



## New England Fishery Management Council

50 WATER STREET | NEWBURYPORT, MASSACHUSETTS 01950 | PHONE 978 465 0492 | FAX 978 465 3116

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

## MEETING SUMMARY

### **Habitat Plan Development Team**

August 13, 2018

The Habitat PDT met via conference call to discuss the Clam Dredge Framework.

#### ***Meeting attendance***

PDT members included Michelle Bachman (Chair), Jessica Coakley, Geret DePiper, Julia Livermore, Dave Packer, Doug Potts, David Stevenson, Peter Auster, Rachel Feeney, Marianne Ferguson, Kathryn Ford, and Carl Wilson. Chris Quartararo (Council staff) and Alison Verkade (GARFO Habitat Conservation Division) also participated in the meeting. Audience members included Mark Rynasiewicz, Melissa Smith, Allison Lorenc, Daniel Cohen, George Lapointe, Domenic Santoro, and Erica Fuller.

#### ***Discuss status of proposals received from fishing industry for the clam dredge framework***

The Council met on June 14 and remanded the framework alternatives back to the Committee for additional work, over concerns that the range developed at the May Committee meeting might not meet the objectives of the action. Staff wrote to various industry members and advised that they submit alternatives by early August, and while there has been correspondence back and forth no specific proposals had been received at the time of the call. Ms. Bachman highlighted the map of fine-scale gridded Vessel Monitoring System data that was provided to the clam industry. Clam industry members have indicated that they intend to narrowly bound their fishing grounds when defining potential alternatives, because they don't want to lose access to productive areas just because boundaries are simplified/squared off. They have been working with NOAA Office of Law Enforcement staff to implement more frequent polling which could allow enforcement of irregular boundaries/smaller areas. Council staff (Ms. Bachman, Dr. Feeney) will be meeting with clam industry members in New Bedford later in the week.

In terms of mussel dredge exemption areas, Mr. Santoro was interested in obtaining an Exempted Fishing Permit (EFP) to gain access to the HMA to identify where mussel beds are located and their spatial extent. Mr. Santoro as well as individuals involved in the mussel fishery in the 1980s and 1990s have identified some mussel bed locations; Mussels were also captured in large numbers at a handful of stations in the August 2017 industry-based clam survey. Staff will work with Mr. Santoro to identify an exemption area alternative based on these bed locations and other data, including benthic habitat data.

Of the existing mussel bed locations, Mr. Santoro commented that he fished some of these beds himself and others were based on catches in clam dredges and gillnets. He regretted not doing more exploratory fishing in the area, but he was unaware until January that the area was going to be closed to MBTG. The purpose of the EFP would be to explore where fishing grounds occur, and hopefully identify beds in areas that avoid complex. The Greater Atlantic Regional Office is looking for feedback from the council on the EFP, specifically whether it would make sense to co-locate clam dredge exemptions and mussel dredging under an EFP. The Council can also comment with any concerns about whether mussel dredging exemptions are consistent with the objectives of this framework or the underlying habitat amendment. Ms. Bachman reminded the group that the Council did note explicitly in the Omnibus Habitat Amendment that habitat-related research should be allowed, or at least considered, in habitat management areas, even if conducted with gears that might otherwise be prohibited due to regulations associated with the HMA. However, a project aimed towards facilitating fishery development is something different.

*Literature on gear effects of mussel dredges; ecological role of mussels*

Dr. Stevenson described what he viewed as the more important publications on the importance of shellfish as habitat. He commented the ecological role of mussels is well documented, and that the removal of mussels constitutes a removal of habitat. While there are other effects of mussel dredging, he viewed the removal of mussels as the primary concern in the context of mussel dredge exemptions in an HMA. The Atlantic State Marine Fisheries Commission conducted a review of the function of shellfish beds as habitats (Coen and Grizzle 2007) which provides a concise summary of their ecological role. Monterey Bay Seafood Watch has evaluated the sustainability of the mussel fishery, but only for hand dredges and other hand implements. The gear was scored as having a relatively low impact. Research on the Danish mussel dredge fishery has contributed a substantial body of literature on mussel fishery impacts. Dolmer et al. (2001) looked at short term impacts related to species composition in the dredged area. They noted some effects but did not return to the beds beyond 40 days post-dredging. Dolmer (2002) looked at impacts over a longer period. Dr. Stevenson acknowledged a recent paper on the impacts of beam trawling and scallop dredging to horse mussel reefs (Cook et al 2013) but commented that this study was not relevant to blue mussel dredging on Nantucket Shoals because the species are different.

Ms. Bachman asked how applicable the Danish studies might be to mussel dredges on Nantucket Shoals as they referenced the use of toothed dredges. The intent here (and what is used in the Cape Cod Bay fishery) would be to use dredges similar to a small New Bedford scallop drag, without teeth. Mr. Santoro noted this was correct, and they conduct very short (~1 min) tows. Dr. Ford asked if there are limits on how many mussels can be harvested annually; Ms. Bachman was not aware of any limits, although there is certainly going to be a practical limit in terms of the number of bushels that a vessel of a given size can carry. Ms. Verkade commented that some of the effects documented in the Danish literature were related to the epifauna that live amongst the mussels, such that whether a toothed or toothless dredge was used wouldn't really matter, and it was more about removal of the mussels themselves. Thinking about the concept in OHA2 that we were aiming to maintain habitat function, Ms. Bachman asked if any of the literature addressed the amount of dredging in a bed relative to the size of the bed and density of mussels in the bed. This could give us a sense for whether a certain intensity of fishing might have minimal impacts. PDT members were not aware of any studies that directly addressed that

## FINAL

question, but the Dolmer et al. (2001) paper suggested that reducing mussel density in a bed did not increase the accumulation of biomass in remaining mussels. Dr. Auster noted that horse mussels do have density dependent population dynamics. Mr. Quartararo circled back to the finding of the Dolmer et al 2001 paper that changing the density of the bed did not increase biomass accumulation in the mussels remaining. The authors suggested that the filtration efficiency of the bed declined when the bed was fished. In addition, there appears to be a ceiling on the filtration rate of the bed, and limited removals may not have an effect on filtration rate. The larger concern appears to be reduction in structure of the beds.

Dr. Stevenson asked if mussels are declining in Massachusetts (as seems to be the case in Maine). Dr. Ford commented that she didn't know but didn't think they had the data to say one way or the other. Dr. Auster commented that in Long Island sound, they have seen shifts from *Mytilus edulis* to *Crepidula fornicata* dominated habitats, which could be linked to phytoplankton size distribution, as *Crepidula* are more competitive feeding for small phytoplankton. Dr. Stevenson commented that declines in Maine are attributed to green crab predation. Dr. Ford noted that there are some areas off Massachusetts where *Crepidula* are quite abundant, including evidence of historical occupation (*Crepidula* beaches), and how the two species trade off is not really known. Dr. Auster commented that he would share some additional papers on the ecological functions of bivalves.

Ms. Bachman asked the group if they could articulate whether the effects of mussel dredging were likely to be adverse (more than minimal/not temporary), since the Committee might ask this question. Dr. Stevenson commented that this situation is not "normal" (i.e. carries a higher burden of proof?) because the desire is to allow mussel dredging in an area designated as an HMA. He wondered if the Council might be more comfortable with allowing mussel dredging in an area where clam dredges were also exempt, vs. allowing mussel dredging in an additional area of the HMA. Ms. Bachman wondered if the intensity and amount of mussel dredging mattered? What if a mussel dredge exemption area were limited in spatial extent, relative to the size of the HMA? Dr. Stevenson suggested that any removal of mussels would be an adverse impact given that we are working within an existing HMA. Dr. Ford asked if he was suggesting that the cumulative effects might be acceptable if another fishery (the clam dredge fishery) was already impacting the area. Dr. Ford suggested that you could extend the argument of a fishery resource as habitat to many species – scallops, even fish. They all have an ecological role that could be compromised if removed. Dr. Auster agreed with this but noted that mollusks especially are known to provide important structural elements to the landscape.

Dr. Ford wondered how much protection is enough? Are we trying to avoid impacts on every mussel bed everywhere? She noted that we identified specific HMAs that were determined to provide adequate protection at the scale of the region. Reducing protection within existing designations fails on a logical argument – it has been decided that this HMA is the size needed to provide adequate protection at the scale of the region. Dr. DePiper reminded the group of the caveat that we have been asked to define exemptions within one of these HMAs. Dr. Auster asked what would the timeline be to move the location of the HMA, if we are unable to determine appropriate exemption areas within it? If we are wanting to effectively balance habitat conservation with impacts to fisheries operations that could take a different management area. Dr. Stevenson commented that such a change would require a new action. Ms. Bachman agreed;

## FINAL

we know the scope of this action is exemptions in this HMA as designated, and the timeline is this calendar year with implementation next spring. If the council doesn't get to a set of exemptions that the industry can live with, once this action concludes, that the council discusses initiating another action to better balance other competing issue. Dr. Auster confirmed that these decisions would need to happen sequentially. Ms. Bachman considered that the Council could say that we are just continuing work on this action, but along different lines, with an expansion of the scope. Dr. Ford asked what if we expand areas closed to all fishing? Can we balance impacts that way somehow? The difference in the northeast corner is that it is closed to all gears now.

Dr. DePiper asked how ephemeral mussel beds are. Acknowledging that removal of mussels is removal of habitat, it would help to know if they are transient, or more persistent. Ms. Bachman noted that we do know there were beds on Nantucket Shoals that supported a fishery, and then the fishery stopped in the area, at least in part due to changes to the beds (also due to market factors). Dr. Auster commented that mussels come and go from specific areas, certainly over decadal time frames. In Long Island Sound they have observed 5- to 7-year cycles. Over this period there can be a recruitment events, followed by a period of growth, then senescence, predation, and then the bed is primarily an aggregation of shells. Then there is new recruitment. Of course, smaller recruitment events can be ongoing in a bed. These dynamics are occurring on Nantucket Shoals too. Dr. Ford commented that these dynamics are consistent with the inshore Massachusetts beds as well. Generally, they have observed that mussel beds come and go, and it is hard to get a sense of population over time. However, Dr. Auster noted, mussel beds don't come and go in very short time frames – i.e. these shifts are not annual – so impacts to the beds would be “more than temporary”. Dr. Ford presumed that dynamics of offshore beds such as on Nantucket Shoals and nearshore beds might be somewhat different.

Getting back to the earlier discussion, Ms. Coakley asked of the Committee had expressed interest in redefining the boundaries of the HMA. In this context, what sort of experimental fishing for mussels makes the most sense, from a data-gathering standpoint? Should there be caps on catch, or effort, associated with these investigations? While it would be most efficient to go to known beds, if there is some requirement to search comprehensively, then we would be getting more information to use down the road. Ms. Bachman agreed that something closer to a comprehensive survey of the HMA would be most useful. Dr. Ford asked if fishing was needed to understand mussel distribution. Couldn't we use other tools – photos and video that are less invasive? While these are not non-invasive, they would have less impact. Is there a need to use a dredge to assess whether a bed is commercially viable? Cost could be an issue; certainly, with experimental dredging you could sell the harvest to offset the cost of the project.

Dr. Stevenson asked if our task to provide feedback to the committee about mussel dredge exemption alternatives? Ms. Bachman commented that we can provide information on their ecological role and gear effects. She assumed the Committee's question would along the lines of, does the PDT have an opinion on the use of mussel dredges in the HMA and does the gear have adverse impacts on EFH that are more than minimal and not temporary? Is there an amount of fishing that is consistent with the underlying purpose of the management area? Is there some fishing that won't irretrievably harm the HMA, and if so how much? They could ask the same questions about clam dredging? How much is too much? What is acceptable? I think that's kind

## FINAL

of what they want to know. Obviously not a clear answer. Dr. Stevenson countered that there really is; if it's complex habitat then no amount of dredging is acceptable. If it's less complex (to be defined, acceptably where impacts are more minimal) than council may want to create exemptions there, and it will be up to NMFS to determine if the action is approvable or not. We should consider if a mussel dredge exemption area might be spatially consistent with a clam dredge exemption area although the effects of the two gears are different. Ms. Bachman asked if that presumes that there is a clam dredge exemption area that has acceptable impacts, such that any mussel dredging within the area would be okay? Dr. Stevenson said maybe, but that he didn't think the council should consider a mussel exemption unless it's overlaid with a clam exemption.

Dr. Auster asked didn't we already show that a clam exemption area would occur in locations with complex habitat? I think that the conundrum is that we are going through these exercises, and rightly so to exhaust logic and possibilities, but at some point if there is no "ah ha" moment, our report is going to be that we can't do this with the logic that the EFH final rule requires. So, what are the next logical steps? Mr. Verkade responded that even if we do define an area for a clam dredge exemption area in mobile sand, non-complex habitat, mussel dredging, because it removes mussels, removes complex habitat within that area.

Ms. Bachman attempted to recap the group's progress so far, noting that we can summarize some of the pertinent facets of the discussion with regard to mussel beds, but otherwise we are not saying anything new. It probably doesn't make a whole lot of sense to speculate what alternatives will look like – we need to await what the industry provides and then see what the Committee's feedback is and go from there in terms of analysis. We can reiterate concerns about the underlying purpose of HMA, and the effects of the gears, and the alignment of fishing with complex habitat, but not hearing anything new here. May want to just wait for the Committee discussion. Ms. Coakley asked if NMFS planned to weigh in at the Committee meeting to indicate if those areas of activity overlap with areas that NMFS considers would result in minimal and temporary impacts? If the answer is no, then why continue down this path, and what are our other options? What are the other options that NFMS has in mind to mitigate impacts? Ms. Bachman clarified, habitat or economic impacts? Ms. Coakley continued that NMFS seems interested in mitigating habitat impacts; what options are there other than redrawing the HMA boundary? Ms. Bachman replied that what we are trying to do is define gear exemptions within the HMA. If we are finding ourselves unable to do that effectively, we might need to discontinue the framework and initiate a new one with a different scope, or we might need to reset this one in terms of the scope. But if we change the scope to affect other fisheries (i.e. consider shifting the location of the HMA), the Committee is very concerned that we take a step back and ensure that those parties are involved in this action. If we can't get something feasible in the short term, we maybe should reset what we are trying to do.

The immediate question is what else can we provide to support the Committee discussion in a couple of weeks. We have already put a lot of information out there in terms of habitat maps, image analysis results; is there anything that we can repackage? I would like to go into committee meeting feeling that we have at least provided some tools to help them understand what is going on. Are there other ways to present any of this information? What else can we give them as tools to understand tradeoffs and costs?

## FINAL

Dr. Stevenson suggested that we should make the point to industry members that in order for there to be access areas for clam or mussel dredging, they need to be located in areas of less vulnerable habitat. Ms. Bachman asked is this really so black and white? The other framing is that the Council is conceptually interested in providing access but wants that to be done in a way that has as minimal impacts as possible. Dr. Stevenson asked if fewer but still adverse impacts was really consistent with the problem statement.

The PDT revisited the problem statement for the action. Dr. Stevenson emphasized that we are working to minimize adverse effects of fishing on habitat, and Ms. Bachman emphasized it included the language to the extent practicable. Her read was that council can authorize exemptions that have adverse effects, but that it needs to keep underlying amendment in mind. Dr. Stevenson argued that the Council needs to look at the habitat amendment itself, not just the problem statement. Ms. Bachman countered that this is the problem statement the Committee developed and the Council agreed to, with NMFS participation. Dr. Ford asked if it was too simplistic to say that we are trying to find areas they can fish without causing too much damage? Perhaps not, but how much is too much? Is it the amount of habitat exposed? Amount of fishing activity expected in those areas? What percentage of seabed contact is concerning? Ultimately for both fisheries you are talking about gear that doesn't move very fast, isn't very wide, and conducts short tows. In either fishery there are areas not contacted by the gear.

Dr. Auster suggested that we need to lay out the assumptions that all habitat is not equivalent in terms of use by managed species. The 'how much is too much' evaluation is very subjective. Dr. DePiper asked Dr. Stevenson if he was afraid we are overstepping our remit. Shouldn't we ask the Council what their intent is? None of us are qualified to make that decision.

Dr. Stevenson responded that it bothered him that we are still in a situation where industry thinks the way to define access areas is to do a better job of defining fishing areas. He argued that is the wrong way to approach this – we/they should be identifying areas of less complex habitat that can be fished without jeopardizing the HMA. Dr. DePiper didn't disagree, but commented that the Council has asked us to evaluate exemption areas where fishing occurs, and seems to have decided what their interpretation of the problem is. Dr. Stevenson commented that embedded in the problem statement is the assumption that industry could come forward with access areas consistent with the purpose and need of the habitat amendment.

Ms. Coakley noted that the problem statement does speak to areas currently fished, and that's what fishermen have documented. We have a tremendous amount of habitat data, which is accessible to NMFS. Is there anywhere in the HMA, at this time, where fishing gear can be used consistent with minimizing adverse effects? Has NMFS identified any areas that are feasible? What level of fishing could be allowed in specific areas that has minimal impacts? I don't think we are getting good advice on scale and scope of effort that would minimize effects. Ms. Bachman commented that unfortunately the June Council discussion focused on the range of alternatives as concerning, but the merits of each individually were not discussed, i.e. where did individual proposals fall on the spectrum of very to mildly concerning. She observed that the southwest quadrant scored differently in our analysis related to the others. Dr. Feeney asked didn't the regional administrator say that no combination of options proposed would be

## FINAL

acceptable? She suggested that we can't do much more until we have some clarity on what is acceptable. Mr. Potts said he didn't hear a specific comment that none were acceptable. When the council passed the habitat amendment and signaled this exemption discussion was coming, they said exemptions could be designated in discrete areas that wouldn't adversely affect the habitats in the HMA. The GSC HMA designation is part of the portfolio of areas that minimize effects of fishing on EFH to the extent practicable in the region. To now subdivide an area based on different practicability determinations is challenging. That is the issue NMFS staff are having.

Ms. Bachman asked if the PDT was agreed as to how they were thinking about complex habitat? Have said > 10% cover of pebble/cobble/boulder is complex. But some areas have a greater degree of complexity within that. Is that important? Should we provide information on where these features occur? If we know where they are, does that help? Dr. Auster suggested that this would require assumptions about what is between the sample points. Ms. Bachman commented that she wasn't thinking about interpolation...just providing station locations. Dr. Auster suggested there were two issues. One is scale mismatch between actual dynamics of fishing and habitat, and the data we have available to understand the issues. The other is that this creates a dangerous precedent for other HMAs, where trailing actions whittle down benefits. It is arrangement of habitats in the landscape that is important. OHA2 already explains which features are used by which species. Ms. Bachman suggested that maybe there is nothing we can provide until we see what the industry puts forward, and we need to just continue to have these fairly hideous conversations without any obvious answers. As noted at the PDT's Providence, RI meeting earlier in the spring, there is no easy answer here.

Having said all that, in term so next steps, staff can work with industry members, and then we'll see the Committee's reaction and what they want to recommend. Before the Council meeting we can scope out how we could construct an analysis at least, and go into council meeting with a plan of work and see what they think. We could then meet in person in October. Another option is to meet in person in September and have a dialog with industry then. The Committee wanted to see PDT/industry collaboration. Dr. Stevenson asked is there anything to prevent the PDT from suggesting some alternatives? Ms. Bachman didn't think so. They haven't asked us to do that, but if the intent is to designate areas that are useful as fishing grounds, who are we to define those? Path now is industry says which areas are important to them. I have suggested that they try to prioritize among them if the Council's answer is not all of those areas can be exempted. I think the PDT is better suited to evaluate those areas once they come forward. Not all that useful for us to suggest areas that have minimal impacts if no one wants to fish there. Ms. Verkade reiterated that we should provide guidance that we want them to concentrate on areas that are less complex; i.e. get them to fine tune areas on this basis. The intent was to focus the exemptions on less vulnerable habitat. They are fine tuning in the wrong way – we should be looking at less complex areas where it is still worthwhile for them to fish.

Dr. Feeney commented that previously, the Committee asked us to bring ideas to them. So we did that, and presumably that instruction still holds. We can identify less complex areas and the industry can say within that which locations would be useful for fishing. Ms. Bachman asked do we want to do that at some sort of spatial scale different than quadrant analysis? Dr. Ford submitted that she felt like that's what we did with quadrant analysis (put forward more and less vulnerable areas). Do we now look for lower vulnerability areas within the high effort areas? Ms.

## FINAL

Bachman expressed concern that the PDT would run into a spatial scale/data issue because the areas are so small. She commented that clam fishermen are arguing that they avoid and target certain habitat types, and that in this way they are minimizing effects while fishing on concentrations of clams. Unfortunately we don't have the data (fishing effort or habitat) to document interactions on that scale. Dr. Stevenson didn't disagree, but reiterated Dr. Auster's earlier point that we aren't just trying to protect areas where there are more rocks. It's the whole picture of habitat we should consider.

Ms. Verkade asked how do we know how it is that they are avoiding complex habitats in these areas? How are they determining where those habitats occur? Would be good to discuss. Ms. Bachman responded that she assumed it is partly based on what they see on their sounder, and partly based on repeated tows in same location and seeing what comes up in dredge. learning/experience over time. Seems intuitive that there would be an incentive for avoidance – fishing for rocks has an economic cost.

Ms. Bachman suggested to NMFS staff on the team that if there is guidance that can be provided beyond what was expressed at the June council meeting, that would help.

Mr. Santoro asked if we could see the figure showing the overlap between the GSC HMA and the mussel dredge exemption area. Most of the exemption area is taken up by the HMA. He asked if the PDT talked about the mussel fishery during habitat amendment development. Or only once we brought it up? Some key things talked about today were balancing yield with habitat protection. Easier to shut down mussel harvesting, but I think that would be a mistake. Opportunity to have a fishery that coexists with habitat protection. He referenced a letter from Peter Hanlon, a retired Massachusetts Environmental Police Officer, that the fishery had few issues (e.g. limited bycatch). Would hate to see the fishery shut down. Ms. Bachman responded that the prior existence of the fishery was not something discussed in OHA2, but we did talk about mussels as a structural feature of benthic habitats. We didn't talk about balancing a mussel dredge fishery with habitat protection because that fishery was not on our radar during OHA2 development.

Chris Shriver commented that if there are questions the clam dredge fishery can answer to let them know.

The meeting adjourned at 3:15 p.m.

### ***References***

- Coen L.D. and Grizzle, R. E. (2007). The importance of habitat created by molluscan shellfish to managed species along the Atlantic coast of the United States. Habitat Management Series #8.
- Cook, R., J. M. Fariñas-Franco, F. R. Gell, R. H. F. Holt, T. Holt, C. Lindenbaum, J. S. Porter, R. Seed, L. R. Skates, T. B. Stringell and W. G. Sanderson (2013). "The Substantial First Impact of Bottom Fishing on Rare Biodiversity Hotspots: A Dilemma for Evidence-Based Conservation." PLOS ONE **8**(8): e69904.
- Dolmer, P. (2002). "Mussel dredging: Impacts on epifauna in Limfjorden, Denmark." J. Shellfish Res. **21**(2): 592-538.
- Dolmer, P., T. Kristensen, M. L. Christiansen, M. F. Petersen, P. S. Kristensen and E. Hoffmann (2001). "Short-term impact of blue mussel dredging (*Mytilus edulis* L.) on a benthic community." Hydrobiologia **465**(1): 115-127.



**Table 1 – Follow up items from August 13, 2018 PDT meeting**

<b>Task</b>	<b>Name(s)</b>	<b>Due date</b>
Summarize mussel dredge impacts and mussel's ecological role	Chris Quartararo, Dave Stevenson	ASAP (completed week of August 20)
Add this information to framework document	Michelle Bachman	ASAP