New England Fishery Management Council
50 WATER STREET | NEWBURYPORT, MASSACHUSETTS 01950 | PHONE 978 465 0492 | FAX 978 465 3116
E.F. "Terry" Stockwell III, *Chairman* | Thomas A. Nies, *Executive Director*

MEMORANDUM

DATE: August 28, 2016

TO: Monkfish Committee

FROM: Monkfish Plan Development Team

SUBJECT: **Monkfish specifications for FY 2017 - 2019**

The Monkfish PDT met on August 24, 2016 to review the SSC recommended Allowable Biological Catch (ABC) for the monkfish fishery, and to make recommendations for both the calculated discard rate and the management uncertainty buffer. The SSC recommended status quo OFL and ABC for both the Northern and Southern Fishery Management Areas (Table 1).

Calculated Discard Mortality

The PDT discussed whether the calculated discard rate should be updated using the most recent 3 years (2013 – 2015) from the 2016 operational assessment. The discard rate itself is calculated from the ratio between 3 years of discards and catch. The status quo calculated discard rate, as used in Framework 8, was calculated using 2004 – 2006 discard and catch estimates from the 2007 Data Poor Working Group Assessment. The PDT noted that these estimates do not use Standardized Bycatch Reporting Methodology (SBRM). The 2016 operational assessment contains revised historic discards and total catch that are consistent with SBRM. Because SBRM changed the estimation and therefore the historic discards, it is difficult to do a direct comparison of the calculated discard rate from the 2007 assessment and the 2016 operational assessment. Re-calculating the discard rate using the revised 2004 – 2006 numbers would result in a higher discard rate for the SFMA (~30%) compared to the 22.5% used in Framework 8. Considering the changes in SBRM and the range of years used in the previous calculation, the PDT agreed that the calculated discard rates for both the NFMA and SFMA should be updated to the 2013-2015 time period as specified in the 2016 operational assessment. This would result in a calculated discard rate of 13.9% and 24.6% in the NFMA and SFMA, respectively.

Management Uncertainty Buffer

The PDT discussed whether changes to the management uncertainty buffer were warranted at this time. The management uncertainty buffers were set as part of Amendment 5 and differ between the management areas – 13.5% in the NFMA and 6.5% in the SFMA. The purpose of the buffer is to reduce the likelihood of the ACL being exceeded. In 2009, the PDT identified a wide range of factors that were contributing to management uncertainty (Table 2). The PDT

didn't identify any change in overall contribution to management uncertainty for any factor contained in Table 2.

The management uncertainty buffer should not allow the ACL to be exceeded. If the risk of exceeding the ACL is low then a larger management uncertainty buffer is not needed and vice versa. The TAL has been under-harvested in both management areas since the late 2000s (Table 3). Amendment 5 to the Monkfish FMP described the ACT as:

> *A proactive AM would be an ACT that is set sufficiently below the ACL such that the measures that are based on the ACT prevent the ACL from being exceeded , in consideration of all sources of management uncertainty. Proactive AMs, as described below, would set catch targets based on the expectation that, in spite of uncertainty in the effectiveness of management measures, those measures would ensure that the ACL is not exceeded. The ACT which would be the basis for setting management measures (DAS/trip limits), after accounting for incidental catch in non-directed fisheries, and includes discards in all fisheries.*

The PDT discussed arguments for and against adjusting the management uncertainty buffer but did not reach consensus on whether it should be done or what would be an appropriate adjustment in the 3-10% range for both areas. It was decided that guidance from the Committee regarding an appropriate level of risk was necessary.

The discussion whether to adjust the management uncertainty buffer focused on trends in landings and how well the methodology to calculate the discard rate performed. An analysis comparing the predicted discard ratio (discard: total catch) to the actual ratio in individual years indicated that the method for calculating discards is performing well and is not biased towards over- or under-estimating discards. In some years, the calculated discard ratio was higher than expected but in other years was lower (Table 4 and Table 5). The observed discards have remained below the projected amount in recent years indicating that the current method has been setting aside a sufficient amount of discards. The adequate performance of the calculated discard rate suggests a lower management uncertainty buffer may be acceptable for both areas. However, there are several caveats to be considered, as discussed below.

For the SFMA, one concern is the potential impact of scallop effort on discards. Scallop dredges contribute the largest portion to monkfish discards in the SFMA and if scallop fishing effort increases, monkfish discards could increase. There is no information at this time on whether increases or decreases in scallop effort should be expected. Even without an increase in scallop effort, discards (mt) could increase because as individuals of the strong 2015 year class grow, even after they reach legal size, many will be discarded in the scallop sector for regulatory and economic reasons. In addition, until the 2015 year class grows to exploitable size, they will be discarded in the trawl sector. These fish appear to be experiencing a fast growth rate and potentially could recruit to the fishery within a 1-2 year time frame.

An additional concern for the SFMA is the recent decrease in exploitable biomass and increase in relative exploitation ratios. Given these trends, some members of the PDT were hesitant to reduce the management uncertainty buffer in the SFMA, especially if reducing the buffer would increase the TAL. It was also counterintuitive to some PDT members that the buffer should be

decreased at a time when we're uncertain about monkfish growth (hence, the change in the assessment from the SCALE model to a survey-based assessment). Other PDT members found it counterintuitive to set substantial management uncertainty buffers given the apparently low likelihood of exceeding the ACL under existing management measures, and suggested that it is the ABC that should be reduced if there are concerns about scientific uncertainty/stock status.

The PDT discussed whether the buffer should be reduced when the TAL was not being achieved. Failure to achieve the TAL could reflect declining exploitable biomass; however, the TAL has not been achieved since 2008 in the SFMA, and exploitable biomass did not drop substantially until 2014. At previous meetings, fishery participants have indicated that external factors such as gear conflicts, skate prevalence, weather, regulations set in other FMPs, and environmental conditions can limit participation and catch. The 2015 year class adds another source of uncertainty, since landings may go up if this year class persists and enters the fishery during the upcoming specifications period.

Overall, adjusting the management uncertainty buffer appears justifiable but the PDT could not quantify an acceptable level of uncertainty, and therefore is providing specifications calculated under a range of buffers (Table 6 and Table 7). Guidance from the Committee regarding their risk tolerance of exceeding the ACL relative to the recent performance of the fishery and the Committee's knowledge of the likely course of this fishery over the next three years would assist in this policy decision. The impact of changing the management uncertainty buffer may differ between the two management areas. The northern fishery is largely incidental, however, vessels in the NFMA fishing on both a NE multispecies and Monkfish DAS will have no trip limit now that Framework 9 has been approved. The SFMA is more directed on monkfish but the 2016 operational assessment indicated a decrease in exploitable biomass. The TAL has not been achieved in either management area since the late 2000s, which may continue to act as an additional buffer, preventing the ACL from being exceeded even if discards are higher than expected. Overall, given recent fishery performance, minor changes to the uncertainty buffer appear unlikely to lead to significant impacts.

Table 1 - SSC recommended Overfishing Limit (OFL) and Allowable Biological Catch (ABC) for the Northern and Southern Fishery Management Areas in mt

	NFMA	SFMA
OFL (mt)	17805	23204
ABC (mt)	7592	12316

Table 2 - Sources of management uncertainty from PDT memo to the CTE dated February 27, 2009

		Source of Uncertainty
Permits	**Limited Access**	# active vs. total permits changes annually
		# participating as Cat. F (Offshore fishery) varies annually
	Open access (incidental catch)	# active incidental catch permits changes annually
DAS/trip limits	**DAS usage rate**	# DAS used vs. total allocated to active vessels changes annually
		carryover DAS
	DAS usage pattern	# landings per partial DAS
		steaming time inside VMS demarcation line (compared to pre-VMS call-in system)
	Catch rates	Variable # and amount of landings below trip limit
		Variable # and amount of catch above trip limit (bycatch)
		Catch below minimum fish size varies depending on recruitment and fishing effort patterns
Incidental Catch Fisheries	**Participants**	Type of Fishery (gear, location, etc.), governing regulations changes over time
		# LA vessels catching of monkfish while not on a DAS (under incidental limit)
	Catch rates	catch above incidental limit (bycatch)
		Catch below minimum fish size
Management Areas	**Participation**	vessels fishing in different areas varies annually
Gear	**Gillnets**	# nets used above minimum mesh size
Enforcement		Unknown extent of illegal behavior
Other FMPs/Protected Species Regs.		Regulations in other FMPs and to address protected species may change unpredictably, with consequences for directed and incidental monkfish effort and catch

Table 3 - Management measures for monkfish, fishing years 2000-2015 for the NFMA and SFMA

Northern Fishery Management Area

		Trip Limits*	Trip Limits*			
Fishing Year	Target TAC/TAL	Cat. A & C	Cat. B & D	DAS Restrict	FY Landings (mt)	Percent of TAC
2000	5,673	n/a	n/a	40	11,859	209%
2001	5,673	n/a	n/a	40	14,853	262%
2002	11,674	n/a	n/a	40	14,491	124%
2003	17,708	n/a	n/a	40	14,155	80%
2004	16,968	n/a	n/a	40	11,750	69%
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	3,403	58%
2015	5,854	1,250	600	45	4,105	70%

* Trip limits in pounds tail weight per DAS

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

In 2011, the target TAC became a target TAL

Southern Fishery Management Area

		Trip Limits*	Trip Limits*			
Fishing Year	Target TAC/TAL	Cat. A,C,G	Cat. B, D, H	DAS Restrict	FY Landings (mt)	Percent of TAC
2000	6,024	1,500	1,000	40	7,960	132%
2001	6,024	1,500	1,000	40	11,069	184%
2002	7,921	550	450	40	7,478	94%
2003	10,211	1,250	1,000	40	12,198	119%
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	57%
2014	8,925	610	500	32	5,415	61%
2015	8,925	610	500	32	4,703	53%

Table 4 - Performance of the calculated discard ratio in the NFMA. The discard ratio is calculated using 3 years of discards and catch ($(d_1+d_2+d_3)/(c_1+c_2+c_3)$), where d_y = discards is year y and c_y = catch in year y.

Year	Landings	Discards	Predicted Ratio	Actual Ratio	Difference in value
2004	13,209	847			
2005	10,140	711			
2006	6,974	738			
2007	4,953	778			
2008	3,942	338	7.0%	7.9%	-0.9%
2009	3,210	465	9.2%	12.7%	-3.5%
2010	2,424	317	10.5%	11.6%	-1.1%
2011	2,362	452	11.6%	16.1%	-4.5%
2012	4,033	**602**	10.5%	13.0%	-2.5%
2013	3,332	589	13.4%	15.0%	-1.7%
2014	3,402	552	13.5%	14.0%	-0.5%
2015	4,027	601	14.5%	13.0%	1.5%

Table 5 - Performance of the calculated discard ratio in the SFMA. The discard ratio is calculated using 3 years of discards and catch ($(d_1+d_2+d_3)/(c_1+c_2+c_3)$), where d_y = discards is year y and c_y = catch in year y.

Year	Landings	Discards	Predicted Ratio	Actual Ratio	Difference in value
2004	7978	3782			
2005	9177	3421			
2006	7980	3448			
2007	7388	2755			
2008	7250	1901	29.8%	20.8%	9.0%
2009	5532	1626	28.2%	22.7%	5.5%
2010	4996	2109	26.4%	29.7%	-3.3%
2011	6344	2200	23.7%	25.7%	-2.0%
2012	5724	**2714**	24.1%	32.2%	-8.1%
2013	5253	1922	26.0%	26.8%	-0.8%
2014	5135	1724	29.2%	25.1%	4.0%
2015	4609	1239	28.3%	21.2%	7.1%

Table 6 - Specifications (in mt) for the NFMA using the 3-10% range of management uncertainty buffers discussed by PDT and status quo with the updated calculated discard rate

	3%	4%	5%	6%	7%	8%	9%	10%	13.5%
ABC	7,592	7,592	7,592	7,592	7,592	7,592	7,592	7,592	7,592
ACT buffer	228	304	380	456	531	607	683	759	1,025
ACT	7,364	7,288	7,212	7,136	7,061	6,985	6,909	6,833	6,567
Discards	1,026	1,015	1,005	994	984	973	963	952	915
TAL	6,338	6,273	6,208	6,142	6,077	6,011	5,946	5,881	5,652

Table 7 - Specifications (in mt) for the SFMA using the 3-10% range of management uncertainty buffers discussed by PDT and status quo with the updated calculated discard rate

	3%	4%	5%	6%	7%	8%	9%	10%	6.5%
ABC	12,316	12,316	12,316	12,316	12,316	12,316	12,316	12,316	12,316
ACT buffer	369	493	616	739	862	985	1,108	1,232	801
ACT	11,947	11,823	11,700	11,577	11,454	11,331	11,208	11,084	11,515
Discards	2,935	2,905	2,875	2,844	2,814	2,784	2,754	2,723	2,829
TAL	9,011	8,918	8,825	8,733	8,640	8,547	8,454	8,361	8,686