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## GMRI Monkfish Verification Report Final June 28 2018

Gulf of Maine Research Institute

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**Gulf of Maine Responsibly Harvested  
Verification Report**

**Monkfish**  
*(Lophius americanus)*

- ☒ The fishery is managed by a competent authority and has a management plan in place that incorporates a science-based approach to ensure sustainability.
  - *Monkfish is managed jointly by the NEFMC and MAFMC under NMFS and is regulated by the Monkfish Fishery Management Plan. This plan uses the best available science to set biological reference points and harvest restrictions.*
  
- ☒ If stock sizes are below management target levels, whether due to natural or man-made causes, management plans are established that enable rebuilding within a specified timeframe.
  - *Monkfish stock size is not below management target levels; there is no indication that overfishing is occurring, and the stock is not considered to be overfished.*
  
- ☒ Sufficient data exists to determine harvest levels.
  - *The 50<sup>th</sup> Stock Assessment Workshop in 2010 and the 2013 operational assessment utilized fisheries-dependent and –independent data to determine biological reference points. The 2016 operational assessment updated stock abundance based on biomass survey indices. Ultimately, the Council sets the harvest levels (Total Allowable Landings) based on these data and information, which incorporate uncertainty.*
  
- ☒ Monitoring and compliance measures are in place to ensure acceptable harvest levels.
  - *Monkfish catch is monitored through vessel trip reports (VTRs), observers, and dealer reports. Compliance is assessed through consistency throughout these reports as well as enforcement in the field.*
  
- ☒ Enforcement exists to ensure that harvesters follow regulations, and to prevent illegal practices and unreported harvest.
  - *U.S. Coast Guard, NMFS Office of Law Enforcement agents, and state marine patrol agents enforce the laws and regulations governing the harvest of monkfish.*

## I. Definition of the Monkfish Fishery

Northern stock monkfish (*Lophius americanus*), also known as goosefish, are harvested from the waters off the coast of Massachusetts, New Hampshire, and Maine. While a southern stock extends into the Mid-Atlantic coast, this report focuses on the management and harvesting of monkfish in the area outlined by the Gulf of Maine Responsibly Harvested Standard, which aligns with the northern stock of monkfish (Figure 1).

Monkfish are landed as tails, livers, or whole gutted fish. Historically, monkfish were landed as tails but now whole fish are also a significant portion of the catch (NEFSC 2016). In the southern stock, gillnets are the primary gear type used, however trawl gear has accounted for 75% of monkfish landings in the northern stock area (NEFSC 2016). In the northern stock area, gillnets account for much of the remaining landings, with a small percentage coming from scallop dredges.

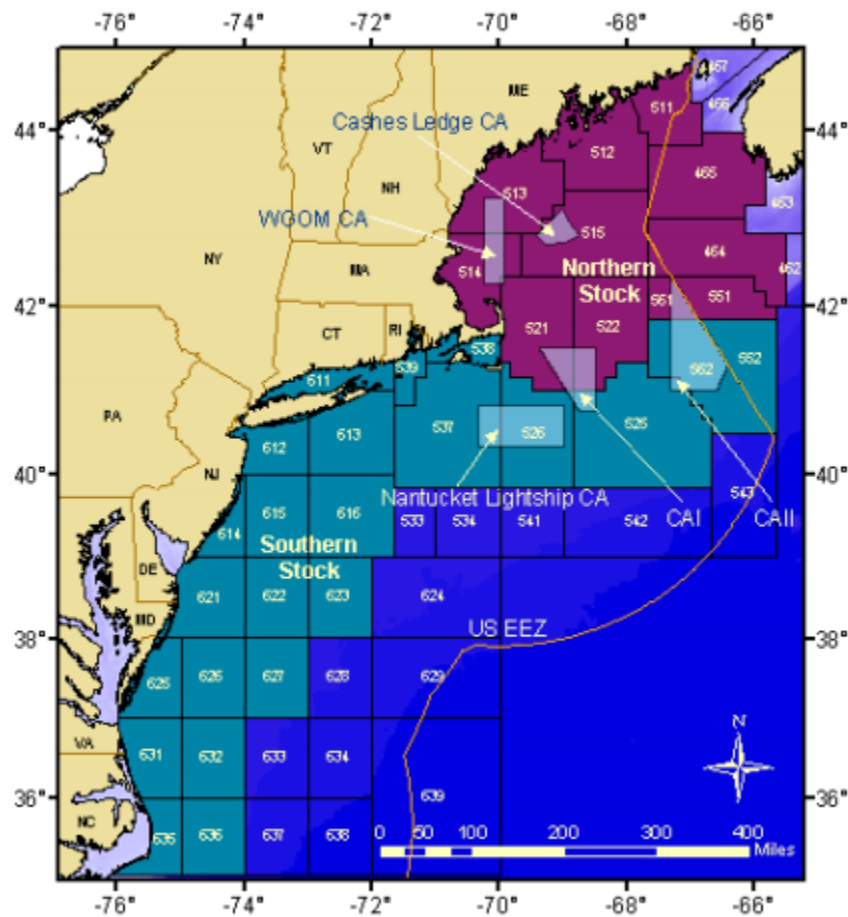


Figure 1. Fishery statistical areas that define the northern and southern stocks of monkfish (NEFSC 2016).

***CRITERION: The fishery is managed by a competent authority and has a management plan in place that incorporates a science-based approach to ensure sustainability.***

## **II. Description of Management Authority and Regulatory Process**

Responsibility of monkfish management lies within the [National Marine Fisheries Service \(NMFS\)](#), which is a part of the [National Oceanic and Atmospheric Administration \(NOAA\)](#). The [New England Fishery Management Council \(NEFMC\)](#) and the [Mid-Atlantic Fisheries Management Council \(MAFMC\)](#) jointly facilitate the development of northern and southern monkfish stock regulations as part of the Monkfish Fishery Management Plan (FMP). The NEFMC consists of 18 voting members, including the Regional Administrator for NMFS, the principal marine resource management official from each New England state, and governor appointees. The MAFMC consists of 21 voting members from each state's fish and wildlife agencies and 13 citizens involved in marine conservation as well as recreational and commercial fishing.

For the monkfish FMP, a sub-set of NEFMC and MAFMC members form an Oversight Committee. This committee is responsible for the development of the fishery management plan and regulations that are consistent with the ten national standards outlined in the [Magnuson Stevens Act \(MSA\)](#), which dictate that conservation and management measures shall:

1. Prevent overfishing while achieving optimum yield.
2. Be based upon the best scientific information available.
3. Manage individual stocks as a unit throughout their range, to the extent practicable; interrelated stocks shall be managed as a unit or in close coordination.
4. Not discriminate between residents of different states; any allocation of privileges must be fair and equitable.
5. Where practicable, promote efficiency, except that no such measure shall have economic allocation as its sole purpose.
6. Take into account and allow for variations among and contingencies in fisheries, fishery resources, and catches.
7. Minimize costs and avoid duplications, where practicable.
8. Take into account the importance of fishery resources to fishing communities to provide for the sustained participation of, and minimize adverse impacts to, such communities (consistent with conservation requirements).
9. Minimize bycatch or mortality from bycatch.
10. Promote safety of human life at sea.

To help the oversight committee meet these requirements, a Monkfish Advisory Panel, made up of representatives from the fishing industry, scientists, and conservation organizations, provides input to management measures. The chairs of the oversight committee provide detailed guidance (terms of reference) to a Monkfish Plan Development Team (PDT), which consists of scientists, managers and other experts on biology and/or management of monkfish. The PDT meets at least annually to review the status of the FMP. The PDT reviews available data on landings and discards, days-at-sea (DAS), measures of fishing effort, stock status, enforcement, and compliance with management measures. Based on this review, the PDT provides reports to the oversight committee in response to the terms of reference.

The PDT meets regularly to provide analysis of species-related information and to develop issue papers, alternatives, and other documents as appropriate. The Councils are also assisted by the members of the Scientific and Statistical Committees (SSC); SSC members review and participate in stock assessment updates, and develop acceptable biological catch (ABC) recommendations that inform management decisions. Figure 2 provides a visual of this process.

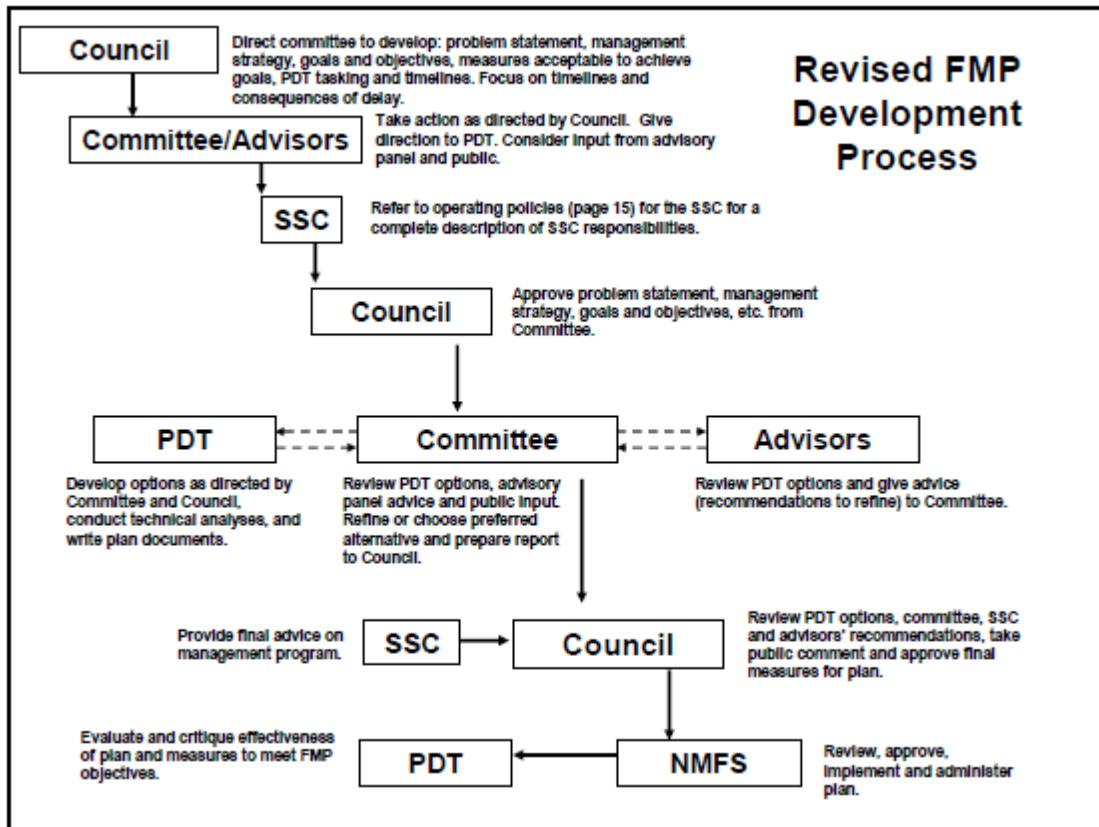


Figure 2. Fishery Management Plan Process (Fiorelli 2008)

### III. Monkfish Management Plan

Monkfish are managed under the Monkfish Fishery Management Plan (FMP), which was implemented in 1999. This plan includes a limited access permit program and a Days-at-Sea (DAS) management system. In addition, regulatory measures include limitations on DAS, mesh size restrictions, trip limits, minimum size limits, and annual catch limits (NEFSC 2016).

The monkfish stock is divided into two management areas: the Northern Fishery Management Area (NFMA) and the Southern Fishery Management Area (SFMA). These stocks are defined by differences in temporal patterns of recruitment, perceived differences in growth patterns, and differences in gear usage. A GMRI-led tagging study provided additional evidence that very little movement takes place between the stock areas (Sherwood et al. 2013). Additionally, possession limits and regulatory requirements are

different in each of the areas. The possession limits are different depending on permit, area, gear type, and under which type of DAS permit the monkfish are being landed (GARFO 2017a).

Monkfish are landed in different market categories, including tails, whole gutted fish, and livers. Landed weight often must be converted to live weight because monkfish are commonly landed as just tails. This is done by multiplying landed tail weight by a conversion factor of 2.91. Minimum size for whole monkfish is 17 inches, and 11 inches for tails (GARFO 2017a). Until the 1990s, landings were primarily tails, but whole gutted fish are currently the largest market category (NEFSC 2016). Since 1996, there have consistently been over 2,000 mt of whole gutted monkfish landed in the southern FMA, whereas landings of whole gutted fish in the northern FMA only rose above 2,000 mt between 2000-2003. Landings of tails have been less than 2,000 mt and mostly declining in the SFMA since 2000. Tail landings in the NFMA have fluctuated between 650 – 3,700 mt since 2000. (NEFSC 2016).

In 2011, Amendment 5 to the monkfish FMP established Annual Catch Limits (ACLs) and accountability measures (AMs). The Magnuson-Stevens Reauthorization Act (MSRA) requires the NEFMC to determine ACLs and AMs that enable rebuilding within specified time frames for all managed stocks. This action implements a process for calculating an ACL in addition to the overfishing level (OFL) and acceptable biological catch (ABC) for each stock. Recommendations for these figures are developed by the PDT. The Science and Statistical Committee (SSC) sets ABC levels, and the NEFMC and MAFMC approve final ACLs, but cannot exceed the SSC's set OFL and ABC levels. ACLs may be broken into subcomponents for different segments of the fishery, including state waters, commercial, recreational, sectors, and the common pool. Accountability measures can be implemented in-season as management actions to prevent reaching or exceeding the ACL, or they can be corrective post-season management actions that address overages of an ACL. Amendment 5 also adjusted biological reference points (BRPs), and implemented measures to reduce waste and enhance efficiency. These measures allowed monkfish heads to be landed separately from the body, and also allowed for an additional day to be added to a limited access monkfish DAS vessel in the case of an overage to reduce discards (NMFS 2011).

In 2016, Framework Adjustment 9 approved possession limits for vessels operating under different DAS programs aside from a monkfish DAS. A new measure allowed Northeast Multispecies (groundfish) permit A and monkfish DAS vessels to possess unlimited monkfish tails under category C and D permits in the NFMA (NMFS 2016).

***CRITERION: If stock sizes are below management target levels, whether due to natural or man-made causes, management plans are established that enable rebuilding within a specified timeframe.***

***CRITERION: Sufficient data exist to determine harvest levels.***

#### **IV. Monkfish Data**

##### *Stock Status*

According to the 50<sup>th</sup> Stock Assessment Workshop (SAW 50) in 2010 (NEFSC 2010) and an operational assessment in 2013 (NEFSC 2013), monkfish is not overfished and overfishing is not occurring. Biological reference points (BRPs) were estimated using a Statistical Catch at Length (SCALE) model in SAW 50, as well as the 2013 operational assessment. In 2016, there was an operational assessment, for which the Terms of Reference were approved by an Assessment Oversight Panel (AOP). According to the preface of the 2016 operational assessment (NEFSC 2016):

*“One purpose of the AOP meeting was to confirm the recommendation made by the NEFSC and the concurrence of the NEFMC’s Scientific and Statistical Committee to not update the monkfish assessment using the same modeling approach as used in the last assessment. This recommendation was based on new scientific evidence that the vertebral ageing method for monkfish is not valid. The AOP agreed with the recommendation to not update the previous modeling approach (SCALE) for monkfish during the update assessment. This decision is recognized as a departure from standard procedure but is based on the recognition that the inability to estimate monkfish growth makes any analysis using SCALE unusable for providing catch advice. The AOP recommended that stock status not be evaluated during this data update for monkfish because of the lack of biological reference points to allow status determination.”<sup>1</sup>*

Thus, the BRPs are currently considered uncertain according to the 2016 operational assessment (NEFSC 2016). Rather than updating the stock status, the focus of the 2016 assessment was on developing analyses to help the Scientific and Statistical Committee (SSC) project acceptable biological catch (ABC) based on proxies used in the place of fishing mortality and spawning stock biomass (SSB), such as exploitation of the stock and survey indices, respectively. Survey data allow a direct understanding of the stock trends and have been used in the past for the management of monkfish. This method appears to work well for monkfish due to consistent data.

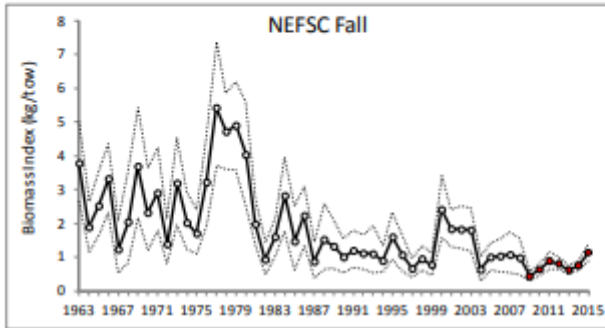
Biomass indices for monkfish in the NEFSC fall and spring research trawl surveys were at their lowest in the 1990s. Since the FSV Bigelow survey series began in 2009, however, biomass and abundance indices have been increasing. A strong yearclass and increase appeared in 2015, the latest year for which survey data is available (NEFSC 2016). Additionally, the Atlantic States Marine Fisheries Commission (ASMFC) shrimp survey data is used, and there were more monkfish caught by the shrimp survey prior to 2009 than by the NEFSC spring or fall surveys. Patterns of abundance have been consistent among the NEFSC, ASMFC shrimp, and the Maine/New Hampshire inshore surveys (see figure 3 below). The 2016 Review Panel did not express concern for the biomass trends of the stock, finding no indication that the fishery is overfished or experiencing overfishing (NEFSC 2016).

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<sup>1</sup> The full AOP report can be found in Appendix 4 of the 2016 monkfish operational assessment (NEFSC 2016).

## North

### Biomass



### Abundance

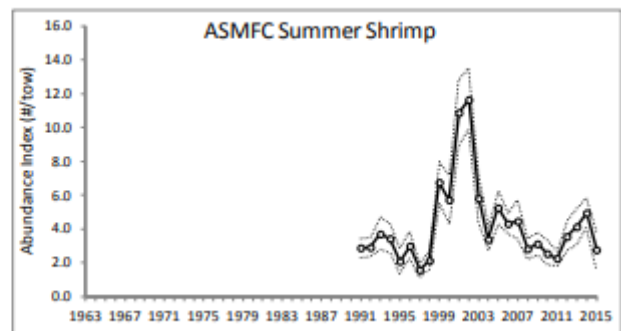
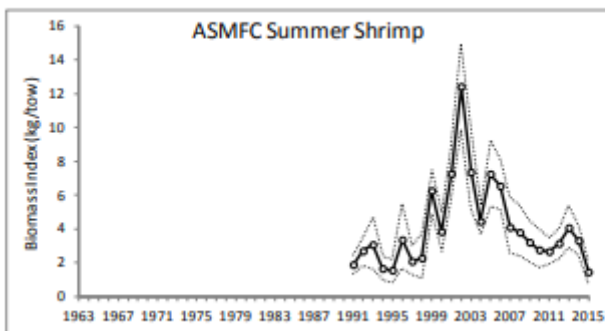
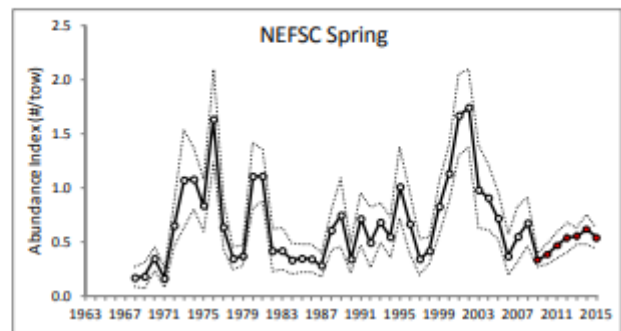
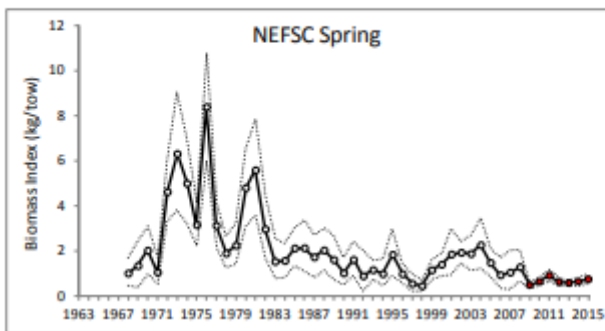
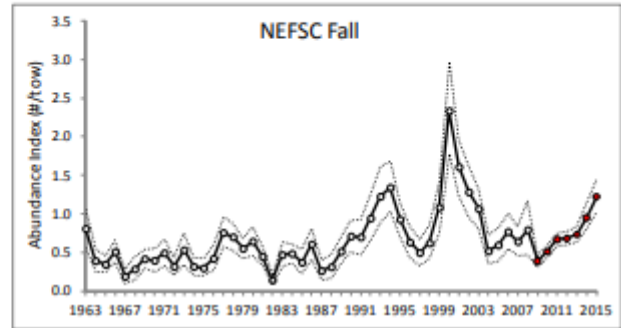


Figure 3. Survey indices for monkfish in the northern management area. Red-filled points are NEFSC surveys conducted on the FSV Bigelow (after 2008), converted to Albatross units.

### Sources of Uncertainty

The largest sources of uncertainty in the 2010 and 2013 SAW assessments were as follows:

- Estimations of total catch. Before 1980, fishery removals of monkfish were bycatch and largely unreported.
- The true size and age composition of catch were unknown.
- Estimates of stock size, recruitment, and fishing mortality came from poorly known input data and incomplete information on age and growth, longevity, natural mortality, and sex ratios.
- The NFMA's population model had a strong retrospective pattern

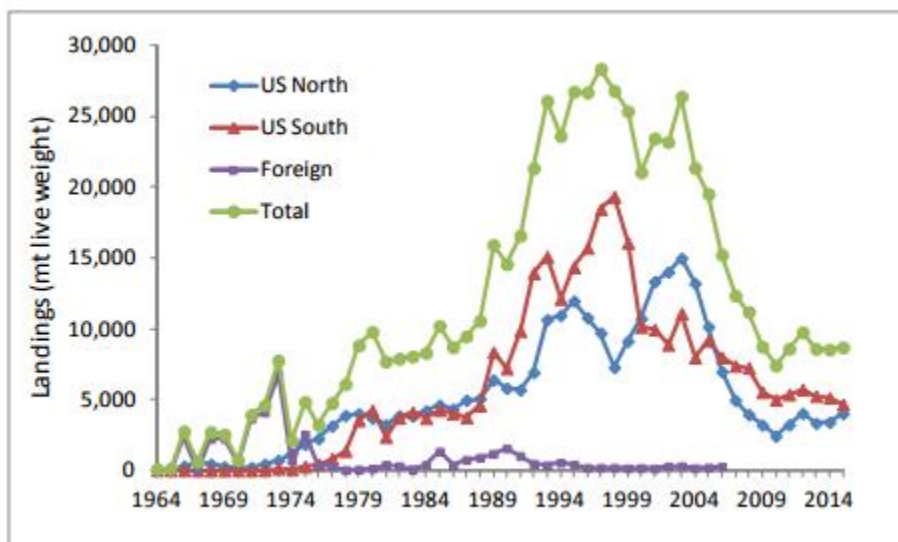


Many of these uncertainties were a roadblock for the development of new BRPs in the 2016 assessment. These uncertainties are taken into account in management decisions to ensure that the stock is healthy and stays below overfished and overfishing levels.

There is a collective effort among management and scientific organizations to improve information and uncertainties surrounding the monkfish fishery and stock. A Research Set-Aside (RSA) program was created for monkfish starting in 2006 to help develop an understanding of the stock structure to inform management decisions and stock assessments. The RSA focuses on priorities set by the Councils, including monkfish life history, stock definition, ecological significance, bycatch and discard, and improvement of gear selectivity (NEFMC 2017).

### *Stock History*

Prior to the late 1970s, monkfish were caught for personal consumption or sold outside of the dealer system, so catch statistics during this time are uncertain. During the 1980s, annual landings ranged between roughly 7,500-10,000 mt. Landings increased between 1992-2004, peaking at 28,500 mt in 1997. Historical landings for both management areas can be seen below in Figure 4 (NEFSC 2016).



*Figure 4. Landings (mt live weight) of monkfish in the NFMA and SFMA from 1964 to 2015 (NEFSC 2016).*

Coastwide landings began to decline after 2003, and most recently were reported at 4,138 mt in 2015. During 2008-2015 in the NFMA, landings have remained below the total allowable landings (TAL). This is suspected to be a result of groundfish (Northeast Multispecies) management restrictions. Landings in recent years compared to target TALs in recent years are shown in Figure 5 (NEFSC 2016).

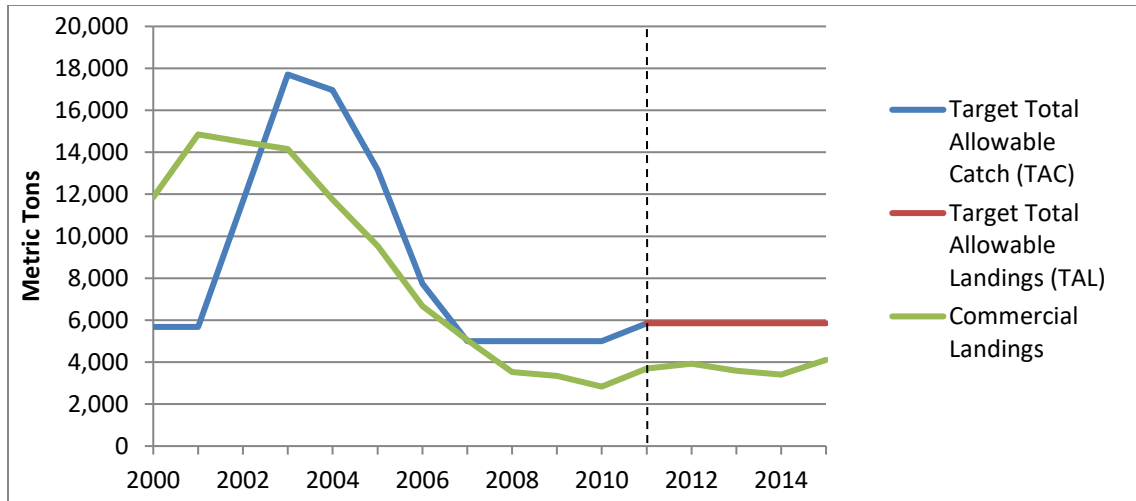


Figure 5. Target Total Allowable Landings (TAL) compared to commercial landings in the Northern Fishery Management Area from 2000 to 2015. The dotted line notes the change from target Total Allowable Catch (TAC) to target TAL in 2011.

#### Harvest Levels

Harvest levels were most recently determined by Framework Adjustment 10 in 2017, listed in Table 1 below. Framework Adjustment 10 increased the TAL for monkfish in fishing years 2017-2019 to 6,338 mt, compared to the previous TAL of 5,854 mt, which was set by Framework Adjustment 8 in 2014. The ABC and the Annual Catch Target (ACT) remained the same (NMFS 2014; GARFO 2017b).

Table 1. Monkfish Northern Fishery Management Area Harvest Levels for 2017-19	
Acceptable Biological Catch (ABC)	7,592 mt
Annual Catch Target (ACT)	6,567 mt
Total Allowable Landings (TAL)	6,338 mt

Possession limits are also set for monkfish. These limits are different depending on permit, gear, and what type of DAS permit under which they are being landed. The most up to date possession limits can be seen in Table 2 below (GARFO 2017a).

Table 2. Northern Fishery Management Area Possession Limits by DAS Program and Permit Category			
DAS Declaration	Monkfish DAS		Monkfish DAS and Multispecies A DAS
Permit Category	A & C	B & D	C & D
Landing Limit (tail weight per DAS)	1,250 lb (3,638 lb whole weight)	600 lb (1,746 lb whole weight)	Unlimited

Additionally, incidental trip limits are determined for vessels not fishing under a monkfish DAS. These vessels include scallop DAS, Sea Scallop Access Area Program, and Northeast Multispecies DAS. Incidental trip limits are different for non-DAS vessels and non-DAS trips with a skate bait letter of authorization (LOA), depending on the fishing area (NFMA, SFMA, or Regulated Mesh Areas) and gear type. Some additional permits held by non-DAS vessels may also affect incidental landing limits, including Northeast Multispecies small vessel permits, surf clam or quahog permits, and sea scallop permits (GARFO 2017a).

***CRITERION: Monitoring and compliance measures are in place to ensure acceptable harvest levels.***

## **V. Monitoring**

The NMFS has the primary responsibility for monitoring and surveillance of the monkfish FMP. The monitoring programs in place provide information to scientists and managers about when, where, and how fish are caught. In addition to information about fish that are landed, the monitoring programs can provide information about species that are not landed. For example, in support of the Marine Mammal Protection Act (MMPA) and the Endangered Species Act (ESA), observers record interactions with protected and endangered species.

Vessels are required to submit vessel trip reports (VTRs) for each fishing trip, which provide details on type of gear fished, area fished, species caught (and discarded), dealer information, and port of landing information, in addition to other details. These reports are due to NMFS on a weekly basis. When fishing in certain areas, such as the Eastern U.S./Canada Area, vessels are required to submit daily VTRs.

The New England Fisheries Observer Program (NEFOP) employs at-sea observer coverage at a level of 8%, as well as port sampling for the monkfish fleet. The final rule for Standardized Bycatch Reporting Methodology (SBRM) states that the Regional Administrator and the Science and Research Director will allocate at-sea observer coverage to the applicable fisheries of the Northeast Region sufficient to achieve a statistically significant sample (measured as the coefficient of variation [CV]) no greater than 30% for each stock it manages (73 FR 4736; January 28, 2008). In addition, vessels fishing in Special Access Programs (SAPs) are required to contact NEFOP prior to their trip to determine if they will have observer coverage. There are also shore-side port samplers who periodically work at fish auctions and exchanges taking biological samples. This program ensures compliance with the MSA in addition to the Endangered ESA and the MMPA.

Monkfish trips are subject to at-sea monitoring (ASM) coverage only in specific cases where a vessel has a Northeast Multispecies permit *and* is fishing such that the vessel's groundfish discards would count against their allocation. This ASM coverage is designed to address discard questions in the Northeast Multispecies fishery. As monkfish vessels operate primarily under days-at-sea with trip limits, there is no requirement for ASM specific to monkfish.

In other fisheries where there can be incidental catch of monkfish (e.g. scallop fisheries), there are also VTR and observer coverage requirements to ensure monitoring of the catch.

Shore-side, there is 100% electronic dealer reporting on a weekly basis, which includes, but is not limited to, unique trip identifier, quantity of species landed, price per unit by species, and port and state landed.

***CRITERION: Enforcement exists to ensure that harvesters follow regulations, and to prevent illegal practices and unreported harvest.***

## **VI. Enforcement**

In general, enforcement of the Monkfish FMP is coordinated through NOAA's Office of Law Enforcement (OLE). OLE Special Agents and Enforcement conduct complex criminal and civil investigations, board vessels fishing at sea, inspect fish processing plants, and conduct patrols on land, in the air and at sea. In addition to this enforcement work, the OLE administers the Cooperative Enforcement Program (CEP), which authorizes certain coastal state and territorial marine conservation law enforcement agencies to enforce federal laws and regulations in the Exclusive Economic Zone (EEZ). OLE also partners with the U.S. Coast Guard (USCG) and various other federal agencies, fishery management councils, and non-governmental organizations. In the common pool, enforcement of the Monkfish FMP is focused on compliance with DAS, seasonal closures, closed areas, gear restrictions, and trip limits, to name a few measures. For monkfish landed by a sector vessel, enforcement primarily relies on monitoring harvest levels through sector reporting, dockside monitoring, dealer reporting, and VTRs (in addition to some of the measures described above for which sectors are not universally exempt); however, individual sectors are also responsible for self-enforcement.

It is the responsibility of each sector to enforce any provisions adopted through procedures established in the operations plan and agreed to through the sector contract. Sectors may be held jointly liable for violations of the following sector operations plan requirements: Annual Catch Entitlement overages, discarding of legal-sized fish, and misreporting of catch (landings or discards).

NOAA's Office of General Counsel reports on any enforcement actions taken, by region, on a semi-annual basis, and also outlines regional enforcement priorities on an annual basis. Monkfish is not identified as a species of concern under OLE's enforcement priorities.

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