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January 14, 2010

VIA ELECTRONIC MAIL

Mr. John Pappalardo, Chairman
New England Fishery Management Council
60 Water Street Mill, No. 2
Newburyport, MA 01950

Re: Reconsideration of Framework 21 Decision

Dear Chairman Pappalardo:

On behalf of the Fisheries Survival Fund ("FSF"), we would like to express our sincere appreciation for your decision to place reconsideration of the target scallop fishing mortality rate back on the agenda for the New England Fishery Management Council's January 27, 2010, meeting. The Council, at its November 2009 meeting, made many important decisions. FSF and the scallop industry at-large supported the overwhelming majority of these decisions. However, FSF strongly opposes the Council's controversial choice of using 0.20 as the target fishing mortality rate ("F") for the purpose of setting open area days-at-sea ("DAS") for 2010. For the reasons given below, FSF respectfully requests that this decision be reconsidered, and the 2010 scallop fishery specifications for 2010 be based on an F of 0.24.

As an initial matter, FSF recognizes the Council was faced with an extremely full and complex agenda in November, with demanding decisions for many fisheries. FSF appreciates the work by Council staff, the Scallop Plan Development Team ("PDT"), the Scientific and Statistical Committee ("SSC"), and the Scallop Oversight Committee to support the Council's decision-making regarding the Great South Channel, turtles, and yellowtail flounder. With all that was on the agenda for scallops, what is normally the principal decision in a framework – setting annual specifications (particularly the annual target landings level and measures designed to achieve it) – does not appear to have been considered as thoroughly as it otherwise would have been.

The lack of a Scallop Committee recommendation on this matter further complicated matters. For instance, as Massachusetts Division of Marine Fisheries Director Paul J. Diodati noted in his letter to National Marine Fisheries Service ("NMFS") Regional Administrator Patricia Kurkul (attached), certain findings and recommendations of the SSC with respect to the target landings

level were never brought forward or discussed at the November meeting. As well, at least in part, the decision to base 2010 DAS on an F of 0.20 was, in our opinion, overly influenced by consideration of net economic benefits calculated over an inappropriately long six-year period. While this was not the sole basis for the decision, FSF strongly believes that reconsideration is appropriate so that the reasons behind the SSC's recommendation can be more fully explored, and so these net benefits analysis can be placed in a more complete context.

As we will show, 2010 scallop specifications based on a target F of 0.24, resulting in 38 open area DAS, is both precautionary and provides more economic benefits in the critical near term. As this option was analyzed in the Framework 21 document, adopting this approach should not materially slow down the framework approval process.

The bases for reconsideration are as follows:

1. **The buffer between Acceptable Biological Catch ("ABC") and the target landings level is overly precautionary.** As Council staff noted in the unusual January 5, 2010, press release regarding Framework 21, the SSC recommended an ABC of 65.2 million pounds based on a target F of 0.29.[1] However, the Overfishing Level ("OFL") is 80 million pounds, based on the current estimate of F_{MAX}, which is the Amendment 10 threshold of overfishing. By contrast, projected landings under the chosen F of 0.20 are only 41 million pounds, ***just over half of the OFL.*** We are attaching a figure that compares the critical values; specifically, estimated scallop landings levels and associated probabilities of overfishing associated with OFL, ABC, F=0.24, and F=0.20.

2. **The scallop fishery was not subject to overfishing in 2009.** While it is true that the target F of 0.20 for 2008-2009 was exceeded—F is preliminarily estimated as 0.28 in 2008 and 0.30 in 2009—Amendment 10 establishes F_{MAX} as the OFL. Framework 19 reemphasized this point, stating "overfishing occurs when fishing mortality exceeds F_{MAX}, *currently estimated at **0.29***." (FW 19 § 2.6.2, at 60; bold emphasis in original). When Framework 19 was adopted, 0.29 was the best estimate of F_{MAX}. However, the PDT recently incorporated new information and determined that F_{MAX} currently equals 0.37.[2] Thus, according to the best scientific information

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[1] *See* Final Framework 21 to the Atlantic Sea Scallop FMP at iv-v (Dec. 17, 2009), *available at* http://www.nefmc.org/scallops/frame/fw%2021/FW21_091221.pdf.

[2] D. Hart, *Quantifying the Tradeoff Between Precaution and Yield in the U.S. Sea Scallop Fishery* (July 31, 2009), *available at* http://www.nefmc.org/tech/council_mtg_docs/Sept%202009/Scallops/Doc%204_SC_SSC%20discussion.pdf; *see also* Final Framework 21 at 20 ("Based on the results of the last stock assessment workshop, biological reference points have been set for the entire US sea scallop stock. The threshold fishing mortality rate for fully-recruited scallops that generates the maximum yield-per-recruit, ***Fmax, was estimated at 0.37***.") (*continued. . .*)

available, current F does not exceed the OFL defined in Amendment 10, although the F may have breached the outdated threshold set forth in Framework 19.

Based on correspondence from NMFS, it appears that there is some dispute over whether the proper overfishing definition is F_{MAX} or the older estimate of F_{MAX} employed in Framework 19 (*i.e.*, 0.29). As the relevant section of that framework quoted above shows, however, that action did not presume to change the overfishing definition, but merely plugged-in the then-current estimate for F_{MAX} based on what had been the best scientific information available. The Council, however, has an ongoing duty to utilize the best scientific information available, and the most current F_{MAX} estimate is 0.37. Indeed, this was the estimate employed by the PDT and SSC in developing the ABC recommendation. There can be no serious question at this point that the OFL is 0.37, corresponding with an harvest of 80 million pounds of scallops.

3. The under-estimation of open area catch rates that led to F_{target} being exceeded in 2008 and 2009 has been corrected. As a result of improved estimates in daily open area catch rates, there is a much improved probability that the fishery will meet the target F. This reduces the need for setting the target F at a super-precautionary level. As the Final Framework 21 document notes:

> Since FW19 the PDT has improved the assumptions and models used to set Ftargets primarily based on adjustments made to how fishing mortality is estimated from open area DAS. Modifications have been made based on work the PDT did for developing alternatives in Amendment 15 to comply with new annual catch limit (ACL) requirements. To take this into account, the FW21 analysis included an adjustment to the model for calculating DAS to more accurately reflect the landings per-unit-effort (LPUE) value. Therefore, it is likely that projected targets used in FW21 will be closer to realized landings and fishing mortality compared to projections used in previous frameworks.

Final Framework 21 at vi. Assumptions about the number of permits in active use have likewise been updated to reflect increases in participation. In a public presentation to the Scallop Committee, the NMFS scientist who prepared the projections for both 2009 and 2010 highlighted the low probability that such an over-run would occur again, analogizing the chances as akin to 50-to1 long-shot Mine That Bird wining the Kentucky Derby.

(emphasis added). **This estimate was accepted by the SSC when it recommended an ABC based on 25 percent of F_{MAX}, or 0.29.**

4. The SSC's ABC of 65 million pounds conforms with the National Standard 1 Guidelines' advice for precautionary management; a target F of 0.24 for 2010 presents a virtually nonexistent chance of overfishing. The ABC of 65 million pounds, corresponding with an F of 0.29, represents a twenty-five percent probability of exceeding the OFL,[3] in line with National Standard 1 guidelines. *See* 50 C.F.R. § 600.310(f)(4) ("This probability that overfishing will occur [under an ABC control rule] cannot exceed 50 percent and should be a lower value."). The probabilities of exceeding OFL associated with Fs of 0.24 and 0.20, accounting for implementation uncertainty, are 13.1 percent and 6.1 percent, respectively.[4] Keeping in mind that the legal standard is fifty percent, the F=0.20 strategy is far, far more conservative than necessary, particularly given the dramatic economic implications it has for fishing year 2010.

The F=0.24 strategy is estimated to result in a catch of approximately 47 million pounds, compared to an ABC of 65 million pounds, and an OFL of 80 million pounds. Even assuming that discards and incidental catch mortality in 2010 approach the 7.4 million pound level assumed in Framework 21 (at page 20), the resulting 54 million pounds or so of scallop mortality is still significantly below the 65 million pound ABC. The additional precaution that results from using an F of 0.20 simply forgoes sustainable yield for a very minor seven percent increase in certainty that the OFL will not be breached.

5. The virtually imperceptible economic advantages of the F=0.20 approach are highly uncertain and do not outweigh short-term economic impacts. Under the selected alternative, the scallop industry is asked to forgo nearly six million pounds of sustainable scallop harvest in 2010 on the speculative promise of an additional five million pounds over seven years. Final Scallop Framework 21 at 239 (Table 80). This results in less than a one percent difference in net present value of the two options over the 2010 to 2016 timeframe – 0.68 percent, to be exact.[5] Obtaining even these small benefits is based on a presumption of actions the Council may or may not make over the course of three specification-setting processes.

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[3] *See* Final Framework 21 at 20 ("This recommendation is based on analyses prepared by the Scallop PDT that would set ABC at the fishing mortality rate estimated to have 25% chance of exceeding OFL.")

[4] *See* Hart, *supra* n.1, at 13 (Table 5).

[5] *See* "Economic Impacts" at 7 (Table 6), Item 1A Council Scallop Materials for the November 2009 Meeting, *available at* http://www.nefmc.org/scallops/council_mtg_docs/Nov%202009/1a%20%20Framework%2021%20Econ%20_3_.pdf. Similar tables are reproduced in Final Framework 21, at 263-64 (Tables 112 & 113), which show 0.0 percent benefits between the F=0.20 and F=0.24 options over the 2010-2023 period, but this is an artifact of rounding.

At best, this small benefit over a six-year period is highly speculative, and may be entirely illusory. As the attached critique of the economic impacts analysis by Georgetown Economic Services notes, "Because the uncertainty associated with these projections grows exponentially over time, the comparison of the economic benefits of the allocation alternatives given in FW21 should be made over a shorter period." *See* attached report, at 1. As it stands, the only discounting made in these projections relate to the net present value of benefits. If management uncertainty were included in the model, there would be (and arguably there are no) meaningful differences between the two alternatives over the mid- and long-term timeframes.

For 2010, however, the differences are very real and quite stark. The F=0.24 alternative provides a minimum of $40 million more in ex-vessel revenues in 2010 over the selected option, translating in hundreds of millions of dollars in economic activity in struggling fishing communities this year. Dr. Daniel Georgianna, Chancellor Professor of Economics at University of Massachusetts' School of Marine Science and Technology, estimates the F=0.20 strategy to result in a loss of $119,000 per vessel compared to F=0.24, and job losses of over 500.[6] For its part, the General Category fleet will suffer a reduction of 300,000 pounds, creating hardship and difficulties particularly as the sector transitions to individual quota share management in 2010.

Given that the country is still in the midst of – or only starting to climb out of – a deep recession, the certain economic benefits of the 0.24 options are far superior to the statistically insignificant longer term differences.

6. The differences in projected yellowtail flounder bycatch cannot justify the F=0.20 strategy. According to the Council decision documents presented on November 18, 2009, in connection with Groundfish Framework 44, the scallop fishery's yellowtail flounder "needs" for 2010, expressed as a percentage of the 2010 total yellowtail flounder TAC,[7] are as follows, under the various fishery allocation scenarios:

Georges Bank yellowtail flounder

No GSC closure – F = 0.20	11.4%
No GSC closure – F = 0.24	15.2%
GSC Closure – F = 0.18	18.9%
GSC Closure – F = 0.20	22.4%

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[6] D. Georgianna, "Sort Term Economic Impacts of Scallop Framework 21 at 5 (Jan. 7, 2010.

[7] In all scenarios, the scallop fishery's "need" for Cape Cod yellowtail is under the 5% threshold applied for setting a sub-ACL.

Southern New England/Mid-Atlantic yellowtail flounder

No GSC closure – F = 0.20	22.5%
No GSC closure – F = 0.24	27.3%
GSC Closure – F = 0.18	36.3%
GSC Closure – F = 0.20	40.9%[8]

The following can be determined from this information:

- The Council elected to take the principal "savings" of yellowtail available when it elected, by a wide margin, not to close the Great South Channel ("GSC"). (Yellowtail use only increased without the closure for the Cape Cod stock, which follows, as the Great South Channel is in the Cape Cod yellowtail stock area.) The same is true for reductions in area swept and the presumed lessened impacts on habitat resulting from these area-swept reductions.

- The Council's choice of "No GSC Closure – F=0.20" resulted in the lowest possible use of yellowtail flounder.

- The differences in percentage yellowtail use between F=0.20 and F=0.24 are discernible, but they are modest: For Georges Bank yellowtail, the increase is estimated at 3.8 percent, and for Southern New England/Mid-Atlantic yellowtail, the increase would be 4.8 percent. These figures may not be much different from the margin for error.

- The scallop fishery's use of Georges Bank yellowtail flounder is relatively modest under either scenario: At F=0.20, the yellowtail use (11.4 percent) is functionally indistinguishable from what would have been allocated for the access area trip to Closed Area II in 2009 (10 percent).[9] It would thus be only a modest increase (to 15.2 percent) to fund all scallop fishing in 2010 in the Georges Bank yellowtail stock area.

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[8] Drawn from Table 1, at page 4, in the September 17, 2009, Memo from the Groundfish and Scallop PDTs to the Groundfish and Scallop Oversight Committees.

[9] The Council gained considerable "savings" by refusing to consider a Closed Area II trip in 2010, and, in fact, the potential for yellowtail bycatch was the stated principal reason a fifth access area trip was not considered by the PDT. It is worth noting, however, that keeping access areas closed can actually contribute to yellowtail bycatch, as more bottom time is generally needed for the same landings level in areas that have had scallop grow-out, even with scallops being abundant in large sections of the open areas.

- Yellowtail usage is relatively higher for the Southern New England/Mid-Atlantic stock irrespective of the option chosen. The difference in projected yellowtail usage is 111 mt vs. 135 mt, or a difference of 24 mt. Table 1, Sept. 17, 2007, Memo. The real savings of Southern New England yellowtail, in absolute terms, is derived from not closing the Great South Channel.

Minimizing bycatch is, of course, an important Magnuson-Stevens Act objective. This duty, however, is bounded by limitation that bycatch minimized only "to the extent practicable." *See, e.g.,* 16 U.S.C. § 1851(a)(9). More importantly, the primary objective of fishery management is to achieve optimum yield. *Id.* § (a)(1).

The modest increase in yellowtail use resulting from the F=0.24 strategy is, respectfully, not commensurate with foregoing six million pounds in sustainable scallop yield for 2010. When it is considered that these yellowtail use levels are below the scallop fishery's historic catch, combined with the other "savings" mentioned above, the trade-offs become more stark.

That is not to say that the scallop industry is insensitive to the importance of minimizing yellowtail flounder bycatch. FSF has dedicated significant time, effort, and resources to investigating gear solutions to minimize bycatch. In cooperation with gear technologist Ron Smolowitz, FSF participants have worked to develop a new dredge that shows promise in both reducing flatfish retention and improving scallop harvest rates, while also minimizing harm to sea turtles. Many scallopers have adopted this new dredge design. Moreover, the industry has looked into other gear solutions to minimize finfish bycatch, such as advocating for 10-inch mesh twine tops and testing optimal hanging ratios and mesh configurations. FSF is committed to reducing its incidental take of groundfish, and will continue to do so.

That said, the reductions called for by Framework 21 – a loss of one access area trip and nine open area DAS compared to 2009 – is a hardship to the industry and the communities and businesses relying on the scallop fishery that ultimately cannot meet the "practicability" test.

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In conclusion, FSF strongly urges the Council to revisit the decision to use the F=0.20 approach, and instead set the open area DAS at 38, based on an F of 0.24. We are joined in this request by well over 1,000 scallop fishermen and representatives of businesses that rely on this key fishery, as well as seventeen Members of Congress, the Governor of Massachusetts, and the Mayor of New Bedford, among others. This unprecedented breadth of support underscores the urgency of this matter.

If you have any questions about any of these points, please do not hesitate to contact us. We will also be available at the upcoming Council meeting to discuss these matters in more depth. Thank you for your kind attention to this important matter.

Sincerely,

David E. Frulla
Shaun M. Gehan
Andrew E. Minkiewicz

Counsel for Fisheries Survival Fund

ENCLOSURES

cc: Members of the New England Fishery Management Council
Captain Paul Howard, Executive Director
Ms. Patricia Kurkul, NMFS Northeast Regional Director

Attachment 1

Commonwealth of Massachusetts
Division of Marine Fisheries
251 Causeway Street • Suite 400
Boston, MA 02114
(617) 626-1520
fax (617) 626-1509

Paul J. Diodati
Director

December 2, 2009

Ms. Patricia Kurkul
Regional Administrator, Northeast Region
National Marine Fisheries Service
55 Great Republic Drive
Gloucester, MA 01930-2276

Dear Ms. Kurkul:

By now you are well aware of the furor created by the New England Fishery Management Council's recent decision to allocate far fewer days to the limited access sea scallop fishery for the next fishing year. Through Framework Adjustment 21 to the Atlantic Scallop Fishery Management Plan we now intend to reduce days-at-sea from 37 to 29 – a 22% decrease. After reflecting on Council discussions regarding the decrease in Days-At-Sea (DAS) and reviewing documents not discussed at the Council meeting, I conclude that important scientific advice was forgotten. I request you consider that advice during your review of Framework 21 in preparation for its implementation next year.

In July Council correspondence with the Science & Statistical Committee (SSC), Paul Howard indicated: *"Full implementation of ACLs is not required in the Scallop FMP until 2011 because overfishing is not occurring, but the Council is still required to include a specific ABC for 2010, based on SSC recommendations. Therefore, the PDT will present an estimate of ABC for 2010, based on the same quantitative approach the SSC is reviewing for Amendment 15."* Being said about four months ago, this very relevant description of what was to come regarding Plan Development Team (PDT) and SSC involvement in providing a 2010 Allowable Biological Catch (ABC) was omitted and, therefore, had no influence on the November Council decision to set the 2010 ABC at a fishing mortality of 0.20 (29 DAS).

After reviewing Framework 21 development with Council and my staff and referencing PDT and SSC documents, we conclude the Council did not refer to PDT/SSC findings; consequently, 2010 DAS are far too restrictive with unnecessary economic loss.

I refer you to a Council summary of the PDT August 12 meeting. On pages 7 & 8 ("Summary of SSC decisions from 8/11/09 meeting") it reads: *"Staff briefed the PDT on the SSC meeting held the previous day. In general the SSC supported using the 25% chance of overfishing as the ABC control rule and was very complimentary of the work done by the PDT. It was accepted that this be used to set ABC and noted that the 25% chance fell between the 10-40% guidelines given in draft guidance documents NMFS is working on for implementing ACLs. The PDT reviewed the results about management uncertainty and* ***support consideration of an ACT that is set at an F level with 25% chance of exceeding ABC.*** *This happens to be an F of 0.24 for 2010 (my underlined emphasis)..."*

Then in a September 23 memo to Paul Howard from SSC chairman Steve Cadrin, the Council learned that the SSC *"endorses the proposal by the Scallop PDT and other conventions of risk-based harvest rules that ABC be based on 25% probability of overfishing. Analyses of uncertainty indicate that a 25% risk of overfishing is associated with less than 1% loss in yield relative to F_{max}."* Steve provided a table with alternative projections of fishing mortality and yield at alternative probabilities of overfishing. That table depicted a 25% chance of overfishing with a 2010 F of 0.29 with a 2010 yield of 29,500 mt. He ended with a SSC recommendation: *"The SSC recommends that Acceptable Biological Catch of scallops in 2010 should be 29,578 mt for the overall fishery."*

The SSC/PDT probability of overfishing with corresponding 2010 Fs and yield never was brought forward by the Scallop Committee at the November Council meeting. In fact, the Committee had nothing to offer on this critical issue. I believe this omission played a key role in the Council adopting an F of 0.20 with all its attendant consequences. For this reason, I request you take appropriate steps to account for PDT and SSC analyses of uncertainty and that the 2010 ABC be set at F = 0.24, providing an even lower probability of overfishing, i.e., less than 20%.

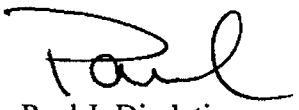
I realize your modifying the Council's decision will present some scheduling and framework implementation problems. Nevertheless, it is justified because the Council unintentionally failed to use PDT and SSC advice.

If those recommendations had called for an F lower than 0.20, I would still urge you to consider those recommendations developed with critical input from the Northeast Fisheries Science Center. I suspect you would feel compelled to do so. Perhaps, the Council can be requested to revisit this issue at its next meeting even though that meeting is in January.

Considering the success of sea scallop management and the tremendous support of the fishing industry for management and science, I feel your acting to correct an unfortunate situation caused by a Council misunderstanding about technical/scientific recommendations is warranted. I'm sure you will find yourself and the National Marine Fisheries Service congratulated by an appreciative, extremely valuable sea scallop fishing industry.

Pat, thanks for your attention to this matter.

Sincerely,



Paul J. Diodati
Director

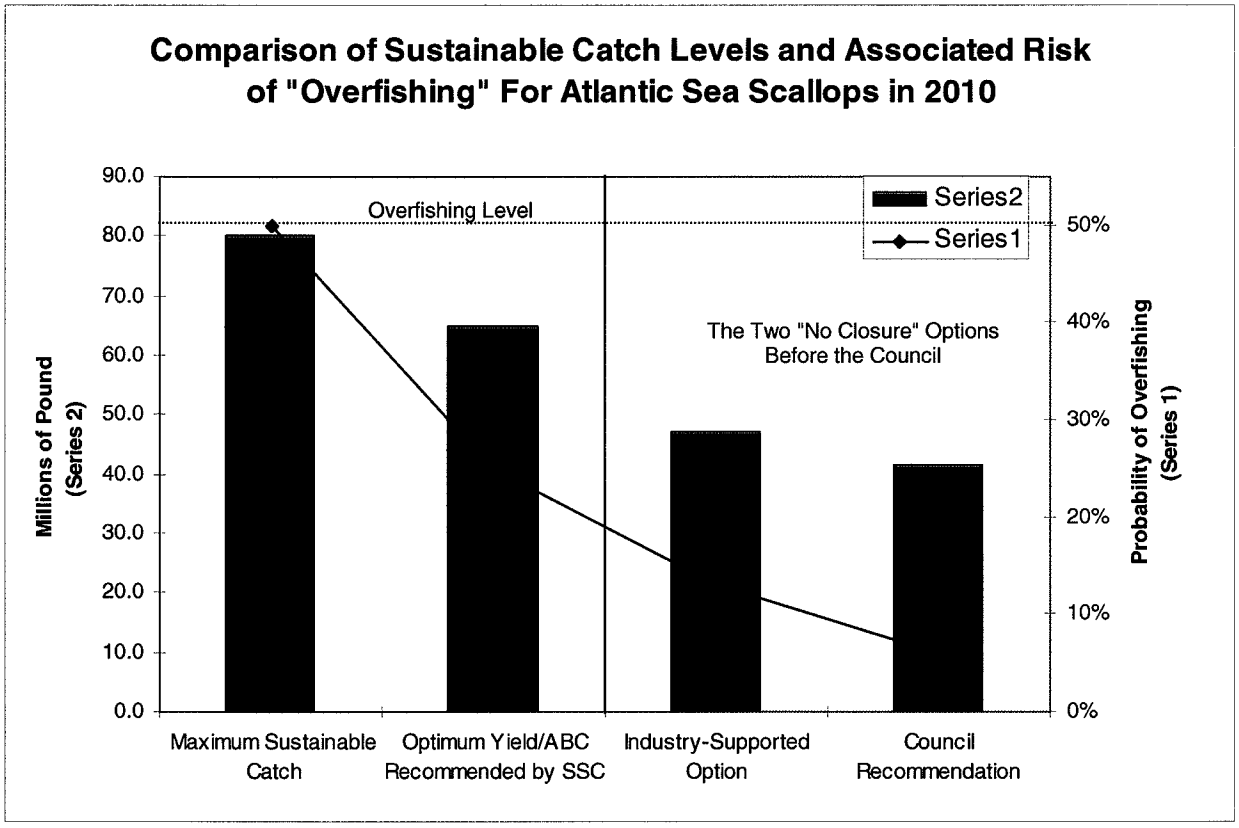
Cc: John Pappalardo, NEFMC
Paul Howard, NEFMC
Richard Robins, MAFMC
Daniel Furlong, MAFMC
Steve Cadrin, NEFMC SSC

Attachment 2

The following chart shows the catch expected for fishing at the rates associated with the Overfishing Level ("OFL"), Acceptable Biological Catch ("ABC"), the Council-Selected Option, and the Industry-Supported Option. The line shows the probability of overfishing if these levels of catch were to occur in 2010.

The OFL is associated with a 50 percent chance of exceeding the overfishing rate. That is legal minimum standard of uncertainty. The ABC is associated with a 25 percent chance of exceeding the overfishing rate. This is the preferred standard under the new National Standard 1 guidelines. The Industry's preferred option entails a mere 13 percent chance that the overfishing level will be breached, while the Council's, only 6 percent.

In effect, $40 million of certain economic losses in 2010 are being imposed to buy an additional seven percentage points that the fishing rate will not be too high. Given the that scallop stock is fifty percent higher than the long-term target biomass, this price is far too high.



Attachment 3

Georgetown Economic Services, LLC

3050 K. Street, N.W.
Washington, D.C. 20007

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An Assessment of the New England Fisheries Management Council's Economic Impact Assessment of Atlantic Sea Scallop Framework 21

Ariel H. Collis & Dr. Robert N. Fenili
Georgetown Economic Services

December 2009

The New England Fisheries Management Council's ("NEFMC") Economic Impact Study of the allocation alternatives presented under Framework 21 to the Fisheries Management Plan("FW21") gives too much weight to the "estimated" long-term economic benefits projected for each alternative. NEFMC's benefit calculations do not adequately take into account the uncertainty associated with the assumptions that underlie its projections.

There is considerable risk that the NEFMC's assumptions about future values of scallop allotments, fishing mortality, ex-vessel prices, and trip costs, which form the foundation of the NEFMC's projections, will not be realized. Because the uncertainty associated with these projections grows exponentially over time, the comparison of the economic benefits of the allocation alternatives given in FW21[1] should be made over a shorter period. The three-year period from 2010 to 2012 is the longest timeframe for comparison that is economically meaningful. Alternately, the projections of economic benefits after 2012 can be re-weighted in the present value benefit calculations so as to adequately reflect the uncertainty of the

[1] FW21 presents four allocation alternatives for the scallop fishery, namely, the No Closure F=.24 option, the No Closure F=.20 option, the Closure F=.20 option and the Closure F=.18 option. The closure of the Great South channel was voted down, after which the economic report was used to compare the economic benefit of the two "No Closure" options. This report refers exclusively to the comparison of the benefits of the to "No Closure" options.

calculations made for later years.[2] A short term comparison shows that the No Closure F=.24 option ("NCLF24") gives a higher cumulative present value of producer profits than the No Closure F=.20 option ("NCLF20").

The assumptions about the target fishing mortality rates that will be enforced for 2010 to 2016 drive the NEFMC's projections of the economic benefit of each allocation considered by the Council. In its projections of biomass, landings, landings per unit effort ("LPUE"), and days at sea ("DAS"), the Council takes as given that each allocation alternative will have a different allowable mortality rate in 2010, but from 2011-2016 all alternatives are projected to have a F target of .24, identical area rotations, and identical DAS schedules.[3] As is true in all economic forecasts, the likelihood that the projected benefits for the scallop fishery will be realized becomes less certain the further into the future that predictions are made. However, the Economic Report does not take this uncertainty adequately into account.

FW21 sets allocations only for 2010.[4] After 2010, another framework will set allocations and specifications in the scallop fishery for 2011 and 2012.[5] Since FW21 only directly affects the fishery in 2010, it may be argued that the proper timeframe for judging the

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2 That is, a suitably high discount rate can be used to compute the present discounted value of the economic impacts of each alternative. A higher discount rate for a projection means that one is less certain that a predicted value will be realized and thus the projections value should be reduced in the present value calculation to reflect that there is a chance that that projection will not occur. A present value calculation adds up predicted future benefits over the prediction period.

3 Except for the closure of the south channel under the CLF20 and CLF18 options. Framework 21 to the Atlantic Sea Scallop FMP, November 19, 2009 (hereafter "FW21"), p. 116.

4 FW21, p 15.

5 *Id.*, p.15. ("the Council decided to develop this action for 2010 only and a subsequent framework will set measures for 2011 and 2012.")

effects of FW21 is to look at only 2010 economic benefits.[6] Because the details of the next framework are not yet known, the model forecasts about allocations for succeeding year's benefits are uncertain.

The NEFMC may reasonably expect that, because the specification process for 2011 will start soon in the future, the Council may have some insight into the outcome of the allocation process for 2011 and 2012.[7] Thus, the allocation can be predicted with some degree of accuracy for 2011 and 2012. However, such an argument a cannot be made for predictions about the allocations for 2013 and beyond, because the framework which will govern those years will be set in 2012. No justification is given as to why it is reasonable to assume that allocations from 2013 to 2016 will stay constant across all options.

Assuming that the allocation holds constant from 2011 to 2016 might be considered reasonable if allocations had been unchanging in the past. However, the regulatory history of the scallop fishery shows that allocations and area management systems have changed frequently and significantly in recent history.[8] For example, there have been four frameworks, and several amendments and adjustments in the last four years, each of which has changed allocations. If history is a guide, it is unlikely that the allocation will remain fixed from 2011 to 2016.

The likelihood that area allotments and area management will change over the next several years adds another level of uncertainty to NEFMC's projections. The 45th Scientific Assessment Workshop Report ("SAW45") explains that:

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6 While it is not possible to judge the effects of the "Closure" options in 2010, since the positive effects of the channel closure will not be manifested until 2013, the effects of the "No Closure" options come fully into effect in 2010.

7 *Id*, p116. The Council's indicates this insight by reporting that, "Access area trip allocations are expected to return to five per year after 2010."

8 See Framework 19 to the Atlantic Sea Scallop FMP (hereafter "FW19"), December 19, 2007, p. 2-6.

> Because of the sedentary nature of sea scallops, fishing mortality of sea scallops can vary considerably even in the absence of area specific management. Area management, such as rotational and long term closures can make variation even more extreme. Projections that ignore such variation might be unrealistic and misleading.[9]

The Council's calculations of economic benefits do not account for the variation in the projections of biomass. One way to account for this would be to apply a suitable discount rate to the future benefits because the likelihood of those benefits are not certain. The Economic Report also does not consider the considerable variation in the projections of landings.[10] To account for this variation requires an even higher discount rate to be used in present value calculations.

In addition to the uncertainties that accompany the Council's biomass and landings projections, NEFMC's predictions of scallop ex-vessel price and trip cost also rely on assumptions that involve considerable uncertainties. The model of the ex-vessel price of scallops assumes that many of the variables which NEFMC uses in its ex-vessel price prediction model remain constant from 2010 to 2016. For example, the model assumes that the U.S. disposable per-capita income and ex-vessel prices of imported scallops will stay constant at their 2008 inflation adjusted levels. NEFMC also assumes that scallop exports will constitute 45% of the domestic landings from 2010 to 2016.[11] Similarly, it is assumed that trip costs-per-day remain constant over the prediction period. In the short term these assumptions may be reasonable, but over long term the assumptions about the predicted import prices, trip costs, and percentage of exports weaken. The assumption that these variables will hold at their present value from 2010 to 2016 adjusted for inflation involves considerable uncertainty because the NEFMC admits that

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9 45th Scientific Assessment Workshop Report, p 163.

10 SAW45 states that, "Simulated landings are more variable than biomass, because the landings stream is more dependant on the abundances of a few areas..."Id. P. 165.

11 Economic Impacts Report, p. 5.

that it is not possible to predict the changes in the future values of these explanatory variables accurately.

It may be argued that the NEFMC's long term projections are the best that can be made given the difficulty of forecasting macroeconomic and biological variables. However, no long term forecasts were needed to compare the benefits of the two "No Closure" options. The FW21 alternatives are evaluated in using a six year projection because "[i]f the Channel is closed in 2010, it will likely remain closed until 2013, and would be a controlled access area for about three years (until 2016), those are the years that the impacts of a new closure would be apparent."[12] To accomplish a seven-year comparison, a tradeoff was made. Reasonable short-term assumptions were extended past their point of plausibility in order to facilitate a comparison of all four alternatives. However, once the decision was made that the great south channel would not be closed, there was no longer a reason to compare the remaining alternatives over such a long term time frame at the loss of modeling accuracy.

The NEFMC argues that its models attempt to show the economic consequences of the allocation alternatives *ceteris paribus.*[13] The Council argues that to perform such a comparison it is correct to hold fishing mortality, import prices, per capita income, and trip cost constant. This may be true, but the present value calculations used must account for the low likelihood that these forecasts will be realized by using a suitable discount value in its present value calculations.

The longest period that is economically meaningful to make a comparison between the two "No Closure" options is three years. If a comparison of the economic benefits is made over the 2010 to 2012 period, the present value of revenues is greater for the NCLF24 option than for

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12 FW21, p. 116.

13 That is, all other factors held constant.

the NCLF20 option.[14] The revenue streams of the two "No Closure" options over the 2010 to 2012 period are given in the table below.

Cumulative Present Discounted Value - Revenues (7% Discount Rate)			
Year	NCLF20 (A)	NCLF24 (B)	Difference (A)-(B)
2010	$303,358,538	$343,614,951	$40,256,413
2011	$720,879,725	$749,721,498	$28,841,773
2012	$1,148,475,534	$1,161,366,577	$12,891,043

Source: Framework 21 and The Economic Impact report

Similarly, the present value of profits over the 2010 to 2012 period is higher under the NCLF24 option than under the NCLF20. The year to year present value for profits to the two "No Closure" options are shown in the table below.

Cumulative Present Discounted Value- Profits (Assuming 7% Discount Rate)			
Year	NCLF20 (A)	NCLF24 (B)	Difference (A)-(B)
2010	$268,073,738	$302,430,951	$34,357,213
2011	$638,460,720	$662,666,844	$24,206,124
2012	$1,016,775,019	$1,026,447,480	$9,672,461

Source: Framework 21 and The Economic Impact report

The key to a reasonable assessment of economic benefits is the use of reasonable assumptions and a discount rate that is appropriately adjusted to reflect the uncertainties associated with assumptions and forecasts about the future.[15] The Council's economic report did not adequately take the uncertainty of its projections, especially it long term projections into account when computing the long term benefit of the allocation alternatives. The uncertainty of NEFMC's projections can be reduced if the comparison of economic benefits is made over the three year period from 2010 to 2012. It is arguable that, since FW21 only sets allocations for 2010, a comparison of the effects of the FW21 allocation alternatives should be made only for

[14] A seven percent discount rate is used to reflect the greater likelihood that these forecasts will be realized. The results presented are based on calculations performed by the author.

[15] Richard Razgaitis. Valuation and pricing of technology-based intellectual property. John Wiley& Sons, 2003. p. 181.

2010. In either case, the present value of profits over 2010 or the 2010 to 2012 period is higher under the NCLF24 option than under the NCLF20.