

Monkfish Northern Fishery Management Area Daily Landings and Days-at-Sea Limit Allocation Calculation for FY2011-FY2013

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Abstract

The Monkfish Plan Development Team (PDT) has been tasked with analyzing the effects of effort controls, days-at-sea (DAS) allocations and daily landing limits, on estimated landings of monkfish in the Northern Fishery Management Area (NMA) for fishing years (FY) 2011-2013. Three alternative annual catch targets (ACTs) were considered in the analysis. Different days at sea and trip limit combinations were proposed to offer management flexibility in the means by which effort is regulated in this fishery.

Introduction

The New England and Mid-Atlantic Fishery Management Councils (Councils) are developing Framework 7 to the Monkfish Fishery Management Plan (FMP) to adjust the ACTs for the NMA for FY2011 - 2013 approved by the Councils in Amendment 5 to be consistent with the revised Acceptable Biological Catch (ABC) recommended by the New England Council's Scientific and Statistical Committee (SSC). The objective of this analysis was to produce a range of monkfish trip limit and DAS allocation options under the target TAL alternatives being considered for the NMA.

Three ACT alternatives were used in an analysis of DAS and trip limit allocation setting for the NMA for fishing years 2011 through 2013. These ACTs are being considered in light of the revised ABC calculation for the NMA of 7,592 mt, which is 57 percent below the previous ABC calculation of 17,485 mt, and 29 percent below the ACT of 10,750 mt approved by the Councils in Amendment 5. In Amendment 5, the Councils decided to use an Annual Catch Target (ACT) as a proactive accountability measure, providing a buffer between the ACT, used to set management specifications, and the Annual Catch Limit (ACL). This buffer is necessary to compensate for the management uncertainty inherent to this fishery. If the ACL were to be exceeded, reactive accountability measures that could potentially have a negative impact on the future of the fishery would be activated.

In the NMA, alternatives that set the ACT at 73%, 80%, and 86.5 % (5,550 mt, 6,074 mt, and 6,567 mt, respectively) of ABC were considered. The ACT is the sum of the TAL and discards, which are estimated based on area-specific discard rates over the most recent three years from the recent stock assessment. The PDT analyzed a range of three trip limit and DAS alternatives for each ACT alternative specified above. The first trip limit/DAS allocation alternative analyzed kept monkfish DAS allocations (FY2007-FY2010) at status quo levels to gauge the effect of the ACT options on daily landing limits for each permit category. The second trip limit/DAS allocation alternative kept

monkfish daily landing limits (FY2007-FY2010) at status quo levels to gauge the effect of an ACT increase on DAS allocation. The third alternative considered set either daily landing limits or DAS allocations at a specified historic level to determine the appropriate corresponding DAS or trip limit level.

Recent advances in reporting in DAS monitoring have allowed us to use DAS declarations along with Vessel Trip Reports (VTR) and dealer-reported data to more accurately describe monkfish landings. Prior to the use of DAS declarations, landings by limited access monkfish-permitted boats could not be 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 were 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 two of the three proposed ACT levels in the NMA represent increases over TAL levels in the recent past, the method laid out in 50 CFR 648.96(b)(3)(iii) to reduce DAS and/or trip limits was not applicable. Basically, this method has used fishing vessel trip reports, scaled to dealer-reported landings, to adjust trip-level and vessel-level aggregate data down incrementally in an effort to identify DAS levels and/or trip limits that will sum to an allocated TAL for each of two sets of monkfish permit categories (AC and BD) after subtracting estimated incidental landings. Instead, a method that combined empirical data of both vessel-by-vessel and fleet-wide landings with a linear increase in DAS and/or trip limits, after subtracting for both limited access monkfish and other vessel incidental landings, was employed. In other words, if the allocation to permit category were increased by x%, either the trip limit or DAS allocation was increased by x%. The purpose of this report is to describe the assumptions and methods used to arrive at recommended DAS/trip limit combinations for each ACT option by permit category in the NMA.

Methods

Data sources

Data from fishing year 2009 were used as our baseline set for this analysis. Several data sources were used for this analysis, including: dealer electronic reports, the vessel permits database, DAS declaration (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. Data from fishing year 2009 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 management area, which has advanced our ability to describe and understand the directed monkfish fishery. Prior to this activity code, FVTRs, which contained no indication as to

whether a vessel was on an incidental or directed monkfish trip, were matched to dealer information to determine days and area fished.

Dealer-reported monkfish landings, while considered more comprehensive than FVTRs, lack information on the location of a fishing trip. Both DAS declaration and DAS charged, along with FVTR data, which contain fishing location information, are thus used to prorate the dealer-reported landings data by area, fishing activity (directed or incidental monkfishing by a limited access monkfish vessel) and permit category.

Assumptions

- Landings from monkfish permit category E and state-only permitted vessels will be exactly the same, in terms of live pounds landed, in FY2011-FY2013 as they were in FY2009. This assumption enables a reasonable reduction of the FY2011 monkfish quotas to account for the landings from monkfish permit category E and state-only permitted vessels.
- Landings and effort on trips in FY2009 by limited access vessels on non-directed (incidental) monkfish trips will be the same in FY2011-FY2013.
- Fishing and landing patterns will be similar in FY2011-FY2013 to those experienced in FY2009 as detailed in the text below.

These assumptions may be more uncertain than in previous years, given the changes in the groundfish fishery in 2010. There is, however, no empirical basis for modifying these assumptions going forward. This uncertainty may warrant caution in the selection of a preferred alternative.

Estimated discards

The ACT is first reduced by estimated discards, which are based on the most recent discard percentage calculated for that management area. The most recent discard percentage for the NMA is 11%. The resulting figure is the overall total allowable landings (TAL) for that management area.

Procedures for identification of incidental monkfish landings

Incidental landings by permit category E and state-only permitted vessels

Incidental landings of monkfish must be subtracted from the TAL before the remainder of the TAL can be allocated to the limited access monkfish fishery. Monkfish total reported live pounds from the dealer-reported landings database by FY2009 limited access monkfish permitted vessels were subtracted from total monkfish live pounds in the database to determine landings by non-monkfish limited access vessels. These are landings by monkfish permit category E and state-only permitted vessels. The proportions of these monkfish landed by management area were determined with VTR data and then subtracted from management area TALs.

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 a Fishing Vessel Trip Report. The DAS declaration 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 monkfish management area), the FVTR for the trip indicates the management area fished on the trip.

Procedures for calculation of DAS allocation and/or trip limits for each ACT/management alternative

As mentioned, trip limits and DAS allocations for each set of permit categories (AC and BD) could not be analyzed according to the method laid out in 50 CFR 648.96(b)(3)(iii). This method uses the most recent and complete set of vessel trip reports, scaled to dealer-reported landings, to adjust trip-level and vessel-level aggregate data **down** incrementally in an effort to identify DAS levels and/or trip limits that will sum to the appropriate allocated TAL for each of the two sets of monkfish permit categories after subtracting for estimated incidental landings. Because we were not scaling down trip limits or DAS, but instead were examining the effects of status quo or increased TALs, the previously-employed method was no longer applicable.

For the purposes of trip limit and DAS-setting to achieve the alternative TALs, landings and DAS/trip limits in the NMA from FY2007 to FY2009 were used as a guide to decisions concerning trip limits and DAS. In FY2007, when trip limits of 1,250 lbs and 470 lbs monkfish tail weight per DAS and 31 DAS were allocated to AC and BD permit categories, respectively, 101% of the 5,000 mt TAL was landed (Table 1). This result indicates that status quo DAS and a trip limits offer a potential lower bound for managing this fishery. In FY2009, landings in the NMA amounted to 67% of the TAL (Table 1). Using these landings as a guide, an increase of 50% of DAS or the BD trip limit would represent a potential upper bound for DAS and trip limit increases. With these two alternatives serving to delimit any increases in DAS or trip limits, the mid-point of these limits were chosen as the appropriate management recommendation.

Table 1. Target monkfish target TALs, trip limits, DAS allocations, and landings (FY 2000 - FY 2010) for the NMA

Fishing Year	Target TAL (lbs)	Target TAL (mt)	Trip Limits*		DAS Restrictions**	Landings (lbs)	Percent of TAL
			Cat. A & C	Cat. B & D			
2000	12,507,000	5,673	n/a	n/a	40	26,145,000	209%
2001	12,507,000	5,673	n/a	n/a	40	32,745,000	262%
2002	25,737,000	11,674	n/a	n/a	40	31,947,000	124%
2003	39,039,000	17,708	n/a	n/a	40	31,207,000	80%
2004	37,408,000	16,968	n/a	n/a	40	25,905,000	69%
2005	29,012,839	13,160	n/a	n/a	40	21,016,671	72%
2006	17,057,168	7,737	n/a	n/a	40	14,720,268	86%
2007	11,023,100	5,000	1,250	470	31	11,133,346	101%
2008	11,023,100	5,000	1,250	470	31	7,777,910	71%
2009	11,023,100	5,000	1,250	470	31	7,372,259	67%
2010	11,023,100	5,000	1,250	470	31		

* Trip limits in pounds tail weight per DAS

** Excluding up to 10 DAS carryover, became 4 DAS carryover in FY2007

Results and Discussion

Results for identification of incidental monkfish landings

Incidental landings by permit category E and state-only permitted vessels

The dealer and vessel permits databases allowed for the categorization of landings of monkfish in FY2009 by permit category. Matching these records to FVTRs enables the allocation of landings from the dealer landings database by management area and permit category and the allocation of FY2011-FY2013 TAL to each of the two permit categories based upon historical landings. For FY2009, landings by permit category E and state-permitted-only vessels totaled 2,168,190 live pounds (Tables 2 and 3).

Table 2: Summary statistics for monkfish in FY2009

	Live pounds
FY2009 monkfish landings by permit category E and state-only-permitted vessels	2,168,190
FY2009 monkfish landings by limited access permit category vessels	15,831,088
Total FY2009 monkfish landings	17,999,278

Source: NMFS Permits, Dealer and Vessel Trip Report Databases.

Table 3: FY2009 monkfish landings by permit category E and state-permitted-only vessels by management area.

Management area	Live pounds
NMA	815,245
SMA	1,352,945
Total	2,168,190

Source: NMFS Permits, Dealer and Vessel Trip Report Databases.

Incidental landings by monkfish limited access permitted vessels

Incidental and directed monkfish landings for each limited access permit category area were estimated by matching dealer-reported landings data with vessel-reported DAS declarations and fishing vessel trip reports. In the NMA, more than twice as many monkfish were landed on incidental trips for both permit categories (Table 4).

Table 4. FY2009 monkfish directed and incidental landings by permit category in the NMA.

Permit Category	Incidental or Directed Landings	Prorated Total Live lbs	Percentage of directed fishery by permit category
AC	D	1,153,698	70%
	I	2,421,600	
BD	D	495,742	30%
	I	1,950,474	

Source: NMFS Permits, Dealer, Days-at-Sea, and Vessel Trip Report Databases.

Results for calculation of DAS allocation and/or trip limits for each ACT/management alternative

Alternatives that set the ACT, which includes the TAL plus discards, at 73%, 80%, and 86.5 % of Allowable Biological Catch (ABC) of 7,592 mt were considered for the NMA (Table 5). For each alternative, three DAS and trip limit combinations were analyzed: the first carried over the DAS allocation from FY2007-FY2010 (31), the second carried over the FY2007-FY2010 trip limits (1,250 lbs tail wt. per DAS for AC, 470 lbs tail wt. per DAS for BD), and the third examined trip limits at 40 days at sea, the DAS allocation in the NMA from FY2000-FY2006, under the original FMP allocations (Table 6). In all of the scenarios, the trip limit for permit category AC was designated to be 1,250 lbs tail weight per DAS, which was the highest daily average landings recorded for vessels in this permit category prior to the imposition of trip limits.

As indicated, DAS and trip limits and their resulting landings for FY2007 and FY2009 were used as a guide to determining a range of management alternatives at each TAL alternative (Table 1). The mid-point of the range at each TAL and management alternative was chosen as the recommended management alternative. As an example, at the 5,000 mt TAL, a choice of a lower bound for management was status quo trip limits, while the upper bound was $470 * 1.49$, equivalent to 701 lbs tail weight per DAS for B or D permitted vessels. The mid-point of these two choices is 586 lbs tail weight per DAS (Table 6). At the higher TAL alternatives, the lower and upper bounds of DAS and trip limits were determined by a proportional increase in relation to the status quo 5,000 mt TAL and the 5,050 mt (101% of the TAL) landed in FY2007 in the NMA and the 3,344 mt (67% of the TAL) landed in FY2009 in the NMA (Table 1).

A linear increase in trip limit for the BD permit category for the two alternatives is likely an appropriate management strategy in light of uncertainty in landings and management in this fishery. The DAS and trip limits of 1,250 lbs and 470 lbs for permit categories AC and BD were appropriate in FY2007, as 101% of the TAL was taken. In FY2009, although the entire TAL was not landed, it does not appear that DAS and/or trip limits were limiting the fleet's ability to take the TAL. In fact, DAS usage information from FY 2009 indicates that most vessels fishing in the NMA use only a small number of monkfish DAS and do not land the trip limit (Figures 1-3).

Figure 1. FY2009 NMA DAS usage frequency distribution

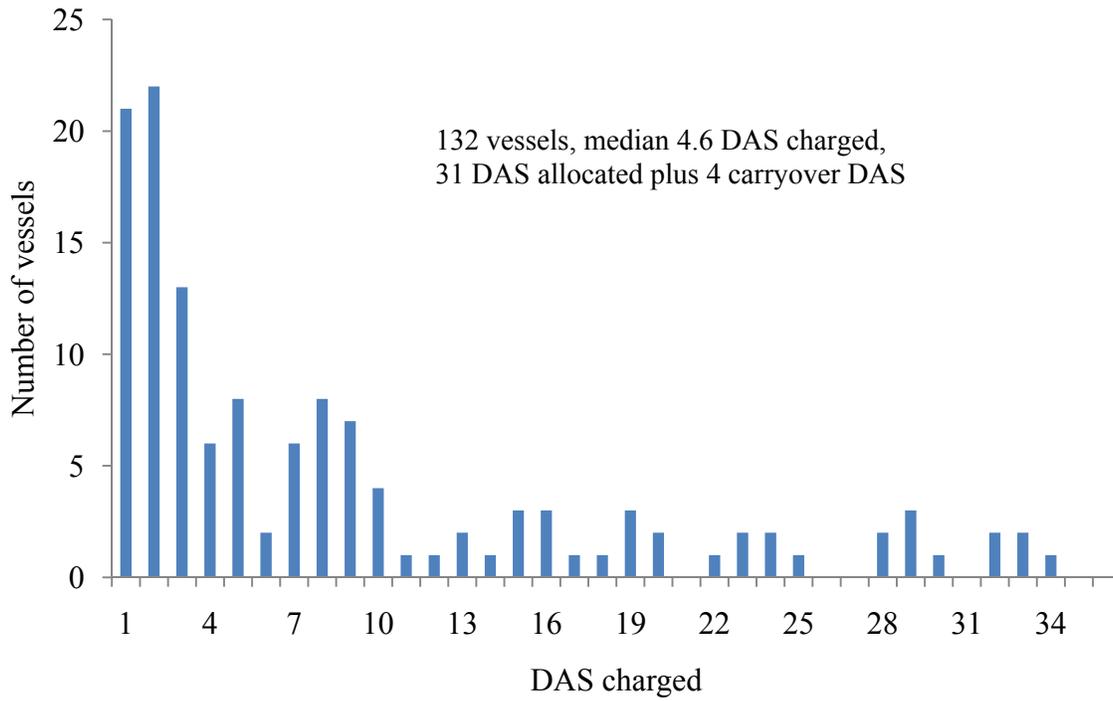


Figure 2. FY2009 permit category AC NMA trip landings frequency distribution

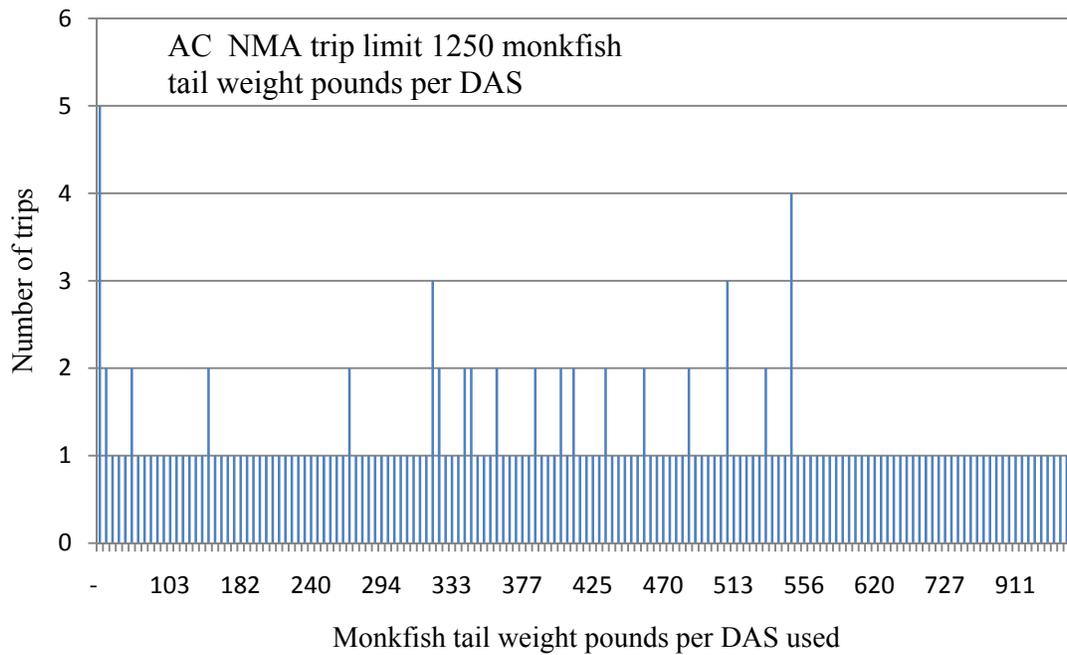
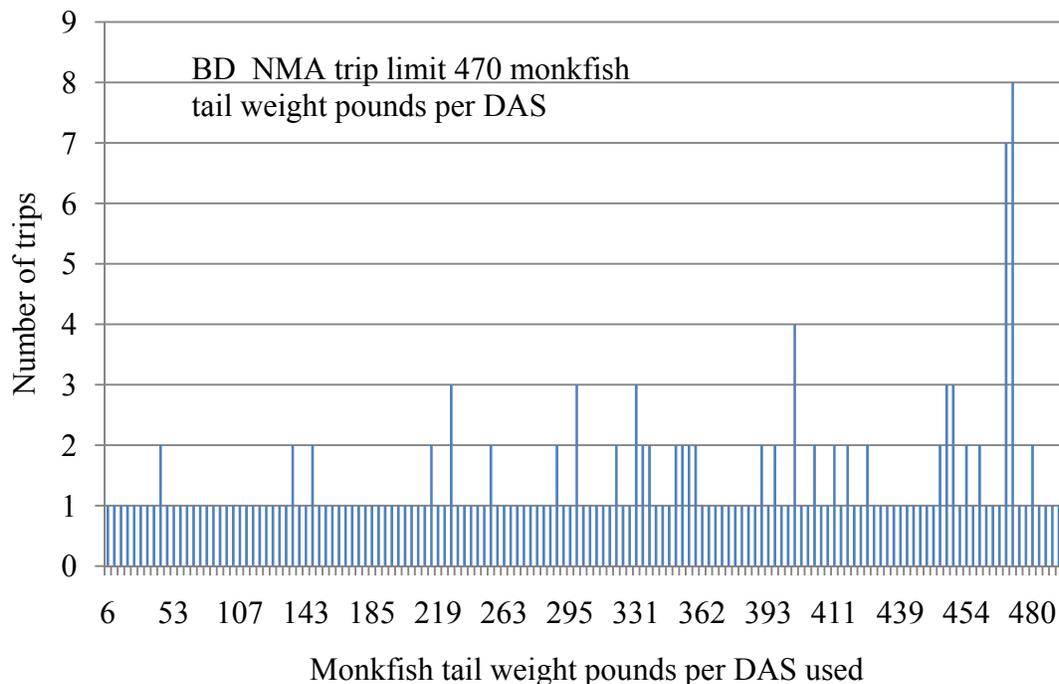


Figure 3. FY2009 permit category BD NMA trip landings frequency distribution



It is unclear at this time what effects changes in groundfish management will have on the monkfish fishery. It is clear from DAS usage in the NMA in FY2009 that monkfish DAS and trip limit allocations did not limit fleet landings. Two factors could have been responsible for holding FY2009 landings below the TAL and may continue to do so in the future: 1) available groundfish DAS or other multispecies restrictions, or 2) availability of monkfish to the fleet. If the former is the case, it is unclear how multispecies restrictions will affect the ability of vessels to target monkfish in the future. If the latter is the case and availability of monkfish in the NMA is waning, an increase in trip limits and/or directed monkfish DAS may not result in increased catch, as catch-per-unit-effort would be expected to decline. This situation could be an early indication of deteriorating stock status not detected by the most recent assessment.

Apart from the external constraints on the fleet’s ability to target monkfish, a large increase in DAS and/or trip limit allocations may promote an increase in fishing pressure on the monkfish resource beyond that anticipated by the DAS and trip limit increases proposed here. In other words, there may be a trip limit or DAS allocation that is high enough to provide an incentive for vessels that did not target monkfish under more restrictive limits in 2009 to do so in the future. While this “tipping point” cannot be predicted, it may be an important consideration in selecting the preferred alternative.

Table 5. ACT options for FY2011-FY2013 for the Monkfish Northern Fishery Management Area with corresponding estimated discards, incidental landings and allocations by monkfish permit category.

Options as percent of ABC*	ACT (mt) (1)	Discards (mt) (2)	NMA TAL (mt) (1)-(2) =(3)	TAL (live lbs) ((3)* 2204.623 lb/t)	TAL (live lbs) incidental landings subtracted (4)	AC incidental landings (5)	BDH incidental landings (6)	AC allocation of TAL ((4)-(5)+(6))*70 %	BD allocation of TAL ((4)-(5)+(6))*30 %
73%	5,550	550	5,000	11,023,115	10,207,870	2,421,600	1,950,474	4,081,837	1,753,959
80%	6,074	602	5,472	12,063,697	11,248,452	2,421,600	1,950,474	4,809,671	2,066,707
86.5%	6,567	722	5,854	12,905,863	12,090,618	2,421,600	1,950,474	5,398,722	2,319,822

* – Acceptable Biological Catch = 7,592 metric tons

Table 6. DAS and daily landing limits corresponding to three ACT options for the Monkfish Northern Fishery Management Area for FY2011-2013. Shaded grey cells and bolded text indicates the variable that has been solved.

Options as percent of ABC	AC daily landing limit	BD daily landing limit	DAS
73%	1250	586	31
	1250	470	39
	1250	465	40
80%	1250	636	31
	1250	470	42
	1250	510	40
86.5%	1250	686	31
	1250	470	45
	1250	556	40