not bumping up against the existing TALs. Over FY2010-2016, the average percent of the NFMA TAL landed was 63%. For the same time period, the average percent of the SFMA TAL landed was 64%. Therefore, it is unlikely that TAL reductions of 202mt (-445,318 live pounds) for the NFMA and 239mt (-526,882 live pounds) for the SFMA would adversely affect monkfish revenues relative to the No Action Alternative. If monkfish landings in FY2017-FY2019 differed substantially from FY2014-FY2016, such that the fishery came very close to landing the TALs during FY2017-FY2019, it is possible that Option 2 could result in lower monkfish revenues than the No Action Alternative, since Option 2 lowers the TALs for both management areas relative to the No Action Alternative. The degree to which monkfish revenues would decrease would depend on whether average monkfish price remained constant. However, this is very unlikely to happen since there is no expectation that the fishery will bump against either the TALs under the No Action Alternative or the slightly lower TALs that would be established by Option 2.

7.4.1.1.3 Option 3: Reduce the Management Uncertainty Buffer to 3% in the Northern Fishery Management Area (*Preferred Alternative*)

Option 3 would reduce the management uncertainty buffer in the NFMA to 3%. The ACL and ABC for the NFMA would remain at 7,592mt. It should be noted that Option 3 is inclusive of Option 2, which means that under Option 3 the management uncertainty buffer would be reduced relative to the No Action Alternative *and* the estimated discard rate would be changed from -10.9% under the No Action Alternative to -13.9%. The TAL for the NFMA would increase to 6,338mt (13,972,901 live lbs.) if Options 2 and 3 were both implemented, compared to 5,854mt (12,905,863 live lbs.) under the No Action Alternative (+1,067,038 live lbs.).

The economic impacts of Option 3 relative to the No Action Alternative (Option 1) are likely to be neutral to possibly slightly low positive for those landing monkfish in the NFMA. Option 3 can be expected to have neutral to slightly low positive impacts in the NFMA relative to Option 2. The existing NFMA TAL does not appear to be constraining landings in the NFMA. Therefore, we would not expect substantial increases in NFMA landings from implementation of Option 3. Since we do not expect substantial increases in landings, we do not expect any change in average ex-vessel price for monkfish, all else held constant. Therefore, Option 3 is expected to have minimal positive impact, if any, on monkfish revenues for those landing monkfish in the NFMA. Any positive impacts on monkfish revenues from the NFMA

TAL increase of +484mt would occur only if the TAL under the No Action Alternative were constraining to monkfish fishing in the NFMA.

In the unlikely event that vessels were able to land and sell the additional the 484mt (1,067,038 live lbs., an 8.3% increase in NFMA landings), each year in FY2017-FY2019 at the FY2015 average price of monkfish per live pound ($0.96 per live pound), the increase in monkfish revenue per year would be $1,024,356 in FY2017 or $3,073,068 over FY2017-FY2019. This additional revenue would accrue to vessels landings monkfish in the NFMA. We would not expect to see a change in average monkfish price from implementation of Option 3. However, if price decreased in response to increased landings, the economic benefit to monkfish vessels landing in the NFMA would be lower. In addition, if increased landings in the NFMA negatively affected ex-vessel price, this could impact the ex-vessel price received by vessels landing monkfish in the SFMA. Any increases in monkfish revenue for vessels landing monkfish in the NFMA would not necessarily translate into increased profit to monkfish vessels; realized changes in profit would depend not only on the effect of increased monkfish landings on average ex-vessel price for monkfish, but also on the costs associated with harvesting the additional monkfish.

7.4.1.1.4 Option 4: Reduce the Management Uncertainty Buffer to 3% in the Southern Fishery Management Area (*Preferred Alternative*)

Option 4 would reduce the management uncertainty buffer in the SFMA to 3%. The ACL and ABC for the SFMA would remain at 12,316mt. It should be noted that Option 4 is inclusive of Option 2, which means that the management uncertainty buffer would be reduced relative to the No Action Alternative *and* the estimated discard rate would be changed from -22.5% under the No Action Alternative to -24.6% under Option 2. The TAL for the SFMA would increase to 9,011mt (19,865,858 live lbs.) if both Options 2 and 4 were implemented, compared to 8,925mt (19,676,260 live lbs.) under the No Action Alternative (+86mt or +189,598 live lbs.).

The economic impacts of Option 4 relative to the No Action Alternative (Option 1) are likely to be neutral to possibly slightly low positive for those landing monkfish in the SFMA. Option 4 can be expected to have neutral to slightly low positive impacts in the SFMA relative to Option 2. The existing SFMA TAL does not appear to be constraining overall landings in the SFMA. Therefore, we would not expect substantial increases in SFMA landings from implementation of Option 4. Since we do not expect substantial increases in landings, we do not expect any change in average monkfish price, all else held constant. Therefore, Option 4 is expected to have minimal positive impact, if any, on monkfish revenues for those landing monkfish in the SFMA. Any positive impacts from the SFMA TAL increase of +86mt would occur only if the TAL under the No Action Alternative were constraining monkfish fishing in the SFMA.

In the unlikely event that vessels were able to land and sell the additional 84mt (189,598 live lbs.) each year in FY2017-FY2019, at the FY2015 average price of monkfish per live lb. ($0.96 per live lb.), the increase in monkfish revenue per year would be $182,014 in FY2017 or $546,042 over FY2017-FY2019. This additional revenue would accrue to vessels landings monkfish in the SFMA. We would not expect to see a change in average monkfish price from implementation of Option 4 given both that landings are not expected to change and that even if they did increase, the increase would be very small. Therefore, compared to the No Action Alternative, we expect Option 4 to have a neutral to slightly low positive impact on vessels landing monkfish in the NFMA.

7.4.1.2 Modifications to Current Monkfish Effort Controls

Vessels must be fishing under one or a combination of the following to land more than incidental amounts of monkfish: a monkfish DAS, a Northeast (NE) multispecies DAS, an Atlantic sea scallop DAS. Vessels with monkfish permits in categories C and D (i.e. those also issued a limited access NE multispecies DAS permit) can declare a monkfish DAS while at sea in the NFMA if they are fishing on a NE multispecies DAS and declared the "monkfish option" prior to leaving port at the start of its trip. Monkfish Permit Category C and D vessels fishing in the NFMA on both a NE multispecies and monkfish DAS do not have a monkfish trip limit.

The economic impacts analysis presented below follows from the daily landings limit and days at sea (DAS) allocation analysis presented in Appendix I (Hermsen, 2016). The objective of this analysis was to examine daily landings limits and DAS allocations under status quo TAL limits for both the NFMA and SFMA, and under TALs for those alternatives which lower the uncertainty management buffer and adjust the discard rates (these alternatives are discussed above in Section 7.4.1.1). The daily landings limit (trip limit) and DAS allocation analysis was conducted based on three assumptions, which must be kept in mind when considering the economic impacts analysis of modifications to the DAS allocation and/or daily landings limits. The assumptions are:

- Monkfish landings from monkfish permit category E (open access or incidental catch permit) and state-only permitted vessels will be exactly the same (in terms of live pounds landed) for each year in the FY2017-FY2019 period as they were in FY2015. In the NFMA, FY2015 monkfish landings by permit category and state-permitted vessels were 459,219 live pounds. For the SFMA, FY2015 monkfish landings by these vessels totaled 878,730 live pounds.

- Monkfish landings and effort on trips by limited access vessels on non-directed (incidental) monkfish trips will be equal to what they were in FY2015 for each year in the FY2017-FY2019 period.

- Fishing and landings patterns will be similar for each year in FY2017-FY2019 to those observed in FY2015.

The assumption of this approach is that any increases in landings due to changes in daily landings limits and/or DAS allocations will occur proportionately over all vessels that land monkfish in the management area and have a permit to which a given alternative applies. While it is likely that there would be heterogeneity in vessels that land monkfish in response to the proposed alternatives due to factors such as vessel-level preferences, costs and available alternatives to monkfish fishing, we cannot make other assumptions about the distribution of possible increased monkfish landings without conducting a vessel-level analysis.

This action would only revise monkfish DAS allocations and landing limits applicable to vessels that hold a limited access monkfish permit; therefore, the following analysis focuses on those entities (monkfish permit category A, B, C, D and H vessels). Estimated monkfish landings from Category E monkfish and state-only permitted vessels are assumed to remain what they were in FY2015 for each year through the FY2017-FY2019 period.

7.4.1.2.1 Modify the DAS allocation and/or trip limits in the NFMA

7.4.1.2.1.1 Option 1: No Action

Under the No Action Alternative, existing daily landing limits and DAS allocations would remain unchanged from those specified in FW8. In the NFMA, daily landings limits would continue to be 1,250 pounds tail weight per Monkfish DAS for monkfish permit Category A and C vessels and 600 pounds tail weight per Monkfish DAS for Category B and D vessels. Allocated DAS (excluding the 4 DAS carryover) would continue to be 45 DAS, as in FY2014-FY2016. Total monkfish landings in the NFMA for FY2015 were 9.1 million live pounds, or approximately 71% of the overall TAL for the NFMA. If there are no changes to the status quo estimated discard rate and management uncertainty buffer for the NFMA, economic impacts from the No Action Alternative would be neutral, as described in Section 7.4.1.1.1.

If the discard rate for the NFMA is updated as described in Section 7.4.1.1.2, without changes to daily landing limits or DAS allocations, economic impacts will be similar to those described in that section. If the management uncertainty buffer is reduced for the NFMA to 3.0%, as described in Section 7.4.1.1.3, the economic impacts of the No Action Alternative for modifying daily landings limits and/or DAS allocations will be similar to those described in that section.

7.4.1.2.1.2 Option 2: Increase the incidental trip limits in the NFMA (*Preferred Alternative*)

Option 2 would maintain the status quo DAS allocations and the status quo trip limits when fishing on a monkfish DAS in the NFMA, but would increase incidental landing limits when fishing in the NFMA on a NE multispecies DAS to 900 lb. tail weight/DAS for Category C vessels (+300 lb. tail weight/DAS compared to No Action) and 750 lb. tail weight/DAS for Category D vessels (+250 lb. tail weight/DAS compared to No Action). Incidental landing limits would remain at 25% of landings onboard, not to exceed 300 lb. tail weight for permit category E, F, or H, when fishing on a NE multispecies DAS.

Under Option 2, two possibilities were analyzed in the DAS allocation and daily landings limits analysis for the NFMA (Hermsen, 2016 [Appendix I]). These were:

- Option 2, Scenario 1: Assuming a status quo management uncertainty buffer of 13.5%, increase the incidental daily landing limits to 900 lbs. t.w. per DAS for monkfish permit category C vessels and to 750 lbs. t.w. per DAS for monkfish permit category D vessels.
- Option 2, Scenario 2: Assuming an updated management uncertainty buffer of 3.0% (the preferred alternative), increase the incidental daily landing limits to 900 lbs. t.w. per DAS for monkfish permit category C vessels and to 750 lbs. t.w. per DAS for monkfish permit category D vessels.

Overall economic impacts from Option 2 relative to No Action are expected to be neutral to possibly slightly low positive, regardless of whether the management uncertainty buffer remains at 13.5% or is lowered to 3.0%. Any positive economic impacts from Option 2 would accrue to monkfish permit Category C and D vessels that are landing monkfish in the NFMA while fishing on a NE Multispecies DAS. Monkfish permit Category C vessels that that declared the “monkfish option” prior to the start of the trip, and land between 600 and 900 lbs. t.w./DAS of monkfish while fishing on a NE Multispecies DAS, would no longer be required to declare the “monkfish option” while at sea. Similarly, monkfish permit Category D vessels that declared the “monkfish option” prior to the start of the trip, and land between 500 and 750 lbs. t.w./DAS of monkfish while fishing on a NE Multispecies DAS would no

longer be required to declare the "monkfish option" while at sea. Vessels with monkfish permits C and D that did not declare the "monkfish option" prior to the start of the trip would have increased flexibility to land monkfish incidentally (+300 and +200 lbs. t.w./DAS for Category C and Category D vessels). Option 2, compared to No Action, would likely decrease the administrative burden associated with declaring the "monkfish option" prior to leaving port and a monkfish DAS while at sea for Category C and D Vessels fishing on a NE Multispecies DAS. In addition, Option 2 may reduce regulatory discards of monkfish caught incidentally while fishing on a NE Multispecies DAS.

Landings in the NFMA are not expected to change under Option 2, which means that there would likely be no change in average monkfish price or monkfish revenues. Currently, most allocated monkfish DAS in the NFMA go unused, and the proposed increases in incidental trip limits under Option 2 would likely reduce allocated monkfish DAS usage even further. The analysis suggests that a higher incidental trip limit of 900lbs. t.w. per DAS for monkfish permit Category C vessels would likely mean that the majority of directed landings by Category C vessels (who may have been fishing under a monkfish DAS) would become incidental landings (while fishing on a multispecies DAS) under Option 2 (Hermsen, 2016 [Appendix I], Figure 3). The analysis also suggests that for Category D vessels, nearly all of the directed activity by these vessels would become incidental if the incidental trip limit were to increase to 750 lbs. t.w. per DAS (Hermsen, 2016 [Appendix I], Figure 4). Table 40 provides the numbers of vessels with monkfish permits in Categories C and D by trip state and trip port that could be impacted by Option 2, based on monkfish landings in the NFMA during FY2015.

Table 40 - Number of monkfish permits in Categories C and D landing monkfish in the NFMA, by trip state and trip port, FY2015

Trip State	Trip Port	Number of Monkfish C Permits landing monkfish in FY2015	Number of Monkfish D Permits landing monkfish in FY2015
CONNECTICUT			
	OTHER CONNECTICUT	ND	ND
MAINE			
	BOOTHBAY HARBOR	ND	ND
	CUNDYS HARBOR	ND	ND
	PORT CLYDE	ND	3
	PORTLAND	8	14
MASSACHUSETTS			
	BOSTON	12	5
	CHATHAM	ND	14
	FAIRHAVEN	ND	ND
	GLOUCESTER	17	22
	HARWICHPORT	ND	ND
	NANTUCKET	ND	ND
	NEW BEDFORD	59	25
	NEWBURYPORT	ND	ND
	PLYMOUTH	ND	ND
	PROVINCETOWN	ND	3
	SCITUATE	ND	ND
	WOODS HOLE	ND	5
NEW HAMPSHIRE			
	PORTSMOUTH	ND	3
	SEABROOK	ND	4
RHODE ISLAND			
	POINT JUDITH	8	ND

Notes:
[1] Trip port is assigned by the DMIS database in order of availability from dealer port (dealer port where the vessel sold the catch), VTR port (first port landed on the Vessel Trip Report), and principal port listed in the permit data (main vessel landings location).
[2] Trip state is assigned by the DMIS database in order of availability from dealer state (dealer port state where the vessel sold the catch), VTR state (first state landed on the Vessel Trip Report), and principal port state from the permit data (state in which the principal port is located).
[3] "ND" within a cell for a port indicates that the data were suppressed due to confidentiality issues.

7.4.1.2.2 Modify the DAS allocation and trip limits in the SFMA

7.4.1.2.2.1 Option 1: No Action

Under the No Action Alternative, existing daily landing limits and DAS allocations would remain unchanged from those specified in FW8. In the SFMA, daily landing limits would continue to be 610 pounds tail weight per DAS for monkfish permit Category A and C vessels and 500 pounds tail weight

per DAS for Category B and D vessels. The trip limit for monkfish permit Category F vessels would be 1,600 lbs. Allocated DAS would be 32 DAS (excluding the 4 DAS carryover) in FY2017-FY2019, as they were in FY2014-FY2016. The incidental landing limit would remain unchanged. Total monkfish landings in the SFMA for FY2015 were approximately 10.4 million live pounds, or 53% of the overall TAL. Compared to the NFMA, a higher percentage of monkfish landings in the SFMA come from directed activity.

If there are no changes to the status quo estimated discard rate and management uncertainty buffer, economic impacts from the No Action Alternative would be neutral, as described in Section 7.4.1.1.1.

If the discard rate for the SFMA is updated as described in Section 7.4.1.1.2, the combined economic impacts of the updated discard rates, without changes to daily landing limits or DAS allocations, will be similar to those described in that section. If the management uncertainty buffer is reduced for the SFMA as described in Section 7.4.1.1.4, the economic impacts of no action for modifying daily landings limits and/or DAS allocations in the SFMA to 3% will be similar to those described in that section.

7.4.1.2.2.2 Option 2: Increase the DAS allocation and trip limits in the SFMA (*Preferred Alternative*)

Option 2 would increase the SFMA DAS allocation from its existing level of 32 DAS by 15% to 37 DAS (+ 5 DAS). It would also increase the SFMA daily landings limit by 15%. Trip limits for monkfish permit Categories A and C would increase to 700 pounds tail weight per DAS (+90 pounds tail weight per DAS compared to No Action). Trip limits for monkfish permit Categories B and D would increase to 575 pounds tail weight per DAS (+75 pounds tail weight per DAS compared to No Action). Incidental landing limits would remain at 50 lb. tail weight per DAS for Category E or Category H permits and non-trawl Category C, D, or F vessels. For trawl vessels with monkfish permits in Categories C, D or F, the incidental landing limit would remain at 300 pounds tail weight per DAS.

Option 2 is expected to have overall economic impacts that are low positive to positive compared to the No Action Alternative. Vessels with limited monkfish permits in Categories A, B, C, and D that land monkfish in the SFMA on directed trips will be the beneficiaries of any positive economic impacts. Depending upon how any increases in monkfish landings affect average ex-vessel price for monkfish, economic impacts from Option 2 are expected to range from low negative to neutral for vessels landing monkish in the NFMA, and vessels in either area that land monkfish incidentally or under a Category E or state permit.

Compared to the NFMA, the SFMA has more directed monkish effort. Allocated monkfish DAS and daily landing limits are more constraining in the SFMA than in the NFMA. The DAS allocation and daily landings limits for the SFMA demonstrate that some vessels in the SFMA are using nearly all their allocated DAS in the SFMA (Hermsen, 2016 [Appendix I], Figure 2). The objective of increasing allocated DAS and landing limits in the SFMA is to allow increased ability to harvest monkfish (to increase landings up towards the TAL for the SFMA), but do so in a modest way to avoid large increases in monkfish landings and possible negative effect on monkfish price. Because of the desire to maintain market stability in terms of price and continuous supply of monkfish, this economic impacts analysis does not include analysis for the impact of increasing allocated DAS to a point where the entire directed fishery FY2017 TAL might be harvested. Monkfish industry advisors expressed consensus that the market could absorb modest increases in allocated DAS and daily landings limits the SFMA without a negative effect (decrease) in ex-vessel price for monkfish.

Under Option 2, two possibilities were analyzed in the DAS allocation and daily landings limits analysis for the SFMA (Hermsen, 2016 [Appendix I]). These were:

- Option 2, Scenario 1: Assuming a status quo management uncertainty buffer of 6.5%, increase the SFMA DAS allocation by 15% to 37 DAS (+ 5 DAS) and increase the SFMA daily landings limit by 15%. Trip limits for monkfish permit Categories A and C would increase to 700 pounds tail weight per DAS (+90 pounds tail weight per DAS compared to No Action). Trip limits for monkfish permit Categories B and D would increase to 575 pounds tail weight per DAS (+75 pounds tail weight per DAS compared to No Action).

- Option 2, Scenario 2: Assuming an updated management uncertainty buffer of 3.0% (the preferred alternative), increase the SFMA DAS allocation by 15% to 37 DAS (+ 5 DAS) and increase the SFMA daily landings limit by 15%. Trip limits for monkfish permit Categories A and C would increase to 700 pounds tail weight per DAS (+90 pounds tail weight per DAS compared to No Action). Trip limits for monkfish permit Categories B and D would increase to 575 pounds tail weight per DAS (+75 pounds tail weight per DAS compared to No Action).

Under both scenarios for Option 2, limited access monkfish landings in the SFMA are projected to increase in FY2017 (compared to FY2015 and the No Action Alternative) by the same amount. Projected limited access monkfish landings per year for each year during FY2017-FY2019 in the SFMA are 12,345,092 live lbs., compared to 9,193,662 live lbs. under No Action Alternative (Table 7, Hermsen, 2016 [Appendix I]). This represents an increase of +3,151,430 live lbs. This represents an increase of 34.2% in landings in the SMA, and a 16.5% increase in all monkfish landings Since projected limited access monkfish landings in the SFMA are expected to be the same regardless of the management uncertainty buffer, the ranges for projected monkfish revenues under Option 2, with the status quo management uncertainty buffer or an updated management uncertainty buffer of 3.0%, are the same. Projected monkfish revenue from limited access monkish landings in the SFMA for each year during FY2017-FY2019 are presented in Table 41.

Table 41 - Projected limited access monkfish landings and monkfish revenues for the SFMA for each year during FY2017-2019 under No Action versus Option 2, depending on price effects

Alternative	Projected Monkfish Landings (live lbs.)	Lower Bound Estimate Projected Monkfish Revenue under average price of $0.83/live lb.	Upper Bound Estimate Projected Monkfish Revenue under average price of $0.96/live lb.
No Action	9,193,662		$8,825,916
Option 2, status quo management uncertainty buffer (6.5%)	12,345,092	$10,246,426	$11,851,288
Option 2, updated management uncertainty buffer (3.0%)	12,345,092	$10,246,426	$11,851,288

The impact of an increase in monkfish landings in the SFMA will depend upon the effect the increased landings have on monkfish price, if any. Upper and lower bounds for projected monkfish revenues for Option 2 are estimated using two assumptions: 1) that increased monkfish landings in the SFMA will have no effect on average monkfish price (average monkfish price remains at $0.96 per live lb.) and 2)

that increased monkfish landings in the SFMA will result in decreases in average monkfish price according to the price flexibility estimate of -0.41 (average monkfish price falls to $0.90 per live lb.). Depending upon price effects, Option 2 is projected to result in $11.1 million to nearly $11.9 million in monkfish revenue, for each year in the FY2017-FY2019 period, from limited access landings in the SFMA, an increase of $2,284,667 to $3,025,373 per year compared to projected revenues under No Action. Table 42 summarizes projected total limited access monkfish landings and total monkfish revenues for the SFMA over FY2017-FY2019 under No Action versus Option 2, depending on price effects.

Table 42 - Projected total limited access monkfish landings and total monkfish revenues for the SFMA over FY2017-2019 under No Action versus Option 2, depending on price effects

Alternative	Projected Monkfish Landings (live lbs.)	Projected Monkfish Revenue under average price of $0.83/ live lb.	Projected Monkfish Revenue under average price of $0.96/live lb.
No Action	27,580,986		$26,477,747
Option 2, status quo management uncertainty buffer (6.5%)	37,035,276	$30,739,279	$35,553,865
Option 2, updated management uncertainty buffer (3.0%)	37,035,276	$30,739,279	$35,553,865

Table 43 summarizes the additional limited access monkfish landings and monkfish revenues Option 2 is projected to result in over the FY2017-FY2019 period (regardless of whether the uncertainty buffer remains at its status quo of 6.5% or is updated to 3%), compared to landings and revenues projected under the No Action Alternative. Option 2 is expected to result in an additional 9.4 million live lbs. of monkfish landings in the SFMA, and, depending on price effects, an additional $6.9 million to nearly $9.1 million in monkfish revenue over the three year period.

Table 43 - Difference between projected total limited access monkfish landings and revenue for the SFMA, over FY2017-2019, under the No Action Alternative versus Option 2, depending on price effects

	Projected Monkfish Landings (live lbs.)	Projected Monkfish Revenue under average price of $0.83/ live lb.	Projected Monkfish Revenue under average price of $0.96/live lb.
Option 2 (regardless of status quo or updated uncertainty buffer)	37,035,276	$30,739,279	$35,553,865
No Action	27,580,986		$26,477,747
Difference (Option 2 - No Action)	9,454,290	$4,261,533	$9,076,118

If the flexibility to take longer trips or more trips allows these vessels to increase net revenue (i.e. if gross revenues exceed the costs associated with the longer or additional trips), these vessels would benefit from increases in profitability, assuming average monkfish price and other market conditions remain stable during FY2017-FY2019. However, it is also possible that if vessels fishing in the SFMA opt to take more trips or longer trips because of Option 2, their variable (trip-related) costs could increase. This may result

in decreased profitability for a vessel if it cannot offset the increases in cost with increases in revenue from sales of fish, although it seems unlikely that a monkfish vessel would choose to extend a trip or take additional trips if these actions were not expected to be profitable.

Option 2 is not expected to result in changes in the monkfish landings of monkfish permit Category E and state-only permitted vessels, which are summarized in Table 42, in either the NFMA or the SFMA. Option 2 is also not expected to result in changes in monkfish landings in the NFMA by limited access vessels. However, increased monkfish landings by the limited access fleet in the SFMA under Option 2 could have the effect of lowering average ex-vessel price, as estimated by the price flexibility estimate of -0.41. If this occurs, the monkfish revenues from monkfish landed by Category E and state permitted only vessels in either area could fall. In addition, revenues from monkfish landings in the NFMA by limited access vessels could also fall, since Option 2 is not expected to increase monkfish landings in the NFMA. Table 44 summarizes possible impacts on monkfish landings and revenues for monkfish permit Category E and state-only permitted vessels, depending upon price effect.

Table 44 - Projected monkfish landings and monkfish revenues over FY2017-2019 for vessels with a Category E monkfish permit and state-permitted only vessels, by management area, depending upon price effects

Management Area	Projected Monkfish Landings by Cat E & State-Only Permitted Vessels	Lower Bound Estimate Projected Monkfish Revenue under average price of $0.83/ live lb.	Upper Bound Estimate Projected Monkfish Revenue under average price of $0.96/live lb.	Possible difference in monkfish revenue depending upon price effect (Option #2 - No Action)
NFMA	1,377,657	$1,143,455	$1,322,551	-$179,095 to $0
SFMA	2,636,190	$2,188,038	$2,530,742	-$342,705 to $0
Total (NFMA & SFMA)	4,013,847	$3,331,493	$3,853,293	-$521,800 to $0

Table 45 summarizes possible impacts to limited access vessels landing monkfish in the NFMA, depending upon any effects Option 2 has on the average ex-vessel price for monkfish. For all three years in the FY2017-FY2019 period, the expected difference in monkfish revenues under Option 2 versus the No Action Alternative for limited access permit holders landing in the NFMA is -$3.3 million (-$1.1 million per year) to $0.

Table 45 - Projected monkfish landings and monkfish revenues over FY2017-2019 for vessels holding a limited access monkfish permit from landing monkfish in the NFMA, under Option 2 versus the No Action Alternative, depending upon price effects

Alternative	Projected Monkfish Landings (live lbs.) by limited access vessels in the NFMA	Lower Bound Estimate Projected Monkfish Revenue under average price of $0.83/ live lb.	Upper Bound Estimate Projected Monkfish Revenue under average price of $0.96/live lb.	Possible difference in monkfish revenue due to price effect (Option #2 - No Action)
No Action	25,661,748		$24,635,278	
Option 2, status quo management uncertainty buffer (6.5%)	25,661,748	$21,299,251	$24,635,278	-$3,336,027 to $0
Option 2, updated management uncertainty buffer (3.0%)	25,661,748	$21,299,251	$24,635,278	-$3,336,027 to $0

The overall possible economic impacts of Option 2 are presented in Table 46. The overall net economic impact of Option 2 compared to the No Action Alternative is expected to be low positive to positive. Compared to the No Action Alternative, Option 2 is estimated to result in nearly 9.5 million live pounds of additional monkfish landings in the SFMA over the period from FY2017 to FY2019. The ultimate impact on monkfish revenues for all vessels landing monkfish will depend upon whether or not these increased landings result in a decreased average ex-vessel price for monkfish.

Option 2 is expected to result in increased overall monkfish revenues compared to the No Action Alternative; this increase is expected to range from $5.1 to nearly $9.1 million over the three year period. Vessels with monkfish permits in Categories A, B, C, D and landing monkfish in the SFMA are expected to benefit from increased monkfish revenues under Option 2 versus the No Action Alternative, regardless of price effect. Over FY2017-FY2019, project monkfish revenues for vessels in Categories A, B, C, and D landing monkfish in the SFMA are $33.3 million to nearly $35.6 million, an increase of $6.9 million to $9.1 million over the three years, compared to the No Action Alternative. Vessels landing in the SFMA under a Category E or state only permit are not expected to see any changes in landings as a result of Option 2, but monkfish revenues could decrease for these vessels if the expected increases in landings from limited access vessels in the SFMA negatively impact price. Projected monkfish revenues over FY2017-FY2019 from monkfish landings in the SFMA by Category E or state permitted only vessels are $2.4 million to $2.5 million, with Option 2 resulting in -$158,171 to $0 less revenue for these vessels compared to the No Action Alternative. The expected increase in monkfish revenues for limited access vessels landings in the SFMA outweighs the possible decrease in monkfish revenues to those landing monkfish in the SFMA under a Category E or state permit. Overall, for vessels landing monkfish in the SFMA, Option 2 is expected to result in $6.7 million to nearly $9.1 million in additional monkfish revenue over the FY2017-FY2019 period compared to the No Action Alternative. The expected increases in monkfish revenue under Option 2 for vessels with permits in Categories A/C and B/D landing monkfish in the SFMA will not necessarily translate into increased profit to monkfish. Realized changes in profit for these vessels will depend not only on the effect of increased monkfish landings on average ex-vessel price for monkfish, but also on the costs associated with the additional monkfish landed. The economic impacts of Option 2 versus the No Action Alternative for vessels landing monkfish in the NFMA are expected to be low negative to neutral, depending upon the impact on average ex-vessel price for monkfish from increased landings in the SFMA. If the expected increases in monkfish landings in the

SFMA have no impact on price, as industry advisors expect, monkfish revenues from landings in the NFMA are not expected to change; they are expected to remain at nearly $26.0 million over the three year period (nearly $8.7 million per year). In this case, the economic impacts of Option 2 versus the No Action Alternative for those landing monkfish in the NFMA would be neutral. If increased landings in the SFMA do negatively affect average monkfish price according to the price flexibility estimate of -0.41 (i.e. if average monkfish price drops to $0.90 per live pound), the expected drop in revenue over FY2017-FY2019 from landings in the NFMA could be as much as approximately $1.6 million, or nearly -$540,788 per year. Overall, when considering possible impacts to both the NFMA and the SFMA from Option 2 compared to the No Action Alternative, the expected net impact on monkfish revenues for FY2017-FY2019 is positive, estimated at $5.1 million to $9.1 million in increased monkfish revenues over the time period (nearly $1.7 million to just over $3.0 million per year).

Table 46 - Projected landings and Monkfish revenues over FY2017-2019 for all vessel landings monkfish, in all management areas, under Option 2 versus the No Action Alternative, depending on price effects

Alternative	Management Area and MF Permit Category	Projected Monkfish Landings (live lbs.)	Lower Bound Estimate Projected Monkfish Revenue under average price of $0.83/ live lb.	Upper Bound Estimate Projected Monkfish Revenue under average price of $0.96/live lb.
No Action	NFMA			
	Limited Access	25,661,748		$24,635,278
	Cat E and state-permitted only	1,377,657		$1,322,551
	Total NFMA	27,039,405		$25,957,829
	SFMA			
	Limited Access	27,580,986		$26,477,747
	Cat E and state-permitted only	2,636,190		$2,530,742
	Total SFMA	30,217,176		$29,008,489
	Total NFMA & SFMA	57,256,581		$54,966,318
Option 2 - Increase DAS allocation and trip limits in the SFMA (Preferred)	NFMA			
	Limited Access	25,661,748	$21,299,251	$24,635,278
	Cat E and state-permitted only	1,377,657	$1,143,455	$1,322,551
	Total NFMA	27,039,405	$22,442,706	$25,957,829
	SFMA			
	Limited Access	37,035,276	$30,739,279	$35,553,865

	Cat E and state-permitted only	2,636,190	$2,188,038	$2,530,742
	Total SFMA	39,671,466	$32,927,317	$38,084,607
	Total NFMA & SFMA	66,710,871	$55,370,023	$64,042,436
Estimated Difference (Option 2-No Action)	**NFMA**	**0**	**-$3,515,123**	**$0**
	SFMA	**9,454,290**	**$3,918,828**	**$9,076,118**
	Total NFMA & SFMA	**9,454,290**	**$403,705**	**$9,076,118**

Table 47 provides a listing of the numbers of monkfish permits in Categories A/C and B/D that landed monkfish in the SFMA on a directed in FY2015, by trip state and trip port. These are the permits that may benefit from Option 2.

Table 47 - Number of monkfish permits in Categories AC and BD landing monkfish in the SFMA on a directed trip, by trip state and trip port, FY2015

Trip State	Trip Port	Number of Monkfish Permits in Categories A and C landing monkfish in FY2015	Number of Monkfish Permits in Categories B and D landing monkfish in FY2015
CONNECTICUT			
	EAST HAVEN	ND	ND
	MYSTIC	ND	ND
	NEW LONDON	7	5
	STONINGTON	6	5
	OTHER CONNECTICUT	ND	ND
MAINE			
	PORTLAND	ND	ND
MARYLAND			
	OCEAN CITY	ND	3
	OTHER MARYLAND	ND	ND
	OTHER WORCESTER	ND	ND
MASSACHUSETTS			
	BOSTON	3	ND
	CHATHAM	ND	14
	EDGARTOWN	ND	ND
	FAIRHAVEN	6	ND
	GLOUCESTER	4	7
	HARWICHPORT	ND	7
	MENEMSHA	ND	ND
	NANTUCKET	ND	ND

	NEW BEDFORD	104	42
	PROVINCETOWN	ND	3
	SCITUATE	ND	ND
	WESTPORT	ND	ND
	WOODS HOLE	ND	3
NEW JERSEY			
	ATLANTIC CITY	ND	ND
	BARNEGAT	ND	3
	BARNEGAT LIGHT/LONG BEACH	15	20
	BELFORD	ND	3
	CAPE MAY	23	15
	OTHER NJ	ND	ND
	POINT PLEASANT	8	19
	SEA ISLE CITY	ND	ND
	WARETOWN	ND	ND
	WILDWOOD	ND	ND
NEW YORK			
	EAST HAMPTON	ND	ND
	HAMPTON BAYS	3	3
	MATTITUCK	ND	ND
	MONTAUK	ND	13
	MORICHES	ND	ND
	POINT LOOKOUT	ND	ND
	RIVERHEAD	ND	ND
	SHINNECOCK	3	4
NORTH CAROLINA			
	BEAUFORT	16	14
	ENGELHARD	ND	3
	HOBUCKEN	3	ND
	WANCHESE	ND	7
RHODE ISLAND			
	DAVISVILLE	ND	ND
	JAMESTOWN	ND	ND
	LITTLE COMPTON	8	3
	NEW SHOREHAM	ND	ND
	NEWPORT	ND	4
	NORTH KINGSTON	ND	ND
	OTHER NEWPORT	ND	ND
	POINT JUDITH	32	28
	TIVERTON	ND	ND
VIRGINIA			
	CHINCOTEAGUE	ND	15

GREENBACKVILLE	ND	ND
HAMPTON	15	11
HAMPTON(COUNTY)	ND	ND
NEWPORT NEWS	8	9
SEAFORD	ND	ND

Notes:
[1] Trip port is assigned by the DMIS database in order of availability from dealer port (dealer port where the vessel sold the catch), VTR port (first port landed on the Vessel Trip Report), and principal port listed in the permit data (main vessel landings location).
[2] Trip state is assigned by the DMIS database in order of availability from dealer state (dealer port state where the vessel sold the catch), VTR state (first state landed on the Vessel Trip Report), and principal port state from the permit data (state in which the principal port is located).
[3] "ND" within a cell for a port indicates that the data were suppressed due to confidentiality issues.

The preferred alternatives proposed by this measure are expected to have a neutral to positive net economic impact overall, compared to the No Action Alternatives. Positive economic benefits, in the form of increased revenues from landing monkfish, are most likely to occur for those vessels that fish for monkfish on directed trips in the SFMA.

7.5 Social Impacts

When reviewing the data below, please keep in mind the primary and secondary ports (Table 48). To facilitate this, all primary ports will be in bold and secondary ports in bold and italics. Primary and secondary ports are based on fishing engagement indicators that account for absolute values of pounds and value of monkfish, number of monkfish permits (both active and inactive) with the community listed as the owner's home, and number of dealers buying monkfish in that community. This captures involvement in monkfish more holistically than pounds and value alone. The current indicators are based on a five-year average from FY2009-2013. All vessels who caught at least one pound of monkfish in the 5-year period of fishing years 2009 to 2013 (FY2009-2013) are included.

Table 48 - All Primary and Secondary Monkfish Ports

PRIMARY PORTS		SECONDARY PORTS	
MA	New Bedford	NY	Hampton Bays/Shinnecock
MA	Gloucester	NJ	Point Pleasant/Point Pleasant Beach
RI	Point Judith/Narragansett	MA	Chatham
NY	Montauk	MA	Boston
NJ	Barnegat Light/Long Beach	NJ	Cape May
		CT	New London
		RI	Little Compton
		ME	Portland
		RI	Newport
		VA	Chincoteague
		MA	Westport
		MA	Scituate
		NH	Portsmouth
		NC	Wanchese
		MD	Ocean City
		VA	Newport News

An additional measure, monkfish reliance, is a per capita measure using similar data to the engagement index but divided by total population in the community. See Figure 19 showing the relationship of high engagement to reliance. Barnegat Light/Long Beach, NJ, for instance, is very highly reliant on monkfish while New Bedford has very low reliance on monkfish, even though New Bedford, MA has much higher engagement. Of these highly engaged communities, then, Barnegat Light/Long Beach is far and away the most reliant on monkfish, followed by Chatham and Montauk. Very low reliance communities include Boston, Portsmouth, Scituate, Westport, Newport, and New London.

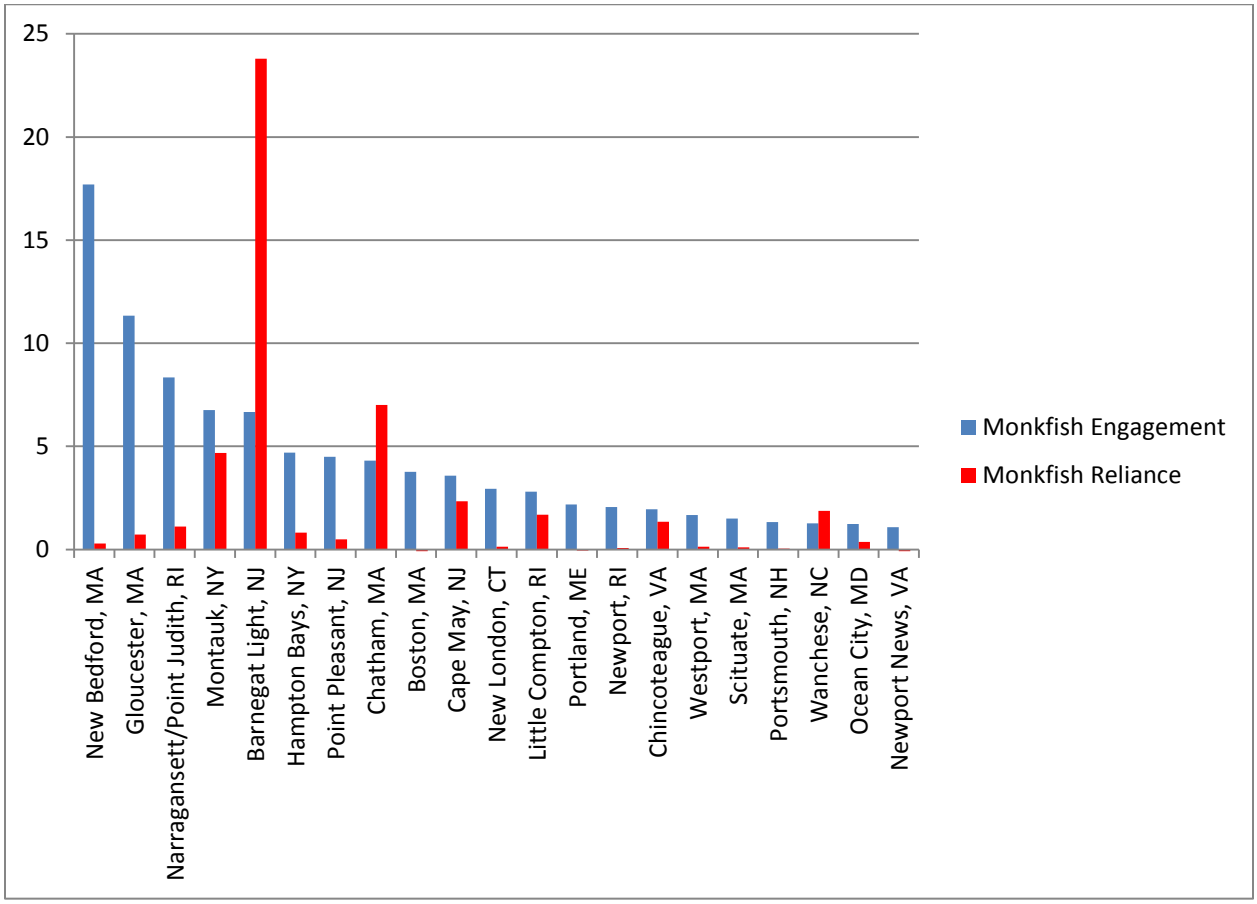


Figure 19 - All high monkfish engagement communities with both engagement and reliance scores

Further, New Bedford, Boston, New London, Portland, Newport News, Wanchese, Chincoteague, Westport, and Ocean City show high social vulnerability in one or more areas (e.g., personal disruption, population composition, poverty). Chatham, Boston, Barnegat Light/Long Beach, Cape May, Montauk, and Point Judith all have high gentrification pressure vulnerability in one or more areas (e.g., housing disruption, retiree migration, urban sprawl). See Section 6.4.2 Framework 9 for more details on engagement, reliance, and social vulnerability (NEFMC, 2016). Each additional vulnerability has the potential to increase impacts to a community.

7.5.1 Updates to Annual Catch Limits

7.5.1.1 Revised Annual Catch Limits

7.5.1.1.1 Option 1: No Action

The No Action Alternative would keep the existing monkfish DAS allocations and landing limits in place, as implemented in FW8 (NEFMC, 2014). In both the NFMA and SFMA, existing daily landings limits per DAS would remain distinct for Category A and C vessels versus Category B and D vessels.

In Table 49 - Table 51, number of vessels is provided for those holding A, C or both A and C permits, or B, D or both B and D permits, in each of the NMFA and SFMA. Some vessels fish in both the NFMA and SFMA, meaning there is some double counting. In both the NFMA and the SFMA, and in both B/D and A/C categories, the majority of permitted vessels come from New Bedford. But the remaining

communities with more than 3 vessels vary by permit categories and fishing location, with management area creating most of the variation. New Bedford has high monkfish engagement, but lower monkfish reliance than most other highly engaged monkfish communities. It also has high social vulnerability. Other communities with 20 or more permits in Table 49 - Table 52 are: Point Judith and Gloucester, with Cape May and Barnegat Light/Long Beach not far behind with 19 each in at least one table. Barnegat Light/Long Beach has high engagement and high reliance. Point Judith, Barnegat Light/Long Beach, and Cape May all show high gentrification pressure vulnerability.

Table 49 - A and/or C permits fishing in SFMA

PORT	ST	PERMITS
NEW BEDFORD	MA	94
POINT JUDITH	RI	28
CAPE MAY	NJ	19
BARNEGAT LIGHT/LONG BEACH	NJ	15
HAMPTON	VA	13
BEAUFORT	NC	11
POINT PLEASANT	NJ	8
LITTLE COMPTON	RI	7
NEW LONDON	CT	6
NEWPORT NEWS	VA	6
STONINGTON	CT	5
FAIRHAVEN	MA	4
GLOUCESTER	MA	4

Table 50 - A and/or C permits fishing in NFMA

PORT	ST	PERMITS
NEW BEDFORD	MA	59
GLOUCESTER	MA	19
BOSTON	MA	12
POINT JUDITH	RI	9
PORTLAND	ME	7

Table 51 - B and/or D permits fishing in NFMA

PORT	ST	PERMITS
NEW BEDFORD	MA	27
GLOUCESTER	MA	20
CHATHAM	MA	15
PORTLAND	ME	13
WOODS HOLE	MA	5
BOSTON	MA	4
SEABROOK	NH	4

Table 52 - B and/or D permits fishing in SFMA

PORT	ST	PERMITS
NEW BEDFORD	MA	35
POINT JUDITH	RI	26
BARNEGAT LIGHT/LONG BEACH	NJ	19
POINT PLEASANT	NJ	18
CHATHAM	MA	14
MONTAUK	NY	12
CHINCOTEAGUE	VA	8
BEAUFORT	NC	7
HAMPTON	VA	7
NEWPORT NEWS	VA	7
CAPE MAY	NJ	6
GLOUCESTER	MA	5
HARWICHPORT	MA	5
NEW LONDON	CT	5
STONINGTON	CT	5
NEWPORT	RI	4
SHINNECOCK	NY	4

7.5.1.1.2 Option 2: Updated Discard Rate for Northern and Southern Fishery Management Areas

Under Option 2 TALs would decrease for both the NFMA and SFMA. Changes in the discard rate would lead to possibly slightly low negative, but likely neutral economic impacts.

If we simply choose the top 5 communities fishing each management area, again New Bedford is top in both areas (Table 53). The next four in the NFMA are: Gloucester, Portland, Chatham and Boston. In the SFMA, on the other hand, the next four are: Point Judith, Point Pleasant, Cape May, and Barnegat Light/Long Beach (Table 54). Barnegat Light/Long Beach, NJ is very highly reliant on monkfish while New Bedford has very low reliance on monkfish, even though New Bedford, MA has much higher engagement. Chatham is the second most reliant community. Further, New Bedford has high social vulnerability, while Chatham, Boston, Barnegat Light/Long Beach, Cape May, and Point Judith all have high gentrification pressure vulnerability.

Table 53 - All permits fishing in the NFMA

PORT	ST	PERMITS
NEW BEDFORD	MA	113
GLOUCESTER	MA	57
PORTLAND	ME	25
CHATHAM	MA	22
BOSTON	MA	18
POINT JUDITH	RI	14

SEABROOK	NH	13
PROVINCETOWN	MA	9
WOODS HOLE	MA	7
SCITUATE	MA	6
FAIRHAVEN	MA	5
MONTAUK	NY	4

Table 54 - All permits fishing in the SFMA

PORT	ST	PERMITS
NEW BEDFORD	MA	186
POINT JUDITH	RI	99
POINT PLEASANT	NJ	57
CAPE MAY	NJ	57
BARNEGAT LIGHT/LONG BEACH	NJ	43
MONTAUK	NY	40
HAMPTON	VA	37
BEAUFORT	NC	31
HAMPTON BAYS	NY	26
NEWPORT NEWS	VA	26
CHINCOTEAGUE	VA	20
GLOUCESTER	MA	16
STONINGTON	CT	16
SHINNECOCK	NY	16
NEW LONDON	CT	15
BELFORD	NJ	15
CHATHAM	MA	14
LITTLE COMPTON	RI	12
ATLANTIC CITY	NJ	10
OCEAN CITY	MD	9
WOODS HOLE	MA	7
NEWPORT	RI	7
ENGELHARD	NC	7
WANCHESE	NC	6
OTHER ATLANTIC	NJ	6
SEAFORD	VA	6
MENEMSHA	MA	6
FAIRHAVEN	MA	6
OTHER WORCESTER	MD	6
HARWICHPORT	MA	5
WILDWOOD	NJ	5
HOBUCKEN	NC	5

OTHER MARYLAND	MD	4
BOSTON	MA	4
PROVINCETOWN	MA	4
SCITUATE	MA	4
BARNEGAT	NJ	4
ORIENTAL	NC	4

7.5.1.1.3 Option 3: Reduce the Management Uncertainty Buffer to 3% in the Northern Fishery Management Area (*Preferred Alternative*)

The economic impacts of Option 3 relative to the No Action Alternative (Option 1) are likely to be neutral to possibly slightly low positive for those landing monkfish in the NFMA. Option 3 can be expected to have neutral to slightly low positive economic impacts in the NFMA relative to Option. See Table 53, for communities most likely to be impacted.

7.5.1.1.4 Option 4: Reduce the Management Uncertainty Buffer to 3% in the Southern Fishery Management Area (*Preferred Alternative*)

The economic impacts of Option 4 relative to the No Action Alternative (Option 1) are likely to be neutral to possibly slightly low positive for those landing monkfish in the SFMA. Option 4 can be expected to have neutral to slightly low positive economic impacts in the SMA relative to Option 2. See Table 54, for communities most likely to be impacted.

7.5.1.2 Modifications to Current Monkfish Days-at-Sea and Trip Limits

This action would only revise monkfish DAS allocations and landing limits applicable to vessels that hold a limited access monkfish permit, i.e., monkfish permit category A, B, C, D and H vessels. Table 55 provides total A, B, C, D, and/or H permits per port. However, because there are so few H permits and they have a limited fishing area they are also examined separately. Only one port has more than 3 H permits, Chincoteague, VA, and only 3 ports with any H permits. The top 5 communities (with a tie for fifth place) are New Bedford, Point Judith, Gloucester, Barnegat Light/Long Beach, Cape May, and Point Pleasant. New Bedford is the most highly engaged community by far, but Barnegat Light/Long Beach is the most reliant. New Bedford also shows high social vulnerability, while Barnegat Light/Long Beach, Point Judith, and Cape May all have high gentrification pressure vulnerability.

Table 55 - All ABCD and/or H permits

PORT	ST	PERMIT
NEW BEDFORD	MA	158
POINT JUDITH	RI	56
GLOUCESTER	MA	41
BARNEGAT LIGHT/LONG BEACH	NJ	34
CAPE MAY	NJ	26
POINT PLEASANT	NJ	26
HAMPTON	VA	20
PORTLAND	ME	20

BOSTON	MA	19
BEAUFORT	NC	18
CHATHAM	MA	17
CHINCOTEAGUE	VA	15
MONTAUK	NY	13
NEWPORT NEWS	VA	13
NEW LONDON	CT	11
STONINGTON	CT	11
LITTLE COMPTON	RI	10
PROVINCETOWN	MA	7
SHINNECOCK	NY	7
WOODS HOLE	MA	7
FAIRHAVEN	MA	6
HAMPTON BAYS	NY	6
HARWICHPORT	MA	6
NEWPORT	RI	5
SEABROOK	NH	4

7.5.1.2.1 Modify the DAS allocation and/or trip limits in the NFMA

7.5.1.2.1.1 Option 1: No Action

Under the No Action Alternative, existing daily landing limits and DAS allocations for A/C vessels and B/D vessels would remain unchanged from those specified in FW8. If there are no changes to the status quo estimated discard rate and management uncertainty buffer for the NFMA, economic impacts from the No Action Alternative would be neutral. Table 56 and Table 57 summarize number of each permit type by port.

Table 56 - A and/or C permits

PORT	ST	PERMITS
NEW BEDFORD	MA	112
POINT JUDITH	RI	30
CAPE MAY	NJ	19
GLOUCESTER	MA	19
BARNEGAT LIGHT/LONG BEACH	NJ	15
BOSTON	MA	14
HAMPTON	VA	13
BEAUFORT	NC	11
POINT PLEASANT	NJ	8
LITTLE COMPTON	RI	7
PORTLAND	ME	7
NEW LONDON	CT	6

NEWPORT NEWS	VA	6
STONINGTON	CT	6
FAIRHAVEN	MA	5

Table 57 - B and/or D permits

PORT	ST	PERMITS
NEW BEDFORD	MA	46
POINT JUDITH	RI	26
GLOUCESTER	MA	22
BARNEGAT LIGHT/LONG BEACH	NJ	19
POINT PLEASANT	NJ	18
CHATHAM	MA	17
PORTLAND	ME	13
MONTAUK	NY	12
CHINCOTEAGUE	VA	8
HAMPTON	VA	7
BEAUFORT	NC	7
NEWPORT NEWS	VA	7
WOODS HOLE	MA	7
HARWICHPORT	MA	6
CAPE MAY	NJ	6
NEW LONDON	CT	5
BOSTON	MA	5
PROVINCETOWN	MA	5
STONINGTON	CT	5
NEWPORT	RI	4
SHINNECOCK	NY	4
SEABROOK	NH	4

7.5.1.2.1.2 Option 2: Increase the trip limits in the NFMA (*Preferred Alternative*)

Option 2 would maintain the status quo DAS allocations and the status quo trip limits when fishing on a monkfish DAS in the NFMA, but would increase incidental landing limits when fishing in the NFMA on a NE multispecies DAS for Category C and D vessels compared to No Action. Any positive economic impacts from Option 2 would accrue to monkfish permit Category C and D vessels that are landing monkfish in the NFMA while fishing on a NE Multispecies DAS. Incidental landing limits would remain the same for permit category E, F, or H, when fishing on a NE multispecies DAS. Overall economic impacts from Option 2 relative to No Action are expected to be neutral to possibly slightly low positive. Further, Option 2, compared to No Action, would likely decrease the administrative burden associated with declaring the “monkfish option” prior to leaving port and a monkfish DAS while at sea for Category C and D Vessels fishing on a NE Multispecies DAS. In addition, Option 2 may reduce regulatory discards of monkfish caught incidentally while fishing on a NE Multispecies DAS.

The top five communities likely to be affected are New Bedford, Gloucester, Portland, Boston, and Chatham (Table 58). New Bedford is the most highly engaged and also shows high social vulnerability. Boston and Portland also show high social vulnerability, while Chatham, Boston, and Point Judith all have high gentrification pressure vulnerability.

Table 58 - C and D permits fishing in the NFMA

PORT	ST	PERMITS
NEW BEDFORD	MA	86
GLOUCESTER	MA	39
PORTLAND	ME	20
BOSTON	MA	16
CHATHAM	MA	15
POINT JUDITH	RI	10
WOODS HOLE	MA	5
PROVINCETOWN	MA	5
SEABROOK	NH	4

7.5.1.2.2 Modify the DAS allocation and/or trip limits in the SFMA

7.5.1.2.2.1 Option 1: No Action

Under the No Action Alternative, existing daily landing limits and DAS allocations would remain unchanged from those specified in FW8. In the SFMA, daily landing limits per DAS for monkfish permits would stay the same for both Category A and C vessels and Category B and D vessels. The trip limit for monkfish permit Category F vessels would also be unchanged, as would allocated DAS and the incidental landing limit. Compared to the NFMA, a higher percentage of monkfish landings in the SFMA come from directed activity. Table 59 - Table 61 summarize the number of each permit type by port in the SFMA.

Table 59 - A and C permits fishing in the SFMA

PORT	ST	PERMITS
NEW BEDFORD	MA	94
POINT JUDITH	RI	28
CAPE MAY	NJ	19
BARNEGAT LIGHT/LONG BEACH	NJ	15
HAMPTON	VA	13
BEAUFORT	NC	11
POINT PLEASANT	NJ	8
LITTLE COMPTON	RI	7
NEW LONDON	CT	6
NEWPORT NEWS	VA	6
STONINGTON	CT	5
FAIRHAVEN	MA	4

GLOUCESTER	MA	4

Table 60 - B and D permits fishing in the SFMA

PORT	ST	PERMITS
NEW BEDFORD	MA	35
POINT JUDITH	RI	26
BARNEGAT LIGHT/LONG BEACH	NJ	19
POINT PLEASANT	NJ	18
CHATHAM	MA	14
MONTAUK	NY	12
CHINCOTEAGUE	VA	8
BEAUFORT	NC	7
HAMPTON	VA	7
NEWPORT NEWS	VA	7
CAPE MAY	NJ	6
GLOUCESTER	MA	5
HARWICHPORT	MA	5
NEW LONDON	CT	5
STONINGTON	CT	5
NEWPORT	RI	4
SHINNECOCK	NY	4

Table 61 - F permits fishing in the SFMA

PORT	ST	PERMIT
POINT JUDITH	RI	8
MONTAUK	NY	4
CAPE MAY	NJ	3
NEW BEDFORD	MA	3

If there are no changes to the status quo estimated discard rate and management uncertainty buffer, economic impacts from the No Action Alternative would be neutral. If the discard rate for the SFMA is updated the combined economic impacts of the updated discard rates, without changes to daily landing limits or DAS allocations, economic impacts are possibly slightly low negative, but likely neutral. If the management uncertainty buffer is reduced for the SFMA the expected economic impacts of no action for modifying daily landings limits and/or DAS allocations in the SFMA are the same.

7.5.1.2.2.2 Option 2: Increase the DAS Allocation and Trip Limits in the SFMA (*Preferred Alternative*)

Option 2 would increase both the SFMA DAS allocation and daily landings limit. Trip limits for monkfish permit Categories A and C and Categories B and D would increase. Incidental landing limits would remain the same for Category E, Category H permits, non-trawl Category C, D, or F permits, and

trawl Categories C, D or F. Option 2 is expected to have overall economic impacts that are low positive to positive compared to the No Action Alternative. Vessels with limited monkfish permits in Categories A, B, C, and D that land monkfish in the SMA on directed trips will be the beneficiaries of any positive economic impacts.

Communities with at least 10 A/C or B/D permits and that landed monkfish in the SFMA on directed trips in 2015 are: New Bedford, Point Judith, Barnegat Light/Long Beach, and Chatham (Table 62 and Table 63). New Bedford is the most highly engaged community and also has high social vulnerability. Barnegat Light/Long Beach is both highly engaged and highly reliant. Point Judith, Chatham, and Barnegat Light/Long Beach all have high gentrification pressure vulnerability.

Table 62 - A/C permits fishing in the SFMA on a directed trip

PORT	ST	PERMITS
NEW BEDFORD	MA	24
POINT JUDITH	RI	22
BARNEGAT LIGHT/LONG BEACH	NJ	19
CHATHAM	MA	12
POINT PLEASANT	NJ	9
LITTLE COMPTON	RI	9
CHINCOTEAGUE	VA	9
NEW LONDON	CT	8
MONTAUK	NY	8
GLOUCESTER	MA	6
HARWICHPORT	MA	5
NEWPORT	RI	5
SHINNECOCK	NY	5
HAMPTON BAYS	NY	4

Table 63 - B/D permits fishing in the SFMA on a directed trip

PORT	ST	B/D PERMITS
BARNEGAT LIGHT/LONG BEACH	NJ	14
NEW BEDFORD	MA	12
CHATHAM	MA	12
MONTAUK	NY	8

POINT JUDITH	RI	8
POINT PLEASANT	NJ	7
HARWICHPORT	MA	5
NEW LONDON	CT	5
GLOUCESTER	MA	4
NEWPORT	RI	4
LITTLE COMPTON	RI	3
CHINCOTEAGUE	VA	3

Depending upon how any increases in monkfish landings affect average ex-vessel price for monkfish, economic impacts from Option 2 are expected to range from low negative to neutral for vessels landing monkish in the NFMA, and vessels in either area that land monkfish incidentally or under a Category E or state permit.

The top 5 communities fishing in the NFMA are: New Bedford, Gloucester, Portland, Chatham, and Boston (Table 64). New Bedford is the most highly engaged. New Bedford, Portland, and Boston all have high social vulnerability, while Chatham and Boston both show high gentrification pressure vulnerability.

Table 64 - Permits fishing in the NFMA

PORT	ST	PERMITS
NEW BEDFORD	MA	113
GLOUCESTER	MA	57
PORTLAND	ME	25
CHATHAM	MA	22
BOSTON	MA	18
POINT JUDITH	RI	14
SEABROOK	NH	13
PROVINCETOWN	MA	9
WOODS HOLE	MA	7
SCITUATE	MA	6
FAIRHAVEN	MA	5
MONTAUK	NY	4

The top five communities with permits that fish incidentally (in either the NFMA or SFMA) are: New Bedford, Point Judith, Gloucester, Cape May, and Point Pleasant (Table 65). New Bedford is the most highly engaged and also has high social vulnerability. Point Judith and Cape May both have high gentrification pressure vulnerability.

Table 65 - Permits fishing incidentally in NFMA or SFMA

PORT	ST	PERMITS
NEW BEDFORD	MA	205
POINT JUDITH	RI	61
GLOUCESTER	MA	56
CAPE MAY	NJ	51
POINT PLEASANT	NJ	44
HAMPTON	VA	36
BEAUFORT	NC	28
NEWPORT NEWS	VA	25
BARNEGAT LIGHT/LONG BEACH	NJ	25
PORTLAND	ME	24
MONTAUK	NY	23
CHATHAM	MA	22
BOSTON	MA	18
STONINGTON	CT	16
HAMPTON BAYS	NY	14
CHINCOTEAGUE	VA	11
PROVINCETOWN	MA	10
BELFORD	NJ	10
WOODS HOLE	MA	9
SEABROOK	NH	9
FAIRHAVEN	MA	9

NEW LONDON	CT	8
SHINNECOCK	NY	7
WANCHESE	NC	6
SCITUATE	MA	6
SEAFORD	VA	6
OCEAN CITY	MD	5
WILDWOOD	NJ	5
HOBUCKEN	NC	5
ATLANTIC CITY	NJ	5
OTHER WORCESTER	MD	4
ORIENTAL	NC	4

The top five communities with category E permits are New Bedford, Point Pleasant, Cape May, Point Judith, and Montauk (Table 66). New Bedford is the most engaged, though not the most reliant. It also has high social vulnerability. Cape May, Montauk, and Point Judith all have high gentrification pressure vulnerability.

Table 66 - Category E permits

PORT	ST	PERMITS
NEW BEDFORD	MA	56
POINT PLEASANT	NJ	29
CAPE MAY	NJ	28
POINT JUDITH	RI	27
MONTAUK	NY	19
GLOUCESTER	MA	18
HAMPTON	VA	15
HAMPTON BAYS	NY	14
NEWPORT NEWS	VA	13
BELFORD	NJ	12

BEAUFORT	NC	11
ATLANTIC CITY	NJ	8
SHINNECOCK	NY	8
CHATHAM	MA	7
SEABROOK	NH	7
BARNEGAT LIGHT/LONG BEACH	NJ	6
OCEAN CITY	MD	6
ENGELHARD	NC	5
SEAFORD	VA	5
OTHER WORCESTER	MD	5
PORTLAND	ME	5
PROVINCETOWN	MA	5
OTHER ATLANTIC	NJ	5
STONINGTON	CT	5
WILDWOOD	NJ	4
FAIRHAVEN	MA	4
HOBUCKEN	NC	4
ORIENTAL	NC	4
CHINCOTEAGUE	VA	4
WOODS HOLE	MA	4
SCITUATE	MA	4

The preferred alternatives proposed by this measure are expected to have a neutral to positive net economic impact overall, compared to the No Action Alternatives. Positive economic benefits, in the form of increased revenues from landing monkfish, are most likely to occur for those vessels that fish for monkfish on directed trips in the SFMA. This means that New Bedford, Point Judith, Barnegat Light/Long Beach, and Chatham are the communities most likely to benefit.

7.6 Cumulative Effects Analysis

7.6.1 Introduction

A cumulative effects assessment (CEA) is a required as part of an EIS or EA according to the Council on Environmental Quality (CEQ; 40 CFR part 1508.7) and NOAA's agency policy and procedures for NEPA, found in NOAA Administrative Order 216-6. The purpose of the CEA is to integrate into the impact analyses, the combined effects of many actions over time that would be missed if each action were evaluated separately. CEQ guidelines recognize that it is not practical to analyze the cumulative effects of an action from every conceivable perspective but rather, the intent is to focus on those effects that are truly meaningful. This section serves to examine the potential direct and indirect effects of the alternatives in this EA together with past, present, and reasonably foreseeable future actions that affect the monkfish environment. It should also be noted that the predictions of potential synergistic effects from multiple actions, past, present and/or future will generally be qualitative in nature.

7.6.1.1 Valued Ecosystem Components (VEC)

As noted in Section 6.0 (Affected Environment), the VECs that exist within the monkfish fishery are identified and include the following:

1. Monkfish stocks (target and non-target);
2. Other stocks (incidental catch and bycatch);
3. Endangered and other protected species;
4. Habitat, including non-fishing effects; and
5. Human Communities (economic/social effects on fishery and fishing communities).

Temporal Scope of the VECs
While the effects of historical fisheries are considered, the temporal scope of past and present actions on monkfish stocks, other stocks, habitat/EFH and the human environment is primarily focused on actions that have taken place since implementation of the initial Monkfish FMP in 1999. An assessment using this timeframe demonstrates the changes to resources and the human environment that have resulted through management under the Council process. For endangered and other protected species, the context is largely focused on the 1980s and 1990s, when NMFS began generating stock assessments for marine mammals and turtles that inhabit waters of the U.S. EEZ. The CEA examines future actions through April 30, 2021. The temporal scope of the analysis was set at 5 years as this was a reasonable time period to be examined, beyond that, further analysis would be considered speculative. Therefore, the cumulative effects will need to be reassessed as part of the NEPA action taken for FY 2020 and beyond, as necessary.

Geographic Scope of the VECs
The geographic scope of the analysis of impacts to monkfish stocks, non-monkfish species and habitat for this action is the total range of these VECs in the Western Atlantic Ocean, as described in the Affected Environment section of the document (Section 6.0) and more fully in Amendment 5 (NEFMC 2011a). The result is a more limited geographic area used to define the core geographic scope within which the majority of harvest effort for the managed resources occurs. For endangered and protected species, the geographic range is the total range of each species.

Because the potential exists for far-reaching social or economic impacts on U.S. citizens who may not be directly involved in fishing for the managed resources, the overall geographic scope for human communities is defined as all U.S. human communities. Limitations on the availability of information needed to measure social and economic impacts at such a broad level necessitate the delineation of core boundaries for the human communities. Therefore, the geographic range for the human environment is

defined as those primary and secondary ports bordering the range of the monkfish fishery from the U.S.-Canada border to, and including, North Carolina.

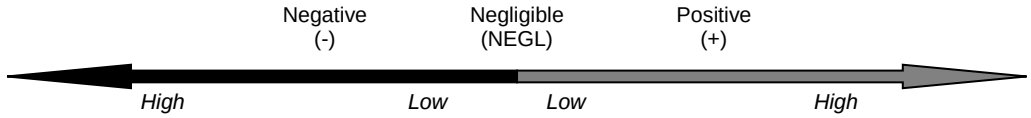
7.6.1.2 Evaluation Criteria

This EA evaluates the potential impacts of past, present, and reasonably foreseeable future actions using the criteria outlined in Table 67. Impacts from all alternatives are judged relative to the baseline conditions, as described in Section 7.0 and compared to each other.

A CEA ideally makes effect determinations based on the culmination of the following: (1) impacts from past, present and reasonably foreseeable future actions; (2) the baseline condition for resources and human communities (note, the baseline condition consists of the present condition of the VECs plus the combined effects of past, present and reasonably foreseeable future actions); and (3) impacts from the preferred alternative and alternatives.

Table 67 - Criteria used to evaluate the potential impacts of past, present, and reasonably foreseeable future actions

Impact Definition			
VEC	**Direction**		
	Positive (+)	**Negative (-)**	**Negligible (Negl)**
Allocated target species, other landed species, and protected resources	Actions that increase stock/population size	Actions that decrease stock/population size	Actions that have little or no positive or negative impacts to stocks/populations
Physical Environment/ Habitat/EFH	Actions that improve the quality or reduce disturbance of habitat	Actions that degrade the quality or increase disturbance of habitat	Actions that have no positive or negative impact on habitat quality
Human Communities	Actions that increase revenue and social well-being of fishermen and/or associated businesses	Actions that decrease revenue and social well-being of fishermen and/or associated businesses	Actions that have no positive or negative impact on revenue and social well-being of fishermen and/or associated businesses
Impact Qualifiers:			
Low (L, as in low positive or low negative)	To a lesser degree		
High (H; as in high positive or high negative)	To a substantial degree		
Likely	Some degree of uncertainty associated with the impact		



7.6.2 Past, Present and Reasonably Foreseeable Future Actions

A summary of past, present and reasonably foreseeable future actions is presented in Table 68. The baseline conditions of the resources and human community are subsequently summarized, although it is important to note that beyond the stocks managed under this FMP and protected species, quantitative metrics for the baseline conditions are not available. Finally, a brief summary of the impacts from the alternatives contained in this action is included. The culmination of all these factors is considered when making the cumulative effects assessment.

Table 69 summarizes the combined effects of other past, present and reasonably foreseeable future actions that affect the VECs (i.e., actions other than those alternatives under development in this document from 2014 onward). Most of the actions affecting this EA and considered in Table 69 come from fishery-related activities (e.g., Federal fishery management actions). As expected, these activities have fairly straightforward effects on environmental conditions, and were, are, or will be taken, in large

part, to improve those conditions. MSA stipulates that management comply with a set of National Standards that collectively serve to optimize the conditions of the human environment. Under this regulatory regime, the cumulative impacts of past, present, and future Federal fishery management actions on the VECs should be expected to result in positive long-term outcomes. Nevertheless, these actions are often associated with offsetting impacts. For example, constraining fishing effort frequently results in negative short-term socio-economic impacts for fishery participants. However, these impacts are usually necessary to bring about long-term sustainability of a given resource and as such, should, in the long-term, promote positive effects on human communities, especially those that are economically dependent upon the managed resource.

Non-fishing activities were also considered when determining the combined effects from past, present and reasonably foreseeable future actions. Activities that have meaningful effects on the VECs include the introduction of chemical pollutants, sewage, changes from climate change such as increased water temperature or acidification, salinity, dissolved oxygen, and suspended sediment into the marine environment. These activities pose a risk to the all of the identified VECs in the long term. Human induced non-fishing activities that affect the VECs under consideration in this document are those that tend to be concentrated in near shore areas. Examples of these activities include, but are not limited to agriculture, port maintenance, beach nourishment, coastal development, marine transportation, marine mining, dredging and the disposal of dredged material. Wherever these activities co-occur, they are likely to work additively or synergistically to decrease habitat quality and, as such, may indirectly constrain the sustainability of the managed resources, non-target species, and protected resources. Decreased habitat suitability would tend to reduce the tolerance of these VECs to the impacts of fishing effort. Mitigation of this outcome through regulations that would reduce fishing effort could then negatively impact human communities.

Summary of Past Monkfish Management Actions

The Monkfish FMP was initially implemented in 1999, and has been amended several times, most recently in 2011 with the implementation of Amendment 5 and FW 8 in 2014. Amendment 6 is currently under development, with the intent to consider catch share management in the monkfish fishery, among other measures. The documents pertaining to previous management actions are available on the NEFMC website, www.nefmc.org. A synoptic discussion, focusing on the science and management aspects of the FMP up to FW 4 (2007) is also contained in an article "*The monkfish fishery and its management in the Northeastern USA*", (Haring and Maguire 2008), which is available on the NEFMC website. Below is a summary of recent management actions beginning with FW 4.

For management purposes, the monkfish fishery is divided into two areas; the NFMA and SFMA (see Figure 1). While scientific evidence for two biological stocks is uncertain, and additional research, including archival tagging, is ongoing, fisheries in the two areas are clearly distinct. As a result, stock assessments are completed for the two areas separately to be able to support the management plan. The NFMA monkfish fishery is closely integrated with the multispecies fishery, and is primarily a trawl fishery, while the SFMA fishery is primarily a gillnet fishery targeting monkfish almost exclusively. These differences have resulted in some differences in management measures, such as landing limits and DAS allocations, between the two areas.

FW4 was implemented on October 22, 2007 and set target total allowable catch levels (TTACs) at 5,000 mt and 5,100 mt for the NFMA and SFMA, respectively. FW 4 also established the requirement that vessels that exceeded the monkfish incidental catch limit while fishing in the NFMA on a multispecies DAS, must declare they were using a monkfish DAS, which could be done by Vessel Monitoring Systems (VMS) any time prior to returning to port. Vessels in the SFMA were already required to declare a

monkfish DAS when exceeding the incidental limit. FW 4 also reduced the monkfish incidental limit in the NFMA from 400 lb tail weight/DAS or 50% of the weight of fish on board, whichever is less, to 300 lb tail weight/DAS or 25% of the total weight of fish on board, whichever is less.

FW 4 retained the 550 lb and 450 lb tail weight/DAS SFMA monkfish landing limit for permit categories A, C, G and B, D, H, respectively. Vessels were allocated 31 monkfish DAS, but vessels were limited to an allowance of 23 DAS in the SFMA out of the total allocation. In the NFMA, landing limits were set at 1,250 lb and 470 lb tail weight/DAS for permit category A and C and B and D, respectively. FW 4 established that the DAS allocations would remain in effect through FY 2009, with extension into FY 2010 in absence of any regulatory change, unless the TTAC was exceeded in an area during the 2007 fishing year. In that case, the TTAC overage backstop provision established in FW 4 would have taken effect and would have resulted in a recalculation of the DAS allocations based on catch and effort data from the 2007 fishing year to keep landings below the TTAC. The backstop provision would have made no adjustment if the TTAC overage was 10% or less, and would have closed the directed fishery in a management area if the overage exceeded 30%, resulting in zero monkfish DAS being allocated, and the application of monkfish incidental limits to all vessels. Other measures adopted under FW 4 included a change in the northern boundary of the Category H fishery from 38°20'N Latitude to 38°40'N Latitude, and a change to the monkfish incidental limit on limited access scallop vessels fishing in the closed area access programs.

FW 5, which was implemented prior to the start of the 2008 fishing year (73 *Federal Register* 22831, April 28, 2008), reduced the number of unused DAS that could be carried over to the next fishing year from 10 to 4; revised the DAS accounting method for gillnet vessels such that all trips less than 15 hours would be counted as 15 hours, eliminating the provision that trips less than 3 hours would be counted as time used; and, revised the monkfish incidental catch allowance applicable to vessels in the Southern New England Regulated Mesh Area (SNE RMA) fishing with large mesh but not on a monkfish, scallop or multispecies DAS, from 5% of the total weight of fish on board (with no landings cap) to 5% of total weight of fish on board not to exceed 50 lb per day, up to 150 lb maximum, and also applied this revision to all vessels fishing under a Skate Bait Letter of Authorization (LOA) east of 74°00'W. In addition, FW 5 modified the Monkfish LOA requirement for vessels fishing under the less restrictive measures for the NFMA such that vessels using a VMS would no longer be required to obtain the LOA, but could make the declaration via the VMS.

With the adoption of new biological reference points and revised stock status as a result of the DPWG assessment, as well as the measures adopted in FW 5 designed to reduce the likelihood of TTAC overages, the Councils concluded that the backstop provision, established in FW4, was no longer necessary. They submitted the regulatory change in FW 6 in April 2008, and the final rule become effective on October 10, 2008, approximately seven months before the start of FY 2009 (73 *Federal Register* 52635, September 10, 2008). This was the only action taken in FW 6.

Amendment 5 was also developed to bring the Monkfish FMP into compliance with recently revised National Standard 1 (NS1) Guidelines (74 FR 3178; January 16, 2009), which not only established a process for setting ACLs and guidance for establishing AMs, but also provided updated guidelines for establishing reference points and control rules (i.e., maximum sustainable yield (MSY), optimum yield (OY), OFL, ABC, ACLs, and ACTs) and clarified the relationship between them. Amendment 5 implemented two different types of AMs to ensure that overfishing does not occur. First, ACTs were set sufficiently below the ACL for each area to account for management uncertainty (ability of management measures to control catch). Management measures were then developed to achieve this lower level of catch. Amendment 5 also implemented reactive AMs that deduct any overages of the ACL on a pound for pound basis from the ACT specified for the year following the overage. Management measures must then be revised to achieve, but not exceed the revised ACT for that area. In doing so, these measures

were implemented to ensure that sufficient protections are in place to prevent overfishing. Amendment 5 also established biological and management reference points consistent with NS1 guidelines using the most recent scientific information available at the time it was developed, from the 2007 DPWG assessment.

Given the timing of SAW 50 (July 2010) and the Councils' final action on Amendment 5 in June 2010, Amendment 5 provided new biomass reference points, recalculated the fishing mortality rate (F) corresponding to the overfishing threshold, F_{max}, and concluded that the stock status would not change, even under the new reference points. Furthermore, the Councils addressed two primary purposes regarding Amendment 5: 1) to implement the MSA mandated ACLs and accountability measures (AMs), and 2) to set the specifications of DAS, landing limits and other management measures to replace those adopted in FW 4. The Councils also proposed modifications to the FMP to improve the Research Set Aside (RSA) Program, to minimize bycatch resulting from trip limit overages, and to allow the landing of monkfish heads.

In 2011 FW 7 proposed a reduction in the ACT for the NFMA below the proposed ACL. This change also required a revision to the specifications for DAS and trip limits based on the ACT. The ACT for the NFMA proposed in Amendment 5 was above the ACL based on SSC recommendations following SAW 50 and was updated as a result of revised scientific information and recommendations of the SSC. As a result, FW 7 addressed the inconsistency seen in Amendment 5, since NS1 Guidelines state that an ACT cannot exceed the ACL established for a stock.

Framework 8 became effective on July 18, 2014 (79 *Federal Register* 41918). It increased monkfish day-at-sea allocations and landing limits, allowed vessels issued a limited access monkfish Category H permit to fish throughout the Southern Fishery Management Area, enabled vessels to use an allocated monkfish-only day-at-sea time throughout the fishing year and revised biological reference points for the monkfish stocks in the Northern and Southern Fishery Management Areas.

On May 1, 2013, NMFS implemented an emergency rule that temporarily suspended existing monkfish landing limits for vessels issued both a Federal limited access Northeast Multispecies permit and a limited access monkfish Category C or D permit that are fishing under a monkfish DAS in the NFMA. This emergency action was continued through the end of the 2013 fishing year, with the suspension of monkfish landing limits expanded to apply to Category C or D permits fishing exclusively on a NE multispecies DAS in the NFMA. This action was necessary to help mitigate expected adverse economic and social harm resulting from substantial reductions to the 2013 ACLs for several stocks managed under the Northeast Multispecies FMP. The intent was to provide additional fishing opportunities to vessels affected by reductions to groundfish catch limits, without resulting in overfishing monkfish within the NFMA or SFMA.

Framework 9 became effective on August 26, 2016, and it eliminated the monkfish possession limits in the NFMA when fishing on both a NE multispecies and monkfish DAS. It also increased operational flexibility for C and D permitted vessels by allowing smaller roundfish gillnets (5" or greater) in the Mid-Atlantic Exemption Area. These vessels are also permitted to land both dogfish and monkfish on the same trip when fishing in the SNE Dogfish Exemption Area and the SNE Monkfish and Skate Exemption Area.

Table 68- Summary of effects on VECs from past, present, and reasonably foreseeable FMP and other fishery-related actions.

Action	Description	Impacts on Regulated Monkfish Stocks	Impacts on Non-target species	Impacts on Endangered and Other Protected Species	Impacts on Habitat – Including Non-fishing Effects	Impacts on Human Communities
MONKFISH FISHERY-RELATED ACTIONS						
Framework 9	Adjusted NFMA trip limits and gear restrictions in the SFMA	**Neutral** No change to directed fishing effort	**Indirect Mixed** No change to directed fishing effort	**Neutral** No change to directed fishing effort	**Neutral** No change to directed fishing effort	**Direct positive** Increased operational flexibility
OTHER FISHERY-RELATED ACTIONS						
Atlantic Sea Scallop FMP – a series of amendment and framework actions from the mid-1990s through the present	Implementation of the Atlantic Sea Scallop FMP and continued management of the fishery, primarily through effort controls	**Direct Positive** Effort reductions taken over time have resulted in a sustainable scallop fishery and reduction in both directed and incidental catch of monkfish	**Indirect Positive** Effort reductions taken over time also reduced bycatch, including gear modifications that improved bycatch escapement	**Mixed** Effort reductions taken over time reduced interactions with protected species however, turtle interactions remain problematic	**Indirect Positive** Effort reductions reduced gear contact with habitat and the current rotational access program focuses fishing effort on sandy substrates which are less susceptible to habitat impacts	**Indirect Positive** Initial negative impacts due to effort reductions have been supplanted by a sustainable, profitable fishery
Scallop FW 27	Set specifications for scallop FY 016 ad 2017. It is also considering proactive accountability measures for windowpane flounder	**Negl to L+**	**Negl to L+**	**Negl**	**Negl**	**- To +**
Groundfish FMP – a series of amendment and framework actions from	Implementation of the NE Multispecies FMP and continued management of the fishery, primarily	**Direct Positive** Multispecies FMP effort controls and reductions have resulted in a fishery	**Indirect Positive** Effort reductions and gear controls taken over time	**Indirect Positive** Reducing effort and other measures reduced opportunities for	**Indirect Positive** Reducing effort and other measures reduced	**Indirect Positive** Reducing effort has created a sustainable fishery for some stocks,

implementation of the FMP in 1977 through the present	through effort controls, and, recently also through sectors	that is no longer overfished, nor is overfishing occurring	also reduced bycatch	interactions with protected species	opportunities for habitat interactions	although ACL reductions have led to economic and social impacts and increased discards
FW55 to the NE multispecies FMP	Set specifications for FY 2015, revised cod spawning and mortality closures, allowed rollover of groundfish specifications and modified sector ACE carryover provisions	**Mixed**	**Mixed**	**Negl**	**Negl**	**Mixed**
Omnibus Essential Fish Habitat Amendment	Phase 2 would consider effects of fishing gear on EFH and move to minimize, mitigate or avoid impacts that are more than minimal and temporary in nature. Further, Phase 2 would reconsider measures in place to protect EFH in the Northeast Region.	**Indirect positive** Protecting EFH would have indirect positive impacts on monkfish	**Indirect positive**	**Negligible**	**Direct positive** Protecting EFH would have indirect positive impacts on monkfish EFH	**Unknown** Possible negative impacts for vessels using trawl gear
Skate FMP FW3	Actions to end overfishing, rebuild overfished stocks, establish ACLs/AMs, and landing limits to achieve catch levels	**Minor Negative** Lower skate possession limits and closures may cause vessels to use DAS for monkfish	**Mixed** Actions taken to reduce skate mortality; they could lead to increased targeting of non-monkfish species	**Unknown** If actions taken to reduce skate mortality, could impact protected species by shifting effort into other fisheries with interactions with protected species	**Unknown** If actions are taken to reduce skate mortality, they could impact habitat	**Minor negative** Actions taken to reduce skate mortality negatively impact human communities by reducing fishing opportunities and revenue

Spiny Dogfish FMP 2016-2018 specifications	Implements quotas, possession limits and ACLs to regulate spiny dogfish catch; many groundfish regulations also control effort in this fishery	**Minor positive** Lower spiny dogfish quotas may result in lower indirect catch of monkfish that may have minor positive impact on monkfish	**Indirect positive** Gear requirements in the groundfish fishery help minimize bycatch of non-target species	**Mixed** Measures affecting spiny dogfish fishing in the groundfish fishery and gear regulations implemented under the ESA and MMPA should also help minimize impacts to protected species, although increased effort from higher quotas may increase interactions; both trawl gear and gillnets are used in this fishery	**Indirect positive** Measures affecting spiny dogfish fishing in the groundfish fishery should also help minimize impacts to habitat	**Mixed** Short-term reductions in landings resulted in negative impact, but recent increases in yearly quotas likely mitigated those impacts

Action	Description	Impacts on Regulated Monkfish Stocks	Impacts on Non-target species	Impacts on Endangered and Other Protected Species	Impacts on Habitat – Including Non-fishing Effects	Impacts on Human Communities
OTHER FISHERY-RELATED ACTIONS CONTINUED						
Atlantic Large Whale Take Reduction Plan Amendment (2008)	Removed the DAM program, implemented sinking ground lines for lobster gear, includes more trap/pot and gillnet fisheries, and requires additional markings on gear for information on entanglements ; future actions will minimize impact of vertical lines	**Negligible** Changes implemented through the amendment are not expected to have substantial changes on groundfish	**Negligible** Changes implemented through the amendment are not expected to have substantial changes on non-groundfish species	**Direct Positive** New regulations implemented to protect large whales are expected to have a positive impact on large whales by reducing incidental takes	**Negligible** Changes implemented through the amendment are not expected to have substantial changes to habitat	**Indirect Negative** Changes implemented through the amendment require some gear changes for gillnet fisheries which have minor negative economic impacts
Harbor Porpoise Take Reduction Plan Amendment (2010)	Actions to reduce takes of harbor porpoise toward the long-term zero mortality rate goal.	**Unknown** If current measures such as closure areas and the use of pingers are expanded upon or modified, it could impact groundfish	**Unknown** If current measures such as closure areas and the use of pingers are expanded upon or modified, it could impact non-groundfish species	**Direct Positive** Changes to protect harbor porpoise have a positive impact on protected species	**Unknown** If current measures such as closure areas and the use of pingers are expanded upon or modified, it could impact habitat	**Unknown** If current measures such as closure areas and the use of pingers are expanded upon or modified, it could impact human communities

Action	Description	Impacts on Monkfish Stocks	Impacts on Non-target species	Impacts on Endangered and Other Protected Species	Impacts on Habitat – Including Non-fishing Effects	Impacts on Human Communities
NON FISHERY-RELATED ACTIONS						
Agriculture runoff	Nutrients applied to agriculture land are introduced into aquatic systems	**Indirect Negative** Reduced habitat quality in the immediate project area	**Indirect Negative** Reduced habitat quality in the immediate project area	**Direct Negative** Reduced habitat quality in the immediate project area	**Indirect Negative** Reduced habitat quality in the immediate project area	**Indirect Negative** Reduced habitat quality negatively affects resource viability and can lead to reduced income from fishery resources
Port maintenance	Dredging of wetlands, coastal, port and harbor areas for port maintenance	**Indirect Negative** Localized decreases in habitat quality	**Indirect Negative** Localized decreases in habitat quality	**Direct Negative** Reduced habitat quality in the immediate project area	**Indirect Negative** Localized decreases in habitat quality in the immediate project area	**Indirect Negative** Reduced habitat quality negatively affects resource viability in the immediate project area
Offshore disposal of dredged materials	Disposal of dredged materials	**Indirect Negative** Localized decreases in habitat quality in the immediate project area	**Indirect Negative** Localized decreases in habitat quality in the immediate project area	**Direct Negative** Reduced habitat quality in the immediate project area	**Indirect Negative** Localized decreases in habitat quality in the immediate project area	**Indirect Negative** Reduced habitat quality negatively affects resource viability in the immediate project area
Beach nourishment	Offshore mining of sand for beaches	**Indirect Negative** Localized decreases in habitat quality in the immediate project area	**Indirect Negative** Localized decreases in habitat quality in the immediate project area	**Direct Negative** Reduced habitat quality in the immediate project area	**Indirect Negative** Localized decreases in habitat quality in the immediate project area	**Mixed** Positive for mining companies, possibly negative for fisheries
	Placement of sand to nourish beach shorelines	**Indirect Negative** Localized decreases in habitat quality in the immediate project area	**Indirect Negative** Localized decreases in habitat quality in the immediate project area	**Direct Negative** Reduced habitat quality in the immediate project area	**Indirect Negative** Localized decreases in habitat quality in the immediate project area	**Positive** Improves beaches and can help protect homes along the shore line

Action	Description	Impacts on Monkfish Stocks	Impacts on Non-target species	Impacts on Endangered and Other Protected Species	Impacts on Habitat – Including Non-fishing Effects	Impacts on Human Communities
NON FISHERY-RELATED ACTIONS CONTINUED						
Marine transportation	Expansion of port facilities, vessel operations and recreational marinas	**Indirect Negative** Localized decreases in habitat quality in the immediate project area	**Indirect Negative** Localized decreases in habitat quality in the immediate project area	**Direct Negative** Reduced habitat quality in the immediate project area	**Indirect Negative** Localized decreases in habitat quality in the immediate project area	**Mixed** Positive for some interests, potential displacement for others
Installation of pipelines, utility lines and cables	Transportation of oil, gas and energy through pipelines, utility lines and cables	**Indirect Negative** Initially localized decreases in habitat quality in the immediate project area	**Indirect Negative** Initially localized decreases in habitat quality in the immediate project area	**Indirect Negative** Initially localized decreases in habitat quality in the immediate project area	**Potentially Direct Negative** Initially reduced habitat quality in the immediate project area	**Mixed** End users benefit from improved pipelines, cables, etc., but reduced habitat quality may impact fisheries and revenues
Liquefied Natural Gas (LNG) terminals (w/in 5 years)	Transportation of natural gas via tanker to terminals located offshore and onshore (Several LNG terminals are proposed, including ME, MA, NY, NJ and MD)	**Indirect Negative** Initially localized decreases in habitat quality in the immediate project area	**Indirect Negative** Initially localized decreases in habitat quality in the immediate project area	**Indirect Negative** Initially localized decreases in habitat quality in the immediate project area	**Potentially Direct Negative** Localized decreases in habitat quality possible in the immediate project area	**Mixed** End users benefit from a steady supply of natural gas but reduced habitat quality may impact fisheries and revenues

Table 69 - Summary effects of past, present, and reasonably foreseeable future actions on the VECs.

VEC	Past Actions	Present Actions	Reasonably Foreseeable Future Actions	Combined Effects of Past, Present, Future Actions
Monkfish Stocks	**Positive** Combined effects of past actions have controlled effort, rebuilt stocks and improved habitat protection	**Positive** Current regulations continue to manage for sustainable stocks and increase likelihood that OY is achieved	**Positive** Future actions are anticipated to continue rebuilding and strive to maintain sustainable stocks and achieve OY	**Positive** Stocks are being managed to achieve optimum yield and prevent overfishing
Other Species	**Positive** Combined effects of past actions have decreased effort and bycatch and improved habitat protection	**Positive** Current regulations continue to manage for sustainable stocks, thus controlling effort on direct and discard/bycatch species	**Positive** Future actions are anticipated to continue control effort and minimize bycatch	**Positive** Continued management of directed stocks will also control incidental catch/bycatch
Endangered and Other Protected Species	**Mixed** Combined effects of past fishery actions have reduced effort and thus interactions with protected resources	**Mixed** Current regulations continue to control effort, but may result in some increases, thus increasing opportunities for interactions	**Mixed** Future regulations will likely control effort and thus protected species interactions, but may result in some effort increase, possibly increasing interactions	**Mixed** Continued effort controls along with protected species regulations will likely help stabilize or reduce protected species interactions, although additional controls may be needed for some species
Habitat	**Mixed** Combined effects of effort reductions, closed areas, and better control of non-fishing activities have been positive but some fishing activities and non-fishing activities continue to reduce habitat quality	**Mixed** Effort reductions and better control of non-fishing activities have been positive but fishing activities and non-fishing activities continue to reduce habitat quality	**Mixed** Future regulations will likely control effort and thus habitat impacts but may allow some effort increase along with additional non-fishing activities	**Mixed** Continued fisheries management will likely control effort and thus fishery related habitat impacts but fishery and non-fishery related activities will continue to reduce habitat quality
Human Communities	**Positive** Fishery management has resulted in rebuilt stocks and controlled, sustainable fishery which supports profitable industries and communities	**Positive** Fishery resources continue to support communities at a sustainable level	**Mixed** Continued management at sustainable levels provides a stable, profitable fishery, benefitting affected communities; changes to the management program may result in redistribution of the benefits among communities	**Positive** Sustainable fisheries should support viable communities and economies

Impact Definitions:
-Monkfish Stocks, Non-monkfish species, Endangered and Other Protected Species: positive=actions that increase stock size and negative=actions that decrease stock size
-Habitat: positive=actions that improve or reduce disturbance of habitat and negative=actions that degrade or increase disturbance of habitat
-Human Communities: positive=actions that increase revenue and well-being of fishermen and/or associated businesses negative=actions that decrease revenue and well-being of fishermen and/or associated businesses

7.6.3 Baseline Conditions for Resources and Human Communities

For the purposes of a CEA, the baseline conditions for resources and human communities is considered the present condition of the VECs plus the combined effects of the past, present, and reasonably foreseeable future actions. Table 70 illustrates the baseline conditions found as part of the FW 8 cumulative effects analysis (NEFMC 2013). These conditions remain timely and relevant.

Table 70 - Summary of baseline conditions for each VEC

Valued Ecosystem Component	Cumulative Effects Assessment Baseline Condition
Monkfish Stocks, Non-monkfish species, Endangered and Other Protected Species	Positive = actions that maintain or increase stock size
	Negative = actions that decrease stock size
Habitat	Positive = actions that improve or reduce disturbance of habitat
	Negative = actions that degrade or increase disturbance of habitat
Human Communities	Positive = actions that maintain or increase revenue and well-being of fishermen and/or associated businesses
	Negative = actions that decrease revenue and well-being of fishermen and/or associated businesses
All VECs	Mixed=both positive and negative

7.6.4 Summary of the Impacts from the Preferred Alternatives

The preferred alternatives for Annual Catch Limits for FYs 2018 – 2019 reduces the management uncertainty buffer to 3% in both fishery management areas and updates the area specific calculated discard rate. The impacts analyses indicate that fishing effort is unlikely to change as a result of the revised buffer and calculated discard rate, accordingly, the TAL would not be expected to be achieved under the preferred alternative. This indicates negligible impacts on the monkfish stock in both fishery management areas. The preferred alternative is not expected to modify interactions of monkfish or groundfish gear with EFH and would therefore have neutral impacts. Because the preferred alternatives would not be expected to change fishing behavior or increase the amount of TAL achieved, the preferred alternatives would have neutral to possibly low positive economic impacts.

The preferred alternative for effort controls in the NFMA would increase the incidental trip limits when on a NE multispecies DAS. As vessels fishing in the NFMA typically land incidental amounts of monkfish this would primarily reduce the administrative burden on vessels as opposed to enabling vessels to land a larger percentage of the TAL, negligible impacts would be expected on the monkfish stock. Accordingly, as no change in fishing behavior would be expected from increasing the incidental possession limit in the NFMA neutral impacts on EFH would be expected. Economic impacts would be expected to be neutral because directed landings would become incidental landings but not expected to increase overall landings based on the analyses.

The preferred alternative for effort controls in the SFMA would increase DAS allocation and trip limits. The impacts analyses indicate that this would increase the ability of vessels to landing a higher percentage of the TAL. This moderate increase in landings would not be expected to result in the TAL being fully achieved or exceeded, therefore, negligible impacts on the monkfish stock would be expected. Despite the potential for increased effort, the fishery is largely executed with gillnet gear in the SFMA which has limited impacts on EFH. Economic impacts would be expected to be low positive as an increase in overall monkfish revenues would be expected if landings increase. However, if increased landings affect the average ex-vessel price for monkfish then impacts could range from low negative to neutral.

7.6.5 Cumulative Effects Summary

The following analysis will summarize the cumulative effects on the VECs identified in this section through the consideration of past, present, and reasonably foreseeable future actions in combination with the baseline condition for resources and human communities and impacts from the preferred alternative.

Monkfish Stocks
As noted in the cumulative effects analysis for FW 8 to the Monkfish FMP (NEFMC, 2014), past actions in the Monkfish FMP have rebuilt monkfish stocks in both the NFMA and SFMA such that neither stock is subject to overfishing nor overfished. Both Amendment 5 and FW 8 implemented measures to comply with the MSA Reauthorization in 2007 that provide for the long-term sustainability of the stock, including implementing ABCs, ACLs, ACTs, and AMs. While the preferred alternatives would allow greater flexibility to harvest monkfish in the NFMA and SFMA, given management measures implemented in the fishery, NFMA and SFMA monkfish landings would not exceed the established NFMA and SFMA monkfish TALs. Thus, there would be positive changes to previously anticipated levels of monkfish catch as a result of the preferred alternatives, without causing negative impacts on either the northern or southern stocks. The preferred alternatives, along with protections afforded through other management plans, such as FW 55 to the NE Multispecies FMP and Atlantic Sea Scallop FMP actions, as well as actions under development to protect habitat and EFH via the Omnibus Habitat Amendment 2 would also not likely result in changes that would affect the current status of the monkfish resource in the NFMA or the SFMA. It is expected that all actions combined would still result in NFMA and SFMA monkfish being considered rebuilt and not subject to overfishing and managed in a manner that would preserve the sustainability of the fishery over the long term. Therefore, the cumulative effect of this action is expected to continue to maintain a healthy monkfish stock in the NFMA and SFMA, with no anticipated significant impacts.

Other Stocks
Effort control measures implemented under the Monkfish FMP over the past decade have reduced overall fishing effort with its associated incidental catch of non-target species, particularly skates and dogfish. This trend is likely to continue under the preferred alternatives, notwithstanding the potential for the preferred alternatives to increase monkfish landings. While the increased opportunity to target monkfish would allow for effort to shift from other fisheries, particularly the groundfish fishery, as intended, there may be increased incidental catch of some species, particularly skates and dogfish. However, such an increase would likely be negligible and controlled by management measures in those fisheries that are designed to prevent overfishing and rebuild overfished stocks consistent with the requirements of the Magnuson-Stevens Act. Thus, the cumulative effect of this action would likely result in negligible changes to the sustainable management of those fisheries, with no anticipated significant impacts.

Endangered and Other Protected Species
As with target and non-target species, past effort controls and other actions developed under the Monkfish FMP have reduced the potential for interaction with protected species. The preferred alternatives may have mixed effects on protected species, depending on the time and area where the increased effort allocation is applied. Since the monkfish fishery in the SFMA is predominantly a gillnet fishery, increasing directed monkfish effort could have a negative effect on protected species, however, the analyses indicate that fishing behavior is unlikely to significantly change and therefore serious injury or mortality would not be expected to go above and beyond that which has been considered in the fishery to date. The 2013 BO indicated that the monkfish fishery does not jeopardize the continued existence of any protected species, including Atlantic sturgeon and no additional measures affecting monkfish fishing operations were necessary under the ESA. Overall, the cumulative low negative to neutral trend in impacts to protected species should continue as a result of the fishing effort controls under the Monkfish

FMP, in combination with actions taken or in development under the ALWTRP and HPTRP, as well as sea turtle and Atlantic sturgeon protection measures.

Habitat Including Non-fishing Effects

Past actions taken under the Monkfish FMP, particularly the controls on fishing effort and the closure of three offshore canyon areas, have had a positive effect on protecting habitat, including EFH. The preferred alternatives would be expected to have neutral impacts on EFH. A negative effect might occur if, for example, vessels fish more directed monkfish trips in the SFMA, however, fishing in this area is dominated by gillnet gear, which has a lower impact on EFH. Interactions with target species other than monkfish may be more likely to limit directed monkfish effort levels during FY 2017-2019. However, if even more effort is directed on monkfish, the preferred alternatives would still ensure that monkfish landings do not exceed established NFMA and SFMA monkfish TALs and, when discards are included, ACT, effort would not increase beyond levels evaluated in the EA. The recent substantially-reduced groundfish ACLs and associated measures to prevent these ACLs from being exceeded are likely an even more limiting factors to control effort. Therefore, in the context of the monkfish and groundfish fisheries as a whole, the overall recent effort reductions in the groundfish fishery, the constrains in fishing effort in effect in both the monkfish and groundfish fisheries, and the ongoing development of the Omnibus Habitat Amendment 2, the net effect of the preferred alternatives will likely be negligible overall.

While the impact analysis in this action is focused on direct and indirect impacts to habitat 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 and EFH. However, the general trend in fisheries management toward effort reductions has yielded positive impacts to habitat and EFH. Based on the above, it is not expected that the preferred alternatives would alter that trend and result in significant impacts to EFH.

Human Communities

Rebuilding of the monkfish resource over the past decade, along with stability afforded by the multi-year specifications-setting process has had an overall positive effect on affected human communities. This trend is likely to continue under the preferred alternatives, which allow for increased fishing opportunities through modified DAS declaration regulations, modified trip limits, and modified mesh size requirements beginning in FY 2017. The cumulative impact of this action in conjunction with other past, present and reasonably future actions would likely do little to offset the larger trend of substantial negative impacts on communities affected by the groundfish fishery until future stock rebuilding occurs for a number of groundfish stocks. However, from a monkfish perspective, the cumulative effect of the ongoing management of the monkfish fishery at sustainable levels, as well as actions taken under other FMPs as they meet MSA mandates, as revised, will likely be positive over the long term. As stocks rebuild, greater fishing opportunities will be made available, thereby increasing revenue and benefits to the affected communities. However, it is not likely that stock rebuilding, particularly for groundfish stocks, will occur through the temporal scope evaluated for this action. Thus, it is not expected that the cumulative effects of this and other actions would result in significant impacts to human communities.

8.0 Consistency with Applicable Laws

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

8.1.1 National Standards

Section 301 of the Magnuson-Stevens Act requires that FMPs contain conservation and management measures that are consistent with the 10 National Standards (NS). The following section summarizes, in the context of the National Standards, the analyses and discussion of the proposed action that appear in various sections of this framework adjustment document.

(1) Conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield from each fishery for the United States fishing industry.

The existing NFMA and SFMA monkfish ACTs were set at a level that would prevent overfishing after taking into account the scientific uncertainty in the estimate of the overfishing level of catch and management uncertainty. OY is defined in Amendment 5 as the yield corresponding to the ACT. The preferred alternatives would help increase monkfish landings to increase the proportion of the NFMA and SFMA monkfish ACTs caught beginning in FY 2017 and, in doing so, more likely achieve optimum yield in the fishery.

(2) Conservation and management measures shall be based upon the best scientific information available.

The proposed measures are based upon the existing TAL and ACT in each area that were adopted by the NEFMC and MAFMC under Framework Adjustment 8. These catch levels were based on the catch guidance provided by the most recent operational stock assessment (Richards, 2016) and the recommendations of the SSC following their review of the results of the 2016 Operational Monkfish Assessment and additional analysis by the Monkfish PDT. These catch levels were then used in developing the NFMA and SFMA monkfish DAS and trip limit measures proposed in this action.

(3) To the extent practicable, an individual stock of fish shall be managed as a unit throughout its range, and interrelated stocks of fish shall be managed as a unit or in close coordination.

Based on the different operations of the monkfish fishery in the NFMA and SFMA, the FMP established a two-area management program for monkfish that covers the exploitable range of the species. As stated in FW 7, the NEFMC and MAFMC considered a single-stock approach, but rejected it, based in part, on scientific information from SARC 34 (NEFSC 2002) that concluded information was insufficient to make a determination whether to manage monkfish as one or two monkfish stocks. The latest assessment, the Operational Monkfish Assessment (NEFSC 2013), did not change the findings of the previous assessment, and the NEFMC and MAFMC did not change this two-area approach due to the insufficient scientific information.

(4) Conservation and management measures shall not discriminate between residents of different States. If it becomes necessary to allocate or assign fishing privileges among various United States fishermen, such allocation shall be (A) fair and equitable to all such fishermen; (B) reasonably calculated to promote conservation; and (C) carried out in such manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges.

The preferred alternatives do not discriminate between residents of different states. The two-area management program is based on differences in the fisheries between the two areas, and not based on allocation of fishing privileges differently among sectors of the industry. While the preferred alternatives

do not discriminate between permit holders, they do have different impacts on different participants. The preferred alternatives would increase the incidental trip limit when on a NE multispecies DAS in the NFMA and would increase DAS allocation and trip limits by 15% in the SFMA. Thus, as specified in the purpose and need for this action (Section 3.2), this was specifically designed to revise existing management measures to achieve, but not exceed, catch limits specified.

(5) Conservation and management measures shall, where practicable, consider efficiency in the utilization of fishery resources; except that no such measure shall have economic allocation as its sole purpose.

The preferred alternatives do not have economic allocation as their sole purpose, and do not distribute fishery resources among fishermen on the basis of economic factors alone. The preferred alternatives were designed as compromises between biological and economic benefits to the monkfish fishery. The preferred alternatives were designed to provide flexibility for the fleet to better achieve, but not exceed, the TAL. This action contributes to the control of fishing mortality by allowing the fishery to catch, but not exceed, the amount of monkfish that is appropriate given the status of the stock, and the requirements of the FMP and MSA, based upon updated scientific information.

(6) Conservation and management measures shall take into account and allow for variations among, and contingencies in, fisheries, fishery resources, and catches.

The two-area management approach of the FMP is specifically intended to take into account the differences in fisheries between the two areas. Other measures in the FMP, such as the permit categories and gear and area-based incidental and directed catch limits are also based on the differences among various fisheries that catch monkfish either as a target or incidental catch species. These considerations are not changed under the preferred alternatives. The primary effort controls in the monkfish fishery, DAS and landing limits, allow each vessel operator some flexibility to fish when and how it best suits his or her business. The preferred alternatives further enhance operational flexibility based on the purpose and need for this action.

(7) Conservation and management measures shall, where practicable, minimize costs and avoid unnecessary duplication.

The flexibility afforded to the fishery by the preferred alternatives would provide additional fishing opportunity and revenue for vessels fishing in both the NFMA and SFMA. The measures do not duplicate other regulatory efforts, and were designed to achieve the management objectives of the Monkfish FMP.

(8) Conservation and management measures shall, consistent with the conservation requirements of this Act (including the prevention of overfishing and rebuilding of overfished stocks), take into account the importance of fishery resources to fishing communities by utilizing economic and social data that meet the requirements of paragraph (2), in order to (A) provide for the sustained participation of such communities, and (B) to the extent practicable, minimize adverse economic impacts on such communities.

Consistent with the requirements of the MSA to prevent overfishing and rebuild overfished stocks, this action would likely increase monkfish landings from both the NFMA and SFMA without resulting in overfishing monkfish in either stock area. Analyses of the impacts of this action show that overall landings and revenues are likely to increase, thereby reducing adverse impacts on fishing communities, without exceeding the NFMA or SFMA TALs or ACTs established by Amendment 5 and FW 8 to the Monkfish FMP. At the individual level, landings and revenue will depend upon the vessel's fishing

behavior and fishing history. This action attempts to provide for the sustained participation of communities associated with the monkfish fishery by providing additional fishing opportunities and potential revenue by allowing more monkfish to be landed from the NFMA and SFMA and increasing operational flexibility beginning in FY 2016.

(9) Conservation and management measures shall, to the extent practicable, (A) minimize bycatch and (B) to the extent bycatch cannot be avoided, minimize the mortality of such bycatch.

By increasing monkfish landings in the SFMA and increasing operational flexibility in the NFMA, this action would reduce incentives to discard monkfish, and may turn some discards, particularly regulatory discards, into landings. Although the preferred alternatives will increase fishing effort and, therefore, may increase bycatch levels of non-target species, the overall impact on non-target species will be negligible, and increased discarding of certain species (some skate species and spiny dogfish) may be a result of stock rebuilding of those non-target species rather than the measures proposed in this action.

(10) Conservation and management measures shall, to the extent practicable, promote the safety of human life at sea.

Under the current monkfish DAS and landing limits requirements, if a vessel caught more monkfish than its intended monkfish DAS charge would allow, it would be forced to either discard the fish or remain at sea until the monkfish DAS charge was sufficient. The preferred alternatives would increase monkfish effort controls in the SFMA and provide vessels with more flexibility in the NFMA, which is expected to have a positive impact on the safety of fishing operations of vessels fishing under a monkfish DAS because such vessels would not have to remain at sea to ensure that the number of monkfish DAS charged is sufficient to account for the amount of monkfish onboard the vessel.

8.1.2 **Required Provisions**

Section 303 of the MSFCMA contains fifteen additional required provisions for FMPs, which are discussed below. Any FMP prepared by any Council, or by the Secretary, with respect to any fishery, shall:

(1) contain the conservation and management measures, applicable to foreign fishing and fishing by vessels of the United States, which are: (A) necessary and appropriate for the conservation and management of the fishery to prevent overfishing and rebuild overfished stocks, and to protect, restore, and promote the long-term health and stability of the fishery; (B) described in this subsection or subsection (b), or both; and (C) consistent with the National Standards, the other provisions of this Act, regulations implementing recommendations by international organizations in which the United States participates (including but not limited to closed areas, quotas, and size limits), and any other applicable law;

Foreign fishing is not allowed under this management plan, or this action and so specific measures are not included that specify and control allowable foreign catch. The measures in the preferred alternatives are designed to prevent overfishing and rebuild overfished stocks by vessels of the U.S. consistent with the National Standards. The preferred alternatives would rely upon measures implemented by previous management actions, including the monkfish NFMA and SFMA ACLs and ACTs adopted in Amendment 5 and FW 8, to ensure that overfishing is prevented for NFMA and SFMA monkfish. There are no international agreements that are germane to the management of NFMA or SFMA monkfish.

(2) contain a description of the fishery, including, but not limited to, the number of vessels involved, the type and quantity of fishing gear used, the species of fish involved and their location, the cost

likely to be incurred in management, actual and potential revenues from the fishery, any recreational interest in the fishery, and the nature and extent of foreign fishing and Indian treaty fishing rights, if any;

The fishery and its components, including biological, social and economic aspects, are described in the Affected Environment section of the EIS for the FMP, as well as in subsequent environmental documents prepared for previous management actions, including Amendment 5 and FW 9 to the FMP. Section 6.0 of this document updates this information, including the number of vessels involved, the type of fishing gear used, and potential revenues from the fishery beginning in FY 2015. There is no foreign fishing for monkfish, no directed recreational fishery, and there are no known Indian treaty fishing rights pertaining to monkfish.

(3) assess and specify the present and probable future condition of, and the maximum sustainable yield and optimum yield from, the fishery, and include a summary of the information utilized in making such specification;

The most recent stock assessment (Monkfish Operational Assessment; Richards, 2016) contains the best estimate of the present condition of the monkfish resource. That information, in conjunction with an evaluation of that stock assessment by the SSC, was used to support the continuation of the NFMA and SFMA monkfish TALs and ACTs originally implemented under FW 8 and Amendment 5, respectively. OY is defined in Amendment 5 as the yield corresponding to the ACT. Assuming these ACTs are not exceeded, as projected in the preferred alternatives, overfishing will not occur on NFMA or SFMA monkfish, and these stocks will continue to not be overfished.

(4) assess and specify: (A) the capacity and the extent to which fishing vessels of the United States, on an annual basis, will harvest the optimum yield specified under paragraph (3); (B) the portion of such optimum yield which, on an annual basis, will not be harvested by fishing vessels of the United States and can be made available for foreign fishing; and (C) the capacity and extent to which United States fish processors, on an annual basis, will process that portion of such optimum yield that will be harvested by fishing vessels of the United States;

Although in recent years the monkfish fishery has not been able to fully harvest OY in the NFMA or SFMA, this action is specifically designed to increase the efficient utilization of the monkfish resource, with the preferred alternatives designed to increase monkfish landings to more fully harvest, but not exceed, the ACTs in the NFMA and SFMA. Projections discussed in Section 7.1 and Appendix 1 suggest that the preferred alternatives would increase the likelihood that a great proportion of the SFMA monkfish TAL would be caught beginning in FY2017. In previous FYs, the domestic fishery has caught monkfish in amounts equivalent to the TALs and ACTs specified in each year that would be continued under this action. Thus, there is no amount of OY available for foreign fishing. Furthermore, sufficient domestic processing capacity exists to utilize all monkfish harvested by United States vessels.

(5) specify the pertinent data which shall be submitted to the Secretary with respect to commercial, recreational, charter fishing, and fish processing in the fishery, including, but not limited to, information regarding the type and quantity of fishing gear used, catch by species in numbers of fish or weight thereof, areas in which fishing was engaged in, time of fishing, number of hauls, economic information necessary to meet the requirements of this Act, and the estimated processing capacity of, and the actual processing capacity utilized by, United States fish processors;

Current reporting requirements for this fishery have been in effect since the implementation of the FMP in 1999. The requirements include VTRs that are submitted by each fishing vessel and DAS declaration

requirements. Dealers are also required to submit reports on the purchases of regulated groundfish from permitted vessels. Current reporting requirements are detailed in 50 CFR 648.7. The Monkfish Plan Development Team (PDT) compiles and publishes annually a description of the fishery, including affected communities, as part of the SAFE Report, most recently in Section 6.0 of this document. There is no significant recreational or charter fishery for monkfish.

(6) consider and provide for temporary adjustments, after consultation with the Coast Guard and persons utilizing the fishery, regarding access to the fishery for vessels otherwise prevented from harvesting because of weather or other ocean conditions affecting the safe conduct of the fishery; except that the adjustment shall not adversely affect conservation efforts in other fisheries or discriminate among participants in the affected fishery;

Vessels issued a limited access monkfish permit are allowed to carry over up to 4 monkfish DAS into the next fishing year to minimize incentives to fish during inclement weather. Further, the framework adjustment mechanism established in the FMP provides the NEFMC and MAFMC with the ability to change regulations to address issues such as vessel safety within the context of the fishery management program on an annual, or as needed basis.

(7) describe and identify essential fish habitat for the fishery based on the guidelines established by the Secretary under section 305(b)(1)(A), minimize to the extent practicable adverse effects on such habitat caused by fishing, and identify other actions to encourage the conservation and enhancement of such habitat;

Section 6.0 contains the description of monkfish essential fish habitat, and Section 7.2 contains the analysis of impacts of the preferred alternatives and other alternatives on EFH.

(8) in the case of a fishery management plan that, after January 1, 1991, is submitted to the Secretary for review under section 304(a) (including any plan for which an amendment is submitted to the Secretary for such review) or is prepared by the Secretary, assess and specify the nature and extent of scientific data which is needed for effective implementation of the plan;

Stock assessments are typically conducted by the NEFSC every three years including a discussion of research needs in the fishery, along with an annual SAFE Report prepared by the NEFMC. Such needs are documented in the 2016 operational assessment (Richards, 2016). Section 6.0 of this document serves as the most recent SAFE Report developed for the monkfish fishery.

(9) include a fishery impact statement for the plan or amendment (in the case of a plan or amendment thereto submitted to or prepared by the Secretary after October 1, 1990) which shall assess, specify, and analyze the likely effects, if any, including the cumulative conservation, economic, and social impacts, of the conservation and management measures on, and possible mitigation measures for: (A) participants in the fisheries and fishing communities affected by the plan or amendment; (B) participants in the fisheries conducted in adjacent areas under the authority of another Council, after consultation with such Council and representatives of those participants; and (C) the safety of human life at sea, including whether and to what extent such measures may affect the safety of participants in the fishery

Biological impacts are evaluated for monkfish, non-target species, protected species, and EFH in Sections 7.1, 7.2, and 7.3 of this EA. Economic and social impacts of the preferred alternatives on fishing communities directly affected by this action and adjacent areas can be found in Sections 7.4 and 7.5 of this EA. Consideration of the effect of measures considered under this action have on the safety of fishery participants is evaluated in Section 6.1.1 of this EA.

(10) specify objective and measurable criteria for identifying when the fishery to which the plan applies is overfished (with an analysis of how the criteria were determined and the relationship of the criteria to the reproductive potential of stocks of fish in that fishery) and, in the case of a fishery which the Council or the Secretary has determined is approaching an overfished condition or is overfished, contain conservation and management measures to prevent overfishing or end overfishing and rebuild the fishery;

Biological Reference Points (BRPs) are used to identify when a stock is overfished. Based on the recommendations of the most recent stock assessment, the 2016 Monkfish Operational Assessment, the BRPs were not revised because the stock assessment model used in their calculation was not updated. Therefore, the $B_{threshold}$ used to evaluate whether the monkfish stock is overfished was specified in 2013 by the NEFMC SSC, and is set at 23,037 mt for the NFMA, and 35,834 mt for the SFMA. Based on the 2016 monkfish updated assessment, monkfish is not overfished in the NFMA or the SFMA.

(11) establish a standardized reporting methodology to assess the amount and type of bycatch occurring in the fishery, and include conservation and management measures that, to the extent practicable and in the following priority: (A) minimize bycatch; and (B) minimize the mortality of bycatch which cannot be avoided;

NMFS currently has in place reporting requirements for all vessels participating in the Federal monkfish fishery, including requirements to report all bycatch on VTRs, and maintains, to the extent the budget allows, a fishery observer program onboard vessels. Additionally, VMS usage is mandatory on the majority of limited access monkfish vessels through the requirements of the Atlantic Sea Scallop and Northeast Multispecies FMPs. Since VMS allows the tracking of fishing vessels, coordination of this information with observer coverage may allow for more accurate bycatch assessment and projection.

Since this provision requires the establishment of a Standardized Bycatch Reporting Methodology (SBRM), in January 2006, development began on the Northeast Region Omnibus SBRM Amendment. This amendment covers 13 FMPs, 39 managed species, and 14 types of fishing gear. The SBRM Amendment was approved on October 22, 2007, and a final rule became effective on February 27. 2008, however, this SBRM was vacated by a ruling by the District Court for the District of Columbia in September 2011. The final rule for the omnibus SBRM amendment, developed by both the New England and Mid-Atlantic Fishery Management Councils, was published on June 30, 2015. The intended effect of the amendment was to implement the following: a new prioritization process for all allocation of observers if agency funding is insufficient to achieve target observer coverage levels, bycatch reporting and monitoring mechanisms, analytical techniques and allocation of at-sea fisheries observers, a precision-based performance standard for discard estimates, a review and reporting process, framework adjustment and annual specifications provisions, and provisions for industry-funded observers and observer set-aside programs.

(12) assess the type and amount of fish caught and released alive during recreational fishing under catch and release fishery management programs and the mortality of such fish, and include conservation and management measures that, to the extent practicable, minimize mortality and ensure the extended survival of such fish;

Monkfish catch in recreational fisheries is not significant enough to be recorded in the recreational catch data.

(13) include a description of the commercial, recreational, and charter fishing sectors which participate in the fishery, including its economic impact, and, to the extent practicable, quantify

trends in landings of the managed fishery resource by the commercial, recreational, and charter fishing sectors;

Monkfish catch in recreational fisheries is not significant enough to be recorded in the recreational catch and vessel data. Commercial fishery sectors are described in the Affected Environment section of the EIS for the original FMP, as well as in subsequent environmental documents (plan amendments and framework adjustments), and is updated in Section 6.0 of this document.

(14) to the extent that rebuilding plans or other conservation and management measures which reduce the overall harvest in a fishery are necessary, allocate, taking into consideration the economic impact of the harvest restrictions or recovery benefits on the fishery participants in each sector, any harvest restrictions or recovery benefits fairly and equitably among the commercial, recreational, and charter fishing sectors in the fishery;

As noted under the discussion of NS 4, while conservation measures may have a differential impact on different sectors of the industry, that differential impact is not the purpose of the regulations, and is done in a manner that is intended to achieve the conservation and management goals of the FMP. Neither the northern or southern monkfish stocks are overfished nor is either experiencing overfishing. The purpose of this action was to increase flexibility in the NFMA and SFMA to better achieve, but not exceed the NFMA and SFMA TALs and ACTs.

(15) establish a mechanism for specifying annual catch limits in the plan (including a multiyear plan), implementing regulations, or annual specifications, at a level such that overfishing does not occur in the fishery, including measures to ensure accountability.

The NEFMC and MAFMC completed Amendment 5 to the FMP in September 2010, which includes, among other provisions, specification of ACLs and AMs. The ACTs are a proactive form of AM. FW 8 increased monkfish DAS allocations and landings limits, allowed vessels issued a limited access monkfish Category H permit to fish throughout the SFMA and enabled vessels to use an allocated Monkfish-only DAS at any time throughout the fishing year. FW 9 removed the monkfish possession limit in the NFMA for Category C and D vessels when fishing on both a NE multispecies and Monkfish DAS. It also allowed for the use of less than 10" mesh in parts of the SFMA to increase operational flexibility when fishing for both dogfish and monkfish on the same trip.

8.1.3 EFH Assessment

This essential fish habitat (EFH) assessment is provided pursuant to 50 CFR 600.920(e) of the EFH Final Rule to initiate EFH consultation with the NMFS.

Description of Action
The preferred alternatives are described in Section 4.0, and consist of setting specifications for both the NFMA and SFMA, increasing incidental monkfish possession limits when on a NE multispecies DAS in the NFMA, and increasing DAS allocations and landing limits in the SFMA.

In general, the activity within the scope of this action, fishing for monkfish within the NFMA and SFMA, occurs off the U.S. coast within the U.S. EEZ. Thus, the range of this activity occurs across the designated EFH of all Council-managed species (see Amendment 11 to the Northeast Multispecies FMP for a list of species for which EFH was designated, the maps of the distribution of EFH, and descriptions of the characteristics that comprise the EFH; NEFMC 1998). The overall effect of the monkfish fishery on EFH was discussed and mitigated for in Amendment 2, and in Multispecies Amendment 13, and the alternatives proposed in this action do not change those findings. EFH designated for species managed

under the Secretarial Highly Migratory Species FMPs are not affected by this action, nor is any EFH designated for species managed by the South Atlantic Fishery Management Council as all of the relevant species are pelagic and not directly affected by benthic habitat impacts.

Assessing the Potential Adverse Impacts
The potential adverse impacts to habitat are described in Section 7.2. This section demonstrates that the overall habitat impacts of the proposed measures have negligible or neutral impacts overall relative to the baseline habitat protections established under the original Monkfish FMP. As such, additional measures to mitigate or minimize adverse effects of the monkfish fishery on EFH beyond those established under the original FMP are not necessary.

Conclusions
Because there are no adverse impacts associated with this action relative to the original Monkfish FMP baseline, no EFH consultation is required.

8.2 National Environmental Policy Act (NEPA)

NEPA provides a mechanism for identifying and evaluating the full spectrum of environmental issues associated with federal actions, and for considering a reasonable range of alternatives to avoid or minimize adverse environmental impacts. This document is designed to meet the requirements of both the MSA and NEPA. The Council on Environmental Quality (CEQ) has issued regulations specifying the requirements for NEPA documents (40 CFR 1500-1508), as has NOAA in its agency policy and procedures for NEPA in NAO 216-6 §5.04b.1. All of those requirements are addressed in this document, as referenced below.

8.2.1 Environmental Assessment

The required elements of an Environmental Assessment (EA) are specified in 40 CFR 1508.9(b) and NAO 216-6 §5.04b.1. They are included in this document as follows:

- The need for this action is described in Section 3.2;
- The alternatives that were considered are described in Section 4.0;
- The environmental impacts of the preferred alternative are described in Section 7.0;
- The agencies, preparers and persons consulted on this action are listed in Section 8.0;
- An Executive Summary can be found in Section 1.0;
- A table of contents can be found on page 7;
- Background and purpose are described in Section 3.0;
- A brief description of the affected environment is in Section 6.0;
- Cumulative impacts of the preferred alternatives are described in Section 7.6;
- A determination of significance is in Section 8.11.1.

8.2.2 Finding of No Significant Impact (FONSI Statement)

National Oceanic and Atmospheric Administration Administrative Order (NAO) 216-6A "Compliance with the National Environmental Policy Act" and its accompanying "Policy and Procedures for Compliance with the National Environmental Policy Act and Related Authorities" (Companion Manual, January 13, 2017) contains criteria for determining the significance of the impacts of a proposed action. The CEQ regulations at 40 C.F.R. §1508.27 also state that the significance of an action should be analyzed both in terms of "context" and "intensity." Each criterion listed below is relevant to making a finding of no significant impact and has been considered individually, as well as in combination with the

others. The significance of this action is analyzed based on the NAO 216-6A Companion Manual 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: This action cannot be reasonably expected to jeopardize the sustainability of any target species that may be affected by the action. Analysis of the measures in Section 7.0 indicates modifying the management uncertainty buffer in the NFMA and SFMA, increasing the incidental monkfish possession limit when on a NE multispecies in the NFMA, and increasing the DAS allocation and possession limit in the SFMA would not result in monkfish catch exceeding the ACTs. Constraining monkfish catch within the ACT is consistent with preventing overfishing and sustaining the biomass over the long term. Both scientific and management uncertainty have been accounted for in the specifications, so the risks of negative biological impacts have been minimized.

(2) *Can the Proposed Action reasonably be expected to jeopardize the sustainability of any non-target species?*

Response: This action cannot be reasonably expected to jeopardize the sustainability of any non-target species that may be affected by the action. The preferred alternatives modify the management uncertainty buffer in the NFMA and SFMA, increase the incidental monkfish possession limit when on a NE multispecies DAS in the NFMA, and increase the DAS allocation and possession limit in the SFMA. The increase in DAS allocation and trip limits in the SFMA could increase fishing effort between FY 2017 – 2019. However, this action would not affect management measures for any other fishery. Therefore, measures designed to limit fishing mortality on monkfish as well as other stocks particularly groundfish stocks, are expected to limit the potential increase and ensure that any increase in fishing mortality as a result of this action does not compromise conservation measures designed to prevent overfishing and rebuild overfished stocks. There are no indications that an increase in monkfish fishing activity will jeopardize the sustainability of non-target species particularly given the other constraints in these other fisheries.

Gear used to target monkfish on a monkfish DAS has very low bycatch and incidental catch of other species. Therefore, increases in fishing effort targeting monkfish would not result in more than negligible catch of these species. Additionally, the catch of skates on trips incidentally targeting monkfish and skates is constrained by skate possession limits, not monkfish possession limits. Allowing vessels in the NFMA to use a NE multispecies DAS to catch more monkfish also will not increase fishing on groundfish species that are almost entirely controlled through sector allocations, but instead will allow vessels to land more monkfish on these trips.

(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 preferred alternatives cannot be reasonably expected to cause substantial damage to the ocean and coastal habitats and/or EFH, as defined under the Magnuson-Stevens Act and identified in the FMP. As discussed in Section 7.2, the preferred alternative in the context of the FMP as a whole, is expected to have a negligible impact on habitat compared to the no action alternative, with overall effort less than effort observed when the FMP was first developed and the impacts of EFH first assessed.

(4) *Can the Proposed Action be reasonably expected to have a substantial adverse impact on public health or safety?*

Response: None of the measures proposed in this action would alter fishing procedures or otherwise create a safety or public health concern. In fact, increasing the possession limits in the SFMA and incidental possession limits in the NFMA may reduce unsafe fishing practices by allowing vessels to land more monkfish in a shorter period of time, without having to wait for monkfish DAS charges to accrue to account for the amount of monkfish caught.

(5) *Can the Proposed Action reasonably be expected to adversely affect endangered or threatened species, marine mammals, or critical habitat of these species?*

Response: Fishing effort would not be expected to significantly increase under the preferred alternatives, therefore the net effect on protected species would be expected to be negligible to low negative (Section 7.3). The activities and fishing effort levels conducted under the preferred alternatives are within the scope of the original FMP, and would be restricted by the specifications set in FW8, as noted in Section 7.3. The measures controlling fishing effort in the monkfish fishery, including those in this action, in combination with NMFS's actions being taken to protect Atlantic sturgeon, sea turtles, harbor porpoise, and large whales will mitigate much of the impact of the fisheries (both the directed monkfish fishery and other fisheries in the region) on protected species, and keep such interactions within acceptable limits.

An updated batched BO was issued for seven fisheries in the Northeast, including the monkfish fishery, on December 16, 2013 (NMFS 2013). The BO reviewed the current status of large marine mammals, sea turtles, and Atlantic sturgeon, the environmental baseline, and cumulative effects in the action area, including the effects of the continued operation of the Monkfish FMP and other FMPs over the next 10 years. The BO concluded that the continuation of these fisheries "may adversely affect, but is not likely to jeopardize, the continued existence of" North Atlantic right whales, humpback whales, fin whales, sei whales, the Northwest Atlantic DPS of loggerhead sea turtles, leatherback turtles, Kemp's ridley turtles, green sea turtles, any of the five DPSs of Atlantic sturgeon, or the GOM DPS for Atlantic salmon. This BO also concluded that these fisheries will not adversely affect hawksbill sea turtles, shortnose sturgeon, smalltooth sawfish DPS, *Acroporid* corals, Johnson's seagrass, sperm whales, blue whales, designated critical habitat for right whales in the Northwest Atlantic, or designated critical habitat for GOM DPS Atlantic salmon (NMFS 2013).

(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 preferred alternatives are not expected to have a substantial impact on biodiversity and/or ecosystem function within the affected area. The use of the NFMA and SFMA monkfish ACTs would control catch of monkfish. As noted in FW 8 and SAW 50, although the role of monkfish within the ecosystem is not well understood, monkfish account for upwards of six percent of total consumption by all finfish in the ecosystem (NEFMC 2011b, NEFSC 2010). Accordingly, maintaining sustainable levels of monkfish would likely promote biodiversity and ecosystem function over the long term.

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

Response: The EA documents that no significant natural or physical effects will result from the implementation of the preferred alternatives. There are no significant natural or physical environmental effects resulting from the preferred alternatives that may have an impact on communities or the human environment in the context of NEPA. The preferred alternatives are designed to increase efficient use of the monkfish resource, increase operational flexibility and to achieve, but not exceed the ACTs. As

described in Section 7.1, the preferred alternatives would allow the fishery to better achieve but not exceed existing NFMA or SFMA monkfish TALs or ACTs recommended by the NEFMC SSC at a level that would prevent overfishing and sustain the biomass over the long term. Accordingly, expected impacts fall within the scope of those analyzed under Amendment 5, and FW 8, and are considered to not be significant. The action cannot be reasonably expected to have a substantial impact on habitat or protected species, as the level of fishing effort targeting monkfish is still limited by monkfish DAS allocations and other effort controls in both the monkfish and groundfish fisheries, including ACLs, gear restrictions, size limits, and AMs. The action's potential economic and social impacts are also addressed in this EA (see Sections 7.4 and 7.5, respectively) and more specifically in the Executive Order 12866 review and the Regulatory Impact Review (Section 8.11). Based on that analysis, the preferred alternatives would likely result in low increases in fishing revenue for affected entities, which is not characterized as a significant impact.

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

Response:
Based on the scientific data used, the proposed action is not expected to be highly controversial. The 2016 Operational Assessment did not update the SCALE model because of concerns for the age data used in the model. Instead an alternative approach for setting catch advice was provided, which used a NEFSC trawl survey adjustment factor to adjust the existing ABC. The SSC reviewed the assessment and recommended status quo specifications, which were approved as part of FW8. The analysis utilized the best scientific data available. In addition, the stock status under current management appears stable.

(9) *Can the Proposed Action reasonably be expected to result in substantial impacts to unique areas, such as historic or cultural resources, park land, prime farmlands, wetlands, wild and scenic rivers or ecologically critical areas?*

Response: The preferred alternatives modify the management uncertainty buffer in the NFMA and SFMA, increase the incidental monkfish possession limit when on a NE multispecies DAS in the NFMA, and increase the DAS allocation and trip limit in the SFMA. Other types of commercial fishing already occur in these areas, and although it is possible that historic or cultural resources such as shipwrecks could be present, vessels try to avoid fishing too close to wrecks due to the possible loss or entanglement of fishing gear. Therefore, it is not likely that the preferred alternative would result in substantial impacts to unique areas.

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

Response: The preferred alternatives are not expected to result in highly uncertain effects on the human environment or involve unique or unknown risks. Impact analyses were based on a relatively consistent DAS usage patterns and increasing monkfish landing rates over the past few years. Therefore, while it is difficult to predict future fishing behavior, the analyses of the preferred alternatives are expected to be reasonably accurate in predicting monkfish landings and effort. Known risks include whether the reduced fishing opportunities caused by substantially reduced groundfish ACLs will shift fishing operations into other fisheries, including the monkfish fishery. This risk is relatively low due to the aforementioned close linkage between the groundfish and monkfish fisheries and the interrelatedness of associated regulations. In addition, as noted above, any shift in fishing effort would likely be constrained by applicable regulations in either fishery. Therefore, overall, the impacts of the preferred alternative can be, and are, described with a relative amount of certainty.

The analysis of the effects on the human environment of the proposed action is consistent with the analyses done for prior adjustments and a broad range of fishery management actions taken by the Councils. While these analyses have some inherent uncertainty because they involve predicting future impacts that depend on a wide range of variables, such as the response of the target species to the management measures and the short-term range of alternative fisheries for affected vessels, the effects are not considered highly uncertain. Thus, while the risks inherent in analyses of the effects on the human environment are due to some uncertainty, those risks are not unique or unknown.

(11) *Is the Proposed Action related to other actions with individually insignificant, but cumulatively significant impacts?*

Response: The Proposed Action is not related to other actions with individually insignificant but cumulatively significant impacts. The cumulative effects analysis presented in Section 7.6 of this document considers the impacts of the proposed action in combination with relevant past, present, and reasonably foreseeable future actions and concludes that no additional significant cumulative impacts are expected from the Proposed Action.

(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 impacts of the proposed measures on the human environment are described in Section 7.0 of the EA. The preferred alternatives modify the management uncertainty buffer in the NFMA and SFMA, increase the incidental monkfish possession limit when on a NE multispecies DAS in the NFMA, and increase the DAS allocation and trip limits in the SFMA. Although there are shipwrecks present in the area where fishing occurs, including some registered on the National Register of Historic Places, vessels typically avoid fishing too close to wrecks due to the possible loss or entanglement of fishing gear. Therefore, it is not likely that the preferred alternative would adversely affect the historic resources listed above.

(13) *Can the Proposed Action reasonably be expected to result in the introduction or spread of a non-indigenous species?*

Response: This action would not result in the introduction or spread of any non-indigenous species, as it would not result in any vessel activity outside of the Greater Atlantic region.

(14) *Is the Proposed Action likely to establish a precedent for future actions with significant effects or represent a decision in principle about a future consideration?*

Response: The proposed action is not likely to establish a precedent for future action with significant effects, and it does not represent a decision in principle about future consideration. The preferred alternatives modify the management uncertainty buffer in the NFMA and SFMA, increase the incidental monkfish possession limit when on a NE multispecies DAS in the NFMA, and increase the DAS allocation and trip limits in the SFMA. As such, the action is designed to address a specific circumstance and is not intended to represent a decision about future management actions that may adopt different measures. The impact of any future changes will be analyzed as to their significance in the process of developing and implementing them.

(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 preferred alternatives are intended to implement measures that are consistent with the protection of marine resources and would not threaten a violation of Federal, state, or local law or requirements to protect the environment.

(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: Cumulative effects are analyzed in Section 7.6 of this EA. That analysis concludes that the proposed action is expected to continue to maintain a healthy monkfish stock in the NFMA and SFMA, result in negligible changes to the sustainable management of those fisheries, with no anticipated significant impacts on either monkfish or non-target species. Further, as specified in the responses to the first two criteria of this section, the proposed action is not expected to result in cumulative adverse effects that would have a substantial effect on target or non-target species. This action would be consistent with optimizing the long-term sustainable use of the monkfish resource. Any impacts on target or non-target species would be minimized by other effort controls in the fishery that are designed to limit catch to sustainable levels.

FONSI STATEMENT:	
In view of the information presented in this document and the analysis contained in the supporting Environmental Assessment prepared for Framework Adjustment 10 to the Monkfish Fishery Management Plan, it is hereby determined that this action will not significantly impact the quality of the human environment as described above and in the supporting Environmental Assessment. In addition, all beneficial and adverse impacts of the Proposed Action have been addressed to reach the conclusion of no significant impacts. Accordingly, preparation of an EIS for this action is not required.	
Regional Administrator, Greater Atlantic Regional Fisheries Office, NOAA	Date

8.2.3 List of Preparers; Point of Contact

Questions concerning this document may be addressed to:

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8.2.4 Agencies Consulted

The following agencies were consulted in preparation of this document:

Mid-Atlantic Fishery Management Council
New England Fishery Management Council, which includes representatives from the following additional organizations:
- Connecticut Department of Environmental Protection
- Rhode Island Department of Environmental Management
- Massachusetts Division of Marine Fisheries
- New Hampshire Fish and Game
- Maine Department of Marine Resources

National Marine Fisheries Service, NOAA, Department of Commerce
United States Coast Guard, Department of Homeland Security

8.2.5 Opportunity for Public Comment

The preferred alternatives were developed during the period August 2016 through December 2016 and was discussed at the following meetings. Opportunities for public comment were provided at each of these meetings.

Date	Meeting Type	Location
5/10/16	Monkfish PDT Conference Call	N/A
8/2/16	Monkfish PDT Conference Call	N/A
8/17/16	Monkfish AP	Radisson Airport Hotel, Warwick, RI
8/24/16	Monkfish PDT Conference Call	N/A
9/1/16	Monkfish Committee	Radisson Airport Hotel, Warwick, RI
9/20-22/16	Council Meeting	Doubletree, Danvers, MA
10/4/16	Monkfish PDT Conference Call	N/A
10/12/16	Monkfish AP	Radisson Airport Hotel, Warwick, RI
10/18/16	Monkfish Committee	Radisson Airport Hotel, Warwick, RI
11/1/16	Monkfish PDT	Mariners House, Boston, MA
11/14/16	Monkfish Committee	Hotel Viking, Newport, RI
11/15-17/16	Council Meeting	Hotel Viking, Newport, RI
12/13-15/16	MAFMC Meeting	Royal Sonesta, Baltimore, MD

8.3 Endangered Species Act (ESA)

While ESA Section 7 consultations are required when the preferred alternatives may affect listed species, a conference is required only when the preferred alternatives are likely to jeopardize the continued existence of a proposed species or destroy or adversely modify proposed critical habitat. A biological assessment evaluates the potential effects of an action on listed and proposed species and designated and proposed critical habitat to determine whether any such species or habitat are likely to be adversely affected by the action. A biological assessment is used in determining whether formal consultation or a conference is necessary.

On February 9, 2012, NMFS reinitiated formal consultation to reconsider the effects of the continued authorization of several fisheries, including the monkfish fishery, on DPSs of Atlantic sturgeon listed as threatened or endangered under the ESA on February 6, 2012. An updated batched BO was issued for seven fisheries in the Northeast, including the monkfish fishery, on December 16, 2013 (NMFS 2013). The BO reviewed the current status of large marine mammals, sea turtles, and Atlantic sturgeon, the environmental baseline, and cumulative effects in the action area, including the effects of the continued operation of the Monkfish FMP and other FMPs over the next 10 years. The BO concluded that the continuation of these fisheries "may adversely affect, but is not likely to jeopardize, the continued existence of" North Atlantic right whales, humpback whales, fin whales, sei whales, the Northwest Atlantic DPS of loggerhead sea turtles, leatherback turtles, Kemp's ridley turtles, green sea turtles, any of the five DPSs of Atlantic sturgeon, or the GOM DPS for Atlantic salmon. This BO also concluded that these fisheries will not adversely affect hawksbill sea turtles, shortnose sturgeon, smalltooth sawfish DPS, *Acroporid* corals, Johnson's seagrass, sperm whales, blue whales, designated critical habitat for right whales in the Northwest Atlantic, or designated critical habitat for GOM DPS Atlantic salmon (NMFS 2013).

The Council does acknowledge that endangered and threatened species may be affected by the measures proposed, but impacts should be minimal. In general, the impacts on protected resources would track the trend in fishing effort. The scope of the potential increase with respect to the overall monkfish and groundfish fisheries is expected to be small, however, and the fact that other regulations restricting catch of both monkfish and groundfish will likely limit any increase in fishing effort resulting from the preferred alternatives. The net effects of the preferred alternatives will be neutral impacts for protected species based on fishing effort not being expected to change, largely because landings are still restricted by the specifications set in FW8.

For further information on the potential impacts of the fishery and the proposed management action on listed species, see Section 7.3 of this document.

8.4 Marine Mammal Protection Act (MMPA)

NMFS, Greater Atlantic Region has reviewed the impacts of this action on marine mammals and has concluded that the management action is consistent with the provisions of the MMPA. Although the preferred alternatives are likely to affect species inhabiting the monkfish management unit, the measures will not alter the effectiveness of existing MMPA measures, such as take reduction plans, to protect those species based on overall reductions in fishing effort that have been implemented through the FMP. For further information on the potential impacts of the fishery and the proposed management action on marine mammals, see Section 7.3 of this document.

8.5 Paperwork Reduction Act (PRA)

The purpose of the PRA is to control and, to the extent possible, minimize the paperwork burden for individuals, small businesses, nonprofit institutions, and other persons resulting from the collection of information by or for the Federal Government. The authority to manage information and recordkeeping requirements is vested with the Director of the Office of Management and Budget (OMB). This authority encompasses establishment of guidelines and policies, approval of information collection requests, and reduction of paperwork burdens and duplications. This action makes no alterations to the existing information collection requirements implemented by previous amendments to the Monkfish FMP that are subject to the PRA.

8.6 Coastal Zone Management Act (CZMA)

Section 307(c)(1) of the Federal CZMA of 1972 requires that all Federal activities that directly affect the coastal zone be consistent with approved state coastal zone management programs to the maximum extent practicable. Pursuant to Section 930.36(c) of the regulations implementing the CZMA, NMFS made a general consistency determination that the Monkfish FMP, including Amendment 5 and FW 8 are consistent to the maximum extent practicable with the enforceable policies of the approved coastal management program of Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, and North Carolina. This general consistency determination applies to the current Monkfish FMP, and all subsequent routine Federal actions carried out in accordance with the FMP such as FWs and specifications. A general consistency determination is warranted because FWs to the FMP and catch specifications are repeated activities that adjust the use of management tools previously implemented in the FMP. A general consistency determination avoids the necessity of issuing separate consistency determinations for each incremental action. This determination was submitted to the above states on October 8, 2010. The states of New Hampshire, Rhode Island, Connecticut, Pennsylvania, Delaware, New Jersey, Virginia, and North Carolina responded to concur with the general consistency determination for Amendment 5; concurrence by all other states was inferred.

8.7 Data Quality Act (DQA)

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

8.7.1 Utility of Information Product

The EA and the *Federal Register* document prepared for this action include a description of the proposed measures; the reasons why such measures are necessary; and the biological, economic, and social impacts of the proposed measures. The information in the EA is useful to understand the rationale for the action, along with the anticipated impacts associated with the proposed measures. The *Federal Register* notice provides a summary of the information contained in the EA to inform interested public of the scope and purpose of the proposed measures and to specify regulations that implement such measures. These documents provide the justification that the proposed measures are consistent with the Monkfish FMP, the conservation and management goals of the MSA, and other applicable laws.

The EA includes the expected biological, economic, and social impacts associated with such measures. This information builds upon previous analysis in other recent actions under the Monkfish FMP, and provides updated information on recent and projected monkfish catch rates. The EA also includes updated data summarizing the status of the other species that may be affected by this action, including information on Atlantic sturgeon and loggerhead sea turtles to reflect the recent listing of such species under the ESA. In this regard, the EA provides both more current and detailed information than what was presented in documents supporting previous management actions in the monkfish fishery. The proposed measures reflect the purpose of the action to achieve, but not exceed, ACTs in the NFMA and SFMA, and increase efficient utilization and operational flexibility of the monkfish fishery. Both the EA and the proposed rule to implement the proposed action will be made available to the public to review via publication in the Federal Register, along with posting on both the NEFMC and NMFS websites.

8.7.2 Integrity of Information Product

Prior to dissemination, information associated with this action, independent of the specific intended distribution mechanism, is safeguarded from improper access, modification, or destruction, to a degree commensurate with the risk and magnitude of harm that could result from the loss, misuse, or unauthorized access to or modification of such information. All electronic information disseminated by 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 U.S. Code (confidentiality of census, business, and financial information); the Confidentiality of Statistics provisions of the Magnuson-Stevens Act; and NOAA Administrative Order 216-100, Protection of Confidential Fisheries Statistics.

8.7.3 Objectivity of Information Product

For purposes of the Pre-Dissemination Review, this document is considered to be a "Natural Resource Plan." Accordingly, the document adheres to the published standards of the Magnuson-Stevens Act; the Operational Guidelines, Fishery Management Plan Process; the Essential Fish Habitat Guidelines; the National Standard Guidelines; and NOAA Administrative Order 216-6, Environmental Review Procedures for Implementing the National Environmental Policy Act.

The proposed action and associated analyses in the EA are based upon the best scientific information available, including the Monkfish Operational Assessment (NEFSC 2013) and information from the most recent complete calendar year, through 2013, and in some cases preliminary information collected during calendar year 2014. The EA contains updated information describing catch of monkfish, expected fishing revenue from monkfish operations, and DAS usage in the fishery based upon information collected through the vessel trip report and commercial dealer databases. Updated analysis for Atlantic sturgeon and loggerhead sea turtles included in the EA supporting the proposed action reflects findings from the December 16, 2013 BO. Original analyses in the EA were prepared using data from accepted sources. Finally, the summary of the impacts of proposed measures in the proposed rule is based upon information in the EA.

NS 2 of the MSA requires that the FMP's conservation and management measures be based upon the best scientific information available. Analyses of the proposed action incorporate the most complete data set from recent fishing years that is available to assess the impacts of these measures. These data represent the best information available, and are consistent with the principles for evaluating best scientific information available, as approved in the NS 2 Guidelines (78 FR 43066; July 19, 2013) regarding relevance, inclusiveness, objectivity, transparency, timeliness, verification, validation, and peer review. These measures have been determined to be in compliance with NS 2 based upon the best scientific information available.

The policy choices are clearly articulated in Section 4.0 of this document as the management alternatives considered in this action. The supporting science and analyses, upon which the policy choices are based, are summarized and described in section 7.0 of this document. All supporting materials, information, data, and analyses within this document have been, to the maximum extent practicable, properly referenced according to commonly accepted standards for scientific literature to ensure transparency.

The review process used in preparation of this document involves the NEFSC, the Greater Atlantic Regional Office, and NOAA Fisheries Service Headquarters. The NEFSC'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 document and clearance of a final rule prepared to implement the catch limits is conducted by staff at NOAA Fisheries Service Headquarters, the Department of Commerce, and the U.S. Office of Management and Budget.

8.8 Executive Order 13132 (Federalism)

This Executive Order (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 proposed measures in this 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 NEFMC and MAFMC (all affected states are represented as voting members of at least one Regional Fishery Management Council). No comments were received from any state officials relative to any federalism implications that may be associated with this action.

8.9 Executive Order 13158 (Marine Protected Areas)

The E.O. 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. This 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 E.O. The E.O. requires that the Departments of Commerce and the Interior jointly publish and maintain such a list of MPAs. A list of MPA sites has been developed and is available at: http://marineprotectedareas.noaa.gov/nationalsystem/nationalsystemlist/. No further guidance related to this E.O. is available at this time.

8.10 Administrative Procedure Act (APA)

This action was developed in compliance with the requirements of the Administrative Procedure Act, and these requirements will continue to be followed when the proposed regulation is published. Section 553 of the Administrative Procedure Act establishes procedural requirements applicable to informal rulemaking by federal agencies. The purpose of these requirements is to ensure public access to the federal rulemaking process, and to give the public adequate notice and opportunity for comment. At this time, the Council is not requesting any abridgement of the rulemaking process for this action.

8.11 Regulatory Impact Review and Initial Regulatory Flexibility Analysis (EO 12866 and IRFA)

8.11.1 Determination of significance under E.O. 12866

The purpose of E.O. 12866 is to enhance planning and coordination with respect to new and existing regulations. This E.O. requires the Office of Management and Budget (OMB) to review regulatory programs that are considered to be "significant." Section 8.11 of this document represents the RIR, which includes an assessment of the costs and benefits of the Proposed Action in accordance with the guidelines established by E.O. 12866. NMFS guidelines provide criteria to be used to evaluate whether a proposed action is significant.

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

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

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

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

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

Section 7.4 presents a detailed economic analysis for the proposed action. This analysis is also summarized below, with references to the relevant tables in Section 7.4. Together, the economic analysis included in Section 7.4 and this RIR demonstrate that the proposed action is not "significant" because it will not have an annual effect on the economy of $100 million or more, or adversely affect in a material way the economy or a sector of the economy, productivity, jobs, the environment, public health, or safety, or State, local, or tribal governments or communities.

8.11.1.1 Objectives

The goals and objectives of FW10 are consistent with the goals of the original FMP, which specified the following management objectives:

1. To end and prevent overfishing; rebuilding and maintaining a healthy spawning stock;
2. To optimize yield and maximize economic benefits to the various fishing sectors;
3. To prevent increased fishing on immature fish;
4. To allow the traditional incidental catch of monkfish to occur.

As noted in Section 3.3, the goals and objectives for this framework supplement the basic FMP objectives. This framework is intended to address identified needs consistent with these FMP objectives.

8.11.1.2 Description

A description of the entities affected by this Framework Adjustment, specifically stakeholders in the Monkfish Fishery, is provided in Section 6.3 of this document, Human Environment, Vessels, Ports and Communities. Monkfish revenues, landings, and average price per live pound from incidental and directed trips are also summarized by trip state and trip port for FY2015 in Table 35 in Section 7.4.

8.11.1.3 Problem Statement

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

8.11.1.4 Analysis of Alternatives

This section provides an analysis of each proposed alternative of FW10 as mandated by E.O. 12866. The focus will be on the expected changes 1) in net benefits and costs to stakeholders of the Monkfish Fishery, 2) changes to the distribution of benefits and costs within the industry, 3) changes in income and employment, 4) cumulative impacts of the regulation, and 5) changes in other social concerns. Much of this information is captured already in the detailed economic impacts and social impacts analyses of Section 7.4 and Section 7.5 of this document. This RIR will summarize and highlight the major findings of the economic impacts analysis provided in Section 7.4 of this document, as mandated by E.O. 12866. For social impacts of each alternative, see Section 7.5.

When assessing net benefits and costs of the proposed FY2017-FY2019 specifications, it is important to note that the analysis will focus on the changes in producer surplus earned by the impacted fishing businesses. Consumer surplus is not expected to be affected by any of the regulatory changes proposed in FW10, given the supply of substitutes for monkfish.

8.11.1.4.1 Revised Annual Catch Limits

A detailed description of this alternative can be found in Section 4.1.1 of this document.

Option 1: No Action

If this option was adopted, the existing DAS allocations and landings limits implemented by FW8 (NEFMC, 2014) would remain in place for FY2017-FY2019. In the NFMA, daily landings limits would continue to be 1,250 pounds tail weight per DAS for monkfish permit Category A and C vessels and 600 pounds tail weight per DAS for Category B and D vessels. Allocated DAS (excluding the 4 DAS carryover) would continue to be 45 DAS, as in FY2014-FY2016. Total monkfish landings in the NFMA for FY2015 were 9.1 million live pounds, or approximately 71% of the overall TAL for the NFMA. In the SFMA, daily landing limits would continue to be 610 pounds tail weight per DAS for monkfish permit Category A and C vessels and 500 pounds tail weight per DAS for Category B and D vessels. Allocated DAS in the SFMA would continue to be 32 DAS (excluding the 4 DAS carryover) in FY2017-FY2019, as they were in FY2014-FY2016. Total monkfish landings in the SFMA for FY2015 were approximately 10.4 million live pounds, or 53% of the overall TAL.

Table 71 presents estimated monkfish landings and revenues for both management areas for FY2017 under Option 1 (the No Action Alternative). These estimates should be interpreted with caution, as they rest on several assumptions. The first is the effort and landings remained identical to what they were in FY2015; this assumption applies to both monkfish landings in each fishery management area and monkfish landings by port. The second is that the average price per live lb. for monkfish, $0.96 per live lb., will remain constant into FY2017, which implies that both supply and demand for monkfish remain constant. For Option 1, we do not need to account for the possibility that ex-vessel price may change as a result of a change in monkfish landings, since monkfish landings are expected to remain the same during FY2017-FY2019 under this Option. The No Action Alternative is expected to result in about 9.1 million live lb. of monkfish landings from the NFMA in FY2017, based on FY2015 NFMA landings. Assuming that the average monkfish prices observed in FY2015 continue into FY2017 ($0.96 per live pound), this would result revenues of nearly $8.8 million from monkfish landed in the NFMA during FY2017. The projected total revenue from monkfish for the NFMA includes revenue from all monkfish landings in the NFMA from all permit categories. Similarly, assuming that landings and effort levels remain unchanged from FY2015 in the SFMA, the No Action Alternative can be expected to result in about 10.4 million live lb. of monkfish landings from the SFMA in FY2017. If the average monkfish prices observed in FY2015 continue into FY2017 ($0.96 per live pound), this would result in monkfish revenues of about $10.0 million during FY 2017. We cannot estimate monkfish landings and monkfish revenues at the trip port level for FY2017, but given the assumption that effort and landings are not expected to change in FY2017 from their FY2015 levels, we would expect port level monkfish landing and revenues to be similar to those presented in Table 35 in Section 7.4 for FY2015.

Table 71 - Projected total monkfish landings and total monkfish revenues for the NFMA and SFMA for FY2017 under the No Action Alternative, all monkfish permit categories, directed and incidental landings.

Management Area	Projected Monkfish Fishery Landings (live lbs.)	Projected Price per Pound ($2015 per live lb.)	Projected Revenue ($2015)
NFMA	9,121,088	$0.96	$8,756,244
SFMA	10,447,707	$0.96	$10,029,799
Total	**19,568,795**	$0.96	**$18,786,043**

Table 72 summarizes projected total monkfish revenue from all monkfish landings for the entire FY2017-FY2019 period (the total over 3 years) under the No Action Alternative. Again, these projections assume that monkfish landings in each management area remain what they were in FY2015, and that the average price of monkfish per pound remains what it was in FY2015. Since landings are not expected to change during FY2017-FY2019 under the No Action Alternative and the analysis holds all other factors constant, we do not expect ex-vessel average price for monkfish to change from what it was in FY2015.

Table 72 - Projected total monkfish landings and total monkfish revenues for the NFMA and SFMA over FY2017-FY2019 under the Option 1 (the No Action Alternative), assuming no price change.

Management Area	Projected Total Monkfish Landings (live lbs.), FY2017-FY2019	Projected Average Price per lb. for monkfish ($2015 per live lb.)	Total Projected Monkfish Revenue ($2015), FY2017-FY2019
NFMA	27,363,264	$0.96	$26,268,733
SFMA	31,343,121	$0.96	$30,089,396
Total	**58,706,385**		**$56,358,130**

No immediate economic impacts would be expected from Option 1, assuming that other factors external to this action that may influence monkfish landings and revenues remain constant. We would not expect any changes in producer surplus from Option 1.

Option 2: Updated Discard Rate for Northern and Southern Fishery Management Areas

The economics impacts of implementing Option 2 alone are possibly slightly low negative, but more likely neutral, relative to Option 1 (the No Action Alternative). Table 73 presents a summary of the FY201Y-FY2019 monkfish specifications under Options 1 and 2.

Table 73 - Summary of FY2017-FY2019 monkfish specifications for the NFMA and SFMA under Option 1 (No Action) and proposed alternative Option 2.

Management Area	Alternative	ACL/ABC (mt)	Management Uncertainty Buffer (%)	ACT (mt)	Discard Rate (%)	TAL (mt)	Difference in TAL (Alternative-Option 1) (mt)
NFMA	Option 1	7,592	13.5	6,567	10.9	5,854	
	Option 2	7,592	13.5	6,567	13.9	5,652	-202
SFMA	Option 1	12,316	6.5	11,513	22.5	8,925	
	Option 2	12,316	6.5	11,513	24.6	8,686	-239

Option 2 would maintain the ACL, the management uncertainty buffer and ACT for both management areas as set in FW8 (NEFMC, 2014), but would use the information from the 2016 operational assessment to update the discard rate for both management areas. As a result, the TALs for both the NFMA and SFMA would decrease under Option 2 relative to the No Action Alternative. In the NFMA, Option 2 would change the discard rate from -10.9% to -13.9%. Total allowable landings would decrease from 5,854mt to 5,652mt (-202mt or -445,318 live pounds) for the NFMA. In the SFMA, Option 2 would change the discard rate from -22.5% to -24.6%. Total allowable landings in the SFMA would decrease from 8,925mt to 8,686mt (-239mt or -526,882 live pounds).

The economic impacts of Option 2 relative to the No Action Alternative are possibly slightly low negative, but more likely neutral. For both the NFMA and the SFMA, the decrease in the TAL is modest. The TAL limits for each area under the No Action Alternative do not appear to be constraining landings in either the NFMA or SFMA; total landings of monkfish are not bumping up against the existing TALs. Over FY2010-2016, the average percent of the NFMA TAL landed was 63%. For the same time period, the average percent of the SFMA TAL landed was 64%. Therefore, it is unlikely that TAL reductions of 202mt (-445,318 live pounds) for the NFMA and 239mt (-526,882 live pounds) for the SFMA would adversely affect monkfish revenues relative to the No Action Alternative. If monkfish landings in FY2017-FY2019 differed substantially from FY2014-FY2016, such that the fishery came very close to landing the TALs during FY2017-FY2019, it is possible that Option 2 could result in lower monkfish revenues than the No Action Alternative, since Option 2 lowers the TALs for both management areas relative to the No Action Alternative. In this case, we would expect decreases in producer surplus under Option 2 relative to what would be realized under Option 1, the No Action Alternative. The degree to which monkfish revenues would decrease would depend on whether average monkfish price remained constant, or increased in response to decreases in monkfish landings. However, this is very unlikely to happen since there is no expectation that the fishery will bump against either the TALs under the No Action Alternative or the slightly lower TALs that would be established by Option 2.

Option 3: Reduce the Management Uncertainty Buffer to 3% in the Northern Fishery Management Area (*Preferred Alternative*)

Option 3 would reduce the management uncertainty buffer in the NFMA to 3%. The ACL and ABC for the NFMA would remain at 7,592mt. It should be noted that Option 3 is inclusive of Option 2, which means that under Option 3 the management uncertainty buffer would be reduced relative to the No Action Alternative *and* the estimated discard rate would be changed from -10.9% under the No Action Alternative to -13.9%. The TAL for the NFMA would increase to 6,338mt (13,972,901 live lbs.) if Options 2 and 3 were both implemented, compared to 5,854mt (12,905,863 live lbs.) under the No Action Alternative (+1,067,038 live lbs.). Table 74 presents a summary of the FY2017-FY2019 monkfish specifications for the NFMA under Options 1 and 3.

Table 74 - Summary of FY2017-FY2019 monkfish specifications for the NFMA under Option 1 (No Action) and proposed alternative Option 3 (the preferred alternative).

Management Area	Alternative	ACL/ABC (mt)	Management Uncertainty Buffer (%)	ACT (mt)	Discard Rate (%)	TAL (mt)	Difference in TAL (Alternative-Option 1) (mt)
NFMA	Option 1	7,592	13.5	6,567	10.9	5,854	
	Option 3	7,592	3	7,364	13.9	6,338	+484

The economic impacts of Option 3 relative to the No Action Alternative (Option 1) are likely to be neutral to possibly slightly low positive for those landing monkfish in the NFMA. Option 3 can be expected to have neutral to slightly low positive impacts in the NFMA relative to Option 2. Any positive economic impacts, should they occur, would occur due to increased revenues and producer surplus for those harvesting monkfish in the NFMA. The existing NFMA TAL does not appear to be constraining landings in the NFMA. Therefore, we would not expect substantial increases in NFMA landings from implementation of Option 3. Since we do not expect substantial increases in landings, we do not expect any change in average ex-vessel price for monkfish, all else held constant. Therefore, Option 3 is expected to have minimal positive impact, if any, on monkfish revenues for those landing monkfish in the NFMA. Any positive impacts on monkfish revenues from the NFMA TAL increase of +484mt would occur only if the TAL under the No Action Alternative were constraining to monkfish fishing in the NFMA.

In the unlikely event that vessels were able to land and sell the additional the 484mt (1,067,038 live lbs., an 8.3% increase in NFMA landings), each year in FY2017-FY2019 at the FY2015 average price of monkfish per live pound ($0.96 per live pound), the increase in monkfish revenue per year would be $1,024,356 in FY2017 or $3,073,068 over FY2017-FY2019. This additional revenue would accrue to vessels landings monkfish in the NFMA. We would not expect to see a change in average monkfish price from implementation of Option 3. However, if price decreased in response to increased landings, the economic benefit to monkfish vessels landing in the NFMA would be lower. Any increases in monkfish revenue would not necessarily translate into increased profit to monkfish vessels; realized changes in profit would depend not only on the effect of increased monkfish landings on average ex-vessel price for monkfish, but also on the costs associated with harvesting the additional monkfish. In addition, if increased landings in the NFMA negatively affected ex-vessel price, this could impact the ex-vessel price received by vessels landing monkfish in the SFMA. If monkfish landings increase in the NFMA, but there is no price change and all other factors remain constant, vessels harvesting monkfish in the NFMA would benefit from increases in producer surplus.

Option 4: Reduce the Management Uncertainty Buffer to 3% in the Southern Fishery Management Area (*Preferred Alternative*)

Option 4 would reduce the management uncertainty buffer in the SFMA to 3%. The ACL and ABC for the SFMA would remain at 12,316mt. It should be noted that Option 4 is inclusive of Option 2, which means that the management uncertainty buffer would be reduced relative to the No Action Alternative *and* the estimated discard rate would be changed from -22.5% under the No Action Alternative to -24.6% under Option 2. The TAL for the SFMA would increase to 9,011mt (19,865,858 live lbs.) if both Options 2 and 4 were implemented, compared to 8,925mt (19,676,260 live lbs.) under the No Action Alternative (+86mt or +189,598 live lbs.). Table 75 presents a summary of the FY201Y-FY2019 monkfish specifications for the SFMA under Options 1 and 3.

Table 75 - Summary of FY2017-FY2019 monkfish specifications for the SFMA under Option 1 (No Action) and proposed alternative Option 3 (the preferred alternative).

Management Area	Alternative	ACL/ABC (mt)	Management Uncertainty Buffer (%)	ACT (mt)	Discard Rate (%)	TAL (mt)	Difference in TAL (Alternative-Option 1) (mt)
SFMA	Option 1	12,316	6.5	11,513	22.5	8,925	
	Option 4	12,316	3	11,947	24.6	9,011	+86

The economic impacts of Option 4 (the Preferred Alternative) relative to the No Action Alternative (Option 1) are likely to be neutral to possibly slightly low positive for those landing monkfish in the SFMA. Option 4 can be expected to have neutral to slightly low positive impacts in the SFMA relative to Option 2. Any positive economic impacts, should they occur, would be in the form of increased revenues. The existing SFMA TAL does not appear to be constraining overall landings in the SFMA. Therefore, we would not expect substantial increases in SFMA landings from implementation of Option 4. Since we do not expect substantial increases in landings, we do not expect any change in average monkfish price, all else held constant. Therefore, Option 4 is expected to have minimal positive impact, if any, on monkfish revenues for those landing monkfish in the SFMA. Any positive impacts from the SFMA TAL increase of +86mt would occur only if the TAL under the No Action Alternative were constraining monkfish fishing in the SFMA.

In the unlikely event that vessels were able to land and sell the additional 84mt (189,598 live lbs.) each year in FY2017-FY2019, at the FY2015 average price of monkfish per live lb. ($0.96 per live lb.), the increase in monkfish revenue per year would be $182,014 in FY2017 or $546,042 over FY2017-FY2019. This additional revenue would accrue to vessels landings monkfish in the SFMA. We would not expect to see a change in average monkfish price from implementation of Option 4 given both that landings are not expected to change and that even if landings did increase, the increase would be very small. Therefore, compared to the No Action Alternative, we expect that Option 4 would most likely have a neutral impact on vessels landing monkfish in the SFMA.

8.11.1.5 Modifications to Current Monkfish Effort Controls

A detailed description of this alternative can be found in Section 4.1.2 of this document.

Vessels must be fishing under one or a combination of the following to land more than incidental amounts of monkfish: a monkfish DAS, a Northeast (NE) multispecies DAS, an Atlantic sea scallop DAS. Vessels with monkfish permits in categories C and D (i.e. those also issued a limited access NE multispecies DAS permit) can declare a monkfish DAS while at sea in the NFMA if they are fishing on a NE multispecies DAS and declared the “monkfish option” prior to leaving port at the start of its trip. Monkfish Permit Category C and D vessels fishing in the NFMA on both a NE multispecies and monkfish DAS do not have a monkfish trip limit.

The economic impacts analysis presented below follows from the daily landings limit and days at sea (DAS) allocation analysis presented in Appendix I (Hermsen, 2016). The objective of this analysis was to examine daily landings limits and DAS allocations under status quo TAL limits for both the NFMA and SFMA, and under TALs for those alternatives which lower the uncertainty management buffer and adjust the discard rates (these alternatives are discussed above in Section 4.0). The daily landings limit (trip limit) and DAS allocation analysis was conducted based on three assumptions, which must be kept in mind when considering the economic impacts analysis of modifications to the DAS allocation and/or daily landings limits. The assumptions are:

- Monkfish landings from monkfish permit category E (open access or incidental catch permit) and state-only permitted vessels will be exactly the same (in terms of live pounds landed) for each year in the FY2017-FY2019 period as they were in FY2015. In the NFMA, FY2015 monkfish landings by permit category and state-permitted vessels were 459,219 live pounds. For the SFMA, FY2015 monkfish landings by these vessels totaled 878,730 live pounds.

- Monkfish landings and effort on trips by limited access vessels on non-directed (incidental) monkfish trips will be equal to what they were in FY2015 for each year in the FY2017-FY2019 period.

- Fishing and landings patterns will be similar for each year in FY2017-FY2019 to those observed in FY2015.

The assumption of this approach is that any increases in landings due to changes in daily landings limits and/or DAS allocations will occur proportionately over all vessels that land monkfish in the management area and have a permit to which a given alternative applies. While it is likely that there would be heterogeneity in vessels that land monkfish in response to the proposed alternatives due to factors such as vessel-level preferences, costs and available alternatives to monkfish fishing, we cannot make other assumptions about the distribution of possible increased monkfish landings without conducting a vessel-level analysis.

This action would only revise monkfish DAS allocations and landing limits applicable to vessels that hold a limited access monkfish permit; therefore, the following analysis focuses on those entities (monkfish permit category A, B, C, D and H vessels). Estimated monkfish landings from Category E monkfish and state-only permitted vessels are assumed to remain what they were in FY2015 for each year through the FY2017-FY2019 period.

8.11.1.5.1 Modify the DAS allocation and/or trip limits in the NFMA

Option 1: No Action

Under the No Action Alternative, existing daily landing limits and DAS allocations would remain unchanged from those specified in FW8. In the NFMA, daily landings limits would continue to be 1,250 pounds tail weight per DAS for monkfish permit Category A and C vessels and 600 pounds tail weight per DAS for Category B and D vessels. Allocated DAS (excluding the 4 DAS carryover) would continue

to be 45 DAS, as in FY2014-FY2016. Total monkfish landings in the NFMA for FY2015 were 9.1 million live pounds, or approximately 71% of the overall TAL for the NFMA. If there are no changes to the status quo estimated discard rate and management uncertainty buffer for the NFMA, economic impacts from the No Action Alternative would be neutral, as described in Section 7.4.1.1.1.

If the discard rate for the NFMA is updated as described in Section 7.4.1.1.2, without changes to daily landing limits or DAS allocations, economic impacts will be similar to those described in that section. If the management uncertainty buffer is reduced for the NFMA to 3.0%, as described in Section 7.4.1.1.3, the economic impacts of the No Action Alternative for modifying daily landings limits and/or DAS allocations will be similar to those described in that section.

Option 2: Increase the incidental trip limits in the NFMA (*Preferred Alternative*)

Option 2 would maintain the status quo DAS allocations and the status quo trip limits when fishing on a monkfish DAS in the NFMA, but would increase incidental landing limits when fishing in the NFMA on a NE multispecies DAS to 900 lb. tail weight/DAS for Category C vessels (+300 lb. tail weight/DAS compared to No Action) and 750 lb. tail weight/DAS for Category D vessels (+250 lb. tail weight/DAS compared to No Action). Incidental landing limits would remain at 25% of landings onboard, not to exceed 300 lb. tail weight for permit category E, F, or H, when fishing on a NE multispecies DAS.

Overall economic impacts from Option 2 relative to No Action are expected to be neutral to possibly slightly low positive, regardless of whether the management uncertainty buffer remains at 13.5% or is lowered to 3.0%. Any positive economic impacts from Option 2 would accrue to monkfish permit Category C and D vessels that are landing monkfish in the NFMA while fishing on a NE multispecies DAS. Monkfish permit Category C vessels that that declared the “monkfish option” prior to the start of the trip, and land between 600 and 900 lbs. t.w./DAS of monkfish while fishing on a NE multispecies DAS, would no longer be required to declare the “monkfish option” while at sea. Similarly, monkfish permit Category D vessels that declared the “monkfish option” prior to the start of the trip, and land between 500 and 750 lbs. t.w./DAS of monkfish while fishing on a NE multispecies DAS would no longer be required to declare the “monkfish option” while at sea. Vessels with monkfish permits C and D that did not declare the “monkfish option” prior to the start of the trip would have increased flexibility to land monkfish incidentally (+300 and +200 lbs. t.w./DAS for Category C and Category D vessels). Option 2, compared to No Action, would likely decrease the administrative burden associated with declaring the “monkfish option” prior to leaving port and a monkfish DAS while at sea for Category C and D Vessels fishing on a NE multispecies DAS. In addition, Option 2 may reduce regulatory discards of monkfish caught incidentally while fishing on a NE multispecies DAS.

Landings in the NFMA are not expected to change under Option 2, which means that there would likely be no change in average monkfish price or monkfish revenues. This suggests that we would not expect changes in producer surplus from Option 2 (the Preferred Alternative) relative to the Option 1 (the No Action Alternative). Currently, most allocated monkfish DAS in the NFMA go unused, and the proposed increases in incidental trip limits under Option 2 would likely reduce allocated monkfish DAS usage even further. The analysis suggests that a higher incidental trip limit of 900lbs. t.w. per DAS for monkfish permit Category C vessels would likely mean that the majority of directed landings by Category C vessels (who may have been fishing under a monkfish DAS) would become incidental landings (while fishing on a multispecies DAS) under Option 2 (Hermsen, 2016 [Appendix I], Figure 3). The analysis also suggests that for Category D vessels, nearly all of the directed activity by these vessels would become incidental if the incidental trip limit were to increase to 750 lbs. t.w. per DAS (Hermsen, 2016 [Appendix I], Figure 4).

Table 40 in Section 7.4 provides the numbers of vessels with monkfish permits in Categories C and D by trip state and trip port that could be impacted by Option 2, based on monkfish landings in the NFMA during FY2015.

8.11.1.5.2 Modify the DAS allocation and/or trip limits in the SFMA

Option 1: No Action

Under the No Action Alternative, existing daily landing limits and DAS allocations would remain unchanged from those specified in FW8. In the SFMA, daily landing limits would continue to be 610 pounds tail weight per DAS for monkfish permit Category A and C vessels and 500 pounds tail weight per DAS for Category B and D vessels. The trip limit for monkfish permit Category F vessels would be 1,600 lbs. Allocated DAS would be 32 DAS (excluding the 4 DAS carryover) in FY2017-FY2019, as they were in FY2014-FY2016. The incidental landing limit would remain unchanged. Total monkfish landings in the SFMA for FY2015 were approximately 10.4 million live pounds, or 53% of the overall TAL. Compared to the NFMA, a higher percentage of monkfish landings in the SFMA come from directed activity.

If there are no changes to the status quo estimated discard rate and management uncertainty buffer, economic impacts from the No Action Alternative would be neutral, as described in Section 7.4.1.1.1.

If the discard rate for the SFMA is updated as described in Section 7.4.1.1.2, the combined economic impacts of the updated discard rates, without changes to daily landing limits or DAS allocations, will be similar to those described in that section. If the management uncertainty buffer is reduced for the SFMA as described in Section 7.4.1.1.4, the economic impacts of no action for modifying daily landings limits and/or DAS allocations in the SFMA to 3% will be similar to those described in that section.

Option 2: Increase the incidental trip limits in the SFMA (*Preferred Alternative*)

Option 2 would increase the SFMA DAS allocation from its existing level of 32 DAS by 15% to 37 DAS (+ 5 DAS). It would also increase the SFMA daily landings limit by 15%. Trip limits for monkfish permit Categories A and C would increase to 700 pounds tail weight per DAS (+90 pounds tail weight per DAS compared to No Action). Trip limits for monkfish permit Categories B and D would increase to 575 pounds tail weight per DAS (+75 pounds tail weight per DAS compared to No Action). Incidental landing limits would remain at 50 lb. tail weight per DAS for Category E or Category H permits and non-trawl Category C, D, or F vessels. For trawl vessels with monkfish permits in Categories C, D or F, the incidental landing limit would remain at 300 pounds tail weight per DAS.

Option 2 is expected to have overall economic impacts that are low positive to positive compared to the No Action Alternative. Vessels with limited monkfish permits in Categories A, B, C, and D that land monkfish in the SFMA on directed trips will be the beneficiaries of any positive economic impacts. Any positive economic impacts would occur in the form of increases in producer surplus for limited access monkfish vessels that land in the SFMA. Depending upon how any increases in monkfish landings affect average ex-vessel price for monkfish, economic impacts from Option 2 are expected to range from low negative to neutral for vessels landing monkish in the NFMA, and vessels in either area that land

monkfish incidentally or under a Category E or state permit. Any negative economic impacts to these vessels would occur in the form of reductions in producer surplus.

Compared to the NFMA, the SFMA has more directed monkish effort. Allocated monkfish DAS and daily landing limits are more constraining in the SFMA than in the NFMA. The DAS allocation and daily landings limits for the SFMA demonstrates that some vessels in the SFMA are using nearly all their allocated DAS in the SFMA (Hermsen, 2016 [Appendix I], Figure 2). The objective of increasing allocated DAS and landing limits in the SFMA is to allow increased ability to harvest monkfish (to increase landings up towards the TAL for the SFMA), but do so in a modest way to avoid large increases in monkfish landings and possible negative effects on monkfish price. Because of the desire to maintain market stability in terms of price and continuous supply of monkfish, this economic impacts analysis does consider the impact of increasing allocated DAS to a point where the entire directed fishery FY2017 TAL might be harvested. Monkfish industry advisors expressed consensus that the market could absorb modest increases in allocated DAS and daily landings limits the SFMA without a negative effect (decrease) in ex-vessel price for monkfish.

Under both management uncertainty buffer scenarios (the status quo of 6.5% and the proposed alternative of 3.0%), limited access monkfish landings in the SFMA are projected to increase in FY2017 (compared to FY2015 and No Action) by the same amount under Option 2. Projected limited access monkfish landings per year for each year during FY2017-FY2019 in the SFMA are 12,345,092 live lbs., compared to 9,193,662 live lbs. under No Action Alternative (Table 7, Hermsen, 2016 [Appendix I]). This represents an increase of +3,151,430 live lbs. or 34.2%. Since projected limited access monkfish landings in the SFMA are expected to be the same regardless of the management uncertainty buffer, the ranges for projected monkfish revenues under Option 2, with the status quo management uncertainty buffer or an updated management uncertainty buffer of 3.0%, are the same. Projected monkfish revenue from limited access monkish landings in the SFMA for each year during FY2017-FY2019 are presented in Table 76.

Table 76 - Projected limited access monkfish landings and monkfish revenues for the SFMA for each year during FY2017-FY2019 under No Action versus Option 2, depending on price effects.

Alternative	Projected Monkfish Landings (live lbs.)	Lower Bound Estimate Projected Monkfish Revenue under average price of $0.83/live lb.	Upper Bound Estimate Projected Monkfish Revenue under average price of $0.96/live lb.
No Action	9,193,662		$8,825,916
Option 2, status quo management uncertainty buffer (6.5%)	12,345,092	$10,246,426	$11,851,288
Option 2, updated management uncertainty buffer (3.0%)	12,345,092	$10,246,426	$11,851,288

The impact of an increase in monkfish landings in the SFMA will depend upon the effect the increased landings have on monkfish price, if any. Upper and lower bounds for projected monkfish revenues for Option 2 are estimated using two assumptions: 1) that increased monkfish landings in the SFMA will have no effect on average monkfish price (average monkfish price remains at $0.96 per live lb.) and 2) that increased monkfish landings in the SFMA will result in decreases in average monkfish price according to the price flexibility estimate of -0.41 (average monkfish price falls to $0.83 per live lb.). Depending upon price effects, Option 2 is projected to result in $10.2 million to nearly $11.9 million in monkfish revenue from limited access landings in the SFMA, an increase of $1,420,511 to $3,035,373 per year compared to projected revenues under No Action. Table 77 summarizes projected total limited access monkfish landings and total monkfish revenues for the SFMA over FY2017-FY2019 under No Action versus Option 2, depending on price effects.

Table 77 - Projected total limited access monkfish landings and total monkfish revenues for the SFMA over FY2017-FY2019 under No Action versus Option 2, depending on price effects.

Alternative	Projected Monkfish Landings (live lbs.)	Projected Monkfish Revenue under average price of $0.83/ live lb.	Projected Monkfish Revenue under average price of $0.96/live lb.
No Action	27,580,986		$26,477,747
Option 2, status quo management uncertainty buffer (6.5%)	37,035,276	$30,739,279	$35,553,865
Option 2, updated management uncertainty buffer (3.0%)	37,035,276	$30,739,279	$35,553,865

Table 78 summarizes the additional limited access monkfish landings and monkfish revenues Option 2 is projected to result in over the FY2017-FY2019 period (regardless of whether the uncertainty buffer remains at its status quo of 6.5% or is updated to 3%), compared to landings and revenues projected under the No Action Alternative. Depending on price effects, Option 2 is expected to result in an additional 9.4 million live lbs. of monkfish landings in the SFMA, and an additional $4.2 million to nearly $9.1 million in monkfish revenue over the three year period.

Table 78 - Difference between projected total limited access monkfish landings and revenue for the SFMA, over FY2017-FY2019, under the No Action Alternative versus Option 2, depending upon price effects.

	Projected Monkfish Landings (live lbs.)	Projected Monkfish Revenue under average price of $0.83/ live lb.	Projected Monkfish Revenue under average price of $0.96/live lb.
Option 2 (regardless of status quo or updated uncertainty buffer)	37,035,276	$30,739,279	$35,553,865
No Action	27,580,986		$26,477,747
Difference (Option 2 - No Action)	9,454,290	+$4,261,533	+$9,076,118

If the flexibility to take longer trips or more trips allows these vessels to increase net revenue (i.e. if gross revenues exceed the costs associated with the longer or additional trips), these vessels would benefit from increases in producer surplus and profitability, assuming average monkfish price and other market conditions remain stable during FY2017-FY2019. However, it is also possible that if vessels fishing in the

SFMA opt to take more trips or longer trips because of Option 2, their variable (trip-related) costs could increase. This may result in decreased profitability for a vessel if it cannot offset the increases in cost with increases in revenue from sales of fish, although it seems unlikely that a monkfish vessel would choose to extend a trip or take additional trips if these actions were not expected to be profitable.

Option 2 is not expected to result in changes in the monkfish landings of monkfish permit Category E and state-only permitted vessels in either the NFMA or the SFMA. Option 2 is also not expected to result in changes in monkfish landings in the NFMA by limited access vessels. However, increased monkfish landings by the limited access fleet in the SFMA under Option 2 could have the effect of lowering average ex-vessel price, as estimated by the price flexibility estimate of -0.41. If this occurs, the monkfish revenues from monkfish landed by Category E and state permitted only vessels in either area could fall and decreases in producer surplus for Category E and state permitted only vessels could occur. In addition, revenues from monkfish landings in the NFMA by limited access vessels could also fall, since Option 2 is not expected to increase monkfish landings in the NFMA. In this case, producer surplus for vessels landings monkfish in the NFMA would decrease. Table 79 summarizes possible impacts on monkfish landings and revenues for monkfish permit Category E and state-only permitted vessels, depending upon price effect. For all three years in the FY201-FY2019 period, the expected difference in monkfish revenues under Option 2 versus the No Action Alternative for Category E and state-only permitted vessels landing in both management areas is $-521,800 (-$173,933 per year) to $0.

Table 79 - Projected monkfish landings and monkfish revenues over FY2017-FY2019 for vessels with a Category E monkfish permit and state-permitted only vessels, by management area, depending upon price effects.

Management Area	Projected Monkfish Landings by Cat E & State-Only Permitted Vessels	Lower Bound Estimate Projected Monkfish Revenue under average price of $0.83/ live lb.	Upper Bound Estimate Projected Monkfish Revenue under average price of $0.96/live lb.	Possible difference in monkfish revenue depending upon price effect (Option #2 - No Action)
NFMA	1,377,657	$1,143,455	$1,322,551	-$179,095 to $0
SFMA	2,636,190	$2,188,038	$2,530,742	-$342,705 to $0
Total (NFMA & SFMA)	4,013,847	$3,331,493	$3,853,293	-$521,800 to $0

Table 80 summarizes possible impacts to limited access vessels landing monkfish in the NFMA, depending upon any effects Option 2 has on the average ex-vessel price for monkfish. For all three years in the FY201-FY2019 period, the expected difference in monkfish revenues under Option 2 versus the No Action Alternative for limited access permit holders landing in the NFMA is -$3.3 million (-$1.1 million per year) to $0.

Table 80 - Projected monkfish landings and monkfish revenues over FY2017-FY2019 for vessels holding a limited access monkfish permit from landing monkfish in the NFMA, under Option 2 versus the No Action Alternative, depending upon price effects.

Alternative	Projected Monkfish Landings (live lbs.) by limited access vessels in the NFMA	Lower Bound Estimate Projected Monkfish Revenue under average price of $0.83/ live lb.	Upper Bound Estimate Projected Monkfish Revenue under average price of $0.96/live lb.	Possible difference in monkfish revenue due to price effect (Option #2 - No Action)
No Action	25,661,748		$24,635,278	
Option 2, status quo management uncertainty buffer (6.5%)	25,661,748	$21,299,251	$24,635,278	-$3,336,027 to $0
Option 2, updated management uncertainty buffer (3.0%)	25,661,748	$21,299,251	$24,635,278	-$3,336,027 to $0

The overall possible economic impacts of Option 2 are presented in Table 81. The overall net economic impact of Option 2 compared to the No Action Alternative is expected to be low positive to positive. Compared to the No Action Alternative, Option 2 is estimated to result in nearly 9.5 million live pounds of additional monkfish landings in the SFMA over the period from FY2017 to FY2019. The ultimate impact on monkfish revenues and producer surplus for all vessels landing monkfish will depend upon whether or not these increased landings result in a decreased average ex-vessel price for monkfish.

Option 2 is expected to result in increased overall monkfish revenues compared to the No Action Alternative; this increase is expected to range from $403,705 to nearly $9.1 million over the three year period. Vessels with monkfish permits in Categories A, B, C, D and landing monkfish in the SFMA are expected to benefit from increased monkfish revenues under Option 2 versus the No Action Alternative, regardless of price effect. Vessels landing in the SFMA under a Category E or state only permit are not expected to see any changes in landings as a result of Option 2, but monkfish revenues could decrease for these vessels if the expected increases in landings from limited access vessels in the SFMA negatively impact price. The expected increase in monkfish revenues for limited access vessels landing in the SFMA outweighs the possible decrease in monkfish revenues to those landing monkfish in the SFMA under a Category E or state permit. Overall, for vessels landing monkfish in the SFMA, Option 2 is expected to result in $3.9 million to $9.1 million in additional monkfish revenue over the FY2017-FY2019 period compared to the No Action Alternative. Under Option 2, the expected increases in monkfish revenue for vessels with permits in Categories A/C and B/D landing monkfish in the SFMA will not necessarily translate into increased profit to monkfish. Realized changes in producer surplus or profit for these vessels will depend not only on the effect of increased monkfish landings on average ex-vessel price for

monkfish, but also on the costs associated with the additional monkfish landed. Table 47 in Section 7.4 provides a listing of the numbers of monkfish permits in Categories A/C and B/D that landed monkfish in the SFMA on a directed in FY2015, by trip state and trip port. These are the permits that may benefit from Option 2 due to increases in producer surplus.

The economic impacts of Option 2 versus the No Action Alternative for vessels landing monkfish in the NFMA are expected to be low negative to neutral, depending upon the impact on average ex-vessel price for monkfish from increased landings in the SFMA. If the expected increases in monkfish landings in the SFMA has no impact on price, as industry advisors expect, monkfish revenues from landings in the NFMA are not expected to change. In this case, no change in price is expected and the economic impacts of Option 2 versus the No Action Alternative for those landing monkfish in the NFMA would be neutral. However, if increased landings in the SFMA do negatively affect monkfish price, vessels harvesting monkfish in the NFMA would experience decreases in producer surplus as a result of decreased revenues from monkfish. The expected drop in revenue over FY2017-FY2019 from landings in the NFMA is -$3.5 million, or nearly -$1.2 million per year.

Table 81 - Projected landings and monkfish revenues over FY2017-FY2019 for all vessel landing monkfish, in all management areas, under Option 2 versus the No Action Alternative, depending on price effects.

Alternative	Management Area and MF Permit Category	Projected Monkfish Landings (live lbs.)	Lower Bound Estimate Projected Monkfish Revenue under average price of $0.83/ live lb.	Upper Bound Estimate Projected Monkfish Revenue under average price of $0.96/live lb.
No Action	NFMA			
	Limited Access	25,661,748		$24,635,278
	Cat E and state-permitted only	1,377,657		$1,322,551
	Total NFMA	27,039,405		$25,957,829
	SFMA			
	Limited Access	27,580,986		$26,477,747
	Cat E and state-permitted only	2,636,190		$2,530,742
	Total SFMA	30,217,176		$29,008,489
	Total NFMA & SFMA	57,256,581		$54,966,318
Option 2 - Increase DAS allocation and trip limits in the SFMA (Preferred)	NFMA			
	Limited Access	25,661,748	$21,299,251	$24,635,278
	Cat E and state-permitted only	1,377,657	$1,143,455	$1,322,551
	Total NFMA	27,039,405	$22,442,706	$25,957,829

	SFMA Limited Access Cat E and state-permitted only Total SFMA	 37,035,276 2,636,190 39,671,466	 $30,739,279 $2,188,038 $32,927,317	 $35,553,865 $2,530,742 $38,084,607
	Total NFMA & SFMA	66,710,871	$55,370,023	$64,042,436
Estimated Difference (Option 2-No Action)	**NFMA** **SFMA** **Total NFMA & SFMA**	**0** **9,454,290** **9,454,290**	**-$3,515,123** **$3,918,828** **$403,705**	**$0** **$9,076,118** **$9,076,118**

8.11.1.6 Summary of Expected Economic Impacts from Implementation of FW10 Preferred Alternatives versus No Action

The preferred alternatives proposed by FW10 are expected to have a neutral to positive net economic impact overall, compared to the No Action Alternatives. Table 82 provides a summary of expected economic impacts from FW10 preferred alternatives compared to those under the set of No Action Alternatives, where those impacts are quantifiable.

Table 82 - Summary of Expected Economic Impacts for FW10 Preferred Alternatives from FY2017-FY2019 monkfish specifications for the NFMA and SFMA compared to the No Action Alternatives.

Management Area	Alternative	Projected Monkfish Landings (live lbs.)	Lower Bound Estimate Projected Monkfish Revenue under average price of $0.83/live.lb.	Upper Bound Estimate Projected Monkfish Revenue under average price of $0.96/live.lb. (no price effect)
NFMA	No Action	27,039,405		$25,957,829
	Preferred	27,039,405	$22,442,706	$25,957,829
	Difference (Preferred - No Action)	0	-$3,515,123	$0
SFMA	No Action	30,217,176		$29,008,489
	Preferred	39,671,466	$32,927,317	$38,084,607
	Difference (Preferred - No Action)	9,454,290	$3,918,828	$9,076,118
NFMA and SFMA	No Action	57,256,581	$54,966,318	$54,966,318
	Preferred	66,710,871	$55,370,023	$64,042,436
	Difference (Preferred - No Action)	9,454,290	$403,705	$9,076,118

In total, if implemented, the preferred alternatives proposed in FW10 would updated the discard rates for both the NFMA and SFMA, reduce the management uncertainty buffer to 3.0% for both the NFMA and SFMA, increase incidental trip limits in the NFMA, and increase the DAS allocation and DAS trip limits for the SMFA by 15%. These changes from the No Action Alternatives are expected to have neutral or positive net economic impacts. If positive net economic benefits do occur, they would stem from increased flexibility, reduced administrative burden and possible decreases in regulatory discards for vessels fishing on a NE Multispecies DAS in the NFMA and from increased revenues and producer surplus for vessels fishing on a directed monkfish trip in the SFMA. The analysis has accounted for the possibility that average ex-vessel price for monkfish could fall if monkfish landings increase by providing both lower bound estimates (price effect) and upper bound estimates (no price effect) of projected monkfish revenues. Overall, FW10 is expected to result in an increase in total monkfish revenue of $403,705 to $9.1 million over FY2017-FY2019, or $134,568 to nearly $3.0 million per year.

8.11.1.7 Determination of Significance

The Proposed Action is not predicted to have an adverse impact on fishing vessels, purchasers of seafood products, ports, recreational anglers, and operators of party/charter businesses in excess of $100 million. Not all alternatives have impacts that could be quantified, but the likely economic impacts of all FW10 measures have been discussed qualitatively, and where possible, quantified.

8.9 REGULATORY FLEXIBILITY ACT (RFA)

The Chief Counsel for Regulation of the Department of Commerce certified to the Chief Counsel for Advocacy of the Small Business Administration (SBA) that this proposed rule, if adopted, would not have a significant economic impact on a substantial number of small entities.

As outlined in section 3.2, the purpose of this action is to implement Framework 10 to the Monkfish FMP. Framework 10 would set monkfish specifications for fishing years 2017-2019 (May 1, 2017, through April 30, 2020). As proposed, this TAL of monkfish in both the NFMA and SFMA would increase slightly. This Framework would also increase trip limits in both management areas and the DAS allocations that could be fished in the SFMA. As a result, this Framework would provide additional operational flexibility and fishing opportunities. Current monkfish quotas have been underharvested for the past several years. This framework is needed to allow the fishery to more effectively harvest its optimum yield. This action seeks to fulfill the purpose and need while meeting the overarching goals and objectives of the Monkfish FMP.

As of May 1, 2015 (beginning of fishing year 2015), NMFS had issued 798 limited-access monkfish permits. Ownership entities are identified on June 1st of each year based on the list of all permit numbers, for the most recent complete calendar year, that have applied for any type of Northeast Federal fishing permit. The current ownership data set is based on calendar year 2015 permits and contains gross sales associated with those permits for calendar years 2013 through 2015.

For RFA purposes only, NMFS has established a small business size standard for businesses, including their affiliates, whose primary industry is commercial fishing (see 50 CFR § 200.2). A business primarily engaged in commercial fishing (NAICS code 11411) is classified as a small business if it is independently owned and operated, is not dominant in its field of operation (including its affiliates), and has combined annual receipts not in excess of $11 million for all its affiliated operations worldwide. The determination as to whether the entity is large or small is based on the average annual revenue for the three years from 2013 through 2015.

Ownership data collected from permit holders indicates that there are 390 distinct business entities that hold at least one limited-access monkfish permit. Of these 390 entities, 34 do not have revenues (are inactive). Of the 390 entities, 382 entities are categorized as small and 8 are categorized as large entities per the NMFS guidelines. All 390 entities could be directly regulated by this proposed action. There are 38 entities that are "monkfish dependent" (greater than 50 percent of the entity's gross sales are from the sales of monkfish) and all are considered small entities.

This action, which updates specifications and increases DAS and trip limits, would provide monkfish fishermen with additional fishing opportunities and enhance their operational flexibility.

The measures proposed in Framework 10 are expected to have a positive economic effect on small entities. It could further increase catch per unit effort; well accepted economic theory holds that this will result in increased profitability, all else held constant. Providing increased fishing opportunities should increase landings and profits.

This action is not expected to have a significant or substantial effect on small entities. The effects on the regulated small entities identified in this analysis are expected to be positive relative to the no action

alternative, which would result in lower TALs, fewer DAS, and lower trip limits than the proposed action. Under the proposed action, small entities would not be placed at a competitive disadvantage relative to large entities, and the regulations would not reduce the profit for any small entities. As a result, an initial regulatory flexibility analysis is not required and none has been prepared.

9.0 References

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Monkfish Fishery Management Area Daily Landings and Days-at-Sea Limit Allocation Analysis for FY2017-FY2019

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Introduction

The New England and Mid-Atlantic Fishery Management Councils (Councils) are developing a new framework to the Monkfish Fishery Management Plan (FMP) to adjust daily landing and/or trip limit allocations for the Northern Fishery Management Area (NMA) and Southern Fishery Management Area (SMA) for FY2017 – 2019. The objective of this analysis was to examine daily landing limits and days at sea (DAS) allocations under both status quo Total Allowable Landings (TALs) and TALs under a reduced management uncertainty buffer (to 3%) for both the NMA and SMA.

In the NMA, nine management alternatives were considered: 1) the status quo alternative: maintained status quo daily landing limits and DAS allocations by permit category; 2) adjusted the allocation of DAS in the NMA to a level at which projected landings approximated the FY2017 directed fishery allocation of the northern area TAL with a status quo management uncertainty buffer; 3) adjusted NMA daily landing limits of monkfish tail weight per DAS to a level at which projected landings approximated the FY2017 directed fishery allocation of the northern area TAL with a status quo management uncertainty buffer; 4) adjusted the allocation of DAS in the NMA to a level at which projected landings approximated the FY2017 directed fishery allocation of the northern area TAL with a 3% (down from 13.5%) management uncertainty buffer; 5) adjusted NMA daily landing limits of monkfish tail weight per DAS to a level at which projected landings approximated the FY2017 directed fishery allocation of the northern area TAL with a 3% management uncertainty buffer; 6) increased incidental daily landing limits to 900 lbs tail weight per DAS for monkfish permit category C vessels and to 750 lbs tail weight per DAS for monkfish permit category D vessels with a status quo management uncertainty buffer; 7) increased incidental daily landing limits to 900 lbs tail weight per DAS for monkfish permit category C vessels and to 750 lbs tail weight per DAS for monkfish permit category D vessels with a 3% management uncertainty buffer; 8) increased incidental daily landing limits to 1500 lbs tail weight per DAS for monkfish permit category C vessels and to 1250 lbs tail weight per DAS for monkfish permit category D vessels with a status quo management uncertainty buffer; 9) increased incidental daily landing limits to 1500 lbs tail weight per DAS for monkfish permit category C vessels and to 1250 lbs tail weight per DAS for monkfish permit category D vessels with a 3% management uncertainty buffer.

For the SMA, seven management alternatives were also considered: 1) the first alternative (the status quo alternative) maintained status quo daily landing limits and DAS allocations by permit category; 2) adjusted the allocation of DAS in the SMA to a level at which projected landings approximated the FY2017 directed fishery allocation of the southern area TAL with a status quo management uncertainty buffer; 3) adjusted SMA daily landing limits of monkfish tail weight per DAS to a level at which projected landings approximated the FY2017 directed fishery allocation of the southern area

TAL with a status quo management uncertainty buffer; 4) adjusted the allocation of DAS in the SMA to a level at which projected landings approximated the FY2017 directed fishery allocation of the southern area TAL with a 3% (down from 6.5%) management uncertainty buffer; 5) adjusted SMA daily landing limits of monkfish tail weight per DAS to a level at which projected landings approximated the FY2017 directed fishery allocation of the southern area TAL with a 3% management uncertainty buffer; 6) increased the DAS allocation and daily landing limits by 15% (from 32 DAS to 37 DAS and to 700 lbs tail weight per DAS for permit category AC vessels (from 610) and to 575 lbs tail weight per DAS for permit category BDH vessels (from 500) under the status quo uncertainty buffer; and 7) increased the DAS allocation and daily landing limits by 15% (from 32 DAS to 37 DAS and to 700 lbs tail weight per DAS for permit category AC vessels (from 610) and to 575 lbs tail weight per DAS for permit category BDH vessels (from 500) under a 3% management uncertainty buffer.

DAS monitoring and a refinement of the DAS declaration activity code allows the use of DAS declarations along with Vessel Trip Reports (VTR) and dealer-reported data to more accurately characterize monkfish landings. Prior to detailed VMS activity code DAS declarations, landings by limited access monkfish-permitted boats could not be easily separated into directed and incidental monkfish trips. Matching DAS declarations to dealer-reported data and VTRs has enabled a description of directed monkfish activity by limited access vessels by area, namely when a vessel has declared it is using a monkfish DAS. Monkfish landings by limited access vessels not on a monkfish DAS are considered to be incidental landings. These incidental landings by limited access vessels can then be subtracted from a management area monkfish allocation by permit category, allowing for a more accurate description of this fishery.

Because the allocated total allowable landings in the both the Northern and Southern Fishery Management areas were not fully harvested in FY2015 (the reference year for this analysis of DAS and daily landing limit allocations for FY2017-2019), the method that has been used to reduce DAS and/or daily landing limits for previous management actions was not applicable. Basically, this method has historically used fishing vessel trip reports, scaled to dealer-reported landings, to adjust trip-level and vessel-level aggregate data for each management area down incrementally in an effort to identify DAS levels and/or daily landing limits that summed to an allocated TAL for each of two sets of monkfish permit categories (AC and BDH) after subtracting estimated incidental landings. Instead, a method that modeled fleet-wide landings by area with an increase in DAS and/or directed daily landing limits, after subtracting for both limited access monkfish and other vessel incidental landings, was employed. The purpose of this report is to describe the assumptions and methods used to arrive at recommended DAS/daily landing limit combinations for each DAS/daily landing limit alternative by permit category in the NMA and SMA.

Methods

Data sources

Data from fishing year 2015 were used as our baseline set for this analysis. Several primary data sources were used for this analysis including: dealer weighout reports, the vessel permits database, DAS declarations (which can be transmitted into the database via the Vessel Monitoring System (VMS) or the Interactive Voice Response (IVR) system), and the fishing vessel trip report (FVTR) database. The source for days at sea declarations, dealer-reported landings data, and vessel-reported area fished data is a trip-matching derivative database: the data matching and imputation system (DMIS). Data from fishing year 2015 are the most recent available and can be matched to a very descriptive DAS declaration for monkfish trips. Starting in FY2007, DAS declarations in the directed monkfish fishery include the monkfish management area, which has advanced our ability to characterize and manage the monkfish fishery.

DMIS data were matched to monkfish vessel permit category (from the permits database) and days at sea charged information (from the Allocation Management System (AMS) database) to derive a comprehensive picture of fleet activity for this analysis.

Assumptions

● Landings from monkfish permit category E and state-only permitted vessels will be exactly the same, in terms of live pounds landed, in FY2017-FY2019 as they were in FY2015. This assumption enables a reasonable reduction of the FY2017-FY2019 monkfish TALs to account for the landings from monkfish permit category E and state-only permitted vessels.

● Landings and effort on trips in FY2017-FY2019 by limited access vessels on non-directed (incidental) monkfish trips will be the same as they were in FY2015.

● Fishing and landing patterns will be similar in FY2017-FY2019 to those observed in FY2015 as detailed in the text below.

There is no empirical basis for modifying these assumptions going forward. This uncertainty should be understood in the selection of management alternatives.

Estimated discards

To derive the directed fishery TALs for the NMA and SMA, the Annual Catch Target (ACT) was first reduced by estimated discards, which are based on the discard percentage calculated for that management area in the most recent stock assessment. The discard percentage is 13.9% for the NMA and 24.6% for the SMA. The resulting figure is the overall TAL for each management area.

Procedures for identification of incidental monkfish landings

Incidental landings by open access permit category E and state-only permitted vessels

Incidental landings of monkfish must be subtracted from the TAL before the remainder can be allocated to the limited access monkfish fishery. Monkfish total reported live pounds from the dealer-reported landings database by FY2015 limited access monkfish permitted vessels were subtracted from total monkfish live pounds to determine landings by monkfish non-limited access vessels. These are landings by monkfish permit category E and state-only permitted vessels.

Incidental landings by monkfish limited access permitted vessels
Incidental landings for each permit category by monkfish limited access vessels was estimated by matching dealer-reported trips with a vessel's DAS declaration and to the Fishing Vessel Trip Report in DMIS. The DAS declaration indicated whether the vessel was on a directed or incidental monkfish trip. If the vessel was on an incidental trip (which has a DAS declaration code that lacks the monkfish management area), the FVTR for the trip indicated the management area fished on the trip.

Procedures for calculation of DAS allocation and/or trip limits for each management alternative

For the purposes of daily landing limit and DAS-setting to achieve the alternative TALs, landings and DAS/ daily landing limits in the NMA and SMA from FY2015 were used as a guide to trip limits and DAS. In FY2015 in the NMA, directed daily landing limits of 1,250 lbs and 600 lbs monkfish tail weight per DAS and 45 DAS allocated to AC and BD permit categories, respectively, 71% of the 5,854 mt TAL was landed (Table 1a). In FY2015 in the SMA, under trip limits of 610 lbs and 500 lbs monkfish tail weight per DAS and 32 DAS allocated to AC and BDH permit categories, respectively, 53% of the 8,925 mt TAL was landed (Table 1b).

Adjustment of allocated DAS for monkfish limited access permitted vessels

To adjust the allocated DAS under status quo trip limits in each management area, frequency distributions of the number of vessels by annual DAS charged were created for each management area. The area under the FY2015 frequency distribution was assumed to be proportional to the directed fishery landings by management area. To project landings under increased DAS allocations, the FY2015 DAS charged frequency distribution was moved iteratively along the horizontal axis until the Riemann sum (the area under the frequency distribution) of the distribution proportional to the directed allocation of the FY2017-2019 management area TAL. DAS allocations in the NMA did not appear to constrain DAS usage in the NMA on the bulk of the fleet. Therefore, an increase in DAS allocations in the NMA would be expected to have a minimal, if any, effect on total monkfish landings.

Adjustment of daily landing limits for monkfish limited access permitted vessels by permit category

To adjust the allocated daily landing limits under status quo DAS allocations in the both Management Areas, frequency distributions of the number of DAS charged by daily landings from a trip were created for each permit category and area. The area under these FY2015 frequency distributions is equivalent to the directed landings by permit category. To project landings under increased daily landing limits, the FY2015 daily limit frequency distribution was moved iteratively along the

horizontal axis until the Riemann sum under the distribution increased to the value of the directed allocation of the FY2017-2019 management area TAL by permit category, if plausible. Again, because daily landing limits in the NMA appeared to be limiting on a small fraction of trips in the NMA, an increase in daily landing limits would be expected to have a minimal effect on total monkfish landings.

Results and Discussion

Results for identification of incidental monkfish landings

Incidental landings by open access permit category E and state-only permitted vessels

The dealer and vessel permits databases allowed for the categorization of landings of monkfish in FY2015 by permit or permit category (Table 2). Matching these records to FVTRs enabled the allocation of dealer-reported landings to each of the two management areas (Table 3). For FY2015, landings by permit category E and state-permitted-only vessels totaled 1,337,949 live pounds.

Incidental landings by monkfish limited access permitted vessels

Incidental and directed monkfish landings for each limited access permit category and management area were estimated by matching dealer-reported landings data with vessel-reported DAS declarations and fishing vessel trip reports in the Data Matching and Imputation System (DMIS). In the NMA, incidental landings of monkfish by limited access monkfish vessels were approximately four times higher than landings on directed trips for both permit categories (Table 4). The pattern was reversed in the SMA, with a much higher proportion of landings on directed trips than on incidental trips by limited access monkfish vessels (Table 4).

After subtracting estimated discards and incidental landings by both limited and non-limited access vessels, the portion of the management area TAL to be allocated to the directed monkfish area by permit category could be calculated. The allocations of monkfish for the directed limited access fishery were further apportioned by the percentage of directed fishery landings by permit category (Tables 4 and 5)

Procedures for calculation of DAS allocation and/or trip limits for each management alternative

Adjustment of allocated Northern Management Area DAS for monkfish limited access permitted vessels

To project the allocation of days at sea necessary to land the directed fishery allocation of the FY2017-2019 NMA TAL under status quo and 3% management uncertainty, the frequency distribution of DAS charged by number of vessels was iteratively increased until the Riemann sum under the distribution increased proportionally to the FY2017-2019 directed NMA allocation divided by the FY2015 directed NMA landings (Figure 1, Table 6). Days at sea usage was increased by 29 days at sea (from 45 to 74) and 42 days at sea (from 45 to 87) in the NMA to increase the area under the NMA DAS frequency distribution proportional to the directed allocation of the FY2017-2019 NMA monkfish TAL under status quo and 3% management uncertainty buffers, respectively (Figure 1, Table 7).

Adjustment of allocated Southern Management Area DAS for monkfish limited access permitted vessels

The same method as described above for the NMA was applied to the DAS charged by number of vessels frequency distribution in the SMA. Days at sea usage was projected to increase by 24 days at sea (from 32 to 56) and 26 days at sea (from 32 to 58) in the SMA to land the directed allocation of the FY2017-2019 SMA monkfish TAL under status quo and 3% management uncertainty buffers, respectively (Figure 2, Table 7).

Adjustment of daily landing limits for monkfish limited access permitted vessels in the Northern Management Area by permit category

Frequency distributions of DAS charged by daily landings (tail weight lbs) by permit category were created for the NMA for FY2015. A projection to increase in the daily landing limits necessary to harvest the allocated portion of the TAL on directed monkfish trips was not analytically feasible because the daily landing frequency distribution observed for both permit categories were not limited to any significant extent by the daily landing limits in place in FY2015 (Figures 3 and 4). It is therefore proposed that daily landing limits be set at or around 1250 lbs tail weight per DAS for both permit categories in the NMA (Table 7).

Adjustment of daily landing limits for monkfish limited access permitted vessels in the Southern Management Area by permit category

To adjust daily landing limits in the Southern Management Area, frequency distributions of DAS charged by daily landings (tail weight lbs) by permit category were created. To project the increase in the daily landing limits necessary to harvest the allocated portion of the TAL on directed monkfish trips, the distribution observed in FY2015 was moved along the horizontal axis until the Riemann sum of the distribution equaled the directed allocation of the FY2017-2019 TAL for each permit category (Figures 5 and 6). For permit category AC, the daily landing limit increased to 1160 lbs and 1200 lbs tail weight per DAS to harvest the directed portion of the FY2017-2019 TAL in the SMA (Figure 5, Table 7) under the status quo and 3% management uncertainty buffers, respectively. For permit category BDH, the daily landing limit increased to 1000 lbs and 1030 lbs tail weight per DAS to harvest the directed portion of the FY2017-2019 TAL in the SMA under the status quo and 3% management uncertainty buffers, respectively (Figure 6, Table 7).

Projected Landings under SMA Alternatives 6 and 7

Landings under SMA Alternatives 6 and 7, increased directed landing limits to 700 lbs tail weight per DAS for permit category A and C vessels and to 575 lbs tail weight per DAS for permit category B, D, and H vessels under 37 DAS under the status quo and 3% management uncertainty buffers, were projected according to the methods described in the analysis. The method first calculated the expected increase in monkfish landings under increased daily landing limits (Figures 5 and 6). Projected increased landings under increased daily landing limits are multiplied by the proportional increase in the area under the DAS usage frequency distribution with 37 allocated DAS in the SMA (Figure 2). With an allocation of 37 DAS, an increase of 5 DAS over the status quo 32 DAS allocation from 2014-2016, directed fishery landings were projected to increase by approximately 34%, to yield a total projected landings in the SMA by limited access monkfish vessels of 12,345,092 lb (Table 7).

Examination of the landings of tail weight per DAS on incidental trips by monkfish limited access permitted vessel in the NMA in FY2015

In 2014, Framework 8 to the Monkfish Fishery Management Plan (FMP) increased incidental landings limits for limited access permitted monkfish vessels in the NMA (from 300 lbs to 600 lbs tail weight per DAS for AC vessels and from 300 lbs to 500 lbs tail weight per DAS for BD vessels). The FY2012 incidental landing distributions were used to model what distribution of incidental trips would look like under increased daily landing limits (Figures 7 and 8). The distributions from FY2015 appear to validate the FY2012 models and the adoption of the increased daily landing limits (Figure 9). The FY2015 distribution also appears to indicate that trips were not generally limited by the FY2015 incidental landing limits that were adopted in Framework 8.

NMA Management alternatives 6-9 propose to increase incidental daily landing limits from 600 lbs tail weight per DAS to 900 (Alternatives 6 and 7) or 1500 (Alternatives 8 and 9) lbs tail weight per DAS for monkfish permit category C vessels on a multispecies DAS and from 500 lbs tail weight per DAS to 750 (Alternatives 6 and 7) or 1250 (Alternatives 8 and 9) lbs tail weight per DAS for monkfish permit category D vessels on a multispecies DAS under the two proposed management uncertainty buffers. It does not appear that daily landing limits were limiting for the overwhelming majority of incidental trips by C or D monkfish permit category vessels in the NMA in FY2015 (Figure 9). The proposed increased incidental landing limit alternatives will likely have a minimal effect on monkfish landings in the NMA. Rather, the proposed increases in the incidental landing limits in alternatives 6-9 will likely have a greater impact on whether vessels will have to use any directed monkfish DAS in the NMA. For monkfish permit category C vessels, a 900 lbs tail weight per DAS incidental landing limit would convert most of the directed fishing activity by this permit category into incidental activity (Figure 3). The higher incidental limit of 1500 lbs tail weight per DAS would likely convert all of the directed fishing activity by this permit category into incidental activity (Figure 3). Both monkfish incidental landing limit alternatives (750 and 1250) under consideration for permit category D vessels on a multispecies DAS would convert most, if not all, directed monkfish activity to incidental activity (Figure 4). Converting directed fishing activity to incidental activity in the NMA will likely not result in a significant increase in landings as very few, if any, monkfish limited access permit category vessels were limited by DAS allocations in the NMA in 2015 (Figure 1). There does not appear to be a ready analytical solution to the question of DAS allocation or daily landing limits in the NMA under alternatives 6-9. Because most directed fishing activity in the NMA would be converted to incidental activity (and directed activity is already a relatively smaller fraction of limited access monkfish vessel monkfish landings in the NMA than in the SMA (Table 4)), most, if not all, allocated DAS in the NMA would likely go unused, as has been the long-running case in this fishery. An increase in incidental landing limits would obviate the need for monkfish DAS with daily landing limits, it would not be practical to attempt to solve for monkfish DAS allocations and landings limits under these alternatives.

Table 1a. Monkfish target TALs, daily landing limits, DAS allocations, and landings (FY 2000 - FY 2016) for the NMA

Fishing Year	Target TAL (lbs)	Target TAL (mt)	Limit per DAS*		DAS Allocation**	Landings (lbs)	Landings (mt)	Percent of TAL
			Cat. A & C	Cat. B & D				
2000	12,507,000	5,673	n/a	n/a	40	26,145,000	11,859	209%
2001	12,507,000	5,673	n/a	n/a	40	32,745,000	14,853	262%
2002	25,737,000	11,674	n/a	n/a	40	31,947,000	14,491	124%
2003	39,039,000	17,708	n/a	n/a	40	31,207,000	14,155	80%
2004	37,408,000	16,968	n/a	n/a	40	25,905,000	11,750	69%
2005	29,012,834	13,160	n/a	n/a	40	21,016,667	9,533	72%
2006	17,057,165	7,737	n/a	n/a	40	14,720,265	6,677	86%
2007	11,023,100	5,000	1,250	470	31	11,133,344	5,050	101%
2008	11,023,100	5,000	1,250	470	31	7,777,909	3,528	71%
2009	11,023,100	5,000	1,250	470	31	7,372,258	3,344	67%
2010	11,023,100	5,000	1,250	470	31	6,247,901	2,834	57%
2011	12,905,845	5,854	1,250	600	40	8,153,433	3,699	63%
2012	12,905,845	5,854	1,250	600	40	8,349,609	3,788	65%
2013	12,905,845	5,854	1,250	600	40	8,032,200	3,644	62%
2014	12,905,845	5,854	1,250	600	45	7,591,355	3,444	59%
2015	12,905,845	5,854	1,250	600	45	9,121,088	4,138	71%
2016	12,905,845	5,854	1,250	600	45			

* Trip limits in pounds tail weight per DAS

** Excluding up to 10 DAS carryover, became 4 DAS carryover in FY2007

Table 1b. Monkfish target TALs, daily landing limits, DAS allocations, and landings (FY 2000 - FY 2016) for the SMA

Fishing Year	Target TAL (lbs)	Target TAL (mt)	Limit per DAS*		DAS Allocation**	Landings (lbs)	Landings (mt)	Percent of TAL
			Cat. A & C	Cat. B & D				
2000	13,281,000	6,024	1,500	1,000	40	17,549,000	7,960	132%
2001	13,281,000	6,024	1,500	1,000	40	24,404,000	11,069	184%
2002	17,463,000	7,921	550	450	40	16,487,000	7,478	94%
2003	22,511,000	10,211	1,250	1,000	40	26,891,000	12,198	119%
2004	14,929,704	6,772	550	450	28	13,719,000	6,193	92%
2005	21,325,315	9,673	700	600	39.3	21,287,811	9,656	100%
2006	8,084,351	3,667	550	450	12	13,027,100	5,909	161%
2007	11,243,562	5,100	550	450	23	15,829,172	7,180	141%
2008	11,243,562	5,100	550	450	23	14,883,407	6,751	132%
2009	11,243,562	5,100	550	450	23	10,582,189	4,800	94%
2010	11,243,562	5,100	550	450	23	9,885,528	4,484	88%
2011	19,676,234	8,925	550	450	28	12,789,016	5,801	65%
2012	19,676,234	8,925	550	450	28	11,746,229	5,328	60%
2013	19,676,234	8,925	550	450	28	11,250,189	5,103	57%
2014**	19,676,234	8,925	610	500	32	12,076,923	5,478	61%
2015	19,676,234	8,925	610	500	32	10,447,707	4,739	53%
2016	19,676,234	8,925	610	500	32			

* Trip limits in pounds tail weight per DAS

** Excluding up to 10 DAS carryover, became 4 DAS carryover in FY2007

Table 2: Summary statistics for monkfish in FY2015

	Live pounds
FY2015 monkfish landings by permit category E and state-only-permitted vessels	1,337,949
FY2015 monkfish landings by limited access permit category vessels	18,050,633
Total FY2015 monkfish landings	19,388,582

Source: NMFS GARFO permits, dealer, and DMIS (Data Matching and Imputation System) databases, accessed 9/13/2016.

Table 3: FY2015 monkfish landings by permit category E and state-permitted-only vessels by management area.

Management area	Live pounds
NMA	459,219
SMA	878,730
Total	1,337,949

Source: NMFS GARFO permits, dealer, and DMIS (Data Matching and Imputation System) databases, accessed 9/13/2016.

Table 4. FY2015 monkfish directed and incidental landings by permit category and management area.

Management Area	Permit Category	Incidental or Directed Landings	Prorated Total Live lbs	Percentage of directed fishery by permit category
NMA	AC	D	1,093,479	62%
		I	4,009,656	
	BD	D	657,654	38%
		I	2,793,127	
SMA	AC	D	3,040,534	39%
		I	897,236	
	BDH	D	4,825,055	61%
		I	430,837	

Source: NMFS GARFO permits, dealer, and DMIS (Data Matching and Imputation System) databases, accessed 9/13/2016.

Table 5. ACT options for FY2017-FY2019 by Monkfish Fishery Management Areas with corresponding estimated discards, incidental landings and directed fishery allocations by monkfish permit category.

Management Area	ACT (mt) (1)	Discard rate (2)	Discards (mt) (3)	TAL (mt) (1)-(3) =(4)	TAL (live lbs) ((4)* 2204.623 lb/t) (5)	TAL (live lbs) incidental landings subtracted (6)	AC incidental landings (7)	BD(H) incidental landings (8)	AC proportion of directed landings (9)	BD(H) proportion of directed landings (10)	AC allocation of TAL ((6)-(7+8))*(9))= (11)	BD(H) allocation of TAL ((6)-(7+8))*(10))= (12)
NMA (status quo)	6,567	13.9%	915	5,652	12,460,527	12,001,308	4,009,656	2,793,127	62%	38%	3,246,172	1,952,352
NMA (3% uncertainty buffer)	7,364	13.9%	1,026	6,338	13,972,898	13,513,679	4,009,656	2,793,127	62%	38%	4,190,559	2,520,337
SMA (status quo)	11,515	24.6%	2,829	8,686	19,149,352	18,270,623	897,236	430,837	39%	61%	6,549,338	10,393,211
SMA (3% uncertainty buffer)	11,947	24.6%	2,936	9,011	19,865,854	18,987,125	897,236	430,837	39%	61%	6,826,311	10,832,741

Table 6. Directed allocations of the monkfish area TAL by permit category for FY2017-FY2019 under 2 uncertainty buffer options and FY2015 landings by Monkfish Fishery Management Area with corresponding proportional increase in landings necessary to harvest the directed allocation of the FY2017-FY2019 monkfish TAL.

	AC directed allocation of FY2017-2019 TAL (1)	BDH directed allocation of FY2017-2019 TAL (2)	Area directed fishery allocation FY2017-2019 (lbs) (1)+(2)=(3)	Total directed FY2015 landings (4)	Proportional increase in FY2015 landings to land FY2017-2019 directed allocation of TAL (3)/(4)=(5)
NMA (status quo)	3,246,172	1,952,352	5,198,524	1,751,133	2.97
NMA (3% uncertainty buffer)	4,190,559	2,520,337	6,710,895	1,751,133	3.83
SMA (status quo)	6,549,338	10,393,211	16,942,550	7,865,589	2.15
SMA (3% uncertainty buffer)	6,826,311	10,832,741	17,659,052	7,865,589	2.25

Table 7. DAS, directed fishery daily landing limits, and incidental landing limits (lbs tail weight per DAS) alternatives for both Monkfish Fishery Management Areas for FY2017-2019. Shaded grey cells indicate the variables that were solved for in this analysis.

Management Area	Alternative	Incidental Landing Limit (lb/DAS) (when fishing under a groundfish DAS in the NMA)	A,C daily landing limit (lb/DAS)	B,D (H – SFMA only) daily landing limit (lb/DAS)	DAS	Projected Limited Access Monkfish Fishery Landings for FY2017-2019
NFMA	1) NMA (status quo)	600 for C permits, 500 for D permits	1250	600	45	8,553,916
	2) NMA (status quo uncertainty buffer)	600 for C permits, 500 for D permits	1250	600	**74**	
	3) NMA (status quo uncertainty buffer)	600 for C permits, 500 for D permits	**>1250**	**>1250**	45	
	4) NMA (3% uncertainty buffer)	600 for C permits, 500 for D permits	1250	600	**87**	
	5) NMA (3% uncertainty buffer)	600 for C permits, 500 for D permits	**>1250**	**>1250**	45	
	6) NMA (status quo uncertainty buffer)	900 for C permits, 750 for D permits	**>1250**	**>1250**		
	7) NMA (3% uncertainty buffer)	900 for C permits, 750 for D permits	1250	600		
	8) NMA (status quo uncertainty buffer)	1,500 for C permits, 1,250 for D permits	**>1250**	**>1250**		
	9) NMA (3% uncertainty buffer)	1,500 for C permits, 1,250 for D permits	1250	600		
SFMA	1) SMA (status quo)	300	610	500	32	9,193,662
	2) SMA (status quo uncertainty buffer)	300	610	500	**56**	17,989,589
	3) SMA (status quo uncertainty buffer)	300	**1160**	**1000**	32	18,238,128
	4) SMA (3% uncertainty buffer)	300	610	500	**58**	18,722,583
	5) SMA (3% uncertainty buffer)	300	**1200**	**1030**	32	18,931,908

	6) SMA (status quo uncertainty buffer)	300	700	575	37	12,345,092
	7) SMA (3% uncertainty buffer)	300	700	575	37	12,345,092

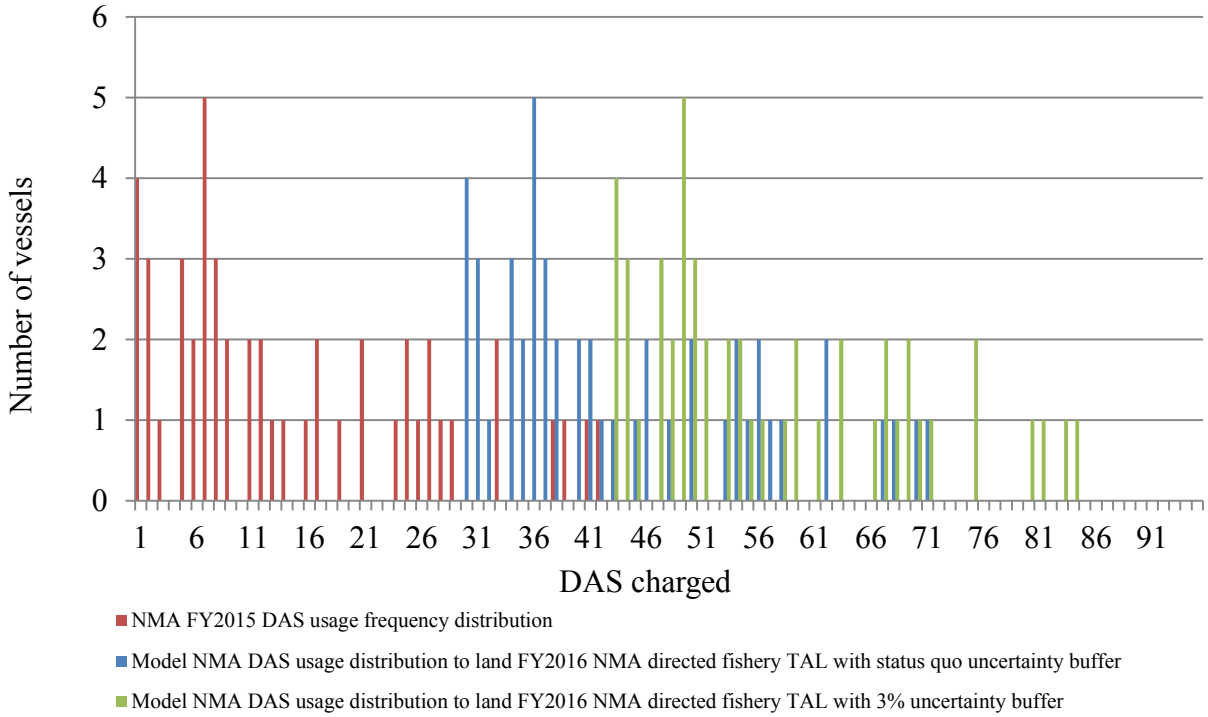

Figure 1. Monkfish Northern Management Area, FY2015 observed and modeled DAS usage by vessel frequency distribution

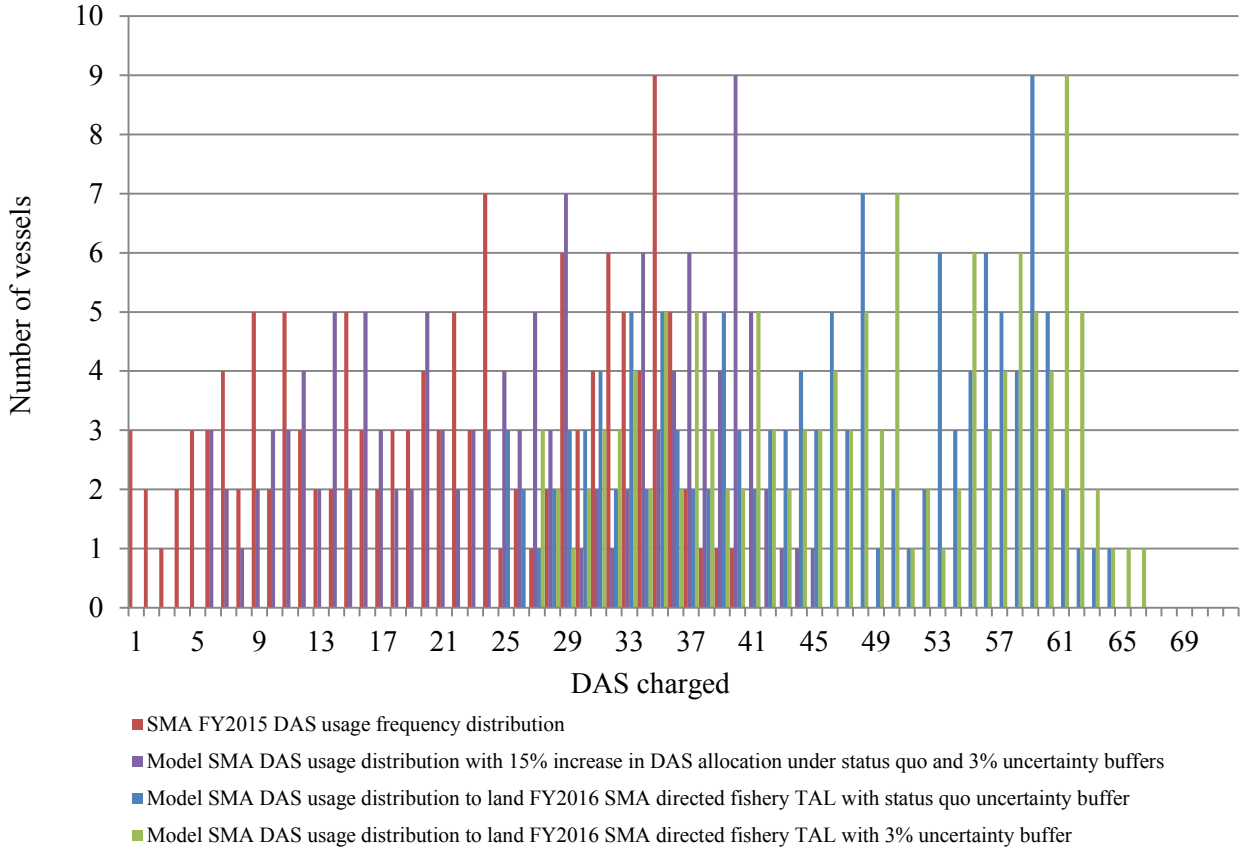

Figure 2. Monkfish Southern Management Area, FY2015 observed and modeled DAS usage frequency distribution with a 15% increase in DAS allocated and under staus quo and 3% management uncertainty buffers.

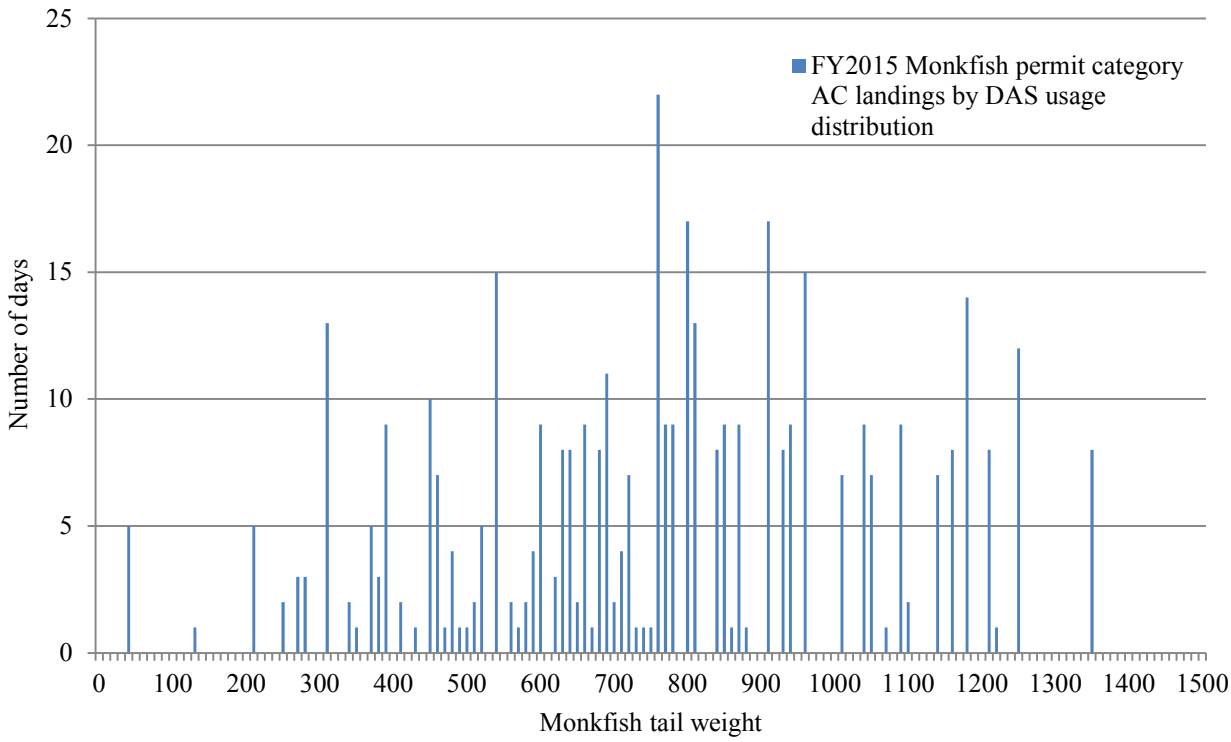

Figure 3. FY2015 Northern Management Area, Monkfish permit category AC observed daily landings by day frequency distribution

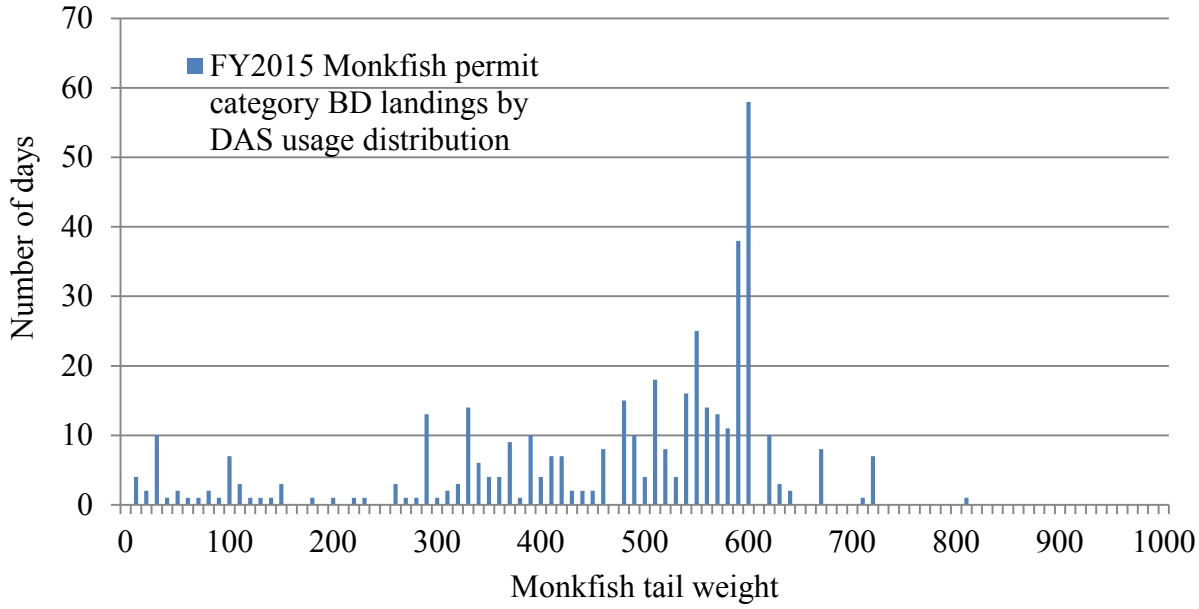

Figure 4. FY2015 Northern Management Area, Monkfish permit category BD observed daily landings by day frequency distribution

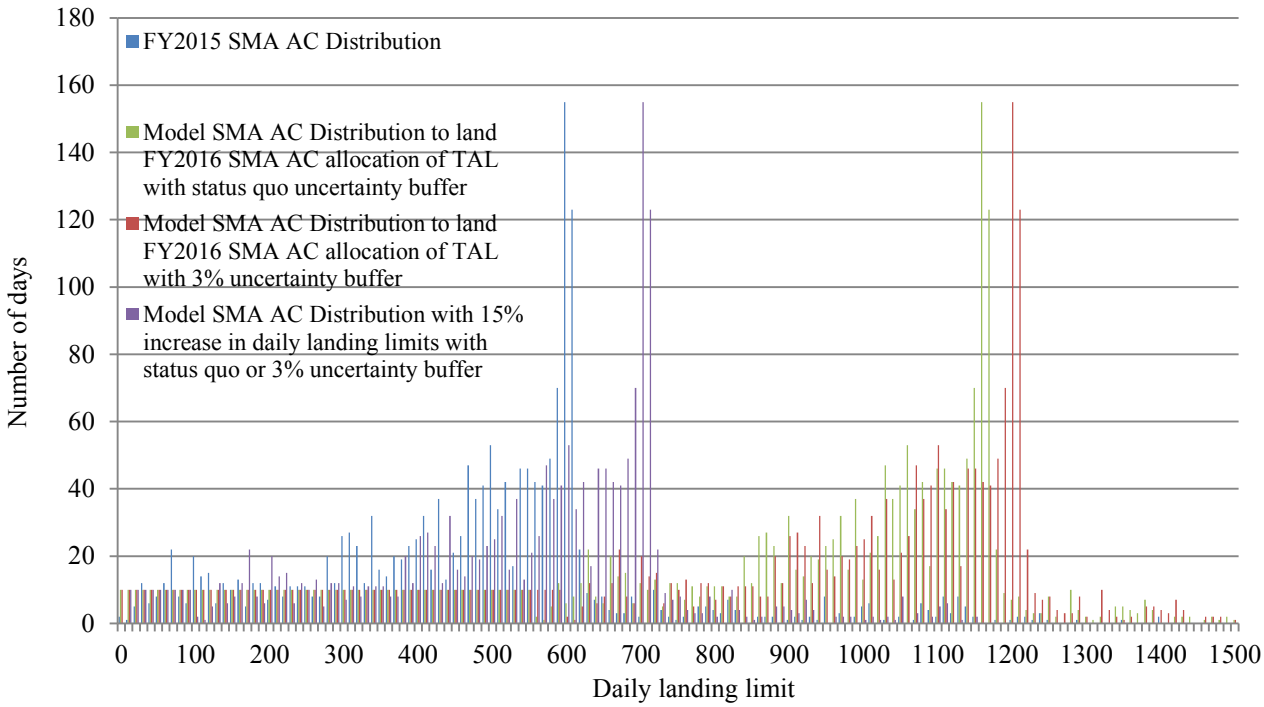

Figure 5. Southern Management Area, Monkfish permit category AC FY2015 observed and modeled daily landings by day frequency distribution

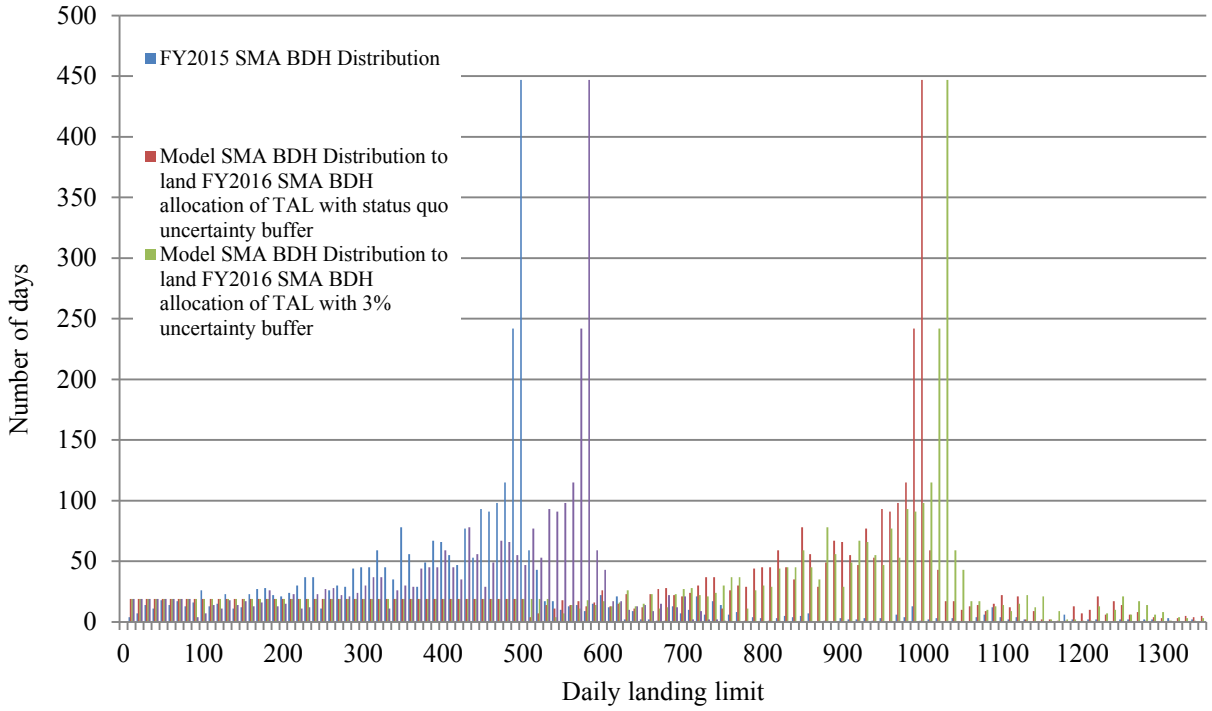

Figure 6. Southern Management Area, Monkfish permit category BDH FY2015 observed and modeled daily landings by day frequency distribution

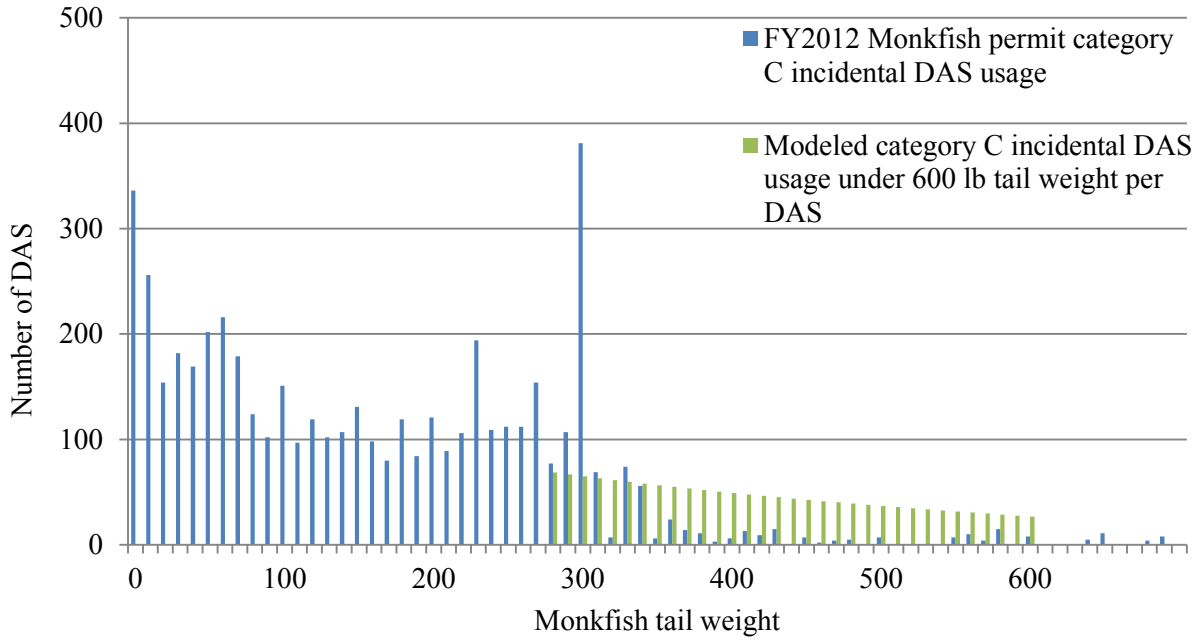

Figure 7. Monkfish Northern Management Area, FY2012 actual and modeled incidental monkfish permit category C DAS usage frequency distribution under increased incidental landing limits.

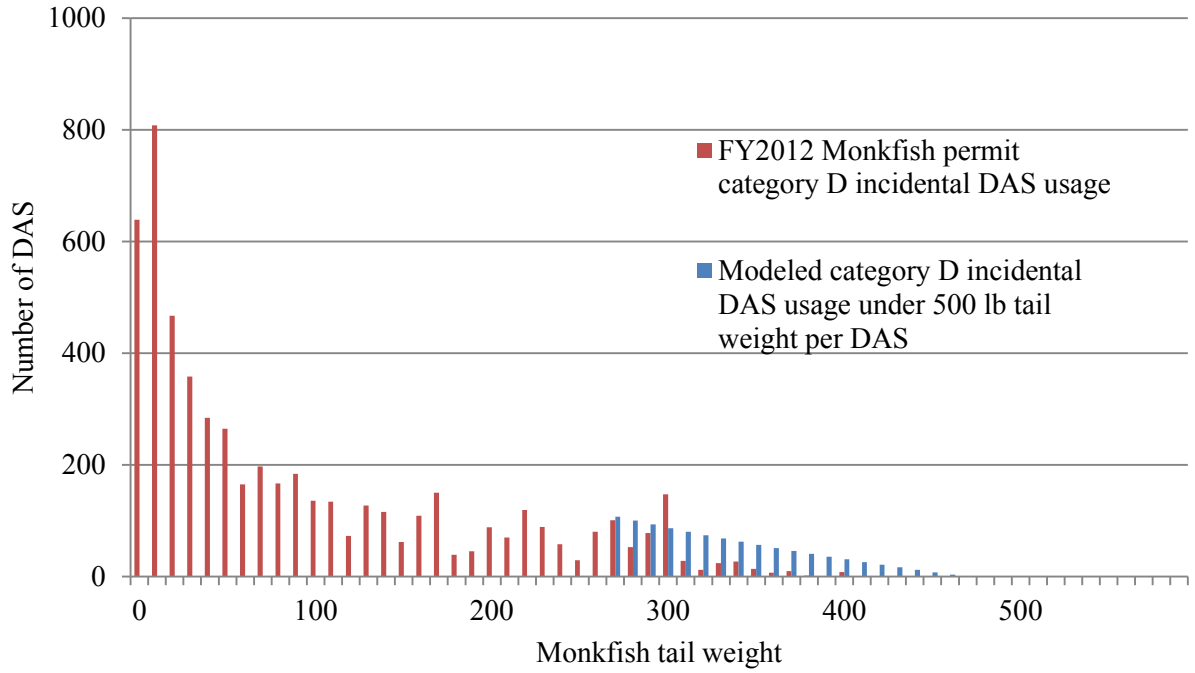

Figure 8. Monkfish Northern Management Area, FY2012 actual and modeled incidental monkfish permit category D DAS usage frequency distribution under increased incidental landing limits.

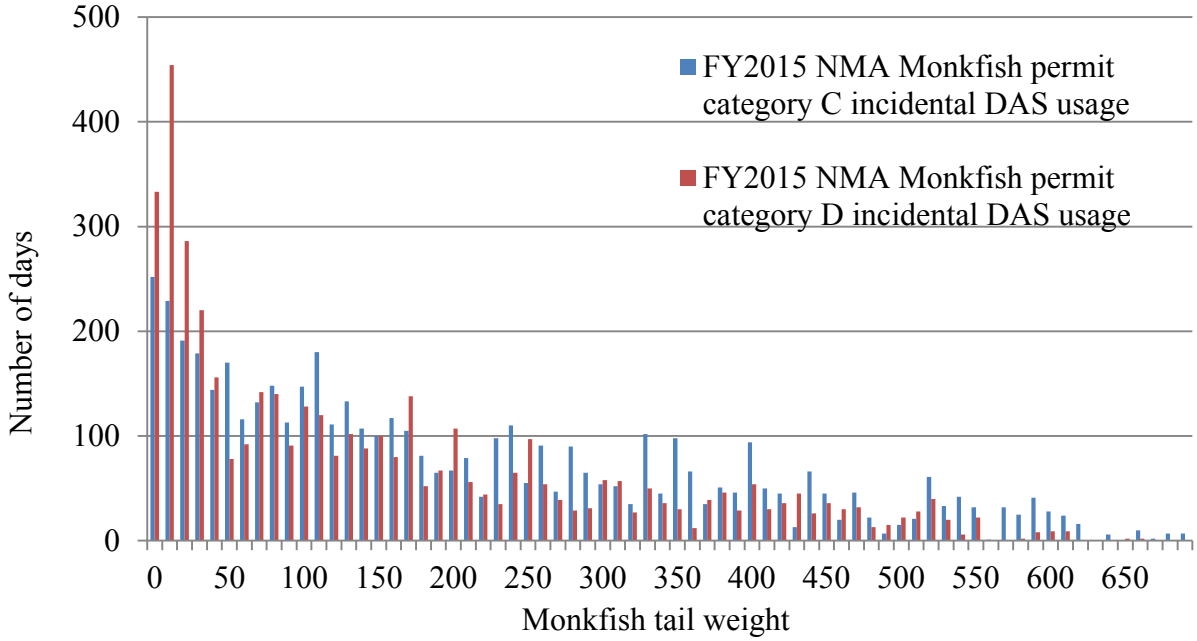

Figure 9. FY 20105 Monkfish Northern Management Areamonkfish permit category C and D DAS usage frequency by monkfish tail weight landed distribution