



New England Fishery Management Council

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C.M. "Rip" Cunningham, Jr., *Chairman* | Thomas A. Nies, *Executive Director*

MEMORANDUM

DATE: May 22, 2013

TO: Monkfish Oversight Committee (SSC)

FROM: Phil Haring, Monkfish Plan Development Team (PDT) Chair

SUBJECT: Report on April 30th PDT meeting

On April 30, 2013, the Monkfish PDT met to address the following agenda items:

1. Review the 2013 assessment update report and develop any recommendations to the Scientific and Statistical Committee (SSC), including calculation of Overfishing Limit (OFL) and Allowable Biological Catch (ABC) under existing reference point control rules. Also develop recommendations to the Monkfish Oversight Committee, as appropriate, particularly regarding Annual Catch Targets (ACT) and management measure options.
2. Discuss and assign the tasks needed to prepare the Framework 8 document, including the SAFE Report (2 years), the DAS/trip limit specifications, and any other measures the Councils want to add (e.g., permit Category H fishery boundary line).
3. Review progress to date on Amendment 6, make recommendations to the Monkfish Committee, as appropriate, and identify what analysis and document prep needs we foresee.
4. Time permitting, we will review RSA priorities, and make recommendations to the Committee.
5. Review and develop recommendations to the Committee regarding the monkfish emergency action for 2013.

Agenda item #1 occupied the bulk of the discussion time due to the necessity of completing a report to the SSC on calculations of OFL and ABC in advance of their May 16th meeting. The PDT's report to the SSC is appended to this document. With regard to developing ACT options, the PDT noted that specification of final options would depend on the SSC's ABC recommendations and the advice of the Oversight Committee. Nonetheless, the PDT agreed it

could provide qualitative input to the Committee on factors contributing to management uncertainty, and descriptions of some ACT alternatives for Committee consideration.

The purpose of the ACT is to provide a numerical basis for specifying days-at-sea (DAS) allocations and trip limits so that the total catch does not exceed the limit (ACL) by taking into account management uncertainty. Even if sources of management uncertainty could be quantified for past circumstances and conditions, it is nearly impossible to do so into the future with much certainty because many of the factors contributing to management uncertainty are exogenous to the monkfish fishery management plan, and there cumulative and offsetting effects. Thus, the setting of ACT is a subjective process that depends on the collective sentiments of all participants. As originally stated in Amendment 5, the expectation is that actual catch will vary above or below the target, and part of the specifications process is to try to ascertain and address the causes of that variability.

While we can quantify some factors that contribute to catch relative to the ACT, such as recent DAS usage rates, catch rates relative to the trip limits and, to some extent, discard rates and operator-reported reasons for those discards (on observed trips), we cannot necessarily assume that those patterns will persist into the future. For example, DAS usage rates have remained relatively constant over the past several years, even with the implementation of sector management in the groundfish fishery. As illustrated in our earlier Latent Effort White Paper (August, 2011), one-half of the DAS allocated to vessels that use at least one monkfish DAS in a year, are not used, and those could easily be activated if conditions warranted. Any departure from the assumptions about the persistence of past behavior introduces management uncertainty, which the FMP needs to account for to prevent exceeding the ACL.

To aid in the Committee's discussion of ACT specification in Framework 8, the PDT compiled a list of factors that could result in effort shifts into or out of the fishery or otherwise contribute to management uncertainty. Potentially, the PDT could attempt to assign directionality or magnitude to the impacts of these independent factors, but likely not a calculation of the cumulative total impact in terms of projected changes in monkfish catch. The factors contributing to management uncertainty include, but are not limited to the following:

- **Changing catch rates and DAS usage patterns** – the model used to specify DAS allocations and trip limits assumes that catch rates and DAS usage in the most recent year or two will persist into the next three years, and also that the magnitude of incidental catch of monkfish remains relatively stable. Any deviation from that assumption introduces management uncertainty;
- **Changing regulations in other fisheries**, both those which are closely integrated with the monkfish fishery (such as, multispecies, scallops, skates and dogfish), and other, less directly linked fisheries will impact decisions by monkfish vessel operators on whether and how to direct effort on monkfish, and on the magnitude of incidental monkfish catch, which generally comprises ½ of the total monkfish catch,. For example, a number of southern area fishermen have expressed concern that quota reductions being implemented for several key groundfish stocks in the northern area will cause northern area groundfish fishermen to shift their monkfish effort to the southern area. This concern has been expressed formally in response to the New England Council's recent Emergency Action request, to modify or eliminate monkfish trip limits for vessels fishing on a groundfish DAS in the northern area (see Emergency Action discussion summary below). Changes in other fisheries could also have an unpredictable impact on the incidental catch of monkfish. Such changes could result in either more or less incidental monkfish

catch. Another source of uncertainty is the impact on monkfish catch rates of changes to existing closed areas under Frameworks 48 and 50 to the Multispecies FMP;

- **Measures adopted under laws other than the Magnuson-Stevens Act**, such as the Endangered Species Act or Marine Mammal Protection Act, can have a significant and immediate impact on monkfish fishing effort patterns, including Harbor Porpoise Consequence Closures or new measures to reduce fisheries impacts on harbor porpoise, and yet-unknown measures to reduce the takes of Atlantic sturgeon;
- **Market forces-** Monkfish is primarily an export product, and the market price, which directly affects fishermen's decisions on whether to target monkfish, often depends on unpredictable, highly exogenous factors totally outside of the control of domestic suppliers (i.e., both U.S. monkfish fishermen and processors/exporters), including availability of product from other sources, and economic or political conditions in market countries. For example, the primary market countries for U.S. monkfish are Korea, Japan, France and Spain. Currently, Korea is facing a looming military conflict with North Korea, the Japanese Central Bank is taking aggressive steps to devalue the yen (which makes dollar-priced monkfish more expensive), and both France and Spain are in the midst of a Euro-wide economic crisis manifested by high rates of unemployment, rising debt burdens and other uncertainties. While these factors likely have resulted in lower levels of demand for monkfish, any alleviation of these crises could rapidly result in a demand increase, especially since monkfish is so highly valued in those markets;
- **Fuel prices -** The volatility in fuel prices has a direct impact on vessel operator decisions to target monkfish, particularly in the trawl and offshore fisheries. Trawling is the predominant method for targeting monkfish in the northern management area and in the Southern Offshore (Category F) Fishery. Trawling for monkfish frequently involves making long, deep tows which are highly fuel consumptive. While fuel prices have been at historic highs in recent years, any short-term drop could provide sufficient incentive to increase directed monkfish effort, which currently is not constrained by DAS allocations nor, in most cases, by the trip limits currently in place, particularly in the northern management area. Conversely, any spike in fuel prices would likely constrain directed fishing for monkfish, especially by trawl vessels, at least over the short term.
- **Catch reporting** – Potential changes to catch reporting requirements and observer coverage, will alter the frequency and accuracy of catch reporting in unpredictable ways, and introduce additional uncertainty into the management process, particularly where historical data and current data are involved in the same decision process.

With the above considerations in mind, and others that aren't specified, the PDT could not establish a systematic or quantitative basis for setting the catch target. To avoid a completely arbitrary ACT-setting process, however, the PDT identified some options for Committee consideration:

1. **Maintain current ACT values:** 6,567 mt in the north and 11,469 mt in the south. This approach would be valid as long as those targets remain below the revised ACLs. Based on the draft assessment results, however, the preliminary ABC calculations done by the PDT for SSC consideration (see attached memo) would result in the ACT exceeding the ABC in the southern area using this approach;
2. **Maintain current buffer between ACT and ACL:** While the ACTs adopted in Amendment 5 and Framework 7 (for the north) were not based on a specific buffer applied to the ACL and were set by independent methods, they, coincidentally resulted in equivalent buffers of

approximately 14% (ACT/ACL=0.86). Based on the alternatives for ABC that the PDT is presenting to the SSC (with no assurance that one of those will be recommended to the Councils), the resulting ACTs and % change would be in the range of 7,440-9,526 mt for the north (increases of 13-45%), and 8,996-7,865 mt for the south (decreases of 22-32%); and,

- 3. Set ACT equal to current catch** – This is similar to, but not exactly the same as the “constant catch” method used by the Mid-Atlantic Council for fisheries that have the lowest level of assessment quality (Level 4), such as Black Sea Bass. The primary difference in using this method for setting monkfish ACTs is that current catch would be used to set the catch target, not the catch limit. Nonetheless, the PDT offers this as an alternative for Committee consideration. This approach would likely result in only minor adjustments to the current DAS allocations and trip limits, although those calculations have not yet been done.

Framework 8 Preparation

The PDT then discussed the Framework 8 (specifications) document preparation. Members generally agreed that work could begin on some sections of the document, such as the Affected Human Environment and SAFE Report, but analytical work including specification of DAS and trip limits, and the impacts of those alternatives, could not begin until the Council has approved the ABC and ACT alternatives for consideration. Approval is scheduled for the June NEFMC meeting. PDT Members are now aware of the goal of facilitating final Council action at the September NEFMC and October MAFMC meetings, and can plan their work schedules accordingly.

One of the Amendment 6 alternatives that has been suggested for inclusion in Framework 8 is changing the northern boundary of the permit category H fishery, which is currently 38°40'N Lat.. In Amendment 6, the proposal is to eliminate the boundary. Another alternative for Committee consideration is to move the boundary to the existing Northern/Southern Management Areas boundary line, which would disallow Category H vessels from fishing in the Northern Management Area.

Emergency Action discussion

The PDT discussed the potential impact of proposed changes to the recent Emergency Action (EA) implemented by NMFS to help alleviate the adverse economic impact of quota reductions for several key groundfish species in the Gulf of Maine and on Georges Bank. Under the current EA, the monkfish trip limit is lifted for vessels fishing on a monkfish DAS in the northern area. NMFS also considered, but did not approve, an alternative that would have eliminated the monkfish trip limit for vessels fishing on a groundfish DAS in the northern area.

According to the Environmental Assessment prepared for the EA, increased groundfish DAS usage by sector vessels that do not currently use groundfish DAS (to take advantage of higher monkfish landing limits) poses a greater risk that the monkfish ACT would be exceeded, although such a risk is somewhat mitigated by NMFS' authority to reinstate trip limits if circumstances warrant. Secondly, however, NMFS received a number of comments, including from the Mid-Atlantic Council, that this alternative poses a real and substantial risk of monkfish fishing effort shifting to the Southern Management Area. If vessels are not required to use a monkfish DAS to avail themselves of the higher or unrestricted monkfish limits in the northern area, because the same opportunity is available when a vessel is on a groundfish DAS, then vessels could retain their monkfish DAS for use in the southern area.

In response to the proposed EA, the NEFMC voted to request that NMFS consider modifying the measures such that the current trip limits applicable to vessels on a monkfish DAS would apply to monkfish limited-access permit holders fishing on a groundfish DAS in the northern area (i.e., not that the trip limit would be eliminated, as in the alternative not approved). The Monkfish Committee will discuss this proposal at its upcoming meeting, in consideration of PDT input. Having a discussion at this meeting also provides an opportunity for MAFMC members to provide additional comment and participate in the development of any formal Committee recommendations.

After discussing the EA alternatives, the PDT concluded that the potential for effort shifts into the southern area is a real and valid concern, but that the actual impact cannot be projected or quantified with any acceptable degree of precision, due to the large number of allocated but unused monkfish DAS, the low cost of leasing groundfish DAS, and other factors affecting vessel operators who may to shift effort to the southern area. The PDT also agreed that the NEFMC's new proposal is unlikely to reduce the potential for such effort shifts compared to the EA alternative that was not approved, given that the current trip limits are not constraining on vessels fishing on a monkfish DAS in the northern area, and that incentives would still exist to target monkfish under a groundfish DAS in the northern area and use monkfish DAS to target monkfish in the southern area..

Amendment 6 Development

The PDT discussed the status of Amendment 6 and the Committee's intent to proceed with concurrent development of Amendment 6 and Framework 8. Due to the time remaining in the meeting, the PDT discussion of Amendment 6 focused on work load issues, and tasking of various document preparation and analysis needs. Members noted that in some cases, the work being done for Framework 8 will be applicable to the Amendment 6 document.

On specific Amendment 6 alternatives, one member raised the issue of the lack of consistency among the various time periods proposed for catch shares qualification, latent effort reductions, and DAS leasing alternative, and noted that having consistent alternatives would reduce the complexity of the document. Another member questioned whether the horsepower classification restrictions applicable to DAS leasing were necessary, given that they were not included in the leasing program ultimately adopted in the groundfish fishery. Unless necessary to address a particular management objective, adopting a leasing program that differs from the existing groundfish DAS leasing program would unnecessarily complicate administration of such a program for both NMFS and vessels, particularly in the northern area.

The PDT had no other specific comments on Amendment 6.

RSA priorities

The current priorities for cooperative research projects under the monkfish Research Set-Aside (RSA) program were distributed for PDT review. Due to a lack of time, here was no discussion, but the Chair requested that members submit comments. One member provided comment and recommendations which are provided below. These were vetted by email to the PTD.

1. Priority 1: Research on monkfish life history focusing on: (a) Age and growth, (b) longevity, (c) reproduction, and (d) natural mortality;

2. Priority 2: Stock definition, stock movements, mixing, and migration through tagging studies, DNA markers, morphological characteristics and other means, focusing on: (a) Short- and long-term movements, and, (b) habitat use in relation to broad scale movements
3. Priority 3: Research concerning trophic interactions of monkfish with other species and monkfish cannibalism;
4. Priority 4: Research concerning bycatch and discard mortality focusing on: (a) Target species (i.e., monkfish or Northeast multispecies), and (b) non-target species (e.g., monkfish or skate);
5. Priority 5: Trawl and gillnet gear studies focusing on: (a) Size and/or species selectivity, and (b) bycatch reduction, including reducing bycatch of and interactions with protected species.

The PDT supports the following changes

1. Continue unchanged.
2. Suggested re-wording: "Migration patterns focusing on: (a) Short- and long-term movements with respect to management areas and off-shelf movements, and, (b) habitat use." Regarding the stock definition issue that has been embedded in #2, a number of ongoing and past projects may resolve the issue. Perhaps a new RSA priority could be to "develop an allocation method under a one-stock, two-management area scenario" (although it is unclear how research addressing this idea would involve industry in a cooperative research effort).
3. Move # 5 to #3 to address whether there is dome shaped selectivity in gillnets and/or trawls
4. Also, get rid of #3 or put it on a lower priority.



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MEMORANDUM

DATE: May 1, 2013
TO: Scientific and Statistical Committee (SSC)
FROM: Phil Haring, Monkfish Plan Development Team (PDT) Chair
SUBJECT: PDT calculations and comments on monkfish reference points

On April 30, 2013, the Monkfish PDT convened to review the recent stock assessment update, provide comments and background information to the SSC for its development of recommendations to the Council on Allowable Biological Catch (ABC) for the monkfish fishery. In preface, readers should be aware that the PDT's efforts were hampered by lack of an assessment report (since it had not been finalized as of the meeting) and associated reviewer comments, which also had not yet been compiled. In light of that, some PDT members agreed that the following quote from the statistician, John Tukey, would be an appropriate way to introduce this discussion summary:

The data may not contain the answer... the combination of some data and an aching desire for an answer does not ensure that a reasonable answer can be extracted from a given body of data. **Sunset salvo. The American Statistician 40 (1)**

That said, the PDT did have available some summary data which enabled it to perform the necessary calculations, and to develop commentary on the results.

Calculation of the overfishing limit (OFL)

OFL, based on the control rule adopted in Amendment 5, is defined as the product of the fishing mortality threshold (F_{max}) and the current estimate of exploitable biomass. Based on the draft assessment results, $F_{max} = 0.44$ and 0.37 , for Northern and Southern stock components, respectively. The terminal year (2011) estimates of exploitable biomass are 44,730 mt and 98,450 mt, North and South. The PDT also projected an estimate of exploitable biomass at the start of 2014 by applying the status quo (2011) F to the terminal year exploitable biomass from the assessment in order to provide the SSC with an alternative to using what will be a 3-year-old OFL estimate by the time it takes effect. The PDT cautions, however, that neither method resolves the inherent uncertainty in the OFL values.

Further, the estimate of exploitable biomass at the start of 2014 is based upon a projection from the SCALE model, a model that has demonstrated an optimistic retrospective pattern in the past. The PDT could not come to consensus on whether to recommend using an admittedly older terminal year estimate of exploitable biomass, or one that is based on uncertain projections as the basis for determining OFLs for fishing years 2014-2016.

The following table provides the results of these calculations:

Area	Basis	Fmax	EB ₂₀₁₁ , mt	OFL mt
North	SCALE 2011 EB	0.44	44,730	13,907
	Projected 2014 EB status quo F		57,267	17,805
South	SCALE 2011 EB	0.37	98,430	26,542
	Projected 2014 EB status quo F		86,052	23,204

EB = exploitable biomass

OFL= Fmax * B current (exploitable biomass)

Options for calculation of Allowable Biological Catch (ABC)

As with OFL, the ABC control rule was adopted in Amendment 5, but the two differ in that the ABC control is not expressed simply as an equation. The following excerpt from Amendment 5 explains:

ABC is the level of catch that accounts for scientific uncertainty in the estimate of OFL and any other scientific uncertainty. NSI Guidelines state that the Council must establish an ABC control rule based on scientific advice from its SSC. Further, the guidelines prescribe that “the determination of ABC should be based, when possible, on the probability that an actual catch equal to the stock’s ABC would result in overfishing.

The SSC observed in its June 23, [2010, following SARC 50] report to the Council that “considerable uncertainties in the assessment model preclude its use to determine probability of exceeding the projected Overfishing Level of catch.” Therefore, the SSC recommended the method of determining ABC should be considered an interim proxy until Overfishing Level of catch and its uncertainty can be projected.

The SSC recommended [in March 2009, during the development of Amendment 5, and subsequently adopted by the Councils] that the interim ABC should be derived (ABC control rule) as:

the product of the average exploitation rate during the recent period of stable or increasing trend in biomass for each management unit and the most recent estimate of exploitable biomass.

Based on the results of SARC 50 (2010), the SSC reported to the Councils in September 2010 the following:

Using average exploitation rates during the most recent periods of biomass increase (2006-2009 in the northern area; 2002-2009 in the southern area) and the most recent estimate of exploitable biomass from SARC 50, 2010 ABC is 7,592 mt in the northern area and 12,316 mt in the southern area. These are about 40% and 34% of the OFLs for the northern and southern areas NMA and SMA respectively and highlight the large uncertainties in the assessments.

Based the 2013 assessment update, the PDT calculated the ABC options in the same way it did for the OFL options, i.e., using the terminal year results for exploitable biomass, and projecting exploitable biomass to 2014 by applying the status quo Fs. The PDT also updated the period used to derive the applicable exploitation rate under the control rule language to 2006-2011 (North) and 2002-2009 (South), noting that the assessment showed a decline in southern area biomass in 2010 and 2011, despite the relatively low Fs. A member of the PDT suggested that the period of “stable or increasing trend in biomass” is somewhat subjective, and that the declines in 2010 and 2011 may just natural variability, as might be expected, rather than a real change in biomass trajectory, which could be better confirmed by additional data points.

The following table summarizes the PDT’s calculation of the ABC options, and includes an updated calculation of the MSY proxy for reference:

Area	Basis	F _{threshold}	M	U	B _{target} ¹	B _{threshold}	Exploitable B 2011, mt	MSY proxy ²	OFL ³	Fabc ⁴	Uabc	ABC	ABC/OFL
North	SCALE 2011 EB	0.44	0.30	0.311	46,074	23,037	44,730	9,383	13,907	0.25	0.19	8,601	0.62
	Projected 2014 EB status quo F						57,267		17,805			11,012	
South	SCALE 2011 EB	0.37	0.30	0.270	71,667	35,834	98,430	14,328	26,542	0.13	0.11	10,400	0.39
	Projected 2014 EB status quo F						86,052		23,204			9,092	

EB = exploitable biomass
¹ total biomass, 2013 assessment, longterm projected biomass at Fmsy proxy (=Fmax)
² catch produced from Fmax at Btarget, 2013 assessment update
³ Fmax * B current (exploitable biomass)
⁴Fabc=F during recent increases in biomass North: 2006-2011 South: 2002-2009
* ACT based on buffers from Amendment 5 and FW7

It is noted here that the MSY proxies calculated by the PDT following SARC 50 (2010) were 10,745 mt (North) and 15,279 mt (South).

In its March 30, 2009 report for the development of the original reference point control rules, the SSC commented that “the data-poor default method for determining an interim ABC produces catch advice that is substantially less than the nominal OFL, but is not directly associated with overfishing (i.e., it is not directly based on OFL and its uncertainty).” The SSC stated that it will re-consider ABC recommendations based on updated information. The most recent assessment update does not provide any additional quantification of the elements of uncertainty in the estimate of OFL.

Throughout its discussion, the PDT continually pointed out the high degree of uncertainty in these numbers and its impact on their application to management, both those in the terminal year of the assessment, and, additionally, when using values projected to 2014. Even using just the terminal year values, one member questioned the logic of having a northern area ABC roughly

90% of the southern area ABC when the total northern area biomass is roughly $\frac{1}{2}$ of the southern area total biomass.