



New England Fishery Management Council

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John F. Quinn, J.D., Ph.D., *Chairman* | Thomas A. Nies, *Executive Director*

OMNIBUS DEEP-SEA CORAL AMENDMENT

Appendix C: NEFMC Coral Workshop Report

April 2017



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DEEP-SEA CORAL WORKSHOPS

March 13, 2017 – New Bedford, MA

March 15, 2017 – Portsmouth, NH

SUMMARY REPORT

Background and planning

The New England Fishery Management Council (NEFMC, Council) has been developing management measures to protect deep-sea corals since 2010. In 2012, these measures were split from a larger plan amendment intended to review and revised essential fish habitat-related provisions of all NEFMC fishery management plans (FMP). Development of coral measures was largely set aside during completion of the essential fish habitat amendment, and resumed in late 2015. In April 2016, the Council approved an updated range of alternatives for analysis. These were updated slightly in September and November 2016. The Council plans to select preferred alternatives during April 2017, and final alternatives during June 2017. Under this schedule, the amendment will likely go into effect in early 2018.

Relatively early in the process of amendment development, the Council agreed to coordinate with the Mid-Atlantic and South Atlantic Fishery Management Councils on the development of coral-related conservation measures, per the terms of a memorandum of understanding signed in June 2013. One important feature of this agreement was that NEFMC would develop conservation measures east of Alvin Canyon to the edge of the exclusive economic zone, and the Mid-Atlantic Council (MAFMC) would focus on areas west of Alvin Canyon to the southern extent of their jurisdiction at the Virginia/North Carolina border. The Councils also committed to seek consistency in management across the two regions, whenever possible.

The MAFMC took final amendment on their coral amendment (Amendment 16 to the Mackerel, Squid, and Butterfish FMP) in June 2015. During the planned final action meeting, the MAFMC determined that an enhanced stakeholder engagement process was necessary to develop the most appropriate management area boundaries. They organized a workshop to gather this input, which was held in Baltimore, MD in April, 2015. During the workshop, fishing industry members, coral scientists, environmental non-governmental organization staff, and others including MAFMC members, advisors, and staff collaborated to define a single set of recommended management area boundaries for fifteen discrete canyon/slope management zones off the coasts of Connecticut, New York, New Jersey, Delaware, Maryland, and Virginia. A summary of the

workshop as well as the final amendment and implementing regulations are available on the MAFMC website.¹

Because the MAFMC workshop was widely viewed as a successful way to gather feedback from a variety of interested stakeholders, the NEFMC agreed it would be helpful to host a similar workshop to refine coral management area boundaries in New England. Details of the workshop were discussed at two public meetings, including a January 30 meeting of the Habitat Advisory Panel and a February 24 meeting of the Habitat Committee.²

Purpose

The two purposes of the workshop as described in the announcement and agenda were as follows: (1) develop a detailed understanding of fishing practices in and around specific coral zones; (2) identify specific ways to modify coral zone boundaries in each location to balance fishing access and coral conservation. The New Bedford workshop focused on the discrete canyon zones and broad zones (300-900 meter starting depths), while the Portsmouth workshop focused on the offshore Gulf of Maine zones in Jordan Basin and at Lindenkohl Knoll (western side of Georges Basin). After consultation with Maine Department of Marine Resources, the Council decided not to host a workshop in eastern Maine to gather feedback about the Mt. Desert Rock and Outer Schoodic Ridge zones. Public hearings will be held in eastern Maine and other locations later in the spring.

Registration and logistics

Registration was open to any interested members of the public. The workshop announcement encouraged the participation of active fishermen in particular. Habitat advisory panel, plan development team, and committee members were contacted directly and encouraged to attend. The workshops were also announced via the Council's general email list, and this announcement was picked up by a variety of new outlets.

Participants were able to select multiple affiliations when registering for the workshop online. Based on prior analysis of fishing effort data in and around the coral zones, and knowledge of the affiliations of other stakeholders, the following options were provided: Jonah Crab, Red Crab, Squid, Groundfish, Lobster, Whiting, Scallop, Monkfish, Tilefish, Commercial fishery, Recreational/Charter fishery, NOAA, State Agency, Environmental organization, University, Fishing Industry Association (Staff, Board Member, Attorney), Other. Registrants were also asked to specify the gear types they fished with, if applicable, as well as their homeport. As noted below on the participant lists, attendees represented a variety of fisheries as well as these other groups.

Weather the week of the workshops was inclement, and as a result the second day in New Bedford was cancelled and the Portsmouth workshop began two hours later than originally planned. Storm-related travel issues are known to have prevented a few people from attending in each location, although other pre-registrants may have decided not to attend for other reasons. In total, 50 people pre-registered for New Bedford and 38 attended, and 39 people pre-registered for Portsmouth and 29 attended. It is possible that additional attendees did not sign in and are not captured on this lists below. Those who commented during the discussions were added to the lists below. The workshops were in-person meetings only and no webinar access was provided.

¹ <http://www.mafmc.org/workshop/2015/deep-sea-corals>, <http://www.mafmc.org/actions/msb-am16>

² See <http://www.nefmc.org/management-plans/habitat> for summaries of these and other meetings.

New Bedford, MA workshop

Attendees

Michelle Bachman – NEFMC staff (Habitat PDT)
David Borden – Atlantic Offshore Lobstermen’s Asso., Jonah/crab lobster commercial fishery (Habitat Committee)
Gib Brogan – Oceana (Habitat AP)
Peter Brown – Jonah crab/lobster commercial fishery
John Bullard – NOAA GARFO
Chris Campanale – Jonah crab/lobster commercial fishery
Mike Carroll - The Vertex Companies, Inc. (Red Crab AP, Scientific and Statistical Committee)
Lou Chiarella – NOAA GARFO (Habitat Committee)
Kiley Dancy – MAFMC staff (Habitat PDT)
Greg DiDomenico – Garden State Seafood Association
Elizabeth Etrie – Northeast Sector Service Network, Monkfish/Groundfish (Habitat Committee)
Daniel Farnham – Squid/whiting/tilefish commercial fishery
Rachel Feeney – NEFMC staff (Habitat PDT)
Travis Ford – NOAA GARFO (Habitat PDT)
Kathryn Ford – Massachusetts Division of Marine Fisheries (Habitat PDT)
Donald Fox – Seafreeze, Ltd., squid/whiting/groundfish/monkfish commercial fishery
Mario Gonsalves
Douglas Grout – New Hampshire Dept. of Fish and Game (Habitat Committee)
Michael Jackson
Renee King – NOAA Habitat Conservation Div.
Hank Lafner – Squid commercial fishery
Gary Mataronas - Jonah crab/lobster commercial fishery
James Mataronas III – Jonah crab/lobster commercial fishery
Michael Matulaito
Chris McGuire – The Nature Conservancy (Habitat AP)
Conor McManus – Rhode Island Dept. of Environmental Management
Grant Moore – Jonah crab/lobster commercial fishery, Atlantic Offshore Lobstermen’s Asso.
Laurie Nolan – Tilefish commercial fishery, MAFMC member
John Quinn – University of Massachusetts School of Law (Habitat Committee)
Eric Reid – Seafreeze, Ltd. (Habitat Committee)
Brad Sewell – Natural Resources Defense Council
Burton Shank – NOAA Northeast Fisheries Science Center
Peter Shelley – Conservation Law Foundation
Ron Smolowitz – Coonamessett Farm Foundation, scallop commercial fishery (Habitat AP)
David Spencer – Jonah crab/lobster commercial fishery
Jonathan Williams – Red crab commercial fishery
John Williamson (Habitat AP)
Tim Shank – Woods Hole Oceanographic Institution

Introduction

Dr. John Quinn (Council Chairman/Habitat Committee Chairman) facilitated the meeting. He gave a brief introduction, welcoming attendees to New Bedford. He thanked staff, noted the consolidated agenda, and gave some background on how we got here, what we are going to do, what has already been done, who is here, format and ground rules, and where we go from here.

A brief history:

- 2005 – Monkfish joint FMP closed two canyons to monkfish fishing
- 2007 – Discretionary authority enacted in MSRA
- 2015 – Approved Omnibus Habitat Amendment 2 – corals were originally part of this action, later split out

Dr. Quinn noted that opportunities for input at Committee level can be somewhat limited in terms of time provided, so these meetings are another opportunity. Goal is to understand where and how you fish within the canyons, take your input on adjusting boundaries of alternatives given what you know, and understand operational concerns. The goal of the amendment is to limit impacts on industry while protecting corals.

- *What has already been done?* MAFMC coral amendment implemented January 2017 – broad zone 450 m, discrete zones, red crab exemption. Did not consider any restrictions on lobster fishery.
- *Attendees:* Industry, NGOs, federal and state governments. Council and Habitat Committee members attended to listen and learn as we finalize alternatives. PDT to help with discussion of technical issues.
- *Format:* Overview presentation, break to discuss what is most important to present about your fishery in each area. After that, begin an area by area discussion. Participants should introduce themselves before speaking the first time.

Dr. Quinn emphasized that there would be no decisions made during the workshops, and that there will be additional opportunities for comment later at the Committee and Council meetings. A report of these workshops will be provided to the Committee and Council before they select preferred alternatives.

Council staff presentation

Ms. Bachman provided an introduction to the amendment. The Mid-Atlantic amendment includes the slope and canyon regions. The New England amendment includes the canyon, slope, and seamounts, as well as areas in the Gulf of Maine. We can use this workshop to confirm our working assumption that fishing is not currently occurring on the seamounts, but the seamounts are not an intended focus of the discussion.

Deep-sea corals live below the photic zone and are active feeders. They inhabit both soft sediment and hard bottom areas. There are four major types in New England (soft, stony, sea pens, black), and black corals in particular are found in very deep waters. More species have been found on the continental margin vs. in the Gulf of Maine. The Gulf of Maine species are found in the canyons as well. There is lots of new science in the past few years, including discovery of species unknown previously in New England (for example the stony coral *Lophelia pertusa*). Most corals found in New England are colonial, but not reef building.

We are discovering new deep-sea corals all the time (approximately three new species per week every week for the past 15 years). Diverse other animals (crabs, worms, shrimp, octopus, and fish) live on these corals and some lay eggs on them. In some cases these relationships are very specific between two species (coral host and associated animal). Perhaps 3,000 deep-sea coral

species have been described (currently, there are more deep-sea species than shallow species, and deep-sea discovery continues).

Why are we doing this? While there is the possibility for continued coexistence of corals with fishing, corals are fragile, and very long lived. Some are soft/flexible, while others are more brittle and susceptible to breakage. Growth rates are very slow. We don't know very much about their recruitment, but it seems that their ability to recolonize habitats may be limited. The Council recognizes that these coral habitats are diverse, often in good condition, and largely outside fishing areas, but that precautionary conservation approaches are likely appropriate regardless. A task for the workshop and ultimately for the Council is to define a line between fishing grounds and coral management areas that balances conservation with fishing industry operational needs. The amendment problem statement was shared with the group, emphasizing that the idea is to balance costs and benefits.

The section 303(b) discretionary provision in the 2007 Magnuson Stevens Fishery Conservation and Management Act is the core authority being used here. Early (2010) guidance from the Northeast Regional Office on this authority suggested the Council did not have the ability to restrict fisheries managed by the states (i.e. ASMFC,) but subsequent (2014) national level guidance on the provisions indicated the Council can restrict Commission-managed gears and fisheries. We are engaging ASMFC through consultation with their staff, technical groups, and through membership on our Habitat Committee.

In terms of alternatives, there are twenty canyons, as well as depth-based broad zones. The canyon zones are based on the extent of each canyon, beginning at the shelf break, with the 3 degree slope contour used as a proxy for the shelf break. The idea with the depth-based zones was to explore different options with respect to the footprint of fishing – perhaps slightly shallower, equal to, or deeper than the footprint. The problem during initial development of these options, which remains, is that we don't know exactly what the footprint is. (Understanding the footprint better is a large part of the reason to host this workshop.) Current depths considered include 300, 400, 500, 600, 900 meters, but the Habitat Committee may ultimately recommend something intermediate to these. In the Mid-Atlantic, excluding lobster from the discussion and exempting red crab, they decided a 450 meter boundary was reasonable. In order to simplify the boundary somewhat from the contour line, the Mid-Atlantic coral area extends as shallow as 400 meters, and as deep as 500 meters. We used the same approach here for the draft broad zones, such that the 300 meter line falls within the 250 and 350 meter contours, etc. Because the areas are steep and the contour lines are close together, these tolerances produce boundaries that are still fairly complex, so it may be helpful to simplify further, perhaps using a hard minimum depth and allowing more latitude on the maximum depth tolerance for each.

Gear restriction options in the amendment are focused on bottom tending gears only. If the Council elects to prohibit both fixed and mobile bottom tending gears, red crab and/or other trap fisheries could be exempted. Another approach would be to restrict mobile bottom tending gears only. Transiting provision would be the same as the Mid-Atlantic provision: gears have to be out of the water and on deck when crossing a coral zone, but full stowage is not required.

What do we know about gear impacts on corals? Much of the scientific literature focuses on mobile gear impacts, less on fixed gear effects. Unlike in New England, other parts of the world have deep water trawl fisheries, including on seamounts. These fisheries are the source of many of the trawl gear impact studies. Fixed gear studies are many fewer, so assessment about the

negative impacts are more inference based. Mechanisms for impact include crushing when gear is deployed, dragging over corals when gear is hauled back. There is coral bycatch in New England fisheries, mainly in the Gulf of Maine basins (sea pens in Wilkinson Basin, soft corals in Jordan Basin).

The Council is in the process of evaluating the effects of amendment proposals on corals, managed species (e.g. groundfish), human communities (fisheries, and more generally), and protected resources (marine mammals, other endangered/threatened species).

What data are we using to understand impacts to the fishery? Vessel trip reports, which are the cornerstone of the analysis, at-sea observer, and vessel monitoring system. Vessel trip report data are somewhat uncertain spatially, but can be used to assess the fisheries that overlap, determine roughly how much, and compare between alternatives. Revenue is summarized at the owner level to assess dependence on the coral zones relative to other fishing grounds. One goal of the workshops is to flesh out caveat that we should present along with these data. We have data summarized at the gear, species, and community/port level. Questions include whether communities are particularly vulnerable, or dependent on fishing. The analysis protects confidential data, and we have to consolidate information for some species and gears to avoid representing fewer than three vessels. At the port level, we look for at least three vessels selling to at least three dealers. Individual data will not be represented in the amendment analysis except to the extent that individual observations inform caveats. Also, the analysis will try to capture general conservation interest/existence value placed on corals.

A variety of data sets can be viewed during the workshop: management area boundaries, coral locations (point data of coral presence or tracks and descriptions of recent dives), high habitat suitability for soft corals (model-based), depth, slopes above 30 degrees and 36 degrees, essential fish habitat maps, revenue by species or gear type, and nautical charts. The best quality depth and slope data cover much of the canyon/slope region from 300-2000 meters, and are 25 meter spatial resolution. Lower resolution data are available outside this footprint. The heat maps of fishery revenues by gear type and species are a bit coarse given the underlying trip report data, but show the most important areas to each fishery.

Discussion

Note that some of the responses about coral science were provided by Tim Shank, WHOI.

How will the Council consider non-use/existence values of corals? What does it mean that people view deep-sea dives in coral habitats via the internet? Analysis will be qualitative – virtual observation of telepresence-enabled cruises certainly indicates interest in the continued existence and protection of corals, but this is hard to quantify.

What depths are we talking about in terms of deep-sea corals? Roughly 350 to 6000 meters.

It seems that this discussion pits lobstermen against trawl fishermen. Not to say there aren't gear interactions when gear being hauled. But these two groups have a pretty good agreement at this point in terms of sharing fishing grounds. Want to save lobster bottom – we fish out to 550 meters.

Has there been research on specific canyons? Yes, we have studies in individual canyons. For example within a canyon like Alvin you might have a handful of multi-hour dive transects, plus

older records of coral occurrence from previous dives and grab samples. Although large areas of each canyon remain unexplored, we have suitability modeling, bathymetry data, and maps of high slope areas. Steep slope is predictive of corals. We are somewhat limited in terms of recent coral data in shallower areas of the canyons. Corals occur between the canyons as well.

In the ROV dives between canyons, at depths 600-1000 meters, what type of substrates are found? What about commercial species? Mostly sedimented habitats between canyons. Major canyons incise shelf, minor canyons do not. Major canyons have more survey effort, because they connect more directly to the shelf through currents. Originally scientists has assumed there was a greater likelihood of finding corals in the shelf-incising canyons, but in reality both larger shelf-incising and smaller slope-confined canyons have coral habitats. Around 500-600 meters the seafloor tends to be covered with sediments. There are large numbers of red crab, and more fish than at deeper depths. Around 700-800 meters, you observe more hard bottom and vertical walls, and more corals. Within the canyon, most of the fish are at 500-700 meters, although there are corals, including those species that tend to occur in soft sediments. Around 800-1200 meters the corals are most diverse. Earlier exploratory fishery surveys looked for bottom that was towable between canyons. Found lots of hard bottom in these areas, and some commercial species including redfish, white hake, and Greenland halibut.

What about the relationship between existing gear restrictions and fishing effort, for example in the tilefish closures, monkfish closures, and monument? Ms. Bachman responded that the best approach was to take a longer view of these areas – what types of fishing happen now, and how had they been fished in the past.

What is the intended purpose of the discrete vs. broad zones? Why would we have both? In the Mid-Atlantic, the Council wanted the option of different fishing restrictions in different types of zones. During final action, the MAFMC adopted the same measures for both, but this could change down the road. The MAFMC used boundaries from their workshop for the canyons, and then defined a depth-based boundary in between. With the draft New England boundaries, the shallowest parts of the discrete zones cover the heads of the canyons, and align with the shallower broad zones boundaries. In New England, we could end up with a single management area (broad zone) vs. a combination of discrete and broad zones, especially if the fishing restrictions measures are the same. If there is a desire to retain flexibility to have different measures in the discrete vs. broad zones, then it may be useful to designate broad zones and overlapping discrete zones.

Alvin Canyon

The group explored the coral data in relation to depth using Alvin Canyon as an example. The head of the discrete zones follows the 300 meter contour. Alvin Canyon has two recent dives, one on the east wall (1000-1100 m) and one on the west wall (846-927 m), and 11 records in the pre-2012 database. These older observations are from a range of depths, and include some records shallower than 200 meters outside the zone. The group discussed that some of the coral presence records in general are old (late 1880s), and the positions are uncertain, while others were obtained using submersibles such as Alvin and are more recent (1970s-2000s). Dr. Shank confirmed that a variety of coral types were found during both of the recent dives, including soft and stony corals. In general the approach has been to survey at various depth ranges, i.e. shallow 600-800m, moderate 800-1200m, and deep 1200m or more. The goal has been to dive in locations where corals are likely to occur, vs. selecting dive sites at random, so there are few sites where corals were absent. The discrete zones go shoaler than the recent dive observations

because the canyon itself encompasses these shallower depths. The PDT used the three degree slope contour to define the shelf break, and drew the shallow/landward boundary of the canyon zones at the shelf break. The results of the habitat suitability modeling work were also used as a guide. The high slope areas were defined as greater than 30 degrees slope, so 3 degrees is fairly shallow, but 3 degrees would be considered the maximum extent of the canyon.

A participant suggested just drawing a simple boundary at around 600m and cutting straight across. Why do the discrete zones go up into the heads of the canyons is many corals are in deeper waters? The response is that coral habitats are likely to occur somewhat further up into the heads of the canyons. The suitability model incorporates oceanographic variables such as salinity, oxygen, temperature, chlorophyll, etc. so it captures the features that distinguish the canyons from the surrounding slope.

A participant commented that details are important at a fine scale. It is interesting that new corals are being found all the time, and that corals are found during all recent dives in these areas, but that doesn't tell us about density in particular areas, or about areas that do not have corals. Because the dives are in areas where we don't fish, it's difficult to respond to this information. Dr. Shank agreed that there is a disconnect between fished areas and surveyed areas, and that the heads of the canyons are more gently sloping. Suitable habitats predicted in the shallower parts of the canyons are due to a combination of oceanographic factors and suitable slopes and substrates.

Ms. Bachman confirmed that we can overlay a variety of data sets for each area on the screen, and adjust individual boundary points listed in the map book on the fly. Next there was a discussion of individual points in Alvin Canyon. An updated map for the canyon is shown below that would work for the trawl fishery for whiting, monkfish, and squid.

A participant commented that the areas didn't seem protective enough, especially when further adjusted as shown above, and that it would be helpful to be clear about what is driving these boundary changes. The MAFMC FMAT drew boundaries based on the suitability model, plus a buffer. The Habitat PDT's approach was to focus on the depth and slope data and use the model outputs less prescriptively. The PDT generated a somewhat more refined area as a starting point. At the conclusion of the MAFMC workshops and amendment process, the resulting areas were made smaller and some of the edges of the suitability outputs were removed.

Another participant commented that drawing a line along a contour would be better. Another suggested that 500m should be a minimum boundary, deeper to provide a buffer for enforcement (550m or 600m). The coral surveys generally ran up against fishing vessels at around 500 meters.

A participant commented that the objective is to preserve the footprint of the fishery and stop the expansion of fishing into deeper areas. A depth of 500m would preserve the trawl footprint, but deeper may be required for traps. The goal should not be to preserve every piece of coral habitat (or likely coral habitat) but to protect as much coral as possible given that we want to preserve fishing opportunities.

A trap fishermen commented that a deeper depth would be required to preserve their footprint, and that he was not assuming they would receive an exemption. The group agreed that any depth that works for the lobster industry would work for the trawl fleet.

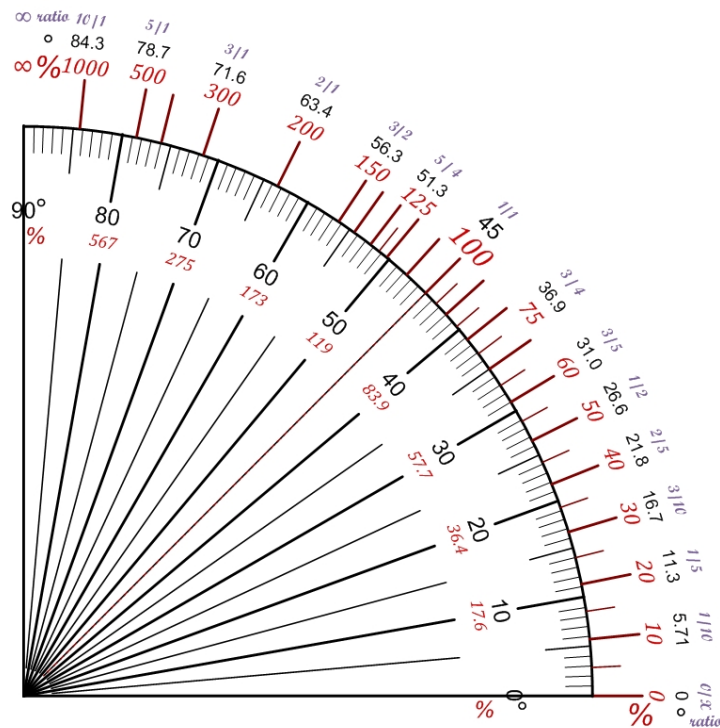
Ms. Bachman clarified that she felt it would be helpful to establish the total footprint of fishing, as well as to understand the depths within that footprint that are fished by different gears.

An attendee commented that a red crab exemption may be justified due to the distribution of the animals, which do not occur in shallower areas. Perhaps such an exemption is not required for lobster [which occurs in shallower sites as well]? Would be good to get feedback from that industry on where their gear is fished. Mid-Atlantic exempted lobster gear at the outset.

Ms. Dancy clarified that the MAFMC amendment did not consider an exemption for lobster because they assumed they did not have the authority to restrict the lobster fishery to pursue coral conservation. The revised guidance was received fairly late in the amendment development process so the Council decided not to consider any restrictions on the lobster fishery in their amendment.

Ms. Bachman and Dr. Ford clarified that the 3° (approximately 5%) slope contour is an approximation of the shelf break – i.e. where is the transition between the continental shelf and the continental slope, and where do the canyons begin. They confirmed that this is a very shallow slope (90° would be a vertical slope, and 0° would be flat). Areas of >36° slope (72% grade) that were ground truthed during recent coral surveys were always found to contain corals, while areas with slopes greater than 30° (60% grade) were almost always found to contain corals. The suitability model does use slope as a predictor variable. The figure below can be used to compare slope in degrees (black) with percent grade (red).

Figure 1 – Degrees of slope vs. percent grade. [https://en.wikipedia.org/wiki/Grade_\(slope\)](https://en.wikipedia.org/wiki/Grade_(slope))



An attendee commented that boundary lines have to be enforceable. Need a discussion of how they will be enforced. Practical realities are that the gear doesn't get down to bottom for half an

hour, or a trawler starts to tow outside zones but needs half a mile or a mile to get the gear out of the waters. May need buffers around the lines.

The group discussed a minimum depth for a broad zone, and the following points were raised:

- Lobster traps can stay outside of draggers, red crab stays outside lobster. Red crab depth would accommodate everyone. Give a buffer zone around red crab fishery. Another noted that 900m would work for red crab. Assume Coast Guard would rather enforce one zone applying to multiple gears than multiple zones with different regulations.
- Seems unlikely that the Council would adopt multiple zones – knowing the footprints by depth would allow them to select the most conservation-oriented zone possible given the gear restrictions/exemptions applied.
- If the Council decides to exempt red crab fishing, the lobster fishery can live with 550m minimum depth, perhaps with a buffer zone. Concerned about straight lines cutting off areas shoal of 550m.
- A depth of 500m (275fa) would work for the draggers. Talking about broad zones, common sense says go with 900 meters between canyons and apply to all gear types.
- Red crab fishery is both in the canyons and in the broad zones between the canyons.
- Agree that 900 meters is the easiest boundary. Could live with 500 for trawling, but 900 would be the simplest approach.
- A line at 900 meters would work. Is it conceivable that red crabs would move deeper due to climate change?
- Can you delineate where the discrete canyon zones cross the 900 meter contour?
- Red crab fishes in all of the areas but don't have gear everywhere all at once – 1200 traps over entire range of the fishery. Continually moving across the shelf. Travel right through broad zones.

Atlantis Canyon

An attendee suggested that the minimum depth should be 900 meters in all canyons, so why go through a discussion of each one? Want to allow time for discussion on all areas, to be prepared for Committee/Council discussion no matter what the alternatives are.

Suggested Atlantis modifications – eliminate points 361, 364-351, 355-358. Rationale is that from a dragger perspective, allows access to traditional grounds, while simplifying area.

An attendee representing an environmental organization commented that they were not sure if the Council was interested in input from NGOs – but the above suggestions seem to encompass areas within the coral zone that aren't fished – wouldn't be acceptable to us because they exclude areas of steep slope.

Another participant noted that the revised lines are easier and cleaner. Agree from trawl/longline perspective – longlines are set across the tips of the canyons for tilefish.

Summary of gears used in Atlantis Canyon and target species: Trawls: whiting, monkfish, squid, and butterfish. Longline: tilefish. Traps: red crab, Jonah crab, and lobster.

A participant asked how far apart are points between broad zone options? Not a consistent distance – depends on how steep the area is. A few kilometers to a fraction of a kilometer. Perhaps minimum depth combined with a maximum amount of complexity is a better rule.

Someone suggested that the two tilefish GRAs should put on charts. Another noted that lobster gear restricted areas run along the edge of the shelf (see map on page 28).

Nantucket Canyon

To simplify, eliminate points 365-368, 370, 371. Rationale – avoid monkfish, whiting grounds; line is simpler, slope not extreme, no coral observations. Then go from point 375, below 376, straight across to 370.

Anything shallower than 550 would restrict lobster fishery. The fishery moves with migrating lobsters but depths are the same within canyons or between canyons.

NGO comment – recommend retaining 500 meter approach in case there is an exemption for lobster fishery.

An attendee asked about actual depth contours vs. straight line approximations used to define area boundaries. Lobster vessels here fish along contours. Deeper areas get into red crab. Someone suggested that straight lines outside of footprint are the best approach. Trawl vessels tend to follow fathom curves as well. Need to keep areas enforceable. And easy to plot.

Another attendee note that all lines should be drawn deeper than 550 meters to accommodate the lobster fishery.

Related to gear conflicts, an attendee noted that there used to be lots of dragger/fixed gear confrontations in this region – reached a resolution where in the winter, beyond 120 fathoms the lobster fishery works, and inside of 120 fathoms the trawlers. Switch in June to the opposite. Agreement has been in effect for many years. This attendee said they were not sure about discrete zones – it seems that they have agreed that 900 meters works for all fisheries.

An attendee asked if the Council had considered exemptions for the tilefish fishery. Others agreed that the consensus was broad brush approach at 900 meters would work across all fisheries. Red crab exemption would allow for a depth of 550 meters, lobster exemption for a depth of 500 meters.

The group summarized the discussion about broad zone depths. Fishing industry members agreed that 900 meters is okay to preserve all fishing grounds; 550 meters is acceptable for lobster fishery and trawl fishery, assuming a red crab exemption.

An attendee asked for an explanation of the discrete/broad area concept? What is the difference? Discrete zones just the canyons, existing boundaries at the edge of the shelf/slope transition, broad zones around the depths and deeper. What is the point of having both? If the boundaries align, then there is no reason have both. When we first started this, the idea was either/or – canyons or a broad approach. If a depth-based strategy is a useful way forward, the discrete zones are a good starting point for the discussion, because we can review the specific points, but can maybe just merge them. With both, you'd have shallower areas in the heads of the canyons, and maybe a deeper zone at 550. How to analyze these options? Depend on model? Questions –

what is estimated revenue in just discrete zones? What about broad zones? Encompassing a lot of additional habitat with broad zones between canyons. In deeper areas these intercanyon areas are not fished.

Veatch Canyon

Is it possible to superimpose the suitability model results on these charts? Very high suitability between 450-550. Lobster industry prefers 900 meter, 550 meter okay. Shifted some vertices to align with 550 meter line. Rationale, where we fish currently is inside this line. Problem statement – limit expansion of effort into areas of probable coral. Note that any large displacement of fixed or mobile gear could lead to gear conflict issues.

As a dragger, how is this going to read? John laid it out well. Assume that any approach that works for the lobster industry will work with the trawl and longline fishery. Focus on 550 meter line.

Hydrographer Canyon

One of the largest canyons, existing discrete zone is fairly shallow, broad zone boundaries are similar on western wall owing to steepness of canyon. Still prefer 900, but if not, move lines to approach 550 m contour. Rationale same as for Veatch.

Attendees suggested amendments to boundary in hydrographer canyon based on longline fishing grounds.

Clarifying question – what is the purpose of canyon discrete zones going into deep water? Slope flattens out around 2000 meters; seaward areas are the maximum extent of the canyons in deep water. Probably not all that important in deep water if there is an overlapping broad zone designation.

A participant from an environmental organization expressed concern about cutting through high slope and high suitability areas with the edited boundary line. Concerns about the feedback being provided by fishing industry members – no objective information or data – these are the opinions of people in this room. Need to be substantiated with information. Any changes need to be substantiated.

Dogbody Canyon

Existing discrete zone is at 300 meters – observations of corals near head, in areas of deeper tow as well. Suggest pushing the zone deeper – make lines straighter to exclude current fishing grounds. Staff noted that there are shallower towed camera observations here between 558-675 meters, corals found but uncommon, deeper tow higher numbers of corals, then corals less abundant again at deepest tow.

At this point there was a lengthy discussion about the purpose of the workshop, engagement of fishing industry vs. other attendees, and what the Council was looking to gain from the discussion.

NMFS Regional Administrator John Bullard: That is a comment that is provoked really by what Gib Brogan and Brad Sewell raised. I think the process used in the workshop in the Mid-Atlantic was we will introduce evidence, cruise tracks, things like that, but basically industry and NGOs are going to be fully engaged. I hate to say both sides, but you know, a lot of stakeholders

and going to be present, fully engaged, vigorous debate, and we're going to stipulate at the end of the discussion that there's agreement after this vigorous debate. And at the end it doesn't matter so much what the proof is, that on the one side we're protecting coral, on the other side protecting economic interests, because we're debating it and have literally shaken hands at the end of each canyon. And the proof is that both sides are vigorously engaged. What I fear is going on here is that industry is drawing the lines, and the environmental folks are being very quiet, and not really engaged in debate. And there is no stipulation that this is where the line should be. What may happen is someone may say with some legitimacy that we should do this over again, with more information. Area these lines located in the best place to protect corals and take in the interests of industry? Worry that we will have invested this time, but that balancing of goals was not achieved here, with mostly just one side being represented in the discussion.

Council Chairman John Quinn: I'd love to hear from the environmental reps on all of these – but can't make people engage. Trying to have this discussion as open as possible for everyone to have a say. If people aren't taking that opportunity we can't force it.

Council Staff Michelle Bachman noted that we have PDT boundaries for discrete zones, various broad zones, is there another approach that should be considered that's different from this? What would be a good solution to the environmental community?

Brad Sewell (NRDC): My understanding reading the notice for the workshop was that it wasn't going to be the same as the mid-Atlantic. We are here to provide input as requested – but the meeting was not apparent as an effort to drive consensus and collaboration. We are here to provide input as you would like – but a very different process. Entirely different. Would have to go backwards. Would take more time and potentially different tools. Reason for why participation is what it is. For the record, we could add [the same] feedback for each canyon.

Gib Brogan (Oceana): Going forward, concerned about saying this was a fact-finding mission. We don't have new facts – PDT represents most of the facts we have. Seems to be a lot of opinion and anecdotes but not a lot of facts.

Dr. Quinn suggested that perhaps the results be framed as fact finding/consensus building? Are you willing to participate more?

Brad Sewell: Clearly we have very different opinions. It's our understanding the red crab fishery doesn't go to 900 meters. Not apparent to me that draggers consistently go to 500-550. 550 for the lobster fishery seems to be right at their outer bound.

Hank Lafner (squid fishery): Problem John Bullard is seeing here is that the lobstermen and red crab went into MAMFC assuming an exemption. That meeting was Illex/dragger fleet vs. the ENGOs. New England Council is recognizing and [possibly restricting] other groups, so they are realizing the line needs to go out further than it did in the Mid-Atlantic. Modifying the amendment to include fixed gear types is an entirely different picture. We don't have to worry about our trawling grounds given the input of the fixed gear fishery, which fishes deeper. At the outset, it should have been decided, are fixed gear guys getting an exemption, or not?

Dr. Quinn: Different regulatory environment vs. Mid-Atlantic workshop. There weren't discussions about red crab and lobster at that meeting – analogy doesn't fit. Do we want to go

forward if there is such an objection to the approach? Trying to get as much information as we can and build any consensus that we can.

Peter Shelley (Conservation Law Foundation): If we are to go forward in consensus building fashion, need to add vessel track data. Stuff PDT has looked at. I am here to learn, be respectful. Not assuming that there would be a common alternative – this is an industry alternative. If this is to be more than that, we would need more data.

Michelle Bachman: Don't have set level data for lobster fishery, mostly, or for red crab, at all. I can't include data I don't have in an amendment document to help determine the red crab or lobster footprint. So, part of what the PDT has struggled with in evaluating the effects of these areas, assuming the existing range of zone alternatives, is that I can't say "this zone affects this percentage of whiting tows". So, instead we can ask the whiting industry, "where are your tows"? We can ask for examples but won't get a census. Something I would find interesting and don't have the answer to is are the PDT boundaries a good approach? Too shallow, too deep? Where do ENGOs for example, come down on these areas?

David Borden (lobster fishery): On the issue of bringing forth new and additional data, this is kind of a tricky issue. PDT has accessed the data they can access. Lobster fleet doesn't have VMS. Around 26% of lobster permits don't require logbooks (VTR). We have info on a subset of the fleet and no guarantee they're representative. In terms of this process, if the lobster industry is modifying a boundary line to get away from their grounds, they are doing it based on their own info. Can't provide those data to staff to circulate – that runs afoul of confidentiality requirements. This is kind of circular – you're getting the best you can get – not like the PDT can go forward and analyze this a lot of different ways – they've already done that.

John Quinn: Confidentiality issue raised at several points. If someone says that's where I fish, do we accept that assertion at face value? Trying to get some information about operations within the 20 canyons.

Donald Fox (squid/small mesh fishery): What are we trying to do here is give new information. Most of us came here with the intent of engaging in this process. To sit back and say we didn't bring new science and not engage is disturbing to me. Share your thoughts.

Doug Grout: As a Council member one question I have is what gears will be impacted by a particular boundary. Mobile bottom tending gear? Bottom tending gear? Have heard two zone options for bottom tending gear. What if the council decides to exempt fixed gears? What would the lines be that would freeze the footprint of just the mobile bottom tending gear fleet? This is something we are still looking for. What if we exempt lobster and red crab? What would boundaries be? Is there VMS data? Is there observer data to validate?

Jon Williams (red crab fishery): I have to agree with where Bullard is headed with his concerns. Council hosting two workshops to bring together active fishermen to discuss issues related to the deep sea coral amendment. Announcement wasn't to bring undeniable proof – it was to discuss and become part of the process, which we definitely welcome. There are facts we do have, and a lot we don't have. Lots of area being managed on a few dives and data. Some shallow observations are mostly sponges. Shallower areas have less dense corals, at least in certain areas.

After a break, Dr. Quinn suggested that there is value in going forward with an amended approach. Feedback from fishing industry, environmental groups, managers, etc. identify specific ways to modify zones balancing access and conservation. Looking for rationale. Hoping for consensus but short of that, looking to find information that is helpful. Encourage environmental community to tell us if there is a problem, big problem or non-starter. Looking to put information in front of the Council.

Libby Etrie (Council member): want to pick up on what John is saying – I appreciate hearing what you have to say. Acknowledge that we are talking about affecting fisheries that don't have data we need.

Peter Shelley: Assumption was that we are not modifying PDT lines by any of this work? Ms. Bachman responded that while we don't want to have too many alternatives, we will continue to analyze PDT areas (discrete zones). May add other options for analysis later in the process.

Clipper Canyon and Sharpshooter Canyon

Clipper and Sharpshooter are smaller canyons – little historical data, some shallower tows. 495-571 meters – sparse soft corals. Additional corals at deeper tow. Sharpshooter has a couple of recent tows – shallower tow around 900 meters, no corals, deeper tow, 1100+ stony and soft corals. Compared to other canyons some sparse corals in shallower areas. PDT boundaries at around 400 meters, so a bit deeper than other canyons.

Propose moving line to 550 meter boundary on these canyons and previous canyon, assuming a red crab exemption. If not move to 900 meter boundary.

An attendee said he was still trying to understand what is being developed here is industry comments? Industry consensus position? 550 meters seems to be the comment. Specific canyons (discrete) zones are going shallower [than 900 m].

Hearing industry suggestion inclusive of lobster as 550 meters is appropriate, regardless of discrete or broad zone. Pattern developing – different fishermen fish in different canyons, but the depths are the same.

Are there additional data for these particular areas? Are there data/evidence to support these requests?

A lobsterman commented that all lobstermen have data to back this up. Have been asked to accept coral distributions based on modeling. Our data and modeling have inconsistencies. Accepting with a bit of trepidation. Suggesting that industry will not put data up is totally wrong.

Goal to get as much data as we can. Supporting evidence for people's positions.

Coral data suggest differences between canyons in depths that are needed for conservation. Are there also differences in the fisheries? Are the different canyons all equally important for all fisheries? Are there specific priorities or issues in each? Do we need to make distinctions for the council? If depth is the main driver than we can say that and focus more on operational issues.

Has NMFS reviewed the bathymetric data? Seams in charts showing up as slope? Ms. Bachman noted that we are working with the same dataset used by MAFMC, but have the advantage of

knowing to look for those issues. Coral amendment document maps of alternatives point out seams in the maps explicitly. For example anything in axis of canyon is likely true high slope. East west patterns where data sets come together are assumed to be artifacts.

An attendee commented that the habitat suitability model appeared wrong in certain areas. Ms. Bachman noted that the suitability model relies on lower resolution bathymetry, predecessor to ACUMEN data. There are areas where we know coastal relief model contours don't match ACUMEN contours. ACUMEN contours appear to ring true with industry members. Exact boundaries of high suitability models are uncertain. Haven't done an explicit review of specific areas of discrepancy. She emphasized that the PDT had used the model as a general indicator of coral habitats, drawing boundary lines based on high resolution bathymetry. I.e. the PDT was not using model prescriptively.

Is there some sort of a buffer built into areas based on slope/habitat? Wouldn't refer to it that way. Tried to define what is the maximum extent of the canyon – looked for 3 degree slope and then used bathymetry. There is gap between the 3 degree contour and most of the recent coral observations. Uncertain what is going on in between the boundary and the high coral abundance areas. Don't have a good sense for corals and coral habitats at the edge of these zones.

Moving ahead for today's discussion, to map the industry recommendation, plan is to adjust boundary to 550 meters and then further adjust from there.

Welker Canyon

This canyon was not studied until recently. Four dives, range of depths. Corals found during all dives. Very diverse at deepest dive, shallowest even stony and soft, between 550-800. Perhaps an area where corals are right up against fished depths. Model suggests high degree of habitat suitability in head of canyon, as compared to some others. Diverse corals at other two dives.

Similar recommendation to Clipper – move to 550 meters – 900 without red crab exemption. Comment will be the same going forward.

A little confused, if industry as a whole is suggesting 550, what happens if the trap fishery is exempted, what will the Council do? Should this be discussed now?

Think we have to stick with a combined discussion that assumes the need to accommodate both lobster and dragger. Council can modify later.

Want to be clear we can provide more information now, from tilefish and dragger fleet.

In terms of 550 boundary across all areas – objection would be that each canyon is unique in terms of habitat (and fishing). Each canyon is really unique. 550 line seems to fall short in terms of conservation value, and likely not achieve the best balance between industry impacts and coral conservation.

These corals we are trying to protect – going back to early monument discussions – corals are cited as being pristine. There would be damage evident given fishing – we are looking to freeze our footprint. Don't get into corals – we know where they are. Have deemed areas pristine. Why are we in here? Don't think we are doing any harm to it.

From an industry position standpoint, do we want some feedback on whether red crab should be exempt, or not? Yes – want this type of feedback. My opinion is that it should be exempt – primarily based on extent of fishery – number of traps. Going from 550 vs. 900 meters makes a big difference in terms of coral impacts.

Heel Tapper

Smaller canyon, there were three dives ranging shallow 666 m to 1450 m – soft corals on all dives. Deeper than 550 is where sampling has occurred.

How to get information that will help us develop final alternatives? We already have the data to draw depth-based boundaries. If there is a particular concern about fishing or corals in a specific area, kind of tricky. Not sure what the PDT can do with an individual's fishing effort data – not clear how it can be used in documents/analysis. Could be used to caveat, develop descriptive information. So, would use additional information to verify, in qualitative way.

Would be helpful to have tow data to demonstrate fishing inside PDT areas? Ms. Bachman: Yes – I expect so. Concern is that I don't know how to serve as a filter for those data. With one individual, I can't forward on their data. Better to provide comments directly to the committee and/or Council. I can assimilate general information but tow by tow data would be better provided directly to the Council.

Other question – have we used any of the VMS data? Yes – but haven't mapped it. We have compared VMS hours fished patterns by area to VTR-based patterns by area. I.e. can see how hours fished drops off by depth in VMS, and use to compare to VTR. Compared to some of the VTR based tables that infer fishing in deep areas, VMS data drops off more quickly, for fisheries we have VMS for. Can also pull up tow tracks from observer data. But without a sense of how representative they are, hard to know what to make of them. Reluctant to use absence of tows to suggest an absence of fishing.

Should map VMS and observer data – just knowing where activity is would be useful.

Is the VMS data on the Northeast Ocean data portal what we would use? Not sure it would be exactly the same. Portal data are filtered for speed; Northeast Fisheries Science Center uses model-based filtering methods by gear to identify fishing vs. non-fishing VMS polls. Can probably translate VMS data into a map. Reminder that we don't have VMS data for lobster, and they are not observed at high rates. Might have approached this differently if the focus was the trawl fishery, but the trap fishery is more data poor. VMS data on portal indicates not much fishing deeper than 100 fathoms – doesn't seem to match the comments we are getting here.

Lots of the data we have are regional scale – effort is concentrated spatially and these are minor fishing grounds compared to the region overall. May still be a key area for the subset of the fleet that fishes there.

Also, think about historical data. Example monkfish – recently shows little effort in canyons. But go back to when category F trip limit was higher, there was more fishing in deep parts of canyons – 300 fathoms.

Uncomfortable about portal – need to use their disclaimers if we use their data. Example, evidence for scalloping in deep waters. Also butterflyfish was quota limited until recently but

fishery has grown. Now more butterfly fishing to 150 fathoms. Tilefish GRAs have also precluding fishing,

Canyons within Northeast Canyons and Seamounts Marine National Monument

Oceanographer

One of the largest, best explored – historical coral records even in deep areas – early 1980s. Occurrence of *Lophelia* noteworthy, not common in New England. Recent coral survey activity in Gilbert Canyon, less so in Lydonia/Oceanographer Canyons. The Council was asked how they wanted to handle overlap between monument and coral amendment, wanted to keep looking at these alternatives regardless of existence of monument. No action in this canyon includes closures, so there is less effort in this area than there might be absent such regulations.

Filebottom

Discrete zone boundary is closer to 400 meters.

Chebacco

Similar to Filebottom.

Gilbert

Noteworthy in terms of coral abundance, lots of recent effort. 600-800 meters dive, high abundance soft corals. Deeper areas of canyon have other taxa.

Lydonia

Little recent coral data, previously well studied. Also corals are diverse – 15 spp on recent dive, 1100-1200 meters.

Comments – move to 550 for lobster. Concern that points might go shallower in some areas due to simplification of straight lines. To follow up – would be useful to actually discuss that separately. Applies to all canyons.

Emphasized existence of Tilefish GRAs and monkfish/squid closures. Inferring limited revenue in these areas – can assume these areas would be fished similarly to other canyons if they were open to fishing.

Comment/question – if the Council approves the amendment with 550 line, monkfish and tilefish closures would remain? Yes, that's the assumption. Joint plan and MAFMC plan, respectively. Monkfish areas are about coral conservation. Tilefish GRAs are based on distribution of tilefish burrow habitat and are shallower to accommodate this objective. So MAFMC may want to keep tilefish areas regardless. Norfolk Canyon coral zone off Virginia was set equal to tilefish GRA boundary.

Monument is closed to all gears. Reminder about monument boundary. Could implement trap restrictions sooner, but if outside trap fishing areas then materially the same as having the monument – i.e. no additional impact of coral zones.

Eastern canyons

Seems that these areas are more fished for squid and whiting than others. Some areas quite noteworthy in terms of coral diversity.

- Powell – mid-deep tows- high diversity. Localized abundance high.
- Slope area between Powell and Munson Canyons at 500 meters – corals rare.
- Deeper intercanyon site with diverse corals.
- All areas seem to have variability lower to higher abundance of corals. Sometimes varies by depth.
- Munson tows indicate diverse corals across many depths.
- Nygren higher diversity found vs. Munson

Powell

Suggested change some specific boundary points to change the shape of the coral zone in particular locations. Not a big area but critical. Gear fished on both sides of canyon. Very narrow. Clay bottom in some areas – at 900 meters the real characteristics of canyon evident.

Munson

Shallow dive with 550 meters minimum depth during the dive had a range of corals. Could figure out where along dive corals are observed – seem to have diverse corals but not sure what depths.

Made specific boundary adjustments for Munson.

Note that a straight line with an average depth of 550 is different than a straight line with a minimum depth of 550. Takeaway – subtle difference between minimum 550 approach vs. how areas were initially drawn by PDT. For those who don't understand lobster traps, closing even a small area would displace maybe 8 to 10 trawls (lines of traps). Where does this effort go? Can't go north/shallower – run into whiting trawl fishery. Lobster gear fished along these contours all up and down the bank.

Each canyon dive is different – can we display that somehow on the maps? Also show point data. PDT has struggled with how to interpret the data from these dives. With the Tow Cam dives, the intent is to calculate percent of photos with different types of corals. Can try to provide more nuance on maps.

Nygren Canyon

High coral diversity – large number species observed, even relative to Munson Canyon. Mix of shallow and deep dives – 700-900 meters mix of sediment types and diverse coral fauna.

Unnamed canyon between Nygren and Heezen

Shallower dive 500-800 meters, diverse habitat types, various coral types. Dig into further.

Heezen Canyon

Has been well sampled historically; a few recent dives here in 2013. One deep, various coral types and all major groups, shallower portion 700-900 meters very large soft coral colonies, and other types of animals. 2014 sampling as well – locally abundant especially on vertical walls, but lower diversity vs. Nygren, Munson. Very large colonies, some in moderate depths.

Suggested moving boundary out to 550 for all three canyons.

General comments

Bachman: NOAA strategic plan for how to apply discretionary provisions. What do you do in areas where you think corals occur but aren't certain, vs. areas where there is more certainty? What to do with areas of canyon where corals are known to occur in shallower waters? Be more conservative in these specific locations? Strategic plan suggests considering certain actions when corals are known, or waiting for more data when appropriate.

Noted rarity of undisturbed corals at shallow depths. Particularly important to protect these areas as they are most threatened.

Have we decided what percentage of coral data to encompass? Suggest soft corals and sponges should be treated differently vs. slower growing corals (although soft corals are slow growing). Need to come up with some thresholds. Could argue there are rare habitats in shallow waters.

Similar to EFH amendment conversation – what percentage of corals should be protected? Don't have the data to be able to do this. Can put percentages on the suitability model but the outputs are bit coarse resolution. (And the hard coral models aren't that useful and there are no black coral models.) Can't assess what percentage of fishing activity we are encompassing. Some species of corals occur shallower vs. deeper; also there are associations between coral and other taxa. Corals in deep water may not be equal ecologically to corals in shallow waters.

Not talking about sea pens, talking about large colonies of structure forming soft corals.

Another question – how complicated can we make the boundary? Seems to be a willingness to deal with a complex boundary in order to accommodate where gear is set. Can try to simplify a bit, perhaps more tolerant on deeper side. Stuck with at least some complexity to be fairly precise.

Feels like from the fishermen's side the idea of a depth boundary is pretty easy, almost easier than following a line, because depth soundings are readily available at sea. That's sort of a question, but that's my sense. Not sure about enforcement.

I remember a long time ago in a discussion of depth as a control factor, could be done with technologies that monitor depth. But if there is a continuous data recorder, could assess if a vessel is routinely violating that contour. Requires new tools.

Depth would be easier. Sets are parallel. Could be 2.5 microseconds from a trawler east to west, further north to south. From our point of view depth is doable. Don't venture beyond these depths because there is nothing there (in terms of target species).

Mid-Atlantic Council – on the issue of depth vs. a line need to put some series of coordinates in the regulations. Too ambiguous. Prefer simple, but will work with them as long as enforceable.

End lines are 1700 meters long. Location of fishing gear vs. the location of the boat are two different things. Need a serious buffer if you are managing where the vessel is.

Gets to one of the questions I wanted to ask – how will lines be enforced? Gear on the bottom or vessel location? Has Coast Guard given guidance on this? Will be over the coral zone almost immediately.

MAFMC was told can only enforce where the vessel is – don't know where the gear is. MAMFC lines were drawn accordingly to accommodate the fact that the vessel and the gear are a bit apart.

Discussion earlier today was depth where gears are set. In setting the gear, vessel may need to be deeper than that. MAFMC talked about a depth logger requirement. Wasn't clear to Council how it would be used – enforcement tool, or just required to have it? So, the Council dropped from amendment. Intent is no vessel can have gear on the bottom, but not how the regulations are written.

In practice, vessels can transit the Mid-Atlantic coral zone. When doing so, gear needs to be on the reel, but don't need to cover it and completely stow it. Leads to some issues, frequency of pings within area may be tricky for enforcement.

The zone boundaries at the various depths are close to each other in terms of distance over ground and gear may be very long. What do we need from an enforcement perspective to really protect these areas?

To follow up, Council could designate an area and intent is that you are not fishing on bottom here, but we can't enforce to the edge of it. Enforceable is gear on the boat, but only if a Coast Guard cutter is out there looking. Can enforce vessel in/out of area remotely with pings. MAMFC recognized these types of challenges when they enacted their areas.

Recap – have a common understanding of industry interests, points of dispute/pressure. General thoughts before we move on?

Intent is that there will be points at 550 line in earlier canyons? Yes – will make sure that is done.

Getting back to the discussion about contours/enforceability. Do we have the information we need? What is a reasonable buffer? Not sure I heard that. Heard there needs to be a buffer but not explicitly stated.

I guess there is maybe a couple ways to think about it – go with 550, no buffer, and assume there is an operational buffer, and area can't be enforced near the edge. Or a more deliberate approach. 550 line accommodates gear, plus additional space for vessels. Either way, what is that distance? How might it vary by location? Distance at sea surface but this will cover more or less depth depending on steepness of area? If a vessel is trying to fish right up to the line, where will the boat be?

Industry should think about this issue between now and Committee meeting. I.e., what is deepest possible depth you might be hauling back in a high relief canyon?

Based on this, should the line be at 600 meters? Alternative in document for 600 meter zone falls between 550 and 650 meter contour. Goes no shallower than 550 and seems to meet objectives of this group. But targeting 600. Maybe can tighten this up if people are willing to go right to this line.

Make 600 meter line (actual contour) the buffer? Enforceability – gear conflicts in Veatch, Block, Hydrographer. Find out how this depth-based enforcement works – now a Coast Guard regulation? Does it cover all areas along the slope? Not sure – 120 fa, 150 fa depending on area?

Other issues discussed

Transit provisions – are these really what is needed? Vessels may transit if gear is out of the water. This could pose a problem if vessels are within the zone, even if there gear is deployed and is outside the zone.

Gear stowage – traps are either on the boat, or in the water, or in the process of being set or hauled. Regulations were written for squid. Maybe should revise to describe how it would apply to fixed gear.

Gillnets were considered when writing this transit provision – they are often piled on deck. Transiting canyon happens quickly don't want to have to take the doors off.

What's wrong with idea of gear not deployed? Maybe it's clear enough. But some vessels might have some gear deployed legally and be transiting.

Issue with gear deployed – if we are setting south to north, we would throw the highflyer and then it would be outside the zone with elements of the gear, even if anchors or traps are inside the zone.

Portsmouth, NH workshop

Attendees

Terry Alexander – Squid/groundfish/monkfish commercial fishery (Habitat Committee)
Michelle Bachman – NEFMC staff (Habitat PDT)
Peter Begley – Jonah crab/lobster commercial fishery
David Borden – Atlantic Offshore Lobstermen's Asso., Jonah crab/lobster commercial fishery
(Habitat Committee)
John Bullard – NOAA GARFO
Todd Ellis – Jonah crab/lobster commercial fishery
Elizabeth Etrie – Northeast Sector Service Network, Monkfish/Groundfish (Habitat Committee)
Rachel Feeney – NEFMC staff (Habitat PDT)
Travis Ford – NOAA GARFO (Habitat PDT)
Douglas Grout – New Hampshire Dept. of Fish and Game (Habitat Committee)
Heidi Henninger – Atlantic Offshore Lobstermen's Asso.
Chris Kellogg – NEFMC staff
Renee King – NOAA Habitat Conservation Division
Ben Martens – Maine Coast Fishermen's Association (Habitat AP)
Grant Moore – Jonah crab/lobster commercial fishery, Atlantic Offshore Lobstermen's Asso.
Jackie Odell – Northeast Seafood Coalition, groundfish commercial fishery
Jim Odlin – Groundfish commercial fishery
John Quinn – University of Massachusetts School of Law (Habitat Committee)
Charlie Raymond – Jonah crab/lobster commercial fishery
Eric Reid – Seafreeze, Ltd. (Habitat Committee)
Bill Semrau – NOAA GARFO
Jon Shafmaster – Jonah crab/lobster commercial fishery

Burton Shank – NOAA Northeast Fishery Science Center
Peter Shelley – Conservation Law Foundation
Geoffrey Smith – The Nature Conservancy
Melissa Smith – Maine Dept. of Marine Resources
David Stevenson – NOAA GARFO
Terry Stockwell – Maine Dept. of Marine Resources (Habitat Committee)
Carl Wilson – Maine Dept. of Marine Resources (Habitat PDT)

Introduction

Dr. John Quinn facilitated the discussion. His introduction was similar the one provided in New Bedford (see page 4). He emphasized that the workshops go above and beyond traditional public meetings (Committee, Advisory Panel) to gather additional input in a more informal setting. Three types of feedback were requested. First, the Council wants to understand fishing grounds and practices, especially given that we have fewer data for the lobster fishery than others (no VMS, fewer observed trips, <100% VTR). Second, we want you to give feedback on PDT/Council proposals in a way that helps us balance coral protection and fishing opportunities. Third, we want to understand any operational issues that might affect how you fish near a coral closure. He emphasized that the Mid-Atlantic coral amendment did not explicitly consider or analyze restricting the lobster fishery, based on NMFS guidance available to them during the initial development of their amendment.

Council staff presentation

Ms. Bachman gave a presentation for background, similar to the one provided in New Bedford (see page 5). Gulf of Maine corals typically between 150-250 meters, fewer species than in canyons (which have a much larger range of depths). The stony corals of the Gulf of Maine are generally found in shallower depths. Sea pens are particularly common in the Gulf of Maine, and found in soft sediment areas including the basins such as Wilkinson Basin. Black corals are not known to occur in the Gulf of Maine. Thus, soft corals vs. sea pens, stony corals, or black corals are the particular conservation focus of the Gulf of Maine management areas.

In response to an earlier question, Ms. Bachman noted that the authority cited in the Council's problem statement is the discretionary §303(b) authority. While the discretionary authority provides a more flexible mechanism for designating coral zones vs. the essential fish habitat provisions that required Councils to minimize adverse effects of EFH, both authorities are relevant in the Gulf of Maine, given the managed fishes occur throughout the Gulf of Maine coral zones and use these areas as habitat.

The Gulf of Maine zones include Outer Schoodic Ridge and Mt. Desert Rock inshore, and five offshore areas, four in Jordan Basin and one in Georges Basin. The offshore areas were the focus of the Portsmouth workshop (see page 3). In addition to the offshore boundaries the Council has formally asked the PDT to analyze, the Committee suggested some alternate boundaries in February. Both sets of areas were presented to the group.

In terms of coral data, much of the information we have for the Gulf of Maine zones is from recent (since 2003, mostly since 2013) remotely operated vehicle and towed camera data.

The presentation also included an overview of revenue (by gear type and species), trips by gear type, and permits by gear type associated with the offshore zones in each basin. Bottom trawl and lobster pots are the dominant gear types used in both locations.

Discussion

Again, Dr. Quinn emphasized that the workshop was intended to be part fact-finding, part consensus building opportunity, and that there is a difference between what we are doing here and what was done in the Mid-Atlantic. The lobster fishery was not part of the Mid-Atlantic process, and here they are an integral part of the discussion.

Questions – when I see pictures and see presence of corals – how do we know fishing is damaging these areas if we have been fishing there for a long time? Answer – inference based on research from other parts of the world where gear is known to impact corals. These areas are open to fishing. Are coral habitats specifically unfished? Do you fish around the corals and are avoided? Are the corals naturally resilient?

We fish extensively in these areas, so it isn't avoidance. Would guess they are more resilient to trawling than you think. Perhaps should be considering gear options – using rollers in these area currently. Would bigger rollers help? We don't know enough about the extent to which damage is actually occurring. Don't know enough about cost – numbers (potentially displaced revenues) seem low.

Roller gear measures are not in the amendment now, but could be, perhaps. We had these conversations [about using larger rollers or rollers along the sweep to raise it up) during development of the habitat amendment. In terms of economic impact, perhaps we can ground truth some of the data to figure out whether the numbers of vessels, etc. are squaring with people's experience.

Images from recent coral scientific cruises show trawl tracks through coral areas at Lindenkohl, with no corals growing on the exposed seafloor around trawl marks, with corals only in the crevices. Common sense that trawling would affect corals.

How has effort changed? In Lobster Conservation and Management Area 1 effort/landings are increasing.

Another participant agreed that revenue numbers are low. Two vessels that fish in these areas pretty much exclusively. They are trying to avoid flounders and cod. The revenue listed would not support those vessels. Talking about accountability measures that are going to further drive effort to these areas.

There was a lengthy discussion of VMS data. Data question – did we use VMS data? Yes – to estimate hours fished but only for certain gears, not for lobster fishery. A question we can answer is whether hours fished with VMS aligns well with VTR results. We can also look at observer data.

The group examined maps of the estimated distribution of fishing effort/revenue generation. These are based on VTR data, assuming effort is distributed around the reported point. Where are the hotspots on these figures? Do they seem to be in the right place? If they reflect true hotspots, results of the analysis should be reasonable, but if they don't, the analysis will be off. Are Lindenkohl boundaries (large and small) reasonable?

At Lindenkohl site, gillnets are used mostly in the eastern part, sometimes the western part. The 99 Fathom Bump is probably the main trawling area. Lobster activity throughout. Hague Line to the west, and below the knoll for lobster. Do most vessels submit trip reports?

Jordan Basin – revenue is mostly not centered on Jordan Basin. The basin straddles some statistical areas, which may make it harder to develop reliable revenue estimates. For LCMA 3, at least 75% percent of vessels submit VTRs, so most of these vessels should be submitting a VTR. Can scale the magnitude of revenue based on vessels that don't submit VTRs, but if estimating fishing locations are wrong that will be affecting the analysis.

If they just put the one set of coordinates on a VTR that's the location we would show on an effort/revenue map? Yes – although model assumes effort is spread out around the point. Could have two sources of error: point could be wrong, or effort is estimated to be more or less diffuse from reported point than it actually is. Staff noted that the lobster model is based on a comparison of observed fishing with trawl gear, as there is little observer effort in the lobster fishery.

A participant observed that we are fishing in small and discrete patches. Problematic to assume fishing is spread out evenly from the reported point when effort is in fact aggregated. Maybe there is a scale issue between the fishing effort data and the coral data?

Is the VTR data showing there is limited revenue in Jordan Basin from lobster industry? Yes. Staff asked, how can we ground truth? What's a reasonable revenue per square mile that we can check? What magnitude of revenue per trip is reasonable? We can assume that any gillnet/lobster/trawl data for these areas are real, and species are legitimate. Surprised there is not more revenue from Canadian line.

Jordan Basin 118 Fathom Bump area – 8 or 9 trawls of traps set here, northern 96 to southern 96 to whale. Gear spread between areas during a trip. A single point doesn't cover the trip, and the trip report revenue should perhaps be inferred over a wider area. Length of a trawls is similar to canyons (1 mile).

Gillnet hotspots seem to be accurate. What is different about 96 fathom? Fishing for pollock and redfish.

Are some areas avoided based on habitat type? Very heavy coral hard bottom is avoided for lobster. How does that work for trawls? Probably if rigged the right way would tow over them. But can't tow over lobster gear. Gillnets would be set on top. Very light monofilament. Corals could damage the gear. Lobster fishery is here in the winter, mostly. Do patterns of effort in trawl fishery change when there are fewer lobster pots? Seasonal lobster agreement does not include Lindenkohl. Two industries co-exist year round, a bit less so in the summer when lobster fishery shifts to GB. Can alternatives be modified to protect corals and avoid impacts to fishing? Cannot entirely avoid impacts to fishing. If you make the coral zones smaller, you would of course reduce impacts. Depth-based canyon zones would have clear consequences in the canyons, but this is less clear here. Hard to predict effects of just shrinking the areas. Not sure how you would ever not affect the lobster fishery. When we started this I thought we would limit this to mobile bottom tending gear fishery. Lobsters are in the places where we want to manage. Other than an exemption? Is there a way to design these areas to be acceptable to trawl fishery?

Well, committee modifications are the best we can do. Not doing damage if they have been there for 25+ years. This goes beyond freezing the footprint.

How far away would a vessel be from the gear on the bottom? In 114 fathoms 350-375 fathoms of wire, lose 700 ft of depth. Could be ¼ to 1/3 of a mile away from a net on the bottom. Would have to set in the area and tow out of it. Have to base area on where the boat is, not where the gear is. Takes a long time to get the gear to the bottom. Red crab example – end lines with 1700 meters of line. Along the shelf break, industry agreement about depth of footprint (aside from red crab) coalesced around 550 meters, but suggested setting boundary at 600 meters to have a buffer that would accommodate fishing.

Can you fish up to the edge of a 1 mile box around 118 fathom bump? Or does it create a buffer? Would set up so we would be fishing right along the edge. The way a lobster trap fishes is very different – could imposing closures affect the catchability of traps set nearby? Maybe. There are concentrated ‘sweet spots’ and if you miss those (due to an area closure) there would be losses.

Are lobster fishing locations over time consistent and repeatable by individual? Yes. So, areas could have asymmetric impacts. Lobstermen try to stay away from each other. Entire fleet has their own specific grounds. Question – following New Bedford recommendation did we look at what 550 meters looks like in the GOM? Staff responded that it doesn’t apply – there are no areas of the GOM that deep.

Final comments – question about corals – what is the connectivity between canyons and the northeast channel, etc.? Connectivity has been examined through genetic studies, and there are links between areas. Are there Canadian closures? Yes – there is one in the northeast channel.³ The same species of corals found in the GOM occur at deeper depths in the canyons.

Next steps

Two sets of Habitat Committee and Council meetings are planned for April and June to identify preferred alternatives and take final action on the amendment, respectively. Habitat Committee meetings are held prior to Council meetings because the Committee serves as an advisory body to the full Council. The full Council recommends management plan amendments to NOAA NMFS.

During the April meetings, the Committee and Council will review and consider the information provided during the workshops. In between the two sets of meetings, the Council plans to hold public hearings on the draft amendment. These will be conducted throughout the region, in locations convenient to potentially affected stakeholders. One hearing will likely be held online through a webinar. Comments provided during the public hearings will be reviewed by the Committee and Council in June. The Habitat Advisory Panel may also be convened prior to the June Committee meeting.

Materials provided at the workshops

- Summary presentation (tailored to each workshop)
- Coral Amendment and Environmental Assessment (March 10 draft)
- Map books (tailored to each workshop)

³ <http://www.inter.dfo-mpo.gc.ca/Maritimes/Oceans/OCMD/Coral/Conservation-Measures>

- Coral Amendment GIS data sources summary

Lobster gear restricted areas

GEAR RESTRICTED AREAS (§ 697.23)

There are four restricted areas that are alternatively closed to either trap or mobile gear on a seasonal basis. These areas were agreed upon by the mobile gear and trap fishers to reduce gear conflicts. These areas run west to east along the 50 fathom contours, south of Rhode Island. Refer to the map below for geographical reference. See Table 3 for seasonal closures.

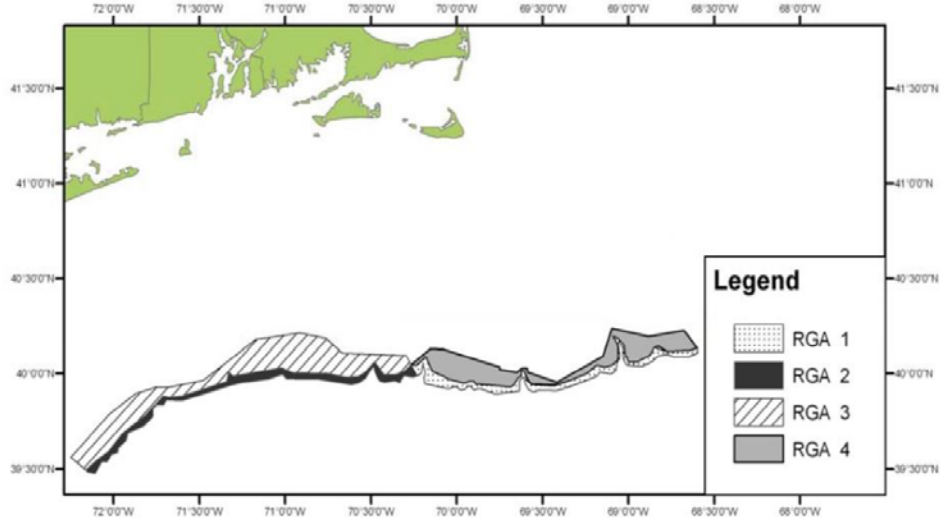


Table 3: Summary of Gear Restricted Areas

Restricted Gear Area	Area Closed to Mobile Gear	Area Closed to Lobster Fixed Gear
I	October 1 st – June 15 th	June 16 th – September 30 th
II	November 27 th – June 15 th	June 16 th – November 26 th
III	June 16 th – November 26 th	January 1 st – April 30 th
IV	June 16 th – September 30 th	N/A

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