NEW ENGLAND FISHERY MANAGEMENT COUNCIL

Habitat/Marine Protected Areas/Ecosystems

I. STATUS

Meetings:

Committee: The Committee met on February 4, 2008 to discuss issues with EFH designations and HAPC boundaries, as well as approaches to Phase II of the Omnibus EFH Amendment.

The next Committee meeting has not been scheduled at this time.

Habitat/MPA/Ecosystem Plan Development Team: The PDT has met twice in person and once via conference call since the last Council meeting.

The next PDT meeting has not been scheduled at this time, but will be held in late February.

Habitat/MPA/Ecosystem Advisory Panel: The Advisory Panel has not met since the last Council meeting.

The next Advisory Panel meeting has not been scheduled at this time.

II. COUNCIL ACTION

Consider committee recommendations including possible revision of adult white hake EFH designation and canyon-area HAPC boundaries.

III. INFORMATION

1. PDT meeting reports dated November 6, 2007, December 10, 2007 and January 29, 2008.
2. NMFS summary of approaches to the 'more than minimal, not temporary in nature' standard for adverse impacts from fishing on essential fish habitat
3. Habitat Amendment Timeline

#1

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Habitat PDT Meeting Summary

November 6, 2007
Newport, RI

The PDT met on Tuesday, November 6, 2007 in Newport, RI to wrap up Phase 1 of the Omnibus Habitat Amendment and to begin work on Phase 2 of this action. Of note, the PDT welcomed a new chair (yours truly) and a new member, Brad Stevens of UMass Dartmouth, SMAST. Brad brings with him the potent combination of a wealth of experience with habitat mapping/analysis and boundless energy for the minutiae of policy and regulation.

Omnibus Phase 1

The PDT discussed the final Ctte and Council decisions on the Great South Channel HAPC, as well as the fact that the EFH designation alternatives and HAPC's have been approved by the Council and may now be referred to as part of the Proposed Action. The PDT will continue to correct small mapping discrepancies that cropped up throughout the process, with the stated aim of publishing the Phase 1 document in DSEIS form. This work should ideally be completed by the holidays.

One PDT member pointed out that the Council has approved HAPC designations in particular areas, but without specifying which species/life stages' (S/LS) EFH these HAPCs were intended to refer to. The implication here is that, because HAPCs must be comprised wholly of designated EFH, the EFH leading to the HAPC designation should be specifically referenced. There was tentative PDT concensus that this viewpoint may be correct, and that the Habitat Ctte and/or Council may need to specify which S/LS's EFH was intended to be afforded the HAPC designation.

For reference, EFH Final Rule language applicable to this issue is as follows:
"*Identification of habitat areas of particular concern.* FMPs should identify specific types or areas of habitat within EFH as habitat areas of particular concern based on one or more of the following considerations:
(i) The importance of the ecological function provided by the habitat.
(ii) The extent to which the habitat is sensitive to human-induced environmental degradation.
(iii) Whether, and to what extent, development activities are, or will be, stressing the habitat type.
(iv) The rarity of the habitat type."

From this, it is not clear to the PDT Chair if HAPCs must apply to specific S/LS EFH, or if the area designated as HAPC is intended to generically, but still wholly, contain EFH. The Chair will work with NERO staff to reach a conclusion on this issue, and prepare a short discussion paper on the topic if further PDT review or Council/Ctte action is warranted.

Omnibus Phase 2

To focus the discussion, the PDT reviewed the published Goals for the management action we are supporting. They are:

1. *Update the identification and description all EFH for those species of finfish and mollusks managed by the Council*
2. Identify all major threats (fishing *and non-fishing*) to the EFH of those species managed by the Council
3. Identify and implement mechanisms to protect, conserve, and enhance the EFH of those species managed by the Council to the extent practicable.
4. Defining the measurable thresholds for achieving the requirements to minimize adverse impacts to the extent practicable
5. Integrate and optimize measures to minimize the adverse impacts to EFH across all Council managed FMPs
6. *Update research and information needs,* including consideration of dedicated habitat research areas.
7. *Review and update prey species information as required*

(Note: Italicized items were completed in Phase 1)

Risk Assessment

To continue evaluating risk assessment methods, the Chair will assemble available information on the various methods already discussed by the PDT to facilitate detailed discussion at the next PDT meeting. Central to this, however, is the specification of More than Minimal/Not Temporary in Nature (the standard by which 'risk' will be evaluated). NERO staff will work with the Chair on assembling available information on this standard, which will be distributed to the PDT. Other PDT members will investigate modeling and quantitative capabilities that they may have access to at their work sites to see if co-workers may have something to offer. Also, the PDT will receive an unbiased review of the habitat vulnerability approach utilized by the Council for the A13/A10 EFH impact's analysis from PDT member Jon Grabowski. The PDT also discussed various incarnations of external methods and results review, with no firm conclusions reached.

Dedicated Habitat Research Areas

Consideration Dedicated Habitat Research Areas (DHRA's) is required by Goal 6 of the management action. Members of the PDT recalled that the origin of the DHRA's stemmed from the mid-1990's and was specific to the New England Council (i.e., it's not a MFCMA mandate). The PDT did not have enough information on the topic to reach

any conclusions or recommendations, so the Chair will assemble a brief discussion paper on the topic, which will be picked up again at the next PDT meeting.

Gear Descriptions / Reduced Impact Gear list

The Gear Descriptions document will be reviewed by PDT member Steve Eayrs, who will work with Ron Smolowitz to ensure that this document meets its stated objectives. In brief, those objectives are: (1) identify broad categories of fishing gear; (2) Name and identify most gears used in our region; (3) Specify how is the gear is commonly employed, and; (4) Discuss potential modifications to the gear to reduce impacts on the bottom.

The Reduced Impact Gear list is an artifact of the A13/A10 analysis which specified four area closure levels, with closure Level 4 being closed to all gears not considered Reduced Impact Gear. The Council, however, never specified what gears might be Reduced Impact Gear and how a gear could make it on that list. Staff will produce a short discussion document on the topic to help frame the discussion for the next PDT meeting.

The PDT will try to meet again between the Thanksgiving and Christmas holidays.

#1a

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Habitat PDT Meeting Summary

December 10, 2007
Plymouth, MA

The PDT met on Monday, December 10, 2007 in Plymouth, MA to continue work on Phase 2 of the Omnibus Habitat Amendment.

Omnibus Phase 1

The PDT discussed the need for assigning specific species/life stages to HAPCs. A review of precedent from other regions and consultation with the Habitat office at Silver Springs showed that HAPCs must encompass designated EFH, but need not be linked to particular species' EFH. Subsequent analysis indicates that a small portion of a number of canyon-area HAPCs have boundaries that extend into water deeper than the deepest species EFH we have designated. Three options exist: do nothing; re-draw the boundaries of the HAPCs to correspond to designated EFH, or re-designate the canyon-area HAPCs as coral protection areas. The appropriate course of action will be taken up at the committee level, but the PDT may be called upon for advice.

Omnibus Phase 2

We began the discussion with a fundamental question about the nature of Essential Fish Habitat and its relationship to fishery management. We discussed the legal and conceptual basis for EFH designations and other requirements. While this may have been a review for most, it's important to start with a good working concept of where we've been and where we're going.

The MSA requires that Fishery Management Plans *"describe and identify essential fish habitat for the fishery based on the guidelines established by the Secretary under section 305(b)(1)(A), minimize to the extent practicable adverse effects on such habitat caused by fishing, and identify other actions to encourage the conservation and enhancement of such habitat."* (-emphasis added-)

We discussed in general terms these three tasks: describe and identify EFH, minimize to the extent practicable the adverse effects of fishing on EFH, and identify other actions to encourage conservation and enhancement of EFH.

The obvious question was asked: what is EFH?

The MSA defines EFH as: *"The term "essential fish habitat" means those waters and substrate necessary to fish for pawning, breeding, feeding or growth to maturity."*

The guidelines provide details on how to define EFH in an FMP...specifically, it must be species-specific, cover all life stages, etc, and this is what the PDT and Council have been doing for the past two years. Delving a bit more deeply, however, the PDT discussed the practical impacts of designating EFH. The chair noted that a brief review of EFH designations and their use in FMP's throughout the country indicated that the primary

utility of EHF designations has been allowing the NMFS to consult on activities that occur within designated EFH. The chair was unable to find a single instance where EFH designations, per se, led directly to a fishery management action. That is to say, the protection of designated EFH has not been a driving factor in fishery management decision making. This practical reality speaks to the advantages of a more inclusive approach to designating EFH; the greater the range of designated EFH, the more likely it is that NMFS will have input into the development of non-fishing projects that may impact EFH. The Council's EFH definitions, being fairly inclusive, are likely to be advantageous if thought of in this context.

One PDT member requested clarification on the question of whether EFH designation was intended to provide environmental protection or to promote fish productivity. The PDT debated both sides of this argument, and while no firm conclusion was reached it was determined that, practically speaking, EFH as a 'tool' is most often employed for environmental protection. Conceptually, it should be pointed out, this has some pertinence: the Findings that precede the MSA state "*Congress finds and declares that--...(6) a national program for the conservation and management of the fishery resources of the United States is necessary to prevent overfishing, to rebuild overfished stocks, to insure conservation, to facilitate long-term protection of essential fish habitats, and to realize the full potential of the Nation's fishery resources.*"

Further, "*Purposes – It is therefore declared to be the purposes of the Congress in this act--... (7) to promote the protection of essential fish habitat in the review of projects conducted under Federal permits, licenses, or other authorities that affect or have the potential to affect such habitat.*"

So, speaking to the purpose question almost directly, Congress seems to indicate that its intent with regard to EFH was to serve the environmental protection role (albeit with an implicit assumption, in the Findings, that habitat protection will assist in "realiz(ing) the full potential of the Nation's fishery resources." In fact, in its Purpose, the MSA points directly to NMFS' consultation mission and does not mention any other role for EFH designation.

As previously stated, the PDT did not reach a consensus on this issue but was comfortable moving forward with the understanding that our role was more closely aligned to environmental protection than the promotion of fish productivity. Practically speaking, this 'comfortable consensus' does not change the PDT's decision-making when moving forward with Phase II, but it does help define the role of Phase I's work in designating EFH and HAPCs as we move forward with minimizing to the extent practicable the adverse impacts of fishing on habitats.

The conversation next turned to HAPCs. HAPCs are not defined in the MSA, rather, they are a product of the EFH Guidelines that state: *"FMPs should identify specific types or areas of habitat within EFH as habitat areas of particular concern based on one or more of the following considerations:*

(i) The importance of the ecological function provided by the habitat.
(ii) The extent to which the habitat is sensitive to human-induced environmental degradation.
(iii) Whether, and to what extent, development activities are, or will be, stressing the habitat type.
(iv) The rarity of the habitat type."

The question of the relationship between the product of the Habitat Committee-directed risk assessment and the Council-designated HAPCs was brought up. Will the risk assessment identify specific types or areas of habitat within EFH, or will the areas it may identify as being 'at risk' be treated as something different? Furthermore, if HAPCs are already designated, is a risk assessment necessary, or is it redundant? Several members of the Team pointed out that the Council's HAPC proposals were the result of a request for input from the public and not the result of a scientific inquiry, and as such the risk assessment requested by the Committee is likely to yield results far different than those of the Council's HAPC proposal request. Further, if the PDT agrees—or at least concedes—that a primary purpose of designating EFH is to facilitate a wide range of non-fishing project consultations, then the HAPCs determined by the Council to be appropriate may serve a critical role in heightening the attention paid to any non-fishing projects that would fall inside the potential HAPC boundaries.

They need not be the starting or ending point of the discussion on management measures to minimize the adverse impacts of fishing on habitats to the extent practicable.

The Guidelines definition of an adverse effect is: "*Adverse effect means any impact that reduces quality and/or quantity of EFH.*"

The question of how do we minimize one was asked. The Guidelines answer is that *"Councils must act to prevent, mitigate, or minimize any adverse effects from fishing, to the extent practicable, if there is evidence that a fishing activity adversely affects EFH in a manner that is more than minimal and not temporary in nature."*

The Chair asked for clarification on what *risk* does the Team think we are being tasked to assess? After a few rounds of discussion, the Team grew comfortable with the following *risk*: **the instance of a more that minimal and not temporary in nature adverse impact to physical habitat due to fishing.**

Several Team members requested that "physical habitat" be defined to mean both geological and biological physical structure. One Team member pointed to a quote from the EFH Guidelines that states *"Loss of prey may be an adverse effect on EFH... Therefore, actions that reduce the availability of a major prey species, either through direct harm or capture, or through adverse impacts to the prey species' habitat that are known to cause a reduction in the population of the prey species, may be considered adverse effects on EFH if such actions reduce the quality of EFH"* and suggested that adverse effects of fishing on prey should be part of the risk assessment.

At this point the Team broke for lunch.

Upon return we took up the discussion of the risk assessment in more detail. Data needs were streamlined to focus on datasets summarizing substrate, fishing effort, gear impacts, water depth, biota, oceanographic kinematics/energetics and habitat rates of recovery.

The basic risk model discussed is one where risk is a function of the vulnerability of physical structure to fishing. Vulnerability in this context is a function of a habitat's sensitivity to impacts from fishing gear and it's recovery from such impacts.

It was suggested that vulnerability could be measured as the likelihood that the functional value of a habitat would be degraded by fishing activities. This measure could become problematic, because defining functional value would invoke the PDT's morning discussion on the central purpose of EFH—is a habitat's functional value merely existence (supporting the consultation mission), or is it fishery productivity? If it's the latter, can we measure it? If we can't, is it a useful metric in determining vulnerability?

One subtlety to the general risk assessment approach was explicitly discussed by the PDT—the segregation of risk from actualized fishing activities. The basic model outlined above is intended to assess spatially explicit (and potentially temporally-explicit) risk irrespective of current or past fishing activities. The overlay of fishing effort (actualized and, potentially, predicted) would enter the analysis in the assessments of impacts and practicability. This is critical because a risk assessment approach that endogenously considers fishing activity would fail to adequately capture risks to areas that are unfished currently, particularly areas that are unfished due to regulatory restrictions.

The PDT elected to piece out critical elements of both the risk assessment and subsequent impacts analysis by forming working group teams, with suggestions for personnel as follows:

Vulnerability: Peter Auster, Joe DeAltaris, David Dow, Jonathan Grabowski, Brad Harris, Mark Lazari, Dave Packer, David Stevenson and Page Valentine

Gear Impacts: Steve Eayer, David Stevenson

Fishing Activity: Steve Edwards, Chad Keith, Patricia Clay

Additionally a Prey Species working group may be empanelled, though this is still under review.

These working groups, particularly the latter two, may be filled out with subject matter experts not currently serving on the PDT.

The expectation is that Terms of Reference will be developed for each of the three groups, and that they will provide advice to the PDT, the Committee and the Council on how to best employ existing datasets within the framework of the risk assessment. Specifically and at a minimum, issues of spatial and temporal scale, fungibility of various data, and measurement/precision will be addressed.

The PDT lastly discussed the timeline, and noted that as currently constructed the timeline calls for the risk assessment to be completed by late summer, 2008.

There will be a Committee meeting in late January. The next PDT meeting will be in late February or early March, though there may be a need for a conference call (or two) between now and then.

#1B

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Habitat PDT Conference Call Summary

January 29, 2008

The PDT met via conference call on Tuesday, January 29, 2008 at 3PM to discuss issues relevant to the designation of HAPCs in the offshore canyon areas and the potential for augmenting protection of deep sea corals via the risk assessment process.

Canyon-area HAPCs

Background: Three canyon-area HAPCs are non-conforming, in that they contain areas that are not designated EFH for any species. The deepest on-slope EFH designated in Phase I of the Omnibus Am. is for adult white hake. At issue is how to best re-draw the boundaries of the non-conforming HAPCs such that they wholly contain EFH.

PDT Discussion: The PDT discussed the need to keep the HAPC designation covering as much real estate as possible within the currently-drawn (non-conforming) boundaries. One member suggested that, looking ahead to the potential for management measures being applied to HAPCs, we should ensure that relatively straight lines are drawn. Other members made a case for following the applicable EFH-designate depth contours in areas where the boundaries need to be re-defined, such that the absolute minimum real estate is 'lost' when bringing the HAPC boundaries into compliance with the MSA.

A plenary discussion around the difference between HAPC boundaries and management area boundaries took place. The resolution within the PDT was that the HAPC boundaries are primarily intended to highlight areas of EFH that meet the criteria of ecological importance, susceptibility to threats, and rarity. Any future management areas intended to protect EFH or deep sea corals (DSCs) from adverse impacts of fishing could be drawn to meet that specific need when appropriate. In other words, the PDT did not feel there would be a need to create management measures specific to HAPC boundaries and, therefore, HAPC boundaries did not need to be based on criteria such as their potential 'enforceability' or 'plot-ability' on a chart.

With this in mind, the PDT recommended that the non-conforming HAPC boundaries be re-drawn and mapped to the outermost extent of designated EFH within each area,

including following appropriate depth contours. It was noted that this was consistent with the method the Council employed in designating the two seamount HAPCs.

A tangential but potentially critical discussion took place regarding the appropriateness of the white hake adult EFH spatial extent. One member in particular with experience in the slope region was not aware of any white hake at the deeper end of the depth ranges covered in the white hake adult text descriptions (100-2250m). The deep-water extent of this description was based on one site in a paper by Richard Haedrich and Nigel Merrett. To ensure the accuracy of the depth for this species/life stage, the PDT elected to contact Dr. Haedrich directly to confirm his site of white hake occurring at those depths.

Additional information: The response from Dr. Haedrich came back thusly –

"I tried to find a copy of the paper, but don't seem to have any more Around here. But that reported depth range for white hake cannot be right. Seems as though there are some extra 0's in there. White hake are found at quite shallow depths in embayments, especially as juveniles, and I wouldn't say they go much deeper than 300-400 m. Even the longfin hake (U. chesteri), a more deepwater species, would not be expected much deeper than 1500 m. So wherever those numbers came from, they are wrong!"

The PDT had significant discussion of HAPC boundaries should the white hake depth need to be amended. The PDTs opinion was that the seaward side of the HAPC boundaries would have to be relocated to the depth contour that corresponds to the deepest depth of EFH within that area, most likely 1500 or 1000 meters instead of the 2250 m previously approved. The PDT Chair will address the resolution to this issue in separate correspondence.

Deep Sea Coral Protection

Background: The HAPC boundaries, while clearly trying to protect corals, do not reflect a holistic approach to coral protection. Section 303(b)(2)(B) of the MSA now gives the Council the authority to designate zones where fishing will not be permitted in areas where deep sea corals are identified, to protect deep sea corals from physical damage from fishing gear. Coral areas that emerge, for example, from a risk analysis as being vulnerable to more than minimal and not temporary in nature adverse impacts from fishing may be designated as Deep Sea Coral Protection Areas (DSCPAs) if the Council should so chose. The HAPC process was not geared toward coral protection simply because the proper mandate did not exist at the time the Council began this process. As a result, while the presence of known structure forming organisms was considered in evaluating proposed HAPCs, a comprehensive approach to protecting deep sea coral areas was never considered.

PDT Discussion: The PDT discussed the need to ensure that appropriate areas of known coral presence are captured in the MSA-mandated (Sec 408) report to Congress. Several members agreed to take a look at the NOAA internal draft report to ensure that it contained some information on all areas of known corals. It was noted that the report focuses primarily on the canyon areas, and may need additional detail on Gulf of Maine-located corals. The PDT determined that the risk assessment for Phase II was a reasonable way to assess the risks associated with adverse impacts to corals from fishing.

Phase II Risk Assessment

The PDT discussed finalizing TORs for the assigned internal working groups. It was decided that, if and when appropriate, additional non-PDT members may be brought into these groups to provide their expertise on an ad hoc basis. A stand-alone working group, with it's own TORs, will be formed to address the potential adverse impacts of fishing on deep sea corals.

The call concluded at about 4:30 PM.

#2

A review of regional approaches to Essential Fish Habitat's More than Minimal and Not Temporary (MMNT) Standard

"Councils must act to prevent, mitigate, or minimize any adverse effects from fishing, to the extent practicable, if there is evidence that a fishing activity adversely affects EFH in a manner that is ***more than minimal and not temporary*** *in nature,...."*

-EFH Final Rule, (50 CFR 600.815(a)(2)(ii))

I. BACKGROUND

The Magnuson Stevens Fishery and Conservation Management Act was amended by the Sustainable Fisheries Act (Public Law 94-265) in 1996 to contain the Essential Fish Habitat (EFH) provisions. The EFH mandates are to describe and identify EFH, minimize adverse fishing impacts on EFH to the extent practicable, identify other actions to encourage the conservation and enhancement of EFH, and for each Federal Agency to consult with the Secretary with respect to any actions that may adversely affect EFH. Since that time the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NMFS) has developed regulatory guidelines (EFH Final Rule under 50 CFR 600), Fishery Management Plans (FMPs) and FMP amendments to comply with the EFH provisions. One of the requirements stated in the EFH regulatory guidelines is that all adverse impacts due to fishing activities that are "more than minimal and not temporary" (MMNT) be prevented, minimized or mitigated through regulatory action. In addition to the regulatory guidelines, NMFS has developed guidance to assist the Fishery Management Councils and NMFS regional offices in determining whether or not impacts meet the MMNT threshold (see Appendix A). This guidance is provided to achieve national consistency while allowing the flexibility necessary to accommodate diverse fishery characteristics.

The purpose of this document is to review the various approaches used by different regions and Councils to determine fishing impacts that are "more than minimal and not temporary" and evaluate the degree of national consistency achieved by the various approaches. In addition, the intent of this paper is to inform future attempts to assess fishing impacts for effects that are MMNT, and to assist in the development of additional guidance.

The court order and settlement agreement (December 19, 2001) that resulted from the AOC v. Daley lawsuit required NMFS to undertake new National Environmental Policy Act (NEPA) analyses for the FMPs and FMP amendments that NMFS and the Councils originally developed to comply with the EFH mandate. These new NEPA analyses contain the most recent effort by the agency and the Councils to analyze all aspects of EFH including gear effects on EFH. For this evaluation NMFS' Office of Habitat Conservation (OHC) reviewed those Environmental Impact Statements (EIS) that emerged as a product of the AOC v. Daley Joint Stipulation and Order. The OHC

focused on the similarities and differences in regional approaches, in particular the use of qualitative and quantitative methods for assessing if the MMNT threshold has been met. In addition, OHC considered how the NEPA alternatives developed by the regional fisheries management councils for minimizing adverse fishing effects related to those impacts determined to have a more than minimal and not temporary impact on EFH.

The five regions that drafted EISs following the AOC v. Daley court order and whose efforts were reviewed by OHC for this evaluation include:

- Caribbean
- Gulf of Mexico
- New England
  - Groundfish
  - Monkfish
  - Scallop
  - Herring
- Alaska (North Pacific)
- Pacific

II. CURRENT GUIDANCE

The preamble to the EFH regulatory guidelines (67 FR 2354) defines the following terms:

> ***Temporary impacts*** *are those that are limited in duration and that allow the particular environment to recover without measurable impact. The duration and frequency of impacts should be considered.*
> ***Minimal impacts*** *are those that may result in relatively small changes in the affected environment and insignificant changes in ecological functions.*

The OHC outlined a step-by-step process (listed below) for complying with the legal requirements of the MSA and NEPA in the document *Considerations for Conducting a Thorough Analysis of Options to Minimize the Adverse Effects of Fishing on EFH* (Oct 2002).

1) Identify all fishing activities
2) Evaluate the potential adverse effects of each fishing activity
3) Eliminate those activities not adversely affecting EFH in a manner that is MMNT
4) Of those remaining, determine which activities appear to be most relevant for addressing adverse effects
5) Develop a list of potential management measures
6) Package potential management measures into alternatives for further analysis
7) Evaluate the practicability of the identified range of alternative management measures
8) Explain the reasons for the Council's conclusion

III. REGIONAL APPROACHES

Caribbean

The Caribbean Council produced NEPA analyses for all their fisheries together in a single document. The Council and Southeast Region (SER) took a qualitative approach in analyzing the impacts of fishing activities on areas currently designated as EFH by developing a Fishing Impacts Index. This methodology assesses impacts on habitat as a function of the habitat's sensitivity to an interaction with a specific gear type (context) and the level of fishing effort (intensity) displayed by the fishery. They used the fishing impacts index to determine which fishing effects were having a MMNT effect on habitat and then developed NEPA alternatives to address those MMNT impacts.

The SER and Council developed qualitative scores for habitat sensitivity (see Appendix B) and fishing effort and then multiplied those scores together to arrive at a qualitative index of the relative probability of fishing impacts (*fishing impacts index*) for each gear/habitat combination.

MMNT: Fishing Impacts Index > 0

Fishing Impacts Index = Index of Sensitivity X Fishing Effort Index

Rankings for both the sensitivity and fishing effort indices were developed for each gear type on each habitat based on available data and professional judgment [FEIS, 3/04, Section 2.1.4.2.2.1 & 2.1.5.3.1 respectively]. Habitat types present within areas designated as EFH were defined on the basis of substrate (i.e. bottom type) and vegetation, separated by estuarine and marine zones. Fishing sensitivity index values were derived from the 1999 NOAA Fisheries workshop on gear impacts on essential fish habitat in the Southeast Region (Hamilton 2000).[1] A qualitative discussion of the sensitivity of specific habitats to perturbation is provided within the EIS, including a description of the gear, and the strength and type of disturbance perpetuated. The value assigned to the fishing effort index was based on the best professional judgment as to how commonly a gear is traditionally used in a particular habitat.

A lack of fishing effort data was a major constraint in performing this analysis, and thus the distribution of gear use within a habitat type was assumed to be uniform because no spatially explicit fishing effort distribution was available for mapping.[2] In contrast, information is available in greater detail on the distribution of habitat types. Minimal

[1] All gear types used in the Caribbean were considered during the workshop, but not all habitat types were considered. In such cases inferences were made based on the effect of that gear on a similar habitat type, or if not applicable, then scientific literature and professional judgment were relied upon to produce a ranking.
[2] Landings data from Puerto Rico was used as a proxy to estimate the relative use of gears among habitats, but the validity of this data is uncertain due to missing gear codes and use of multiple gears on a single trip.

geospatial analysis was conducted because fishing effort data was not available on a similar scale as habitat distribution data.

The SER and the Caribbean Council acknowledged in their EFH EIS that calculating sensitivity and effort indices in the face of uncertainty, and then multiplying the resulting values to get a fishing impacts score, propagates and compounds unknown errors. Yet in light of the best scientific information available they determined that the approach taken was the most viable option.

Fishing Impact Index scores ranged from no adverse impact (0) to a high level of adverse impact (9). The values of the Fishing Impacts Index were used to determine which fishing practices had a MMNT effect on which habitats. All gear/habitat interactions that had fishing impacts index scores in the lowest category (0) were considered to fall below the threshold of "minimal and temporary".[3] Eighteen gear/habitat combinations received a fishing impact score above 0. All other scores (1-9) were considered potentially MMNT. The EIS states that some of the gear/habitat interactions that received fishing impact scores above 0 may actually result in impacts that fall below the minimal and temporary standard, but without further analyses such a determination could not be made.

NEPA Alternatives

Alternatives were developed for all legal gear interactions with habitat that ranked above the lowest category (0) so that a further analysis of fishing impacts could take place [Section 2.1.5.4.2-table). Possible Council actions to restrict gear or minimize habitat damage during fishing activities are discussed in the EIS [Section 2.1.5.4.3]. The SER and the Caribbean Council developed the NEPA minimization alternatives so that each progressive NEPA alternative affords greater protection for habitat.

A Relative Risk index was developed as a means of prioritizing those gear impacts most likely to have a negative affect on managed fishery species. The results of this index guided decisions as to which management measures should be adopted to minimize adverse effects from fishing activities. [Section 2.1.6.2, pg. 2-55] The analysis seems to be successful in both highlighting those gear types with the greatest impact on certain habitats and in identifying measures that specifically address the need for minimization.

Gulf Of Mexico

The Gulf of Mexico and SER produced NEPA analyses for all their fisheries together in a single document using a process almost identical to that of the Caribbean Council for analyzing the impact of fishing activities on habitat.[4] The greatest difference in approaches is that the Gulf of Mexico only utilized the Fishing Gear Sensitivity Index to determine adverse impacts that were potentially more than minimal and not temporary, while the Caribbean used the Fishing Impacts Index (which factored in both sensitivity

[3] Fishing gear that is currently banned in the Caribbean region was considered through the Fishing Impacts Analysis, but since fishing effort for those gear types received a ranking of 0 of the resulting Fishing Impact Scores were 0, and none of the gear/habitat interactions for banned gear were considered MMNT.
[4] Both the Gulf of Mexico and Caribbean hired the same contractor to assist in writing their EFH EISs.

and fishing effort) in determining those impacts that met the MMNT threshold. Those gear/habitat combinations with a fishing sensitivity index score greater than zero were considered to have impacts that are potentially "more than minimal and not temporary." They used the sensitivity index to determine those impacts that were MMNT and then developed NEPA alternatives to address those impacts.

MMNT: Fishing Sensitivity Index > 0

The values of the sensitivity index were used to determine which fishing practices had a MMNT effect on which habitats. Most of the values for the fishing sensitivity index (see Appendix B) were derived from the 1999 NOAA Fisheries workshop on gear impacts on essential fish habitat in the Southeast Region, the same workshop from which the Caribbean Region's Fishing Gear Sensitivity Index values are based (Hamilton 2000).[5] All gear/habitat interactions that had sensitivity impact scores in the lowest category (0) were considered to fall below the "minimal or temporary" threshold. All those with sensitivity index scores of 1-3 were considered to be potentially MMNT.

The SER and the Gulf of Mexico Council performed additional analysis by using the Fishing Impacts Index, which was also used by the Caribbean Council, to assess gear effects on habitats. Refer to the Caribbean section of this document for further details regarding the Fishing Impacts Index.

Fishing Impacts Index

Fishing Impacts Index	=	Sensitivity Index	X	fishing effort (by gear)
(by gear, substrate and grid unit)		(by gear & substrate)		area to which effort applied[6]

A lack of fishing effort data was a constraint in performing this analysis since data for commercial fisheries in the Gulf of Mexico is available only in aggregated form. Information is collected on a trip trip-by-trip basis through logbook interview programs or trip tickets. It is assumed by the Gulf of Mexico Council that fishing effort is evenly distributed within a unit of measurement because no data is available to allocate effort on a finer scale. Due to the poor resolution in the fishing effort data, the scale of the areas of habitat mapped in the GIS is much smaller than the scale of the fishing effort data, leading the Gulf of Mexico Council to rely solely on the Fishing Sensitivity Index when determining those impacts that are MMNT [Section 2.1.5.2.3]

NEPA Alternatives

The Gulf of Mexico FEIS [Section 2.1.5.3.2] contains a table highlighting those habitat/ gear combinations for which the fishing gear sensitivity was greater than zero. NEPA alternatives were developed and analyzed to address these gear and habitat interactions. The NEPA alternatives that were developed for minimization/mitigation purposes were successively more restrictive, except for the last two alternatives (6 & 7) which are a

[5] The NOAA Fisheries habitat-gear ranking did not include all the habitats or gears analyzed for the Gulf of Mexico. Members of the Council's EIS advisory panels provided recommendations that assisted in ranking habitat-gear combinations not included in the NOAA Fisheries habitat- gear rankings.

[6] The area of the grid units are not uniform, therefore fishing effort must be divided by the area of the unit.

mixture of measures introduced in the first 5 alternatives. Alternatives were primarily developed for gear/habitat combinations with fishing gear sensitivity rankings of 2 and 3. The remaining gear/habitat combinations with fishing sensitivities greater than 0 are addressed under habitat alternative 5.[7]

New England

The New England Fishery Management Council (Council) Northeast Region (NER) took a different approach than all of the other regions affected by the AOC v. Daley lawsuit by amending each of its FMPs individually, producing separate NEPA documents for the Scallop, Herring, Groundfish and Monkfish FMP amendments. This path was chosen because the Council, in 2002 when the lawsuit settlement agreement was approved, had already initiated major amendments to their FMP for other purposes. However, like the other regions and Councils subject to the AOC v. Daley lawsuit, the NER and New England Council developed a single methodology for evaluating gear effects and determining adverse effects on EFH.(known as the Vulnerability Matrix) for evaluating gear effects on its fisheries (Stevenson et al. 2003).

The approach designed by the Council adheres strictly to items #1-5 in the NMFS October 2002 guidance entitled *Considerations for Conducting a Thorough Analysis of Options to Minimize the Adverse Effects of Fishing on EFH* (Oct 2002). The step-by-step approach is outlined below:

1) Identify all fishing activities
Describes commercial fishing gears used in the Northeast region of the U.S. and the geographic distribution and use of the principal bottom-tending gears in three broadly-defined habitat types.

2) Evaluate the potential adverse effects of each fishing activity
Evaluates the effects of bottom trawls and dredges on benthic marine habitats in the region.
Most of this information is derived from the NMFS, NEFMC and MAFMC-sponsored Gear Effects Workshop that evaluated the effects of fishing gears used in the Northeast region on mud, sand, and gravel habitats (NREFHSC 2002) and from an extensive review of relevant gear effects studies (Stevenson et al. 2003). The literature review that evaluated the type of gear impact included relevant information on: Alteration of physical structure, sediment suspension, changes in chemistry and changes to benthic communities. Additional sources of information include work done by the NEFMC Habitat Plan Development Team and NEFMC and NMFS staff, and a National Research Council report on the Effects of Trawling and Dredging on Seafloor Habitat (NRC 2002).

3) Eliminate those activities not adversely affecting EFH in a manner that is MMNT
The purpose of this section is to evaluate potential adverse effects of bottom-tending fishing gears regulated by the Magnuson-Stevens Act (MSA) on benthic EFH in the

[7] This determination is made by comparing those impacts with a ranking of 1+ with the table highlighting those interactions between gear and habitat for which alternatives were developed (FEIS p2-58).

Northeast region of the U.S. as required by the EFH final rule, 50 CFR 600.815(a)(2)(I). The EFH final rule recommends that the evaluation consider the effects of each fishing activity on each type of habitat found within the EFH for any affected species and life stage and recommends that the following information be reviewed in making an evaluation: intensity, extent, and frequency of any adverse effects on EFH; the types of habitat within EFH that may be adversely affected; habitat functions that may be disturbed; and conclusions regarding whether and how each fishing activity adversely affects EFH. Therefore, the approach taken by the Council serves as the basis for evaluating which gear types, if any, are most likely to have an adverse impact on essential fish habitat for federally-managed species in the NE region.

Vulnerability is defined as the likelihood that the functional value of EFH would be adversely affected as a result of fishing. Given the limited nature of the information available for this evaluation, emphasis was placed on the identification of potential adverse impacts of fishing on benthic EFH. Information used to perform these evaluations included: 1) the EFH designations adopted by the Mid-Atlantic, New England, and South Atlantic Fishery Management Councils; 2) the results of a Fishing Gear Effects Workshop convened in October 2001 (NREFHSC 2002); 3) the information provided in this report, including the results of existing scientific studies (**See Table 1 – Appendix C**), and the geographic distribution of fishing gear use in the Northeast region; and 4) the habitats utilized by each species and life stage as indicated in their EFH designations and supplemented by other references (**See Table 2 – Appendix C**).

The following five fishing gear classifications were evaluated: otter trawls (OT); New Bedford style scallop dredges (SD); hydraulic clam dredges (CD); pots and traps (PT); and sink gill nets and bottom long lines (NL). Vulnerability was evaluated according to four broad categories: none (0); low (L); moderate (M); and high (H), based upon a matrix analysis of habitat function, habitat sensitivity and gear use. The matrix analysis consistently applied these criteria to all benthic life stages and species. Adult and spawning adult life stages were combined due to the difficulty in distinguishing between the two. In some cases (e.g., pelagic life stages that are not vulnerable to bottom-tending fishing gear effects) a vulnerability ranking was not applicable (NA).

Three main evaluation criteria were considered in the evaluation of the vulnerability of EFH (and resulting MMNT/adverse impact determination) for each species and life stage and the rationale behind the evaluation conclusions were outlined by species in "vulnerability tables" and developed using the following criteria (**See Table 2 – Appendix C**):

1. The habitat's value to each species and life stage was characterized to the extent possible, based on its function in providing shelter, food and/or the right conditions for reproduction.

2. Another criterion was the sensitivity of the habitat to disturbance and its ability to recover from any effects of fishing given the range of natural disturbances experienced in the environment. These considerations took into account available information on the

energy level of the natural environment, including the degree of disturbance from tidal and storm-related currents.

3. The extent to which each of the five bottom-tending gear types is used in areas that are designated as EFH for any given species and life stage was evaluated by examining the spatial distribution of fishing activity for individual gears for the period 1995-2001.

To determine the EFH vulnerability, used as the threshold indicator for the MMNT evaluation and subsequently the adverse impact determination, an equation was developed to determine the vulnerability of EFH to a particular gear type (**See Table 4 – Appendix C**):

Habitat Rank x Gear Distribution = Gear Rank or EFH Vulnerability
where,

Habitat Rank = shelter + food + reproduction + habitat sensitivity
Gear Distribution = percentage of overlap between fishery and EFH

If EFH Vulnerability > or = moderate or high, then MMNT threshold exceeded.

Three ranking criteria were qualitatively evaluated for each life stage based upon existing information:

1. Habitat rank
The habitat rank was determined quantitatively as the sum of the previous scores (shelter + food + reproduction + habitat sensitivity). Another way to characterize the habitat rank is the relative vulnerability of the habitat to non-natural physical disturbance

2. Gear distribution
This criterion factors in the use of a particular gear type (otter trawl, scallop dredge, hydraulic clam dredge) in EFH for a particular lifestage. Distribution was determined as the qualitative overlap of EFH on the Vessel Trip Report location data which has been described in previous sections of this report.

3. Gear rank.
The gear rank provides the vulnerability of EFH to a particular gear type and was calculated as the product of the Habitat Rank x Gear Distribution.

4) Of those remaining, determine which activities appear to be most relevant for addressing adverse effects
Summarize the results and findings of the above section (Step 3), identifying the potential adverse impacts of the three principal bottom-tending mobile gears on three principal bottom types in the region. These results serve as the basis for analyzing proposed

alternatives to minimize the adverse impacts of these gears on EFH. The method includes an evaluation of the vulnerability of all 37 federally-managed species' to gear types found to have potential adverse impacts on EFH. Vulnerability was evaluated according to four broad categories: none (0); low (L); moderate (M); and high (H), based upon a matrix analysis of habitat function, habitat sensitivity and gear use. Results are summarized by species and life stage. Individual life stage and gear type vulnerability that was determined to be moderately or highly vulnerable exceeded the MMNT threshold. A simple matrix was developed for each benthic life stage for each species to determine the vulnerability of its EFH to effects from bottom tending mobile gear.

Adverse impacts determinations:
The following conclusions were reached for the Groundfish (Multispecies), Scallop and Monkfish FMP Amendments were applicable:

- Adverse and potentially adverse habitat impacts from bottom trawling occur throughout most of the NE region on a variety of substrates;
- Adverse and potentially adverse habitat impacts from scallop dredging occur primarily in the Mid-Atlantic and secondarily on Georges Bank on sand, gravelly sand, and gravel substrates;
- Adverse and potentially adverse habitat impacts from hydraulic clam dredging occur primarily in the Mid-Atlantic and secondarily in southern New England on sand substrates.

Herring
The Herring EIS concluded that impacts from Herring fishery "are minimal and/or temporary and do not need to be minimized" and thus "no management measures are necessary at this time". This conclusion is based upon the New England Workshop's finding that occasional contact with the seafloor from mid-water trawls and purse seines may result in adverse impacts, but that such impacts are not MMNT (NREFHSC 2002).

5) Develop a list of potential management measures and 6) Package potential management measures into alternatives for further analysis

Groundfish, Scallop, and Monkfish Amendments:
Because several life stages were determined to be adversely impacted and those adverse impacts exceeded the MMNT threshold, the Council developed a myriad of closed area, effort reduction and gear modification alternatives for the Groundfish, Scallop, and Monkfish Amendments.

In Amendment 13 (Groundfish), the Council included approximately eleven (11) closed area alternatives, 4 effort reduction alternatives (as links to Alternative 2 – other AM13 alternatives with significant habitat benefits), 5 gear modification alternatives and 1 alternative to require VMS on all vessels.

In Amendment 10 (Scallop), the Council included approximately twelve (12) closed area alternatives, 4 effort reduction alternatives, 2 gear modification alternatives, 1 alternative

to require VMS on all vessels and 1 alternative to require a portion of the TAC set-aside for research be targeted at habitat-related research.

In Amendment 2 (Monkfish) the Council included approximately four closed area alternatives, three gear modification alternatives, and an effort reduction alternative

Implemented Alternatives

Groundfish: The measures implemented that minimize adverse effects of fishing (both by the GF fishery and on GF EFH) in Amendment 13 are as follows:

1) Effort reductions through significant DAS reductions and seasonal closures

2) Habitat closed areas (approx. 2811 sq nautical miles), closed to all bottom-tending mobile gear, to reduce the effect of fishing on benthic habitats.

Scallops: The measures implemented that minimize adverse effects of fishing (by the SC fishery on EFH) in Amendment 13 are as follows

1) Effort reductions through DAS reductions and rotational management primarily and days-at-sea limits in open access areas;
2) Habitat closed areas (approximately 4041 sq. nautical miles) , closed indefinitely to scallop dredge gear, to reduce the effect of fishing on benthic habitats...
3) Gear modifications that increases dredge ring size to 4" throughout the fishery; and,
4) Mandate a portion of the TAC set-aside for habitat research.

Monkfish: The measures implemented that minimize adverse effects of fishing (both by the MF fishery on EFH) in Amendment 13 are as follows:

1. Habitat closed areas (approximately 118 sq. nautical miles): Deep-sea canyon habitat closures for Oceanographer and Lydonia Canyon.
2. Gear modifications: increase mesh size to 12" to reduce habitat bycatch.

Herring Amendment 1:
The monkfish fishery received a low gear ranking through the vulnerability matrix. The MMNT threshold is discussed in general terms in the EIS with conclusions regarding the relative impact of otter trawls and scallop dredges on sand, mud, and gravel based on the 2001 Workshop report.

No adverse impacts exceeded the threshold of the MMNT evaluation; therefore, no measures to minimize adverse effects were required. However, due to a subsequent modification agreement with the plaintiffs in the AOC v. Daley lawsuit that allowed the Council and the NE Region to exclude a new Atlantic salmon EIS from the settlement agreement and provide an extension to the DSEIS filing deadline for the Monkfish

Amendment 2 EIS, the Council and Region were required to develop alternatives to minimize adverse impacts on EFH in a separate Herring EFH DEIS (separate from the Herring Amendment 1 deliberations). Because the Council was working on the Herring Amendment 1 document simultaneously, the Region agreed to prepare the separate Herring EFH DEIS.

Herring EFH DEIS (public comment ended on 10/13/04): Alternatives include modifications to the definitions of mid-water trawls and propose areas closed to mid-water trawls. Since this EIS was driven solely by the lawsuit and not by issues related to MMNT, this is not an example of how the process should be undertaken

7) Evaluate the practicability of the identified range of alternative management measures and 8) Explain the reasons for the Council's conclusion

A spatial model was developed to summarize and evaluate the ecological importance of and difference between the closed area alternatives within the Groundfish and Scallop Amendments. The six metrics used in the spatial analysis include:

1. SIZE and OVERLAP – Size of each proposed closed area option and overlap with year-round closed areas.

2. SUBSTRATE –Area of each sediment or substrate type contained within each proposed closure.

3. EFH – The amount of vulnerable species' EFH encompassed by each proposed closure.

4. TROPHIC GUILD –Biomass encompassed by each closure for five guilds: planktivores, amphipod eaters, shrimp and fish eaters, benthivores, and piscivores.

5. SPECIES ASSEMBLAGE - Biomass encompassed by each closure for three species aggregations: elasmobranchs, demersal species, and pelagic species.

6. BENTHIC SPECIES - Biomass encompassed by each closure for six species (longhorn sculpin, sea raven, redfish, ocean pout, jonah crab and American lobster) with high levels of association to benthic habitats.

When assessing the environmental attributes of the proposed closure alternatives, the No Action Alternative (which does not contain areas closed expressly for EFH protection) is included as a point of reference.

Alaska

The Alaska Region's (AKR) evaluation of the effects of fishing on EFH has two components: a quantitative mathematical model to show the expected long term effects of

fishing on different habitat features and a qualitative assessment of how those changes affect fish stocks.

I. Quantitative Mathematical Model (see Appendix D)

The quantitative mathematical model evaluates fishing effects on habitat features based on:

- Sensitivity of habitat features to contact with fishing gear
- Recovery rates of habitat features
- Fishing Intensity (frequency of contact)
- Distribution of fishing effort relative to different types of habitat

The quantitative model was designed to estimate proportional effects on habitat features that would persist if fishing continued at its present level until affected habitat features neither further degrade nor improve. At this point, known as equilibrium, effects would not be of limited duration and would be considered "not temporary" in nature. With the duration of impact remaining constant, the model is used to predict the reductions in habitat features when effects and recovery reach equilibrium. Effects that persist at the equilibrium state are not considered to be temporary, so any remaining impacts that meet the "more than minimal" standard would automatically meet both components of the MMNT threshold. The model results indicated that many fishing activities cause persistent (i.e., not temporary) effects to EFH, and the remainder of the analysis focused on whether those effects are more than minimal.

II. Qualitative Assessment: Species Evaluations

The model outputs were utilized by assessment biologists familiar with the stocks to carry out qualitative evaluations. The model outputs were used to determine how fishing affects the ability of habitat to support the spawning, breeding, feeding, or growth to maturity of each managed species. Specifically, stock assessment scientists assessed whether the fisheries, at their current rate and intensity, are affecting habitat that is essential to the welfare of each managed species and thereby altering the ability of a managed species to sustain itself over the long term.

NMFS conducted three types of analyses to assess the consequences of the predicted habitat changes for managed species. First, analysts reviewed available information on egg, larvae, juvenile, and adult life stages to describe associations between each species and specific habitat types. Next, analysts compared the Long-term Effect Index scores from the model with the species distributions and habitat types, and weighted habitat impacts by how much of the species distribution was associated with a given habitat type. Third, analysts assessed whether habitat loss was affecting productivity for each stock by considering the status of each stock relative to its minimum stock size threshold (MSST).[8] Specifically, analysts assessed whether available information provides any indication that habitat changes caused by fishing would alter the ability of each stock to stay above its MSST over the long term.

[8] The minimum stock size threshold is the greater of 1) one-half the MSY stock size or 2) the minimum stock size at which rebuilding to the MSY level would be expected to occur within 10 years if the stock were exploited at the specified maximum fishing mortality threshold. A stock would be considered overfished if the size in a given year fell below that threshold.

The regulatory definition of EFH (50 CFR 600.10) indicates that EFH is the habitat necessary to fish for spawning, breeding, feeding, and growth to maturity, and interprets "necessary" to mean the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem. Evaluating stock status relative to MSST addresses whether fishing diminishes the ability of the habitat to support a sustainable fishery. NMFS also used the ability to stay above MSST as a proxy to reflect the ability of a species to contribute to a healthy ecosystem, unless the evaluating scientists knew of ecosystem functions of the species that required a higher population level. The analysis assumed that stock levels above MSST ensure that substantial numbers of fish are available to serve as prey or predators to other species, as well as fulfilling other ecosystem functions.

Conclusions from analysis:
The quantitative mathematical model indicated that the groundfish fisheries (trawl fisheries in particular) had some measurable effect on benthic habitat, whereas the scallop[9], crab[10], and salmon[11] fisheries had almost no measurable impacts, primarily due to the small footprints of these fisheries relative to the available habitats (Witherell 2002). The analysis concluded "that no current fishing activities had more than minimal or temporary impacts on EFH for managed species" and therefore minimization alternatives are not required. By the time this conclusion was reached NEPA alternatives had already been developed. These alternatives were evaluated to "provide an opportunity for NMFS and the Council to consider potential changes to the FMPs to further minimize any effects of fishing on EFH." (DEIS, p.2-51, 01/04) Even though the analysis did not find any indication that fishing results in more than minimal and temporary effects to EFH, the range of alternatives provided choices for the Council to decide how much precaution is warranted in light of the inherent uncertainty in the analysis.

NEPA Alternatives
The model directed the development of the NEPA alternatives in addition to providing the species' experts information to perform the assessments. The majority of the NEPA alternatives were developed by an EFH Committee appointed by the Council. The EFH Committee developed those alternatives based on the results of the preliminary fishery

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[9] For the scallop fishery, the analysis indicated that although the effects of this gear on the bottom are higher than other gear types, the fishery occurs in areas and habitat types that have relatively rapid recovery rates. Additionally, the overall footprint (area affected annually) of the scallop fishery was very small (149 nm), equating to about 0.1 percent of the total available benthic habitat area. Thus, the effects of the fishery are concentrated in a relatively small proportion of EFH, and these effects are considered minimal in nature.

[10] For the BSAI crab fisheries, the analysis indicated that the fisheries have an extremely small overall footprint with the number of pot sets (approximately 720,000 pot sets per year) totaling about 1 nm per year and equating to less than 0.0007 percent of the total available benthic EFH area. Thus, the effects of the fishery are concentrated in an extremely small proportion of available EFH and these effects are considered minimal and temporary in nature.

[11] For the salmon fisheries, the analysis indicated that the effects of this gear on EFH are almost nonexistent, because the gear generally never touches bottom. Only the drift gill net fishery was found to have an overall footprint of more than 0.1 percent of available EFH. Therefore the effects of the Alaska salmon fisheries on EFH are considered minimal and temporary in nature.

evaluation (Rose 2002). The quantitative model determined those gears considered to be most damaging and indicated those fisheries with the highest impacts on certain habitat features. Fisheries with the greatest effects on habitat were addressed in each alternative, while fisheries with fewer effects were only addressed in the higher numbered (and more restrictive) alternatives. The Council subsequently added additional alternatives to protect coral and sponge areas to address concerns about habitat features not adequately evaluated through the model.

Review by Center for Independent Experts (CIE)
NMFS AKR contracted with the Center for Independent Experts (CIE) to conduct a peer review of their evaluation of the effects of fishing on Essential Fish Habitat (EFH) in Alaska. The review was initiated in June 2004 and a report by the panel was released in August 2004 critiquing Alaska's approach to assessing the impacts of fishing on EFH. The chair presented the results of the review during the October 2004 Council meeting. The following are a few of the panel's more general recommendations.

1. A precautionary approach to management is needed due to a large uncertainty in our understanding of the distribution and ecological role of habitats, and the impacts of fishing upon them. Use the precautionary approach especially where data are unclear, recovery times are long, or habitat reduction is high.
2. The use of stock status relative to MSST to assess the possible influence of habitat degradation on fish stocks is inappropriate on its own, and should be combined with analyses of time series indices such as size-at-age, population size structure, fecundity, gut fullness, and spatial patterns in fish stocks relative to fishing effort.
3. Give adequate consideration to localized habitat impacts.
4. Validation of the model using data from Alaska and other areas is essential.
5. Provide clear standards for incorporating professional judgment into evaluations for effects on individual species and broaden the scope of the evaluators of habitat effects by including the opinions, information and data of stakeholders.
6. Integrate the results from on-going fishing gear impacts research to the greatest extent possible.
7. Review the work being done elsewhere on ways of assessing the health of an ecosystem and develop relevant indices to help monitor the health of regional ecosystems.

Pacific

The Pacific Groundfish DEIS has not yet been released. The following summary is based on the Risk Assement that was developed for the EIS.

The risk assessment for the Pacific Groundfish FMP interprets the "minimal and temporary" standard as a means "to help determine which fishing activities, individually and cumulatively, cause inconsequential effects to EFH (Risk Assessment- Executive Summary, p9). An EFH model, known as Habitat Suitability Probability (HSP), was developed for assessing the likely importance of habitats for each species and life stage in the FMP. This model evaluates the probability that particular habitats are suitable for

particular species and life stages, based on available data sources.[12] In addition, a Sensitivity Index and Recovery Index were developed as inputs for a second model, which used the products of these indices, along with fishing effort data, to examine fishing impacts by trawl gear. This second model, known as the Impacts Model, provides a framework for quantitatively considering habitat status and the effects over time of different management regimes on habitat.

Sensitivity and Recovery Index

The Sensitivity index provides a relative measure of the likely changes to habitat caused by interactions with various fishing gears. The Recovery Index provides a measure of the time taken for a habitat to recover to a pre-impacted state. The indices were constructed using a 3-step approach. First, habitat types and gear types to be used in the analysis were identified and levels of sensitivity and recovery were defined based on the best available information in the literature. Second, a literature review was conducted to determine *recovery times* by gear type and habitat type. The third and final step was the construction of the sensitivity and recovery matrices.

Impacts Model

The Impacts Model is intended to be a relative measure used to investigate changes over time and space in the level of impacts to EFH resulting from different management regimes or different intensities of gear use. These management regimes may either be in the past, in which case the model is used to investigate existing levels of impact and hence the current relative status of EFH, or they can be alternative strategies for future management, in which case the model is used to investigate potential changes in impacts resulting from management interventions.

Highly Migratory Species

The 1999 Fisheries Management Plan for Atlantic Tuna, Swordfish and Sharks, and Amendment 1 to the HMS FMP determined that there is no evidence that HMS fishing practices are causing adverse impacts on EFH. The only gear used in these fisheries that contacts benthic habitat is bottom longlines, which are used to target coastal sharks. It has been determined that the impact of this gear on shark EFH is minimal. Published literature and anecdotal evidence of potential impacts or comparable impacts from other fisheries were used in performing this analysis.[13]

The Amendment states that "Even if there were any adverse impacts, such impacts are not expected to be more than minimal and not temporary in nature." (pg 3-39). The Amendment considers the impact of both HMS and non-HMS fisheries on HMS EFH and other EFH, but states that the degree of impacts on other EFH are difficult to ascertain based on the information available. No NEPA alternatives were considered for

[12] Data sources included the NMFS groundfish surveys for as many species and life stages as possible, and information on habitat associations from the habitat use database for other species and life stages.

[13] The only data currently available regarding bottom longline impacts is from submersible observations of halibut longline gear off southeast Alaska in 1992 (NPFMC 1992). The 1999 NOAA Fisheries (SE) EFH Workshop categorized the impact of bottom longline gear on mud, sand, and hard-bottom as low (Barnett 2001).

minimization/mitigation purposes but the following conservation recommendations were provided:

(1) fishers should take appropriate measures to identify bottom obstructions and avoid setting gear in areas where it may become entangled; and
(2) if gear is lost, diligent efforts should be undertaken to recover the lost gear.

Summary Table

	Caribbean	Gulf of Mexico	New England				Alaska	Pacific	Highly Migratory Species
			Scallop	Monkfish	Groundfish	Herring			
Qualitative or quantitative analysis?	Qualitative	Qualitative	Qualitative	Qualitative	Qualitative	Qualitative	Both	Both	Qualitative
Clear link between MMNT determination and NEPA alternatives? NE comment	Fishing Impact Index scores presented through a prioritized list	Sensitivity Index scores presented through tables	Alternatives developed for spp based on Adverse Impacts/MMNT analysis			Not MMNT. Alts developed due to a lawsuit modification	Alternatives addressed greatest impacts according to the Fishing Effects model	N/A*	Yes- not MMNT
Analysis focus on habitat types or species productivity?	Habitat types	Habitat types	Vulnerability of EFH for lifestage to bottom tending gear				Both	N/A*	Habitat types
Geospatial analysis?	Minimal	Minimal	Metric analysis of size, area, sediments, EFH, trophic guilds, species assemblages and benthic indicator species were spatially conducted				Substantial- Quantitative model	N/A*	No
Independent peer review?	No	No	No	No	No	No	Yes- CIE Review	N/A*	No
Rankings of gear effects based relative to other factors or independently?	Independent	Independent	Independent: Vulnerability matrix and literature review. Relative: Use of Gear Effects Workshop findings				Independent:: quantitative model, lit review Relative: compared footprints of different gear types.	N/A*	Independent

* *The Pacific EIS has not yet been released.*

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Appendix A:
Excerpt from EFH guidance *Considerations for Conducting a Thorough Analysis of Options to Minimize the Adverse Effects of Fishing on EFH* (Language developed by NMFS Headquarters- Oct 2002)

Eliminate from further consideration any fishing activities that do not adversely affect EFH in a manner that is more than minimal and not temporary in nature
The EFH Final Rule (50 CFR 600.815(a)(2)(ii)) establishes a threshold for determining which fishing activities warrant analysis to prevent, mitigate, or minimize to the extent practicable the adverse effects of fishing on EFH:

> Councils must act to prevent, mitigate, or minimize any adverse effects from fishing, to the extent practicable, if there is evidence that a fishing activity adversely affects EFH in a manner that is more than minimal and not temporary in nature, based on the evaluation conducted pursuant to paragraph (a)(2)(i) of this section and/or the cumulative impacts analysis conducted pursuant to paragraph (a)(5) of this section."

As discussed in the preamble to the EFH Final Rule at 67 FR 2354, management action is warranted to regulate fishing activities that reduce the capacity of EFH to support managed species, not fishing activities that result in inconsequential changes to the habitat. The "minimal and temporary" standard in the regulations, therefore, is meant to help determine which fishing activities, individually and cumulatively, cause inconsequential effects to EFH.

In this context, temporary effects are those that are limited in duration and that allow the particular environment to recover without measurable impact. The following types of factors should be considered when determining if an impact is temporary:

- The duration of the impact;
- The frequency of the impact.

Minimal effects are those that may result in relatively small changes in the affected environment and insignificant changes in ecological functions. Whether an impact is minimal will depend on a number of factors:

- The intensity of the impact at the specific site being affected;
- The spatial extent of the impact relative to the availability of the habitat type affected;
- The sensitivity/vulnerability of the habitat to the impact;
- The habitat functions that may be altered by the impact (e.g., shelter from predators)
- The timing of the impact relative to when the species or life stages need the habitat.

In general, if the effects of fishing are not clearly less than minimal and temporary, to ensure a thorough analysis and a strong administrative record it is best to proceed with an evaluation of potential management measures to minmize adverse effects to the extent practicable.

Appendix B: Gulf of Mexico & Caribbean

Fishing gear sensitivity ranks

High (3): Capable of severe damage to a wide swath of habitat during a single encounter. Seriously impairs the function (for fish) of the impacted habitat.

Moderate (2): Capable of severe damage to habitat in a "footprint" of the gear during a single encounter; or capable of moderate damage to habitat over a swath. Impairs the function (for fish) of the habitat.

Minor (1): Capable of moderate damage to habitat in a limited area during a single encounter. May impair the function (for fish) of the habitat.

Negligible (0): Does not typically cause damage. No perceptible impairment to the function (for fish) of the habitat

Appendix C: New England

Appendix C: New England

This appendix includes supporting information to better explain or exemplify the MMNT/Adverse Impacts determination methodology utilized by the NE Council.

Types of Gear Effects – literature analysis tables

No.	Reference	Location	Depth	Sediment	Effects	Recovery	Approach
1	Auster et al. 1996	Gulf of Maine (Jeffreys Bank)	94 m	Gravel/boulder with thin mud veneer.	Gravel base exposed, boulders moved, reduced abundance of erect sponges and associated epifaunal species.		Submersible and video observations in same location in 1987 and 1993, changes attributed to trawling.
2	Freese et al. 1999	Gulf of Alaska	206-274 m	93% pebble, 5% cobble, 2% boulder.	Boulders displaced, groundgear left furrows 1-8 cm deep in less compact sediment, layer of silt removed, S reductions in abundance of sponges, anemones, and sea whips, damage to sponges, sea whips and brittle stars.		Video observations from a submersible 2-5 hr after single trawl tows in area exposed to little or no commercial trawling for about 20 years.
3	Van Dolah et al. 1987	Georgia, SE U.S. coast	20 m	Smooth rock with thin layer of sand and attached epifauna.	Reduced abundance of and damage to large sponges and soft corals, esp barrel sponges and stick corals; no S effects on abundance of vase/finger sponges, or stony corals.	Full recovery of damaged organisms and abundance within 12 mos.	Experimental study using diver counts of large sponges and corals before, immediately after, and 12 mos after a single trawl tow in an un-exploited area.

Example Table 1 - Effects of Otter Trawls on Gravel/Rock Substrate Habitat: Summary of Published Studies

Assessing Vulnerability – vulnerability summary tables

Life Stage	Geographic Area of EFH	Depth (m)	Seasonal Occurrence	EFH Description	EFH Vulnerability*				
					OT	SD	CD	PT	NL
Eggs	GOME, GB, eastern portion of continental shelf off southern NE and following estuaries: Englishman/ Machias Bay to Blue Hill Bay; Sheepscot R., Casco Bay, Saco Bay, Great Bay, Mass Bay, Boston Harbor, Cape Cod Bay, Buzzards Bay	<110	Begins in fall, peaks in winter and spring	Surface waters	NA	NA	NA	NA	NA
Larvae	GOME, GB, eastern portion of continental shelf off southern NE and following estuaries: Passamaquoddy Bay to Penobscot Bay; Sheepscot R., Casco Bay, Saco Bay, Great Bay, Mass Bay, Boston Harbor, Cape Cod Bay, Buzzards Bay	30-70	Spring	Pelagic waters	NA	NA	NA	NA	NA
Juveniles	GOME, GB, eastern portion of continental shelf off southern NE and following estuaries: Passamaquoddy Bay to Saco Bay; Mass Bay, Boston Harbor, Cape Cod Bay, Buzzards Bay	25 - 75		Bottom habitats with a substrate of cobble or gravel	H	H	0	L	L
Adults	GOME, GB, southern NE, middle Atlantic south to Delaware Bay and following estuaries: Passamaquoddy Bay to Saco Bay; Mass Bay, Boston Harbor, Cape Cod Bay, Buzzards Bay	10-150		Bottom habitats with a substrate of rocks, pebbles, or gravel	M	M	L	L	L
Spawning Adults	GOME, GB, southern NE, middle Atlantic south to Delaware Bay and following estuaries: Englishman/ Machias Bay to	10-150	Spawn during fall, winter, and early spring	Bottom habitats with a substrate of smooth sand, rocks, pebbles, or gravel	M	M	L	L	L

	Blue Hill Bay; Sheepscot R., Mass Bay, Boston Harbor, Cape Cod Bay, MA								

Rationale: Atlantic cod (Gadus morhua) are distributed regionally from Greenland to Cape Hatteras, NC, from nearshore to depths greater than 400 m. In U.S. waters, they are concentrated on Georges Bank and in the Gulf of Maine, on rough bottom from 10 - 150 m (Klein-MacPhee 2002b; Fahay et al. 1999). Eggs and larvae are pelagic so EFH vulnerability is not applicable.

Juvenile cod are found mostly in nearshore shoal waters or on offshore banks. Cobble is preferred over finer grained sediments, and this life stage appears to use benthic structure and cryptic coloration to escape from predation (Fahay et al. 1999). Juvenile cod may benefit, perhaps strongly, from physical and biological complexity (Lindholm et al. 2001) (see discussion in 9.3.1.2.4). Otter trawls and scallop dredges have been shown to reduce habitat complexity (see Section 9.3.1.2.4) therefore EFH Vulnerability to these gear types is rated as high since the gear may affect the functional value of EFH for this life stage. Vulnerability to clam dredges was rated as none since this gear is not operated in juvenile cod EFH (see 9.3.1.2.3).

Adults and spawning adults occupy a variety of hard bottom habitat types including rock, pebbles, and gravel, and tend to avoid finer sediments. Cod are euryphagous, eating a wide variety of prey including fish, decapods, amphipods, and polychaetes (Fahay et al. 1999). Although adult cod are primarily found on rough bottom, the scientific literature does not indicate that this habitat type serves the same function as it does for juvenile cod, which is ranked as high. Based on the variable diet and lack of evidence for direct functional value of benthic habitat. EFH vulnerability to otter trawls and scallop dredges is rated as moderate. Adult cod may use areas where clam dredges operate, such as the nearshore waters of New Jersey, on a seasonal basis. Clam dredges operate only in sand (NREFHSC 2002), and the recovery of benthic communities from the effects of clam dredging in nearshore, sandy habitats is fairly rapid. Clam beds are not chronically disturbed by dredging since the population of clams, which are benthic infauna, must recover before fishing is again profitable (NREFHSC 2002). Based on this information and the rationale described for otter trawls and scallop dredges, habitat vulnerability for hydraulic clam dredges was rated as low. EFH vulnerability for adults applies to spawning adults as well.

Definitions: GOME - Gulf of Maine; GB - Georges Bank; NE - New England; HAPC - Habitat Area of Particular Concern; YOY - Young-of-Year: OT - Otter Trawls; SD - New Bedford Scallop Dredge; CD - Hydraulic Clam Dredge; PT- Pots and Traps; NL - Gill Nets and Longlines. NA - not applicable; 0 – No vulnerability; L - Low vulnerability; M - moderate vulnerability; H - high vulnerability; EFH - essential fish habitat; * derived from matrix analysis – see appendix. **Note that the information presented in columns 2-5 is derived from the EFH descriptions and may not completely agree with information provided in the rationale.**

Example Table 2 - Atlantic Cod EFH - Vulnerability to Effects of Bottom-Tending Fishing Gear

Vulnerability Rankings Approach

Habitat Rank x Gear Distribution = Gear Rank or EFH Vulnerability
where,

Habitat Rank = shelter + food + reproduction + habitat sensitivity
Gear Distribution = percentage of overlap between fishery and EFH

If EFH Vulnerability > or = moderate or high, then MMNT threshold exceeded.

CRITERIA	RANK	KEY
Shelter	0-2	0 = no dependence 1 = lower dependence, not reliant on complex structure 2 = strong dependence, reliant on complex structure
Food	0-2	0 = no dependence on benthic prey 1 = includes benthic prey 2 = relies exclusively on benthic prey
Reproduction	0-1	0 = no dependence (e.g. spawns in water column or life stage not reproductive) 1 = dependence (e.g. spawns on or over bottom)
Habitat Sensitivity	0-2	0 = not sensitive 1 = low sensitivity (i.e. no habitat structure/complexity issues, rapid recovery rates, e.g. high energy sand habitats 2 = highly sensitive (e.g. habitat structural/complexity issues, slow recovery rates, i.e. deep water/low energy habitats)
Habitat Rank	**= Shelter + Food +Reproduction + Habitat Sensitivity**	
Gear Distribution	0-2	0 = gear not utilized in this habitat 1 = gear operates in a small portion of this habitat 2 = gear operates in much of this habitat

Gear Rank	**= Habitat Rank X Gear Distribution**

Table 3 - Summary of the criteria used to identify the EFH vulnerability determinations.

Summary: GEAR RANK is the vulnerability of the EFH to the gear type. In terms of the EFH Vulnerability Section, Gear Rank is the following: 0 = none, 1-6 = Low vulnerability, 7-9 = Moderate vulnerability, 10-14 = High vulnerability.

Species	Shelter	Food	Repro	Habitat Sensitivity	Habitat Rank	OT Dist.	SD Dist.	CD Dist.	OT Rank	SD Rank	CD Rank	OT Vuln.	SD Vuln.	CD Vuln.
American Plaice (A)	1	2	1	1	5	2	2	0	10	10	0	High	High	None
American Plaice (J)	1	2	0	1	4	2	2	0	8	8	0	Mod	Mod	None
Atlantic Cod (A)	1	1	0	2	4	2	2	1	8	8	4	Mod	Mod	Low
Atlantic Cod (J)	2	1	0	2	5	2	2	0	10	10	0	High	High	None

Example Table 4 – Sample parts of Vulnerability Matrix application

Appendix D: Alaska

A Summary of the Fishing Effects Analysis Process, Including Input Data Matrices, Calculation Steps, and Output Matrices

Indices

i - block
g - fishery
j - feature
k - habitat

Input Data

Fishing Intensity matrix (f_{ig}) - proportion of each block's area swept by the gear used by each fishery in an average year.
Sensitivity matrix ($q_{g(j*k)}$)- proportion by which each feature's function in each habitat is reduced by one pass of the gear used in each fishery.
Recovery matrix ($\rho_{(j*k)}$) - The recovery rate for the function of each habitat feature within each habitat.
Block Categorization matrix (C_{ik}) - The area (sq. km) of each block estimated to be within each habitat.
Area vector (A_k) - The area (sq. km) covered by each habitat.

Analysis Steps

1. Multiply effort matrix (f_{ig}) and sensitivity matrix ($q_{g(j*k)}$) to get effect rate matrix ($I_{i\,(j*k)}$)

$$I_{i\,(j*k)} = \sum_g (q_{g(j*k)} * f_{ig})$$

2. Apply effect equation to effect rate matrix ($I_{i\,(j*k)}$) and recovery vector ($\rho_{(j*k)}$) to get effect matrix ($Heq_{i\,(j*k)}$)

$$Heq_{i\,(j*k)} = \rho_{(j*k)} S/(I_{i\,(j*k)} + \rho_{(j*k)} S), \qquad \text{where } S=e^{-I_{i\,(j*k)}}$$

3. Multiply 1 minus each cell of the effect ($Heq_{i\,(j*k)}$) matrix by the corresponding cell of the block categorization matrix (C_{ik}) to get the proportional decrease of that feature in that habitat type occurring in that block , long-term effect index($LEI_{i\,(j*k)}$)

$$LEI_{i\,(j*k)} = (1 - Heq_{i\,(j*k)})*C_{ik}$$

4. Sum $E_{i\,(j*k*d)}$ matrix across blocks (i) and divide by the total area of each habitat type (A_k) to get the total proportional decrease of that feature in that habitat type ($LEI_{(j*k)}$)

$$LEI_{(j*k)} = \sum_i LEI_{i\,(j*k)}/A_k$$

Output - Long-term Effect Index ($LEI_{i\,(j*k)}$, $LEI_{(j*k)}$)

The proportion by which habitat is reduced (adverse effect) for each habitat feature for each block and across each habitat type if recent fishery intensity and distribution were continued at current levels to equilibrium.

EFH Omnibus Amendment #2, Phase 2 Timeline

Project Manager: Chad Demarest, NEFMC

PHASE 2 - Major Topics and Milestones				
A. Gear Effects Evaluation **B. Adverse Impacts Determinations / MMNT Threshold**	**C. Threshold and Goal Setting** **D. Minimize Adverse Impacts, if any**	**E. Dedicated Habitat Research Areas (DHRAs)** **F. Research and Info., Conservation Recs,**	**Approximate Date**	**Type of Meeting**
Council staff briefs the Council on the scoping comments and Council approves goals and objectives for the Amendment			July 13-15, 2004 (Portland, ME)	Council
	Habitat PDT meets to develop advice to Committee on habitat terms of reference strategy for prioritizing habitat protection and reduced impact gear list.	Habitat PDT meets to develop advice to Committee on DHRAs	July 21, 2004 (SBNMS Office, Scituate, MA)	Habitat PDT
Council staff briefs the Council on the ongoing work of Omnibus topics.			September 14-16, 2004 (Fairhaven, MA)	Council
	MPA/EFH Education and Outreach Project Steering Committee meeting		October 13, 2004	Steering Committee

#3

PHASE 2 - Major Topics and Milestones				
A. Gear Effects Evaluation **B. Adverse Impacts Determinations / MMNT Threshold**	**C. Threshold and Goal Setting** **D. Minimize Adverse Impacts, if any**	**E. Dedicated Habitat Research Areas (DHRAs)** **F. Research and Info., Conservation Recs,**	**Approximate Date**	**Type of Meeting**
Advisory Panel meets to prepare advice on gear descriptions.		Advisory Panel meets to discuss DHRA strategy	October 13, 2004	AP
	MPA/EFH Education and Outreach Project Steering Committee		November 29, 2004	Steering Committee
	MPA/EFH Education and Outreach Project Steering Committee		January 6, 2005	Steering Committee
	MPA/EFH Education and Outreach Project Steering Committee		January 31, 2005	Steering Committee
	Update on the MPA Education and Outreach Workshop planning		*February 1-3, 2005 Portsmouth, NH*	*Council*
Review on progress on improved gear descriptions by AP.	Joint discussion with PDT and AP leaders on continued development of a strategy for minimizing adverse impacts from fishing on EFH		February 16, 2005	Committee/PDT/AP (Chair and Vice Chair)
	MPA/EFH Education and Outreach Project Steering Committee		March 16, 2005	Steering Committee

PHASE 2 - Major Topics and Milestones				
A. Gear Effects Evaluation **B. Adverse Impacts Determinations / MMNT Threshold**	**C. Threshold and Goal Setting** **D. Minimize Adverse Impacts, if any**	**E. Dedicated Habitat Research Areas (DHRAs)** **F. Research and Info., Conservation Recs,**	**Approximate Date**	**Type of Meeting**
	MPA/EFH Education and Outreach Project Steering Committee		April 4, 2005	Steering Committee
AP meets to continue work on refined gear descriptions.			April 13, 2005 (AM) Narragansett, RI (URI/GSO)	PDT/AP
	MPA Education and Outreach Workshops towards a Council policy on MPAs		May 5-6, 2005 W. Greenwich, RI May 10-11, 2005 Ogunquit, ME	External Workshops
	Review PDT progress on risk assessment for developing a strategy for minimizing adverse impacts.		May 26, 2005 Narragansett, RI	Committee
	Council updated on preliminary results of MPA workshops (towards an Council MPA policy)		*June21-23, 2005* *Portland, ME*	*Council*
	Reviews MPA workshop report and develops draft MPA policy for Council consideration		August 22, 2005	Committee

PHASE 2 - Major Topics and Milestones				
A. Gear Effects Evaluation **B. Adverse Impacts Determinations / MMNT Threshold**	**C. Threshold and Goal Setting** **D. Minimize Adverse Impacts, if any**	**E. Dedicated Habitat Research Areas (DHRAs)** **F. Research and Info., Conservation Recs,**	**Approximate Date**	**Type of Meeting**
	Council reviews and approves MPA policy.		*September 2005 Hyannis, MA*	*Council*
PDT meets to develop work plan for Phase 2 and to consider peer review process			August 15, 2007 (Narragansett, RI)	PDT
1. PDT to develop Gear Effects Evaluation: review and incorporate AP's gear descriptions with additional info. As appropriate; Update literature and scientific review of gear effects). 2. PDT to develop Risk Assessment strategy			December 2007 – February 2008	PDT
Finalize SSC review panel, develop TORs and set date for SSC review of Risk Assessment			February 2008	PDT
Brief Ctte on gear effects evaluation and adverse impacts determination; get Ctte input on Risk Assessment strategy.			*February 2008*	*Committee*

PHASE 2 - Major Topics and Milestones				
A. Gear Effects Evaluation **B. Adverse Impacts Determinations / MMNT Threshold**	**C. Threshold and Goal Setting** **D. Minimize Adverse Impacts, if any**	**E. Dedicated Habitat Research Areas (DHRAs)** **F. Research and Info., Conservation Recs,**	**Approximate Date**	**Type of Meeting**
	PDT to finalize risk assessment based on results from applied methods implementation, gear effects evaluation and adverse impacts determination.	PDT/AP to develop DHRA proposals for Committee to consider. Habitat PDT develops: - Draft of research and information needs section - Draft conservation and enhancement recommendations (including national guidance)	February-July 2008	PDT/AP
Brief Council on gear effects evaluation and adverse impacts determination.			*April 2008*	*Council*
	Brief Council on Risk Assessment and SSC review process.		*June 2008*	*Council*

PHASE 2 - Major Topics and Milestones				
A. Gear Effects Evaluation **B. Adverse Impacts Determinations / MMNT Threshold**	**C. Threshold and Goal Setting** **D. Minimize Adverse Impacts, if any**	**E. Dedicated Habitat Research Areas (DHRAs)** **F. Research and Info., Conservation Recs,**	**Approximate Date**	**Type of Meeting**
Ad hoc SSC sub-panel review of gear effects evaluation (GEE), risk assessment strategy and adverse impacts (AI) determinations (MMNT)			September 2008	Habitat Evaluation Review Committee (NEFSC) (tentative)
	Review SSC review results with Ctte; develop alternatives for minimizing adverse impacts of fishing on EFH to the extent practicable.		*October 2008*	*Committee*
	Brief Council on SSC review results.		*October 2008*	*Council*
	Habitat PDT develop a range of alternatives under direction from the Committee (may include representatives from other PDTs)		October-December 2008	Habitat PDT / Other PDTs
	Committee reviews alternatives and makes recommendations to the Council for approval in Phase 2 DSEIS.		December 2008	Committee

PHASE 2 - Major Topics and Milestones				
A. Gear Effects Evaluation **B. Adverse Impacts Determinations / MMNT Threshold**	**C. Threshold and Goal Setting** **D. Minimize Adverse Impacts, if any**	**E. Dedicated Habitat Research Areas (DHRAs)** **F. Research and Info., Conservation Recs,**	**Approximate Date**	**Type of Meeting**
	Council considers the range of alternatives for minimizing adverse impacts from fishing across all Council-managed FMPs and approves a range for analysis in the Phase 2 DSEIS.		*February 2009*	*Council*

PHASE 2 - Major Topics and Milestones				
A. Gear Effects Evaluation **B. Adverse Impacts Determinations / MMNT Threshold**	**C. Threshold and Goal Setting** **D. Minimize Adverse Impacts, if any**	**E. Dedicated Habitat Research Areas (DHRAs)** **F. Research and Info., Conservation Recs,**	**Approximate Date**	**Type of Meeting**
Staff and PDT develop DSEIS (Volume 2 – to accompany Volume 1) which will include: • Identify, review and update the major fishing activities (MSA and non-MSA) that may adversely affect the EFH of those species managed by the Council; • Identify and implement mechanisms to protect, conserve, and enhance the EFH of those species managed by the Council to the extent practicable; • Define metrics for achieving the requirements to minimize adverse impacts to the extent practicable; • Integrate and optimize measures to minimize the adverse impacts to EFH across all Council managed FMPs;			March-April 2009	

PHASE 2 - Major Topics and Milestones				
A. Gear Effects Evaluation **B. Adverse Impacts Determinations / MMNT Threshold**	**C. Threshold and Goal Setting** **D. Minimize Adverse Impacts, if any**	**E. Dedicated Habitat Research Areas (DHRAs)** **F. Research and Info., Conservation Recs,**	**Approximate Date**	**Type of Meeting**
Council Approves EIS (Volume 1 and 2)			*April 2009*	*Council*
Public Hearings / Public Comment Period			May-June 2009	
Final Council vote / Council decisions			June 2009	
Submit Final EIS / Omnibus Amendmnet Document (Volume 1 and 2 combined)			August 2009	

New England Fishery Management Council
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John Pappalardo, *Chairman* | Paul J. Howard, *Executive Director*

MEMORANDUM

DATE: February 4, 2008

TO: Habitat, MPA and Ecosystems Committee

FROM: Habitat Plan Development Team

SUBJECT: **Revised adult white hake proposed action text description and map**

Current EFH designation text description:
"Adults*: Benthic habitats in inshore areas and on the continental shelf and slope in depths of* ***100 – 2,250*** *meters with substrates composed of mud and/or sand–mud mixtures as depicted on Map 427 - Map 430. Other conditions that generally exist where EFH for adult white hake is found are bottom temperatures of* ***4.5 – 10.5ºC*** *and salinities of 32 – 35.5 ppt. Spawning takes place primarily in deep water on the continental slope. Adult white hakes feed primarily on fishes (e.g., silver hake, other hakes, gadids, Atlantic herring and other clupeids, argentines), squid (Illex sp.), and also on squids, pandalid shrimps, and euphausiids."*

Proposed EFH designation text description:
"Adults: Benthic habitats in inshore areas and on the continental shelf and slope in depths of **25 – 1000** meters with substrates composed of mud and/or sand–mud mixtures, as depicted on Map ???. Other conditions that generally exist where EFH for adult white hake is found are bottom temperatures of **2 – 13ºC** and salinities of 32 – 35.5 ppt. Spawning takes place primarily on the continental slope. Adult white hakes feed primarily on fishes (*e.g.*, silver hake, other hakes, gadids, Atlantic herring and other clupeids, argentines), squid (*Illex* sp.), and also on squids, pandalid shrimps, and euphausiids."

Why the change?
While reviewing issues surrounding non-conforming HAPCs, an astute PDT member noted his surprise that adult white hake EFH might extend to 2250m when, in his experience, white hake are not found at anything approaching those depths on the shelf and slope. Research revealed that the inferred presence of white hake in this area was based on a paper by Haedrich and

Merritt. Dr. Haedrich himself was contacted by the PDT in order to verify the accuracy of the reference to white hake at those depths in his paper. His response is quoted here:

> "I tried to find a copy of the paper, but don't seem to have any more around here. But that reported depth range for white hake cannot be right. Seems as though there are some extra 0's in there. White hake are found at quite shallow depths in embayments, especially as juveniles, and I wouldn't say they go much deeper than 300-400 m. Even the longfin hake (U. chesteri), a more deepwater species, would not be expected much deeper than 1500 m. So wherever those numbers came from, they are wrong!"

What next?

Other published literature notes white hake adults found at depths to 1000m, which is the PDT's recommendation for the deepest extent of adult white hake EFH on the continental shelf and slope.

Why recommend the minimum depth and temperature ranges be changed?

Areas in Cape Cod, Narragansett, Penobscot and other bays have been designated EFH for adult white hake on the basis of level-one information. Offshore areas were designated based on level-two information. The depth and temperature ranges commensurate with the level-two information lead to an assessment of EFH beginning at 100 meters depth and 4.5ºC, which is what was published in the Draft EIS. However, this is incongruous with the depth and temperature ranges for the inshore area adult designations, which begin at 25 meters depth and 2 ºC. The PDT recommends that these discrepancies be corrected simultaneous to the correction of maximum shelf and slope depth for adult white hake EFH.

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John Pappalardo, *Chairman* | Paul J. Howard, *Executive Director*

MEMORANDUM

DATE: February 4, 2008

TO: Habitat, MPA and Ecosystems Committee

FROM: Habitat Plan Development Team

SUBJECT: **MSA Deep Sea Coral Provisions**

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1. The 2007 MSA has added substantial language regarding the protection of Deep Sea Coral (DSC) that did not exist when the Omnibus EFH Amendment first went out to scoping. The new language reads:

" (b) DISCRETIONARY PROVISIONS.—Any fishery management plan which is prepared by any Council, or by the Secretary, with respect to any fishery, may—

***

(2) (A) designate zones where, and periods when, fishing shall be limited, or shall not be permitted, or shall be permitted only by specified types of fishing vessels or with specified types and quantities of fishing gear;

(B) <u>designate such zones in areas where deep sea corals are identified under section 408, to protect deep sea corals from physical damage from fishing gear or to prevent loss or damage to such fishing gear from interactions with deep sea corals, after considering long-term sustainable uses of fishery resources in such areas;"</u>

2. These discretionary provisions allow the Council, if it so desires, to address adverse impacts of fishing on DSC through area-based management that is independent of designated EFH.
3. The Section 408 Deep Sea Coral report to Congress is in nearing it's final form, and has been reviewed by the PDT to ensure that it contains necessary references to known coral locations and should not restrict any Council actions intended to protect DSC.

New England Fishery Management Council
Habitat/MPA/Ecosystems Committee
February 4, 2008
Mansfield, MA

Committee Members:	Mr. David Preble (Chair), Mr. David Goethel (Vice Chair), Mr. Dennis Spitsbergen, Mr. Jim Salisbury, Mr. David Simpson, and Mr. Mark Gibson
Council Staff:	Mr. Chad Demarest (PDT Chair)
NMFS Staff:	Mr. Lou Chiarella, Dr. David Stevenson, Dr. David Dow, Mr. Chad Keith
Others:	Approximately 20 audience members

The Habitat/MPA/Ecosystems Committee met in Mansfield, MA on February 4, 2008 to discuss issues related to the Draft Environmental Impact Statement (DSEIS) for Phase I of the Essential Fish Habitat (EFH) Omnibus Amendment 2, and to discuss the development of Phase II of this Amendment. Specifically, the Committee was asked to review potential changes the adult white hake EFH designation and the boundaries of several offshore canyon-area HAPCs previously designated under Phase I. Additionally, the Committee discussed the development of a risk assessment to augment analyses required under the goals for Phase II for the Omnibus Amendment 2.

Phase I accomplishments and perspective

Staff gave a presentation on the accomplishments of Phase I of EFH Omnibus Amendment 2, and provided PDT and personal perspectives on how this work relates to other components of the Omnibus Amendment. The thrust of the presentation centered on the idea that the designation of EFH should be based on the best science available, but that the use of those designations should be appropriate to the level of information used in the designation process. The Magnuson-Stevens Conservation and Management Act of 2006 (MSA) points to both fishery production and fish habitat protection as objectives for the EFH provisions. The EFH Final Rule guidelines provided by NOAA Fisheries attempt to draw the link between EFH protection and fishery production, but that link is somewhat tenuous. Using the information levels defined in the Final Rule (levels 1 through 4), the PDT points out that only when Level 3 and Level 4 data are used to designate EFH can that designation be linked directly to the enhancement of fishery productivity. Because only level 1 and level 2 data are currently

available for fish species in the Council's management unit (Fishery Management Unit, FMU), the PDT does not recommend using EFH designations as a basis for assessing the potential impacts of fishing and non-fishing activities on fishery production—the underlying data do not support this purpose. Rather, the PDT points to several Findings and Objectives stated by Congress in the MSA to support the use of EFH designations primarily as a driver for consultation in non-fishing projects likely to impact fish habitats. Such use is potentially beneficial, given the wide spatial breadth of EFH designations and the continued use of offshore marine resources and locations for non-fishing activities.

Committee discussion
One Committee member stated that the MSA was clearly directed toward fishery production. Another agreed that fishery production should be the goal of EFH designation.

Audience discussion
Mr. Smolowitz wanted to know if there were any references to biodiversity in enacted legislation. Staff was not aware of any. Mr. Smolowitz pointed out that the MSA is entirely based on fishery management, that it is not an environmental protection act.

<u>Adult White Hake EFH</u>

Staff briefed the Committee on the need to review and potentially change the text and map descriptions of adult white hake EFH. It came to light that a reference used by the PDT to designated adult white hake EFH along the continental shelf contained an error, as determined though communication with the paper's author, and that this error caused EFH to be designated in deeper water (down to 2250m) than it would have been in absence of that incorrect reference.

Additionally, the merging of two data sources for inshore and offshore EFH designation for this species resulted in erroneous minimum depth and temperature ranges being carried forward in the text description for adult white hake EFH.

The PDT recommended (Document 6 of the Committee Meeting materials) that the depth range for adult white hake be changed from 100m – 2250m to 25m – 1000m, and that the temperature range be changed from 4.5 ºC – 10.5 ºC to 2 ºC - 13 ºC. This recommendation was based on the application of Council-approved methods for designated EFH in the inshore, offshore and off-shelf regions where different levels of data are available.

The Committee discussed these issues and made the following motions:

Motion 1
Mr. Goethel moves and Mr. Simpson seconds,
that the maximum depth for designation of adult white hake EFH be redefined to 850 meters.

Motion 1(a) – Motion to amend

Mr. Salisbury moves and Mr. Gibson seconds,

that the minimum and maximum depths for adult white hake EFH be redefined to 25m and 850m respectively, and that the temperature range for adult white hake EFH be redefined to 2 – 13 degrees C.

*Motion to amend **passed** on a show of hands (5/0/0)*

*Main motion **passed** on a show of hands (5/0/0)*

There was no substantive discussion on the main motion.

Committee discussion on the motion to amend

The maker of the original motion explained that the motion to redefine to 850 meters is based on the actual referenced deepest-caught adult white hake in the literature, which was believed to be at 821m. Further, he wished to have separate discussion so on the minimum and maximum depths for this designation. Other members thought it appropriate to address the issues in one motion. One committee member was uncomfortable with using inference data to designate EFH in areas where the trawl survey does not provide data, and thought that the minimum depth range should correspond to the offshore, survey-based designations. Another Committee member questioned if these off-shelf designations represented truly essential fish habitat.

Audience discussion on the motion to amend

Mr. Smolowitz (Fisheries Survival Fund) asked if adult white hake show up in the inshore surveys, which was confirmed by Mr. Chiarella. Mr. Smolowitz then asked if the deepwater, off-shelf areas were really EFH. Mr. Chiarella pointed out that this was consistent with the Council's methods for designating EFH in off-shelf areas when no survey data available. Dr. Stevenson (NOAA, Habitat PDT) explained that the change for minimum depth and temperature ranges stemmed from the PDT using the level 2 data text descriptions, which applied to the offshore areas and used trawl survey data; these yielded a depth and temperature range that was inconsistent with those provided by the level 1 data used in the inshore designation, and that it might be important to maintain the inshore designations for coastal waters and bays—maintaining the 100m minimum depth would effectively eliminate the EFH designation from these waters. Mr. Taylor (Habitat Advisor) stated that he had not seen or heard of adult white hake at either extreme of that depth range.

<u>Non-conforming HAPCs, Deep Sea Coral Provisions in the MSA</u>

Staff gave a brief presentation detailing the degree to which eight canyon-area HAPCs previously approved in the Phase I DSEIS are non-conforming, in that they contain areas that are not designated EFH for any species. These eight HAPCs are: Hydrographer Canyon (Alt 3E); Veatch Canyon (Alt 3F); Alvin and Atlantic Canyons (Alt 3G); Hudson Canyon (Alt 3H); Wilmington Canyon (Alt 3J); Oceanographer, Gilbert and Lydonia Canyons (Alt 3N); Toms, Hendrickson and Inter-Canyon Areas (Alt 3O). Areas inside the seaward boundaries of these

HAPCs are not designated EFH for any species, and therefore cannot be bounded as HAPCs as per the description provided in the DSEIS for Phase I. The PDT recommended revising the boundaries of the non-conforming HAPCs such that the seaward boundaries would follow the appropriate depth contours for the deepest-water designated EFH, which in this case is witch flounder at 1500m. This method of designation is consistent with the Council's designation of HAPCs for Bear and Retriever seamounts.

Staff also read a PDT memo on the Deep Sea Coral provisions in the MSA. The Councils are now able to take appropriate action to protect deep sea corals from adverse impacts of fishing (Committee Meeting materials document 7). These two items are related because the stated intent of the canyon-area HAPCs was to afford a level of protection to areas containing deep sea corals.

Motion 2
Mr. Simpson moves and Mr. Spitsbergen seconds,

> *that the Habitat PDT evaluate existing information on deep sea corals and develop management options to protect that habitat. It is understood that such options would be independent of EFH and HAPC designations.*

*Motion **passed** on a show of hands (5/0/0)*

Committee discussion on the motion
The Chair noted that this motion does not address the non-conforming HAPCs issue, but that it was acceptable to take up the issues separately. One Committee member wanted to ensure that this motion would not affect the timeline for the Omnibus Amendment. Staff indicated that the PDT had discussed including deep sea corals as a specific habitat type for evaluation in Phase II of the EFH Omnibus Amendment, and that the PDT did not believe that this would affect the timeline.

Audience discussion on the motion
Mr. Minkiewicz (Fisheries Survival Fund) thought that this was the correct way for the Council to go forward with deep sea coral protection, and noted that the report to Congress, mandated under Sec. 408 of the MSA, has not yet been released. Mr. Brogan (Oceana) thought that deep sea coral protections should be peeled out of the Omnibus Amendment and addressed individually in upcoming management actions. Ms. Raymond (Associated Fisheries of Maine) noted that the protections being sought were for deep sea corals and not the EFH found in the canyons, which struck her as confusing. Mr. Smolowitz noted that the proponents who put forward the canyon-area HAPCs did so for coral protection, and recommended the Council honestly consider deep sea coral protection and forget about the twelve HAPCs in the canyons.

Motion 3
Mr. Goethel moves and Mr. Gibson seconds,

that the eight affected HAPC boundaries be revised such that the seaward boundaries follow appropriate depth contours of deepest-water designated EFH, which is adult and juvenile witch flounder at 1500m.

Motion 3a (motion to substitute)
Mr. Salisbury moves to substitute and Mr. Spitsbergen seconds,
that the twelve HAPC boundaries in the canyon areas be eliminated from the EFH Omnibus Amendment.

*Motion to substitute **failed** on a show of hands (2/3/0)*

*Main motion **passed** on a show of hands (5/0/0)*

Committee discussion on the motion to substitute
One Committee member, reading from the EFH Final Rule guidelines, stated that the HAPCs met the requirements of the final rule in that they were EFH for some species (current issues notwithstanding) and were judged to meet the four HAPC requirements, and that therefore they should remain in place. Another member stated that the MSA allows for deep sea coral protection in a stand-alone way, and that is a better tool to use in this case. Continuing to seek deep sea coral protection through EFH and HAPC designations is unnecessarily complicated. Another Committee member opposed the motion to substitute, stating that there needed to be protections in place for deep sea corals before discussing the removal of the HAPCs.

Audience discussion on the motion to substitute
Mr. Smolowitz supported the motion to substitute as the honest thing to do, and that the HAPCs were not justifiable as coral protection measures. Ms. Raymond stated that AFM would support the motion as well, stating that the coral protection mechanism is now available to the Council and should be used accordingly. Mr. Brogan thought that the motion to substitute was a mistake, and that taking the HAPCs out of the EFH Omnibus Amendment may result in an unknown outcome for coral protection—or worse, no outcome at all. He recommended the Council move forward on both the HAPC and coral protection area fronts simultaneously. Mr. Minkiewicz suggested that HAPCs designed to protect corals are arbitrary and capricious, and suggested that the Committee stick to the legal boundaries set forth by Congress. Mr. Williamson (Ocean Conservancy) reminded the Committee that the Council's HAPC designations in the canyon areas have been nationally recognized as doing something right, and that while HAPC might not be the ideal vehicle, it was and is a legal one that should not be undone now. Mr. Taylor supported the motion to substitute, fearing that the HAPCs may turn into no-fishing zones for mobile gear, and noting that the canyon-area HAPCs don't serve the goals of the people that proposed them when coral protection areas, a more direct method of protection, would.

There was no further substantive discussion on the main motion.

Objectives of and process for Phase II of the EFH Omnibus Amendment

Staff gave a brief presentation on the objectives for Phase II, as determined by the Council in the DSEIS for the EFH Omnibus Amendment. These are:

(2) Identify, review and update the major fishing activities (MSA and non-MSA) that may adversely affect the EFH of those species managed by the Council;
(4) Identify and implement mechanisms to protect, conserve, and enhance the EFH of those species managed by the Council to the extent practicable;
(5) Define metrics for achieving the requirements to minimize adverse impacts to the extent practicable;
(6) Integrate and optimize measures to minimize the adverse impacts to EFH across all Council managed FMPs;
(7) Update research and information needs;

Staff discussed issues surrounding the Committee-requested risk assessment as part of Phase II. The PDT intends to assess the risk of the instance (or probability) of *a more that minimal and not temporary in nature adverse impact to physical habitat due to fishing*. This definition of risk to be assessed is derived from applicable requirements of the MSA and the EFH Final Rule. The MSA requires Councils to minimize to the extent practicable the adverse effects of fishing on EFH. The EFH Final rule states that an adverse effect "means any impact that reduces the quality or quantity of EFH", and that "Councils must act to prevent, mitigate or minimize such effects from fishing if there is evidence that a fishing activity will have such an effect in a manner that is more than minimal and not temporary in nature." Importantly, adverse impacts may occur from activities either inside or outside designated EFH. In recognition of this facet of the Final Rule, and in deference to the limitations inherent in designating EFH based solely upon level 1 and level 2 information, the PDT intends to construct a risk assessment independent of the species and life stage specific EFH designations—that is, to assess the risk of more than minimal and non-temporary adverse impacts on physical habitat due to fishing holistically throughout the range of the Council's FMU.

Committee discussion

One Committee member was concerned that the word adverse was too open to interpretation. Another was concerned with the PDT's stated intention to not address the contribution of EFH to fishery production explicitly within the risk assessment framework, and wondered if the PDT's intention was to conduct separate risk assessments on each species and life stage. Staff confirmed that this was not the PDT's intention. Another Committee member was concerned that the risk assessment was not going to be useful, and that the end result may not assist the Committee in decision making. A Committee member stated that the risk assessment should use designated EFH as the starting point, and that risk should be assessed for every species and life stage. The Chair quoted from the MSA to make the point that the emphasis of the EFH provisions seemed to be on habitat protection, and that the PDTs approach seemed consistent. Several Committee members emphasized that environmental change as a result of fishing may be good or bad and, in fact, may be good for some species and bad for others. The Chair pointed out that the PDT was proposing a risk of adverse impacts on the habitat directly and not necessarily the species. A Committee member expressed discomfort with the potential for

assessing all change as adverse, when physical structures change for natural and human-induced reasons and they are not always adverse. Another Committee member wanted to ensure that the changes to all components of EFH, such as temperature and salinity ranges, were included. The Committee also had a lively discussion on the contents of the risk assessment, and conveyed their collective opinion that it should be kept as simple as possible.

Audience discussion
Mr. Minkiewicz reminded the Committee that EFH designations were based on level 1 and level 2 data, which does not provide causal relationships between spatially-designated EFH and the fish found in those areas. By example, he suggested that areas of upwelling may induce fish presence, but that presence may not indicate a strong affinity to the benthic habitats—rather, it's an affinity for the upwelling that has brought the fish to the area. Level 1 and level 2 data cannot differentiate this. Mr. Smolowitz stated that he did not think the PDTs approach to risk assessment would be fruitful due to lack a sufficient science and underlying data. He stated that the best way to minimize adverse impacts to habitat was to minimize fishing effort and maximize catch per unit effort. Mr. Brogan wanted to know if Phase II would include an assessment of current research, and staff indicated it would. He stated that Oceana had conducted a literature search, the results of which would be forwarded to the Committee.

Other business

Mr. Brogan asked whether the Committee would be commenting on the tilefish fishery management areas under discussion with the Mid Atlantic Fishery Management Council. The Chair indicated that the Committee was not planning on commenting. Mr. Brogan also brought to the Committee's attention the Experimental Fisheries Permit application for surf clam/ocean quahog fishing on George's Bank (an area that has been closed for 16 years due to human health concerns).

One Committee member requested that the issue of juvenile cod EFH around the southern portion of the great south channel be reviewed. There may be a data gap that needs to be corrected, and this may relate to the HAPC in that area. The Chair requested that this item be added to the agenda for the next Committee meeting.

The meeting adjourned at approximately 3:45 PM.