

Great South Channel HAPC Strawman Proposal

Prepared by
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following discussions among a “grassroots” group comprising:

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The participants in this group contributed as individuals, not as representatives of any organizations. While all agreed to work constructively towards a “strawman” proposal, there was no commitment to support or endorse the end product and none should be assumed.

Introduction

During development of Habitat Omnibus Amendment 2, which will amend all Fishery Management Plans of the New England Fishery Management Council (NEFMC), the Council issued a Request for Proposals (RFP) for Habitat Areas of Particular Concern (HAPCs). NEFMC has chosen to define HAPCs as designations based on habitat characteristics, without regard to the management measures which may or may not be applied in each designated area. Delimiting HAPCs is, therefore, a science-based process.

As discussions have continued concerning the proposals received in response to the RFP, there has been broad agreement that there is valuable seabed habitat, of particular concern for various reasons, in the Great South Channel. However, the sole HAPC proposal for that area has not won support from either the NEFMC’s Habitat Plan Development Team (PDT), its Habitat Advisory Panel (AP), or its Habitat Committee. Failing to recognize any HAPC in the Channel would be unsatisfactory but designating the wrong places can lead to closures of prime fishing grounds, while effort is displaced onto more vulnerable bottom, causing a net loss of habitat value. Avoiding the dual loss to both the ocean ecosystem and the fishing industry requires the identification of the area(s) of most valuable or vulnerable habitat for designation as HAPCs. Yet no unit within the NEFMC structure was able to grapple with the task of selecting such an area *de novo*.

A deliberately-disparate “grassroots” group, including environmentalists and people from various fishing sectors, therefore came together to review available data and swiftly sketch out a “strawman” proposal, for further development by the PDT, followed by analysis and presentation to public hearings. It should be understood that this “strawman”

was prepared as an aid to the PDT in developing a more refined HAPC design. It was not intended as, and is not suitable for use as, a finished HAPC alternative for presentation to the public. The limited time available for our work prevented the likely-lengthy process of developing agreement on a finalized proposal by the broad range of participants in our group.

While this “strawman” was developed to fill a specific need within the processes of NEFMC, its development was an entirely private initiative by one group of individuals external to the Council’s members and staff. The resulting proposal is non-exclusive, in the sense that it should receive no more weight than any other which may be placed before the NEFMC Habitat Committee or its PDT by any other members of the public.

Purpose

Our aim has been to delimit a proposed HAPC that includes:

- 1: Most of the best habitat for young-of-the-year cod in the Great South Channel,
- 2: Areas within the Channel that are relatively rich in the cobbles and boulders that are known to be important to young-of-the-year cod, and which form a substrate for development of emergent mega-epibenthos, and
- 3: Areas within the Channel that currently or formerly contained high-productivity epibenthic communities that are vulnerable to the impacts of fishing gears. Among the latter, we have had particular concern for horse-mussel beds which, elsewhere in the Gulf of Maine, have been shown to be exceptionally productive and to support high biodiversity. Recent research has indicated that such beds are particularly vulnerable to the prolonged impacts of on-going fishing with mobile bottom-tending gears.

We also attempted to delimit a single, contiguous area and to adapt that area to adjacent HAPC proposals, particularly one for inshore waters to 20 meters depth and one covering the Stellwagen Marine Sanctuary. We have made no attempt to draw a simple boundary of a few straight lines since HAPC design is explicitly science-based, while the boundaries between real habitat types on the seafloor are never straight.

Development of the Strawman

In Massachusetts waters, young-of-the-year cod are known to be particularly abundant in shallow inshore waters, particularly inside the 20-meter contour in the spring but extending down to perhaps 40 meters by the fall. Field studies in Nova Scotia and Newfoundland, plus laboratory work in New England, have shown that their survival rates are highest on cobble bottoms, even scattered cobbles on sand providing them with partial shelter from some types of predators. It has been suggested that epibenthic growths on the cobbles may further enhance the benefits, for the cod, of the cobbles themselves, though the evidence for that remains equivocal. Our focus was thus on

shallower areas, areas relatively rich in cobbles and boulders and on areas that support macro-epibenthic growths.

No detailed maps of the benthos in the Great South Channel are available but we had access to a map of sea scallop distribution, based on the SMAST drop-video survey and to a map of scalloping effort, derived from Vessel Monitoring System (VMS) data. If allowance is made for area closures and perhaps for some areas too rough to tow dredges, the distribution of effort reflects that of scallops and both serve to identify areas occupied by a “scallop dominated” benthic community. Since scallops typically occupy areas of medium to coarse sand, granules and small pebbles, rather than cobbles, the scallop community can serve as a first indicator of areas in the Channel that should be outside the HAPC.

Inspection of the VMS and drop-video data suggested an eastern boundary for the HAPC running down the 50-meter bathymetric contour along the west side of the Channel, from the back side of Cape Cod to Asia Rip, though there is an area of active scalloping inshore of that contour off Chatham, while the limit is deeper than 50 meters in the extreme south.

The SMAST data also showed that macro-epibenthic sponges are more abundant west of this 50-meter contour, reinforcing its use as the eastern boundary of an HAPC.

The distribution of bottom-longline fishing for cod provides a second indication of habitat type, in as much as cod will most readily take a baited hook lying on the bottom if it is lying on clean stones, preferably amongst a rich epibiota. Some longline captains who work out of the Cape reported their understanding of the seabed, reconfirming reports provided to Professor Madeleine Hall-Arber in 1998 – reports which led the then-Habitat Technical Team to draft an array of polygons within the Channel, which polygons were the areas already proposed and rejected for HAPC designation. We therefore returned to the original chart containing the 1998 reports (graciously provided for our inspection by Prof. Hall-Arber), which shows a series of areas along the length of the Channel, centred on (rather than delimited by) the 50-meter contour.

The value of the 1998 reports had already been questioned by the Habitat AP, since very few fishermen contributed their knowledge at that time, while the project had been a pilot – a trial of a methodology for gathering and mapping fishermen’s knowledge of seabed habitats, not the preparation of a map *per se*. However, the SMAST drop-video survey generates a map of sedimentological data which, while it does not show substrate types, does provide an indication of the relative hardness of the bottom in various areas. For three principal areas, that map provides a remarkably-close corroboration of the 1998 fishermen’s reports and of the Technical Team’s polygons drawn in 1999.

The SMAST data also show the presence of the stalked tunicate, *Boltenia* (the “sea tulip”), below 50 meters depth in the area north of the BB Buoy (i.e. north of 42° 15' North). Recent research in the Bay of Fundy has shown that *Boltenia* is particularly vulnerable to the impacts of prolonged mobile-gear fishing. It is thus indicative of both

vulnerable habitat and areas which have not been subject to prolonged dragging over many years.

The mutually-supporting SMAST sedimentological information and 1998 fishermen's reports, supplemented by the observed distribution of *Boltenia*, necessitated an eastern boundary for the "strawman" HAPC which in some places deviated away from the 50-meter contour to encompass some deeper areas. Conversely, there are other areas between the patches of hard bottom where the SMAST sedimentological map and (off Chatham) the distribution of scalloping effort indicate that habitats of lesser concern extend to the westward of the 50-meter contour.

The above considerations address the eastern boundary of an HAPC stretching down the west side of the Channel and containing much of the habitat that was the focus of our attention. A northern boundary for this HAPC could be developed by extending the area until it was contiguous with the proposed HAPC covering the Stellwagen Sanctuary and the proposed inshore HAPC, extending from the tideline to 20 meters depth.

A western boundary posed more difficulty, since the hard bottom there is interspersed amongst bodies of mobile sand. We had neither a sediment map nor one of VMS records for clam vessels (which would serve as an indicator of sand, their hydraulic dredges being unable to work in any other bottom type). We therefore drew an arbitrary boundary at 69° 30' West, based on verbal reports from the surfclam industry that their vessels rarely work further east. While all parts of this "strawman" proposal require development by the PDT, that western boundary would particularly benefit from further efforts to distinguish areas of sand from those with gravel seabeds.

Throughout this development, we were also conscious of the distribution of EFH in the Channel, particularly the new maps of EFH proposed for use in the Omnibus. We did not, however, strictly confine ourselves to areas proposed as EFH, though the final HAPC must be restricted to areas designated as EFH. Thus, either our "strawman" area will have to be trimmed to match designated EFH or the area of EFH will have to be extended (via the Omnibus) to cover all of the proposed HAPC¹.

Once the various areas of interest were marked on a hydrographic chart, it was left to the present writer to draw in a boundary for the HAPC. Given the need to communicate it to Council staff via e-mail, that boundary was drawn in terms of segments of north-south meridians of longitude, east-west parallels of latitude and metric depth contours (in whole

¹ There is a particular problem with juvenile cod EFH in the South Channel. As currently proposed by the PDT, that EFH will comprise an inshore component (based on the presence of the fish in Massachusetts state surveys) and an offshore component, restricted to a range of depths based on the distribution of juvenile cod across the continental shelf. Those leave an irregular gap in between, where there is hard bottom at depths known to be occupied by young-of-the-year cod in the fall and by older juveniles in the spring. Much of the habitat of greatest concern in the Channel overlies that gap.

tens of metres). Those constraints make for a coarse representation, which awaits refinement by the PDT.

Because of the complexity of data-representation marked on the chart, coupled with the broad width of perspectives amongst the “grassroots” group which we had had no opportunity to reconcile, I was not able to draw a single boundary that fairly captured the interpretations of everyone involved in the process while. Much of the “strawman” is outlined by a single boundary but one extensive portion has two options and another smaller part has three. In addition, the northern termination of the western boundary remains uncertain and the single line offered in the “strawman” can be supplemented by other suggestions.

Strawman Boundary

The “strawman” boundary, advanced for discussion and refinement by the PDT, is as follows (with explanations for various portions italicized):

- 1: Starting at the 20 metre depth contour, due west of Race Point Light (at the extreme tip of Cape Cod)
- 2: Proceed due north to the boundary of the Stellwagen Marine Sanctuary
- 3: Turn generally eastwards and follow the boundary of the Sanctuary to its southeastern tip
- 4: Thence follow 50 meter depth contour southeastwards for a little over a mile to 42° 05' North latitude

Explanation: There are no data on the habitat in this area. There have been very few VMS records of fishing activity in this area. I have included it in the “strawman” to give the Council a future option of linking this South Channel HAPC to the Stellwagen Sanctuary HAPC, if they designate both areas. There would be no reason to designate this area unless both the rest of ours and the Sanctuary are designated but, if they are, the Council should at least have the option of filling in the odd little gap that would otherwise lie between. (If the inshore HAPC eventually ends at 10 meters depth, the contour named as the starting point would have to be changed. The seabed is so steep off Race Point that the change would hardly be noticeable on a chart.)

- 5: Proceed east on 42° 05' North to the 80 meter contour (about 3 miles)
- 6: Follow generally southeast along the 80 meter contour to 41° 52' North
- 7: Turn west on 41° 52' North and proceed to the 40 meter contour (about 2.5 miles)

Explanation: These three segments enclose an area which SMAST mapped as relatively hard and which was reported in 1998 as good for cod fishing with hooked gear. The outer boundary could well be drawn at 75 meters (about 40 fathoms) but the bottom there is steep and for ease of plotting this “strawman” uses 80.

- 8: Proceed generally south and southeast along the 40 metre contour to **EITHER** 41° 42' North **or** 41° 35' North

Explanation: Between 41° 52' North and 41° 35' North there is a scallop ground, indicative of slower water movement and finer sediments, that extends inshore of the 50 meter contour. There is no particular evidence of harder bottom in the area and hence an inward jig to 40 meters seems justified.

CONSERVATIVE OPTION:

- 9A: Proceed east on 41° 35' North to the 80 meter contour (about 9 miles)
- 10A: Turn generally south along the 80 meter contour to 41° 15' North – which is the latitude of the BB Buoy
- 11A: Turn west on 41° 15' North to the 40 meter contour
- 12A: Head generally south on the 40 meter contour to 41° 06' North
- {13A is not used here}

Explanation: The jig outward to 80 meters (which might better be 75 once the boundary is finalized) encloses an area reported in 1998 as containing a mussel bed, "lemons" and other biota. SMAST found the area to be harder bottom and to carry the stalked tunicate Boltenia (the "sea tulip" in some textbooks but perhaps the fishermen's "lemons"?).

The jig inward to 40 meters excludes from the HAPC an area that SMAST found to have relatively fine sediments and which was not particularly emphasized by the hook fishermen in 1998.

EXPANDED OPTION:

- 9B: Proceed east on 41° 42' North to 69° 34' West longitude (about 12.5 miles)
- 10B: Turn due north on 69° 34' West to the 170 meter contour [165 would be better but 170 is used for ease of plotting}
- 11B: Proceed generally eastwards on the 170 meter contour to 69° 15' West
- 12B: Turn south on 69° 15' West to the 90 meter contour (about 19 miles)
- 13B: Proceed generally southeast on the 90 meter contour to 41° 06' North

Explanation: This option takes in the entire area identified by the hook fishermen in 1998, not just the prime area bounded by the "conservative option".

The optimal HAPC design may have a boundary drawn somewhere between the two options presented here.

- 14: Turn east (or just possibly west) on 41° 06' North to **EITHER** the 50 metre contour, **or** the 60 metre contour **or** 69° 00' West

MINIMUM OPTION:

15A: Turn south on the 50 metre contour to 40° 55' North, excluding the narrow crest of a ridge (which reaches a little above 50 meters depth) running southeast in this area – a prominent feature on the chart

16A: Proceed east on 40° 55' North to the 60 meter contour

Explanation: This area poses the most difficulty. S Mast found it to be relatively hard (though not as much as the area further north) and the hook fishermen in 1998 reported it as relatively rich. It was formerly the "clay pipes" ground. On the other hand, it is extensively dragged by both scallopers and otter trawlers, suggesting a flatter seabed with a scallop-dominated community, in contrast to most areas enclosed in the proposed boundaries.

17: From 40° 55' North, head generally southwards on the 60 meter contour to 40° 45' North

Explanation: The boundary south of 40° 55' North is set at 60 meters because scalloping, scallops and hence scallop-dominated habitat lie deeper in the area east of Asia Rip.

18: Turn west on 40° 45' North to 69° 30' West

Explanation: We have little data on the seabed around Asia Rip but the bottom south of 40° 45' North (and hence in the NLSA closed area) is certainly fine sand.

19: Turn north on 69° 30' West to 41° 15' North

20: Turn west on 41° 15' North and proceed to 2 miles off the shore of Nantucket Island

Explanation: 69° 30' West is a nominal boundary between the areas of mobile sand that lie south of Nantucket Island and the hard bottom enclosed within this HAPC. We do not have any data sets that would allow for a realistic boundary to be drawn around the sand (which is mobile anyway) but the clambers very rarely fish east of 69° 30' West, which is a strong indication that there is little sand to the eastwards. The converse cannot be confirmed, however: There may well be some hard bottom west of that line, even though the clambers work sand fingers in between.

MEDIUM OPTION:

15B: Turn south on the 60 metre contour to 40° 55' North

{16B is not used here}

MAXIMUM OPTION

15C: Turn south on 69° 00' West to 40° 55' North

16C: Proceed west on 40° 55' North to the 60 meter contour

From the point 41° 15' North 69° 30' West, the boundary should run northwest towards Chatham, while skirting around Davis Bank, which is fished by the clammers and hence is sand. The westward line towards Nantucket used here is purely nominal and designed for ease of plotting ahead of the PDT's refinement of this proposal.

- 21: Proceed south and west around Nantucket Island, remaining 2 miles offshore, to 70° 00' West – where this boundary meets the 20 meter contour and hence is contiguous with the inshore HAPC proposal

Explanation: The proposed boundary two miles off Nantucket is intended as a local substitute for the 20-meter contour used in the inshore HAPC proposal. South of the Island, there is an extensive area of tide-swept mobile sand at depths less than 20 meters that would not provide high-value habitat for juvenile cod and hence should not be included in the present HAPC.

- 22: Turn north to the MLLW mark on the shore of Nantucket Island. Turn east and north, following MLLW to Nantucket Great Point. Proceed thence straight to Monomoy Point. Follow MLLW around the back of the Cape to Race Point – taking straight lines across harbor mouths and entrances between islands as necessary. At Race Point, turn west and connect back to the starting point.

Explanation: The return to Race Point should follow the 10 or 20 meter contours, with the inshore HAPC covering waters inside that line. However, if the Council does not accept the inshore HAPC as proposed, it should still have the option of taking the South Channel HAPC into the beach since the most important habitat for young-of-the-year cod in the spring is in very shallow water.

In addition to the one primary area on the west side of the Channel, four additional areas to the eastward have been identified and should be seen as optional additions to the “strawman”:

X1: Area surrounded by the 140 meter ring contour around 41° 05' North 68° 55' West

X2: Area surrounded by the 140 meter ring contour around 41° 29' North 68° 52' West

X3: Area surrounded by the 150 meter ring contour around 41° 32' North 68° 50' West

X4: An ill-defined area centered on about 41° 20' North 69° 00' West

Explanation: The first three were areas identified by the hook fishermen in 1998. The fourth is a distinct gap in the VMS records of scalloping effort, covering an area that is reported to be exceptionally hard bottom.