New England Fishery Management Council
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MEETING SUMMARY

Habitat Plan Development Team

Conference call

The Habitat Plan Development Team held a conference call on February 22, 2016 to review coral zone recommendations for the Omnibus Deep-Sea Coral Amendment. The group briefly discussed habitat research priorities and the framework adjustment related to clam dredge access.

Plan Development Team members and other Council staff: Michelle Bachman (Chair), Peter Auster, Carly Bari, Kiley Dancy, Geret DePiper, Rachel Feeney, Maria Jacob, Dave Packer, David Stevenson, Carl Wilson

Audience: Katie Almeida, Erica Fuller, Anne Hawkins, Heidi Henninger, Ron Huber, Kyle Molton, Claire Roberts, Brad Sewell, Sarah Smith, David Wallace, Greg Wells, Rob Wilpan, Aaron Kornbluth

Major conclusions:

- **Boundaries for discrete canyon zones should be somewhat more focused and based on high resolution bathymetry, rather than including all areas identified as high and very high habitat suitability by the habitat model.**
- **At this time, discrete canyon zones are recommended in areas where corals have been documented either historically or during recent dives. It would be possible to identify a list of minor canyons where coral zones should be considered based on inference of suitable habitats.**
- **At this time, the PDT is not recommending extending the discrete canyon zones to include fan valleys that extend onto the abyssal plain. This approach would be precautionary and might be appropriate if there is a possibility that the broad zone approach would not be adopted.**
- **In the Gulf of Maine, where high-resolution terrain data are less comprehensive, limited expansion of zone boundaries beyond the footprint of dives sites with known corals is appropriate based on physical features.**

Agenda Item 1: Habitat research priorities

The Council generates an updated list of research priorities every five years. This process is coordinated via the Scientific and Statistical Committee. The Habitat PDT reviewed a draft list

of research priorities via email prior to the call and some comments were provided. No additional priorities were identified or modified during the call, but the chair agreed to re-distribute the draft at a member's request. A final version of the document will be provided to the Committee for review during their March 22, 2016 meeting.

Agenda Item 2: Clam framework adjustment update

The PDT last discussed the clam framework adjustment at an in-person meeting on November 23, 2015. On January 29, the PDT chair, David Stevenson, and Doug Potts met with Eric Powell and David Wallace to discuss the clam survey data project. The project will result in a database of clam survey information, including sediment data compiled from tow logs. Some of these logs were only recently converted to digital format. The database will include clam catches and sediment data, by grain size class, for each tow. While the data should inform development of the framework adjustment, survey tows remain sparse in the northern part of the Council's proposed Great South Channel HMA.

On February 23, the PDT chair, David Stevenson, and Alison Verkade (GARFO HCD) will meet with University of Massachusetts Dartmouth School for Marine Science and Technology researchers Kevin Stokesbury and David Bethony to discuss additional analysis of video survey data to develop a more detailed characterization of the benthic habitat types in the two management areas. Additional analysis of imagery from the video survey will allow for the development of habitat maps that have information besides dominant grain size or maximum grain size, for example percent cover of cobble and boulder, or percent cover of epifauna.

Agenda Item 3: Omnibus Deep-Sea Coral Amendment

Most of the call was spent discussing updates to deep-sea coral zones. PDT recommendations related to the list of deep-sea coral zones and their boundaries will be summarized in a memo (brief) and associated appendix (detailed). After this call, the memo will be edited by staff and forwarded to the PDT for additional comments and edits. The Habitat Committee will review and discuss the recommendations on March 23.

The PDT's goal is have a systematic approach to developing the boundaries for the discrete zones. Purpose of the memo (and especially the appendix) is to help the Committee understand the methods and data used to develop the boundaries. The PDT chair anticipates that the Committee meeting will result in a list of suggested updates to discrete and broad zones, and an understanding about the boundary development approach, but this is likely not the best time for detailed Committee edits to individual boundaries. She noted that there are a couple of weeks between the Committee meeting and Council mailing for additional analysis, map preparation, etc. Later on during the call, the chair noted that she expected some discussion at the Committee meeting about whether a workshop was a useful way to refine alternatives. She would plan to present some preliminary information about fishing effort in the coral zones to the Committee, and expected that industry members would comment at the Committee meeting about the process and their concerns.

First the PDT discussed the broad zone alternatives, which are large areas extending from the shelf/slope break out to the Exclusive Economic Zone boundary. Existing alternatives are based on 300m, 400m, and 500m depth contours. The MAFMC has proposed a broad zone based on the 450m contour, but it is defined using straight line segments, with a minimum depth of 400 m and maximum depth of 500m. Based on the PDT's discussion in September, staff generated straight line approximations of the 300m, 400m, and 500m contours, using the same method as MAFMC. The terrain is more complex at deeper depths, so the 500m boundary has more vertices that the 400m boundary, and the 400m more than the 300m. The broad zone boundaries were updated prior to the discrete canyon zone boundaries, and they proved to be a useful starting point.

After reviewing portions of the broad zone boundaries, the PDT generally agreed that they looked reasonable, and didn't suggest any changes to the boundaries themselves. A PDT member suggested overlaying the simplified broad zone boundaries on the habitat suitability model outputs to help the Committee understand the extent to which the zones encompass habitats that are likely to be suitable for corals.

Another PDT member suggested analyzing the number of historical records in each broad zone. The PDT discussed the pros and cons of such an analysis. Given that the broad zone boundaries are very similar to one another in some locations (less than 0.5 km in steep areas), is the positional accuracy of some of the historical records sufficient to discriminate between broad zones in a meaningful way? Another PDT member suggested that the question should be to what extent does a particular alternative conserve coral habitats, based on prior information? While there has not been a lot of validation of the historical data, recent data information shows that the coral assemblages from the historical information still exist today. If corals are currently absent from an area where they were found historically, is the Council's intention to allow for recovery of those habitats by managing them as protected coral zones?

The PDT agreed that the level of vetting of the historical database was sufficient, but that it would be useful to more fully describe the historical dataset for the Committee, for example, data sources, age distribution of records. Some of this descriptive work has already been completed and exists in previous draft documents. Looking at the historical database in conjunction with the suitability model outputs seems to be the best approach to understanding the distribution of areas important to corals, because the suitability model uses both the historical data and a large number of environmental predictor variables to identify likely coral habitats.

The PDT transitioned to a discussion of the discrete zones. The PDT's recommendations include new zones, as well as boundary changes for some existing zones. For some discrete zones, no changes are recommended. However, for some areas recent surveys provide additional support for designation of a coral zone, relative to the state of knowledge when these alternatives were initially approved by the Council for analysis. This is the case for the Physalia, Retriever, and Mytilus seamount zones, and the Mount Desert Rock zone.

As individual zones were discussed, various issues and questions were raised by the PDT. One discussion topic was how to combine the high resolution terrain data (bathymetry and slope) with the habitat suitability model outputs to develop boundaries for canyon zones. The current version

of the habitat suitability model relies on the Coastal Relief Model for elevation and other terrain data, which is a lower resolution dataset compared to the recently collected ACUMEN bathymetry. Given the spatial resolution of the model outputs, the MAFMC FMAT used a buffer of 0.4 nm around the high suitability grids to help ensure that high suitability habitats were fully encompassed by area boundaries. On the other hand, because the model outputs are a coarser spatial resolution than the 25m ACUMEN data, the higher resolution ACUMEN data are the best foundation for defining the spatial extent of a canyon feature. Therefore, when editing canyon zone boundaries, the ACUMEN data, including the high slope areas derived from the bathymetry, were used as the primary data source for identifying the extent of each canyon feature. The PDT agreed that this was a reasonable approach. The habitat suitability model outputs as well as the recent and historical coral records were used to confirm that the boundaries were appropriate. In particular the suitability model outputs are useful for developing the landward and seaward boundaries of each zone.

The MAFMC FMAT's approach was to encompassing the entire footprint of high and very high habitat suitability areas within each discrete zone, including the 0.4 nm buffer. However, it seems that this approach may be too expansive/precautionary in the heads of the canyons, and that tighter boundaries could be generated based on the ACUMEN data. In the end, the MAFMC boundary development workshop resulted in smaller areas being proposed during final action. Developing canyon zone boundaries at this stage that better reflect the high resolution bathymetry, as opposed to the suitability model outputs, could reduce the number of edits required later in the process of alternatives development.

A PDT member commented that it would be useful to provide some more context for these discussions, for example additional background information on canyon geology and the deep-sea environment (e.g. work by Valentine, Ryan, Levin, etc.). For example, both upslope and downslope currents exist in canyon environments and connect canyons to both the continental shelf and the deeper ocean. Staff will work on this for the next draft of the memo and appendix.

The PDT discussed whether it was appropriate to recommend canyon zones in locations without positive identifications of corals in the historical data set or recent surveys. Shallop Canyon, for example, is a smaller named canyon with some areas of model-predicted high and very high habitat suitability, but no direct observations of corals. Corals have been found in all canyons surveyed, and the lack of coral observations in Shallop Canyon reflects a lack of directed survey effort. It is reasonable to expect that there are corals in Shallop Canyon, based on the model results and the occurrence in corals in canyons of similar size. There are other small unnamed canyons that also are predicted to have suitable habitats, but as they are unnamed, did not make the initial list of canyon zones. It seems somewhat arbitrary to include Shallop on the list of recommended canyon zones, and not any other small but unnamed canyons. The PDT concluded that Shallop should be removed from the list of recommendations, but that it was important to indicate to the Committee that further analysis of the terrain and suitability model results could be used to identify candidate discrete zones in minor, unsurveyed canyons. Note that when the existing range of alternatives was adopted by the Council, a number of the canyon zones were based on inference of suitable habitat, so there is precedent for such an approach. These recommendations based on inference about suitable habitat types predated the habitat suitability modeling and the availability of ACUMEN high resolution multibeam data, which would

provide better data to substantiate zones based on inference of suitable habitats, should the Committee and Council be interested in pursuing this approach.

The group also discussed the need to point out locations where seams in the bathymetry data result in high slope artifacts in the slope surface. After the call, Kiley Dancy provided a summary of what is causing this issue. Relevant parts of this summary will be incorporated into the appendix. Examining a slope of slope dataset could help to minimize these features[1]. Slope of slope was one variable included in the suitability model.

The PDT discussed how to define the seaward boundaries of the canyon zones. Fan valleys are extensions of submarine canyons onto the abyssal plain (Harris and Whiteway 2011)[2]. While they may be less steep than the portion of the canyon that incises the slope, these areas may nonetheless contain corals, cold seeps, and other features. In these areas, the best source of bathymetry data is a 100m resolution dataset compiled by the University of New Hampshire.[3]

The group agreed that the need to extend the discrete canyon zones further out onto the abyssal plain to encompass these canyon extensions is related to whether or not a broad zone was adopted by the Council, because any broad zone would include the deeper portions of all canyons, the intercanyon areas, and the abyssal plain out to the EEZ limit. The PDT concluded that it would be important to lay these issues out for the Committee, and to communicate that at this time, the discrete canyon zones were not drawn to encompass fan valleys, but explain that they could be, especially if there is any uncertainty that a broad zone would be adopted. While there does not appear to be any fishing activity occurring at the base of the continental slope at this time, defining coral management zones (broad or discrete) in these areas would indicate the Council's interest in their protection from other types of impacts, for example seafloor mining. Note that the portions of coral zones in very deep areas (below 1500m) would not be designated as EFH or be part of the formal EFH consultation process, because 1500m is the limit of EFH on the continental slope.

The PDT briefly reviewed maps and descriptions of the four seamount zones. The list of zones and their boundaries has not changed. Two autonomous underwater vehicle dives from 2012 need to be added to the Physalia Seamount map and text.

Finally, the group discussed the Gulf of Maine zones. Because high resolution bathymetric maps are unavailable for many parts of the Gulf of Maine, the boundaries of the Gulf of Maine zones are based on areas where corals have been observed, plus nearby areas beyond the dive sites where suitable habitat can be inferred, versus trying to encompass the entire extent of a terrain feature as was done with the canyons and seamounts. All of the recommended Gulf of Maine zones are known to have corals based on recent camera/ROV dives. There may be corals in other areas in the GOM that have not been surveyed.

[1] Visual examination of a slope of slope surface indicated that this would not be especially useful. However, artefacts were marked on the canyon maps, as appropriate.
[2] Harris, P. T. and T. Whiteway (2011). Global distribution of large submarine canyons: Geomorphic differences between active and passive continental margins. Marine Geology 285(1–4): 69-86.
[3] These data were downloaded after the call and will be included on future maps.

A portion of the Outer Schoodic Ridge has been mapped with multibeam such that the terrain features can be identified. The Outer Schoodic Ridge coral zone boundary encompasses dives where corals were found, and is extended beyond the dive locations to include areas where the terrain features are similar (the same general approach used to develop habitat management alternatives in Omnibus EFH Amendment 2). A PDT member raised concerns that this boundary might be too expansive, and should perhaps be drawn to more tightly encompass the dive sites where coral habitats were found. He noted that this area was likely to be somewhat controversial because there is a lobster trap fishery in the area. While there was no disagreement that the area could be controversial, the group agreed that the seafloor terrain was consistent between the dive sites and nearby areas mapped with high-resolution multibeam. It was noted that Outer Schoodic Ridge dive sites outside the high resolution bathymetric map did not have corals. The group decided to keep the boundary as is, including the areas adjacent to the dives where coral habitats could be inferred based on the similarity in depth, slope, and topography between areas with and without dives.

The PDT discussed the other Gulf of Maine zones as well, Mount Desert Rock, three sites in Western Jordan Basin, Central Jordan Basin, and Lindenkohl Knoll. Concerns were raised that the Central Jordan Basin boundary is based on a single area identified by multibeam and a single ROV dive in 2014. There are data from one additional 2015 ROV dive and there is multibeam data as well, but these are not yet available. Staff will review the Central Jordan Basin zone prior to sending out a revised draft of the memo for PDT review.

Finally, a member asked about the likely longevity of these areas, and the schedule under which they might be reviewed. This question was primarily in reference to the Gulf of Maine. This is always a difficult question. While the amendment includes provisions to revise coral zones and their fishing restrictions via framework, it is likely that significant new data would be needed to prompt a revision of the zones. It is probably safe to assume that they would be in place for a few years at minimum before the Council would consider any revisions. However, one or a few areas could be reconsidered in the future, and a full revaluation of all zones would not be required. Review of a small number of areas only would streamline the process considerably. The call concluded just after 4 p.m.